City of Tracy

Ellis Program Area Finance and Implementation Plan

Think Inside the Triangle™

Approved by City Council
Resolution Number 2013-136
August 20, 2013

Prepared by:

Harris & Associates℠

Shaping the future, One project at a time℠

City of Tracy
Ellis Program Area
Finance and Implementation Plan

TABLE OF CONTENTS

List of Figures

List of Tables

INTRODUCTION

Purpose of Report

This Finance Plan offers a strategy to finance the infrastructure and public facilities necessary to serve the Ellis Program area. The infrastructure needed to serve the area is identified in this report along with Ellis' fair share of the facilities and the resulting fees required to mitigate the impacts of the Ellis development.

Project specific infrastructure for the Ellis Program Area, including traffic, storm drain, wastewater, water, recycled water, public buildings and parks, is estimated to cost approximately $72 million. The infrastructure costs are in addition to in-tract improvements that are expected to be privately funded by the developer. In-tract improvements are not addressed in this report.

Project Description

The Ellis Program Area (Ellis) is located between Lammers Road and Corral Hollow Road along the north side of the Union Pacific rail line as shown in Figure 1.

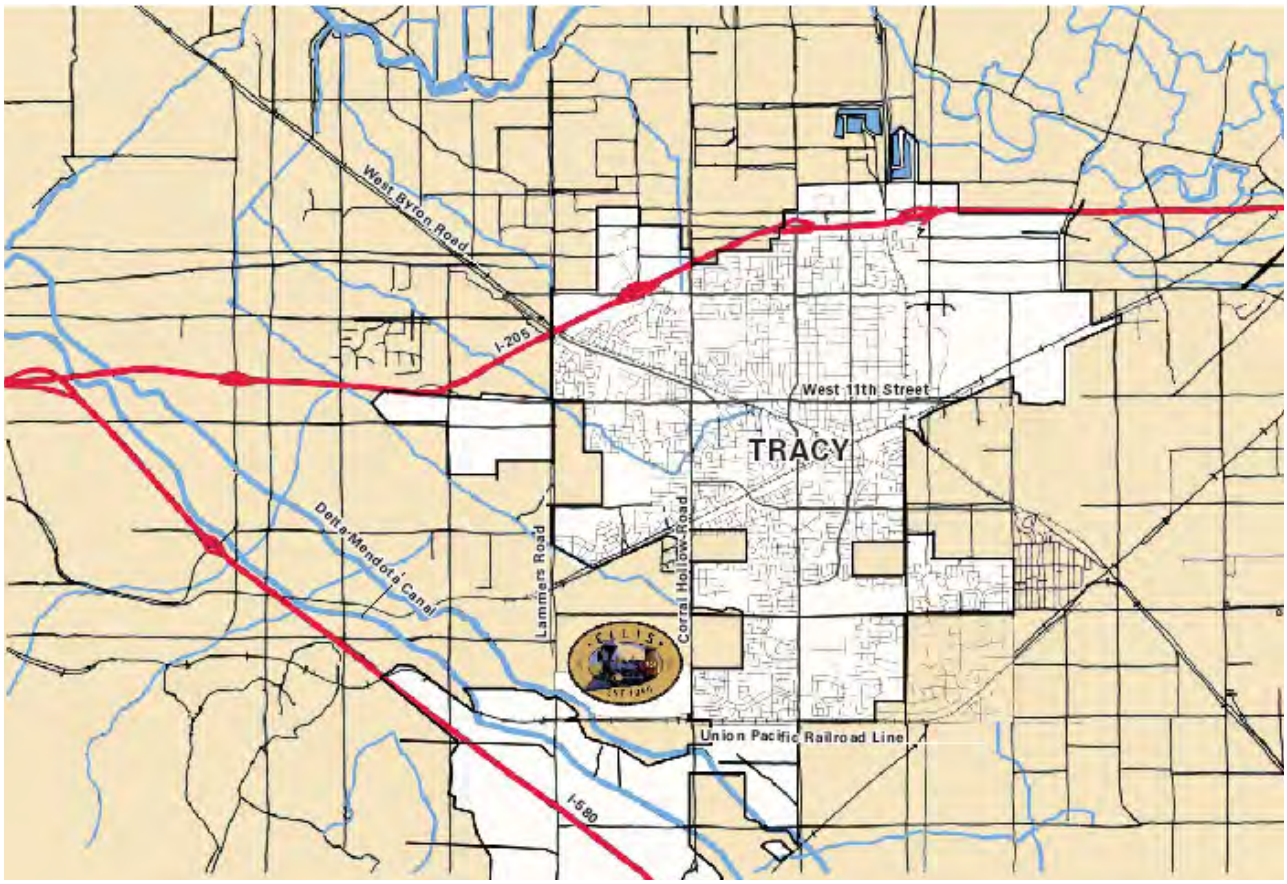


Figure 1 - Vicinity Map

Development within Ellis is expected to include a mix of residential mixed low density (RML), residential mixed medium density (RMM) and residential mixed high density (RMH), a Village Center, a commercial site, and a limited use commercial area that is planned to be a storage unit. The community will be pedestrian friendly and these uses will be within walking distance of one another. Figures 2 show the Ellis Program Area.

Figure 2 - Ellis Specific Plan Area

Land Uses

At build out, Ellis is expected to include a mix of residential mixed low density, residential mixed medium density and residential mixed high density units, a Village Center, a commercial site, and a limited use commercial area. Both the residential mixed low and residential mixed medium landuses are anticipated to be comprised of single family homes of varying lot size. Only the residential mixed high was analyzed as a multi-family dwelling unit. Figure 3 shows the Ellis program area and the various land uses that are anticipated.

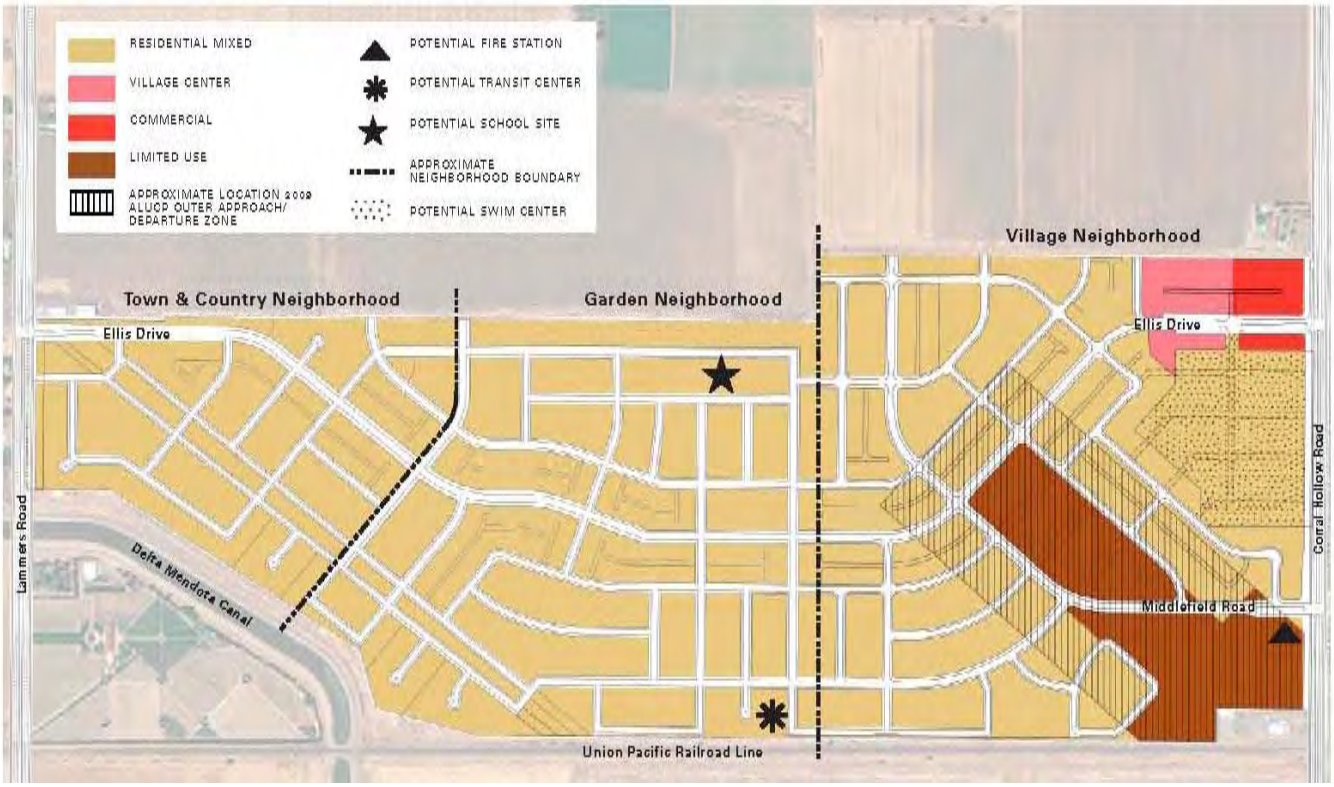


Figure 3 - Ellis Program Area Land Uses

The number of residential units as well as the anticipated square footage of non-residential is summarized in Table 1. These landuse assumptions form the basis for the technical studies that were completed for the area and in determining the total funds anticipated to be collected from the Ellis program area at buildout.

Table 1 - Ellis Program Area Land Use

	Assumed Number of Dwelling Units (DU)	Square Footage (sq ft)
Overall - Ellis Project		
Residential Mixed Low (RML)	505	
Residential Mixed Medium (RMM)	1,705	
Residential Mixed High (RMH)	40	
Village Center		60,000
Commercial (General)		40,000
Limited Use (Storage)		80,000
Overall Total - Ellis Project	**2,250**	**180,000**

Phasing

Development in the Ellis Program Area is anticipated to occur in three phases, primarily by neighborhood. It is anticipated that Phase 1 will be Village Neighborhood, Phase 2 the Garden Neighborhood and Phase 3 the Town & Country Neighborhood. The phases are illustrated on Figure 3 above. It is expected that the build out of the neighborhoods will overlap.

Finance and Implementation Plan Summary

A variety of specific capital improvement projects are outlined in the Finance and Implementation Plan (FIP). The infrastructure projects listed in this FIP are funded by development impact fees paid at the issuance of building permits. As development progresses, the timing and mix of costs and funding sources may change. Since the Ellis Program Are will be sharing major infrastructure improvements such as recycled water and wastewater conveyance improvements with other developments within the Citywide Infrastructure Master Plans, the Ellis Program Finance and Implementation Plan may be amended or superseded in the future as mutually agreed to between the City of Tracy and the Ellis Project. No debt financing was assumed in the capital improvement program for the Ellis Program Area.

Note that the FIP does not account for all the fees required by other public agencies or for regional purposes, such as school fees, habitat mitigation, or County Facilities Fee. Habitat mitigation fees are per gross acre payable at final map recordation.

In summary, this FIP does the following:

- Describes the proposed land uses
- Discusses the phasing plan for the project
- Summarizes the public facilities required to serve future development in the project
- Presents the costs of required facilities and allocates the costs to the proposed land uses
- Identifies the development impact fees
- Provides a guideline for the implementation of the Financing Plan

PROJECT INFRASTRUCTURE

The infrastructure required for new development in the Ellis Program Area includes traffic, storm drain, wastewater, water, and recycled water as well as public buildings and parks. This FIP addresses only the costs of project-specific backbone infrastructure. In-tract infrastructure is not addressed in this report.

The infrastructure requirements and associated costs within the Ellis Program Area were defined in technical studies which were prepared by the City's technical consultants and are included in their entirety as appendices. The technical studies and their authors are:

- "Ellis Program Sub-Basin Final Storm Drainage Technical Report" by Storm Water Consulting, September 2012.
- "Ellis Specific Plan Analysis Technical Memorandum" by West Yost, August 14, 2013.
- "City of Tracy Ellis Program Wastewater Analysis Finance and Implementation Program (FIP) Draft Fees" by CH2MHill, December 2012, updated August 2013.
- "Ellis Program Area Traffic Impact Fees" by Harris & Associates, December 2012.
- "Ellis Program Area Public Building Study" by Harris & Associates, December 212.
- "Ellis Program Area Parks Study" by Harris & Associates, December 2012

The technical studies identify the infrastructure required to mitigate Ellis' impacts and the associated cost estimates and development impact fees. A mark up of 40% is applied to infrastructure costs to account for soft costs such as contingencies, engineering, and administration. The breakdown of these mark ups is below:

10%	design
10%	construction management
15%	contingency
5%	program implementation

A summary of the project cost by Infrastructure is shown in Table 2 below. The costs for individual infrastructure components within the project are described in the sections following. The scope of specific improvements identified in this finance and implementation plan are not subject to change without the mutual agreement of the City of Tracy and Ellis.

Table 2 - Obligation by Improvement Category

Land Use	Public Buildings	Traffic	Wastewater	Water	Recycled Water	Storm Drain	Parks & Recreation	Total Obligation
Residential								
low	$ 1,756,908	$ 1,360,167	$ 2,323,440	$ 3,564,207	$ 1,340,270	$ 907,594	$ 4,104,857	$ 15,357,443
medium	$ 4,853,240	$ 4,592,247	$ 7,965,726	$ 10,348,905	$ 3,891,560	$ 1,673,440	$ 11,339,159	$ 44,664,277
high	$ 92,774	$ 51,713	$ 223,432	$ 163,742	$ 61,573	$ 89,154	$ 216,758	$ 899,146
Villlage Mixed Use[1]	TBD	$ 567,392	$ 4,226,859	$ 2,276,890	TBD	$ 254,256	TBD	$ 7,325,397
Non-residential								$ -
Commercial	$ 84,352	$ 1,053,496	$ 950,418	$ 1,076,835	$ 367,574	$ 586,361	$ -	$ 4,119,036
Storage		$ 24,241		$ 357,621	$ 164,362	$ 73,598	$ -	$ 619,822
Total Ellis Obligation	**$ 6,787,273**	**$ 7,649,256**	**$ 15,689,875**	**$ 17,788,200**	**$ 5,825,339**	**$ 3,584,403**	**$ 15,660,774**	**$ 72,985,120**
Outside Funding Sources		$ 5,550,000						$ 5,550,000
Total Funding	**$ 6,787,273**	**$ 13,199,256**	**$ 15,689,875**	**$ 17,788,200**	**$ 5,825,339**	**$ 3,584,403**	**$ 15,660,774**	**$ 78,535,120**

[1] The fees for the Village Mixed Use will be determined once the exact landuse is known.

The cost of the infrastructure burden shown above is shared by the various land uses, based on proportional demand from each land use. The development impact fees are summarized below in Table 3. An annual ENR adjustment using the San Francisco Construction Cost Index will be made to the fees on January 1st of each year. In addition, the City will do a more detailed update as needed to update all project costs, development assumptions, completed projects and ultimately to calculate new development impact fees. Development impact fees will be paid either at Certificate of Occupancy or at the time of the building permit as set forth in the approved Development Agreement (DA) for the project.

Table 3 - Fees by Land Use

	Public Buildings[1]	Traffic	County Traffic	Wastewater[4]	Water	Recycled Water[4]	Storm Drain	Parks & Recreation	Total Fee[2,3]
Residential (per unit)									
RML	$3,479	$2,693	$1,500	$8,337	$ 7,058	$ 2,654	$ 1,797	$8,128	$35,647
RMM	$2,846	$2,693	$1,500	$6,753	$ 6,070	$ 2,282	$ 981	$6,651	$29,777
RMH	$2,319	$1,293	$720	$5,586	$ 4,094	$ 1,539	$ 2,229	$5,419	$23,199
Non-residential (per acre)									
Commercial	$ 2,369	$42,825	$ -	$43,352	$ 39,736	$ 14,942	$ 23,836	$ -	$164,691
Storage	$ 2,369	$ 2,693	$ -	$3,168	$ 39,736	$ 14,942	$ 6,691	$ -	$67,230

[1]Public Buildings fees are per building SF, the fee shown assumed only 180,000 SF of building over 35.6 acres as provided by the developer.

[2]Residential: per unit, Commercial: per Ac

[3]Fees do not include school fees, habitat mitigation fees, county fees, etc.

[4]Fees are from the 2013 Citywide Mater Plan.

Absorption

While an absorption schedule is simply an estimate of unpredictable future events, it is a critical assumption that drives the entire financing strategy. The timing of fee revenues, phasing of facilities, and every other component of an analysis that accounts for timing issues, are dependent on the absorption schedule. Facilities funded with fee revenues will be constructed only as fee revenues become available. The estimated absorption schedule is included in Appendix A, Table 1.

In some cases, developers will be required to build infrastructure up-front and will receive reimbursements or credits as established through agreement with the City. Building permits expire twenty four (24) months from their date of issuance to the Ellis Program Area.

Fee Revenues

By the end of build-out, estimated to occur in 2023, approximately $72 million will be collected through the fee program to fund the infrastructure identified in this FIP.

CAPITAL IMPROVEMENT PROGRAM

The City of Tracy adopts an annual Capital Improvement Program and Capital Budget for each fiscal year. The Capital Improvement Program is the City's comprehensive multi-year plan for the development of the City's capital facilities and improvements. The Ellis Program has the obligation to mitigate its impacts by providing new or expanded facilities. The Ellis Program improvements, as described in this document as various CIP projects, will be added to the City's Capital Improvement Program. Funding for the CIP projects will come from the Ellis Program development, as described in the Ellis Program Finance Plan section of this document.

The format for the City's Capital Improvement Program involves functional grouping of the CIP projects. All CIP projects of similar types are listed in the same category and, in many cases, are funded from a variety of sources. The CIP functional groups that apply to The Ellis projects include the following:

Group 71: General Government & Public Safety Facilities
Group 72: Traffic Safety
Group 73: Streets & Highways
Group 74: Wastewater Improvements
Group 75: Water Improvements
Group 76: Drainage Improvements
Group 78: Parks
Group 79: Project Management

Group 71: Public Buildings

Projects within the Ellis Program Area will pay a Public Building development impact fee at Building Permit for CIP projects described in this section. The Ellis Program Area's obligation is based on a report titled "Ellis Program Area Public Building Study" by Harris & Associates, dated December 2012 and adopted concurrently with this FIP. The Harris report is based on the Citywide Public Building Fee which was last updated on April 3, 2012 with the Infill report.

The 2012 calculated cost per capita is $1054 for residential development and $235 for non-residential development. This cost per capita is converted into a fee for each land use based on assumed densities of 3.3 people per residential mixed low density unit, 2.7 people per residential mixed medium density unit, 2.2 people per residential mixed high density unit, one worker per 300 square feet in office land use and one worker per 500 square feet in commercial land use. The Ellis Program Area "Public Building Fees" will be collected into one fund account. Table 4 below summarizes the fees and revenue to be collected under this fee:

Table 4 – Ellis Public Building Fee Summary

	Fee Per Capita	People per Dwelling Unit	Fee Per Residential dwelling unit or 1000 SF Commercial	Fee per Residential Dwelling Unit or SF Commercial	Number of Residential Dwelling Unit or SF Commerical	Buildout Obligation
Residential						
RML	$ 1,054.25	3.3	$ 3,479	$ 3,479	505	$ 1,756,908
RMM	$ 1,054.25	2.7	$ 2,846	$ 2,846	1,705	$ 4,853,240
RMH	$ 1,054.25	2.2	$ 2,319	$ 2,319	40	$ 92,774
Total Residential:					**2,250**	**$ 6,702,922**
Commercial/Storage			$ 469	$ 0.47	180,000	$ 84,352
Total:						**$ 6,787,273**

Notes:
Citywide fee from *Citywide Fee Update* prepared by Harris & Associates, adopted on April 3, 2012

Table 5 shows the Public Building Fee breakdown by facility. The various components were calculated using the methodology in the currently adopted Citywide Public Building Fee Study. Funding from Ellis will be credited to specific projects once the new Citywide Public Building and Public Safety Master Plans are completed. Should the Ellis program dedicate land to the City for the construction of a fire station or other public facility, the value of the land and any construction costs incurred by the developer can be used to off-set the development impact fees.

Table 5 - Ellis Public Building Fee Breakdown by Facility

CIP #	Project	Project Cost	Program Management	Total Cost
71PP-xx	City Hall & Public Works Facilities	$ 2,466,434	$ 91,349	$ 2,557,784
71PP-xx	Community Center	$ 1,206,812	$ 44,697	$ 1,251,509
71PP-xx	Library	$ 1,118,404	$ 41,422	$ 1,159,826
71PP-xx	Public Safety Facilities	$ 1,753,220	$ 64,934	$ 1,818,154
Total Obligation		**$ 6,544,870**	**$ 242,403**	**$ 6,787,273**

Group 72 & 73: Traffic Improvements

Ellis Program Area will pay a traffic development impact fee at building permit for CIP projects described in this section. The projects are detailed in the October, 2012 report titled "Ellis Program Area Traffic Impact Fees" by Harris & Associates, which will be adopted concurrently with this Finance Plan.

Fehr and Peers prepared a memo titled "Project Proportional Share Calculations for Ellis Specific Plan Traffic Mitigations" dated December, 2012. This memo identified Ellis' fair share contribution towards citywide intersection and road improvements. Harris & Associates prepared cost estimates for each of these improvements and calculated Ellis' fair share contribution towards each project based on the percentage responsibility from Fehr and Peers' memo.

The description of each of these projects and their associated costs are shown in Table 6:

Table 6 - Summary of Ellis Intersection Costs

CIP No.	Location	Improvements	Project Cost	Program Management	Total Cost
72PP-XXX	Patterson Pass/I-580 EB	Signalize. Widen EB approach to provide 1 LT and 1 TR lane, Widen NB approach to provide 1 Thru and 1 RT lane, Widen SB approach to provide 2 LT and 1 Thru lane	$ 23,381	$ 866	$ 24,247
72PP-XXX	Patterson Pass/I-580 WB	Signalize. Widen WB approach to provide 1 TL and 1 RT lane. Widen SB approach to provide 1 thru lane and 1 RT lane.	$ 57,162	$ 2,117	$ 59,279
72PP-XXX	Corral Hollow/I-580 EB	Signalize. Widen EB approach to provide 1 LT and 1 TR lane. Widen NB approach to provide 1 thru lane and 1 RT lane, Widen SB approach to provide 1 LT lane and 2 Thru lanes.	$ 52,608	$ 1,948	$ 54,556
72PP-XXX	Corral Hollow/I-580 WB	Signalize. Widen WB approach to provide 1 TL and 1 RT lane, Widen NB approach to add 1 Thru lane, widen SB approach to provide 2 thru lanes and 1 RT lane.	$ 58,453	$ 2,165	$ 60,618
72PP-XXX	Lammers Rd./Valpico	Signalize, Widen WB approach to provide 1 LT and 1 RT lane, Widen NB approach to add 2 thru lanes, widen SB approach to provide 1 SB LT and 3 thru lanes.	$ 314,019	$ 11,630	$ 325,649
72PP-XXX	Lammers Rd./Schulte Rd.	Signalize. Widen EB approach to provide 1 LT and 1 TR lane, add WB approach to 1 LT and 1 TR lane, widen NB approach to add 1 thru lane and 1 TR lane, widen SB approach to add 1 TL and 1 Thru lane.	$ 675,035	$ 25,001	$ 700,036
72PP-XXX	Corral Hollow/ Linne Rd	Signalize. Convert intersection to T with no EB Approach, widen WB approach to add 1 LT and 1 TR lane, widen NB approach to provide 2 Thru lanes and 1 RT lane, Widen SB approach to provide 1 LT and 2 Thru lanes.	$ 415,304	$ 15,382	$ 430,686
72PP-053	Corral Hollow/Valpico Rd	Signalize & widen SB approach to provide 1 TL and 1 TR Lane	$ 404,482	$ 14,981	$ 419,462
72PP-021	Corral Hollow Rd/Schulte Rd	Widen EB approach to add 1 LT and 1 Thru, Widen WB approach to provide 1 LT, 3 Thru and 1 RT lane, Widen NB approach to provide 2 LT, 3 Thru, and RT lane, Widen SB approach to provide 2 LT, 3 Thru, and 1 RT lane. Convert EB RT from permitted to free, modify signal and adjust phasing.	$ 168,367	$ 6,236	$ 174,603
72PP-XXX	Corral Hollow Rd/Eleventh St	Widen NB approach to add 1 thru Lane, Widen SB approach to add 1 thru lane, Convert EB and WB RT lanes from permitted to free. Modify Signal.	$ 120,697	$ 4,470	$ 125,168
NA	Corral Hollow/Grant Line	Widen EB approach to add 1 LT and 1 Thru Lane, Widen WB approach to provide 2 LT, 3 Thru, and 1 RT lane, Reduce NB LT lanes from 3 to 2, and add 1 Thru lane, Widen SB approach to provide 2 LT, 3 Thru, and 1 RT lane, convert EB RT lane from permitted to free, made new WB and SB RT lanes free.	Project is fully constructed to full ROW		
72PP-XXX	Tracy Blvd/Linne Rd	Signalize. Widen EB approach to provide 2 LT and 3 Thru Lanes, Widen WB approach to provide 1 TL and 1 TR lane, Widen SB approach to provide 1 LT, 2 Thru, and 1 RT lane.	$ 177,088	$ 6,559	$ 183,647
72038	Tracy Blvd/Valpico Rd	Widen EB approach to add 1 thru lane, widen WB approach to provide 1 LT, 2 thru and 1 RT lane, Widen NB approach to provide 1 LT, 2 Thru, and 1 RT lane, Widen SB approach to provide 2 LT, 1 thru, and 1 RT lane. Modify Signal.	$ 57,388	$ 2,125	$ 59,513
72PP-XXX	MacArthur/Linne Rd.	Signalize. Widen EB approach to provide 1 LT, 1 Thru and 1 TR lanes, widen WB approach to provide 1 TL and 1 TR lane.	$ 246,486	$ 9,129	$ 255,615
72037	MacArthur Drive/Valpico Rd	Widen EB approach to add 1 Thru Lane, Widen SB approach to add 1 Thru Lane, Convert WB and NB LT from protected to permitted. Modify Signal.	$ 43,432	$ 1,609	$ 45,041
72PP-XXX	Chrisman/Linne	Widen EB approach to provide 1 TL and 1 TR lane, widen SB approach to provide 1 TL and 1 TR lane.	$ 44,714	$ 1,656	$ 46,370
72PP-XXX	Chrisman/Valpico	Re-stripe to modify NB approach to provide 1 LT and 1 thru lane. Re-stripe to modify SB approach to provide 1 Thur and 1 RT.	$ 1,143	$ 42	$ 1,186
72PP-XXX	Chrisman/Schulte	Modify NB approach to add 1 Thru lane.	$ 370,802	$ 13,733	$ 384,536
72PP-XXX	Chrisman/11th	Convert SB RT from permitted + overlap phasing to permitted.	$ 506	$ 19	$ 525
72024 & 72056	Lammers Road/Eleventh St	Total Intersections:	$ 7,920	$ 293	$ 8,214
72PP-XXX	Byron/Grant Line	Add EB LT, Thru lane and RT lane, Add WB LT, 2 thru and RT. Add NB LT ,1 thru, and 2 RT lanes. Add SB Thru.	Project is in County and project is under implementation by County.		
72PP-XXX	Lammers/I-580 EB	Intersection Improvements[1]	$ 190,909	$ 7,071	$ 197,979
72PP-XXX	Lammers/I-580 WB	Intersection Improvements[1]	$ 332,603	$ 12,319	$ 344,921
		Total Intersections:	**$ 3,762,499**	**$ 139,352**	**$ 3,901,850**
		Grant/RTIF Funding			**$ (1,640,643)**
		Ellis Intersection Total			**$ 2,261,207**

Notes:

[1] Costs taken from TMP masterplan June 2012 and includes ROW

XXX Designates a new project that will need a CIP number assigned to it.

EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

LT = Left-Turn; RT = Right-turn; TR = Through-Right; TL = Through-Left

Project costs for roadways are estimated on a per linear foot basis. The project costs are broken down into two elements, program portion and frontage portion. The frontage portion covers landscaping, sidewalk curb and gutter, and 20 feet of pavement. The program portion includes the center lanes and median. Frontage improvements are constructed by the adjacent development and the program portion is funded through the fee program. However, on certain key roads, the City felt it was necessary for the City to collect money to complete construction of the road from curb to curb and therefore this cost was included in the fee program. The costs shown in Table 7 for Schulte and Lammers Roads include this curb to curb cost consistent with the 2012 Citywide Transportation Master Plan.

A 40% mark-up is included on these costs to include contingency, design, program management and construction management. Right-of-way costs were included at $100,000 per acre which includes both the cost of the land and the costs associated with acquiring the land.

Based on the Fehr and Peers memo discussed above and the construction cost estimates prepared by Harris & Associates, Ellis' fair share contribution towards the citywide road projects was calculated. The projects, descriptions and associated costs, for the roadway mitigation are listed in Table 7:

Table 7 - Summary of Ellis Road Costs

CIP Number	Road	Extents	Improvement	Project Cost	Program Management	Total Cost
73PP-XXX	Valpico Road	Corral Hollow Road to west of Sycamore	Rural to 4 lane Arterial	$ 445,771	$ 16,510	$ 462,281
73PP-XXX	Valpico Road	Tracy Blvd to MacArthur Blvd.	Rural to 4 lane Arterial	$ 147,987	$ 5,481	$ 153,468
73PP-XXX	Schulte Road [1]	New Alignment west of Lammers	New 6 lane roadway	$ 1,631,121	$ 60,412	$ 1,691,533
N/A	Schulte Road	Corral Hollow to Tracy Blvd	Widen to 6 lanes	Project Completed		
73PP-XXX	11th Street	West of Lammers Road	Widen to 6 lanes	$ 442,053	$ 16,372	$ 458,425
73PP-XXX	Grant Line Road	Byron to Corral Hollow	Widen to 6 lanes	$ 413,247	$ 15,305	$ 428,553
73PP-XXX	Lammers Road[1]	I-205 to Eleventh Street realign to new interchange	New 6 lanes expressway	$ 449,368	$ 16,643	$ 466,011
73092		Eleventh Street to Schulte	Widen to 6 lanes	Project Under Construction		
73PP-045		Schulte to Valpico	2 lane rural to 4 lane parkway	$ 858,756	$ 31,806	$ 890,562
73PP-046		Valpico Rd. to Ellis Drive	2 lane rural to 4 lane parkway	$ 875,575	$ 32,429	$ 908,003
73PP-047		Ellis Drive to I-580	2 lane rural to 4 lane parkway	$ 1,302,053	$ 48,224	$ 1,350,278
73102/73103	Corral Hollow Road	Grant Line to Schulte	Widen to 6 lanes	Project Fully Funded by Other projects		
73PP-046		Schulte Road to Valpico Road	2 lanes to 4 lane arterial	$ 432,021	$ 16,001	$ 448,022
73PP-046		Valpico to Ellis Drive	Rural to 4 lane arterial	$ 667,424	$ 24,719	$ 692,144
73PP-046		Ellis Drive to Linne Road	Rural to 4 lane Arterial	$ 406,468	$ 15,054	$ 421,523
73PP-XXX		Linne Road to I-580	Rural to 4 lane Arterial	$ 821,260	$ 30,417	$ 851,677
73PP-XXX	MacArthur Drive	Schulte to Valpico	2 lanes to 4 lane arterial	$ 72,251	$ 2,676	$ 74,927
			Subtotal Roads:	**$ 8,965,355**	**$ 332,050**	**$ 9,297,405**
			Grant/RTIF Funding			**$ (3,909,357)**
			Ellis Road Improvement Total			**$ 5,388,049**

Note:
[1]Curb to curb costs are included in the program cost.
XXX Denotes a new project that will need a CIP number assigned to it.

Based on the road and intersection costs that serve an estimated 2840 EDU's including the aquatic center traffic, the traffic impact fees are calculated as follows:

Table 8 - Traffic Fee Calculation

	Units/Ac	EDU's/Unit	EDU's
RML	505 units	1	505
RMM	1705 units	1	1705
RMH	40 units	0.48	19.2
Village Mixed Use	20 ac	10.53	210.66
Commercial	24.6 ac	15.9	391.14
Storage Unit	9 ac	1.0	9
Total EDU's:			2,840
Intersection Costs			$ 3,901,850
Road Costs			$ 9,297,405
RTIF Funding/Measure K			$ (5,550,000)
Total Ellis Funded Cost			$ 7,649,256
Cost per Unit or Acre			**$ 2,693**
RML Fee	*per unit*		$ 2,693
RMM Fee	*per unit*		$ 2,693
RMH Fee	*per unit*		$ 1,293
Village Mixed Use Fee	*per acre*		$ 28,370
Commercial Fee	*per acre*		$ 42,825
Storage Fee	*per acre*		$ 2,693

It should be noted that the RML and the RMM units pay the same fees which the RMH pays a lower fee. This is due to the fact, that single family versus multi-family is the factor that distinguishes a lower trip generation rate per unit, not the size of the lots. Both our RML and RMM high landuses are assumed to be single-family homes. Only the RMH is assumed to be multi-family.

In addition to the cost of projects to mitigate the impact of the project, the City will also collect a County Fee of $1500 per single family residential dwelling unit and $720 per multi-family residential dwelling unit that will be remitted to the Joint Powers Authority to fund regional transportation improvements as follows:

- $500 of this fee shall be applied to regional transportation improvement projects within San Joaquin County to improve I-205 and I-580.

- $500 of the fee shall be applied to regional transportation improvements projects within San Joaquin County that are specifically recommended by the JPA and implemented for purpose of reducing the number of vehicle trips on either I-205 or I-580 bound for outside San Joaquin County through the County of I-580 or diverting or reducing trips on Corral Hollow/Tesla Road, Patterson Pass Road, and or/Grant Line and the Old Altamont Pass Roads.

- $500 of the fee shall be expended by the JPA solely for purposes of transportation improvement projects or trip reduction projects within Alameda County.

The fee calculation assumes that a portion of the project costs will be paid through funds received through Grant Funding or through County TIF funds. Should this money not be received as anticipated, the fees will need to be updated in the future.

The total traffic fees due at building permit for the Ellis Specific Plan project are shown in Table 9 below:

Table 9 - Traffic Fee

	EDU Factor	City Fee	County Fee	Total Fee
RML	1	$ 2,693	$ 1,500	$ 4,193
RMM	1	$ 2,693	$ 1,500	$ 4,193
RMH	0.48	$ 1,293	$ 720	$ 2,013
Village Mixed Use (per ac)	10.53	$ 28,370	See Note 1	$ 29,870
Commercial (per ac)	15.9	$ 42,825	0	$ 42,825
Storage (per ac)	1.0	$ 2,693	0	$ 2,693

Note 1: Residential Units must pay the fee the County fee. Depending on the specific landuse, the fees for VMU will be determined at the time fees are due.

The total amount that the City will be collecting to fund projects within the City from the Ellis program area is shown in Table 10 below:

Table 10 - Ellis Traffic Obligation

	Units		Fee	Total Cost
RML	505	units	$ 2,693	$ 1,360,167
RMM	1705	units	$ 2,693	$ 4,592,247
RMH Fee	40	units	$ 1,293	$ 51,713
Village Mixed Use	20	ac	$ 28,370	$ 567,392
Commercial	24.6	ac	$ 42,825	$ 1,053,496
Storage Unit	9	ac	$ 2,693	$ 24,241
Total City Fees:				**$ 7,649,256**

Group 74: Wastewater Improvements

Ellis Program Area's obligation for wastewater treatment plant capacity and wastewater conveyance will be financed with development impact fees paid at the time a building permit is issued. The Ellis Program Area's obligation for wastewater treatment and conveyance is based on CH2M Hill's report "City of Tracy Ellis Program Wastewater Analysis Draft Finance and Implementation Program (FIP) Fees", dated Decenber 2012, Updated August 2013 and adopted concurrently with this report. A summary of the obligation for Wastewater Improvements is shown below:

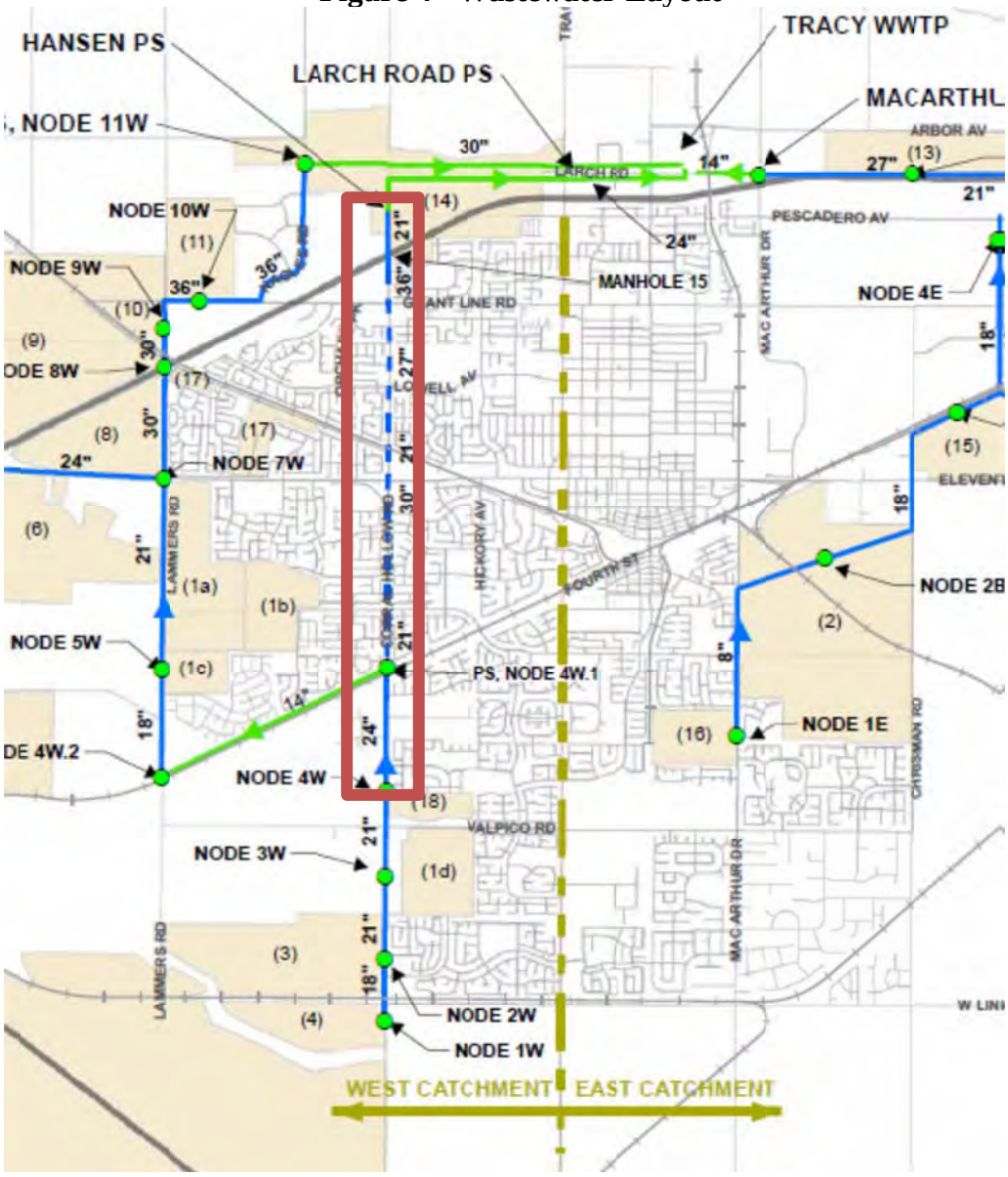
Table 11 - Summary of Wastewater Improvements

CIP #	Project	Project Cost	Program Management	Total Cost
74PP-xx	Corral Hollow Sewer System Improvements	$ 3,186,118	$ 118,004	$ 3,304,123
74PP-xx	Tracy WWTP Expansion Fee	$ 11,943,404	$ 442,348	$ 12,385,752
Total Obligation		**$ 15,129,522**	**$ 560,353**	**$ 15,689,875**
Ellis Wastewater Contibution		**$ 15,129,522**	**$ 560,353**	**$ 15,689,875**

There is limited availability in the Eastside sewer system, until other projects that are designated to discharge to the Eastside sewer system are developed. Ellis could use this available capacity on an interim basis for Storage, the Swim Center, and the first 250 single family units. All other future development is assumed to connect to the Corral Hollow sewer system.

Approximately 12,300 LF of pipe upgrade is needed for the Corral Hollow sewer system to convey the build out flows from the Ellis Program. as shown in Figure 3. The dashed line indicates existing pipeline that needs to be upgraded with a new gravity line. The solid blue line indicates a new gravity line and the green line indicates a new force main is needed. As part of the Ellis project the portion in the red box (the portion from Node 4W north to the Hansen PS) is required as well as upgrades to the Hansen pump station. It is recommended that the upgrades be completed from the downstream end since the capacity is restrained at the downstream portion of the Corral Hollow sewer system.

Figure 4 - Wastewater Layout



The first 550 residential units from Ellis will not pay sewer conveyance fees in accordance with the Ellis Development Agreement. There is enough capacity in the existing Corral Hollow line for the first 330 equivalent single family units, assuming a new sewer line is installed from the Ellis program to the existing Corral Hollow sewer. Beyond the initial 330 units, the Corral Hollow sewer must be improved in accordance with the Tracy Wastewater Masterplan dated March 2012 completed by Ch2MHill.

The Corral Hollow upgrades can be completed as a single project or as a multi-phase project. These two options are described in more detail in CH2MHill's report, "City of Tracy Ellis Program Wastewater Analysis" prepared December 2012 and updated August 2013 and included in the Appendix. For

purposes of the fee calculation, it was assumed that the pipe would be upgraded in one phase as was assumed in the 2013 Citywide master plan. This alternative is the least costly, but requires a higher upfront cost. Should this option not be implemented, wastewater impact fees will need to be updated in the future.

The total wastewater system fee is the sum of the Corral Hollow sewer improvement fee and the Wastewater Treatment Plant improvement fee. The existing Corral Hollow sewer system needs improvements to convey additional wastewater flows from the Ellis Program and other infill projects. Ellis' fair share of these improvements is shown in Table 11 above.

The WWTP expansion from 9 mgd to 21.1 mgd is planned over five or more phases. Ellis will pay the WWTP fee per the 2013 Citywide Master Plan for all units beyond the first 800 equivalent single family homes. The anticipated WWTP fee is shown in Table 12 below. Ellis' contribution towards the WWTP expansion is shown in Table 11.

The Wastewater System improvement fee is shown in Table 12:

Table 12 - Wastewater System Fee

Landuse	EDU Factor	Corral Holllow Upgrade	WWTP Fee	Total Fee Per Unit/Ac
RML	1.0	$ 1,610	$ 6,727	$ 8,337
RMM	0.81	$ 1,304	$ 5,449	$ 6,753
RMH	0.67	$ 1,079	$ 4,507	$ 5,586
Commercial (per ac)	5.2	$ 8,372	$ 34,980	$ 43,352
Storage (per ac)	0.38	$ 612	$ 2,556	$ 3,168

Group 75: Water & Recycled Water Improvements

The Ellis Program Area will be required to construct entirely new water supply, treatment and storage facilities. All development will pay a water fee due at building permit. These water improvements are based on West Yost Associates' report entitled "Ellis Specific Plan Water System Analysis – Technical Memorandum" dated August 14, 2013 and adopted concurrently with this report. This report presents the Ellis Specific Plan area's water system analysis and calculates fair-share water system costs. No excess water system facility capacity exists for Ellis' use, and new supply, treatment plants, pumping plants, transmission mains, and backup generators will be required to provide appropriate water service. The total estimated cost for the facilities is shown in Table 13:

Table 13 - Water Project Costs

CIP #	Item	Unit	Unit Price	QTY	Total Construction Cost	Total Mark-up	Total Cost	Ellis %	Project Cost	Program Management	Total Cost
75PP-XX	City - Side Booster Pump Station Pressure Zone 3 - 6.48 MGD (JJWTP)	ea	$1,852,675	1	$1,852,675	$741,070	$2,593,745	37%	$926,100	$34,300	$960,400
75PP-XX	Clearwell at JJWTP 2.0 MG	ea	$3,251,699	1	$3,251,699	$1,300,680	$4,552,379	63%	$2,760,750	$102,250	$2,863,000
75PP-XX	John Jones Water Treatment Plant Expansion 15.0 mgd	ea	$33,269,046	1	$33,269,046	$13,307,618	$46,576,664	15%	$6,527,250	$241,750	$6,769,000
75PP-XX	Long-term Emergency Groundwater Storage 2,500 gpm	ea	$2,500,000	1	$2,500,000	$1,000,000	$3,500,000	26%	$893,700	$33,100	$926,800
	Land Acquisition	ac	$184,316	0.25	$46,079	$0	$46,079	100%	$44,357	$1,643	$46,000
On-site Backbone Pipelines											
75PP-XX	Water Transmission Line 12" (ESP backbone Phase 1)	LF	$210	8700	$1,827,000	$730,800	$2,557,800	37%	$913,950	$33,850	$947,800
75PP-XX	Water Transmission Line 12" (ESP backbone Buildout)	LF	$210	4370	$917,700	$367,080	$1,284,780	37%	$459,000	$17,000	$476,000
75PP-XX	Water Transmission Line 12"(ESP Backbone - Phase 1 to Valpico Rd)	LF	$210	2615	$549,150	$219,660	$768,810	37%	$274,050	$10,150	$284,200
Water Transmission Mains from JJWTP Z3-City-side BPS											
75PP-XX	Water Transmission Line 24"(JJTP Clearwell to PBS3)	LF	$375	35	$13,125	$5,250	$18,375	37%	$6,557	$243	$6,800
75PP-XX	Water Transmission Line 20"(ESP-JJWTP BPS3 to Corral Hollow Rd and Linne Rd. Phase 1)	LF	$320	9300	$2,976,000	$1,190,400	$4,166,400	37%	$1,487,700	$55,100	$1,542,800
75PP-XX	Water Transmission Line 20"(Corral Hollow Rd and Linne Rd to Middlefield Rd. - buildout)	LF	$320	7950	$2,544,000	$1,017,600	$3,561,600	37%	$1,271,700	$47,100	$1,318,800
75PP-XX	Water Transmission Line 18"(ESP Corral Hollow Rd and Linne Rd to Middlefield Rd - buildout)	LF	$300	705	$211,500	$84,600	$296,100	37%	$105,300	$3,900	$109,200
75PP-XX	Water Transmission Line 18"(ESP-Linne Rd. to Corral hollow Rd. Phase 1 - PZ2 Bypass)	LF	$300	120	$36,000	$14,400	$50,400	36%	$17,550	$650	$18,200
75PP-XX	Water Transmission Line 16"(from existing Clearwell No. 2 to English Oaks)	LF	$230	7705	$1,772,150	$708,860	$2,481,010	37%	$885,600	$32,800	$918,400
75PP-XX	20" Jack and Bore under Delta Mendota Canal	LF	$1,005	458	$460,290	$184,116	$644,406	37%	$229,500	$8,500	$238,000
75PP-XX	20" Jack and Bore (CH and Linne under Railroad)	LF	$1,005	250	$251,250	$100,500	$351,750	37%	$125,550	$4,650	$130,200
Water Transmission Lines to move Portion of Plan C into Zone 3											
75PP-XX	Water Transmission Line 12" (Whirlaway Ln. to Linne Rd.)	LF	$210	563	$118,230	$47,292	$165,522	37%	$59,400	$2,200	$61,600
75PP-XX	12" Jack and Bore (SW Portion of Plan C under RR to Linne Rd.)	LF	$690	150	$103,500	$41,400	$144,900	37%	$51,107	$1,893	$53,000
Valve Connections											
75PP-XX	18" Check Valve Connection at Middlefield Dr.	EA	$84,000	1	$84,000	$33,600	$117,600	37%	$41,850	$1,550	$43,400
75PP-XX	Connection at Middelfield Drive 12" Diameter bypass PZ2 on Corral Hollow, Jack and Bore (SW portion of the Plan C under Corral Hollow	LF	$690	60	$41,400	$16,560	$57,960	37%	$20,636	$764	$21,400
75PP-XX	Pressure Reducing Valve ESP - Phase 1 to Valpico Rd (12-inch Diameter)	EA	$102,000	1	$102,000	$40,800	$142,800	37%	$51,300	$1,900	$53,200
Total:					**$52,926,794**	**$21,152,286**	**$74,079,080**		**$17,152,907**	**$635,293**	**$17,788,200**
Ellis Water Contribution:									**$17,152,907**	**$635,293**	**$17,788,200**
75PP-xx	Citywide Recycled Water Contribution						$5,825,339	100%	$5,617,291	$208,048	$5,825,339
Total Ellis Water/Recycled Water Contribution										**$843,341**	**$23,613,539**

The Ellis Program area is divided into three phases for this water system analysis: Initial Phase 1,Phase 1 and build-out. Ellis Phase 1 consists of approximately 153 acres located on the east side of Ellis. Ellis Phase 1 is divided by the City's existing Pressure Zone 2/3 boundary, with the northern portion (approximately 47 acres which includes a portion of the Village Mixed Use Area within Pressure Zone 2 and the remaining area within Pressure Zone 3 (see Figure 5). The ultimate design for Ellis assumes most of the area will be served as part of Pressure Zone 3. The Initial Phase 1 configuration included construction of approximately 540 homes in Pressure Zone 2 and Pressure Zone3, including the Mixed Village Use area.

The initial residential units located in the Pressure Zone 2 area of Phase 1 can, in the interim, be provided with supply from the existing system and therefore, may be constructed prior to the building of the 2.0 MG clearwell (Phase 1 storage) and 6.48 million gallon per day (mgd) booster pump station infrastructure. If Phase 1 includes any areas within Pressure Zone 3, a Pressure Zone 3 pump will need to be installed.

West Yost evaluated the feasibility of supplying an Initial Phase 1 configuration, which would include all 450 units within the Ellis Phase service area and the Village Mixed Use area as shown in Figure 6. Under this proposed configuration and demand condition, the required fire flow can be supplied to all areas in Phase 1 with the construction of two check valve connections to Pressure Zone 2. To serve this configuration the recommended pipelines, as shown in Figure 6 will be required including the Pressure Zone 3 booster pump at the JJWTP's Clearwell No. 2. Currently, Ellis is planning to implement Initial Phase 1 which includes only the residential units and the Village Mixed Use area.

Previously approved specific plans that have been allotted water in the existing system are not fully built out and do not expect to be completed for several years. Therefore, the City has existing storage capacity on an interim basis available for use. West Yost has assumed that no new storage facility will be constructed to serve the first 450 units in the initial Phase 1 area. Once the initial allotment of 450 units has been reached, or other specified time is agreed to by the City, the Ellis will be required to construct some storage in Pressure Zone 3. It is assumed that Ellis will pursue the option of developing an ASR well on-site or at the JJWTP, in-lieu of construction of an on-site storage tank, or other tank in Pressure zone 3 to meet their emergency storage requirements. Therefore, in addition to the ASR well, Ellis will be required to construct an additional 1.1 MG of active storage (1.2 MG of total storage) to complete build-out. To complete Phase 1, without having to construct an ASR well, it was assumed that Ellis would share in the cost to construct the new 2.0 MG clearwell, Clearwell No. 3 at the JJJWP. Phase 1 build-out would require 0.94 MG of storage or approximately forty-seven (47) percent of the capacity of Clearwell No. 3.

For the initial Ellis Phase 1, the proposed Pressure Zone 3 Pump Station at the JJWTP would serve the area during a peak hour demand condition. Maximum day demands and maximum day demand plus a 1,500 gpm fire can be provided directly from the Pressure Zone 2 system, without additional pumping, however two check valves will be required, see Figure 6.

See Technical Memorandum prepared by West Yost and included in the Appendix of this report for more information. The location and sizes of the facilities required to serve the Ellis Program Area at build-out are shown in Figure 8.

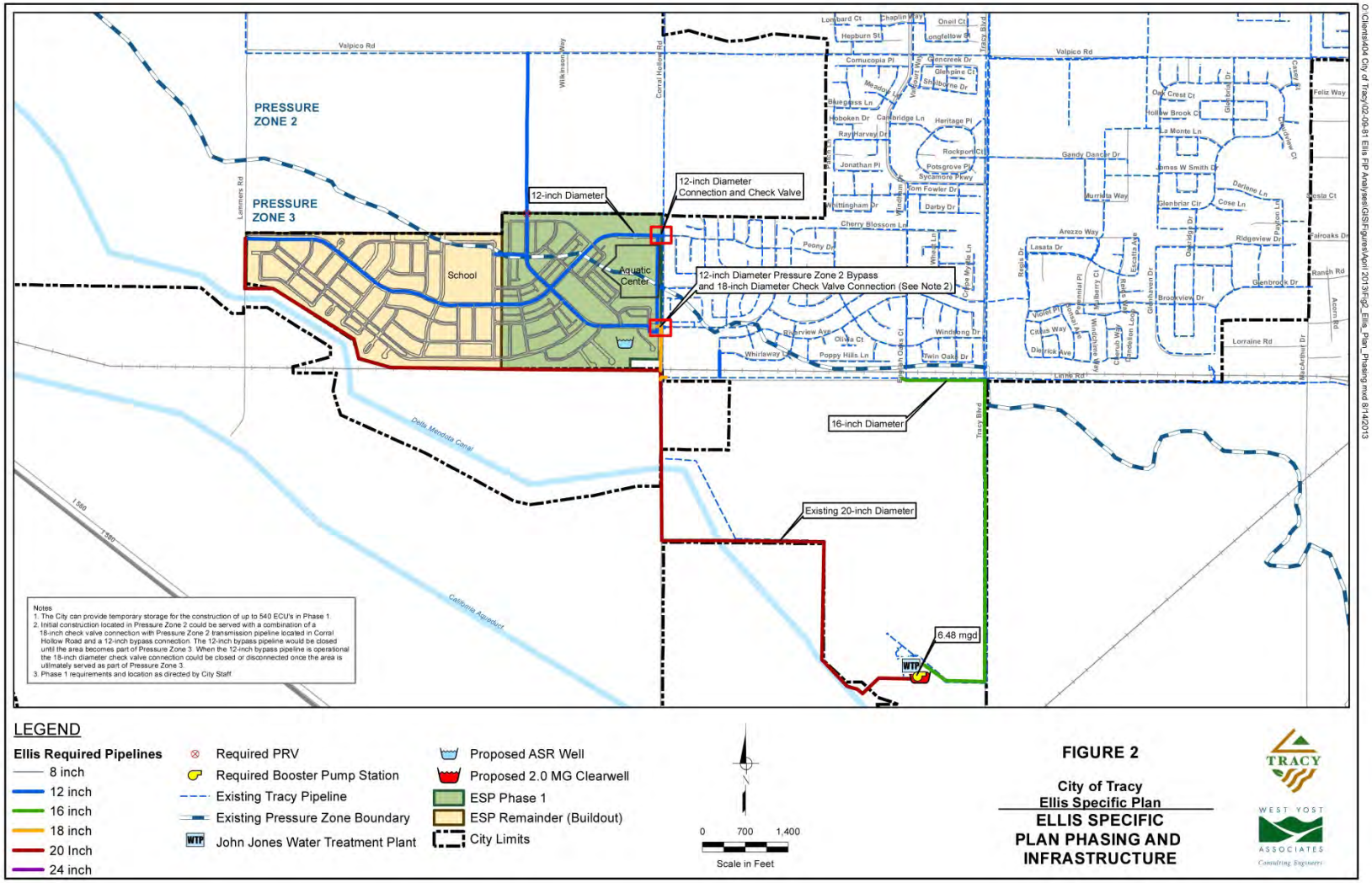


Figure 5 – Water Phasing Plan

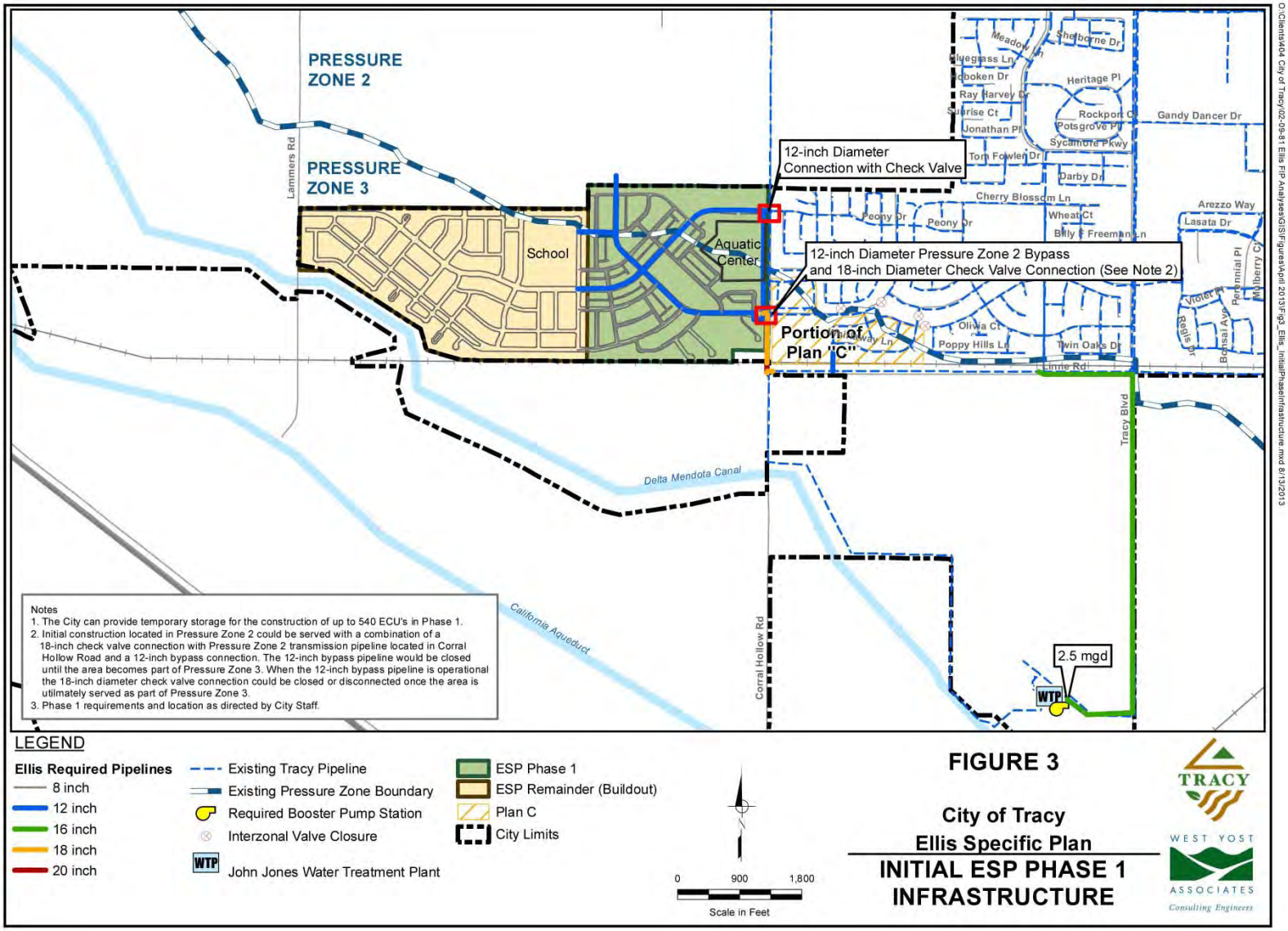


Figure 6 – Initial Phase 1 Water Infrastructure

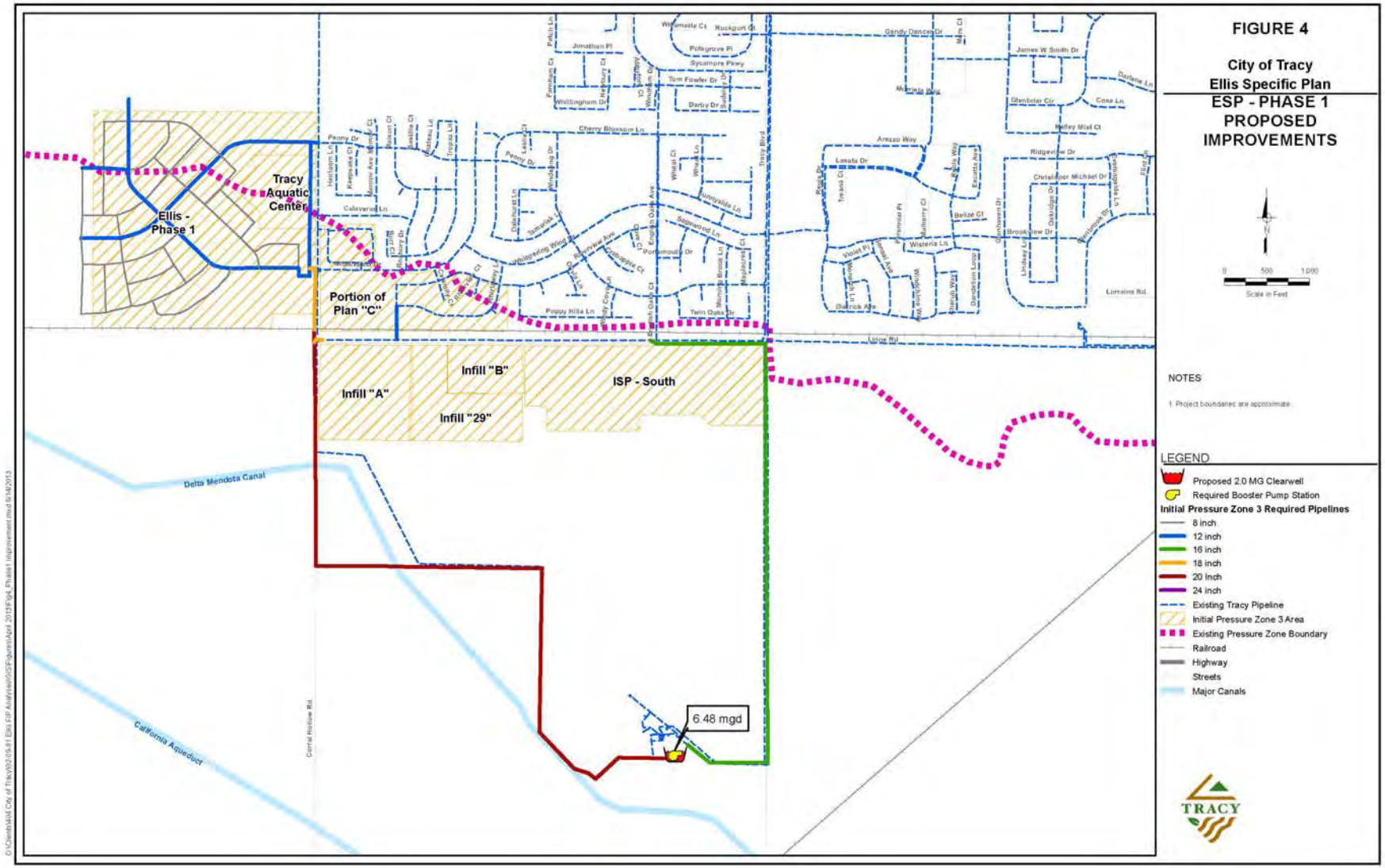


Figure 7 –Phase 1 Water Infrastructure

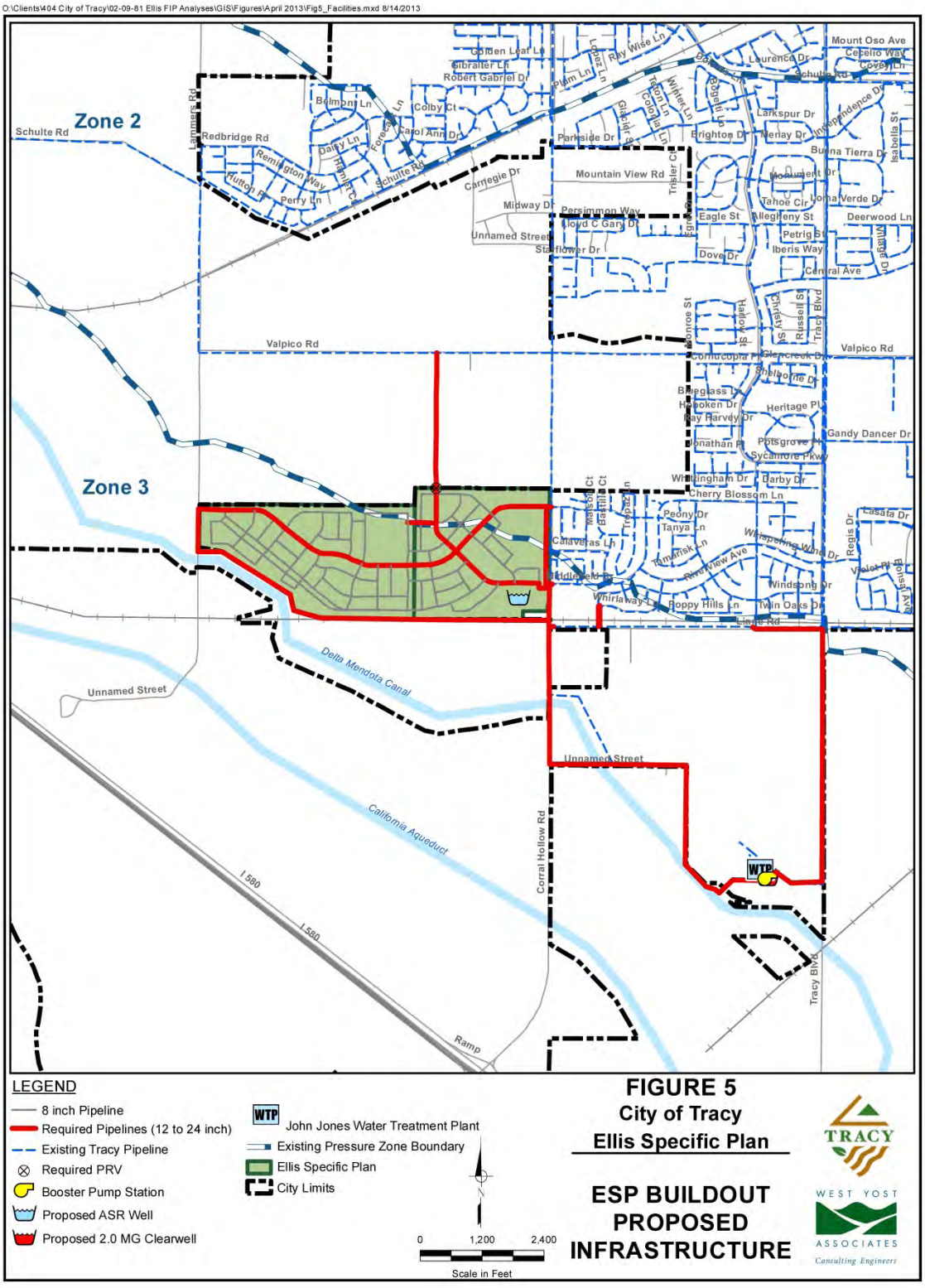


Figure 8– Phase 1 Water Infrastructure

The costs for the projects within ESP are to be paid by each of the projects on a per EDU basis. One EDU is defined as the average day demand for a low-density residential unit and equals 429 gpd. EDUs can be calculated for other land uses on this basis as shown in Table 14. The proposed ESP land uses correspond to a total of 2,198 EDUs.

Table 14 - Potable Water Fee

Landuse	EDU Factor	Supply and Treatment	Infrastructure	Total Potable Water Fee
RML	1	$ 2,686	$ 4,372	$ 7,058
RMM	0.86	$ 2,310	$ 3,760	$ 6,070
RMH	0.58	$ 1,558	$ 2,536	$ 4,094
Commercial (per ac)	5.63	$ 15,121	$ 24,615	$ 39,736
Storage (per ac)	5.63	$ 15,121	$ 24,615	$ 39,736

RECYCLED WATER

Ellis will pay the Recycled Water Fee at building permit per the 2012 Citywide Water Master Plan. The estimated Master Plan fees are shown in Table 15 below. Ellis' fee is subject to update upon adoption of the master plan fees.

Table 15 - Recycled Water Fee

Landuse	EDU Factor	Recycled Water Fee
RML	1	$ 2,654
RMM	0.86	$ 2,282
RMH	0.58	$ 1,539
Commercial (per ac)	5.63	$ 14,942
Storage (per ac)	5.63	$ 14,942

Group 76: Storm Drainage

The Ellis Program Area will pay a storm drain development impact fee at building permit for CIP projects described in this section. Ellis' obligation to pay a development impact fee for "Drainage Fees" is based on the Storm Water Consulting, Inc. report entitled "Ellis Program Sub-Basin Storm Drainage Technical Report", dated September 2012 and adopted concurrently with this report. The total estimated cost of backbone facilities in the Ellis Program Area is shown in the table below:

Table 16 - Storm Drainage Project Costs

CIP #	Project	Construction Cost	Land Acq.	40 % Mark-up	Total Project Cost	Project Cost	Program Management	Total Cost[1]
76PP-XX	Detention Basin 3A (36 AF plus 36 AF add'l excavation)	$ 720,000	$ 2,000,000	$ 288,000	$ 3,008,000	$ 1,765,324	$ 21,383	$ 1,786,707
76PP-XX	Detention Basin SL (17 AF plus 8 AF add'l excavation)	$ 250,000	$ 800,000	$ 100,000	$ 1,150,000	$ 675,658	$ 7,425	$ 683,083
76PP-XX	6,100 LF of 12" SD including 100 LF of Jack and Bore under RR from DET SL	$ 507,500		$ 203,000	$ 710,500	$ 406,954	$ 15,072	$ 422,026
76PP-XX	4,200 LF of 18" SD including 100 LF Jack and Bore under RR from DET 3A North	$ 480,000	$ 95,000	$ 192,000	$ 767,000	$ 441,331	$ 14,256	$ 455,587
76PP-XX	200 LF of 48" SD to DET 3A	$ 70,000		$ 28,000	$ 98,000	$ 56,132	$ 2,079	$ 58,211
76PP-XX	Dewatering	$ 200,000		$ 80,000	$ 280,000	$ 160,376	$ 5,940	$ 166,316
76PP-XX	UPTC/WPRR Crossing Agreements	$ 10,000		$ 4,000	$ 14,000	$ 8,019	$ 297	$ 8,316
76PP-XX	WSID Crossing Agreement	$ 5,000		$ 2,000	$ 7,000	$ 4,009	$ 148	$ 4,158
Total		**$ 2,242,500**	**$ 2,895,000**	**$ 897,000**	**$ 6,034,500**	**$ 3,517,803**	**$ 66,601**	**$ 3,584,403**

[1] Total cost is the construction cost multiplied by the proportional amount (42.2%) attributed to Ellis land uses.

The storm drainage facilities are shown in Figure 9. The program only includes backbone facilities; other facilities will be required, but are considered to be part of onsite improvements and costs associated with new development. The backbone facilities to serve the Ellis Program Area are:

- A detention basin within the South Linne sub-basin. This detention basin will provide enough storage to accept all future runoff from the South Linne sub-basin and control the outflow to the desired rate of 1cfs. Outflow from the South Linne Detention Basin will be discharged to onsite storm drains that will serve the future internal development within the Ellis Program Sub-basin to the north.

- A 12" SD gravity discharge pipe from the South Linne Detention Basin connection to future onsite storm drains to the north within the Ellis Program Sub-basin. This 12" SD will require a jack and bore crossing under the Western Pacific RR.

- A 42" SD extending north from Valpico, west of Corral Hollow Road that will serve as the discharge pipe for the combined Ellis Program Sub-basin. This pipe will discharge to the proposed detention basin DET 3A.

- Detention basin, DET 3A, located on the north side of Valpico Road that will store and mitigate the runoff from the future development within the Ellis Program Sub-basin. The basin will have sufficient storage to control outflow at a rate of 3 cfs. The 100-year peak storage volume is 46 AC-FT. Over excavation will be required for this detention basin in order for upstream storm drainage connections to be made and maintain a low enough surface level to avoid surcharging upstream connecting storm drains.

- An 18" discharge pipe extending north from Detention Basin 3A that will connect to an existing 30" stub that was provided within Gabriel Estates. The 18" SD pipe will require the acquisition of a 20' wide storm drain easement, a crossing underneath WSID's Upper Main Canal, and a jack and bore crossing underneath the Union Pacific RR track.

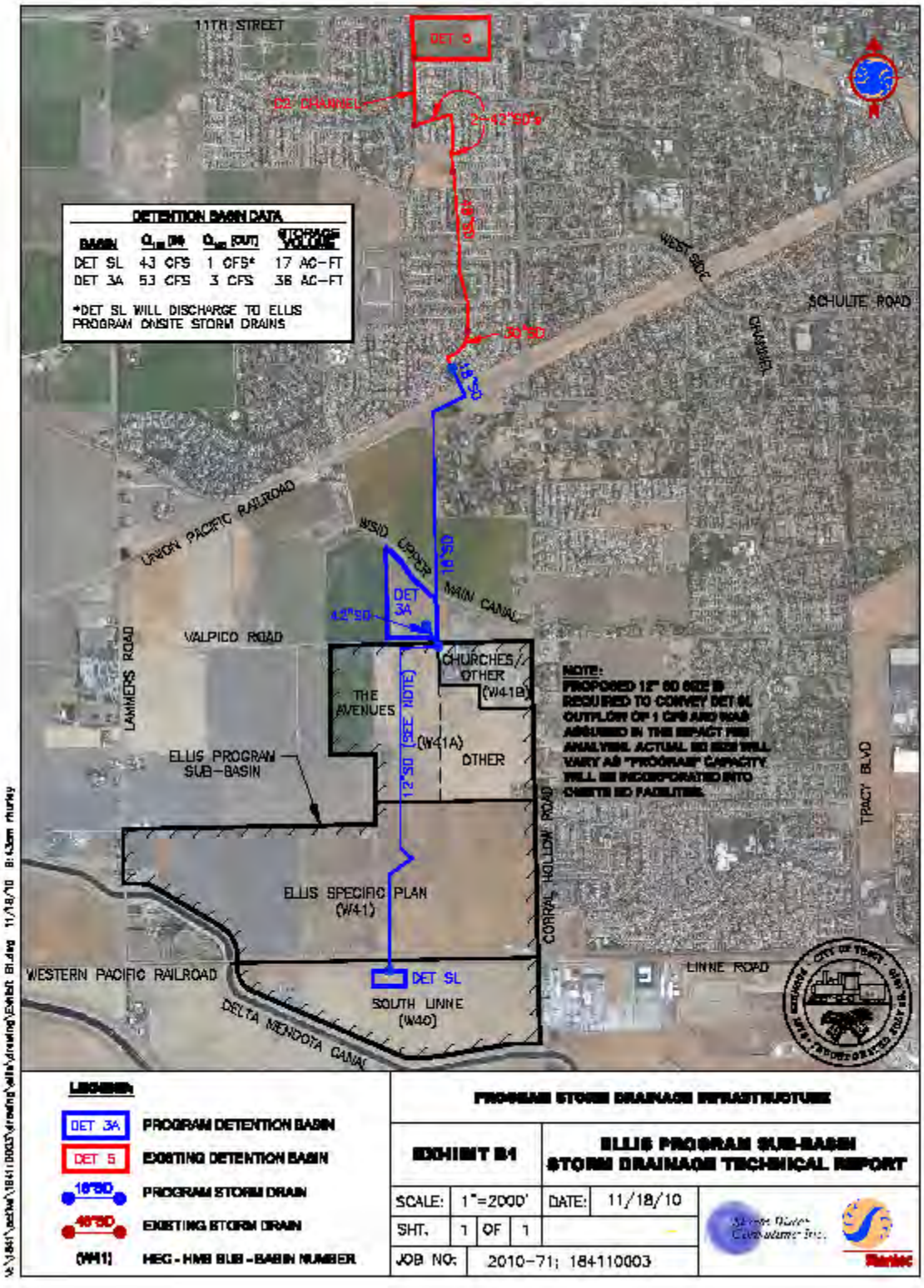


Figure 9 – Storm Drainage Layout

The fees for the Ellis program area are calculated in Table 17 below. There are two components to the fee program; Program Fees and Westside Fees. The Program Fees pay for the new infrastructure needed to serve the Ellis Development as outlined above. The Westside fees pay Ellis' share of excess capacity that exists in downstream facilities that Ellis will be utilizing to discharge their storm drainage.

Table 17 - Storm Drainage Fees

Landuse	Program Fees	Westside Fees	Total SD Fees
RML	$ 1,380	$ 417	$ 1,797
RMM	$ 754	$ 228	$ 981
RMH	$ 1,711	$ 518	$ 2,229
Commercial (per ac)	$ 18,301	$ 5,534	$ 23,836
Storage (per ac)	$ 5,137	$ 1,554	$ 6,691

Group 78: Parks & Recreation

The Ellis Program Area will pay a park development impact fee at building permit. The obligation is based on the report "Ellis Program Area Parks Study" by Harris & Associates dated December 2012 and adopted concurrently with this FIP. The total park obligation is shown in Table 18 below. The developer may enter into an agreement with the City to design and build the neighborhood parks in lieu of paying fees. Ellis will pay a community park fee towards the community park requirement, unless the City accepts the Ellis program contribution towards the swim center, then the contribution will be in lieu of any community park requirements and the Ellis Program's community park obligation will be met for the Ellis Program's 2,250 allowed dwelling units.

Table 18 - Park Obligation

	Project Cost	Program Management	Total Cost
Neighborhood Park	$ 11,729,450	$ 434,424	$ 12,163,874
Community Park	$ 3,372,011	$ 124,889	$ 3,496,900
Total Obligation	**$ 15,101,461**	**$ 559,313**	**$ 15,660,774**

The City's Park Master Plan requires 3 acres of neighborhood park per 1000 people and 1 acre of community park per 1000 people. The assumptions in the Ellis Program Area are that there are 3.3 people per residential mixed low density unit and 2.7 people per residential mixed medium density unit, and 2.2 people per residential mixed high density unit. Based on these requirements and assumptions, the Ellis Program Area is responsible for providing 19.1 acres of neighborhood and 6.4 acres of community parks as shown in Table 19.

Table 19- Required Acreage Calculation

Landuse	No. Units	People/Unit	Total Population	Total Required Acreage (Neighborhood)	Total Required Acreage (Community)
RML	505	3.3	1666.5	5.0	1.7
RMM	1705	2.7	4603.5	13.8	4.6
RMH	40	2.2	88	0.3	0.1
Total	**2250**		**6358**	**19.1**	**6.4**

The development impact fee is based on an estimated per acre cost of developed park land. The cost estimate for neighborhood parks is shown in Table 20 and is based on the facilities that are anticipated to be located in the Ellis Program Area parks:

Table 20 - Neighborhood Park Cost

Basic Improvements	Quantity	Units	Cost	Total
Base Park Acre	19.07	AC	$ 235,092	$ 4,484,145
Amenities				
Basketball	2	EA	$ 47,201	$ 94,402
Play Area (full)	4	EA	$ 256,839	$ 1,027,356
Play Area (small)	2	EA	$ 86,653	$ 173,306
Play Element	2	EA	$ 43,566	$ 87,132
Water Play Element	2	EA	$ 19,800	$ 39,600
Bocce	2	EA	$ 33,352	$ 66,704
Picnic Small	4	EA	$ 11,858	$ 47,432
Picnic Large	6	EA	$ 20,614	$ 123,684
Shade Structure	6	ALLOW	$ 75,000	$ 450,000
Tennis	2	EA	$ 74,718	$ 149,436
Soccer/T-ball Multi-use Field	4	EA	$ 8,382	$ 33,528
Open Green/Volleyball/Badminton	7	Included in base	$ -	$ -
Skate Spot	2	EA	$ 24,500	$ 49,000
Dog Park	2	EA	$ 39,754	$ 79,508
Drinking Fountain	6	EA	$ 6,000	$ 36,000
Fountain/Gazebo	2	ALLOW	$ 30,000	$ 60,000
Information Kiosk	2	EA	$ 10,000	$ 20,000
Focal Element (allowance)	6	ALLOW	$ 20,000	$ 120,000
Ornamental Garden	4	ALLOW	$ 23,705	$ 94,820
Park Sign Large	6	ALLOW	$ 10,000	$ 60,000
Park Sign Small	6	ALLOW	$ 5,000	$ 30,000
Total Program Cost			**$ -**	**$ 7,326,053**
Mark-up for Soft Costs (40%)			**$ -**	**$ 2,930,421**
Land Acquisition	**19.07**	**AC**	**$ 100,000**	**$ 1,907,400**
Total Cost			**$ -**	**$ 12,163,874**

The cost estimate for community parks is shown in Table 21 below and is based on an estimated per acre cost for the construction of a typical community park:

Table 21 - Community Park Cost

Amenity	Cost/ac
Land Acquisition	$ 100,000
Park Construction	$ 321,000
Mark-up for Soft Costs (40%)	$ 129,000
Total Cost per Acre	$ 550,000

The park fee is comprised of two components, the Neighborhood Park Fee and the Community Park fee. The fee for each component as well as the total fee is shown in Table 22:

Table 22 - Park Fee Summary

Landuse	Neighborhood Park	Community Park	Total Park Fee
RML	$ 6,313	$ 1,815	$ 8,128
RMM	$ 5,166	$ 1,485	$ 6,651
RMH	$ 4,209	$ 1,210	$ 5,419

Group 79: Program Management

There is no fee associated with Group 79 Project Management – monies associated with Project Management are collected under other fee programs as part of the 5% mark-ups and will be transferred to this account after they have been collected. The projects outlined in this report will ultimately generate the amounts shown Table 23 below for Project Management Funding. The funds will be transferred into Group 79.

Table 23 - Program Management

	Program Management
Group 71 Public Facilities	$ 242,403
Groups 72 & 73 Streets & Traffic	$ 471,402
Group 74 Wastewater	$ 560,353
Group 75 Water	$ 843,341
Group 76 Storm Drainage	$ 66,601
Group 78 Parks and Recreation	$ 559,313
Total Program Management	**$ 2,743,412**

APPENDIX A: ABSORPTION

Table 1
Anticipated Absorption

Project Year	1	2	3	4	5	6	7	8	9	10	11	Total
Calendar Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Residential units												2250
low density	50	50	45	45	45	45	45	45	45	45	45	505
medium density	98	98	150	150	155	175	175	176	176	176	176	1705
high density										20	20	40
Commercial Ac												
Village Mixed Use			4	4	4	4	4					20
Storage		9										9
Commercial			3	3			6	12.6				24.6

APPENDIX B: CAPITAL IMPROVEMENT PROGRAM

Table B1
Ellis Program Area CIP Projects

		Total Project Cost	Ellis Share	Ellis Total Cost	Ellis Project Cost (less PM)
GROUP 71 PUBLIC FACILITIES					
71PP-xx	City Hall & Public Works Facilities	$ 2,557,784	100%	$ 2,557,784	$ 2,466,434
71PP-xx	Community Center	$ 1,251,509	100%	$ 1,251,509	$ 1,206,812
71PP-xx	Library	$ 1,159,826	100%	$ 1,159,826	$ 1,118,404
71PP-xx	Public Safety Facilities	$ 1,818,154	100%	$ 1,818,154	$ 1,753,220
Total:		**$ 6,787,273**		**$ 6,787,273**	**$ 6,544,870**
GROUP 72 TRAFFIC SAFETY					
Intersection Improvements					
72PP-XXX	Patterson Pass/I-580 EB	$ 1,212,364	2%	$ 24,247	$ 23,381
72PP-XXX	Patterson Pass/I-580 WB	$ 1,077,797	6%	$ 59,279	$ 57,162
72PP-XXX	Corral Hollow/I-580 EB	$ 1,212,364	5%	$ 54,556	$ 52,608
72PP-XXX	Corral Hollow/I-580 WB	$ 1,212,364	5%	$ 60,618	$ 58,453
72PP-XXX	Lammers Rd./Valpico	$ 1,050,481	31%	$ 325,649	$ 314,019
72PP-XXX	Lammers Rd./Schulte Rd.	$ 1,414,214	50%	$ 700,036	$ 675,035
72PP-XXX	Corral Hollow/ Linne Rd	$ 1,872,547	23%	$ 430,686	$ 415,304
72PP-053	Corral Hollow/Valpico Rd	$ 723,211	58%	$ 419,462	$ 404,482
72PP-021	Corral Hollow Rd/Schulte Rd	$ 1,204,158	15%	$ 174,603	$ 168,367
72PP-XXX	Corral Hollow Rd/Eleventh St	$ 385,131	33%	$ 125,168	$ 120,697
NA	Corral Hollow/Grant Line	$ -	12%	$ -	$ -
72PP-XXX	Tracy Blvd/Linne Rd	$ 2,040,517	9%	$ 183,647	$ 177,088
72038	Tracy Blvd/Valpico Rd	$ 457,793	13%	$ 59,513	$ 57,388
72PP-XXX	MacArthur/Linne Rd.	$ 1,704,100	15%	$ 255,615	$ 246,486
72037	MacArthur Drive/Valpico Rd	$ 346,465	13%	$ 45,041	$ 43,432
72PP-XXX	Chrisman/Linne	$ 154,567	30%	$ 46,370	$ 44,714
72PP-XXX	Chrisman/Valpico	$ 3,388	35%	$ 1,186	$ 1,143
72PP-XXX	Chrisman/Schulte	$ 1,569,533	25%	$ 384,536	$ 370,802
72PP-XXX	Chrisman/11th	$ 7,000	8%	$ 525	$ 506
72024 & 72056	Lammers Road/Eleventh St	$ 65,710	13%	$ 8,214	$ 7,920
72PP-XXX	Byron/Grant Line	$ -	11%	$ -	$ -
72PP-XXX	Lammers/I-580 EB	$ 2,639,724	8%	$ 197,979	$ 190,909
72PP-XXX	Lammers/I-580 WB	$ 2,874,345	12%	$ 344,921	$ 332,603
Subtotal:		**$ 23,227,773**		**$ 3,901,850**	**$ 3,762,499**

Table B1

Ellis Program Area CIP Projects

GROUP 73 STREETS & HIGHWAYS					
73PP-XXX	Valpico Road Widen to Four Lanes west of Sycamore	$ 1,359,651	34%	$ 462,281	$ 445,771
73PP-XXX	Valpico Road Widen to Four Lanes Tracy Blvd. to MacArthur Blvd.	$ 1,334,501	12%	$ 153,468	$ 147,987
73PP-XXX	Schulte new alignment west of Lammers, 6 lanes	$ 22,553,778	8%	$ 1,691,533	$ 1,631,121
N/A	Schulte widen to 6 lanes, Corral Hollow to Tracy Blvd.	$ -		$ -	$ -
73PP-XXX	11th Street widen to 6 lanes west of Lammers Rd.	$ 3,667,399	13%	$ 458,425	$ 442,053
73PP-XXX	Grant Line Road widen to 6 lanes, Byron to Corral Hollow	$ 3,571,274	12%	$ 428,553	$ 413,247
73PP-XXX	Lammers Road New 6 lane expressway, I-205 new interchange to 11th St	$ 3,728,086	13%	$ 466,011	$ 449,368
73092	Lammers Road Widen to 6 lanes 11th to Schulte	$ -		$ -	$ -
73PP-045	Lammers Road Widen to 4 lanes Schulte to Valpico	$ 3,180,577	28%	$ 890,562	$ 858,756
73PP-046	Lammers Road Widen to 4 lanes Valpico to Ellis Dr.	$ 3,077,978	30%	$ 908,003	$ 875,575
73PP-047	Lammers Rd. widen to 4 lanes, Ellis Drive to I-580	$ 10,002,056	14%	$ 1,350,278	$ 1,302,053
73102/73103	Corral Hollow Road Widen to 6 lanes Grant Line to Schulte	$ -		$ -	$ -
73PP-046	Corral Hollow widen to 4 lanes, Schulte to Valpico	$ 2,635,421	17%	$ 448,022	$ 432,021
73PP-046	Corral Hollow widen to 4 lanes, Valpico to Ellis	$ 1,488,481	47%	$ 692,144	$ 667,424
73PP-046	Corral Hollow Road Widen to 4 lanes Ellis Drive to Linne Road	$ 1,154,856	37%	$ 421,523	$ 406,468
73PP-XXX	Corral Hollow Road Widen to 4 lanes Linne Road to I-580	$ 8,516,771	10%	$ 851,677	$ 821,260
73PP-XXX	MacArthur Drive Widen to 4 lanes between Schulte and Valpico	$ 2,140,773	4%	$ 74,927	$ 72,251
Subtotal:		**$ 68,411,603**		**$ 9,297,405**	**$ 8,965,355**
Total:		**$ 91,639,376**		**$ 13,199,256**	**$ 12,727,854**
GROUP 74 WASTEWATER					
	Corral Hollow Upgrades	$ 9,158,000	36%	$ 3,304,123	$ 3,186,118
	WWTP Improvement Cost beyond 9mgd	$ 44,800,000	28%	$ 12,385,752	$ 11,943,404
Total:		**$ 53,958,000**		**$ 15,689,875**	**$ 15,129,522**

Table B1

Ellis Program Area CIP Projects

GROUP 75 WATER					
75PP-XX	City - Side Booster Pump Station Pressure Zone 3 - 6.48 MGD (JJWTP)	$ 2,593,745	37%	$ 960,400	$ 926,100
75PP-XX	Clearwell at JJWTP 2.0 MG	$ 4,552,379	63%	$ 2,863,000	$ 2,760,750
75PP-XX	John Jones Water Treatment Plant Expansion 15.0 mgd	$ 46,576,664	15%	$ 6,769,000	$ 6,527,250
75PP-XX	Long-term Emergency Groundwater Storage 2,500 gpm	$ 3,500,000	26%	$ 926,800	$ 893,700
	Land Acquisition	$ 46,079	100%	$ 46,000	$ 44,357
75PP-XX	Water Transmission Line 12" (ESP backbone Phase 1)	$ 2,557,800	37%	$ 947,800	$ 913,950
75PP-XX	Water Transmission Line 12" (ESP backbone Buildout)	$ 1,284,780	37%	$ 476,000	$ 459,000
75PP-XX	Water Transmission Line 12"(ESP Backbone - Phase 1 to Valpico Rd)	$ 768,810	37%	$ 284,200	$ 274,050
75PP-XX	Water Transmission Line 24"(JJTP Clearwell to PBS3)	$ 18,375	37%	$ 6,800	$ 6,557
75PP-XX	Water Transmission Line 20"(ESP-JJWTP BPS3 to Corral Hollow Rd and Linne Rd. Phase 1)	$ 4,166,400	37%	$ 1,542,800	$ 1,487,700
75PP-XX	Water Transmission Line 20"(Corral Hollow Rd and Linne Rd to Middlefield Rd. - buildout)	$ 3,561,600	37%	$ 1,318,800	$ 1,271,700
75PP-XX	Water Transmission Line 18"(ESP Corral Hollow Rd and Linne Rd to Middlefield Rd - buildout)	$ 296,100	37%	$ 109,200	$ 105,300
75PP-XX	Water Transmission Line 18"(ESP-Linne Rd. to Corral hollow Rd. Phase 1 - PZ2 Bypass)	$ 50,400	36%	$ 18,200	$ 17,550
75PP-XX	Water Transmission Line 16"(from existing Clearwell No. 2 to English Oaks)	$ 2,481,010	37%	$ 918,400	$ 885,600
75PP-XX	20" Jack and Bore under Delta Mendota Canal	$ 644,406	37%	$ 238,000	$ 229,500
75PP-XX	20" Jack and Bore (CH and Linne under Railroad)	$ 351,750	37%	$ 130,200	$ 125,550
75PP-XX	Water Transmission Line 12" (Whirlaway Ln. to Linne Rd.)	$ 165,522	37%	$ 61,600	$ 59,400
75PP-XX	12" Jack and Bore (SW Portion of Plan C under RR to Linne Rd.)	$ 144,900	37%	$ 53,000	$ 51,107
75PP-XX	18" Check Valve Connection at Middlefield Dr.	$ 117,600	37%	$ 43,400	$ 41,850
75PP-XX	Connection at Middelfield Drive 12" Diameter bypass PZ2 on Corral Hollow, Jack and Bore (SW portion of the Plan C under Corral Hollow	$ 57,960	37%	$ 21,400	$ 20,636
75PP-XX	Pressure Reducing Valve ESP - Phase 1 to Valpico Rd (12-inch Diameter)	$ 142,800	37%	$ 53,200	$ 51,300
Total Potable Water:		**$ 74,079,080**		**$ 17,788,200**	**$ 17,152,907**
75PP-XX	City-wide Recycled Water Infrastructure Fair Share	$ 5,825,339	100%	$ 5,825,339	$ 5,617,291
Total Water/Recycled Water:		**$ 79,904,419**		**$ 23,613,539**	**$ 22,770,198**

Table B1

Ellis Program Area CIP Projects

GROUP 76 STORM DRAINAGE					
	Detention Basin 3A (36 AF plus 36 AF add'l excavation)	$ 3,008,000	59%	$ 1,786,707	$ 1,765,324
	Detention Basin SL (17 AF plus 8 AF add'l excavation)	$ 1,150,000	59%	$ 683,083	$ 675,658
	6,100 LF of 12" SD including 100 LF of Jack and Bore under RR from DET SL	$ 710,500	59%	$ 422,026	$ 406,954
	4,200 LF of 18" SD including 100 LF Jack and Bore under RR from DET 3A North	$ 767,000	59%	$ 455,587	$ 441,331
	200 LF of 48" SD to DET 3A	$ 98,000	59%	$ 58,211	$ 56,132
	Dewatering	$ 280,000	59%	$ 166,316	$ 160,376
	UPTC/WPRR Crossing Agreements	$ 14,000	59%	$ 8,316	$ 8,019
	WSID Crossing Agreement	$ 7,000	59%	$ 4,158	$ 4,009
Total:		**$ 6,034,500**		**$ 3,584,403**	**$ 3,517,803**
Group 78 Parks & Recreation					
	Neighborbood Parks	$ 12,163,874	100%	$ 12,163,874	$ 11,729,450
	Community Parks	$ 3,496,900	100%	$ 3,496,900	$ 3,372,011
Total:		**$ 15,660,774**		**$ 15,660,774**	**$ 15,101,461**
Group 79 Program Management					
Program Management					**$ 2,743,412**
Total:				**$ 78,535,120**	**$ 78,535,120**
Grant/RTIF Funding Towards Traffic				**$ (5,550,000)**	**$ (5,550,000)**
Total Ellis Funding:				**$ 72,985,120**	**$ 72,985,120**

APPENDIX C: TECHNICAL STUDIES

City of Tracy

Ellis Program Area Public Building Study

December 2012

Prepared by:

Harris & Associates

Shaping the future, One project at a time℠

Ellis Program

Public Building Impact Fee Study

December 2012

A Citywide Public Building Fee for the City of Tracy was completed in December of 2000 by Muni Financial and adopted by the City Council on August 21, 2001 by resolution 2001-301. The report strove to create a fee that would provide new facilities to serve growth within the City at the same level that existing residents are currently being served. To do this, the study used existing facility standards to determine the fee. This ensured that new development would fund facilities at the same level as existing development and would not be paying to raise existing standards. The Citywide Public Building fee applies to all new development within the City of Tracy including the Ellis Program. New Citywide Public Building and Public Safety fee studies were underway for the City of Tracy. Because that fee study had not yet been completed, the Ellis Program used the methodology of the currently adopted Citywide Public Building Fee Study.

Since the time that the Study was completed, the public building fee has been updated three time, once in September of 2003, a second time in July 2007, and the final time on April 3rd 2012 with the Infill report. The latest version of this study is being used as the basis for Ellis' fees.

The calculated cost per capita is $1054.25 for residential and $469 per 1000 sf of retail space. This cost per capita is then converted into a fee for each land use based on assumed densities. A density of 3.3 people per unit is assumed for a residential mixed low unit, a density of 2.7 people per unit is assumed for a residential mixed medium unit, and 2.2 people per unit is assumed for a residential mixed high unit. For non-residential, it is assumed that one worker will occupy 300 square feet in an office land use and 500 square feet in a retail land use.

Table 1 below shows the fees for each land use in the Ellis Program based on the per capita costs and densities described above. It also calculates the total fees that will be collected at build-out based on the estimated residential dwelling units and square footage of non-residential.

The Public Building fees can be updated to reflect changes in the ENR building cost index and CPI inflation factors, beginning in the year following the first residential building permit from the Ellis Program.

Table 1

Ellis Public Building Fee Summary

	Fee Per Capita	People per Dwelling Unit	Fee Per Residential dwelling unit or 1000 SF Commercial	Fee per Residential Dwelling Unit or SF Commercial	Number of Residential Dwelling Unit or SF Commerical	Buildout Obligation
Residential						
RML	$ 1,054.25	3.3	$ 3,479	$ 3,479	505	$ 1,756,908
RMM	$ 1,054.25	2.7	$ 2,846	$ 2,846	1,705	$ 4,853,240
RMH	$ 1,054.25	2.2	$ 2,319	$ 2,319	40	$ 92,774
Total Residential:					**2,250**	**$ 6,702,922**
Commercial/Storage			$ 469	$ 0.47	180,000	$ 84,352
Total:						**$ 6,787,273**

Notes:

Table 2 shows a breakdown of the fees and total money to be collected by specific landuse for each of the various fee components. The various components were calculated using the methodology in the currently adopted Citywide Public Building Fee study. The funding generated from the Ellis Program will be used to fund projects that are consistent with the recently adopted Citywide Public Safety and Public Facilities Master Plans.

Table 2

Ellis Public Builidng Fee Breakdown by Landuse

	Fee Per Residential Dwelling Unit or 1000 SF Commercial	Fee per Residential Dwelling Unit or SF Commercial	Number of Residential Dwelling Units or SF Commerical	Buildout Obligation
Residential				
RML				
City Hall & Public Works Facilities	$ 1,309.77	$ 1,309.770	505	$ 661,434
Community Center	$ 649.57	$ 649.572	505	$ 328,034
Library	$ 601.99	$ 601.986	505	$ 304,003
Public Safety Facilities	$ 917.70	$ 917.697	505	$ 463,437
Single Family Subtotal:	**$ 3,479.03**	**$ 3,479.03**		**$ 1,756,908**
RMM				
City Hall & Public Works Facilities	$ 1,071.63	$ 1,071.630	1,705	$ 1,827,129
Community Center	$ 531.47	$ 531.468	1,705	$ 906,153
Library	$ 492.53	$ 492.534	1,705	$ 839,770
Public Safety Facilities	$ 750.84	$ 750.843	1,705	$ 1,280,187
Single Family Subtotal:	**$ 2,846.48**	**$ 2,846.48**		**$ 4,853,240**
RMH				
City Hall & Public Works Facilities	$ 873.18	$ 873.180	40	$ 34,927
Community Center	$ 433.05	$ 433.048	40	$ 17,322
Library	$ 401.32	$ 401.324	40	$ 16,053
Public Safety Facilities	$ 611.80	$ 611.798	40	$ 24,472
Multi-Family Subtotal:	**$ 2,319.35**	**$ 2,319.35**		**$ 92,774**
Retail				
City Hall & Public Works Facilities	$ 190.52	$ 0.191	180,000	$ 34,294
Public Safety Facilities	$ 278.10	$ 0.278	180,000	$ 50,058
Retail Subtotal:	**$ 468.62**	**$ 0.469**	**655,377**	**$ 84,352**
Total:				**$ 6,787,273**

Notes:

Citywide fee from Citywide Fee Update prepared by Harris & Associates, adopted on April 3, 2012

Table 3 below is a breakdown of how much money is being generated within each category to fund CIP Projects.

Table 3

Ellis Public Building Fee Breakdown by Facility

	Buildout Obligation	
City Hall & Public Works Facilities		
RML	$	661,434
RMM	$	1,827,129
RMH	$	34,927
Retail	$	34,294
Total City Hall and Public Works Funding:	**$**	**2,557,784**
Community Center		
RML	$	328,034
RMM	$	906,153
RMH	$	17,322
Total Community Center Funding:	**$**	**1,251,509**
Library		
RML	$	304,003
RMM	$	839,770
RMH	$	16,053
Total Library Funding:	**$**	**1,159,826**
Public Safety Facilities		
RML	$	463,437
RMM	$	1,280,187
RMH	$	24,472
Retail	$	50,058
Total Public Safety Funding:	**$**	**1,818,154**
Total Obligation	**$**	**6,787,273**

Should the Ellis Program dedicate land to the City for the construction of a fire station or other public facilities, the value of the land and any construction costs incurred by the developer can be used to off-set the development impact fees.

City of Tracy

Ellis Program Area
Traffic Impact Fees

December 2012

Prepared by:

Harris & Associates

Shaping the future, One project at a time℠

Ellis Program

Traffic Impact Fees

December 2012

I. Introduction

As a result of increased population, all new development in a community creates additional demands on public facilities provided by local government. The purpose of this study is to analyze the impact of the Ellis development on transportation facilities in the City of Tracy, to ensure that the City's established level of service is maintained, and to calculate fair and equitable development impact fees based on that analysis.

The Ellis Program Area (Ellis) is currently a 321 acre parcel located between Lammers Road and Corral Hollow Road along the north side of the Union Pacific rail line. Development within Ellis will consist of 505 residential mixed low units, 1705 residential mixed medium units, 40 residential mixed high units 20 acres of, and 180,000 square feet of commercial.

II. Traffic Improvements

As part of the Transportation Impact Analysis for the Ellis Specific Plan in the City of Tracy completed during the EIR process by Fehr and Peers, project level intersection improvements were identified for mitigation. A summary of Ellis' Intersection Improvement costs and percentage shares are shown in Table 2.

The Project is also required to pay their fair share of citywide traffic improvements that have been identified as part of Tracy's 2030 General Plan Roadway Network. A memo prepared by Fehr and Peers titled *Project Proportional Share Calculation for Ellis Specific Plan Traffic Mitigations* is included in Appendix A of this report. The project is expected to contribute a proportional share of the improvement costs for both roads and intersections based on its contribution to future traffic growth.

III. Intersection Cost Estimates

Intersection costs were calculated on a project by project basis. These intersection specific cost estimates are included in Appendix B and summarized below. A 40% mark-up is included on these costs to include contingency, design, program management and construction management. ROW take was estimated for these improvements based on $100,000 per acre. Because these right-of-way takes are typically very small areas, $20,000 per location for right-of-way acquisition related costs has also been added. The costs and percentage shares are shown in Table 2.

IV. Road Cost Estimates

Program costs for the road segments are estimated by applying basic unit construction cost estimates to calculate a per linear foot (LF) cost for the road segments. These construction cost tables are provided in Appendix C along with the assumed cross sections for the road improvements. They are also summarized in the tables below.

The project costs are broken down into 2 elements; program portion and frontage portion. The frontage portion covers landscaping, sidewalk, curb and gutter and 20 feet of pavement. The center portion of the road is considered program. Frontage improvements are constructed by the adjacent development and the program portion is funded through the fee program. On certain key roads as identified by the City, the cost of the road from curb to curb is included in the fee program. This includes Lammers Road and Schulte Road.

A 40% mark-up is included on these costs to include contingency, design, program management and construction management. Right-of-way costs were included at $100,000 per acre which includes both the cost of the land and the costs associated with acquiring the land.

The costs and percentage shares are summarized in Table 3.

Table 2
Summary of Ellis Intersection Improvements

CIP No.	Location	Improvements	Project Cost	Mark Up (40%)	ROW Cost	Total Cost	Ellis % Share	Ellis Cost
72PP-XXX	Patterson Pass/I-580 EB	Signalize. Widen EB approach to provide 1 LT and 1 TR lane, Widen NB approach to provide 1 Thru and 1 RT lane, Widen SB approach to provide 2 LT and 1 Thru lane	$ 828,076	$ 331,230	$ 53,058	$ 1,212,364	2%	$ 24,247
72PP-XXX	Patterson Pass/I-580 WB	Signalize. Widen WB approach to provide 1 TL and 1 RT lane. Widen SB approach to provide 1 thru lane and 1 RT lane.	$ 743,763	$ 297,505	$ 36,529	$ 1,077,797	5.5%	$ 59,279
72PP-XXX	Corral Hollow/I-580 EB	Signalize. Widen EB approach to provide 1 LT and 1 TR lane. Widen NB approach to provide 1 thru lane and 1 RT lane, Widen SB approach to provide 1 LT lane and 2 Thru lanes.	$ 828,076	$ 331,230	$ 53,058	$ 1,212,364	4.5%	$ 54,556
72PP-XXX	Corral Hollow/I-580 WB	Signalize. Widen WB approach to provide 1 TL and 1 RT lane, Widen NB approach to add 1 Thru lane, widen SB approach to provide 2 thru lanes and 1 RT lane.	$ 828,076	$ 331,230	$ 53,058	$ 1,212,364	5.0%	$ 60,618
72PP-XXX	Lammers Rd./Valpico	Signalize, Widen WB approach to provide 1 LT and 1 RT lane, Widen NB approach to add 2 thru lanes, widen SB approach to provide 1 SB LT and 3 thru lanes.	$ 700,638	$ 280,255	$ 69,587	$ 1,050,481	31.0%	$ 325,649
72PP-XXX	Lammers Rd./Schulte Rd.	Signalize. Widen EB approach to provide 1 LT and 1 TR lane, add WB approach to 1 LT and 1 TR lane, widen NB approach to add 1 thru lane and 1 TR lane, widen SB approach to add 1 TL and 1 Thru lane.	$ 954,545	$ 381,818	$ 77,851	$ 1,414,214	49.5%	$ 700,036
72PP-XXX	Corral Hollow/ Linne Rd	Signalize. Convert intersection to T with no EB Approach, widen WB approach to add 1 LT and 1 TR lane, widen NB approach to provide 2 Thru lanes and 1 RT lane, Widen SB approach to provide 1 LT and 2 Thru lanes.	$ 1,293,732	$ 517,493	$ 61,322	$ 1,872,547	23.0%	$ 430,686
72PP-053	Corral Hollow/Valpico Rd	Signalize & widen SB approach to provide 1 TL and 1 TR Lane	$ 496,390	$ 198,556	$ 28,264	$ 723,211	58.0%	$ 419,462
72PP-021	Corral Hollow Rd/Schulte Rd	Widen EB approach to add 1 LT and 1 Thru, Widen WB approach to provide 1 LT, 3 Thru and 1 RT lane, Widen NB approach to provide 2 LT, 3 Thru, and RT lane, Widen SB approach to provide 2 LT, 3 Thru, and 1 RT lane. Convert EB RT from permitted to free, modify signal and adjust phasing.	$ 804,505	$ 321,802	$ 77,851	$ 1,204,158	14.5%	$ 174,603
72PP-XXX	Corral Hollow Rd/Eleventh St	Widen NB approach to add 1 thru Lane, Widen SB approach to add 1 thru lane, Convert EB and WB RT lanes from permitted to free. Modify Signal.	$ 254,905	$ 101,962	$ 28,264	$ 385,131	32.5%	$ 125,168
NA	Corral Hollow/Grant Line	Widen EB approach to add 1 LT and 1 Thru Lane, Widen WB approach to provide 2 LT, 3 Thru, and 1 RT lane, Reduce NB LT lanes from 3 to 2, and add 1 Thru lane, Widen SB approach to provide 2 LT, 3 Thru, and 1 RT lane, convert EB RT lane from permitted to free, made new WB and SB RT lanes free.		$ -		$ -	11.5%	Project is fully constructed to full ROW
72PP-XXX	Tracy Blvd/Linne Rd	Signalize. Widen EB approach to provide 2 LT and 3 Thru Lanes, Widen WB approach to provide 1 TL and 1 TR lane, Widen SB approach to provide 1 LT, 2 Thru, and 1 RT lane.	$ 1,396,001	$ 558,400	$ 86,116	$ 2,040,517	9.0%	$ 183,647
72038	Tracy Blvd/Valpico Rd	Widen EB approach to add 1 thru lane, widen WB approach to provide 1 LT, 2 thru and 1 RT lane, Widen NB approach to provide 1 LT, 2 Thru, and 1 RT lane, Widen SB approach to provide 2 LT, 1 thru, and 1 RT lane. Modify Signal.	$ 300,903	$ 120,361	$ 36,529	$ 457,793	13.0%	$ 59,513
72PP-XXX	MacArthur/Linne Rd.	Signalize. Widen EB approach to provide 1 LT, 1 Thru and 1 TR lanes, widen WB approach to provide 1 TL and 1 TR lane.	$ 1,185,219	$ 474,088	$ 44,793	$ 1,704,100	15.0%	$ 255,615
72037	MacArthur Drive/Valpico Rd	Widen EB approach to add 1 Thru Lane, Widen SB approach to add 1 Thru Lane, Convert WB and NB LT from protected to permitted. Modify Signal.	$ 227,286	$ 90,915	$ 28,264	$ 346,465	13.0%	$ 45,041
72PP-XXX	Chrisman/Linne	Widen EB approach to provide 1 TL and 1 TR lane, widen SB approach to provide 1 TL and 1 TR lane.	$ 84,313	$ 33,725	$ 36,529	$ 154,567	30.0%	$ 46,370
72PP-XXX	Chrisman/Valpico	Re-stripe to modify NB approach to provide 1 LT and 1 thru lane. Re-stripe to modify SB approach to provide 1 Thur and 1 RT.	$ 2,420	$ 968	$ -	$ 3,388	35.0%	$ 1,186
72PP-XXX	Chrisman/Schulte	Modify NB approach to add 1 Thru lane.	$ 1,100,906	$ 440,363	$ 28,264	$ 1,569,533	24.5%	$ 384,536
72PP-XXX	Chrisman/11th	Convert SB RT from permitted + overlap phasing to permitted.	$ 5,000	$ 2,000	$ -	$ 7,000	7.5%	$ 525
72024 & 72056	Lammers Road/Eleventh St	Total Intersections:	$ 46,936	$ 18,774	$ -	$ 65,710	12.5%	$ 8,214
72PP-XXX	Byron/Grant Line	Add EB LT, Thru lane and RT lane, Add WB LT, 2 thru and RT. Add NB LT ,1 thru, and 2 RT lanes. Add SB Thru.	Project is in County and being implemented by County					
72PP-XXX	Lammers/I-580 EB	Intersection Improvements[1]	$ 1,885,517	$ 754,207		$ 2,639,724	7.5%	$ 197,979
72PP-XXX	Lammers/I-580 WB	Intersection Improvements[1]	$ 2,053,103	$ 821,241		$ 2,874,345	12.0%	$ 344,921
		Total Intersections:	**$ 16,020,310**	**$ 6,408,124**	**$ 799,339**	**$ 23,227,773**		**$ 3,901,850**

Notes:
[1] Costs taken from TMP masterplan June 2012 and includes ROW
XXX Designates a new project that will need a CIP number assigned to it.
EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound
LT = Left-Turn; RT = Right-turn; TR = Through-Right; TL = Through-Left

Table 3

Summary of Ellis Road Improvements

CIP Number	Road	Extents	Improvement	Length, LF	Program Cost/LF	Frontage Cost/LF	Total Cost/LF	Program Cost	Frontage Cost	Canal Crossings	Total Program Cost	Ellis Share[1]	Ellis Cost
73PP-XXX	Valpico Road	Corral Hollow Road to west of Sycamore	Rural to 4 lane Arterial	2649	$ 513	$ 1,231	$ 1,744	$ 1,359,651	$ 3,259,749		$ 1,359,651	34.0%	$ 462,281
73PP-XXX	Valpico Road	Tracy Blvd to MacArthur Blvd.	Rural to 4 lane Arterial	2600	$ 513	$ 1,231	$ 1,744	$ 1,334,501	$ 3,199,451		$ 1,334,501	11.5%	$ 153,468
73PP-XXX	Schulte Road[2]	New Alignment west of Lammers	New 6 lane roadway	15900	$ 1,418	$ 713	$ 2,132	$ 22,553,778	$ 11,339,516		$ 22,553,778	7.5%	$ 1,691,533
N/A	Schulte Road	Corral Hollow to Tracy Blvd	Widen to 6 lanes	Project Completed									
73PP-XXX	11th Street	West of Lammers Road	Widen to 6 lanes	4000	$ 917	$ 523	$ 1,440	$ 3,667,399	$ 2,093,694		$ 3,667,399	12.5%	$ 458,425
73PP-XXX	Grant Line Road	Byron to Corral Hollow	Widen to 6 lanes	5200	$ 687	$ 420	$ 1,106	$ 3,571,274	$ 2,181,619		$ 3,571,274	12.0%	$ 428,553
73PP-XXX	Lammers Road[2]	I-205 to Eleventh Street realign to new interchange	New 6 lanes expressway	3300	$ 1,130	$ 685	$ 1,815	$ 3,728,086	$ 2,261,084		$ 3,728,086	12.5%	$ 466,011
73092		Eleventh Street to Schulte	Widen to 6 lanes	Project Under Construction									
73PP-045		Schulte to Valpico	2 lane rural to 4 lane parkway	3100	$ 1,026	$ 718	$ 1,744	$ 3,180,577	$ 2,225,289		$ 3,180,577	28.0%	$ 890,562
73PP-046		Valpico Rd. to Ellis Drive	2 lane rural to 4 lane parkway	3000	$ 1,026	$ 718	$ 1,744	$ 3,077,978	$ 2,153,505		$ 3,077,978	29.5%	$ 908,003
73PP-047		Ellis Drive to I-580	2 lane rural to 4 lane parkway	5850	$ 1,026	$ 718	$ 1,744	$ 6,002,056	$ 4,199,335	$ 4,000,000	$ 10,002,056	13.5%	$ 1,350,278
73102/73103	Corral Hollow Road	Grant Line to Schulte	Widen to 6 lanes	Project Fully Funded by Other projects									
73PP-046		Schulte Road to Valpico Road	2 lanes to 4 lane arterial	6500	$ 405	$ 815	$ 1,221	$ 2,635,421	$ 5,298,528		$ 2,635,421	17.0%	$ 448,022
73PP-046		Valpico to Ellis Drive	Rural to 4 lane arterial	2900	$ 513	$ 1,231	$ 1,744	$ 1,488,481	$ 3,568,619		$ 1,488,481	46.5%	$ 692,144
73PP-046		Ellis Drive to Linne Road	Rural to 4 lane Arterial	2250	$ 513	$ 1,231	$ 1,744	$ 1,154,856	$ 2,768,756		$ 1,154,856	36.5%	$ 421,523
73PP-XXX		Linne Road to I-580	Rural to 4 lane Arterial	8800	$ 513	$ 1,231	$ 1,744	$ 4,516,771	$ 10,828,912	$ 4,000,000	$ 8,516,771	10%	$ 851,677
	MacArthur Drive	Schulte to Valpico	2 lanes to 4 lane arterial	5280	$ 405	$ 815	$ 1,221	$ 2,140,773	$ 4,304,035		$ 2,140,773	3.5%	$ 74,927
		Subtotal Roads:						**$ 60,411,603**	**$ 59,682,092**	**$ 8,000,000**	**$ 68,411,603**		**$ 9,297,405**

Note:

[1] Percentage share is of Program Cost plus the Canal Crossing costs only. Frontage and total cost is included for information only.

[2] Curb to curb costs are included in the program cost.

XXX Denotes a new project that will need a CIP number assigned to it.

IV. Development Impact Fees

Based on the road and intersection costs calculated above, the traffic impact fees are calculated as follows:

Table 4
Transportation Fee Calculation

	Units/Ac	EDU's/Unit	EDU's
RML	505 units	1	505
RMM	1705 units	1	1705
RMH	40 units	0.48	19.2
Village Mixed Use	20 ac	10.53	210.66
Commercial	24.6 ac	15.9	391.14
Storage Unit	9 ac	1.0	9
Total EDU's:			2,840
Intersection Costs			$ 3,901,850
Road Costs			$ 9,297,405
RTIF Funding/Measure K			$ (5,550,000)
Total Ellis Funded Cost			$ 7,649,256
Cost per Unit or Acre			**$ 2,693**
RML Fee	*per unit*		$ 2,693
RMM Fee	*per unit*		$ 2,693
RMH Fee	*per unit*		$ 1,293
Village Mixed Use Fee	*per acre*		$ 28,370
Commercial Fee	*per acre*		$ 42,825
Storage Fee	*per acre*		$ 2,693

The fee calculation assumes that a portion of the project costs will be paid through funds received through Grant Funding or through County TIF funds. Should this money not be received as anticipated, the fees will need to be updated in the future.

These fees will be paid at building permit.

V. County Fees

The project is expected to pay $1500 per residential dwelling unit to the City of Tracy that will be remitted to the Joint Powers Authority to fund regional transportation improvements.

- $500 of this fee shall be applied to regional transportation improvement projects within San Joaquin County to improve I-205 and I-580.

- $500 of the fee shall be applied to regional transportation improvements projects within San Joaquin County that are specifically recommended by the JPA and implemented for purpose of reducing the number of vehicle trips on either I-205 or I-580 bound for outside San Joaquin County through the County of I-580 or diverting or reducing trips on Corral Hollow/Tesla Road, Patterson Pass Road, and or/Grant Line and the Old Altamont Pass Roads.

- $500 of the fee shall be expended by the JPA solely for purposes of transportation improvement projects or trip reduction projects within Alameda County.

VI. Fee Summary

Following is a summary of the fees due at building permit for the Ellis project:

	RML (per unit)	RMM (per unit)	RMH (per unit)	Village Mixed Use (per ac)	Commercial (per ac)	Storage (per ac)
City of Tracy Fee	$ 2,693	$ 2,693	$ 1,293	$ 28,370	$ 42,825	$ 28,370
County Fee	$ 1,500	$ 1,500	$ 720	See Note 1		
Total	**$ 4,193**	**$ 4,193**	**$ 2,013**	**$ 28,370**	**$ 42,825**	**$ 28,370**

Note 1: Residential Units must pay the fee the County fee. Depending on the specific landuse, the fees for VMU will be determined at the time fees are due.

VII. Total of City Fees to be Collected

Following is a summary of the total City fees that will be collected from the Ellis Program Area:

Table 6
Total City Fees to be Collected

	Units/Ac		Fee	Total Cost
RML	505	units	$ 2,693	$ 1,360,167
RMM	1705	units	$ 2,693	$ 4,592,247
RMH Fee	40	units	$ 1,293	$ 51,713
Village Mixed Use	20	ac	$ 28,370	$ 567,392
Commercial	24.6	ac	$ 42,825	$ 1,053,496
Storage Unit	9	ac	$ 28,370	$ 255,326
Total City Fees:				**$ 7,880,341**

These fees will be used to fund the improvements identified in Tables 2 and 3 above.

Appendix A

Fehr and Peers Memo

FEHR & PEERS
TRANSPORTATION CONSULTANTS

MEMORANDUM

Date: October 15, 2012

To: Kul Sharma, City of Tracy
Alison Bouley, Harris & Associates

From: Ellen Poling and Mackenzie Watten, Fehr & Peers

Subject: ***Project Proportional Share Calculations for Ellis Specific Plan Traffic Mitigations***

WC06-2318.01

This memorandum transmits the proportional share calculations for the Ellis Specific Plan traffic mitigations identified in the Ellis Specific Plan EIR. This information is needed for the Project's Finance and Implementation Plan. Fehr & Peers based the calculations on the traffic data in the EIR, including a review of the model runs used to develop the roadway and intersection volumes in that analysis.

The following discussion summarizes the proportional contributions to mitigations for (1) cumulative intersection impacts; and (2) cumulative roadway impacts.

I. CUMULATIVE INTERSECTION IMPACTS

The cumulative traffic analysis assumed future improvements at the twenty-one study intersections, consistent with Tracy's 2030 General Plan roadway network at that time. The Project would be expected to contribute a proportional share of the improvements' costs, based on its contribution to the future traffic *growth* at each intersection.

Table 1 shows the proportional shares, which were calculated from the model files used to develop the intersection volumes. The shares were calculated for the AM and PM peak hours; the percentages could be averaged if desired, to arrive at a single proportional share percentage, or the City could determine that a different percentage could be used.

II. CUMULATIVE ROADWAY IMPACTS

The cumulative traffic analysis assumed future roadway improvements (widening and extensions) consistent with Tracy's 2030 General Plan roadway network at the time. The Project would be expected to contribute a proportional share of the improvements' costs, based on its contribution to the future traffic *growth* at each intersection.

Table 2 shows the proportional shares, by roadway segment, for each of the roadway sections discussed in the EIR. These shares were calculated from the model files used to develop the intersection volumes. The shares were calculated for the AM and PM peak hours; the percentages could be averaged if desired, to arrive at a single proportional share percentage, or the City could determine that a different percentage could be used.

FEHR & PEERS
TRANSPORTATION CONSULTANTS

We appreciate the opportunity to continue assisting the City and Harris Associates with this project. Please call if you have any questions.

FEHR & PEERS
TRANSPORTATION CONSULTANTS

TABLE 1
CUMULATIVE PLUS PROJECT
INTERSECTION FAIR SHARE CALCULATIONS

Intersection	Peak Hour	Existing Volume	Cumulative Plus Project Volume	Project Volume	% Fair Share
1. Patterson Pass / I-580 EB	AM	740	1,280	6	1%
	PM	1,016	2,290	35	**3%**
2. Patterson Pass / I-580 WB	AM	1,058	2,180	69	**6%**
	PM	864	2,900	100	5%
3. Corral Hollow Rd. / I-580 EB	AM	539	1,090	20	4%
	PM	860	2,150	68	**5%**
4. Corral Hollow Rd. / I-580 WB	AM	856	1,760	40	4%
	PM	597	2,060	87	**6%**
5. Lammers Rd. / Valpico Rd.	AM	451	1,940	494	**33%**
	PM	541	3,920	985	29%
6. Lammers Rd. / Schulte Rd.	AM	834	1,630	453	**57%**
	PM	909	2,960	864	42%
7. Corral Hollow Rd. / Linne Rd.	AM	730	1,970	255	21%
	PM	696	3,900	787	**25%**
8. Corral Hollow Rd. / Valpico Rd.	AM	1,064	1,700	349	55%
	PM	1,415	3,070	1,002	**61%**
9. Corral Hollow Rd. / Schulte Rd.	AM	2,198	3,840	243	**15%**
	PM	2,370	7,210	681	14%
10. Corral Hollow Rd. / Eleventh St.	AM	3,896	4,340	197	**44%**
	PM	4,686	7,260	545	21%
11. Corral Hollow Rd. / Grant Line Rd.	AM	2,259	2,750	72	**15%**
	PM	3,653	6,590	236	8%
12. Tracy Blvd. / Linne Rd.	AM	801	1,560	68	9%
	PM	733	2,590	173	**9%**
13. Tracy Blvd. / Valpico Rd.	AM	1,835	2,360	58	11%
	PM	1,945	3,980	302	**15%**
14. MacArthur Drive / Linne Road	AM	564	920	48	13%
	PM	582	1,320	129	**17%**
15. MacArthur Drive / Valpico Road	AM	779	840	12	**20%**
	PM	1,032	1,700	43	6%

TABLE 1
CUMULATIVE PLUS PROJECT
INTERSECTION FAIR SHARE CALCULATIONS

Intersection	Peak Hour	Existing Volume	Cumulative Plus Project Volume	Project Volume	% Fair Share
16. Chrisman Road / Linne Road	AM	592	740	31	21%
	PM	625	800	69	**39%**
17. Chrisman Road / Valpico Road	AM	540	580	21	**53%**
	PM	549	780	40	17%
18. Chrisman Road / Schulte Road	AM	880	920	15	**38%**
	PM	945	1,240	32	11%
19. Chrisman Road / Eleventh Street	AM	1,659	2,000	14	4%
	PM	2,219	2,510	31	**11%**
20. Lammers Road / Eleventh Street	AM	2,462	3,590	145	**13%**
	PM	2,783	6,300	424	12%
21. Byron Road / Grant Line Road	AM	1,268	1,590	48	**15%**
	PM	1,531	4,740	161	5%
22. Lammers Road / I-580 EB	AM	-	1,200	59	5%
	PM	-	2,790	285	**10%**
23. Lammers Road / I-580 WB	AM	-	2,410	268	11%
	PM	-	3,230	418	**13%**

Note: **Bold** indicates the larger of the AM and PM share calculations.
Source: Fehr & Peers, October 2012.

FEHR & PEERS
TRANSPORTATION CONSULTANTS

TABLE 2
CUMULATIVE PLUS PROJECT
ROADWAY SEGMENT FAIR SHARE CALCULATIONS

Roadway	Segment	Peak Hour	Existing Volume	Cumulative Plus Project Volume	Project Volume	% Fair Share
Valpico Road Widen to 4 lanes between Lammers Road and MacArthur Drive						
Valpico Road	Lammers Road to Corral Hollow Road	AM	422	195	0	0%
		PM	552	275	1	**0%**
	Corral Hollow Road to Tracy Boulevard	AM	715	920	58	28%
		PM	673	1,400	294	**40%**
	Tracy Boulevard to MacArthur Boulevard	AM	940	1,280	39	11%
		PM	954	2,310	157	**12%**
Schulte Road Extend west on new alignment to Mountain House Parkway; widen to 6 lanes between Corral Hollow Road and Tracy Boulevard.						
Schulte Road	New Alignment west of Lammers[1]	AM	-	1,700	122	7%
		PM	-	2,250	187	**8%**
	Corral Hollow to Tracy Boulevard	AM	950	1,140	4	**2%**
		PM	1,180	2,710	11	1%
Eleventh Street Widen to 6 lanes west of Lammers Road.						
Eleventh Street	West of Lammers Road	AM	2,031	3,100	140	**13%**
		PM	2,291	5,260	346	12%

FEHR & PEERS
TRANSPORTATION CONSULTANTS

TABLE 2
CUMULATIVE PLUS PROJECT
ROADWAY SEGMENT FAIR SHARE CALCULATIONS

Roadway	Segment	Peak Hour	Existing Volume	Cumulative Plus Project Volume	Project Volume	% Fair Share
Grant Line Road Widen to 6 lanes west of Tracy Boulevard.						
Grant Line Road	Byron Road to Corral Hollow Road	AM	1,185	1,280	18	**19%**
		PM	1,848	3,655	90	5%
Lammers Road Extend south to new interchange with I-580; widen to 6 lanes; realign north of Eleventh Street to new interchange with I-205.						
Lammers Road	I-205 to Eleventh Street	AM	2,031	3,100	140	**13%**
		PM	2,291	5,260	346	12%
	Eleventh Street to Schulte Road	AM	410	1,620	254	16%
		PM	463	3,010	594	**20%**
	Schulte Road to Valpico Road	AM	567	1,705	474	28%
		PM	641	3,290	924	**28%**
	Valpico Road to Ellis Drive	AM	17	1,600	494	**31%**
		PM	32	3,500	985	28%
	Ellis Drive to I-580	AM	0	2,050	268	13%
		PM	0	3,010	418	**14%**

FEHR & PEERS
TRANSPORTATION CONSULTANTS

TABLE 2
CUMULATIVE PLUS PROJECT
ROADWAY SEGMENT FAIR SHARE CALCULATIONS

Roadway	Segment	Peak Hour	Existing Volume	Cumulative Plus Project Volume	Project Volume	% Fair Share
Corral Hollow Road Widen to 4 lanes south of Schulte Road, and to 6 lanes north of Schulte Road.						
Corral Hollow Road	Grant Line Road to Eleventh Street	AM	1,769	2,035	105	5%
		PM	2,317	3,875	324	**8%**
	Eleventh Street to Schulte Road	AM	2,038	2,180	212	10%
		PM	2,136	3,960	590	**15%**
	Schulte Road to Valpico Road	AM	946	1,900	253	13%
		PM	1,065	3,370	700	**21%**
	Valpico Road to Ellis Drive	AM	555	1,400	349	41%
		PM	612	2,520	1,000	**52%**
	Ellis Drive to Linne Road	AM	508	1,290	255	33%
		PM	446	2,400	787	**40%**
	Linne Road to I-580	AM	608	1,435	102	7%
		PM	582	2,635	338	**13%**
Tracy Boulevard Widen to 4 lanes between Valpico Road and Linne Road.						
Tracy Boulevard	Valpico Road to Linne Road	AM	745	1,005	0	0%
		PM	732	1,575	4	**0%**

FEHR & PEERS
TRANSPORTATION CONSULTANTS

TABLE 2
CUMULATIVE PLUS PROJECT
ROADWAY SEGMENT FAIR SHARE CALCULATIONS

Roadway	Segment	Peak Hour	Existing Volume	Cumulative Plus Project Volume	Project Volume	% Fair Share
MacArthur Drive Widen to 4 lanes between Schulte Road and Valpico Road.						
MacArthur Drive	Schulte Road to Valpico Road	AM	276	630	9	3%
		PM	398	1,290	34	**4%**

Note: **Bold** indicates the larger of the AM and PM share calculations.

1. New alignment of Schulte is a new roadway, thus fair share percentage is calculated as project trips over total cumulative trips

Source: Fehr & Peers, October 2010.

Appendix B

Intersection Costs

Patterson Pass/I-580 EB

City of Tracy

Ellis Program Area

Description Signalize
Widen EB approach to provide 1 Lt and 1 TR Lane
Widen NB approach to provide 1 Thru and 1 RT lane
Widen SB approach to provide 2 LT and 1 Thru Lane

Number of New Lanes: 4
Affected Width 12
Length: 300 **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 75,280
2	Clear & Grub	14,400	SF	$ 0.20	$ 2,880
3	Excavation	14,400	SF	$ 1.80	$ 25,920
4	Pavement AC	14,400	SF	$ 3.30	$ 47,520
5	Pavement AB	14,400	SF	$ 4.10	$ 59,040
6	Signage & Striping	14,400	SF	$ 0.28	$ 4,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000	$ 525,000
9	Utility Relocation	1	LS	$ 20,000	$ 20,000
10	Railroad Crossing		LS	$ 350,000	$ -
11	Traffic Control/Staking	1	LS	10%	$ 68,436
				Construction Sub-total	**$ 828,076**
				10% Design	*$ 82,808*
				15% Contingency	*$ 124,211*
				10% Construction Management	*$ 82,808*
				5% Project Management	*$ 41,404*
				Mark Up Sub-total	**$ 331,230**
				Construction Total	**$ 1,159,306**
12	Right-of-Way*	14,400	SF	$ 2.30	$ 53,058
				Segment Total	**$ 1,212,364**

* Cost of ROW per SF plus $20,000 for acquisition costs

Patterson Pass/I-580 WB

City of Tracy

Ellis Program Area

Description Signalize
Widen WB approach to provide 1 TL and 1 RT lane
Widen SB approach to provide 1 Thru lane and 1 RT lane

Number of New Lanes: 2
Affected Width 12
Length: 300 **feet**

Item #	Description	Qty		Units	Unit Cost		Cost
1	Mobilization	1	LS		10%	$	67,615
2	Clear & Grub	7,200	SF	$	0.20	$	1,440
3	Excavation	7,200	SF	$	1.80	$	12,960
4	Pavement AC	7,200	SF	$	3.30	$	23,760
5	Pavement AB	7,200	SF	$	4.10	$	29,520
6	Signage & Striping	7,200	SF	$	0.28	$	2,000
7	Overlay		SF	$	1.50	$	-
8	Signal	1	EA	$	525,000	$	525,000
9	Utility Relocation	1	LS	$	20,000	$	20,000
10	Railroad Crossing		LS	$	350,000	$	-
11	Traffic Control/Staking	1	LS		10%	$	61,468
					Construction Sub-total	**$**	**743,763**
					10% Design	*$*	*74,376*
					15% Contingency	*$*	*111,564*
					10% Construction Management	*$*	*74,376*
					5% Project Management	*$*	*37,188*
					Mark Up Sub-total	**$**	**297,505**
					Construction Total	**$**	**1,041,268**
12	Right-of-Way*	7,200	SF	$	2.30	$	36,529
					Segment Total	**$**	**1,077,797**

* Cost of ROW per SF plus $20,000 for acquisition costs

Corral Hollow/I-580 EB

City of Tracy

Ellis Program Area

Description Signalize
Widen EB approach to provide 1 LT and 1 TR lane.
Widen NB approach to provide 1 Thru Lane and 1 RT lane.
Widen SB approach to provide 1 LT lande and 2 Thru Lanes

Number of New Lanes: 4
Affected Width 12
Length: 300 **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 75,280
2	Clear & Grub	14,400	SF	$ 0.20	$ 2,880
3	Excavation	14,400	SF	$ 1.80	$ 25,920
4	Pavement AC	14,400	SF	$ 3.30	$ 47,520
5	Pavement AB	14,400	SF	$ 4.10	$ 59,040
6	Signage & Striping	14,400	SF	$ 0.28	$ 4,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000	$ 525,000
9	Utility Relocation	1	LS	$ 20,000	$ 20,000
10	Railroad Crossing		LS	$ 350,000	$ -
11	Traffic Control/Staking	1	LS	10%	$ 68,436
				Construction Sub-total	**$ 828,076**
				10% Design	*$ 82,808*
				15% Contingency	*$ 124,211*
				10% Construction Management	*$ 82,808*
				5% Project Management	*$ 41,404*
				Mark Up Sub-total	**$ 331,230**
				Construction Total	**$ 1,159,306**
12	Right-of-Way*	14,400	SF	$ 2.30	$ 53,058
				Segment Total	**$ 1,212,364**

* Cost of ROW per SF plus $20,000 for acquisition costs

Corral Hollow/I-580 WB

City of Tracy

Ellis Program Area

Description Signalize
Widen WB approach to provide 1 TL and 1 RT lane.
Widen NB approach to add 1 Thru lane
Widen SB approach to provide 2 Thru lanes and 1 RT lane

Number of New Lanes: 4
Affected Width 12
Length: 300 **feet**

Item #	Description	Qty		Units	Unit Cost		Cost
1	Mobilization	1	LS		10%	$	75,280
2	Clear & Grub	14,400	SF	$	0.20	$	2,880
3	Excavation	14,400	SF	$	1.80	$	25,920
4	Pavement AC	14,400	SF	$	3.30	$	47,520
5	Pavement AB	14,400	SF	$	4.10	$	59,040
6	Signage & Striping	14,400	SF	$	0.28	$	4,000
7	Overlay		SF	$	1.50	$	-
8	Signal	1	EA	$	525,000	$	525,000
9	Utility Relocation	1	LS	$	20,000	$	20,000
10	Railroad Crossing		LS	$	350,000	$	-
11	Traffic Control/Staking	1	LS		10%	$	68,436
					Construction Sub-total	**$**	**828,076**
					10% Design	*$*	*82,808*
					15% Contingency	*$*	*124,211*
					10% Construction Management	*$*	*82,808*
					5% Project Management	*$*	*41,404*
					Mark Up Sub-total	**$**	**331,230**
					Construction Total	**$**	**1,159,306**
12	Right-of-Way*	14,400	SF	$	2.30	$	53,058
					Segment Total	**$**	**1,212,364**

* Cost of ROW per SF plus $20,000 for acquisition costs

Lammers/Valpico

City of Tracy

Ellis Program Area

Description Signalize
Widen WB approach to provide 1 LT and 1 RT lane
Widen NB approach to add 2 thru lanes
Widen SB approach to Provide 1 SB LT and 3 thru lanes.

Number of New Lanes: 6
Affected Width 12
Length: 300 **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 63,694
2	Clear & Grub	21,600	SF	$ 0.20	$ 4,320
3	Excavation	21,600	SF	$ 1.80	$ 38,880
4	Pavement AC	21,600	SF	$ 3.30	$ 71,280
5	Pavement AB	21,600	SF	$ 4.10	$ 88,560
6	Signage & Striping	21,600	SF	$ 0.28	$ 6,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 350,000	$ 350,000
9	Utility Relocation	1	LS	$ 20,000	$ 20,000
10	Railroad Crossing	-	LS	$ 350,000	$ -
11	Traffic Control/Staking	1	LS	10%	$ 57,904
				Construction Sub-total	**$ 700,638**
				10% Design	*$ 70,064*
				15% Contingency	*$ 105,096*
				10% Construction Management	*$ 70,064*
				5% Project Management	*$ 35,032*
				Mark Up Sub-total	**$ 280,255**
				Construction Total	**$ 980,894**
12	Right-of-Way*	21,600	SF	$ 2.30	$ 69,587
				Segment Total	**$ 1,050,481**

* Cost of ROW per SF plus $20,000 for acquisition costs

Lammers/Schulte

City of Tracy

Ellis Program Area

Description Signalize
Widen EB approach to provide 1 LT and 1 TR lane.
Add WB approach to 1 LT and 1 TR lane.
Widen SB approach to provide 1 LT and 2 Thru lanes.

Number of New Lanes: 7
Affected Width 12
Length: 300 **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 86,777
2	Clear & Grub	25,200	SF	$ 0.20	$ 5,040
3	Excavation	25,200	SF	$ 1.80	$ 45,360
4	Pavement AC	25,200	SF	$ 3.30	$ 83,160
5	Pavement AB	25,200	SF	$ 4.10	$ 103,320
6	Signage & Striping	25,200	SF	$ 0.28	$ 7,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000	$ 525,000
9	Utility Relocation	1	LS	$ 20,000	$ 20,000
10	Railroad Crossing		LS	$ 525,000	$ -
11	Traffic Control/Staking	1	LS	10%	$ 78,888
				Construction Sub-total	**$ 954,545**
				10% Design	*$ 95,454*
				15% Contingency	*$ 143,182*
				10% Construction Management	*$ 95,454*
				5% Project Management	*$ 47,727*
				Mark Up Sub-total	**$ 381,818**
				Construction Total	**$ 1,336,363**
12	Right-of-Way*	25,200	SF	$ 2.30	$ 77,851
				Segment Total	**$ 1,414,214**

* Cost of ROW per SF plus $20,000 for acquisition costs

Corral Hollow / Linne Road

City of Tracy

Ellis Program Area

Description Convert intersection to T with no EB approach
Widen WB approach to add 1 LT and 1 TR lane
Widen NB approach to provide 2 Thru lanes and 1 RT lane
Widen SB approach to provide 1 LT, 1 Thru, and 1 TR lane
Signalize

Number of New Lanes: 5

Affected Width 12

Length: 300 **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 117,612
2	Clear & Grub	18,000	SF	$ 0.20	$ 3,600
3	Excavation	18,000	SF	$ 1.80	$ 32,400
4	Pavement AC	18,000	SF	$ 3.30	$ 59,400
5	Pavement AB	18,000	SF	$ 4.10	$ 73,800
6	Signage & Striping	18,000	SF	$ 0.28	$ 5,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000	$ 525,000
9	Utility Relocation	1	LS	$ 20,000	$ 20,000
10	Railroad Crossing	1	LS	$ 350,000	$ 350,000
11	Traffic Control/Staking	1	LS	10%	$ 106,920
				Construction Sub-total	**$ 1,293,732**
				10% Design	*$ 129,373*
				15% Contingency	*$ 194,060*
				10% Construction Management	*$ 129,373*
				5% Project Management	*$ 64,687*
				Mark Up Sub-total	**$ 517,493**
				Construction Total	**$ 1,811,225**
12	Right-of-Way*	18,000	SF	$ 2.30	$ 61,322
				Segment Total	**$ 1,872,547**

* Cost of ROW per SF plus $20,000 for acquisition costs

Corral Hollow / Valpico Road

City of Tracy

Ellis Program Area

Description Widen SB approach to provide 1 LT & 1 TR lane
Signalize

Number of New Lanes: 1
Affected Width 12
Length: 300 **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 45,126
2	Clear & Grub	3,600	SF	$ 0.20	$ 720
3	Excavation	3,600	SF	$ 1.80	$ 6,480
4	Pavement AC	3,600	SF	$ 3.30	$ 11,880
5	Pavement AB	3,600	SF	$ 4.10	$ 14,760
6	Signage & Striping	3,600	SF	$ 0.28	$ 1,000
7	Overlay	3,600	SF	$ 1.50	$ 5,400
8	Signal	1	EA	$ 350,000	$ 350,000
9	Utility Relocation	1	LS	$ 20,000	$ 20,000
10	Traffic Control/Staking	1	LS	10%	$ 41,024
				Construction Sub-total	**$ 496,390**
				10% Design	*$ 49,639*
				15% Contingency	*$ 74,459*
				10% Construction Management	*$ 49,639*
				5% Project Management	*$ 24,820*
				Mark Up Sub-total	**$ 198,556**
				Construction Total	**$ 694,947**
11	Right-of-Way*	3,600	SF	$ 2.30	$ 28,264
				Segment Total	**$ 723,211**

* Cost of ROW per SF plus $20,000 for acquisition costs

Corral Hollow / Schulte Rd

City of Tracy

Ellis Program Area

Description Widen EB approach to provide 1 LT and 1 Thru lane
Widen WB approach to provide 1 LT, 3 Thru, and 1 RT lane
Widen NB approach to provide 2 LT, 3 Thru, and 1 RT lane
Widen SB approach to provide 2 LT, 3 Thru, and 1 RT lane
Convert EB RT from permitted to free
Modify Signal

Number of New Lanes: 7
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 73,137
2	Clear & Grub	25,200	SF	$ 0.20	$ 5,040
3	Excavation	25,200	SF	$ 1.80	$ 45,360
4	Pavement AC	25,200	SF	$ 3.30	$ 83,160
5	Pavement AB	25,200	SF	$ 4.10	$ 103,320
6	Signage & Striping	32,400	SF	$ 0.28	$ 9,000
7	Overlay		SF	$ 1.50	$ -
8	Signal Modification	1	EA	$ 125,000.00	$ 125,000
9	Curb & Gutter	1,200	LF	$ 20.00	$ 24,000
10	Sidewalk	6,000	SF	$ 6.00	$ 36,000
11	Landscaping	12,000	SF	$ 4.00	$ 48,000
12	Median Curb	2400	LF	$ 15.00	$ 36,000
13	Utility Relocation	1	LS	$ 150,000.00	$ 150,000
14	Traffic Control/Staking	1	LS	10%	$ 66,488
				Construction Sub-total	**$ 804,505**
				10% Design	*$ 80,450*
				15% Contingency	*$ 120,676*
				10% Construction Management	*$ 80,450*
				5% Project Management	*$ 40,225*
				Mark Up Sub-total	**$ 321,802**
				Construction Total	**$ 1,126,307**
15	Right-of-Way*	25,200	SF	$ 2.30	$ 77,851
				Segment Total	**$ 1,204,158**

* Cost of ROW per SF plus $20,000 for acquisition costs

Corral Hollow/11th

City of Tracy

Ellis Program Area

Description Widen NB approach to add 1 Thru Lane (re-stripe)
Widen SB approach to add 1 Thru lane (re-stripe)
Convert EB and WB RT lanes from permitted to free (EB already completed)
Modify Signal

Number of New Lanes: 1
Lane Width 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 23,173
2	Clear & Grub	3,600	SF	$ 0.20	$ 720
3	Excavation	3,600	SF	$ 1.80	$ 6,480
4	Pavement AC	3,600	SF	$ 3.30	$ 11,880
5	Pavement AB	3,600	SF	$ 4.10	$ 14,760
6	Signage & Striping	10,800	SF	$ 0.28	$ 3,000
7	Overlay		SF	$ 1.50	$ -
8	Signal Modification	1	EA	$ 125,000.00	$ 125,000
9	Curb & Gutter	1,200	LF	$ 20.00	$ 24,000
10	Median Curb	130		$ 15.00	$ 1,950
11	Sidewalk	1,500	SF	$ 6.00	$ 9,000
12	Landscaping	3,000	SF	$ 4.00	$ 12,000
13	Median Curb	125	LF	$ 15.00	$ 1,875
14	Traffic Control/Staking	1	LS	10%	$ 21,067
				Construction Sub-total	**$ 254,905**
				10% Design	*$ 25,490*
				15% Contingency	*$ 38,236*
				10% Construction Management	*$ 25,490*
				5% Project Management	*$ 12,745*
				Mark Up Sub-total	**$ 101,962**
				Construction Total	**$ 356,867**
15	Right-of-Way*	3,600	SF	$ 2.30	$ 28,264
				Segment Total	**$ 385,131**

* Cost of ROW per SF plus $20,000 for acquisition costs

Tracy Blvd./Linne Rd.

City of Tracy

Ellis Program Area

Description Widen EB approach to provide 2 LT and 3 Thru Lanes
Widen WB approach to provide 1 TL and 1 TR lane
Widen SB approach to provide 1 LT, 2 Thru, and 1 RT lane
Signalize

Number of New Lanes: 8
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 126,909
2	Clear & Grub	28,800	SF	$ 0.20	$ 5,760
3	Excavation	28,800	SF	$ 1.80	$ 51,840
4	Pavement AC	28,800	SF	$ 3.30	$ 95,040
5	Pavement AB	28,800	SF	$ 4.10	$ 118,080
6	Signage & Striping	28,800	SF	$ 0.28	$ 8,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000.00	$ 525,000
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb		LF	$ 15.00	$ -
13	Railroad Crossing	1	LS	$ 350,000.00	$ 350,000
14	Traffic Control/Staking	1	LS	10%	$ 115,372
				Construction Sub-total	**$ 1,396,001**
				10% Design	*$ 139,600*
				15% Contingency	*$ 209,400*
				10% Construction Management	*$ 139,600*
				5% Project Management	*$ 69,800*
				Mark Up Sub-total	**$ 558,400**
				Construction Total	**$ 1,954,402**
15	Right-of-Way*	28,800	SF	$ 2.30	$ 86,116
				Segment Total	**$ 2,040,517**

* Cost of ROW per SF plus $20,000 for acquisition costs

Tracy Blvd./Valpico Rd.

City of Tracy

Ellis Program Area

Description Widen EB approach to add 1 Thru lane
Widen WB approach to provide 1 LT, 2 Thru, and 1 RT lane
Widen NB approach to provide 1 LT, 2 Thru, and 1 RT lane
Widen SB approach to provide 2 LT, 1 thru, and 1 RT lane
Modify Signal

Number of New Lanes: 2
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 27,355
2	Clear & Grub	7,200	SF	$ 0.20	$ 1,440
3	Excavation	7,200	SF	$ 1.80	$ 12,960
4	Pavement AC	7,200	SF	$ 3.30	$ 23,760
5	Pavement AB	7,200	SF	$ 4.10	$ 29,520
6	Signage & Striping	7,200	SF	$ 0.28	$ 2,000
7	Overlay		SF	$ 1.50	$ -
8	Signal Modification	1	EA	$ 125,000.00	$ 125,000
9	Curb & Gutter	600	LF	$ 20.00	$ 12,000
10	Sidewalk	3,000	SF	$ 6.00	$ 18,000
11	Landscaping	6,000	SF	$ 4.00	$ 24,000
12	Median Curb		LF	$ 15.00	$ -
13					
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ 24,868
				Construction Sub-total	**$ 300,903**
				10% Design	*$ 30,090*
				15% Contingency	*$ 45,135*
				10% Construction Management	*$ 30,090*
				5% Project Management	*$ 15,045*
				Mark Up Sub-total	**$ 120,361**
				Construction Total	**$ 421,264**
17	Right-of-Way*	7,200	SF	$ 2.30	$ 36,529
				Segment Total	**$ 457,793**

* Cost of ROW per SF plus $20,000 for acquisition costs

MacArthur/Linne

City of Tracy

Ellis Program Area

Description Widen EB approach to provide 1 LT, 1 Thru and 1 TR lane
Widen WB approach to provide 1 TL and 1 TR lane.
Signalize

Number of New Lanes: 3
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 107,747
2	Clear & Grub	10,800	SF	$ 0.20	$ 2,160
3	Excavation	10,800	SF	$ 1.80	$ 19,440
4	Pavement AC	10,800	SF	$ 3.30	$ 35,640
5	Pavement AB	10,800	SF	$ 4.10	$ 44,280
6	Signage & Striping	10,800	SF	$ 0.28	$ 3,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000	$ 525,000
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb	0	LF	$ 15.00	$ -
13	Railroad Crossing	1	LS	$ 350,000.00	$ 350,000
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ 97,952
				Construction Sub-total	**$ 1,185,219**
				10% Design	*$ 118,522*
				15% Contingency	*$ 177,783*
				10% Construction Management	*$ 118,522*
				5% Project Management	*$ 59,261*
				Mark Up Sub-total	**$ 474,088**
				Construction Total	**$ 1,659,307**
17	Right-of-Way*	10,800	SF	$ 2.30	$ 44,793
				Segment Total	**$ 1,704,100**

* Cost of ROW per SF plus $20,000 for acquisition costs

MacArthur/Valpico

City of Tracy

Ellis Program Area

Description Widen EB approach to add 1 Thru Lane (re-stripe)
Widen SB approach to add 1 Thru Lane
Convert WB and NB LT from Protected to Permitted
Modify Signal

Number of New Lanes: 1
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 20,662
2	Clear & Grub	3,600	SF	$ 0.20	$ 720
3	Excavation	3,600	SF	$ 1.80	$ 6,480
4	Pavement AC	3,600	SF	$ 3.30	$ 11,880
5	Pavement AB	3,600	SF	$ 4.10	$ 14,760
6	Signage & Striping	7,200	SF	$ 0.28	$ 2,000
7	Overlay		SF	$ 1.50	$ -
8	Signal Modification	1	EA	$ 125,000.00	$ 125,000
9	Curb & Gutter	300	LF	$ 20.00	$ 6,000
10	Sidewalk	1,500	SF	$ 6.00	$ 9,000
11	Landscaping	3,000	SF	$ 4.00	$ 12,000
12	Median Curb	0	LF	$ 15.00	$ -
13					
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ 18,784
				Construction Sub-total	**$ 227,286**
				10% Design	*$ 22,729*
				15% Contingency	*$ 34,093*
				10% Construction Management	*$ 22,729*
				5% Project Management	*$ 11,364*
				Mark Up Sub-total	**$ 90,915**
				Construction Total	**$ 318,201**
17	Right-of-Way*	3,600	SF	$ 2.30	$ 28,264
				Segment Total	**$ 346,465**

* Cost of ROW per SF plus $20,000 for acquisition costs

Chrisman/Linne

City of Tracy

Ellis Program Area

Description Widen EB approach to provide 1 TL and 1 TR (re-stripe)
Widen SB approach to provide 1 TL and 1 TR lane (re-stripe)

Number of New Lanes: 2
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 7,665
2	Clear & Grub	7,200	SF	$ 0.20	$ 1,440
3	Excavation	7,200	SF	$ 1.80	$ 12,960
4	Pavement AC	7,200	SF	$ 3.30	$ 23,760
5	Pavement AB	7,200	SF	$ 4.10	$ 29,520
6	Signage & Striping	7,200	SF	$ 0.28	$ 2,000
7	Overlay		SF	$ 1.50	$ -
8	Signal Modification	-	EA	$ 125,000.00	$ -
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb		LF	$ 15.00	$ -
13					
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ 6,968
				Construction Sub-total	**$ 84,313**
				10% Design	*$ 8,431*
				15% Contingency	*$ 12,647*
				10% Construction Management	*$ 8,431*
				5% Project Management	*$ 4,216*
				Mark Up Sub-total	**$ 33,725**
				Construction Total	**$ 118,038**
17	Right-of-Way*	7,200	SF	$ 2.30	$ 36,529
				Segment Total	**$ 154,567**

* Cost of ROW per SF plus $20,000 for acquisition costs

Chrisman/Valpico

City of Tracy

Ellis Program Area

Description Restripe to Modify NB approach to 1 TL and 1 Thru
Restripe Modify SB approach to 1 Thru and one TR.

Number of New Lanes: 2
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 220
2	Clear & Grub	-	SF	$ 0.20	$ -
3	Excavation	-	SF	$ 1.80	$ -
4	Pavement AC	-	SF	$ 3.30	$ -
5	Pavement AB	-	SF	$ 4.10	$ -
6	Signage & Striping	7,200	SF	$ 0.28	$ 2,000
7	Overlay		SF	$ 1.50	$ -
8	Signal Modification	-	EA	$ 125,000.00	$ -
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb	0	LF	$ 15.00	$ -
13					
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ 200
				Construction Sub-total	**$ 2,420**
				10% Design	*$ 242*
				15% Contingency	*$ 363*
				10% Construction Management	*$ 242*
				5% Project Management	*$ 121*
				Mark Up Sub-total	**$ 968**
				Construction Total	**$ 3,388**
17	Right-of-Way*	-	SF		$ -
				Segment Total	**$ 3,388**

* Cost of ROW per SF plus $20,000 for acquisition costs

Chrisman/Schulte

City of Tracy

Ellis Program Area

Description Signalize
Widen NB approach to add 1 Thru Lane

Number of New Lanes: 1
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 100,082
2	Clear & Grub	3,600	SF	$ 0.20	$ 720
3	Excavation	3,600	SF	$ 1.80	$ 6,480
4	Pavement AC	3,600	SF	$ 3.30	$ 11,880
5	Pavement AB	3,600	SF	$ 4.10	$ 14,760
6	Signage & Striping	3,600	SF	$ 0.28	$ 1,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000	$ 525,000
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb		LF	$ 15.00	$ -
13	Railroad Crossing	1	LS	$ 350,000.00	$ 350,000
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ 90,984
				Construction Sub-total	**$ 1,100,906**
				10% Design	*$ 110,091*
				15% Contingency	*$ 165,136*
				10% Construction Management	*$ 110,091*
				5% Project Management	*$ 55,045*
				Mark Up Sub-total	**$ 440,363**
				Construction Total	**$ 1,541,269**
17	Right-of-Way*	3,600	SF	$ 2.30	$ 28,264
				Segment Total	**$ 1,569,533**

* Cost of ROW per SF plus $20,000 for acquisition costs

Chrisman/11th

City of Tracy

Ellis Program Area

Description Convert SB right from permitted
Overlap phasing to permitted

Number of New Lanes: 0
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	-	LS	10%	$ -
2	Clear & Grub	-	SF	$ 0.20	$ -
3	Excavation	-	SF	$ 1.80	$ -
4	Pavement AC	-	SF	$ 3.30	$ -
5	Pavement AB	-	SF	$ 4.10	$ -
6	Signage & Striping	-	SF		$ -
7	Overlay		SF	$ 1.50	$ -
8	Signal Phasing	1	EA	$ 5,000	$ 5,000
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb		LF	$ 15.00	$ -
13					
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ -
				Construction Sub-total	**$ 5,000**
				10% Design	*$ 500*
				15% Contingency	*$ 750*
				10% Construction Management	*$ 500*
				5% Project Management	*$ 250*
				Mark Up Sub-total	**$ 2,000**
				Construction Total	**$ 7,000**
17	Right-of-Way*	-	SF		$ -
				Segment Total	**$ 7,000**

* Cost of ROW per SF plus $20,000 for acquisition costs

11th/Lammers

City of Tracy

Ellis Program Area

Description Widen EB approach to add 1 RT lane
Reduce NB thru lanes from 2 to 1 and add a 3rd LT lane
Reduce SB LT lanes from 2 to 1 lane
Convert EB, NB and SB RT lanes from Permitted to free

Number of New Lanes: 1
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 4,267
2	Clear & Grub	3,600	SF	$ 0.20	$ 720
3	Excavation	3,600	SF	$ 1.80	$ 6,480
4	Pavement AC	3,600	SF	$ 3.30	$ 11,880
5	Pavement AB	3,600	SF	$ 4.10	$ 14,760
6	Signage & Striping	10,800	SF	$ 0.28	$ 3,000
7	Overlay		SF	$ 1.50	$ -
8	Signal Modification	-	EA	$ 125,000.00	$ -
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb	130	LF	$ 15.00	$ 1,950
13					
14					
15					
16	Traffic Control/Staking	1	LS	10%	$ 3,879
				Construction Sub-total	**$ 46,936**
				10% Design	*$ 4,694*
				15% Contingency	*$ 7,040*
				10% Construction Management	*$ 4,694*
				5% Project Management	*$ 2,347*
				Mark Up Sub-total	**$ 18,774**
				Construction Total	**$ 65,710**
17	Right-of-Way*	3,600	SF	$ 2.30	$ 28,264
				Segment Total	**$ 93,975**

* Cost of ROW per SF plus $20,000 for acquisition costs

Byron/Grant Line

City of Tracy

Ellis Program Area

Description Widen EB approach to provide 1 LT and 1 Thru
Widen WB approach to provide 2 LT, 2 Thru and 1 RT
Widen NB approach to add 1 LT, 2 Thru and 2 RT
Widen SB approach to provide 1 LT, 1 Thru and 1 TR
Signalize

Number of New Lanes: 12
Lane Width: 12
Length: 300 **feet**
Width: **feet**

Item #	Description	Qty	Units	Unit Cost	Cost
1	Mobilization	1	LS	10%	$ 153,239
2	Clear & Grub	43,200	SF	$ 0.20	$ 8,640
3	Excavation	43,200	SF	$ 1.80	$ 77,760
4	Pavement AC	43,200	SF	$ 3.30	$ 142,560
5	Pavement AB	43,200	SF	$ 4.10	$ 177,120
6	Signage & Striping	43,200	SF	$ 0.28	$ 12,000
7	Overlay		SF	$ 1.50	$ -
8	Signal	1	EA	$ 525,000	$ 525,000
9	Curb & Gutter		LF	$ 20.00	$ -
10	Sidewalk		SF	$ 6.00	$ -
11	Landscaping		SF	$ 4.00	$ -
12	Median Curb		LF	$ 15.00	$ -
13	Railroad Crossing	1	LS	$ 350,000.00	$ 350,000
14	Utility Relocation	1	LS	$ 100,000	$ 100,000
15					
16	Traffic Control/Staking	1	LS	10%	$ 139,308
				Construction Sub-total	**$ 1,685,627**
				10% Design	*$ 168,563*
				15% Contingency	*$ 252,844*
				10% Construction Management	*$ 168,563*
				5% Project Management	*$ 84,281*
				Mark Up Sub-total	**$ 674,251**
				Construction Total	**$ 2,359,878**
17	Right-of-Way*	43,200	SF	$ 2.30	$ 119,174
				Segment Total	**$ 2,479,051**

* Cost of ROW per SF plus $20,000 for acquisition costs

Appendix C

Roadway Costs

NEW AREA				Major Arterial 4 Travel Lanes 8' Bike Lanes 16' Median 25' Setbacks w/5' Sidewalks 130' R/W 64' Pavement		Expressway 4 Travel Lanes 8' Shoulders 22' Median 25' Setbacks no Sidewalks 136' R/W 64' Pavement		Minor Arterial 4 Travel Lanes No Bike Lanes TWLTL 25' Setbacks w/5' Sidewalks 116' R/W 66' Pavement		Major Arterial 6 Travel Lanes 8' Bike Lanes 16' Median 25' Setbacks w/5' Sidewalks 154' R/W 88' Pavement	
				Program Width: 30 Frontage Width: 100 Total Width: 130		Program Width: 46 Frontage Width: 90 Total Width: 136		Program Width: 16 Frontage Width: 100 Total Width: 116		Program Width: 64 Frontage Width: 94 Total Width: 154	
	Unit of Measure	**Unit Cost**	**Unit Cost Per SF**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**
Clearing & Grubbing	SF	$0.20	$0.20	$26.00	2.4%	$27.20	2.5%	$23.20	2.4%	$30.80	2.9%
Demolition (AC)	SF	$3.00	$3.00		0.0%		0.0%		0.0%		0.0%
Earthwork (inc. import fill)	CY	$22.00	$0.81	$105.93	10.0%	$110.81	10.3%	$94.52	9.7%	$125.48	11.8%
Erosion Control	Acres	$1,500.00	$0.03	$4.48	0.4%	$4.68	0.4%	$3.99	0.4%	$5.30	0.5%
Drainage Ditch	LF	$20.00			0.0%		0.0%		0.0%		0.0%
Reinforced Concrete Pipe	LF	$65.00		$65.00	6.1%	$65.00	6.1%	$65.00	6.7%	$65.00	6.1%
Storm Drain Lateral	LF	$50.00		$8.00	0.8%	$8.00	0.7%	$8.25	0.8%	$11.00	1.0%
Drainage Structures	EA	$3,500.00		$8.75	0.8%	$8.75	0.8%	$8.75	0.9%	$8.75	0.8%
AC/AB Pavement	SF	$7.40	$7.40	$473.60	44.6%	$473.60	44.1%	$488.40	50.3%	$651.20	61.3%
Signing/Striping/Marking	LF	$2.50		$2.50	0.2%	$2.50	0.2%	$3.75	0.4%	$3.75	0.4%
Median Curb	LF	$15.00		$30.00	2.8%	$30.00	2.8%	$0.00	0.0%	$30.00	2.8%
Median Landscaping + Irrig.	SF	$4.00	$4.00	$64.00	6.0%	$88.00	8.2%	$0.00	0.0%	$64.00	6.0%
Vertical Curb and Gutter	LF	$20.00		$40.00	3.8%	$40.00	3.7%	$40.00	4.1%	$40.00	3.8%
Sidewalk	SF	$6.00	$6.00	$60.00	5.6%	$0.00	0.0%	$60.00	6.2%	$60.00	5.6%
Border Landscaping + Irrig.	SF	$4.00	$4.00	$160.00	15.1%	$200.00	18.6%	$160.00	16.5%	$160.00	15.1%
Lighting	LF	$14.80		$14.80	1.4%	$14.80	1.4%	$14.80	1.5%	$14.80	1.4%
Total Construction				$1,063.05		$1,073.35		$970.66		$1,270.08	
Markup	40%			$425.22		$429.34		$388.27		$508.03	
Right-of-way	SF	$2.30	$2.30	$298.44		$312.21		$266.30		$353.54	
Total Project				$1,786.71		$1,814.90		$1,625.23		$2,131.65	
Per Mile				$9,433,841.73		$9,582,673.34		$8,581,201.57		$11,255,131.38	
Frontage Portion				**$1,263.55**	**70.7%**	**$1,126.27**	**62.1%**	**$1,344.80**	**82.7%**	**$1,287.92**	**60.4%**
Non-Frontage Portion				**$523.17**	**29.3%**	**$688.63**	**37.9%**	**$280.43**	**17.3%**	**$843.73**	**39.6%**
Total				**$1,786.71**		**$1,814.90**		**$1,625.23**		**$2,131.65**	
Curb to Curb Cost				**$1,035.89**		**$1,129.72**		**$874.40**		**$1,418.48**	
Frontage on Curb to Curb				**$750.82**		**$685.18**		**$750.82**		**$713.18**	

Updated 8/14/2013 8:18 AM

DEMOLISH EXISTING 2-LANE RURAL ROAD **Assume 30' of existing pavement** Assume 55' existing ROW				**Major Arterial** 4 Travel Lanes 8' Bike Lanes 16' Median 25' Setbacks w/5' Sidewalks 130' R/W 64' Pavement		**Expressway** 4 Travel Lanes 8' Shoulders 22' Median 25' Setbacks no Sidewalks 136' R/W 64' Pavement		**Expressway** 6 Travel Lanes 8' Shoulders 22' Median 25' Setbacks no Sidewalks 160' R/W 88' Pavement	
				Program Width: 30 Frontage Width: 100 Total Width: 130		Program Width: 46 Frontage Width: 90 Total Width: 136		Program Width: 70 Frontage Width: 90 Total Width: 160	
	Unit of Measure	**Unit Cost**	**Unit Cost Per SF**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**
Clearing & Grubbing	SF	$0.20	$0.20	$20.00	1.8%	$21.20	1.9%	$26.00	1.9%
Demolition (AC)	SF	$3.00	$3.00	$90.00	8.0%	$90.00	7.9%	$90.00	6.7%
Earthwork (inc. import fill)	CY	$22.00	$0.81	$81.48	7.3%	$86.37	7.6%	$105.93	7.9%
Erosion Control	Acres	$1,500.00	$0.03	$4.48	0.4%	$4.68	0.4%	$5.51	0.4%
Drainage Ditch	LF	$20.00			0.0%		0.0%		0.0%
Reinforced Concrete Pipe	LF	$65.00		$65.00	5.8%	$65.00	5.7%	$65.00	4.9%
Storm Drain Lateral	LF	$50.00		$8.00	0.7%	$8.00	0.7%	$11.00	0.8%
Drainage Structures	EA	$3,500.00		$8.75	0.8%	$8.75	0.8%	$8.75	0.7%
AC Pavement	SF	$7.40	$7.40	$473.60	42.2%	$473.60	41.8%	$651.20	48.6%
Signing/Striping/Marking	LF	$2.50		$2.50	0.2%	$2.50	0.2%	$3.75	0.3%
Median Curb	LF	$15.00		$30.00	2.7%	$30.00	2.6%	$30.00	2.2%
Median Landscaping + Irrig.	SF	$4.00	$4.00	$64.00	5.7%	$88.00	7.8%	$88.00	6.6%
Vertical Curb and Gutter	LF	$20.00		$40.00	3.6%	$40.00	3.5%	$40.00	3.0%
Sidewalk	SF	$6.00	$6.00	$60.00	5.3%	$0.00	0.0%	$0.00	0.0%
Border Landscaping + Irrig.	SF	$4.00	$4.00	$160.00	14.3%	$200.00	17.7%	$200.00	14.9%
Lighting	LF	$14.80		$14.80	1.3%	$14.80	1.3%	$14.80	1.1%
Total Construction				$1,122.61		$1,132.90		$1,339.94	
Markup	40%			$449.04		$453.16		$535.97	
Right-of-way		$2.30	$2.30	$172.18		$185.95		$241.05	
Total Project				$1,743.83		$1,772.02		$2,116.96	
Per Mile				$9,207,409.73		$9,356,241.34		$11,177,530.99	
Frontage Portion				**$1,230.56**	**70.6%**	**$1,097.89**	**62.0%**	**$1,176.83**	**55.6%**
Non-Frontage Portion				**$513.27**	**29.4%**	**$674.13**	**38.0%**	**$940.13**	**44.4%**
Total				**$1,743.83**		**$1,772.02**		**$2,116.96**	
Curb to Curb Costs				**$1,025.99**		**$1,115.22**		**$1,455.90**	
Frontage for Curb to Curb				**$717.84**		**$656.80**		**$661.05**	

Updated 8/14/2013 8:18 AM

UPGRADE EXISTING 2-LANE ROAD **Assume 36' of pavement** Assumes 55' Exist ROW				**Major Arterial** 4 Travel Lanes 8' Bike Lanes 16' Median 25' Setbacks w/5' Sidewalks 130' R/W 64' Pavement		**Minor Arterial** 4 Travel Lanes No Bike Lanes TWLTL 25' Setbacks w/5' Sidewalks 116' R/W 66' Pavement	
				Program Width: 30 Frontage Width: 100 Total Width: 130		Program Width: 16 Frontage Width: 100 Total Width: 116	
	Unit of Measure	**Unit Cost**	**Unit Cost Per SF**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**
Clearing & Grubbing [1]	SF	$0.20	$0.20	$18.80	2.5%	$16.00	2.4%
Demolition (AC) [2]	SF	$3.00	$3.00	$30.00	4.0%	$30.00	4.6%
Earthwork (inc. import fill) [1]	CY	$22.00	$0.81	$76.59	10.2%	$65.19	9.9%
Erosion Control	Acres	$1,500.00	$0.03	$3.24	0.4%	$2.75	0.4%
Drainage Ditch	LF	$20.00			0.0%		0.0%
Reinforced Concrete Pipe	LF	$65.00		$65.00	8.7%	$65.00	9.9%
Storm Drain Lateral	LF	$50.00		$8.00	1.1%	$8.25	1.3%
Drainage Structures	EA	$3,500.00		$8.75	1.2%	$8.75	1.3%
AC Pavement	SF	$7.40	$7.40	$207.20	27.7%	$222.00	33.8%
Signing/Striping/Marking	LF	$2.50		$2.50	0.3%	$3.75	0.6%
Median Curb	LF	$15.00		$30.00	4.0%	$0.00	0.0%
Median Landscaping + Irrig.	SF	$4.00	$4.00	$64.00	8.5%	$0.00	0.0%
Vertical Curb and Gutter	LF	$20.00		$40.00	5.3%	$40.00	6.1%
Sidewalk	SF	$6.00	$6.00	$60.00	8.0%	$60.00	9.1%
Border Landscaping + Irrig.	SF	$4.00	$4.00	$120.00	16.0%	$120.00	18.3%
Lighting	LF	$14.80		$14.80	2.0%	$14.80	2.3%
Total Construction				$748.88		$656.49	
Markup	40%			$299.55		$262.60	
Right-of-way	SF	$2.30	$2.30	$172.18		$140.04	
Total Project				$1,220.61		$1,059.12	
Per Mile				$6,444,808.23		$5,592,168.06	
Frontage Portion				**$815.16**	**66.8%**	**$849.05**	**80.2%**
Non-Frontage Portion				**$405.45**	**33.2%**	**$210.07**	**19.8%**
Total				**$1,220.61**		**$1,059.12**	
Curb to Curb Costs				**$631.28**		**$482.53**	
Frontage for Curb to Curb				**$589.33**		**$576.60**	

Notes:

1 For Clearing & Grubbing and Earthwork it is assumed that work will need to be done on everything in the right-of-way except the existing pavement.

2 It is assumed that there will be a cost for demolition of sidewalk existing 5' sidewalks.

UPGRADE EXISTING 4-LANE ROAD **Assume 64' pavement** To 4 lane art.: w/in existing R/W To 4 lane exp.: widen on the sides To 6 lanes: widen on the sides Assume 110' existing ROW				**Major Arterial** 4 Travel Lanes 8' Bike Lanes 16' Median 25' Setbacks w/5' Sidewalks 130' R/W 64' Pavement		**Major Arterial** 6 Travel Lanes 8' Bike Lanes 16' Median 25' Setbacks w/5' Sidewalks 154' R/W 88' Pavement		**Expressway** 4 Travel Lanes 8' Shoulders 22' Median 25' Setbacks no Sidewalks 136' R/W 64' Pavement		**Expressway** 6 Travel Lanes 8' Shoulders 22' Median 25' Setbacks no Sidewalks 160' R/W 88' Pavement	
				Program Width: 70 Frontage Width: 60 Total Width: 130		Program Width 86 Frontage Width 50 Total Width: 136		Program Width: 86 Frontage Width: 50 Total Width: 136		Program Width: 110 Frontage Width: 50 Total Width: 160	
	Unit of Measure	**Unit Cost**	**Unit Cost Per SF**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**	**Section Cost Per LF**	**Percent of Total Cost**
Clearing & Grubbing [1]	SF	$0.20	$0.20	$13.20	2.1%	$18.00	2.9%	$14.40	2.0%	$19.20	2.0%
Demolition (AC) [2]	SF	$3.00	$3.00	$30.00	4.8%	$30.00	4.8%	$30.00	4.1%	$30.00	3.2%
Earthwork (inc. import fill) [1]	CY	$22.00	$0.81	$53.78	8.5%	$73.33	11.6%	$58.67	8.0%	$78.22	8.3%
Erosion Control	Acres	$1,500.00	$0.03	$2.27	0.4%	$3.10	0.5%	$2.48	0.3%	$3.31	0.3%
Drainage Ditch	LF	$20.00			0.0%		0.0%		0.0%		0.0%
Reinforced Concrete Pipe	LF	$65.00		$65.00	10.3%	$65.00	10.3%	$65.00	8.9%	$65.00	6.9%
Storm Drain Lateral	LF	$50.00		$8.00	1.3%	$11.00	1.7%	$8.00	1.1%	$11.00	1.2%
Drainage Structures	EA	$3,500.00		$8.75	1.4%	$8.75	1.4%	$8.75	1.2%	$8.75	0.9%
AC Pavement [3]	SF	$7.40	$7.40	$118.40	18.8%	$177.60	28.2%	$118.40	16.2%	$296.00	31.3%
Signing/Striping/Marking	LF	$2.50		$2.50	0.4%	$2.50	0.4%	$2.50	0.3%	$2.50	0.3%
Median Curb	LF	$15.00		$30.00	4.8%	$30.00	4.8%	$30.00	4.1%	$30.00	3.2%
Median Landscaping + Irrig.	SF	$4.00	$4.00	$64.00	10.1%	$64.00	10.1%	$88.00	12.1%	$88.00	9.3%
Vertical Curb and Gutter	LF	$20.00		$40.00	6.3%	$40.00	6.3%	$40.00	5.5%	$40.00	4.2%
Sidewalk	SF	$6.00	$6.00	$60.00	9.5%	$60.00	9.5%	$60.00	8.2%	$60.00	6.3%
Border Landscaping + Irrig.	SF	$4.00	$4.00	$120.00	19.0%	$120.00	19.0%	$200.00	27.4%	$200.00	21.1%
Lighting	LF	$14.80		$14.80	2.3%	$14.80	2.3%	$3.70	0.5%	$14.80	1.6%
Total Construction				$630.70		$718.08		$729.90		$946.78	
Markup	40%			$252.28		$287.23		$291.96		$378.71	
Right-of-way	SF	$2.30	$2.30	$45.91		$101.01		$59.69		$114.78	
Total Project				$928.89		$1,106.33		$1,081.54		$1,440.27	
Per Mile				$4,904,562.38		$5,841,399.22		$5,710,542.79		$7,604,643.64	
Frontage Portion				**$403.68**	**43.5%**	**$419.54**	**37.9%**	**$498.86**	**46.1%**	**$523.42**	**36.3%**
Non-Frontage Portion				**$525.21**	**56.5%**	**$686.78**	**62.1%**	**$582.68**	**53.9%**	**$916.85**	**63.7%**
Total				**$928.89**		**$1,106.33**		**$1,081.54**		**$1,440.27**	

Notes: **$525.21** **$686.78** **$582.68** **$916.85**

1 For Clearing & Grubbing and Earthwork it is assumed that work will need to be done on everything in the right-of-way except the existing pavement.

2 It is assumed that there will be a cost for demolition of sidewalk existing 5' sidewalks.

3 Assume when there is an existing 4-lane roadway that shoulders, bike lanes, and sidewalks are being added.

City of Tracy- Ellis Program Wastewater Analysis

DRAFT Finance and Implementation Program (FIP) Fees

Prepared for

City of Tracy

December 2012
Updated August 2013

CH2MHILL

2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833
Phone: 916-920-0300

Table of Contents

Executive Summary

The City of Tracy (City) has been requested by the Ellis Program developer to complete a Finance and Implementation Plan (FIP) for the proposed Ellis program. In addition to other details, the FIP includes the wastewater system development impact fee from Ellis.

The Ellis Program includes a mix of residential, commercial, office/professional, institutional, and recreational uses which at this time covers approximately 321 acres.

In order to establish development impact fees for Ellis FIP, the wastewater collection and treatment capacity needs to be analyzed. Due to geographic location and available natural slopes of the terrain, Ellis program is located within the wastewater collection boundaries of Corral Hollow sewer system. This report analyzes the Corral Hollow sewer system capacity for Ellis program and other developments. The Ellis FIP development impact fees are addressed in this Ellis FIP wastewater analysis.

Based on the analysis presented in this report, the following is a summary of Corral Hollow sewer system capacity.

1. All wastewater flows from Ellis would discharge to the Corral Hollow sewer system on a permanent basis.

2. Total units in the Ellis Program

Project	Units	Notes
Ellis	2250	Includes 550 units
Village Mixed Use	507	Equivalent SF units or EDUs
Commercial	114	Equivalent SF units or EDUs

3. City will ultimately decide the order in which wastewater from the above projects is discharged to the Corral Hollow sewer system.

4. Based on the previous analysis, there is approximately 550 unit capacity available in the existing Corral Hollow sewer line **up to I-205**. From this point, flows from 550 units must be directed to Hansen pump station using existing overflow pipe (already installed).

5. Ellis will be served from existing Corral Hollow sewer conveyance system. 550 multi-family residential units from Ellis will not pay sewer conveyance fee in accordance with the Ellis Development Agreement (DA) with the City of Tracy. Out of these units, the first 330 units will use the existing available capacity in the Corral Hollow sewer assuming a new sewer line is installed from Ellis Program to the existing Corral Hollow sewer system.

6. The remaining 220 units from Ellis Program will be served from Corral Hollow sewer after its existing capacity is increased with improvements in accordance with the City of Tracy Wastewater Master Plan—Corral Hollow Sewer Analysis dated April 2012 completed by CH2MHILL.

7. The Eastside sewer capacity for the Ellis Program for 250 units will be temporary until other projects that are designated to discharge to the Eastside sewer system are developed. The City shall monitor the available capacity every year or before approving additional development within the Eastside sewer area.

8. Corral Hollow sewer system upgrade must be completed prior to use of Corral Hollow sewer line capacity beyond 550 units. These upgrades can be completed in multiple phases or at one time as identified in the previous analysis. The development impact fee may change depending on single or multiple phase implementation.

9. Corral Hollow sewer conveyance capacity can be increased by construction of improvements to the system as shown in TABLE 6-2, Major Wastewater Conveyance Facilities Capital Cost Estimate – West Catchment of the 2013 City of Tracy Wastewater Master Plan. To provide consistency amongst all projects in the West Catchment area, the master plan numbers and associated cost have been used in this report.

9. Based on the 2013 Tracy Wastewater Conveyance and Treatment Development Impact Fee Study, the conveyance fee is $1,610 per EDU

10. Tracy WWTP Expansion Fee
    Per Tracy Wastewater Conveyance and Treatment Development Impact Fee Study, the connection fee is $6,727. It should be noted that the above fee is based on build out cost estimate. Since the Tracy WWTP NPDES Permit is renewed every five years and expansion project is built in multiple phases, periodic update to the above fee may be required.

11. Ellis Program Wastewater Connection fee Summary based on the 2013 Tracy Wastewater Conveyance and Treatment Development Impact Fee Study

Property	**Units**	**Conveyance Cost (see note)**	**WWTP Upgrade Fee (per unit)**	**Total cost per unit**	
Ellis program	550	0	$0	$0	Based on DA
Ellis program	250 (per DA)	$1,610	0	$1,610	per ECU
Ellis program	1,957	$1,610	$6,727	$8,337	per ECU
Ellis program/ Commercial (5.2 units per acre)	114	$1,610	$6,727	$43,352	Per acre

Note – **Corral Hollow Upgrade Fee assumes that upgrade will happen in one phase which requires a large upfront capital. The upgrade may occur in more than one phase which will affect the cost. The Financing plan is assumed to address this issue.**

12. The following Conversion factors have been used to compute wastewater system fee for medium and high density units.
1 SF Equivalent = Detached single family home= 264 gallons per day
Medium density = Equivalent to 0.81 S.F.
High density = Equivalent to 0.67 S.F.
Commercial = 5.2 SF equivalent per acre

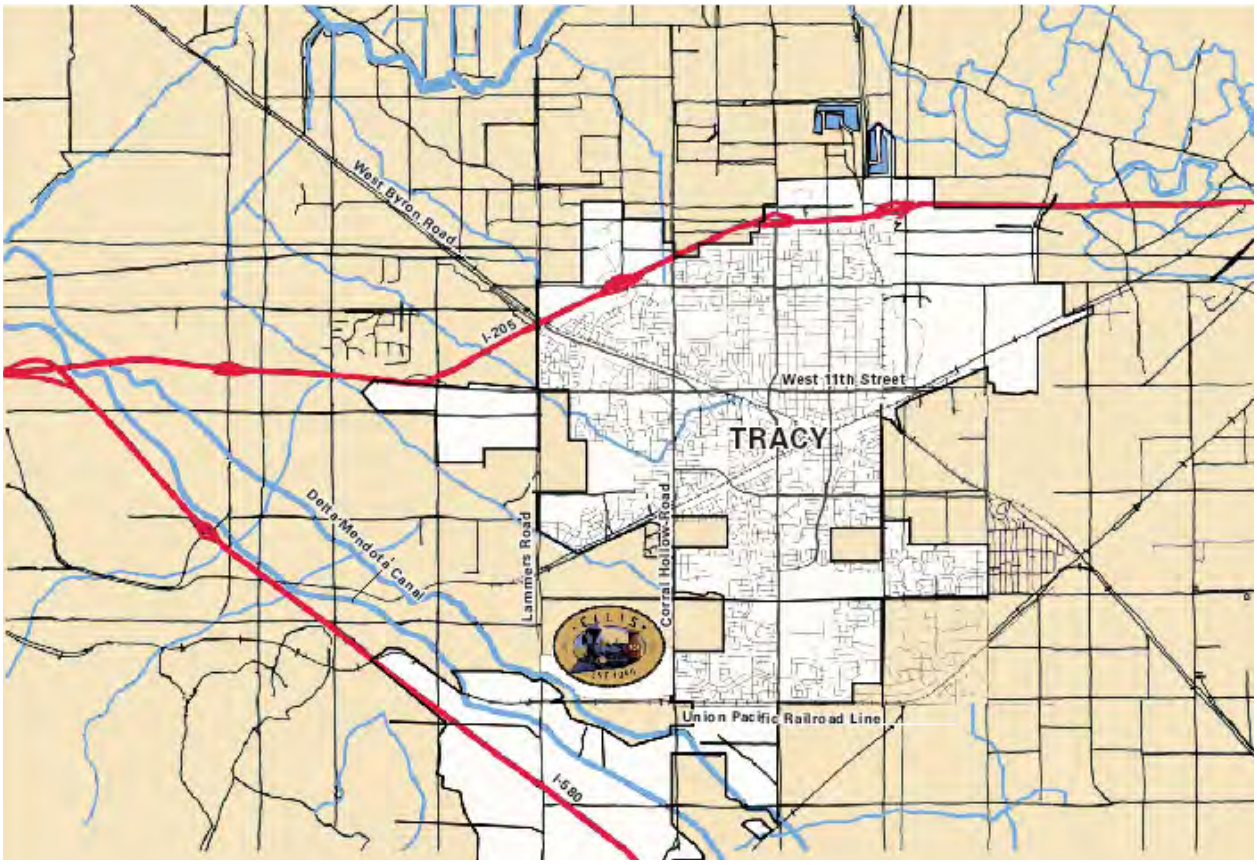
Fee per unit type	Factor	Cost per unit
RML (Low)	1.0	$8,337
RMM (Medium)/VMU	0.81	$6,753
RMH (High)	0.67	$5,586
Commercial	5.2	$43,352

Ellis Program Wastewater Analysis Finance and Implementation Program (FIP) Fees

Project Description

The City of Tracy (City) has been requested by the Ellis Program developer to complete a Finance and Implementation Plan for the proposed Ellis program.

The Ellis Program includes a mix of residential, commercial, office/professional, institutional, and recreational uses currently covering approximately 321 acres.



In order to establish wastewater development impact fee for Ellis FIP, the wastewater collection and treatment capacity needs to be analyzed. Due to geographic location and natural terrain, Ellis program is located within the wastewater collection system boundaries of Corral Hollow sewer system. This report analyzes the Corral Hollow sewer system capacity for Ellis and other developments within that zone.

Purpose and Scope

This report identifies the infrastructure improvements related to the wastewater collection and treatment system for the Ellis program. Based on the *City of Tracy Wastewater Master Plan/Corral Hollow Sewer Analysis* dated April 2012 prepared by CH2M HILL, the Ellis program is ultimately designated to discharge all of its wastewater to the existing Corral Hollow sewer system. However, improvements are needed to the existing Corral Hollow sewer system before the entire wastewater flow from the Ellis program could be discharged to the Corral Hollow sewer system.

This report has been divided into three sections:

1. Interim Infrastructure Needs
2. Phasing Plan and cost for Build out Facilities
3. Benefit and Burden Analysis meeting AB 1600

Interim Infrastructure Needs

Currently, there is limited availability of conveyance capacity in the existing Eastside sewer system. It should be noted that the above capacity is available until other projects that are designated to discharge to the Eastside sewer system are developed. Therefore, Ellis program could use available conveyance capacity in accordance with the Specific Plan. The following designations within the Ellis program are designated to discharge its wastewater to the Eastside sewer system on an interim basis.

- Storage site
- 250 equivalent single family units

All other future development is assumed to connect to the Corral Hollow sewer system.

WASTEWATER FLOWS FROM ELLIS PROGRAM

The following criteria are used to develop wastewater flows from the Ellis Program area:

Flow Parameter	Master Plan Values
Per Capita Flow	80 gpcd
Residential Flow – Very Low Density	264 gpd/unit
Residential Flow – Low Density	264 gpd/unit
Residential Flow – Medium Density	216 gpd/unit
Residential Flow – High Density	176 gpd/unit
Industrial Flow	1,056 gal/acre/day
Retail & Commercial Flow	1,375 gal/acre/day
Office Flow	1,140 gal/acre/day
Peak Wet Weather Flow	2.5 PF

The following is the assumption for each residential type unit:
Very low density = 3.3 people per unit
Low density = 3.3 people per unit
Medium density = 2.7 people per unit
High density = 2.2 people per unit

Approximate wastewater flow from the first 250 units of Ellis project is
250 units x 264 gallons per units x 2.5 (Peak flow factor) = 165,000 gallons or 0.165 mgd.

WASTEWATER FLOWS FROM STORAGE CENTER

It is assumed that there will be two restrooms in the Storage center.

Flow = 50 gallons per day x 2 units = 100 gallons per day.

TOTAL WASTEWATER FLOW FROM INITIAL ELLIS PROGRAM + STORAGE

Ellis Program (initial 250 units)---		165,000 gallons per day
Storage project	---	100 gallons per day
Total wastewater flow		165,100 gallons per day

Eastside Sewer System (interim use)

Based on reconfiguration completed during the development of Edgewood subdivision (located just east of the proposed Ellis program), the beginning of the Eastside sewer system consists of 8 to 15-inch diameter sewer lines. The connection point for the initial 250 units from Ellis and Storage project is an existing manhole located at the intersection of Peony Drive and Heirloom Lane.

There is an existing 8-inch sewer line along Peony Dr and it becomes a15-inch sewer line by the time it reaches Cherry Blossom Lane. The following table shows the existing capacity and the number of units connected to this portion of the Eastside sewer system.

Sewer Lines within Edgewood Estates							
Location	Length (ft)	Dia (in)	Slope %	Hydraulic Capacity (gpm)	Hydraulic Capacity (MGD)	Number of SF Homes Currently Connected	Number of existing SF Homes allowed based on Hydraulic Capacity*
Peony and Heirloom Ln	274	8	1.16	584	0.841534	38	1429
Peony and Keepsake	199	8	3.04	946	1.36232	65	2313
Peony and Memoir	250	10	0.25	492	0.708336	130	1203
Along Peony Dr	1575	12	0.2	715	1.03023	450	1749
Along Cherry Blossom Ln	750	15	0.15	1123	1.617676	650	2747
*at 264 gpd and PF 2.5							

Since the number of homes connected to the beginning sections of the Eastside sewer system is less than the hydraulic capacity, there is sufficient capacity for the initial 250 units from the Ellis program and Storage project. However, there are downstream constraints that prevent discharge of additional wastewater flows.

The connection point for the initial 250 units and storage project is an existing manhole located at the intersection of Peony Drive and Heirloom Lane. It is assumed that the cost of connection to the existing Eastside system for the above projects is part of off-site improvements and not included in the Ellis program cost.

Wastewater System Fee—Ellis Program

The total wastewater system impact fee for Ellis program is based on Tracy Wastewater Conveyance and Treatment Development Impact Fee Study dated January 2013.

Corral Hollow Trunk Sewer Improvements

A portion (3.55 mgd) of the wastewater transmitted to Node 4W.1 will be conveyed to the Tracy WWTP via the Corral Hollow Trunk Sewer and Hansen Pump Station and force main. The following describes the new conveyance facilities (that is, improvements) and the necessary upgrades to the Corral Hollow Trunk Sewer and Hansen Pump Station and force main to provide additional capacity. The conceptual horizontal alignment is shown on Figure 1. The hydraulic capacity and future peak wet weather flows are shown in Figure 2 (Node 4W.1 to manhole 15).

As previously mentioned, a portion of PWWFs in excess of the Corral Hollow Trunk Sewer hydraulic capacity are diverted to the existing relief sewer extending from manhole 15 to the Hansen Pump Station. The existing relief sewer is a 12-inch-diameter pipe with a hydraulic capacity of approximately 1.02 mgd. The existing relief sewer will not accommodate the PWWF from the Future Service Areas; therefore, a second relief sewer (parallel to the existing relief sewer) will be necessary.

The proposed relief sewer consists of approximately 2,180 linear feet of 21-inch-diameter gravity sewer pipe and associated improvements (i.e., manholes). The proposed parallel relief sewer is sized to provide additional relief capacity of up to 3.55 mgd. The proposed parallel relief sewer is assumed to be constructed on the same grade as the existing relief sewer.

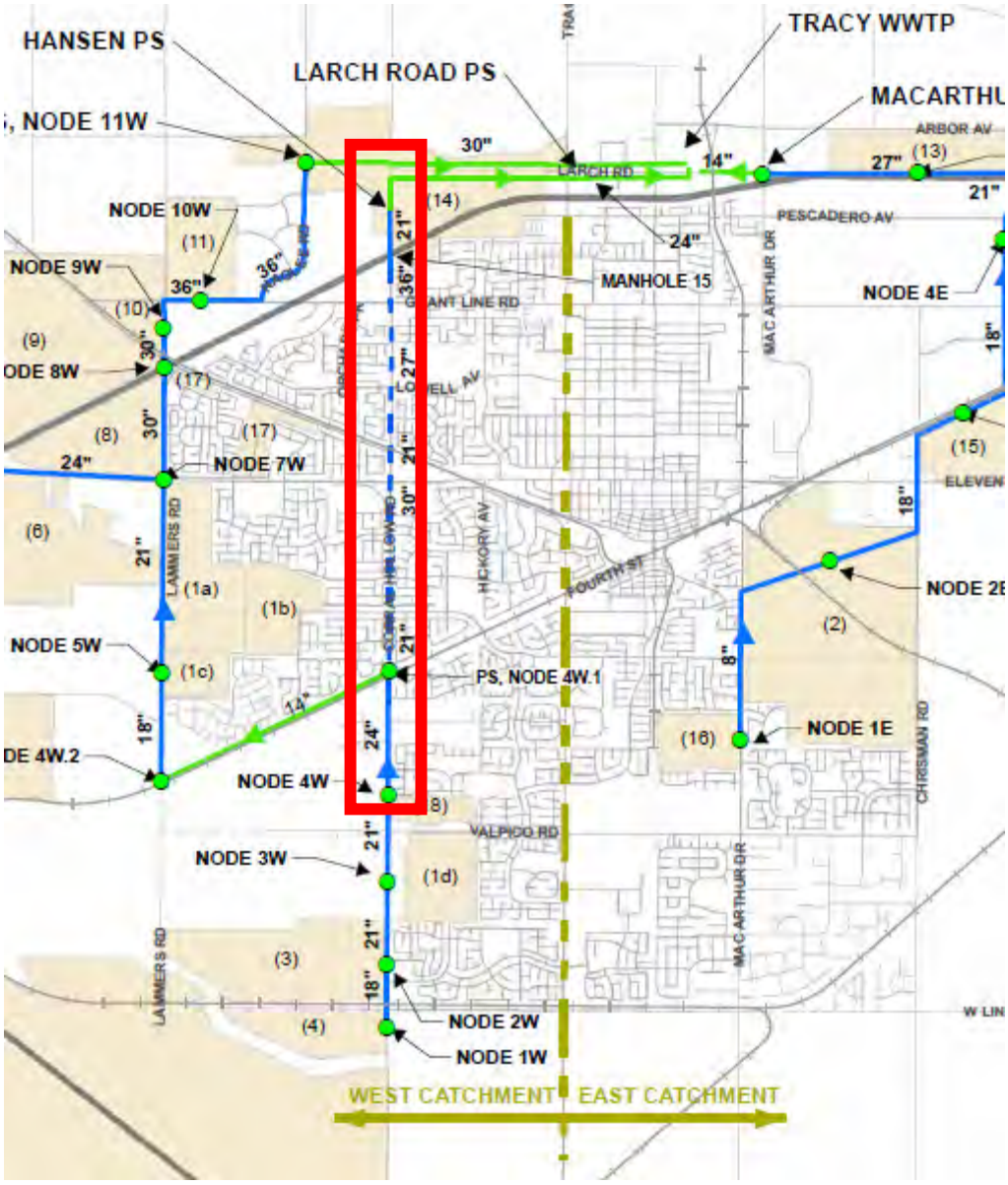


Figure 1. Improvement to the Corral Hollow Sewer System (shown within red box)

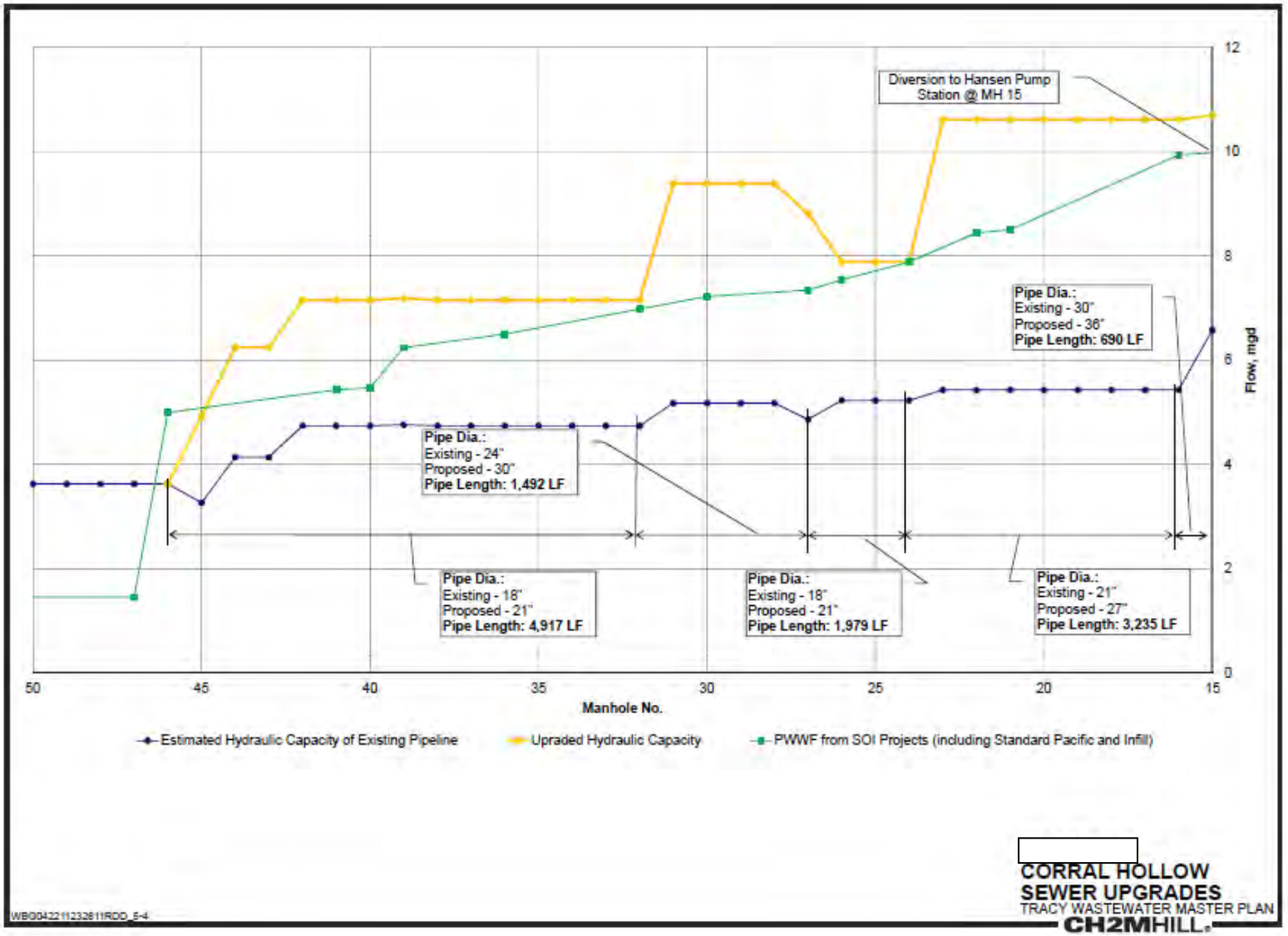


Figure 2. Hydraulic Capacity and future peak wet weather flows in the Corral Hollow Sewer System

Tracy WWTP Expansion Fee

Tracy WWTP is operating at its current capacity of 10.8 mgd and providing tertiary treatment with ammonia removal. Tracy WWTP expansion from 10.8 mgd to the Master Plan Build out Capacity of 21.1 mgd is planned in 4 phases.

Per City of Tracy Wastewater Master Plan (2013 update), the connection fee is $6,727.

It should be noted that the above fee is based on build out cost estimate. Since the Tracy WWTP NPDES Permit is renewed every five years and expansion will be done in multiple phases, periodic update to the above fee is required.

Ellis Program Wastewater Connection Fee Summary

Ellis Program Wastewater Connection fee Summary based on the 2013 Tracy Wastewater Conveyance and Treatment Development Impact Fee Study

Property	**Units**	**Conveyance Cost (see note)**	**WWTP Upgrade Fee (per unit)**	**Total cost per unit**	
Ellis program	First 550	0	$0	$0	Based on development agreement
Ellis program	250 (per DA)	$1,610	0	$1,610	per ECU
Ellis program	1,957	$1,610	$6,727	$8,337	per ECU
Ellis program/ Commercial (5.2 units per acre)	114	$1,610	$6,727	$43,352	Per acre

Note – **Corral Hollow Upgrade Fee assumes that upgrade will happen in one phase which requires a large upfront capital. The upgrade may occur in more than one phase which will affect the cost. The Financing plan is assumed to address this issue.**

9. The following Conversion factors have been used to compute wastewater system fee for medium and high density units.
1 SF Equivalent = Detached single family home= 264 gallons per day
Medium density = Equivalent to 0.81 S.F.
High density = Equivalent to 0.67 S.F.
Commercial = 5.2 SF equivalent per acre

Fee per unit type	Factor	Cost per unit
RML (Low)	1.0	$8,337
RMM (Medium)/VMU	0.81	$6,753
RMH (High)	0.67	$5,586
Commercial	5.2	$43,352

Benefit and Burden Analysis

Fee Justification Study (Compliance with Government Code Section 66000, et Seq.)

The following is a justification for the proposed wastewater impact fees that will be collected from the Ellis program. This section applies to all units except the units covered by a Development Agreement.

Identification of the proposed fee

The purpose of the proposed impact fee is to present a funding mechanism to provide wastewater facilities that are required to provide service to the Ellis program projects.

Descriptions of how the fee will be used

The fee will be used to plan, design, and construct wastewater facilities such as gravity sewer lines, pumping facilities, force mains, and wastewater treatment plant improvements.

Determination of how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed

The proposed impact fee will be used to construct wastewater conveyance and treatment facilities that are required to provide wastewater services to the development projects on which the fee is imposed. Construction of wastewater facilities provides direct benefit to the proposed development projects. Therefore, there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.

Determination of how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed

The proposed developments need wastewater facilities such as gravity sewer lines, pump stations, and force mains to convey wastewater to the treatment facility. They also need a treatment facility to treat wastewater generated by new developments. Failure to provide wastewater facilities would make the proposed development uninhabitable. Therefore, there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.

Determination of how there is a reasonable relationship between the amount of fee and the cost of the public facility (or portion of the facility) attributable to new development

The proposed wastewater facilities will be constructed to meet the wastewater demand from the new developments. Typically, the demand is calculated using a factor of 1 Equivalent Dwelling Unit (EDU) for a single family detached residential unit. The overall cost of the facilities is divided by the number of EDUs or residential units that are connected to the system. Therefore, each residential unit receives direct benefit and their cost will be proportional to the benefits received. In the case of commercial projects, each acre is equivalent to 5.2 Dwelling Units or a wastewater generation rate of 1,375 gpd. Each acre in the proposed development area will receive direct benefit with a cost proportional to the benefits received. Hence, there is a reasonable relationship between the amount of fee and the cost of the public facility (or portion of the facility) attributable to new development.

Benefit and Burden Analysis for Wastewater System

Introduction

The City of Tracy may establish a financing district to provide a funding mechanism for the proposed development projects subject to approval by the City and the Ellis program. Formation of financing districts is consistent with the objectives of the Mitigation Fee Act, Government Code Sections 66000, *et seq*, also known as Assembly Bill 1600 (AB 1600). To establish a financing district, the proposing agency (City of Tracy) should establish a reasonable relationship (benefit and burden) between the type of developments planned for the Ellis program area and the need for the wastewater infrastructure improvements proposed for the Ellis program area. This Benefit and Burden Analysis will show that there is a reasonable relationship between the proposed Ellis program area and the proposed infrastructure improvements that would benefit the Ellis program area.

This section describes the basis of assumptions or City standards for the purpose of estimating the wastewater generation rate of 80 gallons per person per day (gpd), the number of persons per unit type (residential low density=3.3 persons, residential medium density= 0.81 of low density, residential high density = 0.67 of low density) and wastewater demands for commercial areas.

Wastewater Generation Rate

The City of Tracy Design Standards (dated December 1990) state that the average wastewater generation rate for each person shall be 100 gallons per day. Per the City of Tracy Wastewater Master Plan, the following generation rates will be used.

Flow Parameter	2010 Master Plan Values
Per Capita Flow	80 gpcd
Residential Flow – Very Low Density	264 gpd/unit
Residential Flow – Low Density/RML	264 gpd/unit
Residential Flow – Medium Density/RMM	216 gpd/unit
Residential Flow – High Density/RMH	176 gpd/unit
Industrial Flow	1,056 gal/acre/day
Retail & Commercial Flow	1,375 gal/acre/day
Office Flow	1,140 gal/acre/day
Peak Wet Weather Flow	2.5 PF

Wastewater Demand for Commercial Areas

There are assumed to be 5.2 equivalent Dwelling Units (singe family units) EDUs per each General Commercial acre. Therefore, each General Commercial acre is expected to generate 1,375 gpd (5.2 EDUs * 264 gpd/EDU).

Existing Level of Service

The existing wastewater infrastructure in the City consists of gravity sewer lines, pump stations, and a wastewater treatment facility. The existing gravity sewer lines convey wastewater from the existing users to a pump station or to the treatment facility. The pump stations pump wastewater to the treatment plant from areas where wastewater cannot be conveyed by gravity sewer lines.

The existing wastewater treatment facility is used to treat domestic and industrial wastewater generated by the existing users. Treated effluent is discharged into the Old River using an effluent pipeline and outfall facilities.

Planned Projects and Their Potential Impact

Several new developments have been proposed on both the east and west sides of the City of Tracy. The Ellis program developers intend to build residential and commercial developments. Based on previous studies, there is interim excess capacity available in the existing Eastside sewer system to convey wastewater from the initial development of 250 units.

Additional sewer lines and wastewater treatment capacity will be needed, however, because the projected wastewater flows from the Ellis program developments exceed currently available excess capacity. If additional facilities are not constructed, the existing system would not be able to handle additional flows from the Ellis program developments and may lead to sewer overflows. This would be a violation of existing regulations promulgated by the California Regional Water Quality Control Board. In addition, there would be an impact on public health and welfare because of sewer overflows. Therefore, there would be a major impact on existing facilities without the additional facilities required to maintain the current level of wastewater services provided by the City of Tracy.

Need for Additional Public Facilities

Capacity of the existing wastewater system is not sufficient to accommodate additional flows that will be generated by the Ellis program developments. Existing excess capacity will be used; however, additional capacity obtained with expansion is needed. It was determined that additional public facilities are required based on sound engineering judgment and Policy PF 1.7 in the Tracy Urban Management Plan, which states that the City must "*provide adequate wastewater collection and treatment capacity for planned development in Tracy*."

Changes in Level of Service with Additional Public Facilities

After construction of additional facilities, the level of wastewater service with the new development will be similar to the current level of wastewater service provided to the City of Tracy. Wastewater will be collected and treated without causing any nuisance or pollution as defined in Section 13050 of the California Water Code. The treatment plant effluent will meet the conditions of the NPDES permit number R5-2012-0115 issued by the California Regional Water Quality Control Board dated December 2012.

Benefits to New Developments from Additional Public Facilities

The additional public facilities will benefit the Ellis program developments in the following ways:

- By providing wastewater collection and treatment services to the new developments.
- By providing the additional public facilities that are required before the City of Tracy can approve occupancy of the developments.

Cost Basis of Additional Public Facilities

The total wastewater flows were calculated using the following factors:

Single family detached unit = 1 EDU = 264 gpd/unit

Village Center/Commercial = 5.2 EDUs/acre

Based on the above rate, the required facilities (both conveyance and treatment) and associated costs to serve Ellis program developments were identified. The total cost was divided by the number of acres or units to obtain the cost per acre or unit.

Reference Documents Used in Analysis

The documents used in the analysis include the following:

1. *City of Tracy Wastewater Master Plan/Corral Hollow Sewer Analysis,* updated April 2012, CH2M HILL.
2. NPDES Permit dated December 2012 issued to the City of Tracy WWTP by the Central Valley Regional Water Quality Control Board
3. City of Tracy Wastewater Master Plan , CH2MHILL, 2012
4. Tracy Wastewater Conveyance and Treatment Development Impact Fee Study, January 2013

WEST YOST ASSOCIATES
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: August 14, 2013 Project No.: 404-02-09-81

TO: Kul Sharma, City of Tracy

FROM: Charles Duncan, R.C.E. #55498
Shannon Barcal, E.I.T. #139195

SUBJECT: Ellis Specific Plan Water System Analysis - Technical Memorandum

OVERVIEW

This Technical Memorandum (TM) summarizes West Yost Associates' (West Yost's) technical evaluation and identification of required buildout water system facilities and associated costs for the City of Tracy's (City) proposed Ellis Specific Plan (ESP). The ESP is located just outside the southwestern portion of the City and is within the City's Pressure Zone 3 service area. Based on the City's General Plan Update (July 20, 2006), the land use designations for the ESP are comparable with those previously designated for the area. The City has requested a Water System Analysis for the ESP. In addition, ESP's proportionate share of recent water system improvements made to the City water distribution system will also need to be identified based on the hydraulic benefit these existing facilities provide to the ESP.

These new facilities required to serve the demands of the ESP are identified in this TM and include water supply, treatment, pumping and storage facilities, and transmission lines. Specifically, the facilities identified in this TM to serve the ESP are summarized below:

- Proportionate share of a new Zone 3 booster pump station to meet peak hour, daily flow, and pressure requirements for ultimate buildout of ESP;
- Proportionate share of one new Aquifer Storage and Recovery (ASR) well;
- Proportionate share of the City's long-term emergency groundwater storage supply;
- Proportionate share of future 2.0 million gallon (MG) clearwell at John Jones Water Treatment Plant (JJWTP);
- Proportionate share of the City's JJWTP expansion;
- Proportionate share of a recommended 20-inch diameter pipeline from JJWTP to the intersection of Corral Hollow Road and Linne Road;
- Proportionate share of a recommended 20-inch diameter pipeline from the intersection of Corral Hollow Road and Linne Road to the west side of the project site on Lammers Road;

- Proportionate share of the Zone 3 16-inch diameter main from near the City's existing Clearwell No. 2 along Tracy Boulevard to the 18-inch diameter main at Linne Road and English Oaks Avenue;
- Two check valve stations along Corral Hollow Road from Pressure Zone 2 to ESP;
- Pressure Reducing Valve on the 18-inch connection from ESP Phase 1, north to Valpico Road;
- Proportionate share of a 12-inch connection from Whirlaway Lane to Linne Road;
- Proportionate share of the 18-inch diameter pipeline along Corral Hollow Road from Linne Road to Middlefield Drive; and
- Proportionate share of the 18-inch diameter connection from Linne Road to Corral Hollow Road.

Total estimated costs for the facilities are $17,788,200. The ESP will pay these costs through connection fees based on the number of Equivalent Dwelling Units (EDUs). Required ESP Infrastructure costs will be shared among all ESP parcels. One EDU is defined as the average day demand for a low density residential unit and equals 429 gallons per day (gpd), or 4.16 EDUs per one individual/commercial acre (see Table 6 and accompanying text for more detail). Costs per EDU for the required facilities are summarized in Table 1.

Table 1. Ellis Specific Plan Cost Per EDU Summary

Facility Description	Estimated Total Project Cost, dollars	Estimated Aquatic Center Project Cost, dollars	Total Cost ESP, dollars	Cost Per EDU[(a)] for ESP, dollars
ESP Supply and Treatment	6,769,000	866,400	5,902,600	2,686
ESP Infrastructure	11,019,200	1,410,500	9,608,700	4,372
Total Costs	17,788,200	2,276,900	15,511,300	7,058

(a) One (1) EDU is equivalent to 429 gpd and is based on the average day demand for one Low Density Residential dwelling unit assuming 3.3 people/du. Total EDU's for the ESP Properties is 2,198. The current EDU water demand estimate for the ESP is 2,198 based on proposed assumptions. The assumptions may be updated based on future refinements and updates to the ESP.

As directed by the City, the initial residential units located in the Pressure Zone 2 area of Phase 1 of the ESP, can be provided interimly with supply from the existing system and therefore, may be constructed prior to the building of the 2.0 MG clearwell (Phase 1 storage) and 6.48 million gallon per day (mgd) booster pump station infrastructure. If Phase 1 includes any areas within Pressure Zone 3, a Pressure Zone 3 pump will need to be installed. This is discussed in more detail in the subsequent sections of this TM.

West Yost also evaluated the feasibility of supplying an Initial Phase 1 configuration, which would include all 540 units within the Ellis Phase 1 service area and the Aquatic Center as shown in Figure 3. Under this proposed configuration and demand condition, the required fire flow, shown in Figure 6, can be supplied to all areas in Phase 1 with the construction of two check valve connections to Pressure Zone 2. To serve this configuration the recommended pipelines as

shown in Figure 3 will be required including the Pressure Zone 3 booster pump at the JJWTP's Clearwell No. 2. Currently, the ESP is planning to implement Initial Phase 1 which includes only the residential units and the Aquatic Center. The initial residential units are discussed in more detail in the Recommended Water System Infrastructure Section of this TM.

INTRODUCTION

In February 2010, the City requested that West Yost provide technical engineering support to the City related to an analysis of water storage, pumping facilities, distribution system infrastructure, water supply and treatment capacity required to support the City's preparation of an AB1600 Technical Report for the ESP.

West Yost received authorization from the City to proceed with this work in September 2011. As detailed in our professional services agreement, this TM summarizes our findings and conclusions related to the following tasks:

1. Review of Previous Assumptions, Criteria and Studies
2. Water Demand Evaluation
3. Water Storage and Booster Pumping Facilities Evaluation

BACKGROUND

Definition of ESP

The ESP area is bounded by agricultural land on the north, the Union Pacific Railroad on the south, the Delta Mendota Canal to the southwest, Corral Hollow Road on the east, and Lammers Road on the west. Figure 1 shows the location of the ESP.

As shown on Figure 1, the ESP is currently now within the City of Tracy city limits. The ESP is located in the southern portion of an area formerly designated as the South Schulte Specific Plan.

The ESP is also located on agricultural land previously served by the Plain View Water District (PVWD), which recently merged into the Byron Bethany Irrigation District (BBID). The ESP area is currently sparsely developed. A large majority of the ESP area consists of undeveloped land, crops and fields. Residential development exists along Lammers Road and is characterized by large lots (five- and ten-acre parcels) that are developed with homes and accessory structures (barns, storage sheds, etc.).

The ESP includes a mix of residential, commercial, and recreational uses covering approximately 321 acres. The ESP includes a maximum of 2,250 residential units, 180,000 square feet of commercial space, a 16-acre swim center and community park, and approximately 21 acres of neighborhood parks.

As shown in Table 2, the land uses for the ESP area are comparable with those previously designated for the area in the City's General Plan. These land uses are also comparable with those previously specified for the southern portion of the former South Schulte Specific Plan area.[1]

The ESP is divided into three phases for this water system analysis, Initial Phase 1, Phase 1 and Buildout. ESP Phase 1 consists of approximately 150 acres located on the east side of the ESP. ESP Phase 1 is divided by the City's existing Pressure Zone 2/3 boundary, with the northern portion (approximately 47 acres which includes a portion of the Aquatic Center) within Pressure Zone 2 and the remaining area within Pressure Zone 3 (see Figure 2). The ultimate design for the ESP assumes most of the area will be served as part of Pressure Zone 3. The City and the ESP representatives also wanted to evaluate an Initial Phase 1 configuration, which would include the construction of approximately 540 homes in Pressure Zone 2 and Pressure Zone 3, including the Aquatic Center as shown on Figure 3.

PLANNING/MODELING CRITERIA

The general planning and hydraulic modeling criteria used by West Yost in our analysis of the ESP's potential impacts to the City's existing water system infrastructure are listed below:

- Design criteria
  - — As presented in the City's Citywide Water System Master Plan:
    - ❖ The water treatment plant is sized to meet maximum day demands;
    - ❖ Pumping facilities are sized to meet the greater of either a maximum day demand concurrent with fire flow or peak hour demand conditions within each pressure zone with a minimum pressure of 30 psi or 40 psi respectively;
    - ❖ Transmission mains are sized to provide required peak hour flows at a minimum pressure of 40 pounds per square inch (psi);
    - ❖ Storage facilities are sized to include operational, short-term emergency, and fire storage; and
    - ❖ Long term (outage greater than two days) emergency water storage will be provided by the groundwater basin.
- Demands
  - — Average day water demand will be calculated using the water duties presented in the City's Citywide Water System Master Plan.
  - — Maximum day and peak hour demands will be calculated using the peaking factors of 2.0 and 3.4 times the average day demand, respectively, consistent with factors adopted for the City's Citywide Water System Master Plan.
  - — In order to maintain a fire flow requirement at or below 1,500 gpm for Initial Phase 1, the ESP has agreed to limit the allowable construction for commercial land use to buildings of Type 1A or 1B with approved fire flow sprinkler system and a maximum square footage of 83,700 square feet (2007 California Fire Code, Table B105.1).

[1] Page 6-3, South Schulte Specific Plan, March 1997 (as referenced in Figure 2-1 South Schulte Specific Plan Area, Ellis Specific Plan Initial Study, August 2006).

Table 2. Potable Water Demand Estimate for Ellis Specific Plan (Proposed Project)

Land Use Designation	Land Use Data[a] Area, gross acres	Potable Water Acres	Recycled Water Acres	Assumed Number of Dwelling Units (DU)[b]	Square Footage (sq ft)	Potable Water Use Factor gpd/DU[c]	af/ac/yr[c]	gpd/sq ft[d]	Calculated Total Water Demand[e], af/yr
Phase I - Ellis Specific Plan									
Residential Mixed Low	31.0	31.0	-	159		429			76
Residential Mixed Medium	53.0	45.0	-	357		310			124
Irrigation Demand for Residential Mixed Medium[f]		8.0					4.0		32
Residential Mixed High	3.0	2.6	-	24		220			6
Irrigation Demand for Residential Mixed High[g]		0.5					4.0		2
Village Center[h]	5.7	4.8	0.9	-	60,000	220	2.0	0.1	10
Commercial (General)[h]	4.4	3.7	0.7		40,000		2.0	0.1	7
Limited Use[i]	26.0	22.1	3.9		80,000		2.0	0.1	44
Middle School	-						1.5		-
Neighborhood Parks[k]	5.0	-	5.0				4.0		-
Aquatic Center[l]	16.0	16.0				see footnote [l]			33
UAFW (7.5%)									27
Subtotal for Phase I - Ellis Specific Plan	**144.1**	**133.6**	**10.5**	**540**	**180,000**			**Subtotal**	**361**
								Rounded Subtotal	**360**
Remainder - Ellis Specific Plan									
Residential Mixed Low	89.0	89.0	-	346		429			166
Residential Mixed Medium	58.0	49.0	-	1,348		310			468
Irrigation Demand for Residential Mixed Medium[f]		8.7					4.0		35
Residential Mixed High	2.0	1.7	-	16		220			4
Irrigation Demand for Residential Mixed High[g]		0.3					4.0		1
Village Center[h]	-			-	-	220	2.0	0.1	-
Commercial (General)[h]	-				-		2.0	0.1	-
Limited Use[i]	-				-		2.0	0.1	-
Middle School	12.0	10.2	1.8				1.5		15
Neighborhood Parks[k]	16.0		16.0				-		-
Aquatic Center[l]	-					see footnote [l]			-
UAFW (7.5%)									56
Subtotal for Remainder - Ellis Specific Plan	**177.0**	**158.9**	**17.8**	**1,710**	**-**			**Subtotal**	**746**
								Rounded Subtotal	**750**
Total for Proposed Project	**321.1**	**292.5**	**28.3**	**2,250**	**180,000**			**Rounded Total**	**1,110**
Overall - Ellis Specific Plan									
Residential Mixed Low	120.0	120.0	-	505		429			243
Residential Mixed Medium	111.0	94.0	-	1,705		310			592
Irrigation Demand for Residential Mixed Medium[f]		16.7					4.0		67
Residential Mixed High	5.0	4.3	-	40		220			10
Irrigation Demand for Residential Mixed High[g]		0.8					4.0		-
Village Center[h]	5.7	4.8	0.9	-	60,000	220	2.0	0.1	10
Commercial (General)[h]	4.4	3.7	0.7		40,000		2.0	0.1	7
Limited Use	26.0	22.1	3.9		80,000		2.0	0.1	44
Middle School	12.0	10.2	1.8				1.5		15
Neighborhood Parks[i]	21.0	-	21.0				4.0		-
Aquatic Center[j]	16.0	16.0	-			see footnote [l]			33
UAFW (7.5%)									83
Overall Total - Ellis Specific Plan[k]	**321**	**293**	**28**	**2,250**	**180,000**			**Total**	**1,104**
								Rounded Total	**1,100**

[a] Acres, dwelling units and square footages as provided by Surland on May 2, 2013.

[b] Assumed number of dwelling units for purposes of calculating demand for up to 2,250 DUs maximum for Ellis Specific Plan.

[c] Unit Water Use Factors based on Citywide System Master Plan, Draft Report dated December 2011.

[d] Water Use Factor in gpd/sq ft accounts for only indoor water uses. This factor is not used in demand calculations.

[e] Calculated water demand includes estimated indoor and outdoor water uses.

[f] Unit potable water use factors for Residential Mixed Medium Density dwelling units do not include outdoor water uses. For the Ellis Specific Plan, the Residential Mixed Medium Residential dwelling units will be single-family homes with privately maintained front and back yards irrigated with potable water. Irrigation demand for Residential Mixed Medium Density Residential assumes that 15% of the gross acres will be landscaped and irrigated with potable water.

[g] Irrigation demand for Residential Mixed High Density Residential assumes that 15% of the gross acres will be landscaped and irrigated with potable water.

[h] Village Center includes High Density Residential (up to 50 DUs) and Commercial/Office (60,000 sq ft). Assumes that 15% of gross acres are landscaped with recycled water.

[i] Storage (self-storage units) do not have landscaping or recycled water demands and will only have a small apartment as reported by Surland on May 2, 2013.

[j] Assumes that 100% of Park gross acres are landscaped and irrigated with recycled water.

[k] Estimated water use per facility information obtained from RJM Design Group October and November 2010. Average Annual Demand = 33 af/yr. Maximum Day Demand = 189 gpm. Peak Hour Demand = 296 gpm.

[l] The water demand calculations shown for the Ellis Specific Plan are based on overall City-wide assumptions and the assumptions described herein. Actual water demands for the Ellis Specific Plan will be confirmed at the Tentative Map stage of the project. The ESP will be refined and updated in the future. As such refinements and updates occur, the City allows up to one thousand three hundred acre feet of demand for the ESP.

- Supply
  - The July 2012 WSA for the ESP determined that the City's existing and future water supplies are sufficient to meet the ESP future buildout demands.
- Modeling Criteria
  - New pipelines will be hydraulically modeled using a roughness coefficient (C-factor) of 130.
  - The 2010 calibrated hydraulic model of the City's water system will serve as the basis for evaluation of the hydraulic conditions at buildout of the proposed ESP.
- Land Use
  - ESP parcel information was provided to the City and West Yost by Harris & Associates, and is summarized in Table 2.

WATER DEMAND

Average day water demands for the ESP areas were calculated based on the number of acres by land use designation in each phase, as well as the number of dwelling units in the residential areas multiplied by the appropriate water use factors. These factors, which are consistent with those used in the City's Citywide Water System Master Plan, are presented in Table 3:

Table 3. City of Tracy Water Use Factors

Land Use	Water Use Factor
Low Density Residential	429 gallons per day per DU
Medium Density Residential	310 gallons per day per DU
High Density Residential	220 gallons per day per DU
Schools	1.5 acre-feet per acre per year (af/ac/yr)
Parks	4 af/ac/yr
Commercial	2 af/ac/yr

Maximum day and peak hour demands were calculated by multiplying the average day demand by the maximum day demand and peak hour demand peaking factors of 2.0 and 3.4, respectively. Maximum day and peak hour demands for the Aquatic Center facilities were calculated separately based on water use data provided by RJM Design Group.

The resulting demands for average day, maximum day and peak hour for the ESP are summarized in Table 4:

Table 4. Ellis Specific Plan Water Demand

Demand Condition	ESP Phase 1 Water Demands, mgd	Aquatic Center Water Demands[(a)], mgd	ESP Remainder Buildout Water Demands, mgd	Total ESP Water Demands, mgd
Average Day	0.29	0.03	0.66	0.98
Maximum Day	0.58	0.27	1.33	2.18
Peak Hour	0.99	0.43	2.26	3.68

[(a)] Aquatic Center maximum day and peak hour demands based on information provided by RJM Design Group and do not use the City's demand peaking factors.

RECOMMENDED WATER SYSTEM INFRASTRUCTURE

The on-going Citywide Water System Master Plan is completed and has identified the water system backbone transmission system, storage reservoirs and pump station system to serve all land within the City's SOI. As described in the Citywide Water System Master Plan a series of new Pressure Zone 3 booster pumps will be constructed at the existing JJWTP and a new looped transmission pipeline and reservoirs constructed to serve Pressure Zone 3 areas, including the ESP area, see Figure 2. The following sections provide the background for the ESP's proportionate share of these facilities.

Water Supply and Treatment Facilities

The City currently receives water supplies from three sources:

- Surface water from the Delta Mendota Canal (Central Valley Project),
- Surface water from the Stanislaus River via the South County Surface Water Supply Project treated and delivered by the South San Joaquin Irrigation District (SSJID), and
- Groundwater pumped from eight (soon to be nine) groundwater wells located within the City.

The City's CVP water supplies are treated at the City's John Jones Water Treatment Plant (JJWTP), which was constructed in 1979, expanded in 1988, and then expanded again in 2008. The JJWTP is located just north of the Delta Mendota Canal in the southern portion of the City. With the recent plant expansion now complete, the current treatment capacity of the JJWTP is 30 mgd. The JJWTP includes sufficient treatment capacity for buildout of the overall ESP.

The City, in partnership with the cities of Manteca, Lathrop and Escalon, and SSJID, have constructed a surface water treatment plant near Woodward Reservoir in Stanislaus County and a transmission pipeline to deliver treated surface water to each city. The project is called the South County Water Supply Project (SCWSP). This water supply is based on SSJID's senior pre-1914 appropriative water rights to the Stanislaus River, coupled with an agreement with the USBR to store water in New Melones Reservoir. As part of the SCWSP, the City has been allocated up to 10,000 af/yr of water.

The City overlies a portion of the San Joaquin Valley Groundwater Basin-Tracy Sub-basin (Tracy Sub-basin). The City currently operates eight groundwater wells, with a total extraction capacity of 15 mgd. Four wells (Production Wells 1, 2, 3 and 4) are located near the City's JJWTP and pump directly into the JJWTP clearwells, where the groundwater is blended with treated surface water. The other wells (Lincoln Well, Lewis Manor Well (Well 5), Park and Ride Well (Well 6), and Ball Park Well (Well 7)) are located throughout the City and pump water directly into the distribution system after disinfection. A new well (Well 8) has also been constructed. Well 8 will eventually be operated as part of the City's future Aquifer Storage and Recovery Well System. The 2001 Estimated Groundwater Yield Study, which established the City's estimated groundwater yield of 9,000 af/yr, considered the cumulative groundwater usage in the study area by the City and other users.

The City is currently anticipating the following future water supplies:

- Out-of-Basin water banking (Semitropic Water Storage Bank);
- Additional surface water from the Delta Mendota Canal (Central Valley Project);
- Surface water from BBID pre-1914 water rights;
- Aquifer Storage and Recovery Well System; and
- Recycled water.

Water Pumping Facilities

There are two design parameters used to calculate the size of a required pumping facility. The first design parameter is the ability to deliver maximum day demands plus fire flow and the second design parameter is the capability to serve peak hour demands at minimum system pressures within each pressure zone. The proposed ESP project is the first development within the City's Pressure Zone 3 service area. As such, the water system infrastructure system to provide service to the ESP will require a new booster pumping station to maintain the City's minimum design pressures.

In order to serve all of the Phase 1 portion of ESP (including the Aquatic Center), West Yost analyzed an initial Pressure Zone 3 system. This system evaluated serving Phase 1 of ESP, a portion of Infill and ISP South of Linne Road, and portions of the Plan C development that are within the Zone 3 boundary. The results from the analysis are provided in the Initial Pressure Zone 3 Water System Evaluation for the City of Tracy's Initial Pressure 3 Area (see Attachment A). The system configuration and required infrastructure is shown in Figure 4.

It is assumed that ultimately a series of new Pressure Zone 3 booster pumps will be constructed at the JJWTP. These booster pumps will include capacity for the ESP at buildout. The City's Citywide Master Plan has preliminary sized the booster pump station at 6.48 mgd of which ESP will contribute a proportionate share (see Table 5 and Figure 5).

Table 5. Estimate of Probable Water Distribution System and Infrastructure Costs for the Full Buildout of the Ellis Specific Plan Project[a,b]

Item	Unit	Price/Unit	Unit Price[c]	Qty	% for ESP	Total ESP Cost[d]
Zone 3-City-Side BPS (JJWWP)[e]						
6.48 mgd	each		$1,852,675	1	37%	$686,000
Clearwell at JJWTP[f]						
2.0 MG	each		$3,251,699	1	63%	$2,045,000
John Jones Water Treatment Plant Expansion[g]						
15.0 mgd	each		$33,269,046	1	15%	$4,835,000
Long-term Emergency Groundwater Storage[h]						
2,500 gpm	each		$2,500,000.00	1	26%	$662,000
On-site Backbone Pipelines[i,j]						
12-inch (ESP backbone - Phase 1)	lf		$210	8700	37%	$677,000
12-inch (ESP backbone - Buildout)	lf		$210	4370	37%	$340,000
12-inch (ESP backbone - Phase 1 to Valpico Rd)	lf		$210	2615	37%	$203,000
Water Transmission Lines from JJWTP Z3-City-side BPS[i,j]						
24-inch (JJWTP Clearwell to BPS3)	lf		$375	35	37%	$5,000
20-inch (ESP - JJWTP BPS3 to Corral Hollow Rd and Linne Rd - Phase 1)	lf		$320	9300	37%	$1,102,000
20-inch (Corral Hollow Rd and Linne Rd to ESP Northwest corner - Buildout)	lf		$320	7950	37%	$942,000
18-inch (ESP - Corral Hollow and Linne Rd to Middlefield Rd - Buildout)	lf		$300	705	37%	$78,000
18-inch (ESP-Linne Rd to Corral Hollow Rd - Phase 1-PZ2 Bypass)	lf		$300	120	37%	$13,000
16-inch (From existing Clearwell No. 2 to English Oaks)	lf		$230	7705	37%	$656,000
20-inch Jack and Bore under Delta Mendota Canal	lf		$1,005	458	37%	$170,000
20-inch Jack and Bore (Corral Hollow and Linne Rd under RR)	lf		$1,005	250	37%	$93,000
Water Transmission Lines to move Portion of Plan C into Zone 3[i,j]						
12-inch (Whirlaway Lane to Linne Road)	lf		$210	562	37%	$44,000
12-inch Jack and Bore (SW Portion of Plan C under R/R to Linne Road)	lf		$690	150	37%	$38,000
Valve Connections						
Connection at Middlefield Drive:						
18-inch diameter check valve	each		$84,000	1	37%	$31,000
12-inch diameter bypass PZ2 on Corral Hollow, Jack and Bore (SW Portion of Plan C under Corral Hollow)	lf		$690	60	37%	$15,000
Pressure Reducing Valve ESP - Phase 1 to Valpico Rd (12-inch diameter)	each		$102,000	1	37%	$38,000
Estimated Construction Cost						$12,673,000
Design and Planning (10%)		10%	10%			$1,267,000
Construction Management (10%)		10%	10%			$1,267,000
General Contingency (15%)		15%	15%			$1,901,000
Program Administration (5%)		5%	5%			$634,000
Land Acquisition Costs[k]	acres	$184,316	$184,316	0.25		$46,000
Groundwater Conjunctive Use Study[l]	LS		$60,000	1	0%	$0
Total Anticipated "In Place" Project Cost						$17,788,000

[a] Does not include site specific facilities.

[b] All markups and contingencies are consistent with the City's December 2012 Citywide Water System Master Plan.

[c] All unit prices are presented in January 2012 dollars. Unit prices based on combination of cost curves, construction cost guidelines and similar construction projects.

[d] Costs rounded to nearest one thousand dollars.

[e] Pump station costs for ESP assume ESP's proportionate share of the total cost to construct the 6.48 mgd pump station (ESP buildout share is estimated @ 37% of the total construction cost, 2.18 mgd [ESP Buildout Area's Maximum Day Demand] divided by 5.9 mgd [Buildout Zone 3 Area's Maximum Day Demand]).

[f] Clearwell costs for ESP assume ESP's proportionate share of the total cost to construct the 2.0 MG clearwell (ESP's share is estimated @ 63% of the total construction cost, 2.18 mgd [ESP's Maximum Day Demand] divided by 3.46 mgd [operational storage available at clearwell to support a maximum day demand equivalent to 3.46 mgd]).

[g] Water treatment costs assume the ESP proportionate share of the total cost to of the 15.0 mgd expansion of the John Jones Water Treatment Plant (ESP share is estimated at 15% of the total expansion cost, based on [ESP Maximum Day Demand] of 2.18 mgd). The cost of the 15.0 mgd expansion is based on the FY 09/10 adopted budget, CIP 75053, and is equal to $44,358,728. This cost does not include program management mark-ups of 5%, but include all other mark-ups. So the unit price is based on $44,358,728 multiplied by 1.05 and then divided by 1.40, or $33,269,046.

[h] Long-term emergency storage costs assume ESP's proportionate share of the total cost to construct a groundwater well (ESP's share is estimated at 26% of the total cost, 661.5 gpm [ESP's average day demand] ÷ 2,500 gpm [Assumed well capacity]).

[i] Water transmission line costs assume Initial Zone 3 Area's proportionate share of the total cost to construct the Zone 3 pipelines (Initial Zone 3 Area's share is estimated @ 37% of the total construction cost, 2.18 mgd [ESP's Maximum Day Demand] divided by 5.9 mgd [Buildout Zone 3 Area's maximum day demand]).

[j] The unit construction costs for pipeline include pipeline materials, trenching, placing and jointing pipe, valves, fittings, hydrants, service connections, placing imported pipe bedding, native backfill material, and partial asphalt pavement replacement, if required.

[k] Land for facilities identified within the ESP boundary will be dedicated to the City. Land for off-site pump station will need to be acquired.

[l] The groundwater conjunctive use study is Initial Zone 3 Area's proportionate share of the City's Groundwater Management Plan Study.

For the Initial ESP Phase 1, the proposed Pressure Zone 3 Pump station at the JJWTP would serve the area during a peak hour demand condition. Maximum day demands and maximum day demand plus a 1,500 gpm fire can be provided directly from the Pressure Zone 2 system, without additional pumping, however two check valves will be required, see Figure 3. Further discussion on these connections is provided in the Transmission and Distribution mains section below. The available fire flow within the Initial Phase 1 area and portions of the initial Pressure Zone 3 areas, with these check valve connections, are shown on Figure 6.

Water Storage Facilities

The principal advantages that storage provides for the water system are the ability to equalize demands on supply sources, production facilities, and transmission mains; to provide emergency storage in case of supply failure; and to provide water to fight fires. The City's water service area has two sources of available storage: above ground storage (*i.e.*, clearwells and storage tanks) and storage available through the groundwater basin. Together, these two sources of storage must be sufficient to meet the City's operational, emergency, and fire flow storage criteria. The volumes required for each of these three storage components are listed below:

- Operational Storage: 30 percent of a maximum day demand;
- Emergency Storage: Two times an average day demand; and
- Fire Flow Storage: The required fire flow rates multiplied by their associated fire flow duration periods, as required by the City's Fire Department. Two concurrent fire flow events were assumed for the fire flow storage analysis. However, the recommended fire flow storage does not include the volume associated with sprinkler flows.

Based on the above criteria and Ellis' projected demands, the total estimated storage requirements at build out include:

- Operational Storage: 0.65 MG
- Emergency Storage: 1.96 MG
- Fire Flow Storage: 0.42 MG (represents Ellis proportionate share total 1.14 MG storage for Pressure Zone 3)

This results in a total storage requirement of approximately 3.0 MG.

Because the City's potable water supply includes supply from groundwater wells, the groundwater basin can account for a portion of the recommended emergency storage, in the form of a groundwater credit. However, the following must be true to use the groundwater supply to offset the need to provide surface storage reservoirs:

- Groundwater supply is of potable water quality and can be reliably accessed (*i.e.*, wells are equipped with on-site emergency generators);
- Groundwater supply is not already relied upon to meet the City's average day demand requirements;

- Groundwater supply is of firm groundwater supply availability (*i.e.*, assumes 20 percent of wells will be out of service at any given time); and
- Sufficient water distribution facilities are available to distribute this water to demand areas.

In addition, the City currently has two independent sources of treated surface water supply, and some quantity of the total treated surface water supply capacity can also account for a portion of the recommended emergency storage. The treated surface water credit assumes that the smaller of the treated surface water supply sources can be available to offset a portion of the emergency storage requirement. However, the following must be true to use treated surface water supply to offset the need to provide surface storage:

- Treated surface water supply can be reliably accessed (*i.e.*, treated surface water supply facility is equipped with on-site emergency generator); and
- Sufficient treated surface water booster pumping facilities are available to distribute this water to demand areas.

In summary, the Emergency Storage Credit is equal to the sum of the groundwater and treated surface water supply credits. However, the Emergency Storage Credit can only provide a maximum storage credit equal to the Ellis's required emergency storage volume.

Currently, the City does not have any services or storage within the Zone 3 Pressure Zone. For the purposes of this study, West Yost assumed that the total storage calculated is required to be placed in the Zone 3 Pressure Zone and will be pumped from new storage tank(s) into the distribution system.

Previously approved specific plans that have been allotted water in the existing system are not fully built out and do not expect to be completed for several years. Therefore, the City has existing storage capacity on an interim basis available for use. As directed by City Staff, West Yost has assumed that no new storage facility will be constructed to serve the first 540 units in the initial Phase 1 area. Once the initial allotment of 540 units has been reached, or other specified time is agreed to by the City, the ESP will be required to construct some storage in Pressure Zone 3. In order not to lock the ESP into the timing for development in the other areas of Pressure Zone 3, West Yost assumed that the ESP will pursue the option of developing an ASR well on-site, or at the JJWTP, in-lieu of construction of an on-site storage tank, or other tank in Pressure Zone 3 to meet their emergency storage requirements. Therefore, in addition to the ASR well, the ESP will be required to construct an additional 1.1 MG of active storage (1.2 MG of total storage) to complete buildout. To complete Phase 1, without having to construct an ASR well, it was assumed that the ESP would share in the cost to construct the new 2.0 MG clearwell, Clearwell No. 3, at the JJWTP. Phase 1 buildout would require 0.94 MG of storage or approximately forty-seven (47) percent of the capacity of Clearwell No. 3. Proportionate costs of the required storage for the ESP Properties are presented in Table 5.

Transmission and Distribution Mains

The proposed connection for the Initial Phase 1 of the ESP project into the City's treated water transmission system is through an existing 24-inch diameter transmission main running along Corral Hollow Road from the JJWTP. This pipeline was originally sized to provide treated surface water to the Patterson Pass Business Park and transmission of potable water into Pressure Zone 2. The transmission main was not originally sized to provide service to Pressure Zone 3. In addition, the Patterson Booster Pump experiences low suction pressures and is sensitive to demands in Pressure Zone 2. Proportionate costs of the pipeline for the ESP Properties are presented in Table 5. In addition, West Yost does not recommend the long term use of this 24-inch diameter main as a transmission main for Pressure Zone 3. In coordination with the preparation of the Citywide Master Plan, new transmission mains to serve Pressure Zone 3 have been recommended. The proposed pipelines include 20-inch diameter transmission mains to convey water demands to Pressure Zone 3 from the JJWTP which includes ESP.

Per the ESP and City's request, West Yost has evaluated and concluded that it is possible to serve an Initial Phase 1 for the ESP project of 540 EDUs or less. The required pipelines to serve an Initial Phase 1 are shown in Figure 3 and include:

- Two Pressure Zone 2 tie-in connections located along Corral Hollow Road with check valves
- 18-inch transmission main from just north of the railroad on Corral Hollow Road to Middlefield Drive.
- 20-inch transmission main from the intersection of Corral Hollow Rd. and Linne Road to just north of the railroad on Corral Hollow Road.
- 12-inch diameter Pressure Zone 2 bypass on Corral Hollow Road.
- 12-inch pipeline from Linne Road to Whirlaway Road.
- 16-inch main from the vicinity of the existing Clearwell No. 2 along Tracy Boulevard to near the intersection of Linne Road and English Oaks Avenue.

These connections and pipelines are presented on Figure 3, and the proportionate costs for the ESP Properties are presented in Table 5.

ESTIMATE OF PROBABLE PROJECT COSTS FOR ESP RECOMMENDED WATER SYSTEM FACILITIES

Adequate water supplies exist and will be made available to the Ellis Program at no cost. The City reserved for Ellis sufficient capacity in all the various elements of infrastructure in this report so as to ensure adequate and uninterrupted water service for the Ellis Program according to the following:

- The City has reserved and is providing storage and treatment sufficient to serve 540 units for the first phase of the Ellis Program from the existing system.
- In the new, approximately 2 million-gallon clearwell (Clearwell No. 3) to be constructed at the JJWTP, the City reserved priority capacity for the maximum capacity needs of the Ellis Program. Additional development projects during the term

of the Ellis build out would only be allowed use of Clearwell No. 3 on a temporary and interruptible basis, so long as they would not impair or impede the City's ability to provide said reserved water supply/storage to the Ellis Program or impair or impede the City's ability to make all necessary water infrastructure for treatment, storage and transmission needed for the Ellis Program available to the Ellis Program in its development of the Ellis Project to its potential maximum development. Once the Clearwell No. 3 is in service, the Ellis project will have all services required to meet the maximum water supply demands of the Ellis Program. However, additional infrastructure will be required to be constructed as Ellis continues to build out.

- The City shall provide supply, storage, treatment, and transmission through water system upgrades and expansions sufficient to serve 1,100 acre feet per year of potable water to meet the water demands arising from development of the maximum Ellis Program, which does not include the initial 540 units. The City will supply the Ellis Program with thirteen hundred acre feet of water per year.

Figure 5 presents the location of the pumping facility, storage reservoir and transmission mains required to serve the ESP Properties at buildout. Figure 2 shows the proposed Phase 1 and Buildout areas for the ESP. The cost for the ESP Properties' required water facilities is detailed in Table 5 and is summarized in Table 1.

ESTIMATE OF REQUIRED CONNECTION FEES TO FUND ESP WATER SYSTEM FACILITIES

The costs for the water system facilities required for the ESP will be paid for through connection fees, also known as capital facilities fees or development impact fees, to be paid by each of the ESP projects on an EDU basis.

One EDU is defined as the average day demand for a low-density residential unit and equals 429 gpd. On this basis, EDUs can be calculated for other land uses such as medium- and high-density residential, industrial and commercial uses as shown in Table 6.

Table 6. City of Tracy Equivalent Dwelling Customer Units (EDU)

Land Use	Average Day Water Demand	Average Day Water Demand	EDUs
Residential			
Low-Density	429 gpd/du	429 gpd/du	1 EDU per du
Medium-Density	310 gpd/du	310 gpd/du	0.72 EDU per du
High-Density	220 gpd/du	220 gpd/du	0.51 EDU per du
Schools	1.5 af/ac/yr	1,339 gpd/ac	3.12 EDUs per acre
Parks	4.0 af/ac/yr	3,570 gpd/ac	8.32 EDUs per acre
Industrial	1.5 af/ac/yr	1,339 gpd/ac	4.16 EDUs per acre
Commercial	2.0 af/ac/yr	1,785 gpd/ac	4.16 EDUs per acre
Aquatic Center[(a)]	33 af/yr	29,461 gpd	69 EDUs

[(a)] Demands for the Aquatic Center based on facility information obtained from RJM Design Group (updated November 2010). Do not include UAFW.

The proposed 2012 ESP land uses correspond to a total of 2,198 EDUs. The ESP Phase 1 corresponds to 683 EDUs (including the Aquatic Center), and the remainder of the ESP corresponds to 1,515 EDUs. The assumptions may be updated based on future refinements and updates to the ESP; the EDU's may be refined and updated at that time.

The costs per EDU for the proposed supply and treatment and infrastructure improvements are shown in Table 1. Based on the costs per EDU, the corresponding connection fees for each of the proposed ESP phases are also presented in Table 1. The assumptions for Table 1 may be updated with future refinements and updates to the ESP.

SUMMARY OF RESULTS

The ESP Project was evaluated under three separate system configurations. The first was the Initial Phase 1 scenario which evaluated Phase 1 with the Aquatic Center and 540 units constructed in Pressure Zone 2 and 3 of the ESP. Under this configuration, the construction of 12-inch diameter pipeline (8,700 feet) is required, the JJWTP booster pump station, and 16-inch diameter pipeline from the vicinity of Clearwell No. 2 to English Oaks Avenue. The ESP Phase 1 scenario requires the construction of the 2.0 MG clearwell, 6.48 mgd pump station and various pipelines (see Figure 4). The buildout of the ESP Project requires:

- Proportionate share of a new Zone 3 booster pump station to meet peak hour, daily flow, and pressure requirements for ultimate buildout of ESP;
- Proportionate share of one new Aquifer Storage and Recovery (ASR) well;
- Proportionate share of the City's long-term emergency groundwater storage supply;
- Proportionate share of future 2.0 million gallon (MG) clearwell at John Jones Water Treatment Plant (JJWTP);
- Proportionate share of the City's JJWTP expansion;
- Proportionate share of a recommended 20-inch diameter pipeline from JJWTP to the intersection of Corral Hollow Road and Linne Road;
- Proportionate share of a recommended 20-inch diameter pipeline from the intersection of Corral Hollow Road and Linne Road to the west side of the project site on Lammers Road;
- Proportionate share of the Zone 3 16-inch diameter main from the vicinity of Clearwell No. 2 along Tracy Boulevard to the 18-inch diameter main at Linne Road and English Oaks Avenue;
- Two check valve stations along Corral Hollow Road from Pressure Zone 2 to ESP;
- Pressure Reducing Valve on the 12-inch connection from ESP Phase 1, north to Valpico Road;
- Proportionate share of a 12-inch connection from Whirlaway Lane to Linne Road;
- Proportionate share of the 18-inch diameter pipeline along Corral Hollow Road from Linne Road to Middlefield Drive; and
- Proportionate share of the 18-inch diameter connection from Linne Road to Corral Hollow Road.

The cost for each of these Phases is summarized in Table 7.

Table 7. Estimate of Probable Water Distribution System and Infrastructure Costs By Phase[a,b]

Item	Initial ESP Phase 1	ESP Phase 1	Total ESP Cost[c]
Zone 3-City-Side BPS (JJWTP)[d]			
6.48 mgd	$0	$308,303	$611,000
Zone 3-Pump near Clearwell No. 2[e]			
2.5 mgd	$75,000	$0	$75,000
Clearwell at JJWTP[f]			
2.0 MG	$0	$1,528,454	$2,045,000
John Jones Water Treatment Plant Expansion[g]			
15.0 mgd	$0	$2,439,679	$4,835,000
Long-term Emergency Groundwater Storage[h]			
2,500 gpm	$0	$0	$662,000
On-site Backbone Pipelines[i,j]			
12-inch (ESP backbone - Phase 1)	$677,000	$677,000	$677,000
12-inch (ESP backbone - Buildout)	$0	$0	$340,000
12-inch (ESP backbone - Phase 1 to Valpico Rd)	$0	$0	$203,000
Water Transmission Lines from JJWTP Z3-City-side BPS[i,j]			
24-inch (JJWTP Clearwell to BPS3)	$0	$2,523	$5,000
20-inch (ESP - JJWTP BPS3 to north of Corral Hollow Rd and Linne Rd - Phase 1)	$0	$556,055	$1,102,000
20-inch (North of Corral Hollow Rd and Linne Rd to ESP Northwest corner - Buildout)	$0	$0	$942,000
18-inch (ESP - north of Corral Hollow and Linne Rd to Middlefield Rd - Phase 1)	$78,000	$78,000	$78,000
18-inch (ESP-Linne Rd to Corral Hollow Rd - Phase 1-PZ2 Bypass)	$13,000	$13,000	$13,000
16-inch (From Clearwell No. 2 to English Oak)	$331,009	$331,009	$656,000
20-inch Jack and Bore under Delta Mendota Canal	$0	$85,780	$170,000
20-inch Jack and Bore (Corral Hollow and Linne Rd under RR)	$93,000	$93,000	$93,000
Water Transmission Lines to move Portion of Plan C into Zone 3[i,j]			
12-inch (Whirlaway Lane to Linne Road)	$22,202	$22,202	$44,000
12-inch Jack and Bore (SW Portion of Plan C under R/R to Linne Road)	$19,174	$19,174	$38,000
Valve Connections			
Connection at Middlefield Drive:			
18-inch diameter check valve	$ 31,000	$31,000	$31,000
12-inch diameter bypass PZ2 on Corral Hollow, Jack and Bore (SW Portion of Plan C under Corral Hollow)	$15,000	$15,000	$15,000
Pressure Reducing Valve ESP - Phase 1 to Valpico Rd (12-inch diameter)	$0	$0	$38,000
12-inch diameter check valve at Peony Drive	$ 55,100	$0	$0
Estimated Construction Cost	$1,409,485	$6,200,179	$12,673,000
Design and Planning (10%)	$140,949	$620,018	$1,267,000
Construction Management (10%)	$140,949	$620,018	$1,267,300
General Contingency (15%)	$211,423	$930,027	$1,900,950
Program Administration (5%)	$70,474	$310,009	$633,650
Land Acquisition Costs[k]	$0	$0	$46,000
Groundwater Conjunctive Use Study[l]	$0	$0	$0
Total Anticipated "In Place" Project Cost	$1,973,279	$8,680,251	$17,788,000

[a] Does not include site specific facilities.

[b] All markups and contingencies are consistent with the City's December 2012 Citywide Water System Master Plan.

[c] Costs rounded to nearest one thousand dollars.

[d] Pump station costs for ESP assume ESP's proportionate share of the total cost to construct the 6.48 mgd pump station (ESP buildout share is estimated @ 37% of the total construction cost, 2.18 mgd [ESP Buildout Area's Maximum Day Demand] divided by 5.9 mgd [Buildout Zone 3 Area's Maximum Day Demand]). ESP Phase 1 proportionate share is estimated @ 50% of the ESP total cost, 1.1 mgd [Initial ESP Phase 1 Area's Maximum Day Demand] divided by 2.18 mgd [ESP Buildout Area's Maximum Day Demand]. Initial ESP Phase 1 proportionate share is estimated for a single Pressure Zone 3 pump station at 2.5 mgd located near existing Clearwell No 2.

[e] Initial ESP Phase 1 proportionate share is estimated for a single Pressure Zone 3 pump station with firm pumping capacity of 2.5 mgd located near existing Clearwell No 2. The costs associated with this pump station is credited towards the 6.48 mgd pump station for Phase 1 ESP and Total Costs of ESP.

[f] Clearwell costs for ESP assume ESP's proportionate share of the total cost to construct the 2.0 MG clearwell (ESP's share is estimated @ 63% of the total construction cost, 2.18 mgd [ESP's Maximum Day Demand] divided by 3.46 mgd [operational storage available at clearwell to support a maximum day demand equivalent to 3.46 mgd]).

[g] Water treatment costs assume the ESP proportionate share of the total cost to of the 15.0 mgd expansion of the John Jones Water Treatment Plant (ESP share is estimated at 15% of the total expansion cost, based on [ESP Maximum Day Demand] of 2.18 mgd). The cost of the 15.0 mgd expansion is based on the FY 09/10 adopted budget, CIP 75053, and is equal to $44,358,728. This cost does not include program management mark-ups of 5%, but include all other mark-ups. So the unit price is based on $44,358,728 multiplied by 1.05 and then divided by 1.40, or $33,269,046.

[h] Long-term emergency storage costs assume ESP's proportionate share of the total cost to construct a groundwater well (ESP's share is estimated at 26% of the total cost, 661.5 gpm [ESP's average day demand] ÷ 2,500 gpm [Assumed well capacity]).

[i] Water transmission line costs assume Initial Zone 3 Area's proportionate share of the total cost to construct the Zone 3 pipelines (Initial Zone 3 Area's share is estimated @ 37% of the total construction cost, 2.18 mgd [ESP's Maximum Day Demand] divided by 5.9 mgd [Buildout Zone 3 Area's maximum day demand]).

[j] The unit construction costs for pipeline include pipeline materials, trenching, placing and jointing pipe, valves, fittings, hydrants, service connections, placing imported pipe bedding, native backfill material, and partial asphalt pavement replacement, if required.

[k] Land for facilities identified within the ESP boundary will be dedicated to the City. Land for off-site pump station will need to be acquired.

[l] The groundwater conjunctive use study is Initial Zone 3 Area's proportionate share of the City's Groundwater Management Plan Study.

FEE JUSTIFICATION STUDY EXECUTIVE SUMMARY FOR THE ESP WATER SYSTEM

Based on the data and project criteria provided, the recommended backbone water system to serve the ESP Project at buildout is presented on Figure 5. ESP's infrastructure costs are summarized in Table 1. Table 5 presents the total program infrastructure cost to ESP.

It is anticipated that the City will establish a financing district to provide a funding mechanisms for the proposed development projects in ESP. Formation of these financing districts is consistent with the objectives of the Mitigation Fee Act, Government Code Sections 66000, et seq., also known as Assembly Bill 1600 (AB 1600). The Mitigation Fee Act requires documentation of a reasonable relationship (benefit and burden) between the type of development projects planned for the ESP and the need for the water infrastructure improvements proposed to serve the ESP. The purpose of this summary is to show that a reasonable relationship between the proposed development projects in the ESP and the recommended water infrastructure improvements exists.

1. Description of Assumptions and Design Criteria.

Water Demands

For single family residential (*i.e.*, very low and low density residential) water uses, the estimated average day water demand rate of 429 gallons per day per detached single family dwelling unit (gpd/sfdu) is based on work completed in the Citywide Water System Master Plan to verify unit water demand factors. For all other residential water uses, the projected water demand was also calculated based on the appropriate "water duty" or unit water demand factor adopted in the Citywide Water System Master Plan for each particular residential density category and are summarized below.

Medium Density Residential	=	310 gpd/du
High Density Residential	=	220 gpd/du
Very High Density Residential	=	150 gpd/du

The average annual water demands for non-residential land uses such as parks and schools were calculated using the following unit water demand factors:

Commercial	=	2.0 af/ac/yr
Office	=	1.5 af/ac/yr
Industrial	=	1.5 af/ac/yr
Institutional	=	1.5 af/ac/yr
Parks	=	4.0 af/ac/yr

These unit water demand factors presented above are consistent with the adopted water duty factors from the Citywide Water System Master Plan.

The estimated average day water demand rate from single family residential water uses can be used to define an Equivalent Dwelling Unit (EDU). Generally, one EDU is equal to the amount of water required to serve one single family dwelling unit per day (*i.e.*, 429 gallons, based on 130 gallons per capita per day (gpcd) times 3.3 people per single family dwelling unit). Based on this definition (*i.e.*, 1 EDU = 429 gpd), water demands from different types of land uses can be converted to EDUs for comparison.

Number of Persons Per Single Family Unattached Unit

Consistent with the Citywide Water System Master Plan, the City has established a policy regarding the estimated average number of persons per household, as set forth below.

- SFDU: 3.3 people/du
- MF 2-4: 2.7 people/du
- MF > 5: 2.2 people/du

The term "MF 2-4" applies to structures with 2 to 4 attached dwelling units (*i.e.*, medium density residential). The term "MF > 5" applies to structures with 5 or more attached dwelling units (*i.e.*, high density residential).

2. Description of Existing Level of Service.

The existing potable water system infrastructure serving the City consists of pipelines ranging in size from 2 to 42-inches in diameter, pump stations, storage tanks, groundwater production wells, and water treatment facilities. The existing potable water distribution system currently meets the minimum requirements as presented in the City's adopted performance criteria from the Citywide Water System Master Plan. However, not all of the existing approved projects (*i.e.*, development projects with approved water supply) are completely built out. Therefore, before any excess water system treatment, storage or transmission capacity can be assumed to be available for future service areas, full buildout of the previously approved projects must be assumed. This assumption ensures that no existing capacity required for and built (and paid for) by previously approved projects would be inadvertently assigned to the future service areas.

However, to serve the buildout needs of these existing approved projects, additional pumping and storage facilities and back-up generators are required for the existing potable water system. Only after these additional facilities are added to the existing potable water system can the system meet all adopted performance and design criteria as established in the Citywide Water System Master Plan.

3. Description of Assumptions Regarding the Type of Development Planned for ESP.

The ESP Planning Area has been proposed in the southwestern portion of the City. It is assumed, based on information from the City, that ESP will include single-family detached homes, high density housing, park sites, a school, commercial developments, and an aquatic swim center that will increase the overall water demand in the existing system. The existing water system will not be able to treat, store and deliver water of appropriate quality, quantity and pressure if existing water facilities are not modified to serve the future service areas. This would impact public health and welfare because of inadequate system pressures to provide service and/or fight fires. Because additional water demands will have a major impact on existing water system facilities, modifications to these facilities are required to maintain the current level of water service provided by the City. Therefore, additional water supply sources, treatment capacity, pumping capacity, storage capacity and transmission capacity will be required to meet the projected water demands at buildout of the ESP.

4. Description of how the impact of the development in ESP will require additional modifications to public facilities, including description of standards by which it was determined that additional modifications to public facilities are required.

The size and configuration of the City's existing water system is not sufficient to accommodate additional demands that will be generated by ESP. ESP will require additional storage, and pumping facilities and distribution facilities. Without these additional facilities, adequate water service cannot be provided to ESP.

As previously discussed, the City's existing system is sized to meet the full buildout of existing planning areas. Any demands above these will require additional facilities or modifications to the proposed facilities to meet the City adopted performance and design criteria from the Citywide Water System Master Plan. The criteria used to determine the additional public water facilities, or modifications to previously proposed facilities, included:

- Above Ground Storage Requirements—must contain operational storage, emergency storage, and fire flow storage.
- Emergency Storage—defined as 2 times average day demand.
- Allowable system pressure at peak hour must be maintained at or above 40 psi.
- Allowable system pressure during a maximum day plus fire flow demand must be maintained at or above 30 psi.

The City's existing system is capable of meeting all these criteria and with the design and construction of the various water facilities identified as the responsibility of previous planning areas, these too will be able to meet all minimum City required water system criteria. Those water system impacts identified and required in the ESP Water System Analysis will also be required to meet the above City Standards.

5. Description of the level of service that will result from the new development in ESP after the required additional public facilities and/or modifications to previously proposed public facilities are constructed.

After construction of the proposed ESP water facilities, the level of water service after development will be similar to the level of water service currently provided to the City. The City's water system will meet all of the adopted performance and design standards as described in Item 4 above. The system will be in full compliance with the City's adopted design and performance criteria as stated in the Citywide Water System Master Plan.

6. Description of how the new development in ESP benefits from the additional facilities.

It was previously identified that the City's existing water system infrastructure cannot support the ESP developments. For this reason, additional and/or modifications to previously proposed facilities need to be in place and operational for the ESP developments to benefit from them. Therefore, the ESP developments benefit directly from recommended and/or proposed water facility modifications as described in the ESP Water System Analysis. Without these facilities the ESP developments would not be able to meet the City's adopted performance and design criteria

for the water distribution system. Some of the benefits that the new/modified water facilities bring to the ESP developments include:

- Adequate peak hour and fire flow pressures are provided to the new development.
- Adequate storage (emergency, operational and fire) is provided to the new development.
- Adequate treated water supply is provided to the new development.

7. Description of the basis upon which the total estimated cost of providing the ESP Project public facilities is allocated to properties within the ESP area.

Tables 5 and 7 present an estimate of the reasonable costs associated with the required facilities to serve ESP. The unit costs are based on costs for similar water facility projects and from standard construction cost estimating guides and cost curves**.**

8. Description of the basis upon which the total estimated cost of providing the additional and/or the modifications to previously proposed public facilities is allocated to properties within the ESP area.

The total water demands were calculated using the factors set forth in section 1, above, as well as the maximum day and peak hour peaking factors of 2.0 and 3.4, respectively.

Based on the above unit water demands, the total ESP water demand was calculated, required water facilities necessary to support ESP (both conveyance, storage and treatment) were determined and associated costs to serve ESP developments were identified.

9. Reference Documents

The documents used in the analysis include:

1. City of Tracy, Citywide Water System Master Plan. December, 2012.
2. Technical Memorandum “Plan C Water System Analysis”. February 24, 1998.
3. Technical Memorandum “South ISP Water System Analysis”. October 13, 2008.
4. Technical Memorandum “Undeveloped Infill Properties”. October 24, 2011.
5. Technical Memorandum “Ellis Specific Plan Water System Analysis”. November 29, 2010.
6. Draft Technical Memorandum “Aquatic Center Facility Water Demand and Water System Infrastructure Analysis”. December 15, 2010.
7. Draft Technical Memorandum “Water System Evaluation for the City of Tracy’s Initial Pressure Zone 3 Area”. February 7, 2012.

10. Findings with Respect to the Mitigation Fee Act

The ESP Water Impact Fee will provide for the funding of the proportionate share of a portion of the water supply requirements of the ESP Planning Area in accordance with the requirements of the Mitigation Fee Act California Government Code sections 66000, et seq., also known as “AB 1600”. The capital improvements are required to mitigate the water impacts on new development

within the ESP Planning Area consistent with the land use and water policies of the General Plan and the Citywide Water System Master Plan. The fee is not imposed to improve or correct deficiencies in baseline service levels. The fee is based on a water and fair-share cost analysis which: 1) determines capital improvements required to mitigate the water supply impacts of the buildout of the ESP Planning Area, and 2) equitably distributes the costs of the improvements to the development areas that cause the impacts, per the provisions of the Mitigation Fee Act.

The Mitigation Fee Act requires impact fee programs to comply with the following basic requirements:

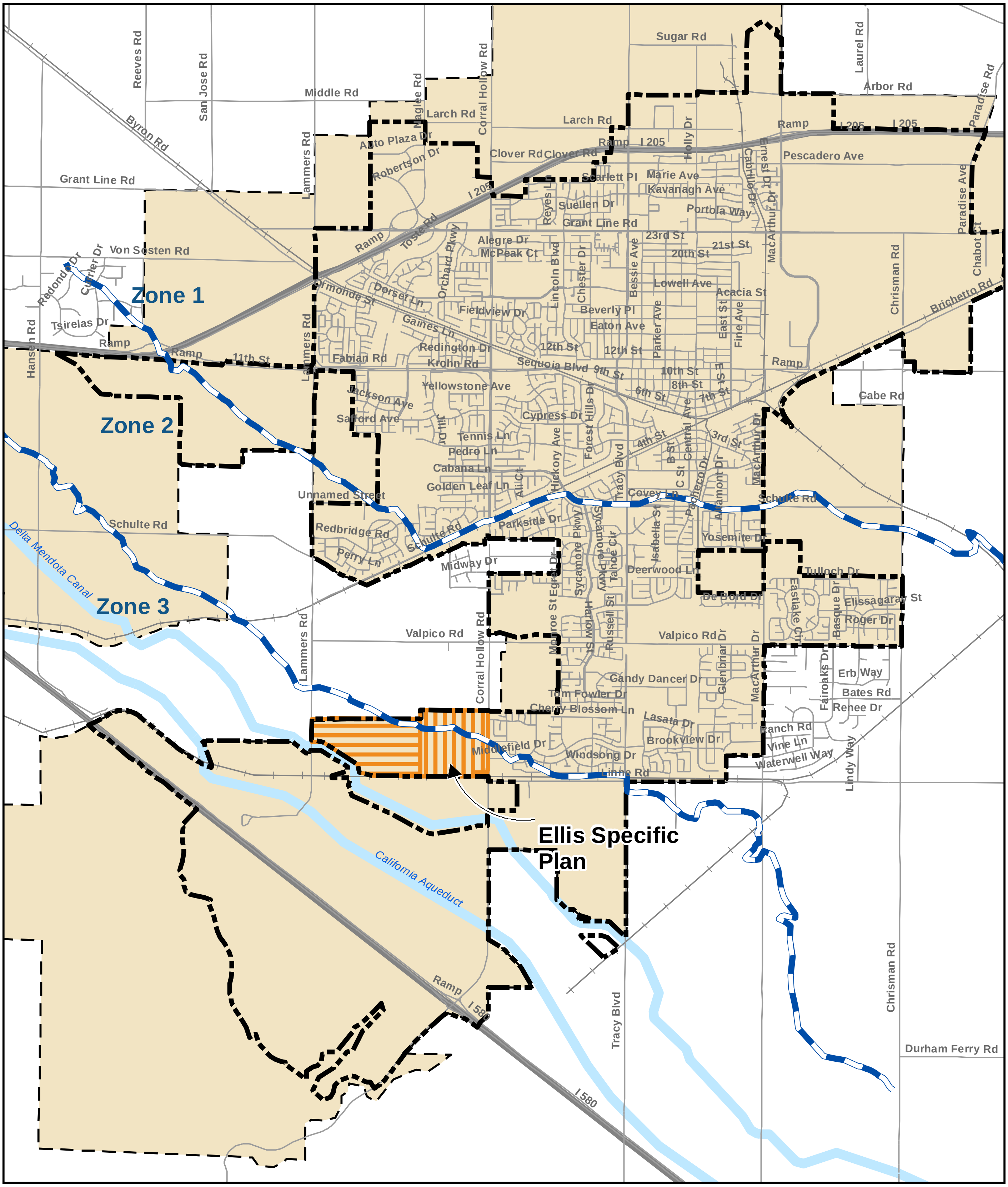
- Identification of the purpose of the fee.
- Identification of how the fee will be used.
- Determination of how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.
- Determination of how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.
- Determination of how there is a reasonable relationship between the amount of the fee and the cost of the public facility (or portion of facility) attributable to new development.

The following findings address each of these five issues:

1. **Identification of the purpose of the fee.** The purpose of the proposed water impact fee is to provide a source of funding based on the ESP's proportionate share of the overall project cost to be used to construct water facilities that are required to provide water supply to the ESP Planning Area. These program water facilities are more completely analyzed in the ESP Water System Analysis and generally include: upgrades to the City's water distribution system (as summarized on Tables 5 and 7).
2. **Descriptions of how the fee will be used.** The fee will be used to plan, design and construct new or water facilities such as pipelines, storage tanks, and booster pump station.
3. **Determination of how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.** The proposed impact fee will be used to construct water distribution facilities that are required to provide water services to the ESP Project. Construction of water facilities provides direct benefit to the proposed development projects. Therefore, there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.
4. **Determination of how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.** The use of a sophisticated and calibrated hydraulic water distribution system computer model, validated and subsequently adopted by the City, demonstrates the need for public facility improvements due to the proposed land uses on which the fee will be imposed. This analytical model was used to determine impacts to the City's existing potable water system and identify impacts to public facilities. Analysis included

evaluation of treatment, transportation and storage requirements to deliver required pressure and flow for average day, maximum day, fire demand, and peak hour demand conditions. Without the identified improvements, the existing potable water system is incapable of providing the City's minimum standard system pressure and flow to serve the future service areas. This will not only affect the future service areas, but also the City's existing customers. Therefore, there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.

5. **Determination of how there is a reasonable relationship between the amount of fee and the cost of the public facility (or portion of the facility) attributable to new development.** The proposed water facilities will be constructed to meet the water demand generated from the ESP Project. The demand is calculated using a factor of 1 EDU for a single-family detached residential unit (low density). The estimated overall cost of the facilities is based on current conceptual engineering estimates which are based on similar facility types. The overall cost of the facilities is divided by the number of EDUs or residential units that are connected to the system. Therefore, each residential unit receives direct benefit and their cost will be proportional to the benefits received. Hence, there is a reasonable relationship between the amount of fee and the cost of the public facility (or portion of the facility) attributable to new development.



LEGEND

- Ellis Specific Plan - Phase 1
- Ellis Specific Plan - Remainder
- Existing Pressure Zone Boundary
- City Limits
- Amended Sphere of Influence (SOI)

N

0 0.5 1

Scale in Miles

FIGURE 1

City of Tracy
Ellis Specific Plan
SITE LOCATION

TRACY

WEST YOST ASSOCIATES
Consulting Engineers

PRESSURE ZONE 2

PRESSURE ZONE 3

12-inch Diameter

12-inch Diameter Connection and Check Valve

12-inch Diameter Pressure Zone 2 Bypass and 18-inch Diameter Check Valve Connection (See Note 2)

16-inch Diameter

Existing 20-inch Diameter

6.48 mgd

School

Aquatic Center

Valpico Rd

Lammers Rd

Wilkinson Way

Corral Hollow Rd

Tracy Blvd

Linne Rd

Lorraine Rd

MacArthur Dr

Acorn Rd

Ranch Rd

Fairoaks Dr

Feliz Way

Sesta Ct

Casey Ct

Cloudview Ct

Glenbriar Dr

Oak Crest Ct

Hollow Brook Ct

La Monte Ln

James W Smith Dr

Darlene Ln

Cose Ln

Payton Ln

Ridgeview Dr

Glenbrook Dr

Brookview Dr

Oakridge Dr

Glenhaven Dr

Gandy Dancer Dr

Murrieta Way

Arezzo Way

Lasata Dr

Regis Dr

Escarta Ave

Perennial Pl

Mulberry Ct

Bonsai Ave

Windchime Way

Cherub Way

Dandelion Loop

Violet Pl

Citrus Way

Dietrick Ave

Lombard Ct

Chaplin Way

Oneil Ct

Hepburn St

Longfellow St

Cornucopia Pl

Glencreek Dr

Glenpine Ct

Shelborne Dr

Meadow Ln

Valfour Way

Bluegrass Ln

Hoboken Dr

Cambridge Ln

Heritage Pl

Ray Harvey Dr

Rockport Ct

Potsgrove Pl

Sycamore Pkwy

Jonathan Pl

Tom Fowler Dr

Whittingham Dr

Darby Dr

Windham Dr

Peony Dr

Cherry Blossom Ln

Wheat Ln

Crape Myrtle Ln

Riverview Ave

Olivia Ct

Poppy Hills Ln

Whirlaway Ln

English Oaks Ct

Windsong Dr

Twin Oaks Dr

Delta Mendota Canal

California Aqueduct

I 580

I 580

Notes
1. The City can provide temporary storage for the construction of up to 540 ECU's in Phase 1.
2. Initial construction located in Pressure Zone 2 could be served with a combination of a 18-inch check valve connection with Pressure Zone 2 transmission pipeline located in Corral Hollow Road and a 12-inch bypass connection. The 12-inch bypass pipeline would be closed until the area becomes part of Pressure Zone 3. When the 12-inch bypass pipeline is operational the 18-inch diameter check valve connection could be closed or disconnected once the area is utilmately served as part of Pressure Zone 3.
3. Phase 1 requirements and location as directed by City Staff.

LEGEND

Ellis Required Pipelines
- 8 inch
- 12 inch
- 16 inch
- 18 inch
- 20 Inch
- 24 inch

- Required PRV
- Required Booster Pump Station
- Existing Tracy Pipeline
- Existing Pressure Zone Boundary
- WTP John Jones Water Treatment Plant

- Proposed ASR Well
- Proposed 2.0 MG Clearwell
- ESP Phase 1
- ESP Remainder (Buildout)
- City Limits

N

0 700 1,400

Scale in Feet

FIGURE 2

City of Tracy
Ellis Specific Plan

ELLIS SPECIFIC PLAN PHASING AND INFRASTRUCTURE

TRACY

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\404 City of Tracy\02-09-81 Ellis FIP Analyses\GIS\Figures\April 2013\Fig2_Ellis_Plan_Phasing.mxd 8/14/2013

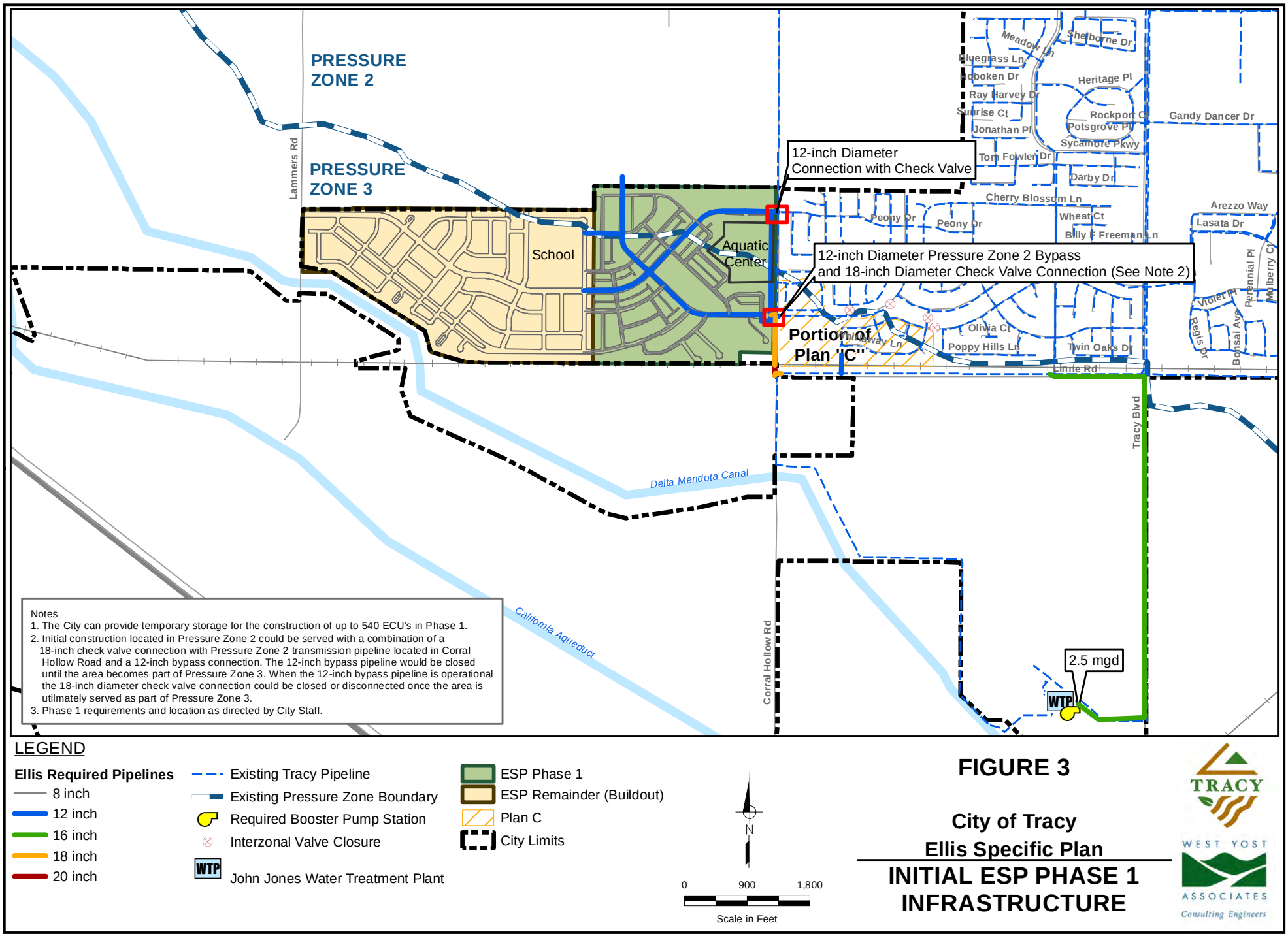


FIGURE 3

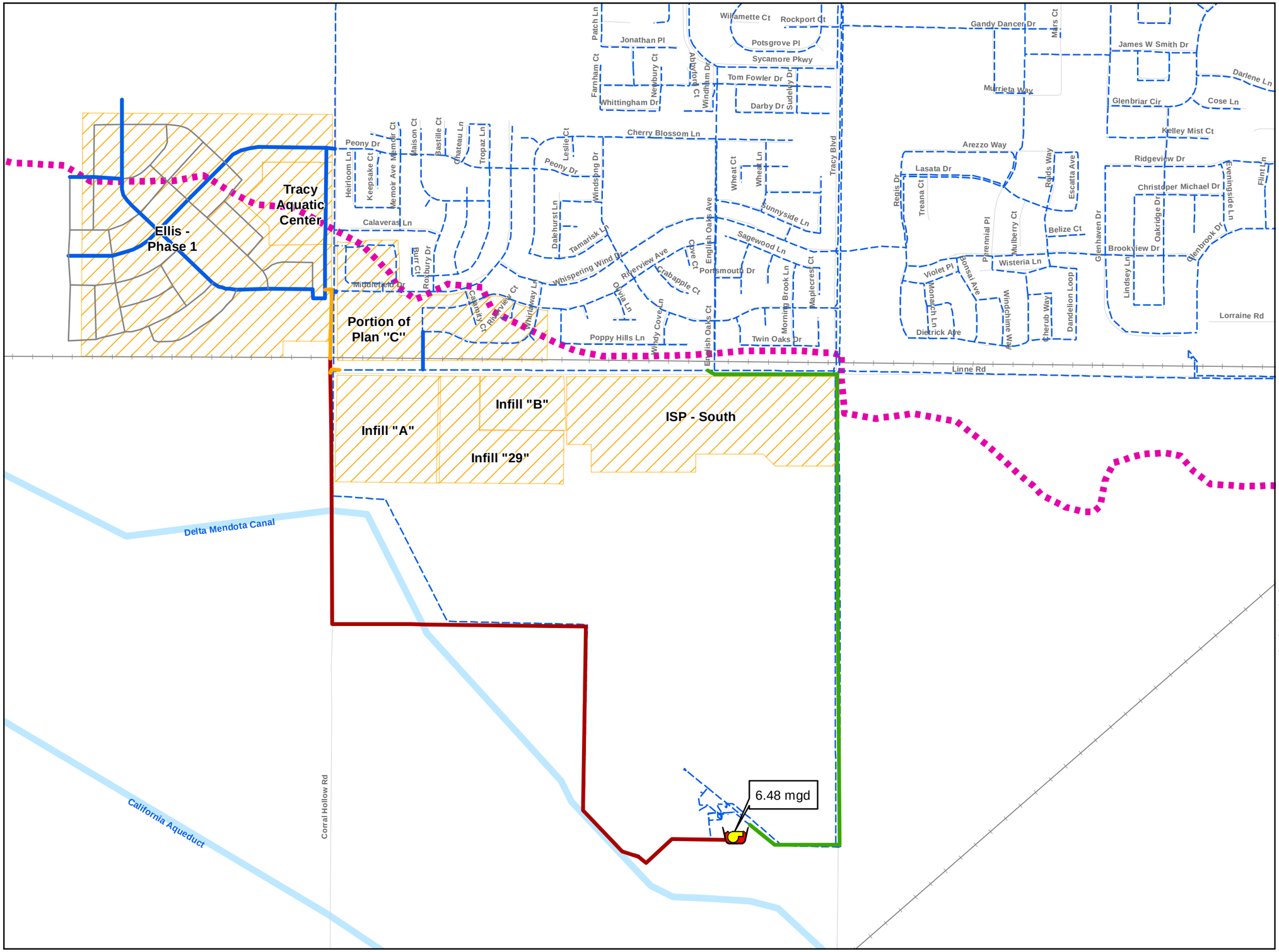
City of Tracy
Ellis Specific Plan
INITIAL ESP PHASE 1 INFRASTRUCTURE

TRACY

WEST YOST ASSOCIATES
Consulting Engineers

FIGURE 4

City of Tracy
Ellis Specific Plan
ESP - PHASE 1 PROPOSED IMPROVEMENTS



NOTES

1. Project boundaries are approximate.

LEGEND

- Proposed 2.0 MG Clearwell
- Required Booster Pump Station

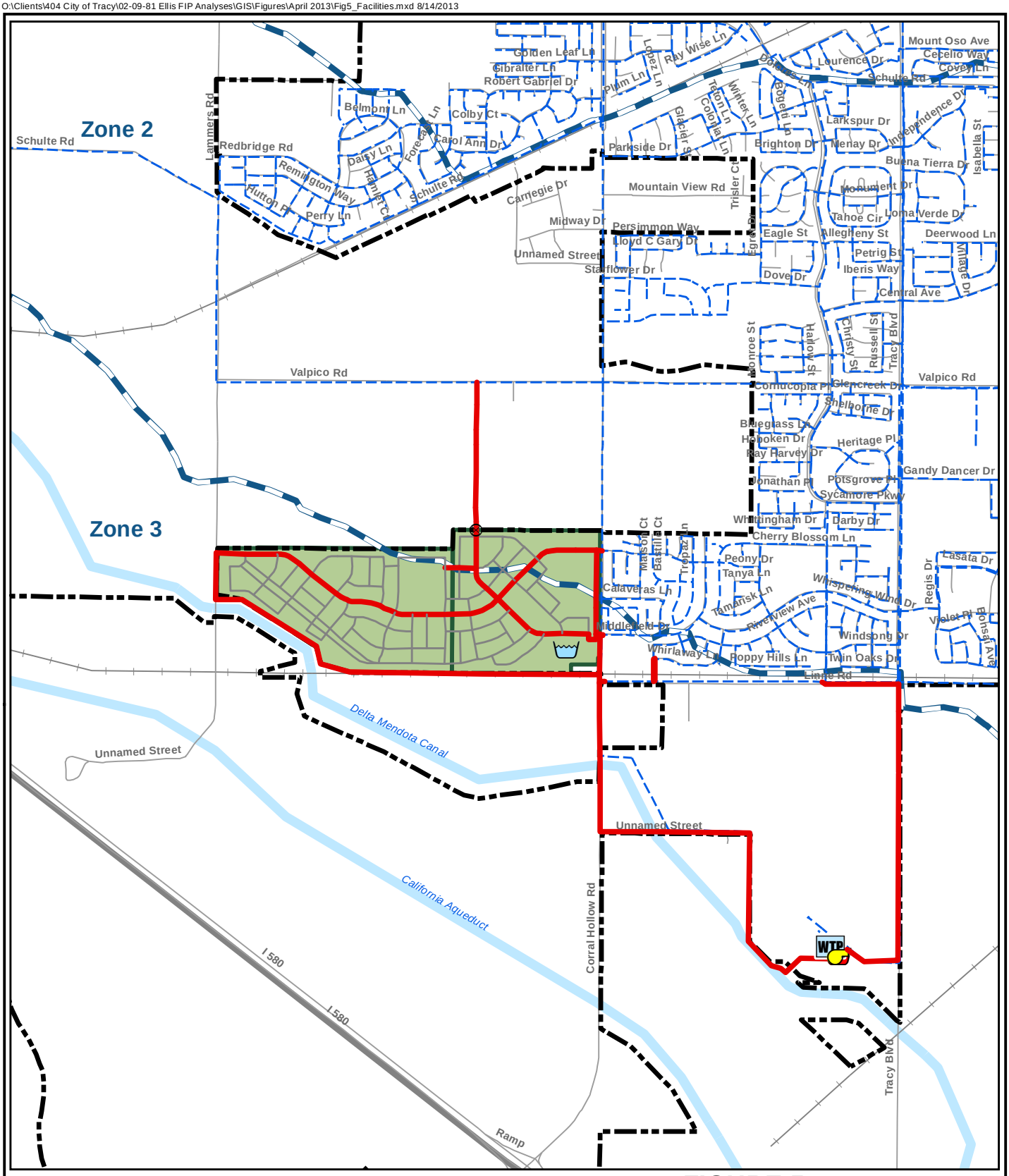
Initial Pressure Zone 3 Required Pipelines

- 8 inch
- 12 inch
- 16 inch
- 18 inch
- 20 Inch
- 24 inch
- Existing Tracy Pipeline
- Initial Pressure Zone 3 Area
- Existing Pressure Zone Boundary
- Railroad
- Highway
- Streets
- Major Canals

TRACY

O:\Clients\404 City of Tracy\02-09-81 Ellis FIP Analyses\GIS\Figures\April 2013\Fig4_Phase1 Improvement.mxd 8/14/2013

O:\Clients\404 City of Tracy\02-09-81 Ellis FIP Analyses\GIS\Figures\April 2013\Fig5_Facilities.mxd 8/14/2013



LEGEND

- 8 inch Pipeline
- Required Pipelines (12 to 24 inch)
- Existing Tracy Pipeline
- Required PRV
- Booster Pump Station
- Proposed ASR Well
- Proposed 2.0 MG Clearwell
- WTP John Jones Water Treatment Plant
- Existing Pressure Zone Boundary
- Ellis Specific Plan
- City Limits

N

0 1,200 2,400

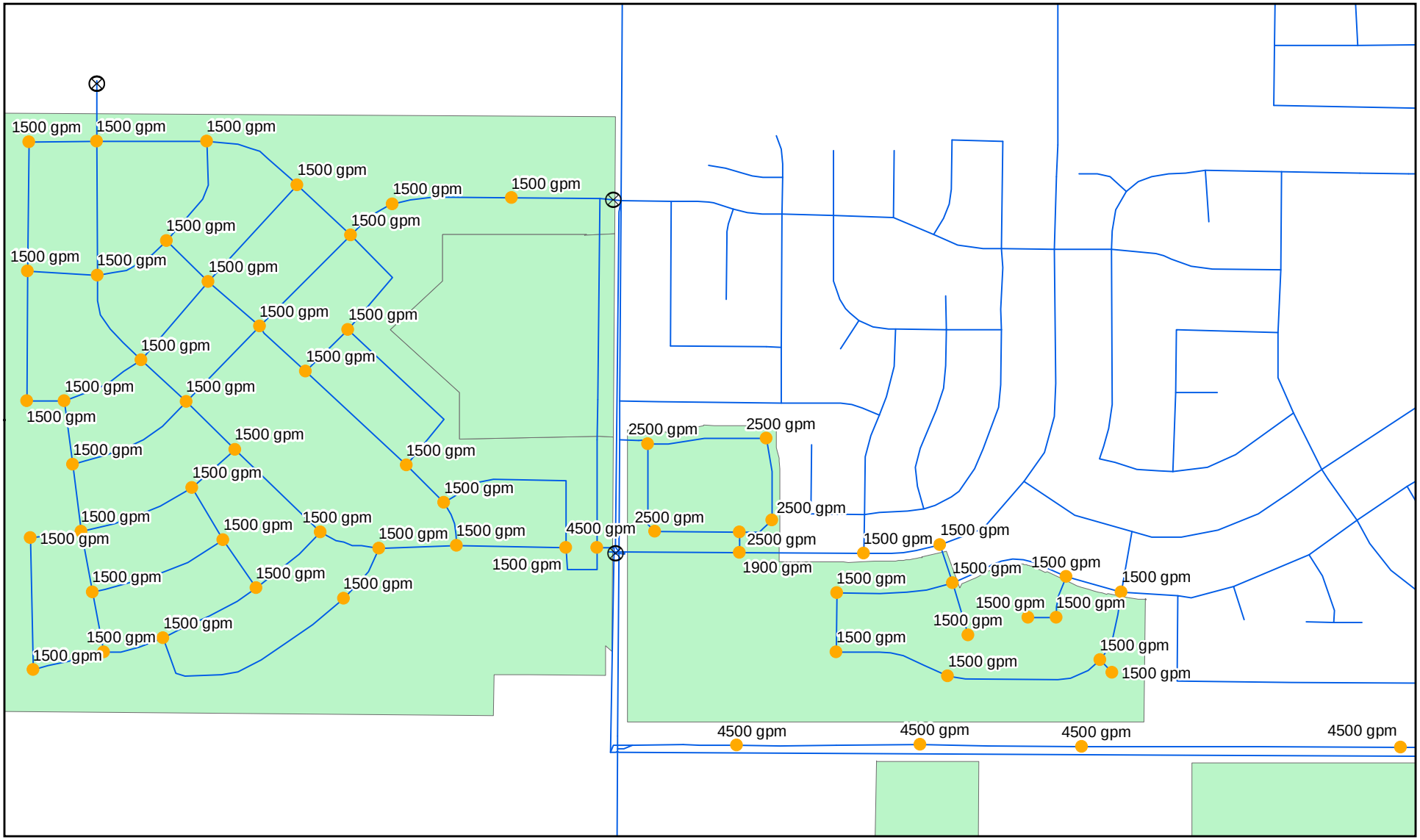
Scale in Feet

FIGURE 5
City of Tracy
Ellis Specific Plan

ESP BUILDOUT PROPOSED INFRASTRUCTURE

TRACY

WEST YOST ASSOCIATES
Consulting Engineers



LEGEND

- Fire Flow Junction (Available Fire Flow)
- Valve
- Water System Pipelines
- Pressure Zone 3

N

0 300 600

Scale in Feet

FIGURE 6

City of Tracy
Ellis Specific Plan
Water System Analysis

ELLIS PHASE 1
AVAILABLE FIRE FLOW

TRACY

WEST YOST ASSOCIATES
Consulting Engineers

ATTACHMENT A

Water System Evaluation for the
City of Tracy's Initial Pressure Zone 3 Area Technical Memorandum,
June 3, 2013

WEST YOST ASSOCIATES
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: June 3, 2013 Project No.: 404-02-11-91

TO: Kul Sharma, City of Tracy

CC: Alison Bouley, Harris and Associates

FROM: Charles Duncan, R.C.E. #55498
Shannon Barcal, E.I.T. #139195

SUBJECT: Water System Evaluation for the City of Tracy's Initial Pressure Zone 3 Area

SUMMARY

This Technical Memorandum (TM) summarizes West Yost Associates' (West Yost) technical evaluation and identification of water system facilities and costs for the City of Tracy's (City) Initial Pressure Zone 3 Area Project (Project). The Project area includes a portion of Plan C (southwest corner of Edgewood subdivision southeast of Corral Hollow Road and Middlefield Drive), existing and future Infill properties south of Linne Road, between Tracy Boulevard and Corral Hollow Road, the proposed Aquatic Center and phase 1 of the Ellis Specific Plan area. All of these properties are located within the City's General Plan Sphere of Influence (SOI). The locations of these existing and proposed development projects are shown on Figure 1.

The new facilities, including water supply, treatment, pumping and storage facilities, and transmission lines that will need to be constructed to serve the needs of the Project are identified in this TM. Specifically, these facilities include:

- Proportionate share of the City's John Jones Water Treatment Plant (JJWTP) Expansion;
- Proportionate share of the City's proposed 2.0 million gallons (MG) Clearwell No. 3 at the JJWTP to provide storage for Zone 3-City Side;
- Proportionate share of the City's proposed 6.48 million gallons per day (mgd) Zone 3-City side booster pump station (JJWTP) to meet peak hour and maximum day flow and pressure requirements;
- Proportionate share of the City's Banta Carbona/Westside Irrigation District supply transfer with storage in Semitropic Water Bank;
- Proportionate share of recommended pipelines from City's proposed Zone 3 City-Side booster pump station (JJWTP) to the Project;
- Proportionate share of the Zone 3 16-inch diameter main from the existing 14-inch diameter main in Tracy Boulevard to the 18-inch diameter main at Linne Road and English Oak;

- Proportionate share of pipelines recommended to serve a portion of Plan C from Zone 3;
- Proportionate share of Aquifer Storage and Recovery well;
- Proportionate share of the City's Regional Groundwater Study.

Total estimated costs for the Initial Zone 3 Pressure Area facilities are $9,813,000 and are shown on Table 2. The proportionate share for the Ellis-Phase 1 Development was calculated to be 43 percent based on the Average Day Demand for the Ellis-Phase 1 Development properties (174 gpm) in relation to the Average Day Demand for the Initial Pressure Zone 3 Area (403 gpm). This proportionate cost equals approximately $4.6 million.

INTRODUCTION

In August 2011, the City authorized West Yost to provide technical engineering support to the City related to performing a water system analysis and defining water system infrastructure needs for the City's Initial Pressure Zone 3 Area. As detailed in our professional services agreement, this TM summarizes our findings and conclusions related to the following tasks:

- Water Demand Evaluation,
- Water Storage and Booster Pumping Facilities Evaluation, and
- Estimate of Probable Facilities Cost and Allocation.

The results of this TM should be incorporated by reference into the City's Citywide Water System Master Plan.

The following sections of this TM describe the additional supply, treatment capacity and pumping and storage facilities required to serve the Project. Also included in this TM are the estimated costs for the new facilities, which will need to be assessed to the Project properties.

PLANNING/MODELING CRITERIA

The general planning and hydraulic modeling criteria used by West Yost in the analysis of the Project's potential impacts to the City's existing water system infrastructure are listed below:

- Design criteria
  - As presented in the City's Citywide Water System Master Plan:
  - The water treatment plant is sized to meet maximum day demands;
  - Pumping facilities are sized to meet maximum day, peak hour or maximum day plus fire flow demand conditions;
  - Transmission mains are sized to provide required peak hour flows at a minimum pressure of 40 pounds per square inch (psi); and
  - Storage facilities are sized to include both operational and fire storage.
  - Emergency water storage will be provided by the groundwater basin.
- Demands

  - — Average day water demand will be calculated using the water duties adopted in the City's Citywide Water System Master Plan.
  - — Maximum day and peak hour demands will be calculated using the peaking factors of 2.0 and 3.4 times the average day demand, respectively.
- Supply
  - — The Project will receive its water supply from the Delta Mendota Canal through the existing water treatment plant, and local groundwater sources.
  - — The City's Banta Carbona/Westside Irrigation District supply transfer with storage in Semitropic Water Bank will be utilized as an additional supply source.
- Modeling Criteria
  - — New pipelines will be hydraulically modeled using a roughness coefficient (C-factor) of 130.
  - — The 2010 calibrated hydraulic model of the City's water system will serve as the basis for evaluation of the hydraulic conditions in the Project area.
- Land Use
  - — Land use for the parcels south of Linne Road between Tracy Boulevard and Corral Hollow Road are assumed to be commercial/light industrial.

WATER DEMAND

Average day water demands for the Project were calculated based on the number of acres in each project area as well as the number of dwelling units in the residential areas multiplied by the appropriate water use factors. These factors, which are consistent with those used in the City's Citywide Water System Master Plan, are presented below:

Land Use	Density	Water Use Factor
Low Density Residential	4.35 dwelling units (DU) per acre	429 gpd per DU
Medium Density Residential	9 DU per acre	310 gpd per DU
High Density Residential	18.75 DU per acre	220 gpd per DU
Commercial	FAR[(a)] 0.3	2.0 af/ac/yr
Office	FAR[(a)] 0.45	1.5 af/ac/yr
Industrial	FAR[(a)] 0.5	1.5 af/ac/yr

[(a)] FAR is floor to area ratio.
gpd = gallons per day
af/ac/yr = acre-feet per acre per year

Maximum day and peak hour demands were calculated by multiplying the average day demand by the maximum day and peak hour demand peaking factors of 2.0 and 3.4, respectively.

The resulting demands for average day, maximum day and peak hour for the Project, are presented in Table 1.

Table 1. Summary of Proposed Water Demands in Initial Pressure Zone 3 Area

Development Project	Land Use Type	Dwelling Units (du) or Acres		Unit Water Demand Factor[a]		Average Day Demand, gpm	Maximum Day Demand, gpm[b]	Peak Hour Demand, gpm[c]
Plan "C"								
Existing Residential Units[d]	Low Density Residential	87	du	429	gpd/du	26	52	88
Waterstone Apartments[d]	High Density Residential	147	du	220	gpd/du	22	44	75
Don Cose Park[d]	Park	3.4	acres[j]	4	af/ac/yr	8	16	27
Proposed Apartments[e]	High Density Residential	144	du	220	gpd/du	22	44	75
UAFW (7.5%)						6	13	21
Subtotal						**84**	**169**	**286**
ISP - South[f]								
Parcel "I-8"	Industrial	66.3	acres	1.5	af/ac/yr	62	124	211
UAFW (7.5%)						5	10	17
Subtotal						**67**	**134**	**228**
Infill[g]								
Parcel "29"	Industrial	17.1	acres	1.5	af/ac/yr	16	32	54
Parcel "A"	Industrial	26.5	acres	1.5	af/ac/yr	25	50	85
Parcel "B"	Industrial	11.7	acres	1.5	af/ac/yr	11	22	37
UAFW (7.5%)						4	8	14
Subtotal						**56**	**112**	**190**
Ellis - Phase 1[h]								
Residential Low	Low Density Residential	93	du	429	gpd/du	28	56	95
Residential Medium	Medium Density Residential	357	du	310	gpd/du	77	154	262
Village Center	Commercial	5.7	acres	2	af/ac/yr	7	14	24
General Commercial	Commercial	4.4	acres	2	af/ac/yr	5	10	17
Limited Use	Commercial	26.0	acres	2	af/ac/yr	32	64	109
Neighborhood Parks	Park	5.0	acres	4	af/ac/yr	12	24	41
UAFW (7.5%)						13	26	44
Subtotal						**174**	**348**	**592**
Tracy Aquatic Center[i]								
Base Bid + Additional Options						20	189	296
UAFW (7.5%)						2	15	24
Subtotal						**22**	**204**	**320**
					Total, gpm[k]	403	968	1,617
					Total, mgd	0.6	1.4	2.3
					Total, af/yr	650		

[a] Based on the adopted unit water demand factors from the City's December 2012 Citywide Water System Master Plan.

[b] Based on the adopted maximum day peaking factor of 2.0 from the City's December 2012 Citywide Water System Master Plan, except for demands from the proposed Tracy Aquatic Center.

[c] Based on the adopted peak hour peaking factor of 3.4 from the City's December 2012 Citywide Water System Master Plan, except for demands from the proposed Tracy Aquatic Center.

[d] Existing parcel(s) currently served by Zone 2 water supply facilities. Proposed to be re-zoned into Pressure Zone 3 to meet the City's minimum pressure requirement.

[e] Data provided to West Yost in email from City staff dated July 27, 2011.

[f] Proposed acreage based on data presented in South ISP Water System Analysis TM prepared by West Yost Associates dated October 2008.

[g] Proposed acreage based on data presented in Undeveloped Infill Properties TM prepared by West Yost Associates dated October 2011.

[h] Proposed dwelling units and acreage based on data presented in the Ellis SP Water System Analysis TM prepared by West Yost Associates dated December 2012.

[i] Proposed water demand based on data presented in the DRAFT Aquatic Center Facility Water Demand and Water System Infrastructure Analysis TM prepared by West Yost Associates dated December 2010.

[j] Acreage based on data presented on the City's website.

[k] Total demand includes 7.5% unaccounted for water.

= Existing Plan C Development Project Demands.

RECOMMENDED WATER SYSTEM INFRASTRUCTURE

Figure 2 presents the location of the facilities and transmission mains required to serve the Project.

Water Supply and Treatment Facilities

Based on the maximum day demand estimated for the Project properties, an additional maximum day treated water supply of 1.2 mgd (the maximum day demand for the Zone 3 initial area), and an additional annual supply of 553 af/yr, will be required to serve the demand of the Project properties. This demand requirement is slightly less than the demand presented in Table 1, because it does not include the existing Plan C Development Project demands (total supply minus the existing Plan C Development Project; 650 af/yr – 97.1 af/yr = 553 af/yr). These demands were removed from the water supply and treatment facilities allocation, since they have already paid for their proportionate share of the existing JJWTP.

The City plans to expand the JJWTP by 15 mgd. In addition, the City has signed a surface water agreement with the Westside and Banta Carbona Irrigation Districts for up to 10,000 af/yr. However, this surface water does not have the same reliability as a Municipal and Industrial (M&I) water supply. To compensate for potential cut backs in the water supply, the City has also entered into an agreement with Semitropic Water Bank to firm up the reliability of the supply. The Project properties will need to pay their proportionate share of the costs for these improvements and supply reliability. The proportionate share of the water supply transfer for the Project properties is based on the Project's average day demand of 553 af/yr (does not include the existing Plan C Development Project demands). As shown on Table 2, this equates to a cost of approximately $857,000.

Costs for the JJWTP expansion are presented in Table 2. The proportionate share of the JJWTP expansion for the Project properties is based on the Project's maximum day demand (1.4 mgd) minus the existing Plan C Development Project demands (0.17 mgd) in relation to the 15 mgd expansion. As shown on Table 2, this equates to approximately 8.2 percent of the expansion at a cost of about $2.6 million. Therefore, the total estimated costs for both the additional raw water supply and the JJWTP expansion are approximately $3.5 million.

Water Pumping Facilities

The December 2012 Citywide Water System Master Plan recommended the installation of a new booster pump station with a minimum firm pumping capacity of 4,500 gpm to meet the buildout maximum day water demands of the Zone 3 City-Side area. The Project's proportionate share of this 6.48 mgd booster pump station is detailed in Table 2 and is equal to $392,000.

Water Storage

Required water storage for the initial Pressure Zone 3 area is based on several components including operational storage, fire flow storage and short-term emergency storage. Operational storage is required to meet peak hour demands and is based on 30 percent of the maximum day demand. Fire flow storage is based on an assumed fire flow demand and duration. The City's required fire flow demand is 4,000 gpm for a duration of four (4) hours. Short-term emergency storage is required to provide a water supply in the event of a supply or treatment plant outage, and is assumed to equal two times the average day demand.

Table 2. Estimate of Probable Water Distribution System and Infrastructure Costs for the Initial Pressure Zone 3 Area[a,b]

Item	Unit	Price/Unit	Unit Price[c]	Qty	% for Initial Area	Initial Zone 3 Area Cost[d]	Ellis Phase 1 Cost[e]
Zone 3-City-Side BPS (JJWWP)[f]							
6.48 mgd	each		$1,822,591	1	22%	$392,000	$169,250
Clearwell at JJWTP[g]							
2.0 MG	each		$3,198,900	1	40%	$1,286,000	$555,243
John Jones Water Treatment Plant Expansion[h]							
15.0 mgd	each		$32,121,838	1	8%	$2,612,000	$1,326,112
BCID/WSID Supply Transfer with Storage in Semi Tropic Water Bank[i]							
10,000 af	each	$15,500,000	$1,550	553	100%	$857,000	$435,099
Long-term Emergency Groundwater Storage[j,k]							
2,500 gpm	each		$2,500,000	1	16%	$403,000	$173,999
Water Transmission Lines from JJWTP Z3-City-side BPS[k,l]							
24-inch	lf		$375	35	24%	$3,000	$1,295
20-inch	lf		$320	9300	24%	$704,000	$303,959
18-inch	lf		$300	825	24%	$59,000	$25,474
16-inch	lf		$230	2935	24%	$160,000	$69,082
20-inch Jack and Bore under Delta Mendota Canal, Railroad	lf		$1,005	458	24%	$109,000	$47,062
20-inch Jack and Bore (Corral Hollow and Linne Rd under RR)	lf		$1,005	250	24%	$59,000	$25,474
Water Transmission Lines to move Portion of Plan C into Zone 3[k,l]							
12-inch (Whirlaway Lane to Linne Road)	lf		$210	562	24%	$28,000	$12,089
12-inch Jack and Bore (SW Portion of Plan C under R/R to Linne Road)	lf		$690	150	24%	$24,000	$10,362
Valve Connections							
Connection at Middlefield Drive:							
18-inch diameter check valve	each	$84,000	$84,000	1	24%	$20,000	$8,635
12-inch diameter bypass PZ2 on Corral Hollow, Jack and Bore (SW Portion of Plan C under Corral Hollow)	lf		$690	60	24%	$10,000	$4,318
Estimated Construction Cost						$6,726,000	$3,167,454
Design and Planning (10%)		10%	10%			$673,000	$317,000
Construction Management (10%)		10%	10%			$673,000	$317,000
General Contingency (20%)		20%	20%			$1,345,000	$633,000
Program Administration (5%)		5%	5%			$336,000	$158,000
Groundwater Conjunctive Use Study[m]	LS		$60,000	1	100%	$60,000	$25,800
Total Anticipated "In Place" Project Cost						$9,813,000	$4,618,000

[a] Does not include site specific facilities.

[b] All markups and contingencies are consistent with the City's 2012 Citywide Water System Master Plan.

[c] All unit prices are presented in 2012 dollars. Unit prices based on combination of cost curves, construction cost guidelines and similar construction projects.

[d] Costs rounded to nearest one thousand dollars.

[e] Ellis- Phase 1 proportionate share of Initial Zone 3 Area costs was estimated at 43% of the total costs (Average Day Demand for Ellis - Phase 1 [174 gpm] in relation to Average Day Demand for Initial Z3 Area [403 gpm]). However, for the water supply and treatment costs, the proportionate share is increased to reflect the existing Plan C Development already paying for their fair share. Ellis- Phase 1 proportionate share of Initial Zone 3 Area costs for water supply and treatment was estimated at 51% of the total costs (Average Day Demand for Ellis - Phase 1 [174 gpm] in relation to Average Day Demand for Initial Z3 Area [342.7 gpm]).

[f] Pump station costs for Initial Zone 3 Area assume Initial Zone 3 Area's proportionate share of the total cost to construct the 6.48 mgd pump station (Initial Zone 3 Area's share is estimated @ 22% of the total construction cost, 1.4 mgd [Initial Zone 3 Area's Maximum Day Demand] divided by 6.48 mgd [Buildout Zone 3 Area's Maximum Day Demand]).

[g] Clearwell costs for Initial Zone 3 Area assume Initial Zone 3 Area's proportionate share of the total cost to construct the 2.0 MG clearwell (Initial Zone 3 Area's share is estimated @ 40 % of the total construction cost, 1.4 mgd [Initial Zone 3 Area's Maximum Day Demand] divided by 3.5 mgd [Maximum Day Demand that the available operational storage can support at Clearwell No. 3]).

[h] Water treatment costs assume the Initial Zone 3 Area's proportionate share of the total cost of the 15.0 mgd expansion of the John Jones Water Treatment Plant (Initial Zone 3 Area's share is estimated @ 8.2% of the total expansion cost, based on [Initial Zone 3 minus existing Plan C Development Area's Maximum Day Demand] of 1.22 mgd). The cost of the 15.0 mgd expansion is based on the FY 09/10 adopted budget, CIP 75053, and is equal to $44,358,728. This cost does not include program management mark-ups of 5%, but include all other mark-ups. So the unit price is based on $44,358,728 multiplied by 1.05 and then divided by 1.45, or $32,121,838.

[i] Supply transfer costs assume Initial Zone 3 Area's proportionate share of the total cost supply transfer and water bank storage (Initial Zone 3 Area's share is estimated at 100% of the total cost of 553 afa [Initial Zone 3 Area's minus existing Plan C Development Average Day Demand]).

[j] Long-term emergency storage costs assume initial Zone 3's proportionate share of the total cost to construct a groundwater well (Initial Zone 3's share is estimated at 16% of the total cost, 403 gpm [Initial Zone 3's average day demand] ÷ 2,500 gpm [Assumed well capacity]).

[k] Water transmission line costs assume Initial Zone 3 Area's proportionate share of the total cost to construct the Zone 3 pipelines (Initial Zone 3 Area's share is estimated @ 24% of the total construction cost, 1.4 mgd [Initial Zone 3 Area's Maximum Day Demand] divided by 5.9 mgd [Buildout Zone 3 Area's maximum day demand]).

[l] The unit construction costs for pipeline include pipeline materials, trenching, placing and jointing pipe, valves, fittings, hydrants, service connections, placing imported pipe bedding, native backfill material, and partial asphalt pavement replacement, if required.

[m] The groundwater conjunctive use study is Initial Zone 3 Area's proportionate share of the City's Groundwater Management Plan Study.

Currently, the City does not have any services or storage within the Zone 3 Pressure Zone. For the purposes of this study, West Yost assumed that the total storage calculated is required to be placed in the Zone 3 Pressure Zone and will be pumped from new storage tank(s) into the distribution system.

As part of the JJWTP expansion, the December 2012 Citywide Water System Master Plan recommended the installation of a new clearwell with a minimum active storage capacity of 2.0 MG. The Project's proportionate share of this facility is detailed in Table 2 and is equal to $1,286,000.

Clearwell No. 3 will only supply the initial Pressure Zone 3 Area's fire flow and operational storage. Short term emergency storage will need to be supplied by another storage facility or an ASR well. In order not to lock in the timing of development of Initial Pressure Zone 3 area with others in Pressure Zone 3, West Yost assumed that the short-term emergency storage would come from a future ASR well. The Project's proportionate share of this facility is detailed in Table 2 and is equal to approximately $403,000.

In addition, as part of the City's policy to continue to allow new development to use the groundwater basin as a long-term emergency supply source, the City is requiring that each new planning area participate in a comprehensive regional groundwater study. As part of the study, maximum groundwater extraction rates and quantities of groundwater that could be extracted in the event of an emergency, without encountering significant issues, such as subsidence or water quality, will be determined. A conjunctive use program will also be evaluated, including the possible use of injection and extraction wells to recharge and store excess water during wet hydrologic periods for future extraction and use during emergency situations and/or improve water supply reliability. Proportionate costs of the study for the Project are presented in Table 2.

Transmission and Distribution Mains

In order to serve water demands for the Project area, the installation of approximately 14,575 linear feet of new pipelines ranging from 8 to 24-inches is recommended. Proportionate costs of the pipelines for the Project are presented in Table 2.

FEE JUSTIFICATION STUDY EXECUTIVE SUMMARY FOR THE PROJECT WATER SYSTEM

Based on the data and project criteria provided, the recommended water system to serve the Initial Pressure Zone 3 Area is presented on Figure 2. Project's infrastructure costs are detailed in Table 2.

It is anticipated that the City will establish a financing district to provide funding mechanisms for the proposed development projects in the Project. Formation of these financing districts is consistent with the objectives of the Mitigation Fee Act, Government Code Sections 66000, et seq., also known as Assembly Bill 1600 (AB 1600). The Mitigation Fee Act requires documentation of a reasonable relationship (benefit and burden) between the type of development projects planned for Project and the need for the water infrastructure improvements proposed for the Project. The purpose of this summary is to show that a reasonable relationship between the proposed development projects for the Project properties and the proposed infrastructure improvements exists.

1. Description of Assumptions and Design Criteria

Water Demands

For single family residential (i.e., very low and low density residential) water uses, the estimated average day water demand rate of 429 gallons per day (gpd) per detached single family dwelling unit (gpd/sfdu) is based on work completed in the Water System Master Plan to verify unit water demand factors. For all other residential water uses, the projected water demand was also calculated based on the appropriate "water duty" or unit water demand factor adopted in the Water System Master Plan for each particular residential density category and are summarized below.

Medium Density Residential	=	310 gpd/du
High Density Residential	=	220 gpd/du
Very High Density Residential	=	150 gpd/du

The average annual water demands for non-residential land uses such as parks and schools were calculated using the following unit water demand factors:

Commercial	=	2.0 af/ac/yr
Office	=	1.5 af/ac/yr
Industrial	=	1.5 af/ac/yr
Institutional	=	1.5 af/ac/yr
Parks	=	4.0 af/ac/yr

These unit water demand factors presented above are consistent with the adopted water duty factors from the Citywide Water System Master Plan.

The estimated average day water demand rate from single family residential water uses can be used to define an Equivalent Customer Unit (ECU). Generally, one ECU is equal to the amount of water required to serve one single family dwelling unit per day (i.e., 429 gallons, based on 130 gallons per capita per day (gpcd) times 3.3 people per single family dwelling unit). Based on this definition (i.e., 1 ECU = 429 gpd), water demands from different types of land uses can be converted to ECUs for comparison.

Number of Persons per Detached Single Family Unit

Consistent with the Citywide Water System Master Plan, the City has established a policy regarding the estimated average number of persons per household, as set forth below.

- SFDU: 3.3 people/du
- MF 2-4: 2.7 people/du
- MF > 5: 2.2 people/du

The term "MF 2-4" applies to structures with 2 to 4 attached dwelling units (i.e., medium density residential). The term "MF > 5" applies to structures with 5 or more attached dwelling units (i.e., high density residential).

2. Description of Existing Level of Service

The existing potable water system infrastructure in the City consists of pipelines ranging in size from 2 to 42-inches in diameter, pump stations, storage tanks, groundwater production wells, and a water treatment facility. The existing potable water distribution system currently meets the minimum requirements as presented in the City's adopted performance criteria from the Citywide Water System Master Plan. However, not all of the existing approved projects (i.e., development projects with approved water supply) are completely built out. Therefore, before any excess water system treatment, storage or transmission capacity can be assumed to be available for future planning areas, full buildout of the previously approved projects must be assumed. This assumption ensures that no existing capacity required for and built by previously approved projects would be inadvertently assigned to the future planning areas.

However, to serve the buildout of these existing approved projects, additional pumping and storage facilities are required for the existing potable water system. Only after these additional facilities are added to the existing potable water system can the system meet all adopted performance and design criteria as established in the Citywide Water System Master Plan, December 2012.

3. Description of assumptions regarding the type of development planned

Based on buildout of the City's General Plan, various future planning areas have been proposed within the City's revised Sphere of Influence. Future planning areas will include a variety of land uses (e.g., residential, commercial, industrial, etc.). These proposed land uses from the future planning areas will increase the overall water demand in the existing potable water system. The existing potable water system will not be able to treat, store and deliver water of appropriate quality, quantity and pressure if existing potable water facilities are not modified to serve the future planning areas. This would impact public health and welfare because of inadequate pressures to fight fires. Because additional water demands will have a major impact on existing potable water system facilities, modifications to these facilities are required to maintain the current level of water service provided by the City. Therefore, additional water supply sources, treatment capacity, pumping capacity, storage capacity and transmission capacity will be required to meet the projected water demands at buildout of the City's General Plan.

4. Description of how the impact of future development projects will require additional modifications to public facilities, including description of standards by which it was determined that additional modifications to public facilities are required

The size and configuration of the City's existing potable water system is not sufficient to accommodate additional water demands that will be generated by the future planning areas. These proposed development projects will require additional storage, pumping and distribution facilities. Without these additional facilities, adequate water service cannot be provided to the future planning areas.

As previously discussed, the City's existing potable water system has been sized to meet the full buildout of existing approved projects. Any demands above these will require additional new facilities or modifications to the proposed facilities to meet the City's adopted performance and design criteria from the Citywide Water System Master Plan. The criteria used to determine the additional public water facilities or modifications to previously proposed facilities included:

- Above Ground Storage Requirements—must contain operational, emergency, and fire flow storage;
- Allowable system pressure during a peak hour demand condition must be maintained at or above 40 psi; and
- Allowable system pressure during a maximum day plus fire flow demand condition must be maintained at or above 30 psi.

The City's existing potable water system is currently capable of meeting all the above criteria based on existing water demands. With the design and construction of the various other water facilities identified as the responsibility of the previously approved projects, demands for these previously approved projects can also be met consistent with the City's potable water system design criteria. However, water system improvements identified and required for future planning areas as documented in the Citywide Water System Master Plan will also be required to meet the above City standards for buildout of the City's General Plan Sphere of Influence.

5. Description of the level of service that will result from new developments after the required additional public facilities and/or modifications to previously proposed public facilities are constructed

After construction of the proposed buildout potable water system facilities recommended for the future planning areas, the level of water service after development will be similar to the level of water service currently provided by the City. The City's potable water system will meet all of the adopted performance and design standards as described in Item 4 above. The potable water system will be in full compliance with the City's adopted design and performance criteria as stated in the Citywide Water System Master Plan.

6. Description of how the new developments benefit from the additional facilities

It was previously identified that the City's existing potable water system infrastructure cannot support the future planning areas. For this reason, additional and/or modifications to previously proposed facilities need to be in place and operational for the future planning areas to benefit from them. Therefore, the proposed development projects benefit directly from recommended and/or proposed potable water facility modifications as described in the Citywide Water System Master Plan. Without these facilities, the future planning areas would not be able to meet the City's adopted performance and design criteria for the potable water distribution system. Some of the benefits that the new/modified water facilities bring to the future planning areas include:

- Adequate peak hour and fire flow pressures;
- Adequate storage (emergency, operational and fire); and
- Adequate treated water supply.

7. Description of the basis upon which the total estimated cost of providing the proposed public facilities is allocated to properties within the future planning areas

Table 2 presents an estimate of the reasonable costs associated with the required facilities to serve the future planning areas. The unit costs are based on costs for similar water facility projects and from standard construction cost estimating guides and cost curves**.**

8. Description of the basis upon which the total estimated cost of providing the additional and/or the modifications to previously proposed public facilities is allocated to properties within the future planning areas

The total projected potable water demands from the future planning areas were calculated using the factors set forth in Item 1 above, as well as the maximum day and peak hour peaking factors of 2.0 and 3.4, respectively.

Based on the above unit water demand and peaking factors and the total projected potable water demand from all the future planning areas as calculated, the required water facilities necessary to support these future planning areas (for conveyance, storage and treatment) were determined and associated costs to serve proposed development projects were identified.

9. Reference Documents

The documents used in the analysis include:

1. City of Tracy, Citywide Water System Master Plan. December, 2012.
2. Plan C Water System Analysis - Final Technical Memorandum. February 24, 1998.
3. Technical Memorandum “South ISP Water System Analysis.” October 13, 2008.
4. Technical Memorandum “Undeveloped Infill Properties.” October 2011.
5. Technical Memorandum “Ellis SP Water System Analysis.” November 2012.
6. Draft Technical Memorandum “Aquatic Center Facility Water Demand and Water System Infrastructure Analysis,” December 2010

10. Findings with respect to the Mitigation Fee Act

The future planning area development impact fee will provide for the funding of the proportionate share of the water supply requirements for the future planning areas in accordance with the requirements of the Mitigation Fee Act California Government Code sections 66000, et seq., also known as “AB 1600”. The recommended capital improvements are required to mitigate the water impacts of new development within the future planning areas consistent with the land use and water policies of the City’s General Plan and the Citywide Water System Master Plan. The fee is not imposed to improve or correct deficiencies in the City’s baseline (i.e., existing) service level. The fee is based on a water and fair-share cost analysis which: 1) determines capital improvements required to mitigate the water supply impacts from the buildout of the City’s General Plan, and 2) equitably distributes the costs of the improvements to the development areas that cause the impacts, per the provisions of the Mitigation Fee Act.

The Mitigation Fee Act requires impact fee programs to comply with the following basic requirements:

- Identification of the purpose of the fee;
- Identification of how the fee will be used;
- Determination of how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed;
- Determination of how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed; and
- Determination of how there is a reasonable relationship between the amount of the fee and the cost of the public facility (or portion of facility) attributable to new development.

The following findings address each of these five issues:

a. **Identification of the purpose of the fee.** The purpose of the proposed water impact fee is to provide a source of funding, based on the future planning areas' proportionate share of the overall project costs, to be used to construct water facilities that are required to provide water supply to the future planning areas. These proposed water facilities are more completely analyzed and presented in the Citywide Water System Master Plan and generally include upgrades to the City's water distribution system (as summarized in Table 2).

b. **Descriptions of how the fee will be used.** The fee will be used to plan, design and construct new or improved water facilities such as pipelines, storage tanks, and booster pump stations.

c. **Determination of how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.** The proposed impact fee will be used to construct water distribution facilities that are required to provide water service to the future planning areas. Construction of water facilities provides direct benefit to the proposed development projects. Therefore, there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.

d. **Determination of how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.** The use of a sophisticated and calibrated hydraulic water distribution system computer model, validated and adopted by the City, demonstrates the need for public facility improvements due to the proposed land uses on which the fee will be imposed. This analytical model was used to determine impacts to the City's existing potable water system and identify impacts to public facilities. Analysis included evaluation of treatment, transportation and storage requirements to deliver pressure and flow for average day, maximum day, fire demand, and peak hour demand conditions. Without the identified improvements, the existing potable water system is incapable of providing the City's minimum standard system pressure and flow to serve the future planning areas. This will not only affect the future planning areas, but also the City's

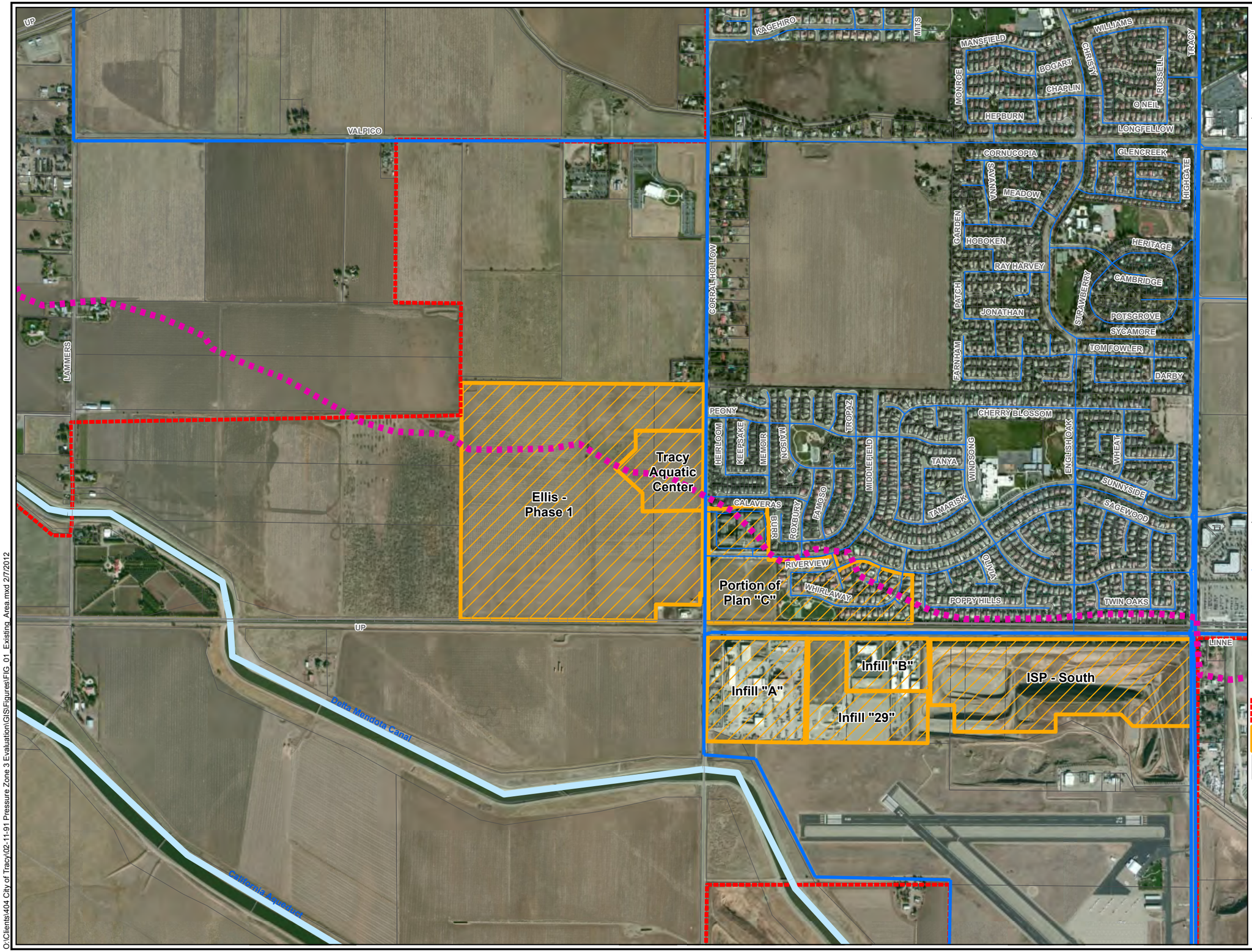
existing customers. Therefore, there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.

e. **Determination of how there is a reasonable relationship between the amount of fee and the cost of the public facility (or portion of the facility) attributable to new development.** The proposed water facilities will be constructed to meet the water demand generated from the future planning areas. The demand is calculated using a factor of one EDU for a single family detached residential unit (i.e., very low or low density residential). The estimated overall cost of the facilities is based on current conceptual engineering estimates which are based on similar facility types. The overall cost of the facilities is divided by the number of EDUs that will be connected to the system. Therefore, each residential unit or developed acre receives direct benefit and their cost will be proportional to the benefits received. Hence, there is a reasonable relationship between the amount of fee and the cost of the public facility (or portion of the facility) attributable to new development.

FIGURE 1

City of Tracy
Initial Pressure Zone 3
Water System Evaluation

INITIAL PRESSURE ZONE 3 AREA



0 500 1,000

Scale in Feet

NOTES

1. City limits and SOI files (citylimit.shp and SOI_revised_January_09.shp) provided by DCE on 11/05/09. SOI shape file was revised based on data received from the City on 08/03/10.
2. Project boundaries are approximate.

LEGEND

- Existing Pressure Zone Boundary
- Pipeline Diameter < 18-inches
- Pipeline Diameter ≥ 18-inches
- Railroad
- Highway
- Existing Street
- SOI
- Study Area
- Parcel

TRACY

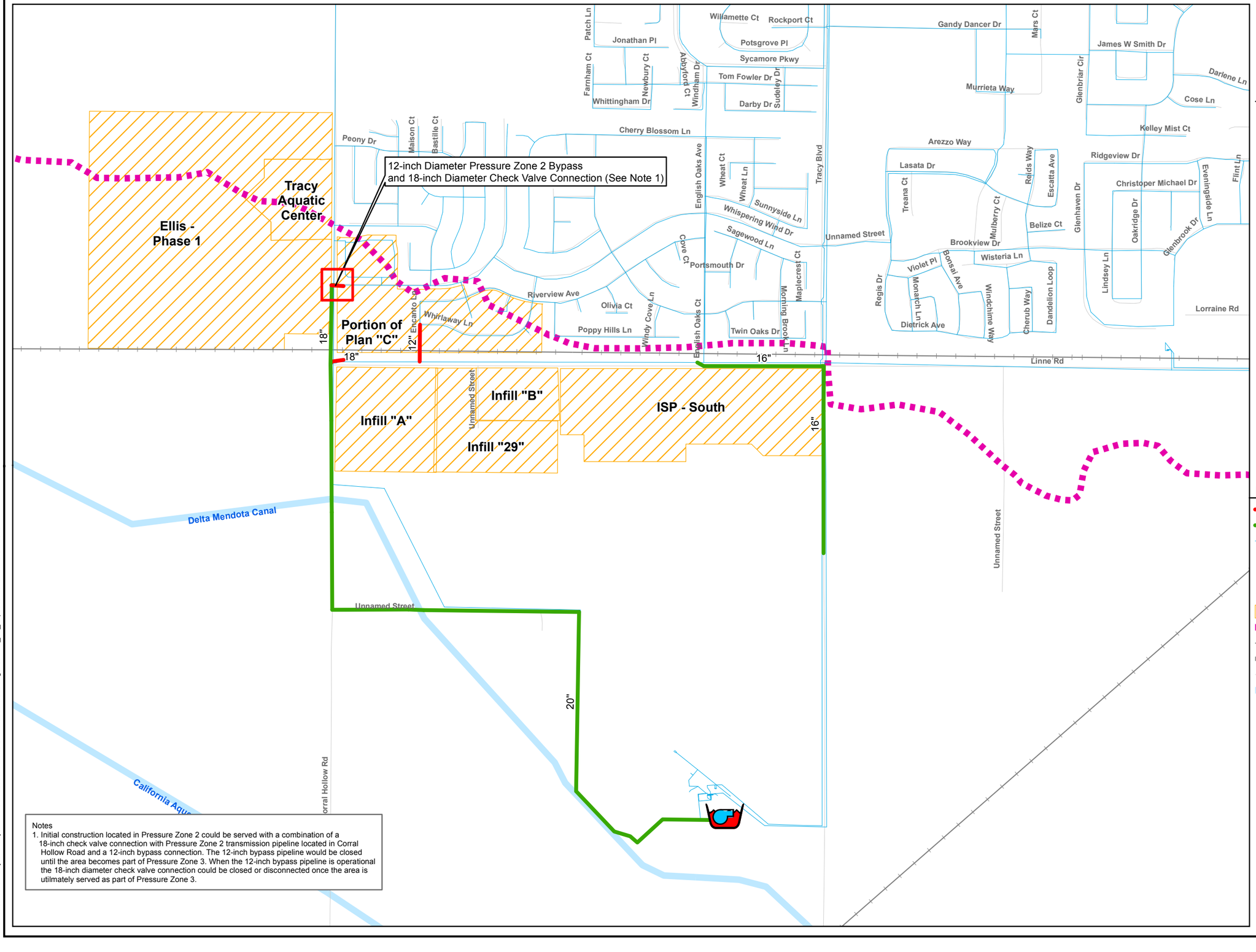
WEST YOST ASSOCIATES

O:\Clients\404 City of Tracy\02-11-91 Pressure Zone 3 Evaluation\GIS\Figures\FIG_01_Existing_Area.mxd 2/7/2012

FIGURE 2

City of Tracy
Initial Pressure Zone 3
Water System Evaluation

PROPOSED IMPROVEMENTS



NOTES

1. Project boundaries are approximate.

LEGEND

- Pipeline Recommended for Zone 3 Initial Area
- Pipeline Recommended in Citywide WMP
- Existing Pipeline
- Proposed 2.0 MG Clearwell
- Proposed Zone 3-City side BPS
- Initial Pressure Zone 3 Area
- Existing Pressure Zone Boundary
- Railroad
- Highway
- Streets
- Major Canals

N

0 500 1,000

Scale in Feet

Notes
1. Initial construction located in Pressure Zone 2 could be served with a combination of a 18-inch check valve connection with Pressure Zone 2 transmission pipeline located in Corral Hollow Road and a 12-inch bypass connection. The 12-inch bypass pipeline would be closed until the area becomes part of Pressure Zone 3. When the 12-inch bypass pipeline is operational the 18-inch diameter check valve connection could be closed or disconnected once the area is utilmately served as part of Pressure Zone 3.

TRACY

WEST YOST ASSOCIATES

O:\Clients\404 City of Tracy\02-11-91 Pressure Zone 3 Evaluation\GIS\Figures\FIG_02_Improvement.mxd 5/31/2013

Ellis Program Sub-Basin

FINAL STORM DRAINAGE TECHNICAL REPORT




City of Tracy

September 2012

Storm Water Consulting Inc.

Stantec

STORM DRAINAGE TECHNICAL REPORT

FOR THE

ELLIS PROGRAM SUB-BASIN

City of Tracy

Final Report
September 2012
SWC Project No. 2010-71

Resolution No. _____

Prepared by:

Storm Water Consulting Inc.

Stantec

City of Tracy
Storm Drainage Technical Report
Ellis Program Sub-Basin
Final Report
September 2012

TABLE OF CONTENTS

REPORT SECTIONS

LIST OF EXHIBITS

APPENDICES

1.0 Executive Summary

This technical report summarizes the results of a storm drainage analysis performed to determine the master plan drainage infrastructure needed to serve properties located within the Ellis Program Sub-basin. The boundary of the Ellis Program Sub-basin is shown on **Exhibit B1** and is generally bordered by Corral Hollow Road on the east, the Delta Mendota Canal (south of Linne Road) on the south, Lammers Road on the west and Valpico Road on the north. Properties included in the Ellis Program Sub-basin are the Ellis Specific Plan, the South Linne Planning Area, St. Bernard's Church, an LDS Church, and other undeveloped and developed parcels. These properties are all included in the Ellis Program Sub-basin as they are contiguous properties in the City's Sphere of Influence that are topographically connected from a storm drainage perspective.

The proposed master plan, or "program", storm drainage infrastructure that will serve the Ellis Program Sub-basin is shown on **Exhibit B1**. A Preliminary Opinion of Probable Cost for implementing the "program" storm drainage infrastructure plan is provided on **Exhibit B2**. "Program" storm drainage infrastructure has been sized for a 100-year 24-hour return period storm capacity.

Storm runoff generated by the development of properties located within the Ellis Program Sub-basin will discharge to existing downstream storm drainage facilities that were built previously by the City and others. These downstream facilities also have a 100-year 24-hour return period storm capacity, including excess capacity to accept attenuated storm runoff from the Ellis Program Sub-basin.

As a result of increased population, all new development in a community creates additional demands on public facilities provided by local government. If the supply or capacity of facilities is not increased to satisfy the additional demand, the quality of public services and infrastructure for the entire community will deteriorate. The purpose of this study is to analyze the impact of development of the Ellis Program Sub-basin on downstream storm drainage facilities in the City of Tracy to ensure that the City's established level of service is maintained and to calculate fair and equitable development impact fees based on that analysis.

This storm drainage technical report includes the derivation of storm drainage impact fees to fund Ellis Program Sub-basin "program" storm drainage infrastructure (**Exhibit B3**), Westside Storm Drainage Fees to utilize excess capacity in existing downstream storm drainage facilities (**Exhibit C4**), and findings with respect to the Mitigation Fee Act.

2.0 Introduction

This technical report summarizes the results of a storm drainage analysis performed to determine the master plan drainage infrastructure needed to serve properties located within the Ellis Program Sub-basin and to determine storm drainage impact fees and fees pertaining to the use of excess capacity in existing downstream storm drainage facilities. The boundary of the Ellis Program Sub-basin is shown on **Exhibit B1** and is generally bordered by Corral Hollow Road on the east, the Delta Mendota Canal (south of Linne Road) on the south, Lammers Road on the west and Valpico Road on the north. Properties included in the Ellis Program Sub-basin are the Ellis Specific Plan, the South Linne Planning Area, St. Bernard's Church, an LDS Church, and other undeveloped and developed parcels. These properties are all included in the Ellis Program Sub-basin as they are contiguous properties in the City's Sphere of Influence that are topographically connected from a storm drainage perspective.

There are several prior storm drainage analyses, studies and improvement projects that have evaluated storm drainage conditions and solutions that include components relevant to the Ellis Program Sub-basin. To the extent applicable, information contained in these prior storm drainage analyses, studies and improvement projects will be superseded by this technical report. The relevant prior studies are:

- Storm Drainage Master Plan; Cella Barr Associates, 1994.
- Citywide Storm Drainage Master Plan; Stantec Consulting Services Inc., March 2012 version.
- Plan "C" Storm Drainage Analysis, Final Report; Cella Barr Associates, April 29, 1998.
- Plan "C" Storm Drainage Analysis Update, Final Report; Stantec Consulting Inc., May 2000.
- Documents provided by The Surland Companies for the Ellis Program, including Project/Document Outline for Utilities, Master Layout (Illustrative Plan), topographic mapping, land use assumptions, boundary survey and soils reports.
- The current Ellis Specific Plan document and Chapter 3A.10 of the Draft EIR for the Ellis Specific Plan entitled Hydrology, Drainage, and Water Quality.
- Plans and project costs pertinent to downstream components of the CITY's Westside Channel system.
- Group 76 Drainage Improvement, Fund 322 project cost data provided by Harris & Associates.

Future land use assumptions for properties residing within the Ellis Program Sub-basin have formed the basis for determining rates and volumes of storm runoff production in this technical report and were provided by the City and by The Surland Companies. A listing of these properties along with their areas and proposed land uses is provided on **Exhibit A**. Assessor's Parcel Maps depicting the properties referenced on **Exhibit A** are provided in **Appendix A-2**.

The Ellis Program Sub-basin is located entirely within the City's Westside Channel Watershed as defined in the Citywide Storm Drainage Master Plan. It occupies the southernmost, upstream portion of the Westside Channel Watershed. Provision has been made in existing downstream storm drainage facilities to accept attenuated (metered) storm runoff from the Ellis Program Sub-basin. Applicable downstream storm drainage infrastructure that will collect and convey future storm runoff from the Ellis Program Sub-basin includes trunk line storm drains and open channels serving residential subdivisions to the north to DET 5 (Plasencia Field) and facilities downstream of DET 5 associated with the City's Westside Channel Outfall System.

This technical report recommends new storm drainage infrastructure (program infrastructure) that will be needed to serve the future buildout of the Ellis Program Sub-basin and provides a Preliminary Opinion of Probable Cost to construct the program infrastructure. The proposed program storm drainage infrastructure improvements needed to serve the Ellis Program Sub-basin are shown on **Exhibit B1**. A Preliminary Opinion of Probable Cost for said infrastructure is provided on **Exhibit B2**.

Also included herein are discussions and calculations for the following storm drainage fees that are proposed for adoption for the Ellis Program Sub-basin:

- Storm Drainage Impact Fees – to fund the program storm drainage infrastructure improvements that will serve the Ellis Program Sub-basin.

- Westside Storm Drainage Fees – to utilize excess capacity in existing downstream storm drainage facilities.

3.0 Existing City Facilities and Levels of Service

Existing City storm drainage facilities include open channels, underground storm drains, detention and retention basins, and pumping facilities. The following is a description of their general levels of service:

- Open channels and detention basins are intended to have a 100-year 24-hour return period storm design capacity under built out conditions for land development in conformance with the City's General Plan and supplemental land use assumptions currently being utilized by the City for infrastructure master planning purposes. Pumping facilities serving detention basins are sized to provide the desired function and attenuation during a 100-year 24-hour return period storm.

- Underground storm drains are intended to have either a 10-year or a 100-year 24-hour return period storm capacity depending upon their location, function and contributing watershed. Generally, the 100-year capacity standard is applied to trunk line storm drains, and the 10-year capacity standard is applied to lateral storm drains or storm drains serving internal areas of individual development projects.

- Some of the City's older, historical storm drains have a capacity that is limited to a 10-year 24-hour return period storm capacity or lower.

- Retention ponds are utilized as a temporary measure to control storm runoff until such time as sufficient downstream facilities are constructed to accommodate the desired flows. These temporary retention ponds are required to have a capacity equivalent to the runoff volume generated from 2 times a 10-year 48-hour storm per the City's Engineering Design and Construction Standards (City Standards).

The previous Storm Drainage Master Plan prepared for the City's Sphere of Influence that was completed in 1994 supported the above levels of service. The new Citywide Storm Drainage Master Plan supports the City's recently updated General Plan and reflects more current storm drainage conditions and requirements. The new Citywide Storm Drainage Master Plan also reaffirms the above stated levels of service.

4.0 Required Level of Service for Ellis Program Sub-basin Funded Storm Drainage Infrastructure

The underground storm drains and detention basins that are proposed as program improvements to serve development within the Ellis Program Sub-basin are considered to fall under the 100-year 24- hour return period storm level of service category, which is consistent with existing downstream storm drainage facilities and City policy.

Underground storm drains that are internal and will serve individual development areas are considered to be onsite facilities and shall have design capacities that are consistent with City Standards. These onsite facilities are not addressed in this Storm Drainage Technical Report.

The City also requires that new development projects include a provision for "emergency downstream release" of runoff to provide a factor of safety that accounts for the possible failure of storm drainage facilities or the occurrence of storms that exceed the design storm. This requirement needs to be addressed with individual development projects and is not included in the program drainage infrastructure presented herein.

Until such time as sufficient downstream storm drainage infrastructure serving the Ellis Program Sub-basin is funded and constructed, some individual developments may be required to construct temporary retention facilities in conformance with City Standards.

5.0 Hydrology

Methodology

The U.S. Army Corps of Engineers' HEC-HMS computer program was used to develop a rainfall/runoff computer simulation for the Westside Channel Watershed, including the Ellis Program Sub-basin. The Soil Conservation Service dimensionless unit hydrograph method, frequently used in practice, was used for the analysis. The HEC-HMS computer model develops a runoff hydrograph for individual sub-basins through the input of numerical representations of their physical and hydrologic characteristics. The computed hydrographs are then routed and/or combined with hydrographs from other sub-basins to yield a dynamic numerical analysis of peak discharges (design flows) and volumes that may be expected to occur at key locations. The model was run for the 100-year 24-hour storm event. The design flows and volumes were subsequently used for the sizing of program storm drainage facilities to serve the Ellis Program Sub-basin.

Sub-basin Delineation

The Ellis Program Sub-basin was further subdivided into four (4) internal sub-basins for hydrologic modeling purposes. These internal sub-basins are shown on **Exhibit B1** and are named Sub-basins W40, W41, W41A and W41B. Sub-basin W40 consists of the South Linne planning area to the south of the Ellis Specific Plan property. Sub-basin W41 consists of the Ellis Specific Plan property and a small existing telecommunications site. Sub-basin W41A consists of undeveloped land and a small residential parcel to the north of the Ellis Specific Plan property. Sub-basin W41B includes St. Bernard's Church (existing), an LDS Church (existing) and small contiguous parcels.

The existing church developments currently drain to temporary onsite retention ponds that provide terminal drainage on an interim basis.

Soil Group Classifications

Soil groups within the Westside Channel Watershed and the Ellis Program Sub-basin were initially determined using soil maps contained in a report entitled *Soil Survey for San Joaquin County, California* issued March 2006 by the Natural Resources Conservation Service (NRCS) - formerly the US Department of Agriculture Soil Conservation Service. Soil groups are classified as A, B, C, or D with Soil Group A having the highest rate of infiltration (lowest runoff production) and Soil Group D having the lowest rate of infiltration (highest runoff production). The NRCS data indicates that the western portions of the Ellis Program Sub-basin consist of Soil Group D soils, and the eastern portions of the sub-basin consist primarily of Soil Group B soils with a small area of Soil Group C soils. Site specific soils data was also provided by The Surland Companies for the properties residing in Sub-basins W41 and W41A. This soils

information was presented in four (4) separate soils reports prepared by Engeo Incorporated (Engeo), along with written opinions from Engeo that the underlying soils for these sub-basins consisted entirely of Soil Group B. Since the site specific soils information prepared by Engeo was based on more detailed evaluations and testing than the broader based soils information prepared by NRCS, Soil Group B was adopted and utilized in the hydrologic modeling of Sub-basins W41 and W41A.

Rainfall Loss and SCS Curve Numbers

Rainfall loss is that portion of the precipitation depth that is lost due to evaporation, interception by vegetation, infiltration into soil, and surface depression storage. Rainfall excess is that portion of the precipitation depth that appears as surface or collected storm runoff during and after a storm event. Rainfall loss consists of both initial and constant losses and was determined using the NRCS Curve Number (CN) Method that uses a soil cover complex for estimating watershed losses. The CN is related to the underlying hydrologic soil group (A, B, C, or D), land use, cover density, and soil moisture conditions. In addition to soil classification, the Curve Numbers are based on the vegetative cover. A vegetative cover classified as “good” with grass cover on at least 75% of the area was assumed.

Land Use Percent Impervious

Future land uses assumed for the Westside Channel Watershed, including the Ellis Program Sub-basin, were taken from the City’s General Plan update, with supplemental input and direction from City staff.

In the Ellis Program Sub-basin, the land use assumptions for the South Linne planning area (Sub-Basin W40) were taken from a land use table dated December 8, 2009 that the City previously provided for use in the preparation of recent infrastructure master plan updates. Land use assumptions and residential unit counts for the Ellis Specific Plan and APN’s 240-140-05 and 06 in Sub-basins W41 and W41A were provided by The Surland Companies. Existing church developments were assigned their existing land uses. The remaining undeveloped properties located within Sub-basins W41A and W41B were assigned a future land use of Residential – Low Density per input from City planning staff. These land uses and residential unit count assumptions are shown on **Exhibit A**.

The percent of impervious area assigned to each sub-basin was based on a weighted average of the amount and type of the different land uses within the sub-basin. This is an important input parameter in the HEC-HMS program because the model relates the amount of impervious area to the total area of a given sub-basin to estimate the amount of runoff losses attributed to pervious areas. For the purposes of hydrologic modeling, design flow determination, and the planning of storm drainage facilities, future build-out of the Sphere of Influence within the Westside Channel Watershed was assumed.

Based on the requirements of the City's Manual of Stormwater Quality Control Standards for New Development and Redevelopment (SWQC Manual) adopted by the City Council in August 2008, different land use percent impervious values were used for existing development than for future development. The Citywide Storm Drainage Master Plan includes an analysis of the impact of the use of sustainable infrastructure principles on storm runoff generation rates and volumes during a 100-year 24-hour storm that would result from implementing practices required per the SWQC Manual for new development. This resulted in a reduction in impervious cover percentages to be applied to new development areas in HEC-HMS modeling at a master plan level, including this storm drainage technical report. *The procedures for hydrology to be utilized for onsite storm drainage facilities are not impacted by this approach and procedures described per City Standards for said facilities shall be adhered to.*

Table 1, below, shows the impervious cover percentages of the different land uses that have been utilized in the HEC-HMS model provided herein.

Table 1 - Land Use Impervious Cover Values

Land Use Designation	**% Impervious *(Existing and Infill Development)****	**% Impervious *(New Development)****
Residential – Very Low Density	10	6
Residential - Low Density	25	16
Residential - Medium Density	35	22
Residential - High Density	65	41
Commercial A – Standard Uses	90	57
Commercial B – Gravel Surface	25	16
Office/Church	90	57
Industrial	90	57
Downtown	90	57
Village Center	90	57
Public Facilities	60	38
Park	10	6
Open Space	3	2

* Provisions from City's *Manual of Stormwater Quality Control Standards for New Development and Redevelopment* **NOT applied**

** Provisions from City's *Manual of Stormwater Quality Control Standards for New Development and Redevelopment* **applied**

As shown in Table 1, the Commercial land use category has been broken down into two (2) separate categories having different impervious cover percentages. This was done to more effectively represent the runoff production characteristics of a proposed 11-acre commercial storage site proposed within the Ellis Specific Plan area. The 11-acre commercial storage site will have a finished ground surface that will consist of loose gravel that will promote onsite retention of rainfall and reduce runoff that leaves the site.

New development areas within the Ellis Program Sub-basin were modeled using the reduced percent impervious values shown on Table 1. The existing churches were modeled utilizing a 90% impervious value assumption based on a review of aerial photographs. The future Swim Center within the Ellis Specific Plan area was modeled under the land use category of Public Facilities.

Rainfall

A 100-year 24-hour storm depth of precipitation of 2.69 inches was used in the HEC-HMS modeling in conformance with the new Citywide Storm Drainage Master Plan. The SCS 24 hour Type I rainfall distribution was used in the modeling of the Westside Channel Watershed, including the Ellis Program Sub-basin.

Unit Hydrograph

For runoff computations from each sub-basin, the NRCS Dimensionless Unit Hydrograph option was utilized in the HEC-HMS computer model.

Lag Time

The temporal distribution of the unit hydrograph is a function of the sub-basin lag time. The lag time is defined as a time required for 50 percent of the volume of runoff to reach the sub-basin outlet and was estimated utilizing the NRCS method. The equation is as follows:

$$Lag = (L)^{0.8}(S+1)^{0.7}/1900(Y)^{0.5}$$

L = hydraulic length of sub-basin in feet

S = potential maximum surface retention = (1000/CN) -10

CN = hydrologic curve number

Y = average watershed land slope in percent

Routing

Routing of runoff between sub-basins was performed utilizing the Muskingum-Cunge method. The Modified Puls Reservoir Routing method was used to route flow through existing and proposed detention basins.

Results

The HEC-HMS output files are included in **Appendix A-1**.

6.0 Hydraulics

The sizing of storm drains required to serve development within the Ellis Program Sub-basin was performed utilizing 100-year discharges derived from the HEC-HMS analysis and assumed full flow conditions for reinforced concrete pipe (RCP) having an average slope of 0.003 ft/ft. Under these assumptions, the following full flow capacities were estimated:

Storm Drain	**Capacity**
12” RCP	2 cfs
18” RCP	6 cfs
42” RCP	59 cfs

Routing of flows through the detention basins that are proposed to serve the Ellis Program Sub-basin (DET SL and DET 3A) was performed utilizing the reservoir routing options in the HEC-HMS model for the 100-year 24-hour return period storm.

7.0 Program Storm Drainage Infrastructure

Storm Drainage Infrastructure Plan for the Ellis Program Sub-basin

A schematic representation of the master plan (or "program") storm drainage facilities that will be required to serve the fully built out condition for the Ellis Program Sub-basin is depicted on **Exhibit B1**. The program facilities only include the backbone facilities needed to serve the Ellis Program Sub-basin. Other storm drains will be needed but are considered to be a part of required onsite improvements and costs attributable to new development.

As a part of formulating the master plan for program storm drainage facilities, capacity has been provided to allow future drainage connections for the existing church developments within Sub-basin W41B and the subsequent decommissioning of the existing temporary retention ponds that serve them.

The program storm drainage facilities proposed to serve the Ellis Program Sub-basin are:

- A detention basin (DET SL) within Sub-basin W40 (South Linne). This detention basin will provide sufficient storage to accept all future runoff from Sub-basin W40 and attenuate inflow to a metered outflow of 1 cfs. The 100-year peak storage volume for DET SL is 17 acre-feet (AC-FT). Outflow from DET SL will be discharged to onsite storm drains that will serve future internal development within the future Ellis Program Sub-basin development to the north.

- An assumed 12" SD gravity discharge pipe extending to the north from DET SL through the Ellis Specific Plan area and the Sub-basin W41A to Valpico Road. This assumed 12" SD will require a "jack and bore" crossing underneath the existing Western Pacific Railroad track on the north side of the alignment of Linne Road. A 12" SD is the size of storm drain required to convey the 1 cfs outflow from DET SL to Valpico Road and is being assumed as a program storm drainage element for impact fee analysis purposes. The actual size of the storm drain connection between DET SL and Valpico Road will vary, as capacity will be integrated into future onsite storm drainage facilities associated with new development. It is also assumed that the storm drain(s) will be aligned within future public streets.

- A 42" SD extending north from Valpico Road, west of Corral Hollow Road that will serve as the discharge pipeline for combined onsite runoff generated from the overall Ellis Program Sub-basin (Sub-basins W40, W41, W41A and W41B). This 42" SD will discharge to proposed detention basin DET 3A on the north side of Valpico Road (described below).

- A detention basin (DET 3A) to be located on the north side of Valpico Road that will store and attenuate runoff from the collective existing and future development within the Ellis Program Sub-basin. This detention basin will have sufficient storage to attenuate inflow to a metered outflow of 3 cfs. The 100-year peak storage volume for DET 3A is 36 AC-FT. Overexcavation will be required for DET 3A in order for upstream storm drainage connections to be made and to maintain a design 100-year water surface elevation that is low enough to avoid surcharging within future upstream connecting storm drains. This detention basin will also have opportunities to incorporate recreational elements as a joint-use for the completed facility. The proposed location for DET 3A has been changed from the location previously reflected in the 1994 Storm Drainage Master Plan for the City, but is reflected in the new Citywide Storm Drainage Master Plan. The new proposed location offers the following benefits when compared to the former proposed location (that abutted the south side of the Union Pacific Railroad track, north of the new proposed location): 1) Improved access, via direct frontage along Valpico Road (the prior proposed location was landlocked), 2) Less acreage due to more favorable topographic conditions, and 3) Greater potential community benefit with regard to joint-use opportunities.

- An 18" SD gravity discharge pipe extending to the north from DET 3A that will connect to an existing 30" SD stub that was previously provided within the Gabriel Estates subdivision (a Plan "C" Yellow Zone residential development) on the north side of the Union Pacific Railroad track. Acquisition of a 20' wide storm drain easement will be required. The 18" SD will need to cross underneath the West Side Irrigation District's (WSID's) Upper Main Canal and will require a "jack and bore" crossing underneath the Union Pacific Railroad track.

At buildout of the proposed storm drainage infrastructure serving the Ellis Program Sub-basin, the program storm drainage facilities will have a capacity to accommodate the 100-year 24-hour return period storm under fully developed conditions and the existing downstream storm drainage facilities will retain their 100-year 24-hour return period storm capacity.

Preliminary Opinion of Probable Cost

The Preliminary Opinion of Probable Cost for program storm drainage facilities that will serve the Ellis Program Sub-basin is provided on **Exhibit B2**, with a total estimated cost of **$6,034,500**.

The Preliminary Opinion of Probable Cost is considered to be an "order of magnitude" estimate that is acceptable for use in initial budgeting and for impact fee calculation purposes. Final project costs will be dependent on a number of factors at the time of bidding, including final design and project scope of work, labor and material costs, number of competing projects, allotted construction schedule, and time of year, among other things.

The Preliminary Opinion of Probable Cost has utilized the same unit costs and markups for construction items that are included in the new Citywide Storm Drainage Master Plan. The unit costs for storm drainage infrastructure elements represent installation costs under what would be considered "typical" site conditions.

The City provided the following unit costs for land acquisitions to utilize in this storm drainage technical report:

Drainage ROW Unit Cost = $100,000/acre

Drainage Easement Unit Cost = $50,000/acre

Soft cost mark-ups incorporated into the preparation of the Preliminary Opinion of Probable Cost account for costs and functions that support the actual construction process and for contingencies. The actual costs for each item in the following four main categories of soft cost mark-ups will vary according to many individual project factors (i.e., complexity of the project, existing site conditions, etc.) but, in general, they are supported historically as appropriate mark-up estimates for master planning purposes (standardized as a percentage relative to the estimated construction cost) and are included in the total estimated cost for identified program storm drainage infrastructure serving the Ellis Program Sub-basin.

General Contingency – Due to the fact that there are many unknowns related to a given project at the master planning level (i.e., site conditions, unforeseen constraints, details of design alternatives, construction schedule uncertainty, etc.), a 15 percent construction contingency is added to the construction cost estimate.

Design & Planning – These services typically include management of consultant agreements, preliminary site investigations, feasibility studies, plans and specifications, surveying and staking, and geotechnical reports. The cost of this work is estimated to be 10 percent of the estimated construction cost.

Construction Management – This primarily covers management of the construction contract, sampling and testing of materials, and site inspections during construction. This work is estimated to be 10 percent of the estimated construction cost.

Program Administration – Among other things, this category includes management and administrative costs, environmental review, permits, regulatory compliance, financing expenses, and legal review. This work is estimated to be 5 percent of the estimated construction cost.

Downstream Storm Drainage Facilities

The program storm drainage facilities that will serve the Ellis Program Sub-basin will connect to an existing 30" storm drain stub that was provided within the Gabriel Estates

subdivision to the north in anticipation of accepting attenuated storm drainage from future upstream development. This 30" storm drain stub discharges to larger trunk line storm drains and an existing open channel (C2 Channel) that ultimately drain to the City's existing DET 5 (Plasencia Field) to the north.

Previous master planning proposals included a need for a future interconnection to be made between the downstream storm drains and future DET 3B to the northwest of proposed DET3A (along the alignment of Schulte Road) whenever future development upstream of the Union Pacific Railroad (such as the Ellis Program Sub-basin) would become connected to the system. DET 3B was intended to provide additional storage and attenuation prior to discharge to DET 5 in order to maintain adequate system capacity. DET 3B would also store and attenuate additional runoff from specific future development areas to the west. Due to the extent of storage and attenuation afforded by proposed DET SL and DET 3A that will serve the Ellis Program Sub-basin, the interflow connection to future DET 3B will not longer be required.

DET 5 discharges to the Westside Channel Outfall System, which consists of a network of City storm drains, detention basins, and channel parkways that ultimately discharge to DET 10/11, a large terminal detention basin located on the west side of Naglee Road north of Tracy Auto Plaza. This system drains the entire Westside Channel Watershed, excepting a roughly 2-square mile area that drains to WSID's Main Drain open channel as facilitated by a drainage agreement between the City and WSID.

Phasing of Infrastructure

It is likely that construction of the program storm drainage infrastructure serving the Ellis Program Sub-basin will occur in phases. The construction of program storm drainage infrastructure elements will be influenced by the location and extent of new development, land acquisition opportunities, and available funding. The following are considerations that may be applied to the phasing of future construction of program storm drainage improvements:

- To the extent considered to be practical and allowed by the City, new development may utilize temporary retention ponds as an interim terminal drainage solution until such time as appropriate program storm drainage infrastructure elements may be constructed. The design requirements for these temporary retention ponds are set forth in current City Standards.

- Phased construction of DET SL and/or DET 3A may occur to serve interim stages of development within the Ellis Program Sub-basin. Phased versions of these program detention basins may be utilized as temporary retention ponds (with capacities set forth in City Standards), or if constructed in conjunction with the program outfall systems, they may be sized to accommodate the phased 100-year 24-hour storm inflow runoff expected from new development with an appropriate reduction for detention basin outflows.

- The City has indicated that they may be willing to allow percolation rates to be factored into the storage volume sizing requirements for the ultimate buildout of DET 3A if supported by data obtained for the initial phase of DET 3A construction via monitoring over a minimum period of 2 storm seasons. If a volume reduction is accepted by the City, it will only account for a portion of the assumed percolation rates given that there are inherent uncertainties associated with the long-term function and effectiveness of percolation facilities.

- Generally, when offsite right-of-way or drainage easements are needed, the City prefers that land acquisitions and easements be acquired for the ultimate system even if actual infrastructure construction is phased.

8.0 Storm Water Quality Provisions and Requirements

The City Council adopted a Manual of Stormwater Quality Control Standards for New Development and Redevelopment (SWQC Manual) in August 2008. The SWQC Manual has the following goals:

- Assist new development in reducing urban runoff pollution to prevent or minimize water quality impacts.

- Provide standards for developers, design engineers, agency engineers, and planners to use in the selection, design, and implementation of General Site Design Control Measures for Low Impact Design (LID) and appropriate site-specific source and treatment control measures.

- Provide maintenance procedures to ensure that the selected control measures will be maintained to provide effective, long-term pollution control.

LID is an approach to managing stormwater runoff that mimics the natural pre-development hydrology of the site by using design techniques that infiltrate, filter, store, treat, evaporate, and detain stormwater runoff close to the source. Almost all areas of site design can incorporate LID measures, including residential landscaping, open space, streetscapes, parking lots, sidewalks, and medians. LID can be used in combination with traditional storm drain systems to infiltrate the smaller, more frequent storms, while allowing the larger storms to flow to pipes and basins for flood control (possibly with lower offsite costs than traditional non-LID systems). LID techniques offer great benefits to stormwater quality, especially for the smaller return interval storm events. LID will help reduce the amount of runoff entering the City's system and will aid in recharging ground water.

The infrastructure identified in this storm drainage technical report assumes that LID practices will be implemented with new development within the Ellis Program Sub-basin in conformance with the SWQC Manual and that the rates and volumes of runoff will be reduced when compared against developed condition runoff production in the absence of said measures.

The Clean Water Act (CWA) was amended in 1972 to prohibit the discharge of pollutants to Waters of the United States from any point source unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Section 402(p) was added to the CWA in 1987 to establish the framework for regulating municipal and industrial stormwater discharges under the NPDES program through a two-phase implementation plan. Phase I regulations were promulgated in 1990 and require large and medium size municipalities (population over 100,000) to comply with the NPDES municipal program. Phase II regulations were promulgated in 1999 and require small municipalities obtain coverage under the NPDES municipal program. The

City of Tracy is subject to the Phase II municipal program and has prepared a Storm Water Management Program (SWMP) to comply with the regulations (General Permit Number CAS000004, Water Quality Order No. 2003-0005-DWQ).

The intent of the SWMP is to implement Best Management Practices to reduce the discharge of pollutants from the City to the Maximum Extent Practicable. The City's current SWMP, dated September 2003, includes six program categories:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post-Construction Storm Water Management in New Development and Redevelopment
- Pollution Prevention and Good Housekeeping for Municipal Operations

The State Water Resources Control Board (SWRCB) is in the process of creating a new Water Quality Order to replace Water Quality Order No. 2003-0005-DWQ. The new Water Quality Order will include additional requirements that Phase II municipalities will need to comply with.

One of the most cost effective methods to improve the quality of stormwater runoff is to utilize detention basins that provide attenuation storage and opportunities for pollutants to settle and be retained within these basins prior to the stormwater being discharged into receiving waters. Detention basins have been used as an acceptable BMP to help the City achieve improvements in stormwater quality. Allowing urban runoff to flow through grassy swales and turf areas also provides a filtering mechanism that serves to improve the quality of urban runoff.

On September 2, 2009, the State Water Resources Control Board (SWRCB) adopted a new Construction General Permit, or CGP (Order No. 2009-0009DWQ) that became effective and superseded the former CGP as of July 1, 2010. New development within the Ellis Program Sub-basin will need to comply with the provisions of this new CGP.

9.0 Storm Drainage Fees and AB 1600 Findings

Overview

In determining program storm drainage *impact fees*, percent impervious cover formed the basis for allocating funding responsibility to different land uses proposed with future development within the Ellis Program Sub-basin. Percent impervious values listed in Section 5.0 of this report were utilized in the impact fee analysis. Application of percent impervious values to the impact fee analysis provides for a consistent approach that may be applied to new development within the Ellis Program Sub-basin and storm drainage connections from the existing churches to program storm drainage facilities.

In determining the *Westside Storm Drainage Fees* that are required for new development within the Ellis Program Sub-basin to utilize excess capacity in existing downstream storm drainage facilities, runoff volume formed the basis for assessing the total fee and reimbursement responsibility. Use of the runoff volume approach allows the effects of flow attenuation within the Ellis Program Sub-basin to be factored into consideration of the degree of fee and reimbursement responsibility that is warranted and appropriate. Once the total level of Westside Storm Drainage Fee responsibility was determined for the Ellis Program Sub-basin on a runoff volume basis, percent impervious was then used to allocate the total fee responsibility among the different land use categories, consistent with the approach used in the impact fee analysis.

Impact Fees

The aggregate of new development within the Ellis Program Sub-basin (and existing churches that will utilize the program storm drainage infrastructure) will fund the program storm drainage infrastructure listed on the Preliminary Opinion of Probable Cost for the facilities (**Exhibit B2**).

In order to establish an equitable fee structure, total areas for each proposed land use category within the Ellis Program Sub-basin were weighted according to their runoff production using their assigned percent impervious values. The percent impervious approach assigns a lesser funding requirement on a per acre basis to a lower runoff producing land use (such as Residential Mixed Low, or RML) than the requirement that will be applied to a greater runoff producing land use (such as Industrial). The total funding responsibility for each land use category was then divided by the total acreage for the land use category to yield a funding responsibility value (or impact fee value) for the land use category on a per acre basis.

For residential land uses, the per acre impact fee amounts were divided by the proposed number of dwelling units for the land use category to yield values for impact fees per dwelling unit. For those properties not in the Ellis Specific Plan or APN's 240-140-05 and 06 and having a Residential-Low Density proposed land use that did not

have a specific number of proposed dwelling units assigned to them, an average development density of 4.0 du/acre was assumed.

Storm drainage impact fees to be applied to the different land use categories within the Ellis Program Sub-basin are derived and presented in the described manner on **Exhibit B3** of this report.

There is a proposed 16-acre school site located within the Ellis Specific Plan area (Sub-basin W41). The program storm drainage facilities that will serve the Ellis Program Sub-basin will have adequate capacity to accommodate storm runoff from this future school site. The school site is an "excluded" parcel with respect to the derivation of storm drainage impact fees, and a proportional fee allocation of roughly $200,000 attributable to the school site will be covered within the storm drainage impact fees that are charged to other development constituents.

Westside Storm Drainage Fees

The program storm drainage facilities that will serve new development within the Ellis Program Sub-basin will discharge to existing downstream trunk line storm drains and open channels within existing residential subdivisions draining to DET 5 and subsequently to existing flood control improvements associated with the City's Westside Channel Outfall System downstream of DET 5. In order to utilize excess capacity provided for in these downstream facilities, new development within the Ellis Program Sub-basin will be required to pay a Westside Storm Drainage Fee.

The Westside Storm Drainage Fee has been determined for the use of facilities draining to DET 5, for the use of facilities discharging downstream of DET 5, and for the composite of downstream storm drainage facilities. The fee derivation was based on determining the ratio of the runoff volume produced by new development in the Ellis Program Sub-basin to the total runoff volume produced by the sub-basins contributing to the C2 Channel that drains to DET 5 and to the overall Westside Channel Watershed and by subsequently applying these proportions to the total cost of the downstream facilities being utilized. The analysis was performed for the 100-year 24-hour storm, which is the capacity of the downstream facilities. Numerical information regarding runoff volumes was obtained from the HEC-HMS modeling of the Westside Channel Watershed performed for this storm drainage technical report, **Appendix A-1**.

Calculation of the Westside Storm Drainage Fees included the following steps:

1. *Runoff Volume Calculation* – Derived from the HEC-HMS model.

2. *Cost Estimate for Downstream Facilities to be Utilized* – Cost estimates were prepared for components of downstream storm drainage facilities draining to DET 5 and components of the Westside Channel Outfall System facilities downstream of DET 5 that will be utilized for conveyance and storage of Ellis

Program Sub-basin runoff. The cost estimate for the Westside Outfall System facilities included actual bid costs from the Westside Channel Outfall Project and unit costs and mark-ups that were being used by the City at or about the time frame for project construction. This cost estimate is included in this report as **Exhibit C1**, and derived a downstream facility total of $23,826,088. The cost estimate for the storm drainage facilities upstream of DET 5 utilized an extrapolation of Group 76 Drainage Improvements Fund 322 data and land acquisition unit costs and markups that were utilized in prior storm drainage analysis reports prepared for Plan "C". This cost estimate is included herein on **Exhibit C2**, and derived a downstream facility total of $1,074,714.

3. *Total Cost Obligation* – The proportion of the new development runoff volume for the Ellis Program Sub-basin to the Westside Channel Watershed runoff volume and the runoff volume contributing to the C2 Channel draining to DET 5 were determined and multiplied by the estimated cost of the applicable downstream facilities as shown on **Exhibit C3**. These calculations yielded a "gross" cost obligation for the use of facilities downstream of DET 5 and facilities upstream of DET 5. Based on the upstream orientation of the Ellis Program Sub-basin within the overall Westside Channel Watershed and the significant degree of flow attenuation that will be provided by DET SL and DET 3A prior to discharge of Ellis Program Sub-basin runoff to downstream facilities, a 50% reduction adjustment was made to determine the fair share "net" cost obligations for the Ellis Program Sub-basin per **Exhibit C3**.

4. *Westside Storm Drainage Fees* – **Exhibit C4** provides the derivation of Westside Storm Drainage Fees recommended to be assessed to the different land use categories within the Ellis Program Sub-basin. The derivation of these fees is based on the fair share "net" cost obligations derived on **Exhibit C3** and uses the same approach to weighting percent impervious for each of the land use areas as was performed in deriving the storm drainage impact fees.

Findings With Respect to the Mitigation Fee Act (AB 1600)

This section provides the nexus findings for establishing development impact fees for storm drainage pursuant to the *Mitigation Fee Act*, California Government Code sections 66000, et seq., AB 1600.

Description of assumptions and design criteria regarding existing level of service, including a description of the existing public facilities and the existing users

Existing condition storm drainage facilities within the City include open channels, underground storm drains, and detention and retention basins. Existing condition levels of service are a) 100-year design capacity for open channels and detention basins, b) 2 times the 10-year 48-hour storm runoff volume for temporary retention basins, and c) either a 10-year or a 100-year design capacity for underground storm drains, depending

upon whether or not they are an integral part of the City's drainage infrastructure or are considered to be lateral facilities. Some of the City's older, historical storm drainage facilities have a capacity that is less than the desired level of service and will eventually require upgrading via a source of funding other than Ellis Program Sub-basin impact fees and drainage fees.

Description of assumptions regarding the type of development planned for the Ellis Program Sub-basin

The Ellis Program Sub-basin consists of approximately 0.98 square miles of land bordered by Corral Hollow Road on the east, the Delta Mendota Canal (south of Linne Road) on the south, Lammers Road on the west and Valpico Road on the north. Proposed land uses include residential, commercial, industrial, public facilities, open space and existing churches. The land uses and acreages for future development properties are shown on **Exhibit A**.

Description of the impacts that new development within the Ellis Program Sub-basin will have on the level of service to existing City residents

New development within the Ellis Program Sub-basin will significantly increase runoff rates and volumes resulting from storm events when compared with existing agricultural, vacant, and lower density land use conditions due to the construction of more efficient storm drainage conveyance elements and the increase in impervious ground cover. These runoff increases will require the construction of new storm drainage facilities and flow attenuating BMPs serve the new development.

Also, the new storm drainage facilities that will serve new Ellis Program Sub-basin development will connect to existing downstream drainage facilities. Some excess capacity is available within these downstream facilities, and this excess capacity may be used by Ellis Program Sub-basin development. However, Ellis program Sub-basin storm drainage infrastructure will need to be planned, designed, and constructed in a manner such that the required capacity will continue to exist in the downstream facilities. This will be accomplished by providing stormwater detention within the Ellis Program Sub-basin and incorporating measures set forth per the City's SWQC Manual to attenuate runoff rates.

Ellis Program Sub-basin runoff will not be hydraulically connected with the City's older, historical storm drains and will have no impact on their level of service.

Description of the facilities required for the new development in the Ellis Program Sub-basin to meet the City's design criteria and level of service standards

New storm drainage facilities that will be needed to serve new development within the Ellis Program sub-basin will include underground storm drains and detention basins.

The "program" storm drains are considered to be integral components of the storm drainage infrastructure. New "program" storm drains and detention basins will have a 100-year 24-hour return period storm capacity, consistent with City policy for master plan storm drainage facilities. The required storm drainage facilities are shown on **Exhibit B1**. Also, the existing downstream storm drainage facilities will retain their capacity to accommodate the 100-year 24-hour return period storm discharge after the completion of the "program" storm drainage infrastructure improvements serving the Ellis Program Sub-basin.

Description of how new development within the Ellis Program Sub-basin will benefit from the new storm drainage facilities

The new storm drainage facilities will benefit new development in the Ellis Program Sub-basin by providing proper control and conveyance of runoff generated by the 100-year 24-hour return period storm.

Pursuant to Government Code section 66005(a), an estimate of the total cost for providing the required public facilities necessary to support the buildout condition for the Ellis Program Sub-basin

Exhibit B2 provides an opinion of probable cost for constructing the necessary program storm drainage improvements to serve Ellis Program Sub-basin. These are considered to be reasonable order of magnitude estimates of costs that will be incurred to construct the required improvements, and have been corroborated with actual bids and experiences on prior storm drainage improvement projects. The cost estimates assume full improvements for integral storm drainage facilities as well as provisions for design and planning, construction management, land acquisition, general contingency, and program administration. The costs do not account for or include the following elements:

- Storm drainage facilities that are internally needed to serve individual developments (onsite facilities).
- Lateral storm drainage facilities that are components of street drainage, but are not considered an integral component of the City's storm drainage infrastructure.
- Temporary retention basins

Description of the basis, or bases, upon which the total estimated cost of providing the required storm drainage facilities will be allocated

The total estimated cost of providing the required storm drainage facilities to serve new development within the Ellis Program Sub-basin will be allocated to new development based on a proportional fair share analysis that utilizes a "percent impervious" approach

as described in this technical report. The Westside Storm Drainage Fee required for new development in the Ellis Program Sub-basin to utilize excess capacity in existing downstream storm drainage facilities has been based on a "proportional runoff volume" assessment, and then allocated to Ellis Program Sub-basin properties utilizing the "percent impervious" approach.

The Storm Drainage Impact Fees to fund new storm drainage infrastructure to serve the Ellis Program Sub-basin are derived and represented on **Exhibit B3**. The Westside Storm Drainage Fees for new development within the Ellis Program Sub-basin to utilize excess capacity for runoff conveyance and storage in existing downstream storm drainage facilities are derived and represented on **Exhibit C4**.

Findings with Respect to the Mitigation Fee Act

This sub-section provides findings which comply with the requirements of California Government Code Section 66000, et seq. The capital improvements to be funded by storm drainage impact fees and the fees required to utilize excess capacity in existing downstream facilities are required to mitigate the storm drainage impacts of new development within the Ellis Program Sub-basin, consistent with the land use and storm drainage policies set forth by the City. The storm drainage impact fees are not being imposed to improve or correct deficiencies in existing condition service levels. The impact fees and drainage fees are based on a storm drainage and fair-share cost analysis which: 1) determines capital improvements required to mitigate the storm drainage impacts of the buildout of new development within the Ellis Program Sub-basin, 2) determines the fair share cost for new development in the Ellis Program Sub-basin to utilize excess capacity in the existing downstream storm drainage facilities, and 3) equitably distributes the costs of the improvements to the new development areas that cause the impacts, per the provisions of the *Mitigation Fee Act*.

The *Mitigation Fee Act* requires mitigation fee programs incorporate the following basic requirements and information relating to reasonable relationship:

- *Identification of the purpose of the fee.*
- *Identification of how the fee will be used.*
- *Determination of how there is a reasonable relationship between the fee's use and the type of development projects on which the fee is imposed.*
- *Determination of how there is a reasonable relationship between the need for the public storm drainage facilities and the type of development projects on which the fee is imposed.*
- *Determination of how there is a reasonable relationship between the amount of the fee and the cost of the public storm drainage facilities (or portion of facilities) attributable to new development.*

The following findings address these requirements on reasonable relationship:

1. Identify the purpose of the fee. The purpose of the fee is to provide a source of funding to be used to construct storm drainage facilities to serve new development within the Ellis Program Sub-basin and for new development within the Ellis Program Sub-basin to utilize excess capacity in existing downstream storm drainage facilities.
2. Identify how the fee will be used. The impact fees and drainage fees will be used to construct the needed program storm drainage facilities, including underground storm drains, detention basins, and appurtenant improvements and to utilize excess capacity in existing downstream storm drainage facilities.
3. Determine how there is a reasonable relationship between the fee's use and the type of development projects on which the fee is imposed. New development proposed within the Ellis Program Sub-basin will generate additional runoff during storm events. The quantities and rates of runoff generated from new development exceed the amounts of runoff generated under existing land uses and create a need for the utilization of program and downstream storm drainage facilities. The establishment of fees to fund storm drainage improvements required to serve and mitigate the impacts of new development and utilize excess capacity in existing downstream facilities is directly related to the type of new development anticipated based on relative rates and volumes of runoff production created by new development.
4. Determine how there is a reasonable relationship between the need for the public storm drainage facilities and the type of development on which the fee is imposed. Hydrologic and hydraulic technical evaluations have been performed to determine quantities and rates of runoff that will be generated by new development within the Ellis Program Sub-basin. Based on these evaluations, relevant storm drainage infrastructure improvements have been recommended to serve said new development and proportional fair share responsibility to utilize excess capacity in existing downstream facilities have been derived.
5. Determine how there is a reasonable relationship between the amount of the fee and the cost of the public storm drainage facilities (or portion of the facilities) attributable to new development. Estimated costs of storm drainage infrastructure improvements that are needed to serve new development have been prepared and are presented in this storm drainage technical report. These are considered to be reasonable order of magnitude estimates of costs that will be incurred to construct the required improvements, and have been corroborated with actual bids and experiences on prior storm drainage improvement projects and other storm drainage planning documents. The Storm Drainage Impact Fees and Westside Storm Drainage Fees allocate a proportionally fair share amount of the estimated storm drainage infrastructure costs and benefits to the various proposed land uses associated with new development.

EXHIBIT A
ELLIS PROGRAM SUB-BASIN - LISTING OF PROPERTIES AND FUTURE LAND USES
September, 2012

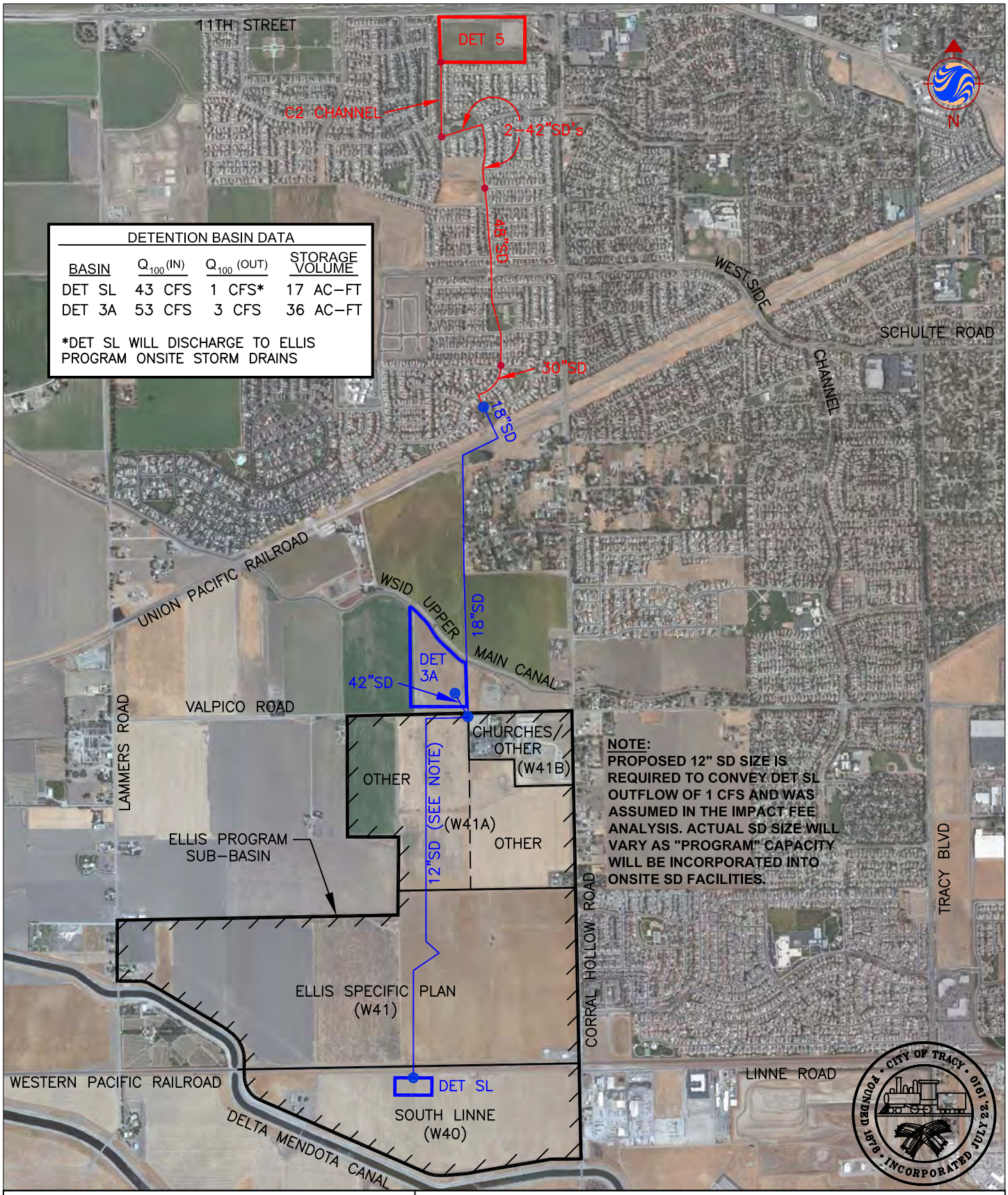
		RESIDENTIAL ACRES			***OTHER ACRES***				
Planning Area or APN ID	**Development Status**	**RML**	**RMM**	**RMH**	**Church**	**Commercial**	**Industrial**	**Public Facilities**	**Excluded**
Ellis Specific Plan Area	Proposed	120.7	111.6	5.2		35.0		16.0	32.5 (PF & OS)*
240-140-05 and 06	Proposed	19.8	70.3						3.9 (PF & OS)*
253-020-11, and 12 (South Linne)	Proposed						120.0		
240-140-07, 08, 10, 11 and 29	Proposed	66.6							
240-140-21 (Telecommunications)	Existing						2.0		
240-140-24 (St. Bernard's Church)	Existing				18.4				
240-140-28 (LDS Church)	Existing				5.6				
Totals		207.1	181.9	5.2	24.0	35.0	122.0	16.0	36.4

Total Acreage = 627.6 Acres
Total Acreage Less Excluded = 591.2 Acres
Total Residential Units for Combined Ellis Specific Plan Area and APN's 240-140-05 and 06 = 2,250 units

* PF & OS = Public Facilities and Open Space

Residential Dwelling Units	Proposed	771**	1705***	40****

** 370 (Ellis Specific Plan) + 135 (APN's 240-140-05 and 06) + 266 (remaining 66.6 acres @ 4.0 du/acre, avg. density)
*** 1240 (Ellis Specific Plan) + 465 (APN's 240-140-05 and 06)
**** Units for HMR Ellis Specific Plan Area



LEGEND:

DET 3A	PROGRAM DETENTION BASIN
DET 5	EXISTING DETENTION BASIN
18"SD	PROGRAM STORM DRAIN
48"SD	EXISTING STORM DRAIN
(W41)	HEC - HMS SUB - BASIN NUMBER

PROGRAM STORM DRAINAGE INFRASTRUCTURE

EXHIBIT B1

ELLIS PROGRAM SUB-BASIN STORM DRAINAGE TECHNICAL REPORT

SCALE:	1"=2000'		DATE:	09/26/12	
SHT.	1	OF 1			
JOB NO:	2010-71; 184110003				

Storm Water Consulting Inc.

Stantec

V:\1841\active\184110003\drawing\ellis\drawing\Exhibit B1.dwg 9/27/12 8:40am dgonzalez

Exhibit B2

Preliminary Opinion of Probable Cost for Program Storm Drainage Infrastructure

ELLIS PROGRAM SUB-BASIN

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL COST
ELLIS PROGRAM SUB-BASIN				
Construction of Major Facilities				
DET 3A (36 AF, plus 36 AF add'l excavation)	72	AF	$ 10,000	$ 720,000
DET SL (17 AF, plus 8 AF add's excavation)	25	AF	$ 10,000	$ 250,000
Construction of Storm Drains				
12" SD	6,100	LF	$ 75	$ 457,500
12" SD (Bore & Jack)	100	LF	$ 500	$ 50,000
18" SD	4,200	LF	$ 100	$ 420,000
18" SD (Bore & Jack)	100	LF	$ 600	$ 60,000
42" SD	200	LF	$ 350	$ 70,000
Other Items				
Dewatering	1	LS	$ 200,000	$ 200,000
UPTC/WPRR Crossing Agreements	2	EA	$ 5,000	$ 10,000
WSID Crossing Agreement	1	EA	$ 5,000	$ 5,000
Subtotal of Construction				**$ 2,242,500**
Design & Planning @ 10% of Construction Subtotal				**$ 224,250**
Construction Management @ 10% of Construction Subtotal				**$ 224,250**
General Contingency @ 15% of Construction Subtotal				**$ 336,375**
Program Administration @ 5% of Construction Subtotal				**$ 112,125**
Land Acquisition				
DET 3A	20.0	AC	$ 100,000	$ 2,000,000
DET SL	8.0	AC	$ 100,000	$ 800,000
18" SD Easement	1.9	AC	$ 50,000	$ 95,000
Subtotal of Land Acquisition				**$ 2,895,000**
TOTAL ESTIMATED COST				**$ 6,034,500**

EXHIBIT B3
ELLIS PROGRAM SUB-BASIN
Program Storm Drainage Impact Fees

Area of Participating Properties in Ellis Program Sub-basin (acres)	Program Storm Drainage Infrastructure Cost	Land Use Category	Acreage by Land Use Category	Proportional Land Use Area	Percent Impervious	Proportional Funding Factor (Land Use % times % Impervious)	Proportional Funding Responsibility (Funding Factor % of Total)	Total Fee Responsibility	Impact Fee (Per Acre)	Dwelling Units (Residential)	Impact Fee (Per Dwelling Unit)
591.2	$ 6,034,500	Residential Mixed Low - RML	207.1	35.03%	16%	0.0560	17.63%	$ 1,063,918	$ 5,137	771	$ 1,380
		Residential Mixed Medium - RMM	181.9	30.77%	22%	0.0677	21.29%	$ 1,284,883	$ 7,064	1705	$ 754
		Residential Mixed High - RMH	5.2	0.88%	41%	0.0036	1.13%	$ 68,453	$ 13,164	40	$ 1,711
		Church	24.0	4.06%	90%	0.0365	11.49%	$ 693,525	$ 28,897		N/A
		Public Facilities (Swim Center)	16.0	2.71%	38%	0.0103	3.23%	$ 195,214	$ 12,201		N/A
		Commercial A - Standard Uses	24.0	4.06%	57%	0.0231	7.28%	$ 439,232	$ 18,301		N/A
		Commercial B - Gravel Surface	11.0	1.86%	16%	0.0030	0.94%	$ 56,509	$ 5,137		N/A
		Industrial	122.0	20.64%	57%	0.1176	37.00%	$ 2,232,764	$ 18,301		N/A
			591.2	100.00%		0.3179	100.00%	$ 6,034,500			

EXHIBIT C1

ELLIS PROGRAM SUB-BASIN - WESTSIDE STORM DRAINAGE FEE DATA

COST OF EXISTING DRAINAGE FACILITIES TO BE UTILIZED DOWNSTREAM OF DET 5

SEPTEMBER, 2012

Item	Quantity	Unit	Unit Cost	Total Cost
DET 5 to Old River (Total Cost)	1	LS	17,653,617	17,653,617
Less Proportional Construction Staking	1	LS	(20,000)	(20,000)
Less Proportional Chain Link Fence	1	LS	(20,000)	(20,000)
Less Proportional Earthwork for Channels	1	LS	(120,000)	(120,000)
Less Proportional Bike Path	1	LS	(125,000)	(125,000)
Less Proportional Cast in Place CBC	1	LS	(122,120)	(122,120)
Less 36" Concrete Storm Drain Pipe	1	LS	(274,498)	(274,498)
Less Proportional 42" Concrete SD Pipe	1	LS	(40,000)	(40,000)
Less Allan Block Walls	1	LS	(183,680)	(183,680)
Less Concrete Channel Linings	1	LS	(24,450)	(24,450)
Less Grouted Rock Riprap	1	LS	(194,740)	(194,740)
Less Irrigation Junction Box & Grate	1	LS	(7,800)	(7,800)
Less Trash Rack @ GLR	1	LS	(3,500)	(3,500)
Less Proportional Landscape Planting	1	LS	(380,000)	(380,000)
Less Proportional Irrigation/Maintenance	1	LS	(400,000)	(400,000)
Less Proportional Channel Furniture	1	LS	(35,000)	(35,000)
Less CO3 (Reimbursed by Chevron)	1	LS	(1,500,000)	(1,500,000)
Less CO5 (Utilities, Byron)	1	LS	(794,097)	(794,097)
Less CO11 (Lammers/Byron Traffic)	1	LS	(57,703)	(57,703)
Less CO13 & CO14 (Fill Dirt @ Future Parks)	1	LS	(49,500)	(49,500)
"Add Back" DET 5 Cost Elements	1	LS	331,391	331,391
Subtotal Construction				13,632,920
Design & Planning @10%				1,363,292
Program/Construction Management @ 10%				1,363,292
Land Acquisition				
C1(60) Channel	1.5	AC	60,000	90,000
Dobler (30' Wide R/W)	1	AC	125,000	125,000
Kuimelis/Robertson (30' Wide R/W)	2	AC	125,000	250,000
DET 11	55	AC	45,000	2,475,000
Program Implementation @ 5%				681,646
Contingency @ 15%				2,044,938
Amendment to Drainage Agreemt w/ WSID - 20 Years				1,800,000
TOTAL ESTIMATED COST				**23,826,088**

Note: Actual bid costs and original estimated unit costs provide basis for this estimate.

EXHIBIT C2
ELLIS PROGRAM SUB-BASIN - WESTSIDE STORM DRAINAGE FEE DATA

COST OF EXISTING DRAINAGE FACILITIES TO BE UTILIZED UPSTREAM OF DET 5
SEPTEMBER, 2012

Item	Quantity	Unit	Unit Cost	Total Cost
30" SD	1	LS	50,000	50,000
48" SD	1	LS	261,700	261,700
2-42" SDs	1	LS	180,070	180,070
C2 Channel Improvements	1	LS	111,260	111,260
DET 5 Modifications	1	LS	57,480	57,480
Subtotal Construction				660,510
Design & Planning @10%				66,051
Program/Construction Management @ 10%				66,051
Land Acquisition				
C2 Channel	1.2	AC	125,000	150,000
Program Implementation @ 5%				33,026
Contingency @ 15%				99,077
TOTAL ESTIMATED COST				**1,074,714**

Note: Costs were extrapolated from Group 76 Drainage Improvements Fund 322 data and prior Storm Drainage Analysis reports prepared for Plan C.

EXHIBIT C3
ELLIS PROGRAM SUB-BASIN
WESTSIDE STORM DRAINAGE FEE COST OBLIGATION
SEPTEMBER, 2012

Ellis Program Sub-basin Runoff Volume (acre-feet)	Westside Channel Watershed Runoff Volume (acre-feet)*	Percent Runoff Volume	Cost of Facilities Used D/S of DET 5	Gross Cost Obligation (Facilities D/S of DET 5)	Reduction for Runoff Attenuation**	Net Cost Obligation (Facilities D/S of DET 5)
56.07	416.53	13.46%	$23,826,088	$3,207,281	($1,603,640)	$ 1,603,640

Ellis Program Sub-basin Runoff Volume (acre-feet)	Runoff Volume at C2 Channel U/S of DET 5 (acre-feet)	Percent Runoff Volume	Cost of Facilities Used U/S of DET 5	Gross Cost Obligation (Facilities U/S of DET 5)	Reduction for Runoff Attenuation**	Net Cost Obligation (Facilities U/S of DET 5)
56.07	136.19	41.17%	$1,074,714	$442,464	($221,232)	$ 221,232

* Excluding 2-square mile area covered by drainage agreement with WSID and excluding I-205 Specific Plan.

** Based on upstream orientation within the watershed and the significant amount of flow attenuation provided by DET SL and DET 3A = 50% Reduction Factor

Note: Runoff Volumes are for 100-year 24-hour storm.

EXHIBIT C4
ELLIS PROGRAM SUB-BASIN
Westside Storm Drainage Fees

Area of Participating Properties In Ellis Program Sub-basin (acres)	Westside SD Cost Obligation (D/S of DET 5)	Land Use Category	Acreage by Land Use Category	Proportional Land Use Area	Percent Impervious	Proportional Funding Factor (Land Use % times % Impervious)	Proportional Funding Responsibility (Funding Factor % of Total)	Westside SD Fee Responsibility (D/S of DET 5)	Westside SD Fee (Per Acre) For Use of Facilities D/S of DET 5	Dwelling Units (Residential)	Westside SD Fee (Per Dwelling Unit) For Use of Facilities D/S of DET 5
591.2	$ 1,603,640	Residential Mixed Low - RML	207.1	35.03%	16%	0.0560	17.63%	$ 282,731	$ 1,365	771	$ 367
		Residential Mixed Medium - RMM	181.9	30.77%	22%	0.0677	21.29%	$ 341,452	$ 1,877	1705	$ 200
		Residential Mixed High - RMH	5.2	0.88%	41%	0.0036	1.13%	$ 18,191	$ 3,498	40	$ 455
		Church	24.0	4.06%	90%	0.0365	11.49%	$ 184,301	$ 7,679		N/A
		Public Facilities (Swim Center)	16.0	2.71%	38%	0.0103	3.23%	$ 51,877	$ 3,242		N/A
		Commercial A - Standard Uses	24.0	4.06%	57%	0.0231	7.28%	$ 116,724	$ 4,863		N/A
		Commercial B - Gravel Surface	11.0	1.86%	16%	0.0030	0.94%	$ 15,017	$ 1,365		N/A
		Industrial	122.0	20.64%	57%	0.1176	37.00%	$ 593,347	$ 4,863		N/A
			591.2	100.00%		0.3179	100.00%	$ 1,603,640			

Area of Participating Properties In Ellis Program Sub-basin (acres)	Westside SD Cost Obligation (U/S of DET 5)	Land Use Category	Acreage by Land Use Category	Proportional Land Use Area	Percent Impervious	Proportional Funding Factor (Land Use % times % Impervious)	Proportional Funding Responsibility (Funding Factor % of Total)	Westside SD Fee Responsibility (U/S of DET 5)	Westside SD Fee (Per Acre) For Use of Facilities U/S of DET 5	Dwelling Units (Residential)	Westside SD Fee (Per Dwelling Unit) For Use of Facilities U/S of DET 5
591.2	$ 221,232	Residential Mixed Low - RML	207.1	35.03%	16%	0.0560	17.63%	$ 39,005	$ 188	771	$ 51
		Residential Mixed Medium - RMM	181.9	30.77%	22%	0.0677	21.29%	$ 47,105	$ 259	1705	$ 28
		Residential Mixed High - RMH	5.2	0.88%	41%	0.0036	1.13%	$ 2,510	$ 483	40	$ 63
		Church	24.0	4.06%	90%	0.0365	11.49%	$ 25,425	$ 1,059		N/A
		Public Facilities (Swim Center)	16.0	2.71%	38%	0.0103	3.23%	$ 7,157	$ 447		N/A
		Commercial A - Standard Uses	24.0	4.06%	57%	0.0231	7.28%	$ 16,103	$ 671		N/A
		Commercial B - Gravel Surface	11.0	1.86%	16%	0.0030	0.94%	$ 2,072	$ 188		N/A
		Industrial	122.0	20.64%	57%	0.1176	37.00%	$ 81,856	$ 671		N/A
			591.2	100.00%		0.3179	100.00%	$ 221,232			

Area of Participating Properties In Ellis Program Sub-basin (acres)	Total Westside SD Cost Obligation	Land Use Category	Acreage by Land Use Category	Proportional Land Use Area	Percent Impervious	Proportional Funding Factor (Land Use % times % Impervious)	Proportional Funding Responsibility (Funding Factor % of Total)	Total Westside SD Fee Responsibility	Total Westside SD Fee (Per Acre)	Dwelling Units (Residential)	Total Westside SD Fee (Per Dwelling Unit)
591.2	$ 1,824,872	Residential Mixed Low - RML	207.1	35.03%	16%	0.0560	17.63%	$ 321,736	$ 1,554	771	$ 417
		Residential Mixed Medium - RMM	181.9	30.77%	22%	0.0677	21.29%	$ 388,557	$ 2,136	1705	$ 228
		Residential Mixed High - RMH	5.2	0.88%	41%	0.0036	1.13%	$ 20,701	$ 3,981	40	$ 518
		Church	24.0	4.06%	90%	0.0365	11.49%	$ 209,726	$ 8,739		N/A
		Public Facilities (Swim Center)	16.0	2.71%	38%	0.0103	3.23%	$ 59,034	$ 3,690		N/A
		Commercial A - Standard Uses	24.0	4.06%	57%	0.0231	7.28%	$ 132,827	$ 5,534		N/A
		Commercial B - Gravel Surface	11.0	1.86%	16%	0.0030	0.94%	$ 17,089	$ 1,554		N/A
		Industrial	122.0	20.64%	57%	0.1176	37.00%	$ 675,202	$ 5,534		N/A
			591.2	100.00%		0.3179	100.00%	$ 1,824,872			

APPENDIX A-1

HEC-HMS Hydrologic Model Data

Westside Watershed - 100-yr Peak Flows

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
W02	0.4975	42.87	12Apr2010, 13:28	32.63
RCP4	0.4975	42.87	12Apr2010, 13:32	32.63
W10	0.2163	44.45	12Apr2010, 11:20	17.7
RCP2	0.2163	44.37	12Apr2010, 11:28	17.7
W03	0.0243	6.6	12Apr2010, 11:00	2.27
RCP1	0.0243	6.59	12Apr2010, 11:08	2.27
COMB 1	0.2406	50.22	12Apr2010, 11:24	19.97
W09	0.209	62.41	12Apr2010, 11:20	24.49
COMB2	0.4496	112.5	12Apr2010, 11:20	44.45
W04	0.034	7.7	12Apr2010, 11:16	3.03
RCP3	0.034	7.7	12Apr2010, 11:24	3.03
COMB 3	0.4836	120.16	12Apr2010, 11:20	47.48
COMB 4	0.9811	137.05	12Apr2010, 11:24	80.11
DET2A	0.9811	5.29	13Apr2010, 03:52	19.45
CP1	0.9811	5.29	13Apr2010, 04:12	19.31
W01	0.2162	26.51	12Apr2010, 11:56	13.95
RCP5	0.2162	26.5	12Apr2010, 12:04	13.95
W08	0.1288	17.85	12Apr2010, 12:04	9.67
COMB 5	0.345	44.35	12Apr2010, 12:04	23.62
W05	0.0633	7.73	12Apr2010, 11:56	4.08
CP7	0.4083	52	12Apr2010, 12:04	27.7
W11	0.0812	23.98	12Apr2010, 10:56	7.63
W11A	0.0319	18.33	12Apr2010, 10:36	4.24
RR03	0.0319	18.23	12Apr2010, 10:40	4.24
Junction-1	0.1131	39.12	12Apr2010, 10:48	11.87
DET2B	0.5214	5	12Apr2010, 07:56	24.45
CP8	1.5025	10.29	13Apr2010, 04:12	43.76
RC1 1C	1.5025	10.29	13Apr2010, 04:40	43.29
W12	0.0362	6.22	12Apr2010, 11:24	2.62
CP5	1.5387	11.22	12Apr2010, 11:24	45.91
RCP6	1.5387	11.09	12Apr2010, 11:40	45.61
W21	0.2483	17.32	12Apr2010, 13:12	13.36
RPCP7	0.2483	17.32	12Apr2010, 13:20	13.36
W15	0.1238	9.72	12Apr2010, 12:36	6.66
W14	0.1224	8.84	12Apr2010, 12:20	5.81
Junction-2	0.4945	34.61	12Apr2010, 12:48	25.84
RCP8	0.4945	34.58	12Apr2010, 13:08	25.84
W16	0.1354	11.01	12Apr2010, 12:20	7.11
W17	0.1251	7.77	12Apr2010, 12:48	5.76
Junction-3	0.755	52.39	12Apr2010, 12:56	38.71
Reach-1	0.755	52.38	12Apr2010, 13:00	38.71
W18	0.0655	6.38	12Apr2010, 12:00	3.66
CP6	2.3592	66.48	12Apr2010, 12:52	87.98
RCP9	2.3592	66.43	12Apr2010, 13:04	87.7
W19	0.1877	10.93	12Apr2010, 13:28	9.05

Westside Watershed - 100-yr Peak Flows

W20	0.1292	15.39	12Apr2010, 12:08	8.68
CP9	2.6761	89.39	12Apr2010, 12:56	105.43
W23	0.2573	15.17	12Apr2010, 12:48	11.31
W22	0.2517	13.6	12Apr2010, 12:48	10.34
RPCP11	0.2517	13.6	12Apr2010, 12:56	10.34
CP11	0.509	28.74	12Apr2010, 12:52	21.65
RPCP9	0.509	28.73	12Apr2010, 13:00	21.65
Junction-5	3.1851	118.12	12Apr2010, 12:56	127.08
W25	0.0967	11.75	12Apr2010, 11:56	6.24
RCP12	0.0967	11.74	12Apr2010, 12:00	6.24
W26	0.0602	7.83	12Apr2010, 11:44	3.88
CP12	0.1569	19.43	12Apr2010, 11:52	10.12
Reach-2	0.1569	19.42	12Apr2010, 11:56	10.12
Junction-6	3.342	132.81	12Apr2010, 12:44	137.2
RCP13	3.342	132.76	12Apr2010, 12:52	137.08
W24	0.1291	14.06	12Apr2010, 11:56	7.88
CP13	3.4711	143.96	12Apr2010, 12:44	144.96
RCP17	3.4711	143.88	12Apr2010, 12:48	144.86
W27	0.1234	15.63	12Apr2010, 12:04	8.63
RCP14	0.1234	15.63	12Apr2010, 12:12	8.63
W28	0.0669	9.04	12Apr2010, 11:40	4.32
CP14	0.1903	23.73	12Apr2010, 11:56	12.95
RPCP15	0.1903	23.72	12Apr2010, 12:00	12.95
W29	0.0429	6.84	12Apr2010, 11:16	2.77
CP15	0.2332	28.63	12Apr2010, 11:52	15.72
RPCP16	0.2332	28.61	12Apr2010, 11:56	15.72
W29A	0.0166	5.36	12Apr2010, 10:52	1.58
C W29A	0.2498	30.69	12Apr2010, 11:48	17.29
RRW29A	0.2498	30.68	12Apr2010, 11:56	17.29
W30	0.0787	9.04	12Apr2010, 11:56	4.9
CP16	0.3285	39.72	12Apr2010, 11:56	22.19
RR W30	0.3285	39.69	12Apr2010, 12:00	22.19
W31	0.0342	5.08	12Apr2010, 11:08	2.03
CP17	0.3627	42.8	12Apr2010, 11:52	24.22
W34	0.1558	12.52	12Apr2010, 12:04	7.67
W33	0.0529	7.18	12Apr2010, 11:28	3.28
W47	0.042	7.73	12Apr2010, 11:00	2.71
RR W47	0.042	7.7	12Apr2010, 11:08	2.71
ADDW33	0.0949	14.41	12Apr2010, 11:16	5.99
RR W33	0.0949	14.39	12Apr2010, 11:40	5.98
W32	0.0916	15.02	12Apr2010, 11:04	5.67
RP17A	0.0916	15.01	12Apr2010, 11:12	5.67
Junction-7	4.1761	208.4	12Apr2010, 12:24	188.4
RCP18A	4.1761	208.22	12Apr2010, 12:32	188.24
W36	0.0459	3.89	12Apr2010, 11:40	2.13
CP18A	4.222	211.18	12Apr2010, 12:32	190.37
RCP18	4.222	211.06	12Apr2010, 12:36	190.28

W35	0.0792	10.1	12Apr2010, 11:52	5.4
CP18	4.3012	219.43	12Apr2010, 12:32	195.69
RCP19	4.3012	219.15	12Apr2010, 12:44	195.44
W38	0.0984	9.35	12Apr2010, 12:16	5.72
W37	0.0778	7.04	12Apr2010, 11:32	3.58
RPCP19	0.0778	7.04	12Apr2010, 11:36	3.58
CP19	0.1762	15.57	12Apr2010, 11:56	9.3
RCP20	0.1762	15.48	12Apr2010, 12:04	9.3
CP20	4.4774	232.87	12Apr2010, 12:44	204.73
Reach-6	4.4774	232.67	12Apr2010, 12:48	204.62
W41	0.502	37.09	12Apr2010, 12:20	24.41
W40	0.1875	42.67	12Apr2010, 11:28	18.14
DET SL	0.1875	1	12Apr2010, 11:32	4.56
RPCP21	0.1875	1	14Apr2010, 15:56	4.5
CP21	0.6895	38.09	12Apr2010, 12:20	28.91
RCP22	0.6895	38.06	12Apr2010, 12:36	28.89
W41A	0.243	11.51	12Apr2010, 12:20	8.35
W41B	0.045	20.57	12Apr2010, 10:40	5.17
CP22	0.9775	53.2	12Apr2010, 12:28	42.41
RRCP3A	0.9775	53.2	12Apr2010, 12:28	42.41
DET 3A	0.9775	2.63	13Apr2010, 04:20	10.26
RCP26	0.9775	2.63	13Apr2010, 04:40	10.17
W49	0.4703	33.31	12Apr2010, 14:00	28.31
CP26	1.4478	34.6	12Apr2010, 14:04	38.48
RCP27	1.4478	34.59	12Apr2010, 14:04	38.46
W51	0.0546	4.92	12Apr2010, 11:40	2.63
CPW51	1.5024	36.72	12Apr2010, 14:00	41.09
RR W51	1.5024	36.71	12Apr2010, 14:04	41.07
W52	0.1002	16.53	12Apr2010, 11:32	7.22
J1	1.6026	42.74	12Apr2010, 13:48	48.29
RRW52	1.6026	42.74	12Apr2010, 13:48	48.28
W50	0.1974	28.09	12Apr2010, 12:00	16.39
W80	0.0927	17.66	12Apr2010, 11:24	8.85
RR 06	0.0927	17.61	12Apr2010, 11:32	8.85
W81	0.0477	7.19	12Apr2010, 11:20	2.97
RR 08	0.0477	7.18	12Apr2010, 11:24	2.97
CP 3B	0.3378	50.62	12Apr2010, 11:40	28.21
DET 3B	0.3378	0.75	13Apr2010, 06:12	3.04
RCP28	0.3378	0.75	13Apr2010, 06:24	3.02
W54	0.0535	8.62	12Apr2010, 11:32	3.76
CP28	1.9939	46.49	12Apr2010, 13:40	55.06
RR W54	1.9939	46.49	12Apr2010, 13:40	55.03
W39	0.2435	26.65	12Apr2010, 12:20	16.36
RPCP20	0.2435	26.64	12Apr2010, 12:24	16.36
W53	0.1574	18.59	12Apr2010, 12:00	9.99
DET5	6.8722	196.3	12Apr2010, 15:44	285.32
RWCR11	6.8722	196.28	12Apr2010, 15:48	285.14

W55	0.0833	10.78	12Apr2010, 11:48	5.42
W56	0.04	17.9	12Apr2010, 10:52	5.33
RPCP29	0.04	17.88	12Apr2010, 10:56	5.33
CP29	6.9955	201.91	12Apr2010, 15:40	295.89
RCP29	6.9955	201.91	12Apr2010, 15:44	295.81
W57	0.1038	15.29	12Apr2010, 11:52	7.65
W54A	0.085	11.07	12Apr2010, 11:44	5.5
CPBYRN	0.085	11.06	12Apr2010, 11:52	5.5
Junction-10	7.1843	210.42	12Apr2010, 15:28	308.96
RR 01	7.1843	210.41	12Apr2010, 15:32	308.79
W84	0.2047	29.43	12Apr2010, 11:40	13.79
W82	0.0918	12.52	12Apr2010, 11:44	6.1
RR 02	0.0918	12.51	12Apr2010, 11:56	6.1
W83	0.0388	10.69	12Apr2010, 11:00	3.39
Reach-3	0.0388	10.68	12Apr2010, 11:04	3.39
COBFD	0.3353	48.25	12Apr2010, 11:40	23.28
DET CP	0.3353	8.54	12Apr2010, 14:44	8.38
RR 04	0.3353	8.54	12Apr2010, 14:56	8.38
W85	0.1066	16.67	12Apr2010, 11:52	8.08
COMB	0.4419	16.67	12Apr2010, 11:52	16.46
CPBERG	7.6262	224.46	12Apr2010, 15:20	325.25
CP15MD	7.6262	224.46	12Apr2010, 15:28	325.04
W86	0.2557	36.89	12Apr2010, 12:36	25.13
CW86	7.8819	244.4	12Apr2010, 14:56	350.18
RP16MD	7.8819	244.39	12Apr2010, 15:00	350.1
W94	0.1343	68.23	12Apr2010, 10:44	18.06
CP1WMD	8.0162	252.38	12Apr2010, 15:00	368.17
W87	0.0716	26.25	12Apr2010, 10:52	7.53
ADD10	8.0878	256.13	12Apr2010, 15:00	375.69
RRW87	8.0878	256.05	12Apr2010, 15:00	375.64
W88	0.1572	41.63	12Apr2010, 11:20	16.39
ADD11	8.245	265.3	12Apr2010, 15:00	392.03
RRW88	8.245	265.27	12Apr2010, 15:04	391.89
W89	0.2343	63.45	12Apr2010, 11:20	24.64
ADDALL	8.4793	321.09	12Apr2010, 11:32	416.53
W93	0.6116	187.93	12Apr2010, 11:20	74.39
W90	0.25	56.45	12Apr2010, 11:36	25.18
RRW90	0.25	56.42	12Apr2010, 11:44	25.18
Junction-8	0.25	56.42	12Apr2010, 11:44	25.18
Reach-7	0.25	56.39	12Apr2010, 11:52	25.18
Junction-4	0.8616	237.36	12Apr2010, 11:28	99.56
W92	0.1656	20.39	12Apr2010, 11:48	9.77
W91	0.0835	23.78	12Apr2010, 11:12	8.78
ADD 12	0.2491	41.16	12Apr2010, 11:28	18.55
DET 11	9.59	10	12Apr2010, 03:44	50.65
W65	0.1453	18.66	12Apr2010, 11:56	9.99
W66	0.1391	12.43	12Apr2010, 12:56	8.68

Westside Watershed - 100-yr Peak Flows

W64B	0.016	5.76	12Apr2010, 10:48	1.64
DET 65	0.3004	1	12Apr2010, 12:00	4.51
W64	0.0507	6.74	12Apr2010, 11:20	3.03
W64A	0.0384	12.64	12Apr2010, 11:00	4.04
DET V	0.0384	2	12Apr2010, 00:00	4.05
ADDW64	0.0891	8.74	12Apr2010, 11:20	7.08
RCP1MD	0.0891	8.74	12Apr2010, 11:24	7.1
CP1MD	0.3895	9.52	12Apr2010, 11:28	11.62
RCP2MD	0.3895	9.51	12Apr2010, 11:28	11.62
CP2MD	0.3895	9.51	12Apr2010, 11:28	11.62
DET C	0.3895	4.09	12Apr2010, 21:00	6.86
RCP3MD	0.3895	4.09	12Apr2010, 21:00	6.85
W67A	0.0235	7.39	12Apr2010, 10:52	2.2
RW67A	0.0235	7.36	12Apr2010, 10:56	2.2
W67	0.0139	8.08	12Apr2010, 10:36	1.84
CP3MD	0.4269	14.06	12Apr2010, 10:44	10.9
Reach-4	0.4269	14.02	12Apr2010, 10:48	10.88
W68	0.1715	33.35	12Apr2010, 11:36	14.68
RCP4MD	0.1715	33.34	12Apr2010, 11:40	14.68
W69	0.0886	17.63	12Apr2010, 11:28	7.27
W70	0.0391	8.05	12Apr2010, 11:36	3.56
CP4MD	0.7261	66.07	12Apr2010, 11:28	36.38
RCP5MD	0.7261	66.03	12Apr2010, 11:32	36.38
W71	0.0563	9.99	12Apr2010, 11:44	4.67
CP5MD	0.7824	75.74	12Apr2010, 11:32	41.05
RCP6MD	0.7824	75.68	12Apr2010, 11:36	41.04
W72	0.1073	17.86	12Apr2010, 11:36	7.92
CP6MD	0.8897	93.53	12Apr2010, 11:36	48.96
RCP7D	0.8897	93.51	12Apr2010, 11:36	48.96
W73	0.049	6.84	12Apr2010, 11:36	3.2
CP7MD	0.9387	100.35	12Apr2010, 11:36	52.15
RCP8MD	0.9387	100.22	12Apr2010, 11:36	52.14
W74	0.1336	29.29	12Apr2010, 11:44	13.51
CP8MD	1.0723	129.49	12Apr2010, 11:40	65.66
RCP9MD	1.0723	129.42	12Apr2010, 11:40	65.65
W68B	0.0916	16.22	12Apr2010, 11:52	8
W63	0.0265	14.09	12Apr2010, 10:44	3.56
W68A	0.0491	11.28	12Apr2010, 11:36	5.03
CW68A	0.1407	27.26	12Apr2010, 11:48	13.04
RRW68A	0.1407	27.24	12Apr2010, 11:48	13.04
W77	0.1044	29.81	12Apr2010, 11:12	10.89
CW77	0.2451	53.1	12Apr2010, 11:24	23.92
RRW77	0.2451	53.05	12Apr2010, 11:28	23.92
W76	0.0885	14.91	12Apr2010, 11:40	6.79
CP10MD	0.3336	67.53	12Apr2010, 11:28	30.71
Reach-5	0.3336	67.5	12Apr2010, 11:32	30.71
W78	0.1893	32.85	12Apr2010, 11:56	16.48

Westside Watershed - 100-yr Peak Flows

RR W78	0.1893	32.83	12Apr2010, 12:04	16.48
W75	0.1387	22.11	12Apr2010, 11:56	11.1
CP9MD	1.7339	248.57	12Apr2010, 11:44	123.95
RCP31	1.7339	248.51	12Apr2010, 11:44	123.94
W58	0.1195	19.34	12Apr2010, 11:40	8.96
RWCR13	0.1195	19.1	12Apr2010, 12:04	8.95
W59	0.0517	7.61	12Apr2010, 11:28	3.35
ADDW59	0.1712	25.39	12Apr2010, 11:56	12.3
RR W59	0.1712	25.17	12Apr2010, 12:12	12.3
W60	0.0737	16.47	12Apr2010, 11:24	6.63
W61	0.0731	14.07	12Apr2010, 11:40	6.29
CP31	0.318	50.85	12Apr2010, 11:52	25.22
CP31MD	2.0519	298.81	12Apr2010, 11:44	149.16
RP11MD	2.0519	298.71	12Apr2010, 11:48	149.15
W79	0.0595	22.27	12Apr2010, 11:00	7.16
CP11MD	2.1379	315.42	12Apr2010, 11:44	159.88
RP1WMD	2.1379	315.16	12Apr2010, 11:48	159.85
DIV2	2.1379	170.16	12Apr2010, 11:48	23.73
W43	0.761	39.73	12Apr2010, 13:56	32.41
OUT2	0.761	39.73	12Apr2010, 13:56	32.41
W46	0.1813	12.12	12Apr2010, 12:28	7.68
OUT4	0.1813	12.12	12Apr2010, 12:28	7.68
W45	0.0585	8.97	12Apr2010, 11:16	3.34
OUT1	0.0585	8.97	12Apr2010, 11:16	3.34
W44	0.0509	7.97	12Apr2010, 11:12	2.91
OUT3	0.0509	7.97	12Apr2010, 11:12	2.91

Project: tracy_westside

Simulation Run: 100-yr 24-hr Reservoir: DET SL

Start of Run:	12Apr2010, 00:00	Basin Model:	Basin 1
End of Run:	14Apr2010, 15:56	Meteorologic Model:	Met 1
Compute Time:	06Oct2010, 15:43:42	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	42.67 (CFS)	Date/Time of Peak Inflow :	12Apr2010, 11:28
Peak Outflow :	1.00 (CFS)	Date/Time of Peak Outflow :	12Apr2010, 11:32
Total Inflow :	18.14 (AC-FT)	Peak Storage :	16.64 (AC-FT)
Total Outflow :	4.56 (AC-FT)	Peak Elevation :	112.63 (FT)

Project: tracy_westside

Simulation Run: 100-yr 24-hr Reservoir: DET 3A

Start of Run:	12Apr2010, 00:00	Basin Model:	Basin 1
End of Run:	14Apr2010, 15:56	Meteorologic Model:	Met 1
Compute Time:	06Oct2010, 15:43:42	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	53.20 (CFS)	Date/Time of Peak Inflow :	12Apr2010, 12:28
Peak Outflow :	2.63 (CFS)	Date/Time of Peak Outflow :	13Apr2010, 04:20
Total Inflow :	42.41 (AC-FT)	Peak Storage :	36.35 (AC-FT)
Total Outflow :	10.26 (AC-FT)	Peak Elevation :	99.63 (FT)

APPENDIX A-2

Assessor’s Parcel Maps

SEC. 6 T.3S. R.5E., M.D.B.&M.

THIS MAP IS FOR ASSESSMENT USE ONLY

240–14

1" = 600'

VALPICO ROAD

LAMMERS ROAD

CORRAL HOLLOW ROAD

UNION PACIFIC RAILROAD

Bk. 209

Bk. 244

Bk. 253

01

1 — 56.55 ACS.

2 — 60.72 ACS.

3 — 21.03 ACS.

4 — 401.00' 396.00' 396.00' 165' 165'

5 — 29.82 ACS.

6 — 64.58 ACS.

7 — 326.70' 209'

8 — 326.70' 625.26' 209'

10 — 40.00 ACS.–NET

11 — 2.00 ACS.–NET

14 — 56.55 ACS.

15 — 56.83 ACS.

16 — 56.27 ACS.

18 — 57.64 ACS.

21 — 475.00' 488.00' 488.00' 174.00' 174.00'

22 — 46.57 ACS.–NET

23 — 10.00 ACS.–NET

24 — 18.44 ACS. NET

26 — 280' 280' 155.57' 155.57'

27 — 21.75 ACS.–NET

28 — 5.62 ACS.–NET

29 — 20.08 ACS.–NET

30 — 22.48 ACS.–NET

31 — 128.90 ACS.

3.00 ACS.–NET

A – P. M. Bk. 06 Pg. 184
B – P. M. Bk. 06 Pg. 193
C – P. M. Bk. 15 Pg. 039
D – P. M. Bk. 15 Pg. 168
E – P. M. Bk. 18 Pg. 167
F – P. M. Bk. 21 Pg. 104
G – P. M. Bk. 25 Pg. 033

△ – WILLIAMSON ACT PARCELS

HIGHEST A.P.N. USED			
YEAR	PAR. #	PAR. #	PAR. #
89–90	19		
90–91	21		
93–94	23		
97–98	25		
98–99	27		
00–01	29		
09–10	31		

2274–39–4 PAR.1
MCI TELECOMMUNICATIONS
(LEASED)

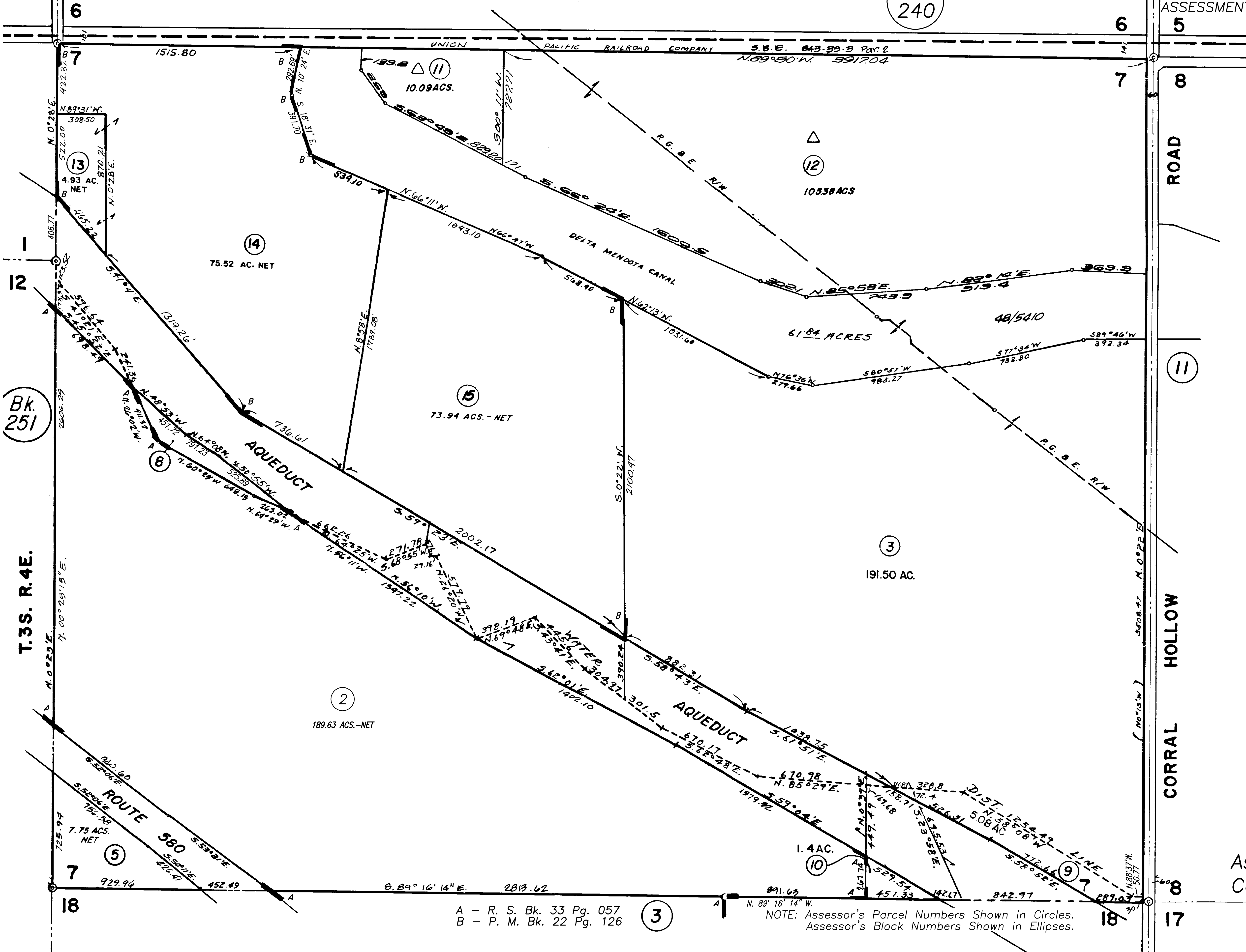
NOTE: Assessor's Parcel Numbers Shown in Circles.
Assessor's Block Numbers Shown in Ellipses.

Assessor's Map Bk.240 Pg.14
County of San Joaquin, Calif.

SEC. 7 T.3S.R.5E. M.D.B.&M.

THIS MAP IS FOR ASSESSMENT USE ONLY

253-02



△ – WILLIAMSON ACT PARCELS

HIGHEST A.P.N. USED			
YEAR	PAR. #	PAR. #	PAR. #
80–81	12		
03–04	15		

A – R. S. Bk. 33 Pg. 057
B – P. M. Bk. 22 Pg. 126

NOTE: Assessor's Parcel Numbers Shown in Circles.
Assessor's Block Numbers Shown in Ellipses.

Assessor's Map Bk.253 Pg.02
County of San Joaquin, Calif.

ELLIS PROGRAM SUB-BASIN
FINAL STORM DRAINAGE TECHNICAL REPORT

Storm Water Consulting Inc.
1899 Sapphire Way
El Dorado Hills CA 95762
Ph: (916) 801-3962

Stantec Consulting Services Inc.
3875 Atherton Road
Rocklin CA 95765
Ph: (916) 773-8100

City of Tracy

Ellis Program Area Parks Study

Think Inside the Triangle™

December 2012

Prepared by:

Harris & Associates℠

Shaping the future, One project at a time℠

Ellis Program

Parks Impact Fee Study

December 2012

I. Introduction

As a result of increased population, all new development in a community creates additional demands on public facilities provided by local government. If the supply of facilities is not increased to satisfy the additional demand, the quality of public services for the entire community will deteriorate. The purpose of this study is to analyze the impact of the Ellis Program on parks and recreation facilities in the City of Tracy, to ensure that the City's established level of service is maintained, and to calculate fair and equitable development impact fees based on that analysis.

The Ellis Program currently contains a 321 acre parcel located between Lammers Road and Corral Hollow Road along the north side of the Union Pacific rail line. The Ellis Program area consists of 505 residential mixed low density, 1705 residential mixed medium density, and 40 residential mixed high density units.

The Ellis Program park acreage includes multi-purpose paths and trails that are eight feet or wider and connect to the City path, trail or bikeway system and may be eligible for Neighborhood Park credits.

Surland's Consultant, Gates & Associates, provided cost estimates and facility plans for the Neighborhood Parks needed to serve the Ellis Program. These cost estimates have been reviewed by Harris & Associates and appear to be appropriate for the facilities required.

The City's Park Master Plan requires 3 acres of neighborhood park per 1000 people and 1 acre of community park per 1000 people. It is assumed that there are 3.3 people per residential mixed low density unit, 2.7 people per residential mixed medium density unit, and 2.2 people per residential mixed high density unit. Based on these requirements, a total of 19.1 acres of neighborhood parks are required to be built by the Ellis Program. In addition, the Ellis Program is responsible for funding 6.4 acres of community park.

The Ellis program will pay a community park fee towards the community park requirement, unless the city accepts the Ellis Program contribution towards the swim center, then the contribution will be in lieu of any community park fee requirements, and the Ellis Program's community park obligation will be met for the Ellis Program's 2250 allowed dwelling units.

The acreage requirements are summarized below:

Required Acreage Calculation

Landuse	No. Units	People/Unit	Total Population	Total Required Acreage (Neighborhood)	Total Required Acreage (Community)
RML	505	3.3	1666.5	5.0	1.7
RMM	1705	2.7	4603.5	13.8	4.6
RMH	40	2.2	88	0.3	0.1
Total	2250	8.2	6358	19.1	6.4

II. Neighborhood Parks

Construction of the parks will be in accordance with Section 4.6 and 5.2 of the Ellis Specific Plan.

The amenities required to serve the projected populations of the Ellis Program are shown in the table below. The table also shows the facilities that are planned to be built as part of the Ellis Program. These planned facilities are then used to determine the cost estimates for the parks in the Ellis Program.

Amenity Requirements - Neighborhood Parks

Amenity	Required	Planned
1 full play area per 3,000 (includes 2-5 AND 5-12)	2.1	4
1 small play or play element per 2,000	3.2	2
1 water play element per 2,500	2.5	2
1 basketball per 3,500 (half basketball permitted)	1.8	2
1 tennis per 5,000	1.3	2
1 multi-purpose (bantam soccer) field (minimum 160'x190') per 2,500	2.5	4
1 large picnic area (4 tables) per 1,500	4.2	6
1 small picnic area (2 tables) per 2,500	2.5	4

Based on the cost estimates provided by Gates & Associates, the following table summarizes the park program costs associated with the Neighborhood Parks for the Ellis Program. The detailed cost estimates are included in Appendix A to this report. A 40% mark-up has been added to account for design (10%), construction management (10%), program management (5%) and contingency (15%). In addition, the cost of the land has been estimated at $100,000 per acre.

Total Park Program Costs - Neighborhood Parks				
Basic Improvements	**Quantity**	**Units**	**Cost**	**Total**
Base Park Acre	19.07	AC	$ 235,092	$ 4,484,145
Amenities	0	0	$ -	$ -
Basketball	2	EA	$ 47,201	$ 94,402
Play Area (full)	4	EA	$ 256,839	$ 1,027,356
Play Area (small)	2	EA	$ 86,653	$ 173,306
Play Element	2	EA	$ 43,566	$ 87,132
Water Play Element	2	EA	$ 19,800	$ 39,600
Bocce	2	EA	$ 33,352	$ 66,704
Picnic Small	4	EA	$ 11,858	$ 47,432
Picnic Large	6	EA	$ 20,614	$ 123,684
Shade Structure	6	ALLOW	$ 75,000	$ 450,000
Tennis	2	EA	$ 74,718	$ 149,436
Soccer/T-ball Multi-use Field	4	EA	$ 8,382	$ 33,528
Open Green/Volleyball/Badminton	7	Included in base	$ -	$ -
Skate Spot	2	EA	$ 24,500	$ 49,000
Dog Park	2	EA	$ 39,754	$ 79,508
Drinking Fountain	6	EA	$ 6,000	$ 36,000
Fountain/Gazebo	2	ALLOW	$ 30,000	$ 60,000
Information Kiosk	2	EA	$ 10,000	$ 20,000
Focal Element (allowance)	6	ALLOW	$ 20,000	$ 120,000
Ornamental Garden	4	ALLOW	$ 23,705	$ 94,820
Park Sign Large	6	ALLOW	$ 10,000	$ 60,000
Park Sign Small	6	ALLOW	$ 5,000	$ 30,000
Total Program Cost			**$ -**	**$ 7,326,053**
Mark-up for Soft Costs (40%)			**$ -**	**$ 2,930,421**
Land Acquisition	**19.07**	**AC**	**$ 100,000**	**$ 1,907,400**
Total Cost			**$ -**	**$ 12,163,874**

The total cost of the program is divided by the estimated number of people generated by the Ellis Program to determine a cost per capita. This cost is then converted into a fee per unit for residential mixed low density, residential mixed medium density and residential mixed high density based on the assumed number of people per unit for each use. The cost per capita as well as the fees are summarized in the following table:

Neighborhood Park Fee Calculation

Total Cost	$ 12,163,874
Overall per-acre cost	$ 637,720
Per Capita Cost	$ 1,913
RML Fee	$ 6,313
RMM Fee	$ 5,166
RMH Fee	$ 4,209

The developer will have the option of entering into an agreement with the City to design and construct the neighborhood parks in-lieu of paying fees (including, but not limited to, improvements, amenities, design, construction management, program management, and contingency mark-ups, and right of way acquisition/land cost).

III. Community Park

Based on the cost estimates provided by Gates & Associates, the following table summarizes the park program costs associated with the Community Park Fee for the Ellis Program. A 40% mark-up has been added to account for design (10%), construction management (10%), program management (5%) and contingency (15%). In addition, the cost of the land has been estimated at $100,000 per acre.

Community Parks

Amenity	Cost/ac
Land Acquisition	$ 100,000
Park Construction	$ 321,000
Mark-up for Soft Costs (40%)	$ 129,000
Total Cost per Acre	$ 550,000

The cost per capital is calculated by dividing the cost per acres by 1000, as one acre of community park is required per 1000 new residents. This cost is then converted into a fee per unit for residential mixed low density, residential mixed medium density and residential mixed high density based on the assumed number of people per unit for each use. The cost per capita as well as the fees are summarized in the following table:

Community Park Fee Calculation

Total Cost per Acre	$	550,000
Per Capita Cost	$	550
RML Fee	$	1,815
RMM Fee	$	1,485
RMH Fee	$	1,210

Should the Ellis program make the contribution towards the swim center, this will be in-lieu of paying the community park fee.

IV. Summary

The Ellis Program will be required to fund a total of 19.1 acres of neighborhood parks and 6.4 acres of community parks. This results in park fee as summarized below.

Total Fee

Landuse	Neighborhood Park	Community Park	Total
RML	$ 6,313	$ 1,815	$ 8,128
RMM	$ 5,166	$ 1,485	$ 6,651
RMH	$ 4,209	$ 1,210	$ 5,419

A summary of the total park costs that Ellis will fund are as follows:

Total Costs Paid By Ellis

Neighborhood Parks	$ 12,163,874
Community Parks	$ 3,496,900
Total	**$ 15,660,774**

The development of the parks and amenities described in this report will meet the Ellis Program park requirements and will be maintained by a Property Owners Association (POA) paid for by the residents of the Ellis Program. Park design and maintenance standards established by the POA will meet or exceed the City's current City Park Standards.

Appendix A

Ellis

Community Park Cost

Population

2,250 Units x 3.21 persons per unit = 7,223 population

Community Park Acreage Required

1 acre per 1,000 population

7,223/1,000=7.2 acres

City of Tracy Standard Community Park Costs

Land Acquisition: $100,000/acre

Park Development: $550,000/acre

Community Park Cost

7.2 acres x $650,000	$4,680,000

Ellis
Opinion of Probable Construction Costs

Basic Park Improvements (per acre)

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Project start-up (10%)				**21,371.98**
	Mobilization - 7%				
	Bonding - 1.5%				
	Temp Facilities/Construction Fencing - 1.5%				
B	**Demolition**				
1.	Clear & grub	43560	SF	$0.20	**8,712.00**
C	**Earthwork**				
1.	Fine Grading	43560	SF	$0.35	15,246.00
				Earthwork Subtotal	**15,246.00**
D	**Basic Improvements**				
1.	Concrete Walks	3500	SF	$8.00	28,000.00
2.	Lighting	1	allow	$5,000.00	5,000.00
	Pedestrian Fixtures				
3.	Benches (5')	2	EA	$1,400.00	2,800.00
4.	Trash Cans	1	EA	$1,200.00	1,200.00
5.	Bike Rack	1	EA	$1,000.00	1,000.00
				Basic Improvements Subtotal	**38,000.00**
G	**Planting**				
1.	Soil Prep.	40060	SF	$0.30	12,018.00
2.	Turf	39060	SF	$0.65	25,389.00
3.	Irrigation	40060	SF	$2.50	100,150.00
	3" Poc, 3" Backflow, Maxicom Contr,		LS		
	Valves, Rotors, 12" pop ups,		EA		
	Mainline, Lateral Line		LF		
4.	Trees	20	EA	$250.00	$5,000.00
5.	Enhanced Planting	1000	EA	$6.00	$6,000.00
5.	Plant Estab. Maintenance (90 day)	40060	SF	$0.08	$3,204.80
				Planting Subtotal	**151,761.80**
H	**Subtotal**				**213,719.80**
I	**Total**				**$235,092**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Basketball -Outdoor
1 court (sized for NCAA)

Item		Description	Quantity	Unit	Unit Cost	Subtotal
A		**General Requirements**				
	1.	Project start-up (10% of project cost				**$4,291.00**
B		**Demolition**				
	1.	Clear & grub	included in park site			
C		**Earthwork & Drainage**				
	1.	Drainage	included in park site			
	2.	Rough grading	included in park site			
	3.	Soil prep. & fine grading	included in park site			
F		**Basketball court**				
	1.	Basketball (double ac courts)	4200	SF	$6.50	$27,300
	2.	Basketball court surfacing	4200	SF	$2.50	$10,500
	3.	Basketball standards	2	EA	$1,800.00	$3,600
	4.	Benches	2	EA	$1,400.00	$2,800
	5.	Trash receptacles	1	EA	$1,200.00	$1,200
	6.	Misc Concrete and Seatwalls	1	LS	$10,000.00	$10,000
	6.	Bike Rack	2	EA	$1,000.00	$2,000
				Subtotal Baseketball Court		**$57,400**
G		**Subtotal**				**$57,400**
H		**Minus Base Planting Cost** Soil Prep, Turf, Irrig., Estab. Maint.	4200	SF	$3.45	**($14,490)**
I		**Subtotal**				**$42,910**
J		**Total**				**$47,201**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis

Opinion of Probable Construction Costs

Play Area - Full (2-5, 5-12)

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Project start-up	10% of project cost			**$23,349**
B	**Demolition**				
1.	Clear & grub	included in park site			
C	**Earthwork & Drainage**				
1.	Drainage	included in park site			
2.	Rough grading	included in park site			
3.	Soil prep. & finish grading	included in park site			
D	**2-5 play:**				
1.	Seating Elements	1	allow	$4,500.00	$4,500
2.	Rubber Surfacing	1800	SF	$15.00	$27,000
3.	Play structure (2-5 y.o.)	1	LS	$54,000.00	$54,000
4.	Sand	20	CY	$85.00	$1,700
5.	Concrete play area curb/ramp	250	LF	$22.00	$5,500
6.	Concrete access ramp	1	EA	$1,500.00	$1,500
7.	Misc Site Concrete	1	LS	$7,000.00	$7,000
8.	Tot swings	1	EA	$3,000.00	$3,000
9.	Trash Receptacle	1	EA	$1,200.00	$1,200
				Subtotal 2-5 Play	**$105,400**
E	**5-12 play:**				
1.	Seating Elements	1	allow	$4,500.00	$4,500
2.	Rubber Surfacing	2000	SF	$15.00	$30,000
3.	Play structure (5-12 y.o.)	1	LS	$68,000.00	$68,000
4.	Concrete play area curb/ramp	250	LF	$22.00	$5,500
5.	Misc Site Concrete	1	LS	$7,000.00	$7,000
6.	Trash Receptacle	1	EA	$1,200.00	$1,200
				Subtotal 5-12 Play	**$116,200**
F	**Shade Structure**				
1.	Shade Structure 25' x 25 similar to Capital Village Renaissance	1	EA	$25,000.00	**$25,000**
G	**Subtotal**				**$246,600**
H	**Minus Basic Planting Cost** Soil Prep, Turf, Irrigation, Maintenance	3,800	SF	$3.45	($13,110)
I	**Subtotal**				**$233,490**
J	**Total**				**$256,839**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis

Opinion of Probable Construction Costs

Play Area - Small

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Project start-up	10% of project cost			**$7,878**
B	**Demolition**				
1.	Clear & grub	included in park site			
C	**Earthwork & Drainage**				
1.	Drainage	included in park site			
2.	Rough grading	included in park site			
3.	Soil prep. & finish grading	included in park site			
D	**Site Construction**				
1.	Benches	2	EA	$1,400.00	$2,800
2.	Rubberized Surfacing	2200	SF	$15.00	$33,000
3.	Play structure	1	LS	$48,000.00	$48,000
4.	Misc Concrete Paving	300	SF	$8.00	$2,400
5.	Trash Receptacle	1	EA	$1,200.00	$1,200
			Subtotal Site Construction		**$87,400**
E	**Minus Basic Planting Cost**	2500	SF	$3.45	**($8,625)**
	Soil prep., turf, irrigation, maintenance				
F	**Subtotal**				**$78,775**
G	**Total**				**$86,653**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis

Opinion of Probable Construction Costs

Bocce Ball Courts

(1 court)

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
	1. Project start-up	10%			**$3,032**
B	**Earthwork & Drainage**				
	1. Drainage	1	LS	$2,500.00	**$2,500**
	2. Rough grading	included in park site			
	3. Soil prep. & fine grading	included in park site			
C	**Site Furnishings**				
	1. Benches	1	EA	$1,400.00	$1,400
	2. Shade structure*	1	EA	$15,000.00	$15,000
	3. Trash receptacles	1	EA	$1,200.00	$1,200
			Subtotal Site Furnishings		**$17,600**
D	**Bocce & Horseshoe Courts**				
	1. Header	420	LF	$20.00	$8,400
	2. Base Rock	1400	SF	$2.00	$2,800
	3. Finish surface (oyster shell)	1400	SF	$2.00	$2,800
	4. Top Dressing (Clay)	1400	SF	$0.75	$1,050
			Subtotal Bocce/Horseshoe		**$15,050**
E	**Subtotal**				**$35,150**
F	**Minus Base Planting Cost** Soil Prep, Turf, Irrigation, Maintenance	1400	SF	$3.45	**($4,830)**
G	**Subtotal**				**$30,320**
H	**Total**				**$33,352**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Drinking Fountain

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**Water**				
1.	Drinking Fountain	1	EA	$6,000.00	$6,000.00
B	**Total**				**$6,000.00**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis

Opinion of Probable Construction Costs

Decorative Fountain

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**Water**				
1.	Fountain -Decorative	1	ALLOW	$30,000.00	30,000.00
				Subtotal Water	**30,000.00**
B	**Total**				**30,000.00**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Soccer Field - Bantam - Small
(Bantam Small U9)

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Base project start-up	included in park site			**$762**
B.	**Site Preparation**				
1.	Base Construction fencing	Included in park site			$0
2.	Base Temp facilities	Included in park site			$0
C	**Demolition**				
1.	Base clear & grub	included in park site			$0
D	**Earthwork & Drainage**				
1.	Base rough grading	included in park site			$0
2.	Base soil prep.	included in park site			$0
3.	Base fine grading	included in park site			$0
F	**Soccer Fields (30yd x 50yd)**				
1.	Base turf sod	included in park site			$0
2.	Base 90 day turf establishment	included in park site			$0
3.	Add for Soccer				
	3a. 90 day turf establishment	19,000	SF	$0.08	$1,520
4.	Base irrigation	included in park site			$0
5.	Add for Soccer				
	5a. Isolation Valves	2	EA	$250.00	$500
6.	Goal posts & field markers	1	SET	$4,000.00	$4,000
7.	Players bench	2	EA	$800.00	$1,600
	Subtotal				**$7,620**
G	**Subtotal**				**$7,620**
H	**Total**				**$8,382**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Tennis Court

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Project start-up	10% of project cost			**$6,793**
B	**Demolition**				
1.	Clear & grub	included in park site			
C	**Earthwork & Drainage**				
1.	Drainage	included in park site			
2.	Rough grading	included in park site			
3.	Soil prep. & fine grading	included in park site			
D	**Tennis Courts (2 courts)**				
1.	Tennis court (base)	5500	SF	$5.00	$27,500
	Tennis court (surface)	5500	SF	$2.00	$11,000
2.	Tennis Edge	240	LF	$15.00	$3,600
3.	Tennis fence & wind screen	360	LF	$100.00	$36,000
5.	Tennis accessories	1	LS	$6,000.00	$6,000
6.	Benches	2	LS	$1,400.00	$2,800
		1		**SubtotalTennis Courts**	**$86,900**
E	**Subtotal**				**$86,900**
F	**Minus Base Planting Cost**	5500	SF	$3.45	**($18,975)**
	Soil Prep, Turf, Irrigation, Maintenance				
G	**Subtotal**				**$67,925**
H	**Total**				**$74,718**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Shade Structure

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**Water**				
1.	Shade Structure	1	ALLOW	$75,000.00	$75,000.00
B	**Total**				**$75,000.00**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Ornamental Garden

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Project start-up	10% of project cost			**$2,155**
B	**Demolition**				
1.	Clear & grub	included in park site			
D	**Site Construction**				
3.	Enhanced Site Amenities tree grates, pots, bollards, garden ornamentation, etc.	1	allow	$20,000.00	$20,000
5.	Ornamental Planting	1,000	SF	$5.00	$5,000
			Subtotal Site Construction		**$25,000**
E	**Subtotal**				**$25,000**
F	**Minus Base Planting Cost** Soil prep., turf, irrigation, maintenance	1,000	SF	$3.45	**($3,450)**
G	**Subtotal**				**$21,550**
H	**Total**				**$23,705**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Water Play Element

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Recommendations**				
1.	Project Startup	10% of total			**$1,800**
B	**Drainage**				
1.	Drainage	1	LS	$3,000.00	$3,000
D	**Site Construction**				
1.	Water Mister for incorporation into play area	1	LS	$15,000.00	$15,000
			Subtotal Site Construction		**$15,000**
E	**Subtotal**				**$18,000**
H	**Total**				**$19,800**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis
Opinion of Probable Construction Costs

Picnic - 4 Tables

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Project start-up 10%				**$1,874**
B	**Demolition**				
1.	Clear & grub	included in park site			
C	**Earthwork & Drainage**				
1.	Drainage	1	LS	$1,000.00	$1,000
2.	Rough grading	included in park site			
3.	Soil prep. & finish grading	included in park site			
D	**Site Construction**				
1.	Trees for Shade	6	EA	$350.00	$2,100
2.	Picnic Tables	4	EA	$1,800.00	$7,200
3.	BBQ Grills	2	EA	$1,200.00	$2,400
4.	Misc Concrete Paving	800	SF	$8.00	$6,400
5.	Trash Receptacle	2	EA	$1,200.00	$2,400
			Subtotal Site Construction		**$20,500**
E	**Subtotal**				**$21,500**
F	**Minus Base Planting Cost**	800	SF	$3.45	**($2,760)**
	Soil Prep, Turf, Irrigation, Maintenance				
G	**Subtotal**				**$18,740**
H	**Total**				**$20,614**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.

Ellis

Opinion of Probable Construction Costs

Picnic -2 tables

Item	Description	Quantity	Unit	Unit Cost	Subtotal
A	**General Requirements**				
1.	Project start-up 10%				**$1,078**
B	**Demolition**				
1.	Clear & grub	included in park site			
C	**Earthwork & Drainage**				
1.	Drainage	1	LS	$1,000.00	$1,000
2.	Rough grading	included in park site			
3.	Soil prep. & finish grading	included in park site			
D	**Site Construction**				
2.	10 Trees for Shade	3	EA	$350.00	$1,050
3.	Picnic Tables	2	EA	$1,800.00	$3,600
4.	BBQ Grills	1	EA	$1,200.00	$1,200
5.	Misc Concrete Paving	600	SF	$8.00	$4,800
6.	Trash Receptacle	1	EA	$1,200.00	$1,200
			Subtotal Site Construction		**$11,850**
E	**Subtotal**				**$12,850**
F	**Minus Base Planting Cost**	600	SF	$3.45	**($2,070)**
	Soil Prep, Turf, Irrigation, Maintenance				
G	**Subtotal**				**$10,780**
H	**Total**				**$11,858**

The above items, amounts, quantities, and related information are based on DGA judgement at this level of document preparation and is offered only as reference data. DGA has no control over construction quantities, costs, and related factors affecting costs, and advises the client that significant variations may occur between this opinion of probable construction costs and actual construction prices. Costs shown reflect todays dollars and no adjustments have been made for inflation/deflation in this estimate. Estimates do not include basic park costs, soft costs or inflation.