APPENDIX M

UTILITIES

- POTABLE AND RECYCLED WATER TECHNICAL MEMORANDUM
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APPENDIX M
UTILITIES

M.1: Potable and Recycled Water Technical Memorandum

WEST YOST ASSOCIATES
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: December 19, 2012

Project No.: 404-02-11-90

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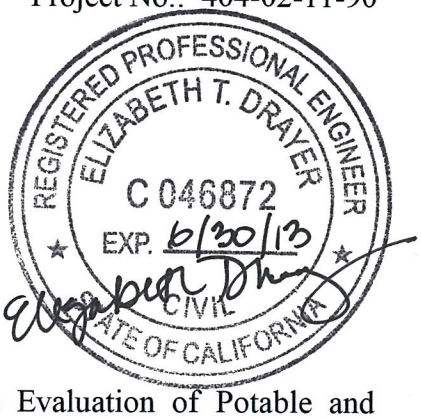


SUBJECT: Cordes Ranch Specific Plan Tier 2 Infrastructure Evaluation of Potable and Recycled Water Systems

OVERVIEW

This Technical Memorandum (TM) summarizes West Yost Associates' (West Yost's) technical evaluation of potable and recycled water systems for the City of Tracy's (City) proposed Cordes Ranch Specific Plan (Proposed Project). The City requested a Water System Analysis for the Proposed Project to identify the required potable and recycled water system facilities to support projected demands, determine the Proposed Project's share of on-site future potable and recycled water system improvements that will be required, and estimate the associated costs.

The Cordes Ranch Specific Plan Project is located on the western side of the City's General Plan Sphere of Influence (SOI), just outside the existing City limits. Figure 1 illustrates the Proposed Project location and the existing potable water system pressure zone boundaries. As shown on Figure 1, the Proposed Project will require potable water service from both Pressure Zones 2 and 3. Similar to the potable water system, recycled water demands for the Proposed Project will also need to be served from two separate pressure zones due to the topography of the Proposed Project location.

Figure 2 presents the proposed land use and identifies parcels anticipated for inclusion in Phase 1 of the Proposed Project.[1] Based on a comparison with the land use data presented in the Citywide Water System Master Plan, it was determined that the land use designations currently

[1] Proposed land use has changed slightly based on new information received on October 16, 2012. A brief review of this new land use data indicates that these changes are minimal and do not affect the results and recommendations presented in this TM.

proposed for the Proposed Project are not identical to, but are comparable with those previously designated for this area.

The following infrastructure evaluation will focus on buildout and Phase 1 of the Cordes Ranch Specific Plan. A subset of Phase 1 will also be evaluated to determine if there are any parcels that could potentially be served with minimal infrastructure improvements. A brief background on the Proposed Project and a summary of recommended potable and recycled water infrastructure from this evaluation are provided below.

BACKGROUND

In May 2011, the City requested West Yost to provide technical engineering support to the City related to an analysis of water storage, pumping facilities, transmission and distribution system infrastructure, and surface water supply and treatment capacity required to support the Cordes Ranch Specific Plan. Specifically, this evaluation is considered to be a "Tier 2" analysis that includes evaluation of required "on-site" infrastructure to meet the needs of this specific proposed development project for Phase 1 and buildout and is considered to be a refinement of the "Tier 1" evaluation presented in the Citywide Water System Master Plan.

West Yost received authorization from the City to proceed with this work on October 18, 2011. As detailed in our professional services agreement, this TM summarizes our findings and conclusions related to the following tasks:

1. Calculate water demands and identify infrastructure at buildout;
2. Identify required infrastructure for Phase 1; and
3. Evaluate a subset of Phase 1 which requires minimal new infrastructure; if possible.

The recommended water system infrastructure presented in this TM was initially based on the proposed buildout backbone potable and recycled water systems developed from the Tier 1 evaluation presented in the December 2012 Citywide Water System Master Plan. However, for this Tier 2 evaluation, recommended potable and recycled water system improvements are somewhat different than those identified in the Tier 1 evaluation due to changes proposed in the new Cordes Ranch Specific Plan. These changes include slight variations in proposed land use and shifts in roadway alignments.

Proposed Tier 2 Specific Plan

As shown previously on Figure 1, the Proposed Project consists of approximately 1,780 acres on the western side of the City's SOI, just outside the existing City limits. The Proposed Project is generally bounded on the north by Interstate 205, on the south by Old Schulte Road, on the west by Mountain House Parkway, and on the east by the current City limits.

Development of the Proposed Project is anticipated to occur over approximately 30 years and will likely occur in several development phases. Phase 1 of the Proposed Project is anticipated to be developed in the next 10 to 12 years. Buildout of the Proposed Project is anticipated to occur in about the year 2040.

Attachment A summarizes key data such as Proposed Project parcel locations, land use, and phasing including preliminary potable and recycled water system infrastructure, which was provided by Cordes Ranch representatives (Kier and Wright) on May 9, 2012 and replaces data previously provided in November 2011. As noted above, revised land use data was received on October 16, 2012 and is provided in Attachment B for reference. A brief review of this data indicated that the land use changes were minimal and do not affect the results and recommendations presented in this TM.

Summary of Recommendations from Infrastructure Evaluation

Tier 1 Infrastructure

Buildout backbone potable and recycled water system infrastructure improvements were identified and presented in the Tier 1 Citywide Water System Master Plan evaluation. The required Tier 1 backbone infrastructure to support the Proposed Project is summarized below, and the costs of these backbone facilities will be proportionately shared by all future planning projects. The Proposed Project's proportionate cost share of the Tier 1 backbone potable and recycled water system facilities was determined as part of the Tier 1 Development Impact Fee Analysis.

It should be noted that at a minimum, the Proposed Project will need to pay for a proportionate share of the Tier 1 backbone potable and recycled water system infrastructure costs; however, depending on the timing of the Proposed Project and other future planning projects in the City, the Proposed Project may be required to fund and construct Tier 1 backbone potable and recycled water system facilities if those facilities have not yet been constructed when the construction of the Proposed Project begins.

In summary, West Yost's technical evaluation of the Proposed Project confirmed that the following Tier 1 backbone potable and recycled water system infrastructure will be required to serve the projected buildout demands of the proposed Cordes Ranch Specific Plan[2]:

Potable Water System Improvements

- Proportionate share of the new 2.0 million gallon (MG) clearwell at the John Jones Water Treatment Plant (JJWTP);
- Proportionate share of a new Zone 3 booster pump station to meet maximum day demands and minimum pressure requirements;
- Proportionate share of the recommended Zone 2 booster pump station upgrade;

[2] Identification of water supply or treatment required to serve the Proposed Project is not included in this evaluation. Consequently, costs presented in this TM do not include the cost to acquire sufficient water supply to meet projected water demands. The Water Supply Assessment being prepared for the Proposed Project addresses availability and reliability of water supplies to serve the Proposed Project, but will not address the water supply cost issue.

- 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 intersection of Hansen Road and Old Schulte Road;
- Proportionate share of the recommended ASR groundwater well;
- Proportionate share of a new Zone 2 storage tank (1.5 MG) and booster pump station to meet peak hour and fire flow demands;
- Proportionate share of a new Zone 3 storage tank (1.5 MG) and booster pump station to meet peak hour and fire flow demands;
- Proportionate share of two new Pressure Regulating Stations (PRS) to serve parcels located in Zone 2; and
- Proportionate share of backbone pipelines.

Recycled Water System Improvements

- Proportionate share of the recycled water storage tanks located at the Holly Drive wastewater treatment plant (WWTP), near the southwest corner of the Cordes Ranch Specific Plan area, and in the Tracy Hills development;
- Proportionate share of the Zone A pump station (located at Holly Drive WWTP), the Zone B Pump Station (located near the south end of the Gateway Project on Lammers Road), the Zone C pump station (located near the southwest corner of the Cordes Ranch Specific Plan area, and the Tracy Hills Zone C and Zone D pump stations; and
- Proportionate share of the required pipelines to convey recycled water from Holly Drive WWTP to the use areas, and in program streets.

Additional details regarding the Tier 1 backbone infrastructure listed above are provided in West Yost's Citywide Water System Master Plan and the Tier 1 Development Impact Fee Analysis. Therefore, this TM only provides the estimated cost for on-site (*i.e.*, Tier 2) infrastructure, for which funding and construction will be the responsibility of the Proposed Project.

Tier 2 Infrastructure

Based on the evaluations completed and discussed further below, the total estimated costs for the recommended on-site (Tier 2) buildout potable and recycled water facilities for the Proposed Project are $10,565,000 and $8,256,000, respectively.[3] The total estimated cost for both on-site potable and recycled water facilities at buildout of the Proposed Project is $18,821,000.

[3] As discussed with City staff, costs include economic adjustment factors of 15 and 30 percent to reduce the anticipated potable and recycled water system construction costs in Summer 2012, respectively. These factors reflect the Summer 2012 (more favorable) bidding climate.

Figures 3 and 4 present the recommended on-site potable and recycled water infrastructure at buildout of the Cordes Ranch Specific Plan, respectively, and also show some of the shared Tier 1 backbone facilities.

The following sections present the detailed Water System Analysis performed for the Proposed Project.

PLANNING AND MODELING CRITERIA

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

- Design criteria for the potable water system
  - — As presented in the Citywide Water System Master Plan:
    - ❖ Surface water treatment and pumping capacity are sized to meet maximum day demands;
    - ❖ Storage facilities are sized to include operational, short-term emergency, and fire flow storage;
    - ❖ Long-term emergency water storage will be provided by the groundwater basin and the City's groundwater wells;
    - ❖ 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 pounds per square inch (psi) or 40 psi, respectively; and
    - ❖ Transmission and distribution mains are sized to provide required peak hour flows at a minimum pressure of 40 psi.
- Design criteria for the recycled water system
  - — As presented in the Citywide Water System Master Plan:
    - ❖ Seasonal storage is not required since projected average dry weather flow treatment, and hence recycled water production capacity, is projected to exceed buildout maximum daily recycled water demands;
    - ❖ Pumping capacity and recycled water storage are sized to meet projected peak hour demand; and
    - ❖ Transmission and distribution piping are sized to provide peak hour flows at a minimum service pressure of 60 psi.
- Potable and recycled water demands
  - — Average day water demand will be calculated using the unit water demand factors presented in the Citywide Water System Master Plan;
  - — Maximum day and peak hour demands for the potable water system will be calculated using the peaking factors of 2.0 and 3.4 times the average day demand, respectively, consistent with factors adopted in the Citywide Water System Master Plan; and

  - — Maximum day and peak hour demands for the recycled water system will be calculated using the peaking factors of 5.8 and 6.4 times the average day demand, respectively, consistent with factors adopted in the Citywide Water System Master Plan.

- Potable water supply
  - — An evaluation of the City's existing and future potable water supplies to meet the Proposed Project potable water demands will be presented in a separate Water Supply Assessment; and
  - — This infrastructure evaluation assumes that there will be sufficient potable water supplies to meet projected buildout potable water demands for the Proposed Project.
- Hydraulic modeling criteria
  - — New pipelines will be hydraulically modeled using a roughness coefficient (C-factor) of 130; and
  - — The 2010 calibrated hydraulic model of the City's potable water system and the hydraulic model developed for the City's proposed recycled water system (as developed for the Citywide Water System Master Plan) will serve as the basis for evaluation of the hydraulic conditions for the Proposed Project.
- Land use
  - — Proposed land use by parcel was provided to the City and West Yost by Kier and Wright on May 9, 2012 and is included in Attachment A.[4]

PROJECTED TIER 2 WATER DEMANDS

Although the land use designations currently planned for the Proposed Project are comparable with those previously designated for this area as presented in the Citywide Water System Master Plan, there are refinements and changes in land use identified in the new Cordes Ranch Specific Plan that required re-calculation of projected potable and recycled water demands for the Proposed Project. Average day potable water demands for the Proposed Project were calculated based on the number of potable water acres[5] by land use designation multiplied with the corresponding adopted unit water demand factor for each land use designation. This demand projection methodology and the adopted unit water demand factors used are consistent with those developed and used in the Citywide Water System Master Plan. The unit water demand factors used in this evaluation are presented in Table 1.

[4] A revised land use plan was received on October 16, 2012 (refer to Attachment B for data). A brief review of this new land use data indicates that these changes are minimal and do not affect the results and recommendations presented in this TM.

[5] Potable water acres assumed to be 85 percent of the total gross acres. Recycled water assumed to be used on the remaining 15 percent of the total gross acres.

Table 1. Unit Water Demand Factors for the Proposed Project[a]

Land Use Designation	Unit Water Demand Factor, af/ac/yr
Commercial[b]	2.0
Office[b]	1.5
Industrial[b]	1.5
Parks (exterior water use)	4.0

[a] Assumes exterior water use will be with recycled water (*i.e.*, 15 percent of the gross acres will be landscaped and irrigated with recycled water).
[b] Applied to 85 percent of the gross acres only (assumes the remaining 15 percent of the gross acres will use recycled water).

Average day recycled water demands for the Proposed Project were calculated based on the number of recycled water acres[6] multiplied by the corresponding adopted unit water demand factor for exterior water use. The new Cordes Ranch Specific Plan also identifies additional recycled water use areas such as on Open Space and detention basins. These additional recycled water demands were calculated based on the number of acres to be irrigated multiplied by the corresponding adopted unit water demand factor for exterior water use.

Maximum day and peak hour demands were calculated by multiplying the average day demand with the appropriate maximum day demand and peak hour demand peaking factors, respectively. A summary of the projected potable and recycled water demands are presented in Tables 2 and 3, respectively. Detailed water demand calculations by parcel are provided in Attachment C.

Table 2. Projected Potable Water Demand[a,b]

Demand Condition	Average Day Demand		Maximum Day Demand[c]		Peak Hour Demand[d]	
	gpm	mgd	gpm	mgd	gpm	mgd
Phase 1	534	0.77	1,068	1.54	1,816	2.62
Buildout (includes Phase 1)	1,390	2.00	2,780	4.00	4,726	6.81

[a] Based on data provided by Kier and Wright on 5/9/12. Detailed calculations by parcel are provided in Attachment C.
[b] Includes unaccounted-for water equal to 7.5 percent.
[c] Maximum day demand is equal to 2.0 times the average day demand.
[d] Peak hour demand is equal to 3.4 times the average day demand.

[6] Recycled water acres assumed to be 15 percent of the total gross acres.

Table 3. Projected Recycled Water Demand[a,b]

Demand Condition	Average Day Demand		Maximum Day Demand[c]		Peak Hour Demand[d]	
	gpm	mgd	gpm	mgd	gpm	mgd
Phase 1	257	0.37	1,491	2.15	1,645	2.37
Buildout (includes Phase 1)	768	1.10[e]	4,454	6.41	4,915	7.08

(a) Based on data provided by Kier and Wright on 5/9/12. Detailed calculations by parcel are provided in Attachment C.
(b) Includes unaccounted-for water equal to 7.5 percent.
(c) Maximum day demand is equal to 5.8 times the average day demand.
(d) Peak hour demand is equal to 6.4 times the average day demand.
(e) Equates to a total annual demand of approximately 1,240 acre-feet per year, which includes unaccounted-for water equal to 7.5 percent of the total demand.

In summary, projected Phase 1 and buildout potable water demands are approximately 860 af/yr and 2,240 af/yr, respectively (includes 7.5 percent unaccounted-for water); and projected Phase 1 and buildout recycled water demands are approximately 410 af/yr and 1,240 af/yr, respectively (includes 7.5 percent unaccounted-for water). When compared with the Citywide Water System Master Plan, projected Tier 2 buildout potable water demands are approximately 170 af/yr (or 7 percent) lower and projected Tier 2 buildout recycled water demands are approximately 120 af/yr (or 11 percent) higher than the Tier 1 evaluation. These differences between the projected Tier 1 and Tier 2 water demands for the Proposed Project are reasonable as land uses have been refined and modified in the new Cordes Ranch Specific Plan. Because the differences between the Tier 1 and Tier 2 potable and recycled water demands for the Proposed Project are small, the sizing of the major backbone infrastructure remains similar to the recommendations presented in the Tier 1 (Citywide Water System Master Plan) evaluation as discussed further below.

It should be noted that the City's proposed recycled water system may not yet be available during Phase 1 of the Proposed Project; therefore, in the interim, water demands for landscape irrigation are assumed to be served from the potable water system during Phase 1 (*i.e.*, potable water would be served to the landscape irrigation sites using the recycled water pipelines installed in Phase 1). An alternative supply to interimly meet these landscape water demands (prior to the availability of recycled water supply) might be non-potable water. Project proponents would have to secure approval from the City to allow the interim use of non-potable water supplies.

As described further below, to minimize operational impacts of this interim operation, it is assumed that Phase 1 landscape irrigation demands will be supplied during off-peak times and will not require any additional water storage or peak pumping capacity in the potable water system to meet the recycled water demands in Phase 1. Beyond Phase 1 of the Proposed Project, all landscape irrigation demands within the Proposed Project (including those developed in Phase 1) must be served from the City's recycled water system to avoid impacts to potable water supply and system operations.

POTABLE WATER SYSTEM FACILITIES EVALUATION

To determine the necessary Proposed Project facilities required to connect to and function within the City's potable water system, the following analyses of the potable water system were conducted:

- Surface Water Treatment and Pumping Capacity,
- Water Storage Capacity,
- Pumping Capacity,
- Interconnections between Pressure Zones, and
- Transmission and Distribution Pipelines.

The results from the potable water system facilities analyses are discussed below.

Surface Water Treatment and Pumping Capacity

Sufficient surface water treatment and pumping capacity from the JJWTP and the City's treated surface water supplies from the South County Water Supply Project (SCWSP) will be required to meet a buildout maximum day demand condition. Based on the projected potable water demands presented previously in Table 2, the Proposed Project would require a minimum surface water treatment and pumping capacity equal to 1.6 and 4.0 mgd to serve Phase 1 and buildout of the Proposed Project, respectively. Recommended infrastructure improvements to supply the required surface water treatment and pumping capacity to the Proposed Project are discussed below by phase (Buildout and Phase 1).

Buildout

Evaluations from the Citywide Water System Master Plan indicate that there will not be sufficient existing surface water treatment and pumping capacity to meet the City's total anticipated buildout potable water demands, including those from the Proposed Project. The Citywide Water System Master Plan recommends that the existing treatment capacity at JJWTP be expanded by 21 mgd to serve buildout potable water demands. In addition, a new 2.0 MG clearwell, 6.48 mgd Zone 3-City-side booster pump station, and 9.65 mgd of additional pumping capacity at the Zone 2 booster pump station (all to be located at the existing JJWTP) are required to serve buildout potable water demands. A new 20-inch diameter transmission main from the new clearwell and Zone 3-City-side booster pump station will also be required for transmission of treated surface water to the Proposed Project.

The City currently uses multiple water supply sources to meet the needs of its customers. Some of these water supplies require treatment at the City's JJWTP, while others are purchased by the City already treated. The water supply for the Proposed Project will be from a blend of the City's future supply acquisitions. Costs for water supply are discussed in West Yost's Tier 1 Development Impact Fee Analysis. A potential alternative for the Proposed Project, in lieu of paying the City's water supply and treatment fee, may be to provide funding to the City for the acquisition of additional treated water supplies.

Phase 1

Evaluations from the Citywide Water System Master Plan indicate that there is currently existing surface water treatment capacity interimly available to supply Phase 1 potable water demands for the Proposed Project. If the Project proponents opt to utilize this currently available treatment capacity and corresponding supply, fees for both the water supply and treatment components will be required as discussed in West Yost's Tier 1 Development Impact Fee Analysis. However, pumping, storage, and conveyance facilities to distribute the treated surface water to Phase 1 of the Proposed Project (new clearwell, Zone 3-City-side booster pump station and 20-inch diameter transmission main) will still be required.

Water Storage Capacity

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 a short-term supply failure (at the water treatment plant); 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 long-term storage available through the groundwater basin and the City wells. Together, these two sources of storage must be sufficient to meet the City's operational, emergency, and fire flow storage criteria.

Based on the projected potable water demands presented previously in Table 2, the Proposed Project would require a minimum water storage capacity equal to approximately 3.0 MG and 6.2 MG to serve Phase 1 and buildout of the Proposed Project, respectively. Table 4 summarizes the required water storage capacity components at Phase 1 and buildout of the Proposed Project.

Table 4. Required Water Storage Capacity

Demand Condition	Operational Storage, MG[(a)]	Emergency Storage, MG[(b)]	Fire Flow Storage, MG[(c)]	Total, MG
Phase 1	0.47	1.54	0.96	3.0
Buildout (includes Phase 1)	1.20	4.00	0.96	6.2

(a) Based on 30 percent of a maximum day demand.
(b) Based on two times the average day demand.
(c) Based on an Industrial fire flow event.

As discussed in the Citywide Water System Master Plan, the groundwater basin can account for a portion of the recommended emergency storage, in the form of a groundwater credit. Therefore, consistent with the recommendations of the Citywide Water System Master Plan, a new Aquifer Storage and Recovery (ASR) groundwater well is recommended for the Proposed Project to reduce the required emergency storage component. Assuming that the capacity of the proposed ASR groundwater well will eliminate the need for the above-ground emergency storage component, the Proposed Project would then require a minimum usable (does not include dead storage or overflow) water storage capacity equal to approximately 1.5 MG and 2.2 MG to serve Phase 1 and buildout of the Proposed Project, respectively. Recommended infrastructure improvements to supply the required water storage capacity to the Proposed Project are

discussed below by phase (Buildout and Phase 1). A discussion on the storage capacity required for a subset of Phase 1 is also provided below.

Buildout

Evaluations from the Citywide Water System Master Plan indicate that there will not be sufficient existing water storage capacity to meet buildout potable water demands for the Proposed Project. Therefore, to provide localized operational and fire flow storage capacity in Zone 3 for the Proposed Project, a new 1.5 MG storage tank and Zone 3 booster pump station is recommended. This recommendation is consistent with the Citywide Water System Master Plan. Another 1.5 MG storage tank and booster pump station is also recommended in the Citywide Water System Master Plan to support localized operational and fire flow storage requirements in Zone 2 (to be located at the Tracy Gateway Project; east of the Proposed Project). Localized storage is recommended as it provides supply reliability in the event that storage from the new clearwell or any other storage facility is unavailable for any reason.

Phase 1

Evaluations from the Citywide Water System Master Plan indicate that there will not be sufficient existing water storage capacity to meet Phase 1 potable water demands for the Proposed Project. Therefore, to provide localized operational and fire flow storage capacity for the Proposed Project, a new 1.5 MG storage tank and booster pump station in Zone 3 is recommended. This recommendation is consistent with the Citywide Water System Master Plan. It is assumed that operational and fire flow storage for Proposed Project demands in Zone 2 will be served in the interim from Zone 3 during Phase 1, if the 1.5 MG (Tracy Gateway) storage tank and booster pump station in Zone 2 has not yet been constructed.

It is assumed that the City's proposed recycled water system may not be available during Phase 1 of the Proposed Project; therefore, in the interim, water demands for landscape irrigation are assumed to be served from the potable water system. It is also assumed that landscape irrigation demands will be supplied during off-peak times and will not require any additional storage capacity in the potable water system to meet recycled water demands. The City will need to establish and enforce a strict irrigation schedule for the Proposed Project in Phase 1 to eliminate landscape irrigation water use that may prohibit effective operations of the potable water system during peak potable water demands, prior to the delivery of recycled water supplies to meet these landscape irrigation demands.

Subset of Phase 1

West Yost was requested to evaluate a subset of Phase 1 to determine if there were any parcels that could initially be served with minimal water system infrastructure improvements. Initial discussions with Cordes Ranch representatives during a meeting held on October 5, 2011 indicated that parcels located adjacent to existing water pipelines on Old Schulte Road and Mountain House Parkway would most likely be developed first (*e.g.*, Parcels No. 40, 41 and/or 42). It was also assumed by Cordes Ranch representatives that water service to Zone 3 for a subset of Phase 1 will be served from Zone 2 via a connection downstream of the Patterson Pass Booster Pump Station.

Based on the existing potable water system infrastructure, there is currently no operational, emergency or fire flow storage available in Zone 3. Also, there is currently no storage located in Zone 2 to serve the western portion of the City's buildout service area. Therefore, at a minimum, the Proposed Project will require a new 1.5 MG storage tank and booster pump station in order to serve the first unit built as a subset of Phase 1. Based on the proposed storage capacity of the new storage tank in Zone 3 (*i.e.*, 1.5 MG of useable storage), and if this storage tank is constructed as part of the subset of Phase 1, there will be sufficient operational, emergency, and fire flow storage to serve approximately 160 total gross acres of Industrial land use or an equivalent of 220 af/yr of potable water use. For example, Parcels No. 40, 41, and approximately half of Parcel No. 42 could be served once the new Zone 3 storage tank and booster pump station is constructed. However, if the Zone 3 storage tank and booster pump station are not constructed as part of the subset of Phase 1, the City's existing potable water system infrastructure cannot support any new units.

Pumping Capacity

The pumping capacity criterion requires the City's potable water system to have sufficient firm pumping capacity to meet the greater of either a maximum day demand concurrent with a fire flow event or a peak hour demand. Based on the projected potable water demands presented previously in Table 2, the Proposed Project would require a minimum firm pumping capacity equal to 5,568 gpm and 7,280 gpm to serve Phase 1 and buildout of the Proposed Project, respectively; this pumping capacity is required to meet a peak demand condition equal to a maximum day demand plus fire flow[7]. Recommended infrastructure improvements to supply the required firm pumping capacity to the Proposed Project are discussed below by phase (Buildout and Phase 1). A discussion on the firm pumping capacity required for a subset of Phase 1 is also provided below.

Buildout

Evaluations from the Citywide Water System Master Plan indicate that there will not be sufficient existing firm pumping capacity to meet buildout potable water demands from the Proposed Project. Therefore, to provide sufficient firm pumping capacity for the Proposed Project (7,280 gpm at buildout), a new 4,500 gpm booster pump station at the new clearwell and a new 4,500 gpm booster pump station at the proposed Zone 3 Cordes Ranch storage tank are recommended. These recommendations are consistent with the Citywide Water System Master Plan. Another 4,500 gpm booster pump station is also recommended for the Tracy Gateway Project Zone 2 storage tank (located east of the Proposed Project) in the Citywide Water System Master Plan to support firm pumping capacity requirements in Zone 2.

[7] The highest fire flow requirement (4,500 gpm) based on Industrial land use was assumed.

Phase 1

Evaluations from the Citywide Water System Master Plan indicate that there will not be sufficient existing firm pumping capacity to meet Phase 1 potable water demands from the Proposed Project. Therefore, to provide sufficient firm pumping capacity for the Proposed Project (5,568 gpm in Phase 1), a new 4,500 gpm booster pump station at the new clearwell and a new 4,500 gpm booster pump station at the proposed Zone 3 Cordes Ranch storage tank are recommended. These recommendations are consistent with the Citywide Water System Master Plan. With the construction of the Cordes Ranch Zone 3 storage tanks and booster pump station, it is assumed that some of the peak demands including fire flow in Zone 2 of the Proposed Project will be served in the interim from the Cordes Ranch Zone 3 storage tank and booster pump station during Phase 1.

Again, it is assumed that the proposed recycled water system may not be available during Phase 1 of the Proposed Project; therefore, in the interim, water demands for landscape irrigation are assumed to be served from the potable water system. It is also assumed that landscape irrigation demands will be supplied during off-peak times and will not require any additional peak pumping capacity in the potable water system to meet recycled water demands. However, sufficient pumping capacity from the JJWTP will be required to fill the recommended Zone 3 Cordes Ranch storage tank and serve peak irrigation demands, concurrently, during an eight-hour period. A review of the proposed buildout firm pumping capacity of the recommended Zone 3-City-side booster pump station indicates that the recommended booster pump station will meet this criterion.

Subset of Phase 1

As described in the water storage capacity evaluation, a new 4,500 gpm booster pump station at the proposed Zone 3 Cordes Ranch storage tank will be required to serve any portion of a subset of Phase 1. Without the proposed Zone 3 Cordes Ranch storage tank and booster pump station constructed, no units can be developed as a part of the subset of Phase 1. The proposed firm pumping capacity from this booster pump station will be sufficient to meet the recommended fire flow demand for Industrial land use. The remaining maximum day water demands from the Proposed Project will need to be served from the existing Patterson Pass Booster Pump Station, which has a firm pumping capacity of 3,000 gpm. However, it should be noted that the amount of water demand that could be served as a subset of Phase 1 is limited by the storage capacity criterion (as discussed previously).

Interconnections between Pressure Zones

Because the Proposed Project is located in both Zone 2 and Zone 3, additional interconnections in the form of Pressure Regulating Stations (PRS) will be required to supply demands from Zone 3 into Zone 2. These PRS facilities will be required during Phase 1 to support parcels located in Zone 2. The Citywide Water System Master Plan recommends PRS #9 and PRS #10 to provide supply interconnections between Zones 2 and 3. Because the current selected subset of Phase 1 only includes parcels located in Zone 3 (does not include service to parcels in Zone 2), these recommended pressure regulating stations will not be required unless Proposed Project parcels are developed in Zone 2.

Transmission and Distribution Pipelines

Pipeline alignments developed in Tier 1 from the Citywide Water System Master Plan were adjusted to match the slightly modified roadway alignments for this Tier 2 evaluation, and additional pipelines were also added based on Tier 2 data (see Attachment A). Initial pipeline sizing for the Tier 2 evaluations was based on the Tier 1 evaluation and updated with data supplied by Kier and Wright. However, some additional 8-inch diameter pipelines were added for system looping near Parcels No. 8, 10, 11, 23, 24 and 32.

Additional modifications required to meet the City's performance criteria are identified and discussed in the potable water system performance evaluation presented below, and the final recommended buildout potable water system was presented previously on Figure 3. It should be noted that additional 8-inch diameter pipelines required for water service and hydrants in the interior of each parcel were not identified for this evaluation, but will be determined later when each parcel is developed and more specific on-site water system infrastructure is designed.

POTABLE WATER SYSTEM PERFORMANCE EVALUATION

Improvements identified above for surface water treatment, storage, pumping, interconnections, and transmission and distribution pipelines were added into the City's hydraulic model for the potable water system evaluation. A summary of the results from the potable water system performance evaluation is provided below by project phase.

Buildout

Figure 5 presents the results from the peak hour demand evaluation at buildout of the Proposed Project. All proposed pipeline velocities are within the maximum allowable pipeline velocity criteria for transmission and distribution pipelines, and all junctions met the minimum pressure criterion of 40 psi, except for one junction at the southwest corner of Parcel No. 35. The low pressure simulated at this location is due to the high elevation that is above the Zone 2 service range. Therefore, to meet the minimum pressure criterion, any services above an elevation of 150 feet must be served by a connection to Zone 3. Parcels that will require water service from two separate pressure zones are highlighted previously on Figure 3.

InfoWater's "*Available Fire Flow Analysis*" tool was used to determine the available fire flow (while meeting the maximum day demand plus fire flow minimum residual pressure and maximum velocity performance criteria of 30 psi and 12 feet per second (fps), respectively) at each fire flow junction within the Proposed Project during a maximum day demand scenario. Figure 6 presents the results from the maximum day plus fire flow evaluation at buildout of the Proposed Project. Based on a required fire flow of 3,500 gpm and 4,500 gpm for Office and Industrial land use, respectively, results indicate that the simulated fire flow junctions located near the boundary of Zones 2 and 3 did not meet the minimum fire flow requirement of 4,500 gpm for Industrial land use.

To mitigate the fire flow deficiency observed near the southwest corner of Parcel 24 at buildout of the Proposed Project, the 8-inch diameter pipeline located on Parcels No. 24 and OP2 is recommended to be upsized to 12-inches in diameter as shown on Figure 6. The remaining fire flow junctions that do not meet the minimum fire flow requirement are relatively close, except for the junction at the corner of Parcel No. 35. Again, the low fire flow availability simulated at

this location is due to high elevation above the Zone 2 service range; it is recommended that fire flow at the southwest corner of Parcel No. 35 be served from Zone 3.

Phase 1

Figure 7 presents the results from the peak hour demand evaluation at Phase 1 of the Proposed Project. All proposed pipelines met the maximum pipeline velocity criteria for transmission and distribution pipelines, and all junctions met the minimum pressure criterion of 40 psi.

InfoWater's "*Available Fire Flow Analysis*" tool was used to determine the available fire flow (while meeting the maximum day demand plus fire flow minimum residual pressure and maximum velocity performance criteria of 30 psi and 12 fps, respectively) at each fire flow junction within the Proposed Project during a maximum day demand scenario. Figure 8 presents the results from the maximum day plus fire flow evaluation at Phase 1 of the Proposed Project. Based on a required fire flow of 3,500 gpm and 4,500 gpm for Office and Industrial land use, respectively, results indicate that the simulated fire flow junctions located (1) in Zone 3, at the most northern part of the system and (2) in Zone 2, near the boundary of Zones 2 and 3 did not meet the minimum fire flow requirement of 4,500 gpm for Industrial land use.

To mitigate these fire flow deficiencies at Phase 1 of the Proposed Project, the following pipeline improvements are recommended to meet the Industrial fire flow requirement:

- Include additional 12-inch diameter looping pipelines located near the most northern part of the system and by Parcel No. 8; and
- Upsize proposed 12-inch diameter pipelines located near Parcel No. 35 to 16-inch diameter pipelines to reduce pipeline head loss simulated during a fire flow condition.

Locations of these pipeline improvements are illustrated on Figure 8. It should be noted that the recommended upsize of proposed 12-inch diameter pipelines to 16-inch diameter pipelines is only required due to the proposed phasing of the Proposed Project and location of the Phase 1 parcels to be served.

Subset of Phase 1

Based on the facilities evaluation presented above for a subset of Phase 1, it was determined that approximately 160 total gross acres of Industrial land use could be served if the new 1.5 MG storage tank and booster pump station is constructed at the Proposed Project in Zone 3. If this facility is not constructed, the City's existing potable water system cannot provide service to any portion of the subset of Phase 1. To evaluate system performance while serving a subset of Phase 1, potable water demands (for 160 total gross acres of Industrial land use) were added to the hydraulic model of the City's existing potable water system. The proposed 1.5 MG storage tank and associated 4,500 gpm booster pump station was also included into the hydraulic model for the City's existing water system.

Subsequent peak hour and maximum day plus fire flow simulations indicate that the City's potable water system can sufficiently support water demands from a subset of Phase 1 if the new Zone 3 storage tank and booster pump station are constructed. However, the City's Operations staff will need to adjust operations at the existing Patterson Pass Booster Pump Station to serve

this subset of Phase 1 due to changes in system conditions initiated from additional water demands and the new Zone 3 Cordes Ranch storage tank and booster pump station. Therefore, during design of the proposed storage tank and booster pump station, it will be critical for the Project proponents and the City to work closely and interface with Operations staff to better understand existing system constraints and coordinate how to best serve this subset of Phase 1.

RECYCLED WATER SYSTEM FACILITIES EVALUATION

The recycled water system facilities were evaluated to confirm or adjust the facility recommendations documented in the Citywide Water System Master Plan. Recommended facilities included:

- Recycled Water Diurnal Storage Tanks
- Recycled Water Pumping Facilities
- Recycled Water Transmission Mains

These facilities are discussed below.

Recycled Water Diurnal Storage Tanks

The total recycled water diurnal storage recommended in the Citywide Water System Master Plan is 10 MG. This value was determined by comparing the projected maximum day demand of 41.5 mgd to an assumed constant recycled water production rate of 13.8 mgd, resulting in a required volume of 10 MG (includes a 10 percent volume contingency). The proposed locations and capacity of the diurnal storage tanks are:

- Holly Drive WWTP – 3 MG
- Cordes Ranch at Zone A Hydraulic Grade – 5 MG
- Tracy Hills – 2 MG

The cost for the 10 MG of storage would be included in the shared recycled water facility cost. Tracy Hills is planning on installing 2 MG of recycled water storage. Because the Zone B and Zone C pump stations pump out of the Zone A hydraulic grade storage located near the southwest corner of Cordes Ranch property, 5 MG of storage, equal to the Zone B and Zone C maximum day demand, is required at that location. The remaining 3 MG of storage would be located at the Holly Drive WWTP.

As indicated in Table 3, the projected recycled water demand of the Cordes Ranch Project is slightly more than 10 percent greater than the demand indicated in Table 9-2 of the Citywide Water System Master Plan. This change, however, is less than two percent of the total system recycled water demand and does not affect the storage facility sizing.

Recycled Water Pumping Facilities

The recycled water pumping capacity was modified from the Citywide Water System Master Plan due to the changes in the Cordes Ranch Specific Plan land use types and projected recycled water demand. The recycled water pumping capacity from the Citywide Water System Master Plan and the revised Cordes Ranch Specific Plan are shown in Table 5.

Table 5. Recycled Water Distribution System Pump Station Design Criteria[a]

Pump Station	Citywide Water System Master Plan		Cordes Ranch Specific Plan	
	Design Flow Rate, gpm (mgd)	Design Total Dynamic Head, feet	Design Flow Rate, gpm (mgd)	Design Total Dynamic Head, feet
Zone A[b]	16,000 (23.0)	240	16,000 (23.0)	240
Zone B[c]	9,600 (14.0)	80	10,200 (15.0)	100
Zone C[d]	2,830 (4.1)	115	2,700 (3.9)	123
Tracy Hills Zone C	4,500 (6.5)	280	4,500 (6.5)	280
Tracy Hills Zone D	3,000 (4.3)	350	3,000 (4.3)	350

[a] Modified from Table 9-5 of the Citywide Water System Master Plan.
[b] Includes flow to all other pump stations.
[c] Includes flow to the Tracy Hills Storage Tank.
[d] Pumps directly out of Zone A Storage located within Zone C.

As shown in Table 5, the Zone B pump station must be upsized to account for greater demands in Cordes Ranch Zone B while the Zone C pump station capacity can be reduced because some demands that were assumed to be in Zone C will actually be delivered to Zone B.

Recycled Water Transmission Mains

Because the increased demand in the Cordes Ranch Specific plan was small relative to the overall projected buildout recycled water demand, there were no changes to the shared pipelines.

The changes to the shared facilities due to the changes in recycled water demand in the Cordes Ranch Specific Plan are very minor. The Zone B pump station firm capacity would be increased from 14.0 mgd to 15.0 mgd while the Zone C pump station firm capacity would be reduced from 4.1 mgd to 3.9 mgd.

RECYCLED WATER SYSTEM PERFORMANCE EVALUATION

Substantial revisions to the on-site recycled water piping were required to conform the proposed recycled water distribution system to the Cordes Ranch Specific Plan revised land use (refer to Attachment A). The revised piping is shown previously on Figure 4. Figure 9 presents the recycled water pipelines that would serve landscape irrigation demand in Phase 1, which are assumed to be connected initially with the potable water system as the recycled water system may not be available yet. The on-site Cordes Ranch recycled water piping presented in the Citywide Water System Master Plan and the revised pipeline quantities based on the Cordes Ranch Specific Plan are shown in Table 6.

Table 6. On-site Recycled Water Distribution System Piping[(a)]

Pipeline diameter	Length of Pipe, lineal feet	
	Citywide Water System Master Plan	Cordes Ranch Specific Plan
8-inch diameter	64,600	32,500
12-inch diameter	5,400	23,200
16-inch diameter	2,600	2,400
Total	72,600	58,100

(a) Modified from Table 10-4 of the Citywide Water System Master Plan.

The revised roadway and hence pipeline alignments reduced the overall length of pipeline required, but required some pipe diameters to be increased because recycled water demand increased and fewer pipe loops would be constructed. Under both studies, the minimum service pressure in the Cordes Ranch Specific Plan area would be 60 psi.

The quantities of required recycled water distribution system piping to serve Phase 1 and Buildout are shown in Table 7.

Table 7. On-site Recycled Water Distribution System Piping by Phase

Pipeline diameter	Length of Pipe, lineal feet		
	Phase 1	Remaining Phases	Buildout
8-inch diameter	17,800	14,700	32,500
12-inch diameter	9,900	13,300	23,200
16-inch diameter	—	2,400	2,400
Total	27,700	30,400	58,100

RECOMMENDED TIER 2 INFRASTRUCTURE FOR THE PROPOSED PROJECT

The following section summarizes the recommended potable and recycled water system infrastructure based on the evaluations discussed above.

Potable Water System Recommendations

Table 8 summarizes the recommended potable water system infrastructure improvements and associated phasing required to serve projected potable water demands from the Proposed Project.

Table 8. Recommended Potable Water System Infrastructure for the Proposed Project

Improvement Description	Required Phase
New 1.5 MG Storage Tank and 6.48 mgd Booster Pump Station (BPS) in Zone 3	Subset of Phase 1
New 2.0 MG Clearwell at JJWTP	Phase 1
New 6.48 mgd Zone 3-City-side BPS	Phase 1
New 20-inch Diameter Transmission Pipeline	Phase 1
New ASR Groundwater Well (minimum 1,500 gpm capacity)	Phase 1
Two New Pressure Regulating Stations (PRS #9 and PRS #10)	Phase 1
9.65 mgd Zone 2 BPS Upgrade	Buildout
New 1.5 MG Storage Tank and 6.48 mgd BPS in Zone 2	Buildout
New 16-inch Diameter Pipelines	Subset of Phase 1
New 8-inch, 12-inch and 16-inch Diameter Pipelines	Phase 1 and Buildout

Recycled Water System Recommendations

Table 9 summarizes the recommended recycled water system infrastructure improvements required to serve projected recycled water demands from the Proposed Project

Table 9. Recommended Recycled Water System Infrastructure for the Proposed Project

Improvement Description	Required Phase
New 3.0 MG Storage Tank at Holly Drive WWTP	Buildout
New 5.0 MG Storage Tank near southwest corner of Cordes Ranch	Buildout
New 2.0 MG Storage Tank in Tracy Hills	Buildout
New 23 mgd Zone A Pump Station	Buildout
New 15 mgd Zone B Pump Station	Buildout
New 3.9 mgd Zone C Pump Station	Buildout
New 6.5 mgd Tracy Hills Zone C Pump Station	Buildout
New 4.3 mgd Tracy Hills Zone D Pump Station	Buildout
New Shared Recycled Water Transmission Pipelines	Buildout
New 8-inch, 12-inch, and 16-inch Diameter Distribution Pipelines	Phase 1 and Buildout

Based on this summary of recommended Tier 2 infrastructure for the Proposed Project, probable construction costs for on-site infrastructure at buildout of the Proposed Project are developed and discussed below.

ESTIMATE OF PROBABLE COSTS FOR RECOMMENDED WATER SYSTEM INFRASTRUCTURE

Figures 3 and 4 presented the recommended on-site potable and recycled water system infrastructure required to serve the Proposed Project at buildout, respectively. The Proposed Project's costs for the required on-site potable and recycled water system infrastructure to serve projected demands are detailed in Tables 10 and 11, respectively. The total estimated cost with economic adjustment[8] for both the on-site potable and recycled water facilities at buildout of the Proposed Project is $18,821,000.

As noted in the previous sections, the Proposed Project will also at a minimum need to pay a proportionate share of (1) backbone potable and recycled water system infrastructure and (2) water supply and treatment fees based on the Tier 1 Development Impact Fee Analysis. However, as discussed in the Tier 1 Development Impact Fee Analysis TM, the water supply and/or treatment fees can be waived by the City if the Proposed Project has an agreement with the City to acquire an alternative water supply (other than one of the water supplies included in the water supply fee) and/or does not require treatment at the City's JJWTP. An alternative fee or funding to cover the costs associated with the acquisition of the alternative water supply and/or cover the costs associated with treatment of the alternative water supply may be required.

[8] As discussed with City staff, costs include economic adjustment factors of 15 and 30 percent to reduce the anticipated potable and recycled water system construction costs in Summer 2012, respectively. These factors reflect the Summer 2012 (more favorable) bidding climate.

Table 10. Summary of Probable On-Site Buildout Potable Water System Construction Costs for the Proposed Project[a]

Improvement Type	Improvement Description	Quantity		Estimated Construction Cost[b]	CIP Cost (includes mark-ups)[c,d]
New Pipeline (Undeveloped Area)	8-inch diameter	8,740	lf	1,136,200	1,591,000
New Pipeline (Undeveloped Area)	12-inch diameter	26,770	lf	4,818,600	6,746,000
New Pipeline (Undeveloped Area)	16-inch diameter	12,420	lf	2,856,600	3,999,000
Bore and Jack	16-inch diameter (24-inch casing)	120	lf	66,600	93,000
				TOTAL	**$ 12,429,000**
				TOTAL w/ Economic Adjustment[e]	**$ 10,565,000**

[a] Costs shown are presented 2012 dollars. Unit costs based on Appendix G of the Citywide Water System Master Plan.

[b] Estimated construction costs do not yet reflect an adjustment, as discussed with the City's Engineer, to account for the current economic bidding climate.

[c] Costs include mark-ups equal to 40 percent (General Contingency: 15 percent; Design and Planning: 10 percent; Construction Management: 10 percent; and Program Administration: 5 percent), as determined by the City.

[d] Total rounded to nearest $1,000.

[e] As discussed with City staff, an economic adjustment factor of 15 percent was applied to reduce the anticipated potable water system construction costs in Summer 2012. These factors reflect the Summer 2012 (more favorable) bidding climate and will need to be adjusted to match current costs.

Table 11. Summary of Probable On-Site Buildout Recycled Water System Construction Costs for the Proposed Project[a]

Improvement Type	Improvement Description	Quantity		Estimated Construction Cost[b]	CIP Cost (includes mark-ups)[c,d]
New Pipeline (Undeveloped Area)	8-inch diameter	32,500	lf	3,835,000	5,369,000
New Pipeline (Undeveloped Area)	12-inch diameter	23,200	lf	4,036,800	5,652,000
New Pipeline (Undeveloped Area)	16-inch diameter	2,400	lf	552,000	773,000
				TOTAL	**$ 11,794,000**
				TOTAL w/ Economic Adjustment[e]	**$ 8,256,000**

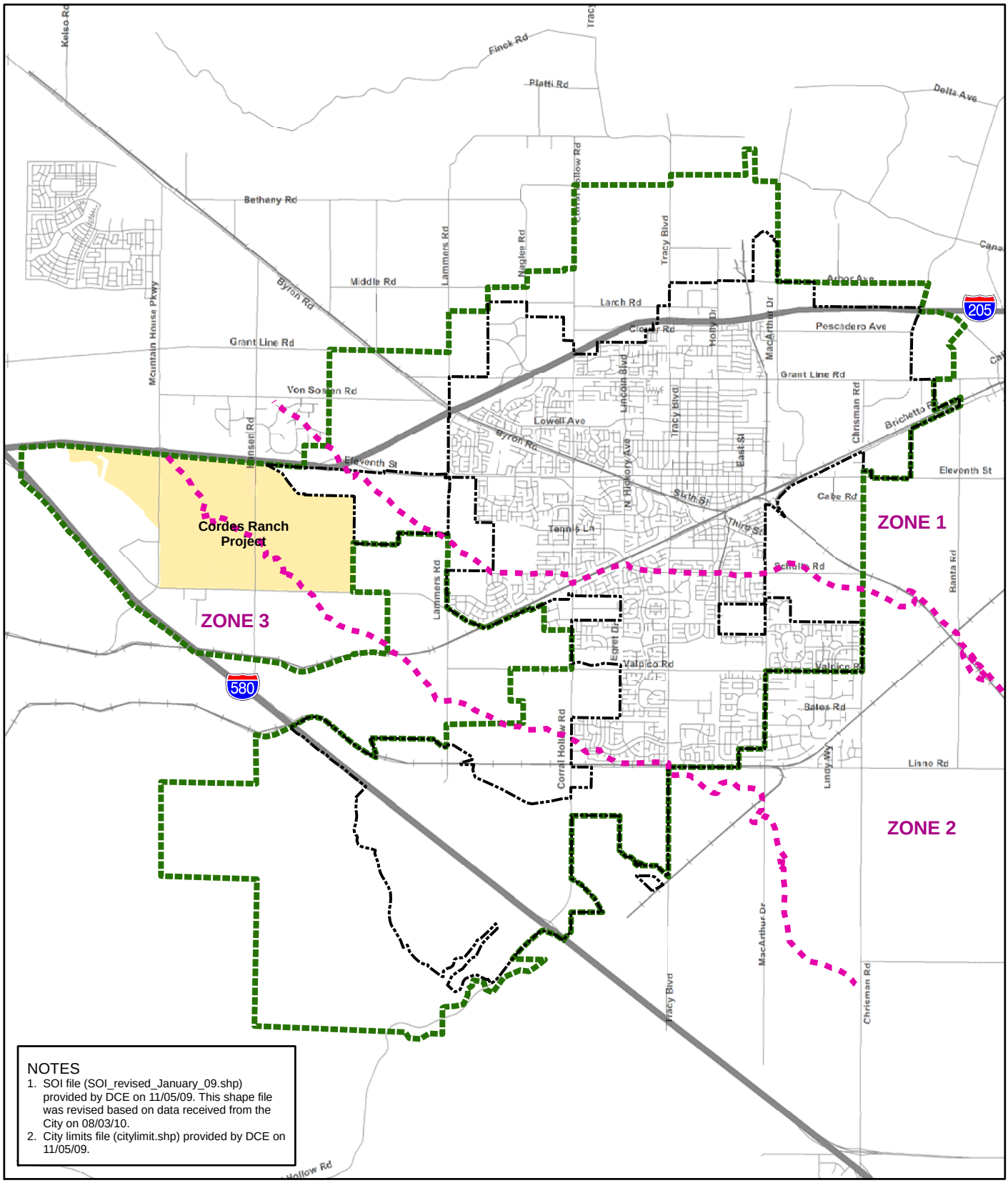
[a] Costs shown are presented 2012 dollars. Unit costs based on Appendix G of the Citywide Water System Master Plan.

[b] Estimated construction costs do not yet reflect an adjustment, as discussed with the City's Engineer, to account for the current economic bidding climate.

[c] Costs include mark-ups equal to 40 percent (General Contingency: 15 percent; Design and Planning: 10 percent; Construction Management: 10 percent; and Program Administration: 5 percent), as determined by the City.

[d] Total rounded to nearest $1,000.

[e] As discussed wtih City staff, an economic adjustment factor of 30 percent was applied to reduce the anticipated recycled water system construction costs in Summer 2012. These factors reflect the Summer 2012 (more favorable) bidding climate and will need to be adjusted to match current costs.



NOTES
1. SOI file (SOI_revised_January_09.shp) provided by DCE on 11/05/09. This shape file was revised based on data received from the City on 08/03/10.
2. City limits file (citylimit.shp) provided by DCE on 11/05/09.

LEGEND:
- Existing Pressure Zone Boundary
- City Limits
- SOI
- Railroad
- Highway
- Existing Street

N

0 3,750 7,500
Scale in Feet

FIGURE 1

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

PROPOSED PROJECT LOCATION

WEST YOST ASSOCIATES
Consulting Engineers

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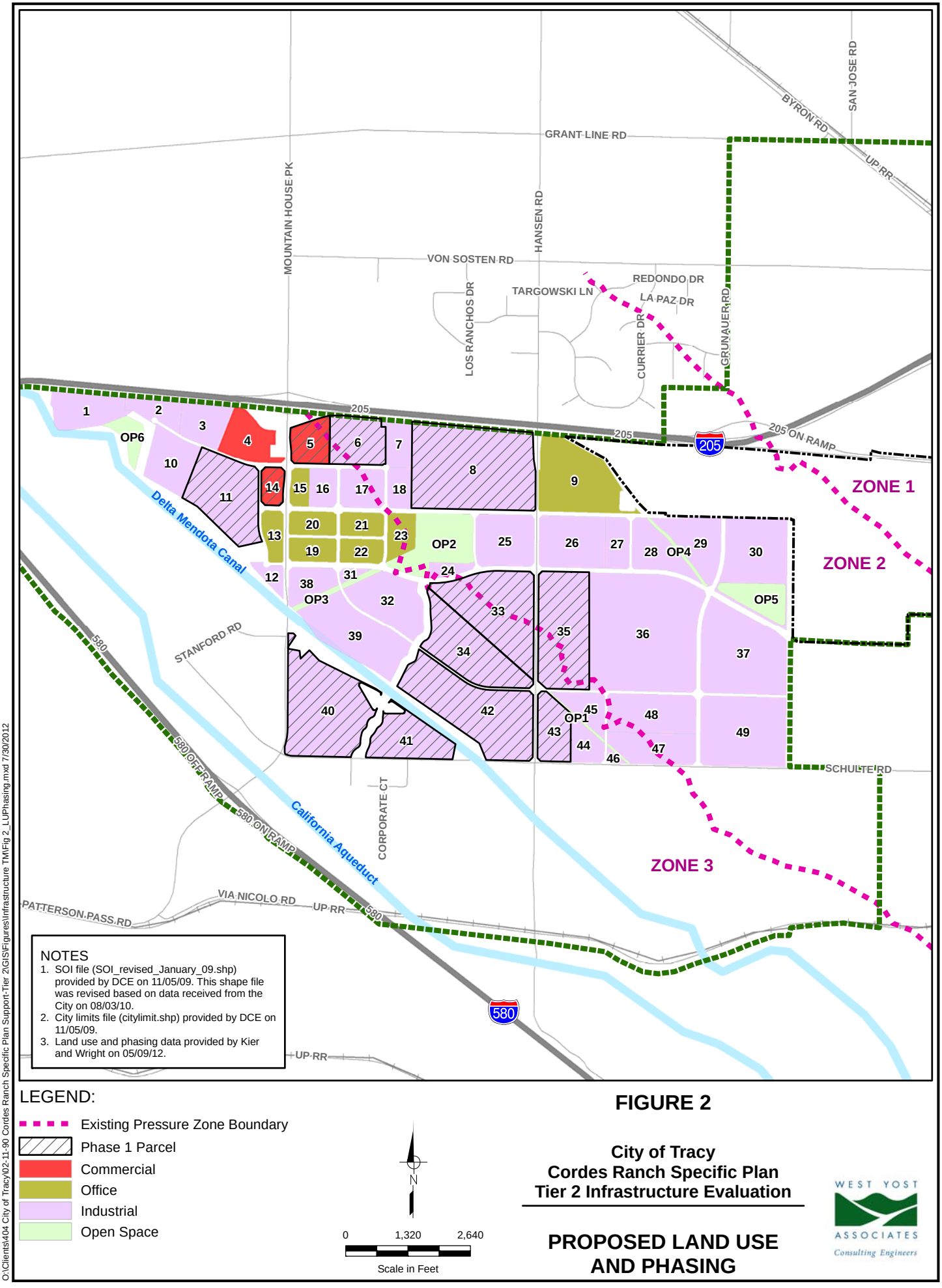


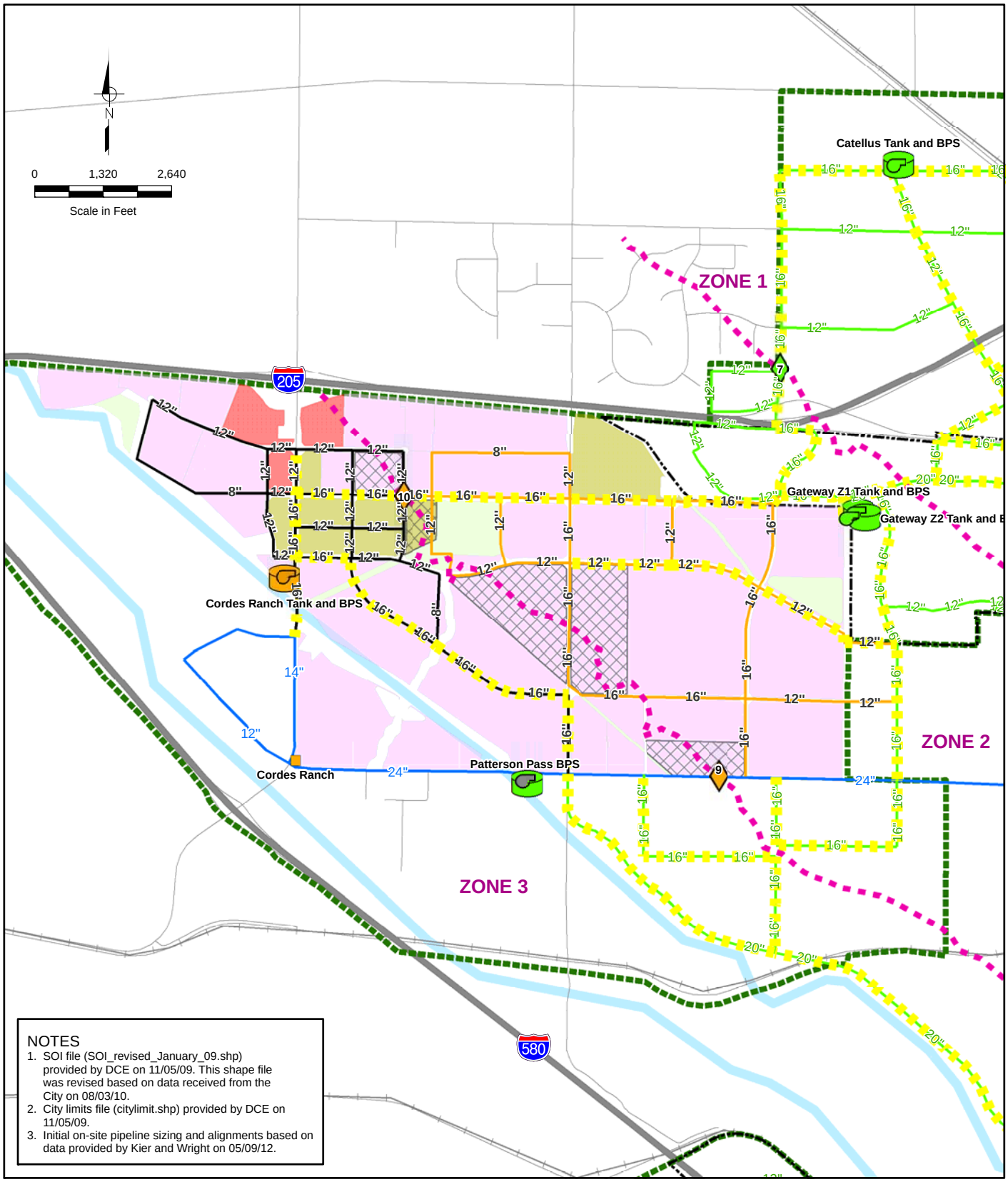
O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 2_LUPhasing.mxd 7/30/2012

FIGURE 2

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

PROPOSED LAND USE AND PHASING

WEST YOST ASSOCIATES
Consulting Engineers



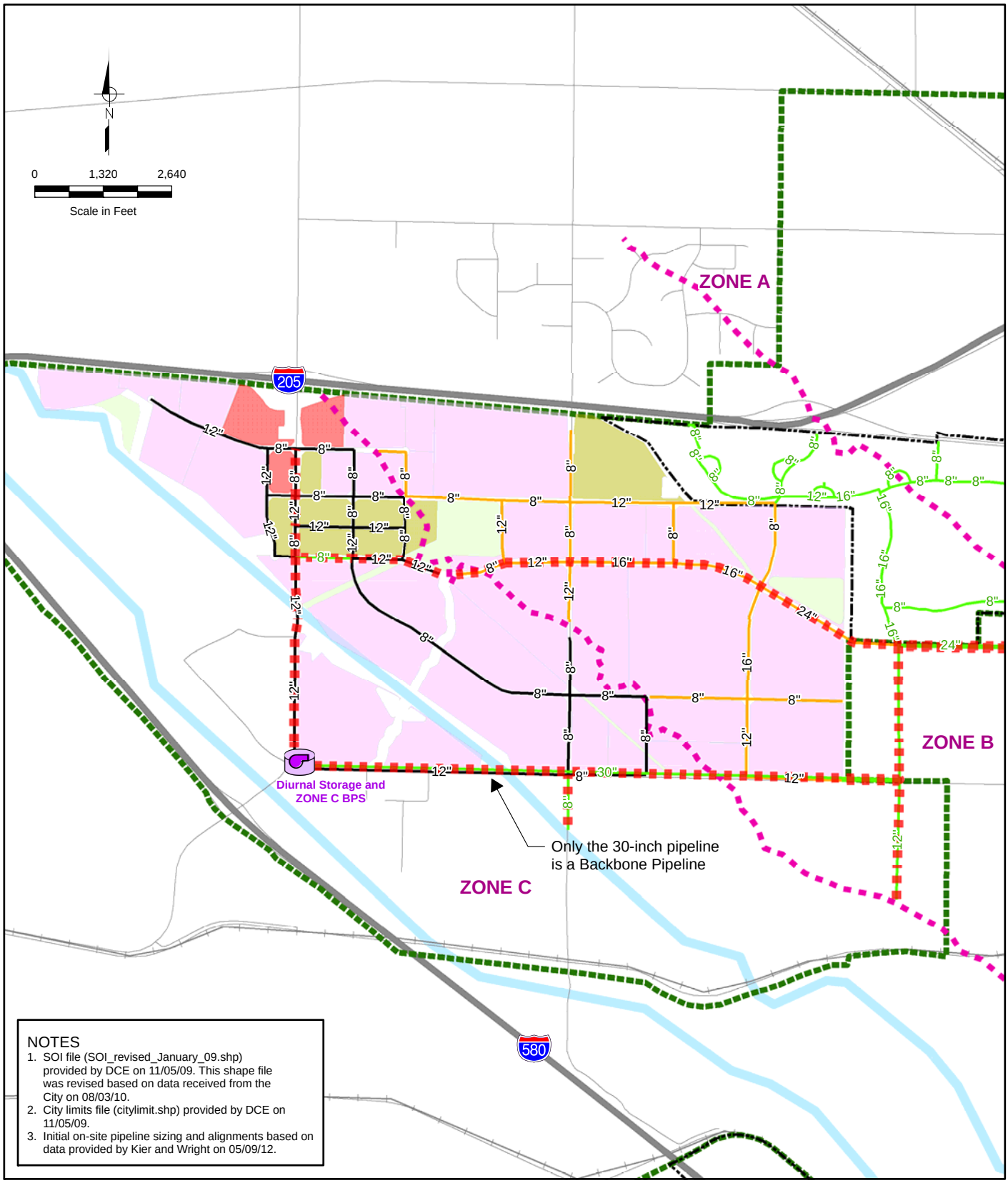
O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 3_PropPotableOnsite_BO.mxd 9/4/2012

FIGURE 3

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

RECOMMENDED ON-SITE POTABLE WATER SYSTEM

WEST YOST ASSOCIATES
Consulting Engineers



NOTES
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2. City limits file (citylimit.shp) provided by DCE on 11/05/09.
3. Initial on-site pipeline sizing and alignments based on data provided by Kier and Wright on 05/09/12.

LEGEND:

- Backbone Pipeline (Tier 1)

Proposed Pipelines

- Cordes Ranch - Zone 2
- Cordes Ranch - Zone 3
- Other Development Projects

FIGURE 4

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

RECOMMENDED ON-SITE RECYCLED WATER SYSTEM

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 4_PropRecycledOnsite_BO.mxd 9/4/2012

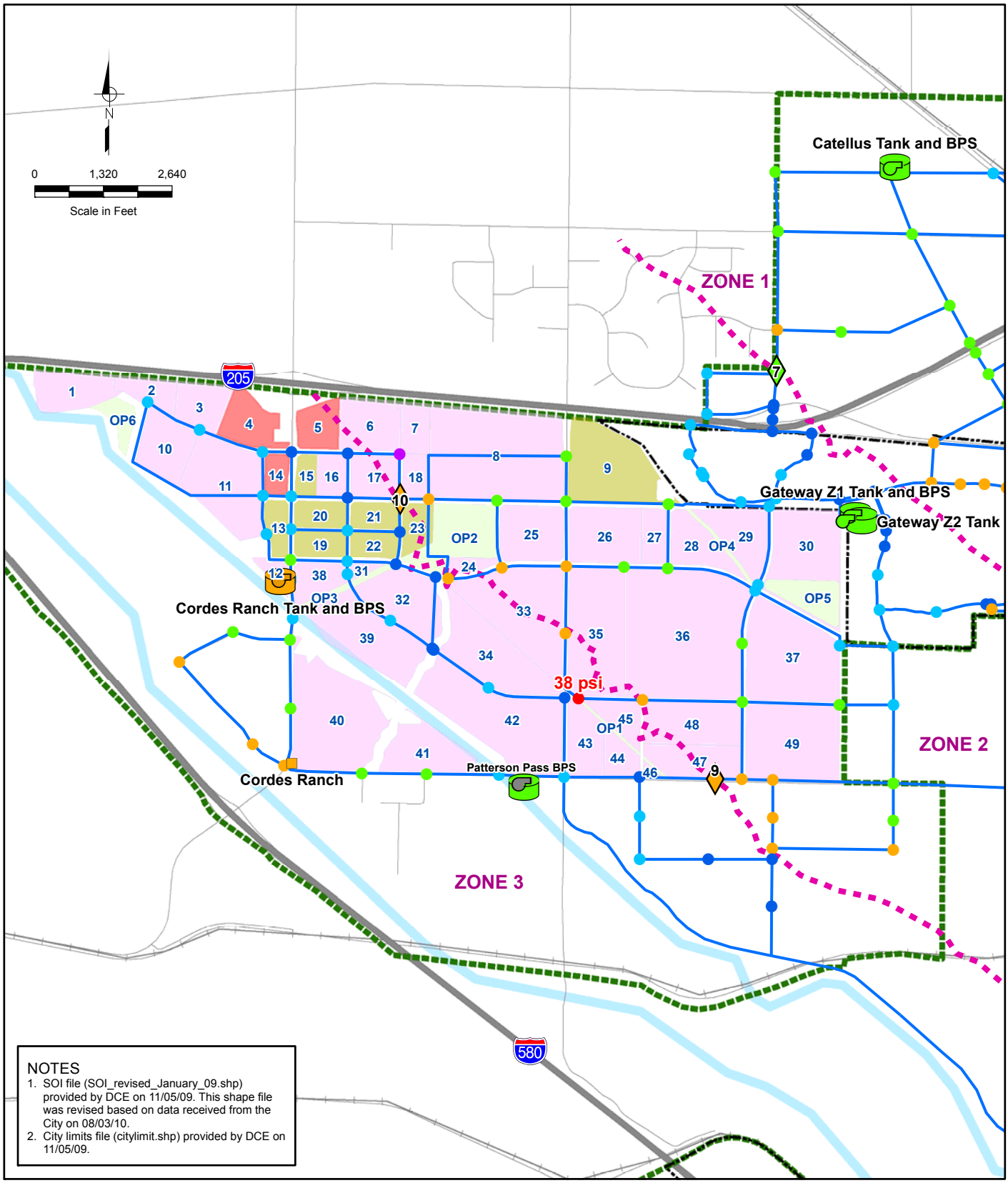


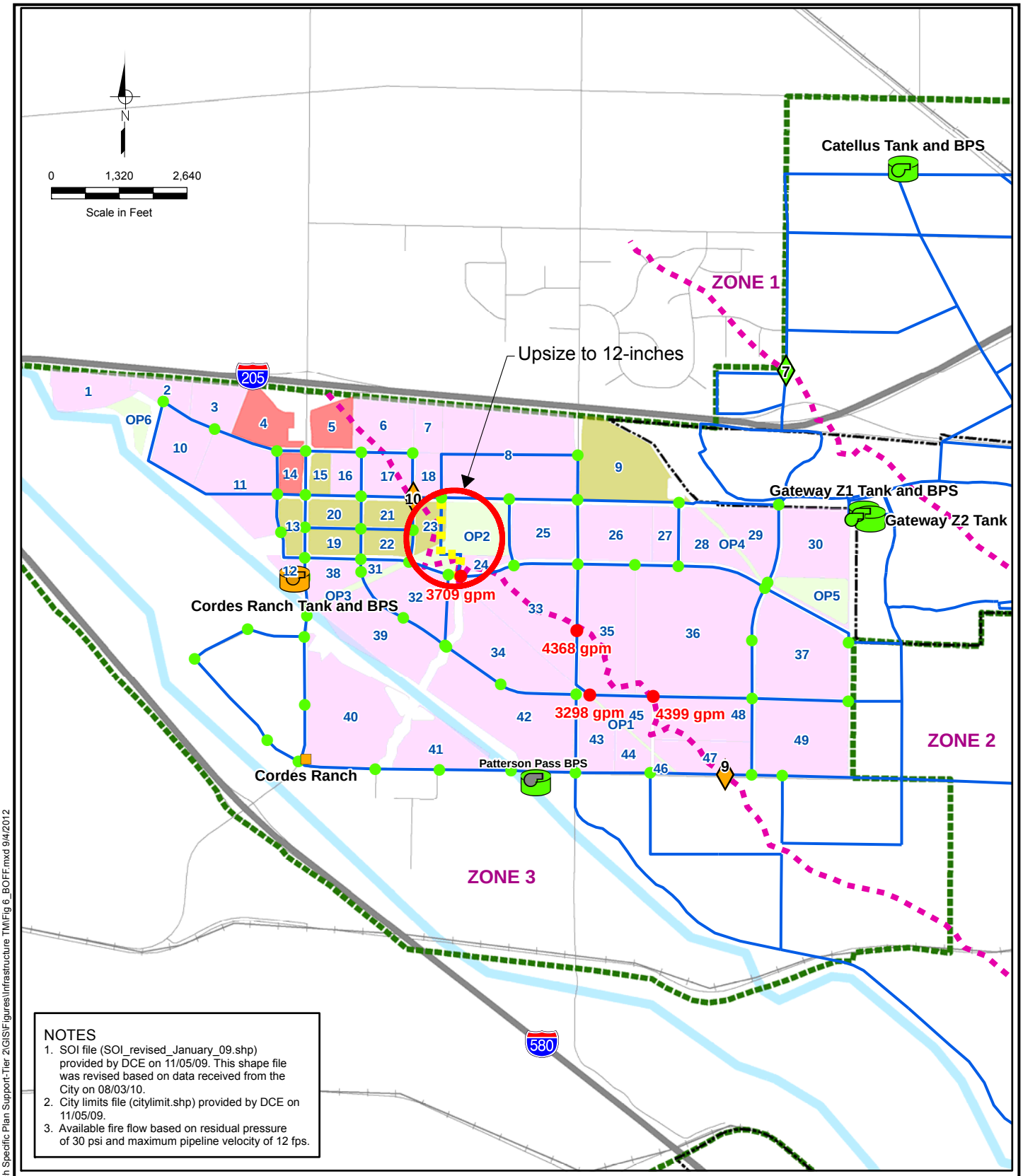
FIGURE 5

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

BUILDOUT POTABLE PEAK HOUR EVALUATION

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 5_BOPH.mxd 8/2/2012



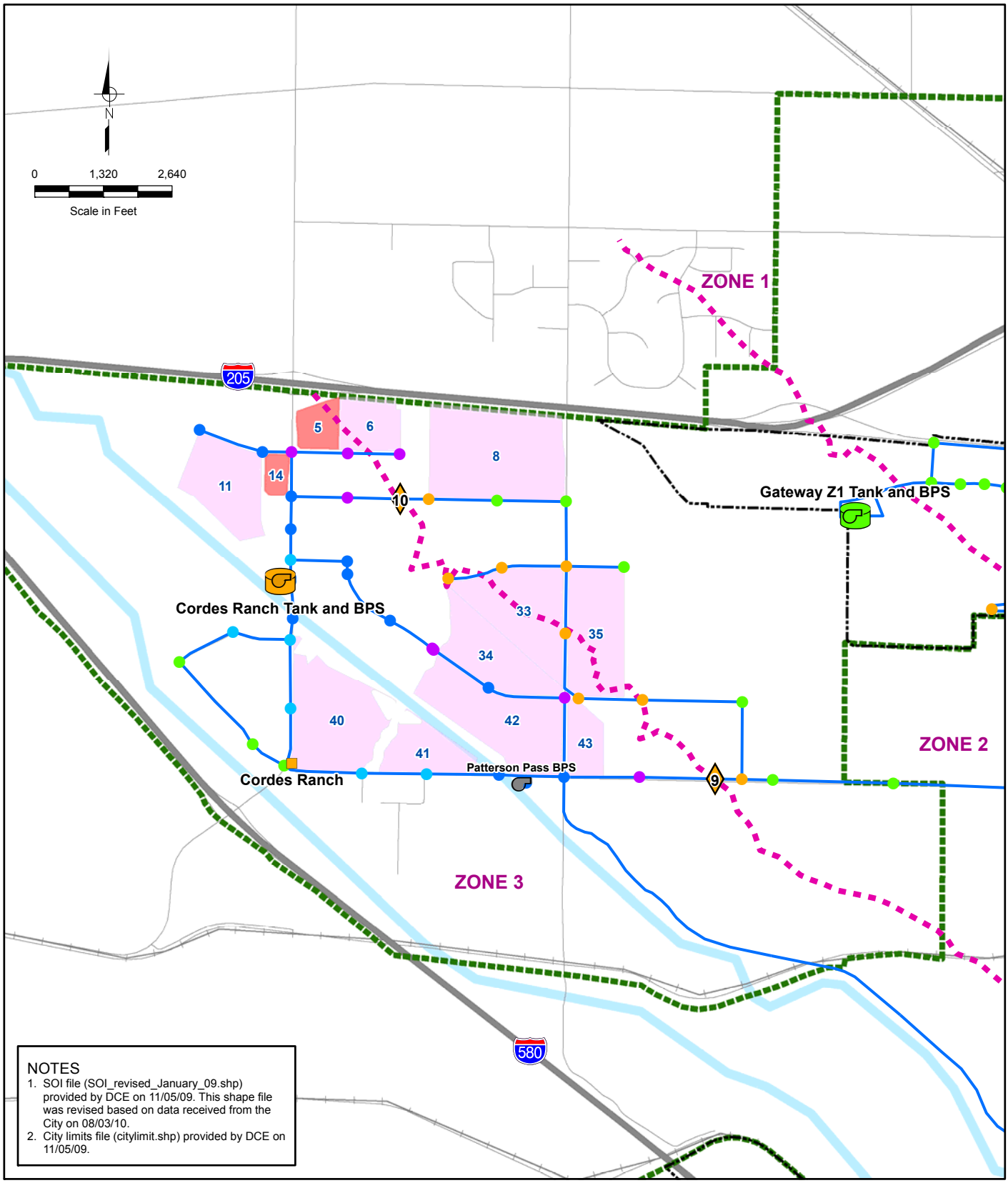
O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 6_BOFF.mxd 9/4/2012

FIGURE 6

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

BUILDOUT POTABLE
MAX DAY + FIRE EVALUATION

WEST YOST ASSOCIATES
Consulting Engineers



NOTES
1. SOI file (SOI_revised_January_09.shp) provided by DCE on 11/05/09. This shape file was revised based on data received from the City on 08/03/10.
2. City limits file (citylimit.shp) provided by DCE on 11/05/09.

LEGEND:

- Pressure < 40 psi
- 40 psi < Pressure ≤ 50 psi
- 50 psi < Pressure ≤ 60 psi
- 60 psi < Pressure ≤ 70 psi
- 70 psi < Pressure ≤ 80 psi
- Pressure > 80 psi

Pipeline Diameter ≥ 18-inches
- Velocity ≤ 6 fps
- Velocity > 6 fps

Pipeline Diameter < 18-inches
- Velocity ≤ 8 fps
- Velocity > 8 fps

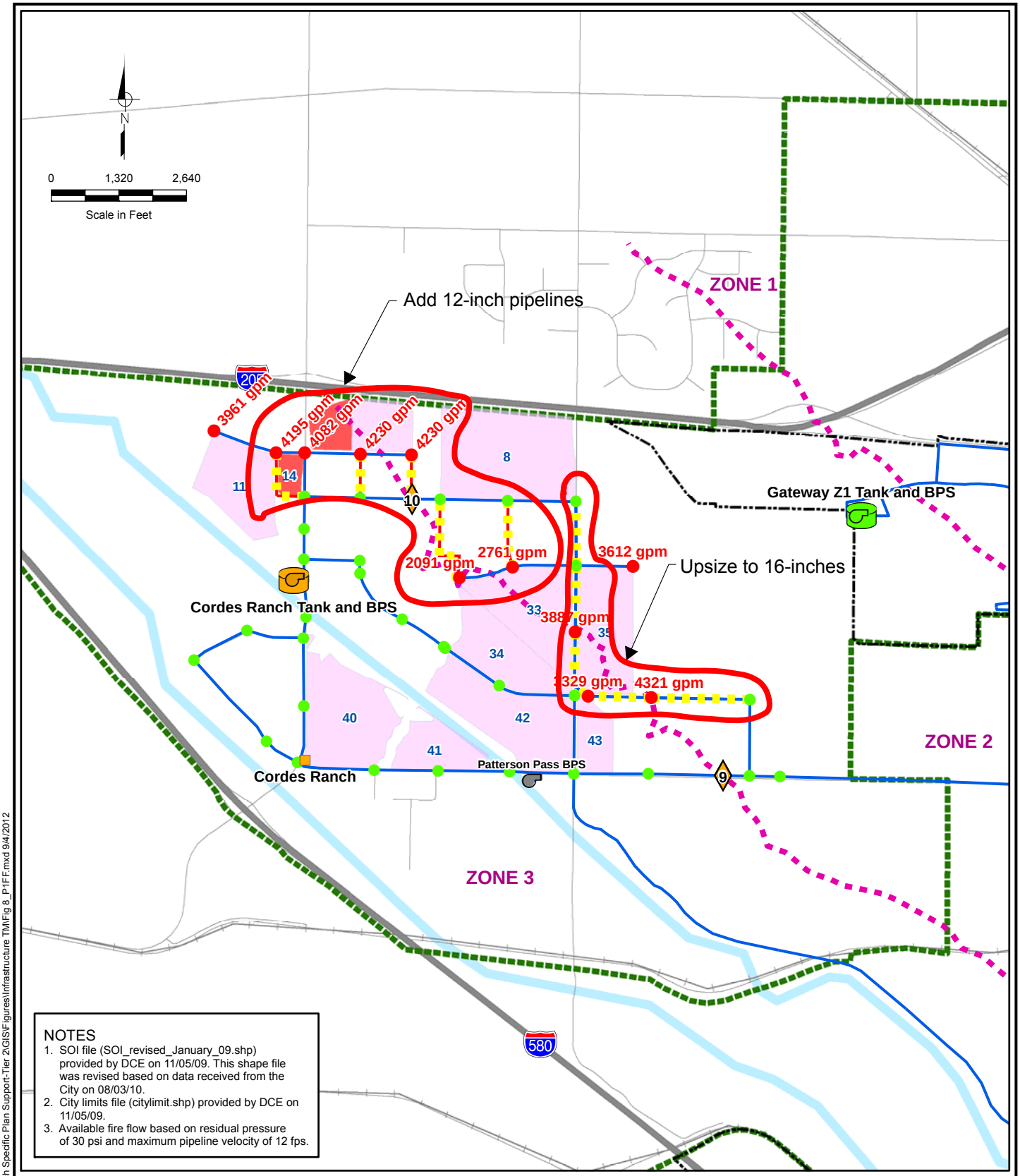
FIGURE 7

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

PHASE 1 POTABLE PEAK HOUR EVALUATION

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 7_P1PH.mxd 8/2/2012



NOTES
1. SOI file (SOI_revised_January_09.shp) provided by DCE on 11/05/09. This shape file was revised based on data received from the City on 08/03/10.
2. City limits file (citylimit.shp) provided by DCE on 11/05/09.
3. Available fire flow based on residual pressure of 30 psi and maximum pipeline velocity of 12 fps.

LEGEND:

- Fail (Available Fire Flow < 4,500 gpm)
- Pass (Available Fire Flow ≥ 4,500 gpm)
- Add Pipeline (12-inches)
- Upsize Pipeline to 16-inches

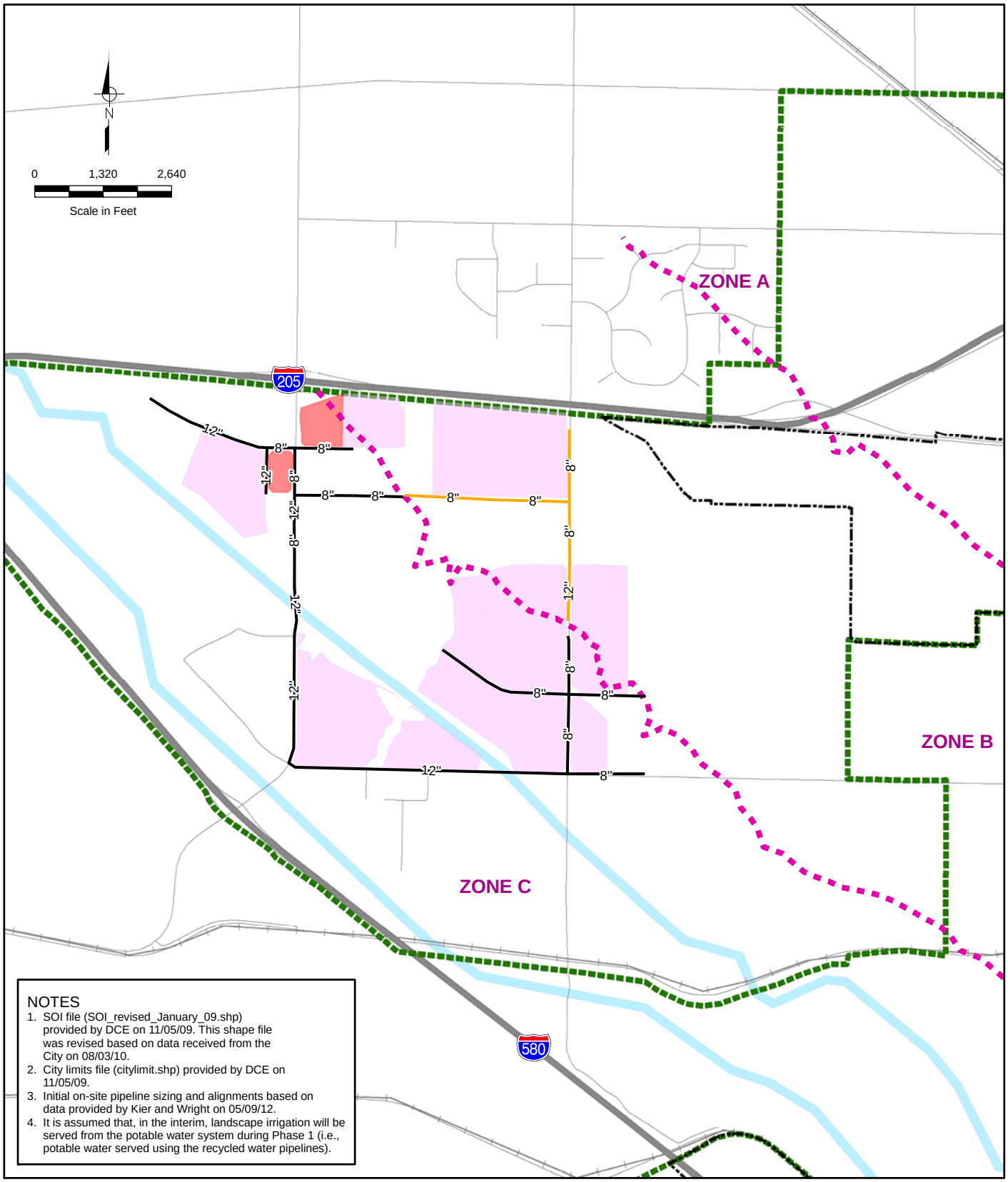
FIGURE 8

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

PHASE 1 POTABLE MAX DAY + FIRE EVALUATION

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 8_P1FF.mxd 9/4/2012



NOTES

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2. City limits file (citylimit.shp) provided by DCE on 11/05/09.
3. Initial on-site pipeline sizing and alignments based on data provided by Kier and Wright on 05/09/12.
4. It is assumed that, in the interim, landscape irrigation will be served from the potable water system during Phase 1 (i.e., potable water served using the recycled water pipelines).

LEGEND:

Proposed Pipelines

Cordes Ranch - Zone 2

Cordes Ranch - Zone 3

FIGURE 9

City of Tracy
Cordes Ranch Specific Plan
Tier 2 Infrastructure Evaluation

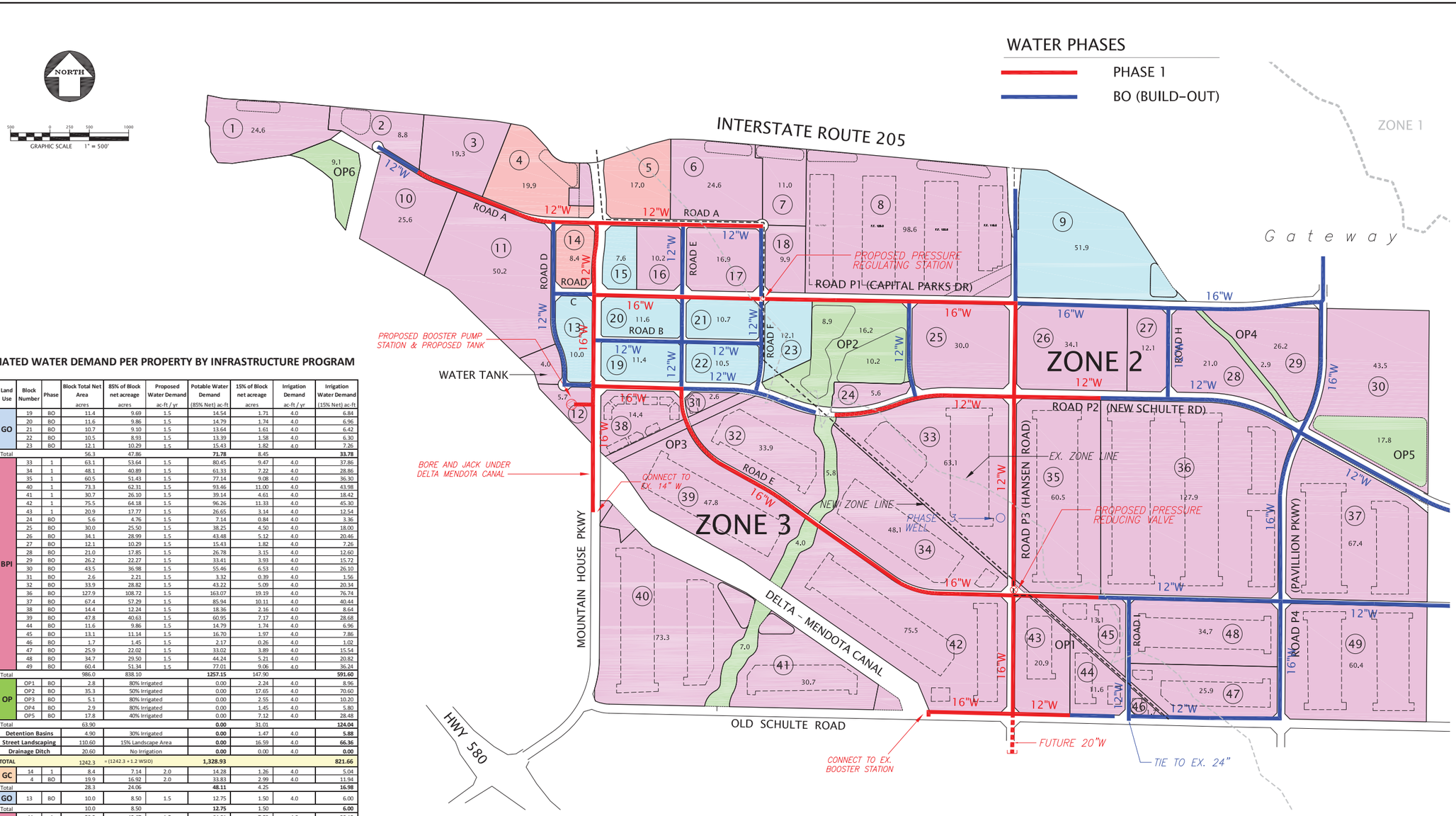
PHASE 1 RECYCLED WATER SYSTEM PIPELINES

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Infrastructure TM\Fig 9_PropRecycledOnsite_P1.mxd 9/4/2012

ATTACHMENT A

Key Data Received from Kier and Wright on May 9, 2012



ESTIMATED WATER DEMAND PER PROPERTY BY INFRASTRUCTURE PROGRAM

Property Owner	Land Use	Block Number	Phase	Block Total Net Area	85% of Block net acreage	Proposed Water Demand	Potable Water Demand	15% of Block net acreage	Irrigation Demand	Irrigation Water Demand
				acres	acres	ac-ft / yr	(85% Net) ac-ft	acres	ac-ft / yr	(15% Net) ac-ft
CROSSROADS BUSINESS CENTER AT CORDES RANCH	GO	19	BO	11.4	9.69	1.5	14.54	1.71	4.0	6.84
		20	BO	11.6	9.86	1.5	14.79	1.74	4.0	6.96
		21	BO	10.7	9.10	1.5	13.64	1.61	4.0	6.42
		22	BO	10.5	8.93	1.5	13.39	1.58	4.0	6.30
		23	BO	12.1	10.29	1.5	15.43	1.82	4.0	7.26
	Total			56.3	47.86		**71.78**	8.45		**33.78**
	BPI	33	1	63.1	53.64	1.5	80.45	9.47	4.0	37.86
		34	1	48.1	40.89	1.5	61.33	7.22	4.0	28.86
		35	1	60.5	51.43	1.5	77.14	9.08	4.0	36.30
		40	1	73.3	62.31	1.5	93.46	11.00	4.0	43.98
		41	1	30.7	26.10	1.5	39.14	4.61	4.0	18.42
		42	1	75.5	64.18	1.5	96.26	11.33	4.0	45.30
		43	1	20.9	17.77	1.5	26.65	3.14	4.0	12.54
		24	BO	5.6	4.76	1.5	7.14	0.84	4.0	3.36
		25	BO	30.0	25.50	1.5	38.25	4.50	4.0	18.00
		26	BO	34.1	28.99	1.5	43.48	5.12	4.0	20.46
		27	BO	12.1	10.29	1.5	15.43	1.82	4.0	7.26
		28	BO	21.0	17.85	1.5	26.78	3.15	4.0	12.60
		29	BO	26.2	22.27	1.5	33.41	3.93	4.0	15.72
		30	BO	43.5	36.98	1.5	55.46	6.53	4.0	26.10
		31	BO	2.6	2.21	1.5	3.32	0.39	4.0	1.56
		32	BO	33.9	28.82	1.5	43.22	5.09	4.0	20.34
		36	BO	127.9	108.72	1.5	163.07	19.19	4.0	76.74
		37	BO	67.4	57.29	1.5	85.94	10.11	4.0	40.44
		38	BO	14.4	12.24	1.5	18.36	2.16	4.0	8.64
		39	BO	47.8	40.63	1.5	60.95	7.17	4.0	28.68
		44	BO	11.6	9.86	1.5	14.79	1.74	4.0	6.96
		45	BO	13.1	11.14	1.5	16.70	1.97	4.0	7.86
		46	BO	1.7	1.45	1.5	2.17	0.26	4.0	1.02
		47	BO	25.9	22.02	1.5	33.02	3.89	4.0	15.54
		48	BO	34.7	29.50	1.5	44.24	5.21	4.0	20.82
		49	BO	60.4	51.34	1.5	77.01	9.06	4.0	36.24
	Total			986.0	838.10		**1257.15**	147.90		**591.60**
	OP	OP1	BO	2.8	80% Irrigated		0.00	2.24	4.0	8.96
		OP2	BO	35.3	50% Irrigated		0.00	17.65	4.0	70.60
		OP3	BO	5.1	80% Irrigated		0.00	2.55	4.0	10.20
		OP4	BO	2.9	80% Irrigated		0.00	1.45	4.0	5.80
		OP5	BO	17.8	40% Irrigated		0.00	7.12	4.0	28.48
	Total			63.90			**0.00**	31.01		**124.04**
	Detention Basins			4.90	30% Irrigated		**0.00**	1.47	4.0	**5.88**
	Street Landscaping			110.60	15% Landscape Area		**0.00**	16.59	4.0	**66.36**
	Drainage Ditch			20.60	No Irrigation		**0.00**	0.00	4.0	**0.00**
	TOTAL			1242.3	= (1242.3 + 1.2 WSID)		**1,328.93**			**821.66**
GBC GLOBAL INVESTMENTS	GC	14	1	8.4	7.14	2.0	14.28	1.26	4.0	5.04
		4	BO	19.9	16.92	2.0	33.83	2.99	4.0	11.94
	Total			28.3	24.06		**48.11**	4.25		**16.98**
	GO	13	BO	10.0	8.50	1.5	12.75	1.50	4.0	6.00
	Total			10.0	8.50		**12.75**	1.50		**6.00**
	BPI	11	1	50.2	42.67	1.5	64.01	7.53	4.0	30.12
		1	BO	23.0	19.55	1.5	29.33	3.45	4.0	13.80
		2	BO	10.4	8.84	1.5	13.26	1.56	4.0	6.24
		3	BO	19.3	16.41	1.5	24.61	2.90	4.0	11.58
		10	BO	25.6	21.76	1.5	32.64	3.84	4.0	15.36
		12	BO	5.7	4.85	1.5	7.27	0.86	4.0	3.42
	Total			134.2	114.07		**171.11**	20.13		**80.52**
	OP	OP6	BO	9.1	40% Irrigated		**0.00**	3.64	4.0	14.56
	Detention Basins			6.20	30% Irrigated		**0.00**	1.86	4.0	**7.44**
	Street Landscaping			15.40	15% Landscape Area		**0.00**	2.31	4.0	**9.24**
	TOTAL			203.2	= (203.2 + 4.0 Water Tank + 2.7 PG&E		**231.97**			**134.74**
DELTA PROPERTIES	GC	5	1	17.0	14.45	2.0	28.90	2.55	4.0	10.20
	Total			17.0	14.45		**28.90**	2.55		**10.20**
	GO	15	BO	7.6	6.46	1.5	9.69	1.14	4.0	4.56
	Total			7.6	6.46		**9.69**	1.14		**4.56**
	BPI	6	1	24.6	20.91	1.5	31.37	3.69	4.0	14.76
		7	BO	11.0	9.35	1.5	14.03	1.65	4.0	6.60
		16	BO	10.2	8.67	1.5	13.01	1.53	4.0	6.12
		17	BO	16.9	14.37	1.5	21.55	2.54	4.0	10.14
		18	BO	9.9	8.42	1.5	12.62	1.49	4.0	5.94
	Total			72.6	61.71		**92.57**	10.89		**43.56**
	Detention Basins			3.80	30% Irrigated		**0.00**	1.14	4.0	**4.56**
	Street Landscaping			13.60	15% Landscape Area		**0.00**	2.04	4.0	**8.16**
	TOTAL			114.6			**121.47**			**66.48**
TWL INVESTORS LLC	BPI	8	1	98.6	83.81	1.5	125.72	14.79	4.0	59.16
	Detention Basins			4.60	30% Irrigated		**0.00**	1.38	4.0	**5.52**
	Street Landscaping			4.90	15% Landscape Area		**0.00**	0.74	4.0	**2.94**
	TOTAL			108.1			**125.72**			**67.62**
OPEZ / ADAMS / GILLON / GOUVEIA / AMB	GO	9	BO	51.9	44.12	1.5	66.17	7.79	4.0	31.14
	Detention Basins			2.20	30% Irrigated		**0.00**	0.66	4.0	**2.64**
	Street Landscaping			4.30	15% Landscape Area		**0.00**	0.65	4.0	**2.58**
	TOTAL			58.4			**66.17**			**36.36**
GRAND TOTAL				1726.6			**1,874.25**			**1,126.86**

OVERALL WATER DEMAND CALCULATIONS

Land Use	Description	Master Plan Water Demand (ac-ft/ac/yr)	Master Plan Area (Gross)	Percentage of Acerage requiring Potable Water	Master Plan FAR	Master Plan Building Square Footage	Master Plan Total Water Demand	Demand per Square Footage of building ac-ft/yr/sf	Weighted Demand per Square Footage of building	Specific Plan Area (Net)	Specific Plan FAR	Specific Plan Potable Water Demand (Based on Net Acres)	Percent Reduction from Master Plan Based on Acreage	Specific Plan Building Square Footage	Potable Water Demand based on building square footage	Percent Reduction from Master Plan Based on Bldg SF
GC	General Commercial	2.0	85	85%	0.30	1,110,780	145	**0.000130**	**0.105219**	45.3	0.30	91	**37.30%**	591,980	77	**46.71%**
GO	General Office	1.5	150	85%	0.45	2,940,300	191	**0.000065**	**0.000065**	125.8	0.45	189	**1.33%**	2,465,932	160	**16.13%**
BPI	Business Park Industrial	1.5	1,488	85%	0.50	32,408,640	1,897	**0.000059**	**0.048485**	1,291.4	0.50	1,937	**-2.10%**	28,126,692	1,647	**13.21%**
			1,723			36,459,720	2,233			1,462.5		2,216	**0.74%**	31,184,604	1,884	**15.63%**

LAND USE LEGEND

- **GC** GENERAL COMMERCIAL
- **GO** GENERAL OFFICE
- **BPI** BUSINESS PARK INDUSTRIAL
- **OP** OPEN SPACE / PARKS

NO.	REVISION	BY

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
3350 Shelby Road, Suite 210
Livermore, California 94551
(925) 245-8788
Fax (925) 245-8796

WATER – INFRASTRUCTURE PROGRAM
ESTIMATED IMPACTS PER PROPERTY BY INFRASTRUCTURE PROGRAM
CORDES RANCH
TRACY CALIFORNIA

DATE	05/02/2012
SCALE	1" = 500'
DESIGNER	M.F.B.
JOB NO.	A09500
SHEET	W
OF	SHEETS

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

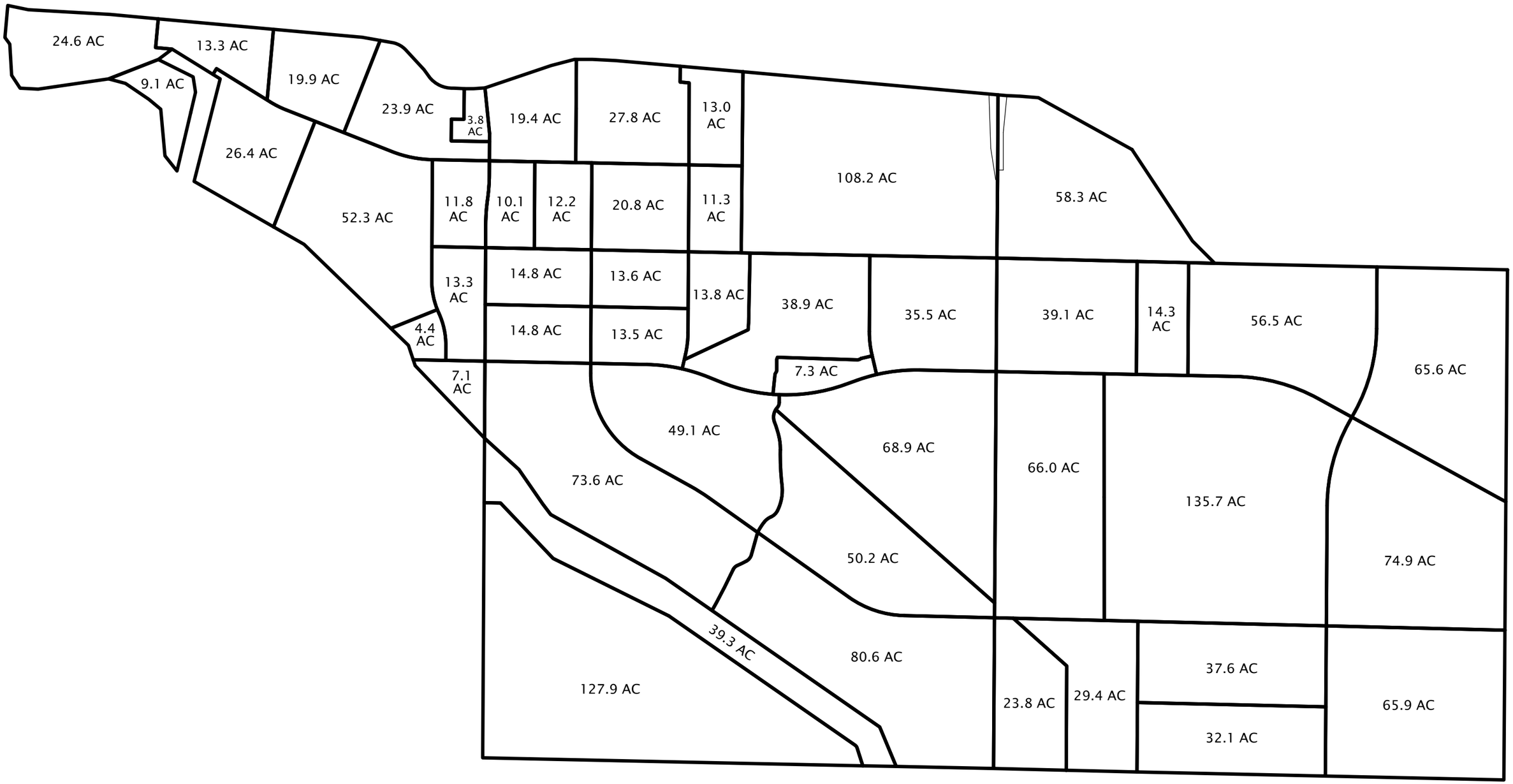
NORTH

NET AREAS CALCULATIONS

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	05/01/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	A-NET



KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

GRAPHIC SCALE 1" = 1000'

NORTH

GROSS AREAS CALCULATIONS

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	05/01/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	A-GROSS

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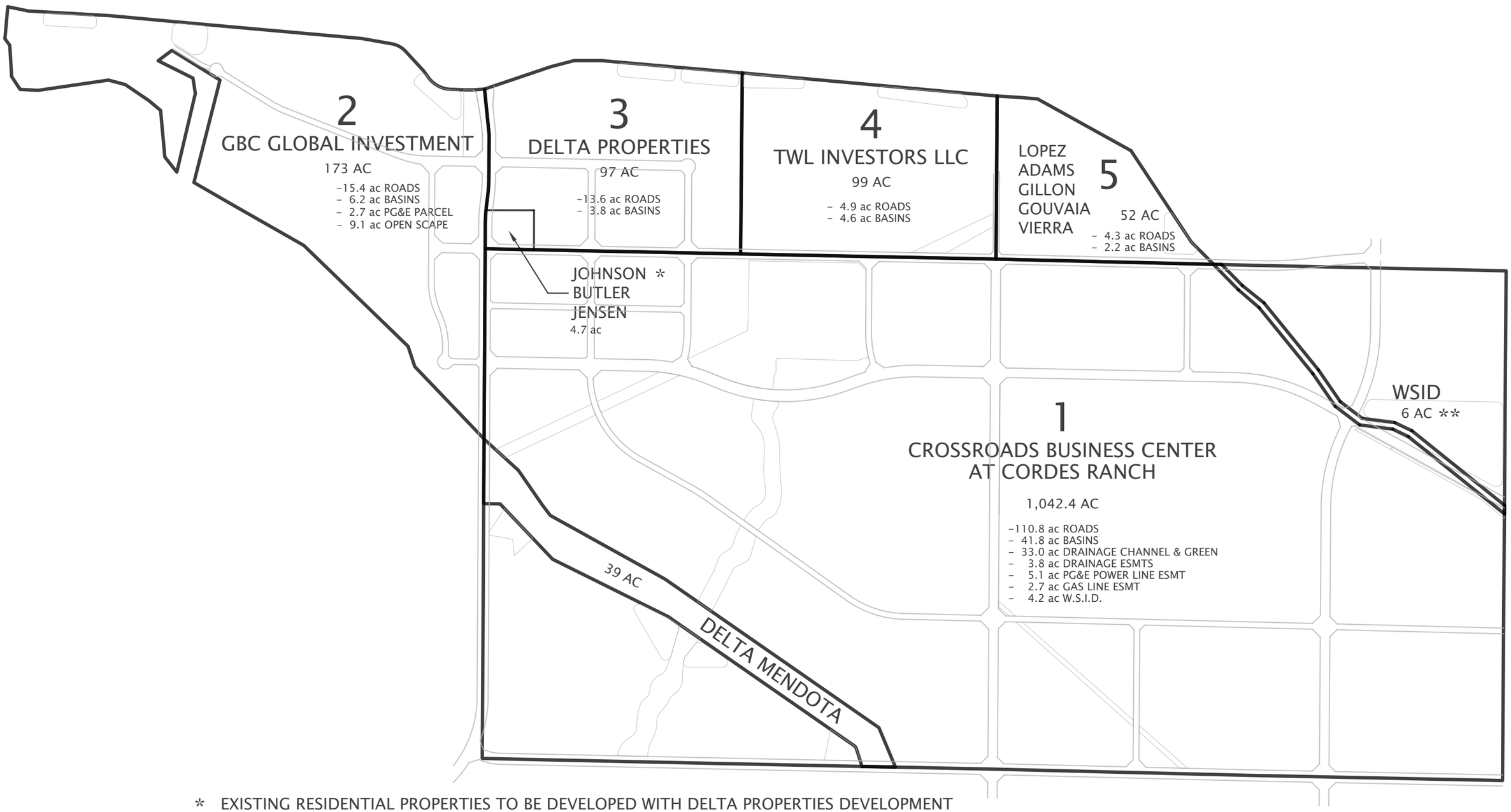

* EXISTING RESIDENTIAL PROPERTIES TO BE DEVELOPED WITH DELTA PROPERTIES DEVELOPMENT

** 2 AC OF WSID ARE WITHIN PROPOSED ROAD RIGHT-OF-WAY

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

GRAPHIC SCALE 0 500 1000 2000 1" = 1000'

NORTH

TOTAL NET AREA
1,464 ACRES

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	05/01/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	TOTAL NET

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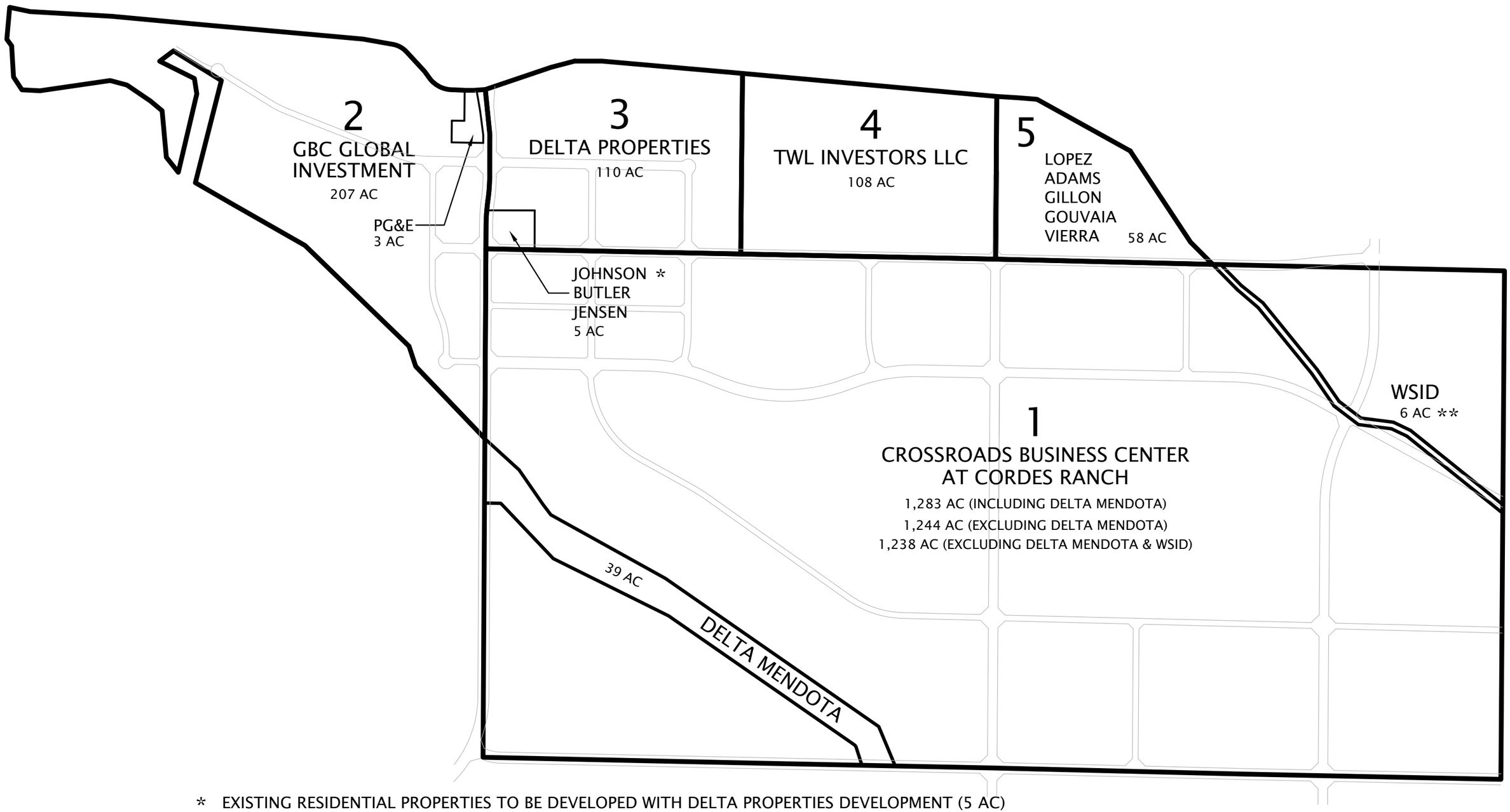

* EXISTING RESIDENTIAL PROPERTIES TO BE DEVELOPED WITH DELTA PROPERTIES DEVELOPMENT (5 AC)

** 2 AC OF WSID ARE WITHIN PROPOSED ROAD RIGHT-OF-WAY

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

TOTAL GROSS AREA
1,774 ACRES

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	04/26/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	TOTAL GROSS

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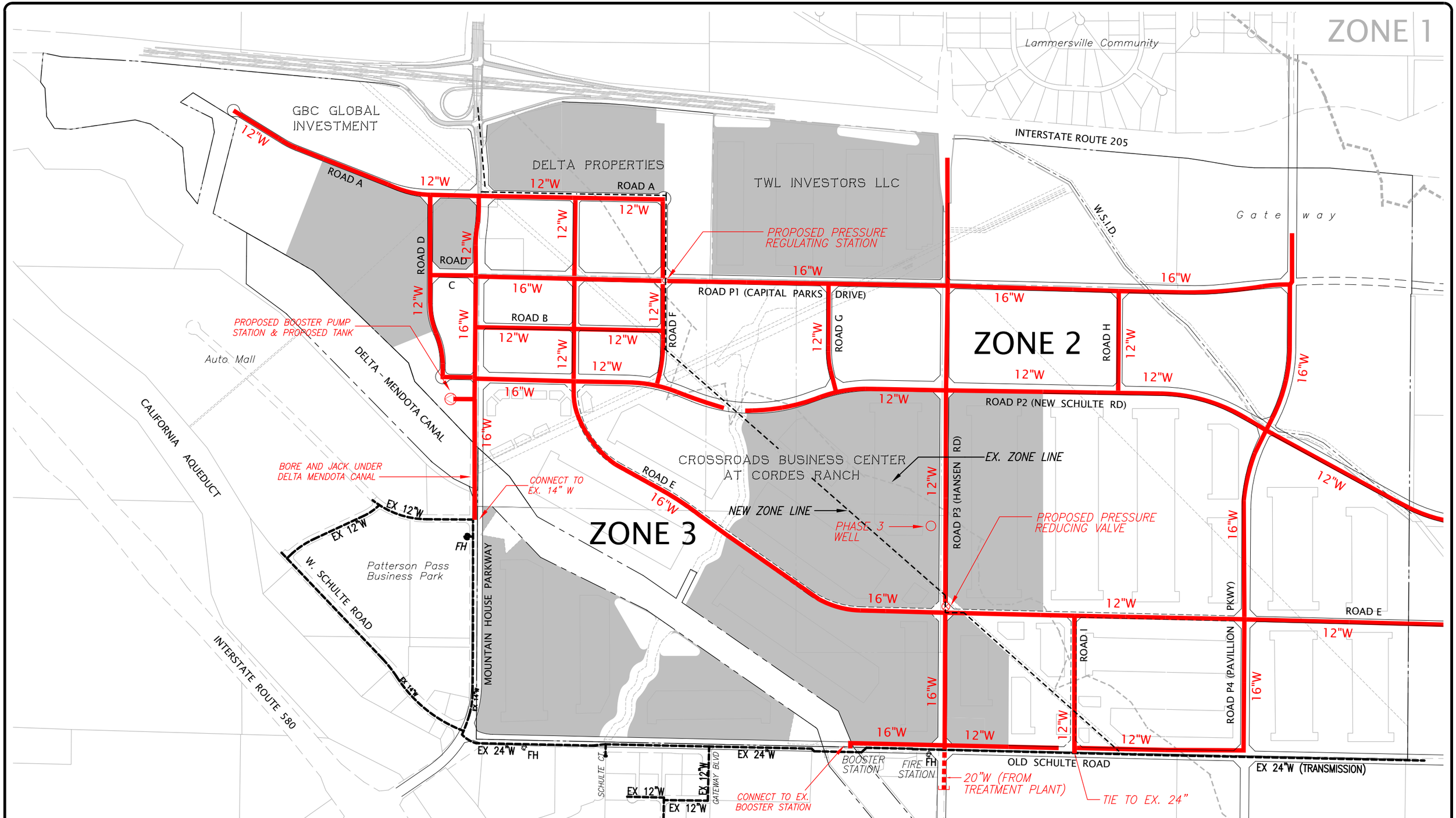

KIER & WRIGHT
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2850 Collier Canyon Road (925) 245-8788
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0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

CROSSROADS BUSINESS CENTER AT CORDES RANCH

CORDES RANCH
BUILD-OUT - WATER

TRACY CALIFORNIA

DATE	05/08/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	WATER-5

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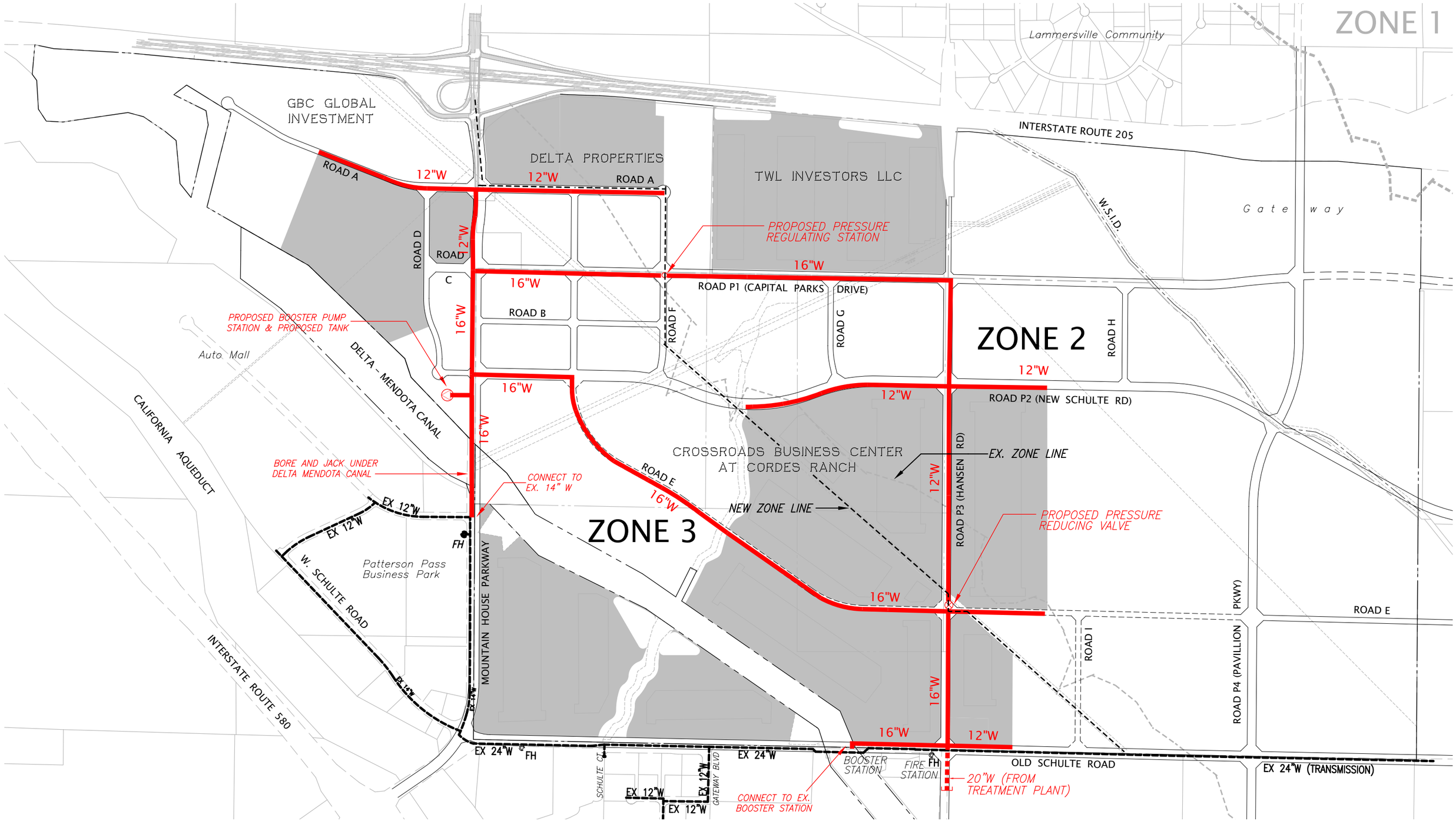

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

CROSSROADS BUSINESS CENTER AT CORDES RANCH

CORDES RANCH
PHASE 1 - WATER

TRACY CALIFORNIA

DATE	05/08/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	WATER-1

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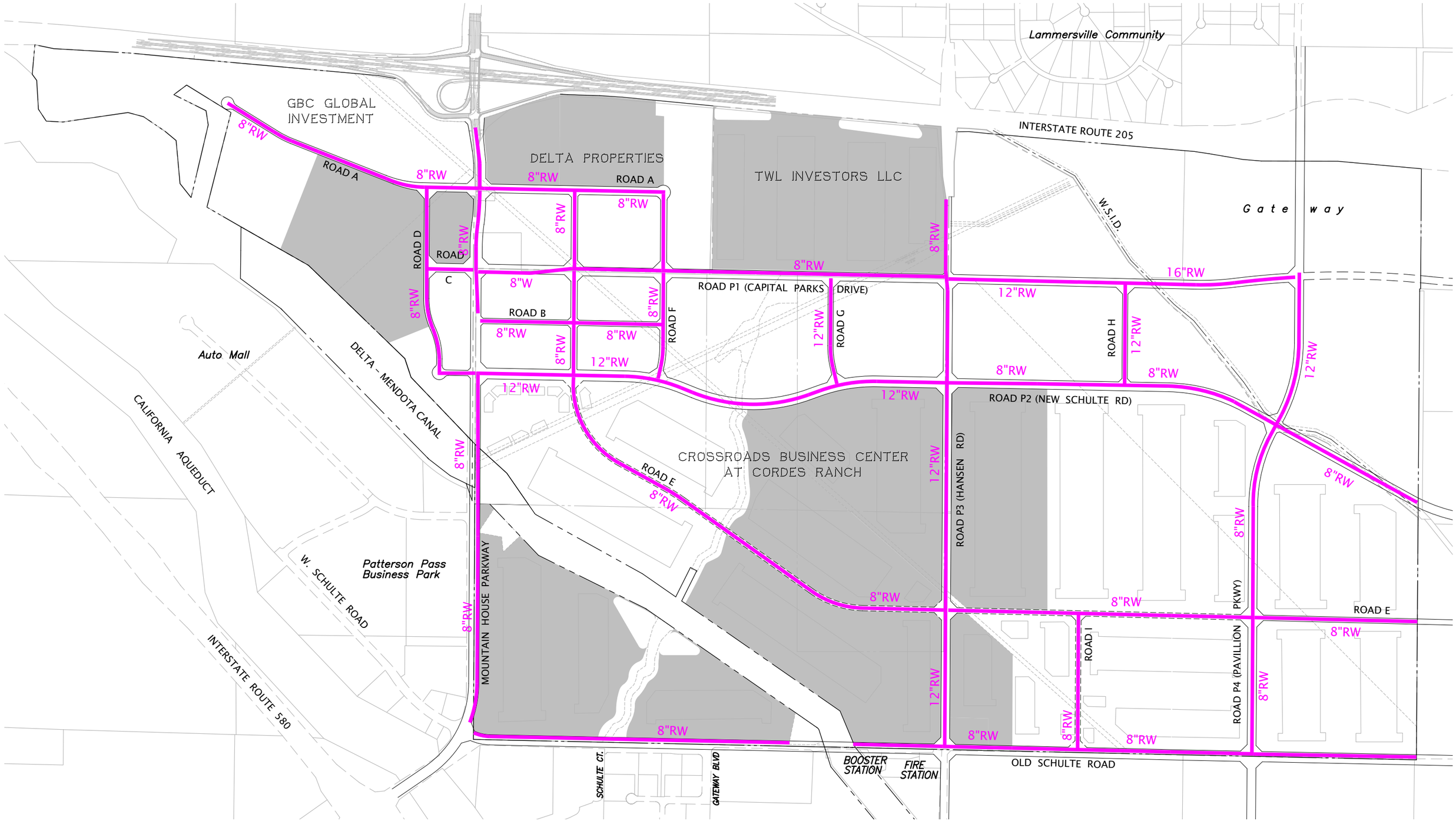

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

CROSSROADS BUSINESS CENTER AT CORDES RANCH

CORDES RANCH
BUILD-OUT - RECLAIMED WATER

TRACY CALIFORNIA

DATE	05/08/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	RW-5

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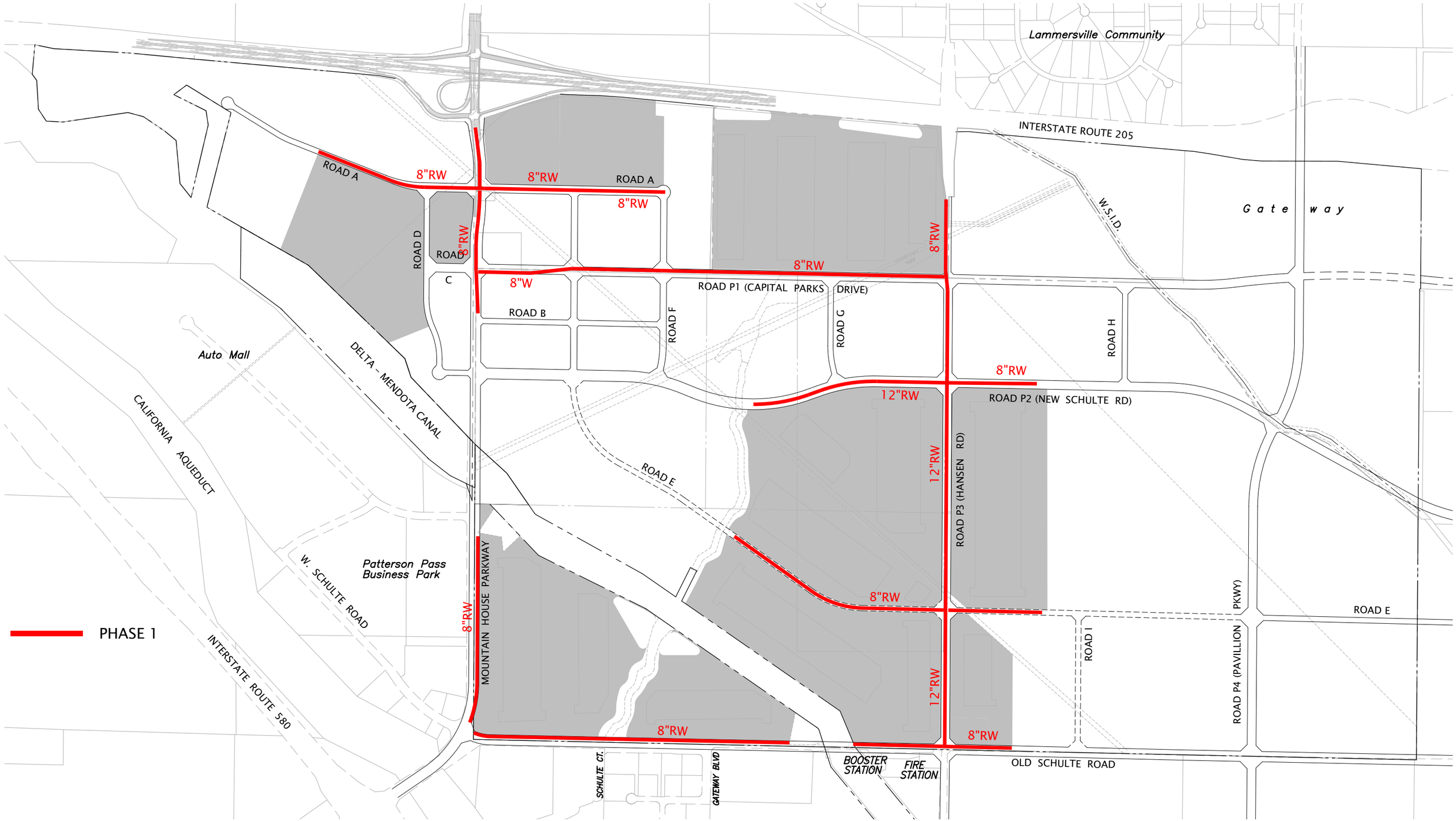

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

CROSSROADS BUSINESS CENTER AT CORDES RANCH

CORDES RANCH
PHASE 1 - RECLAIMED WATER

TRACY CALIFORNIA

DATE	05/08/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	RW-1

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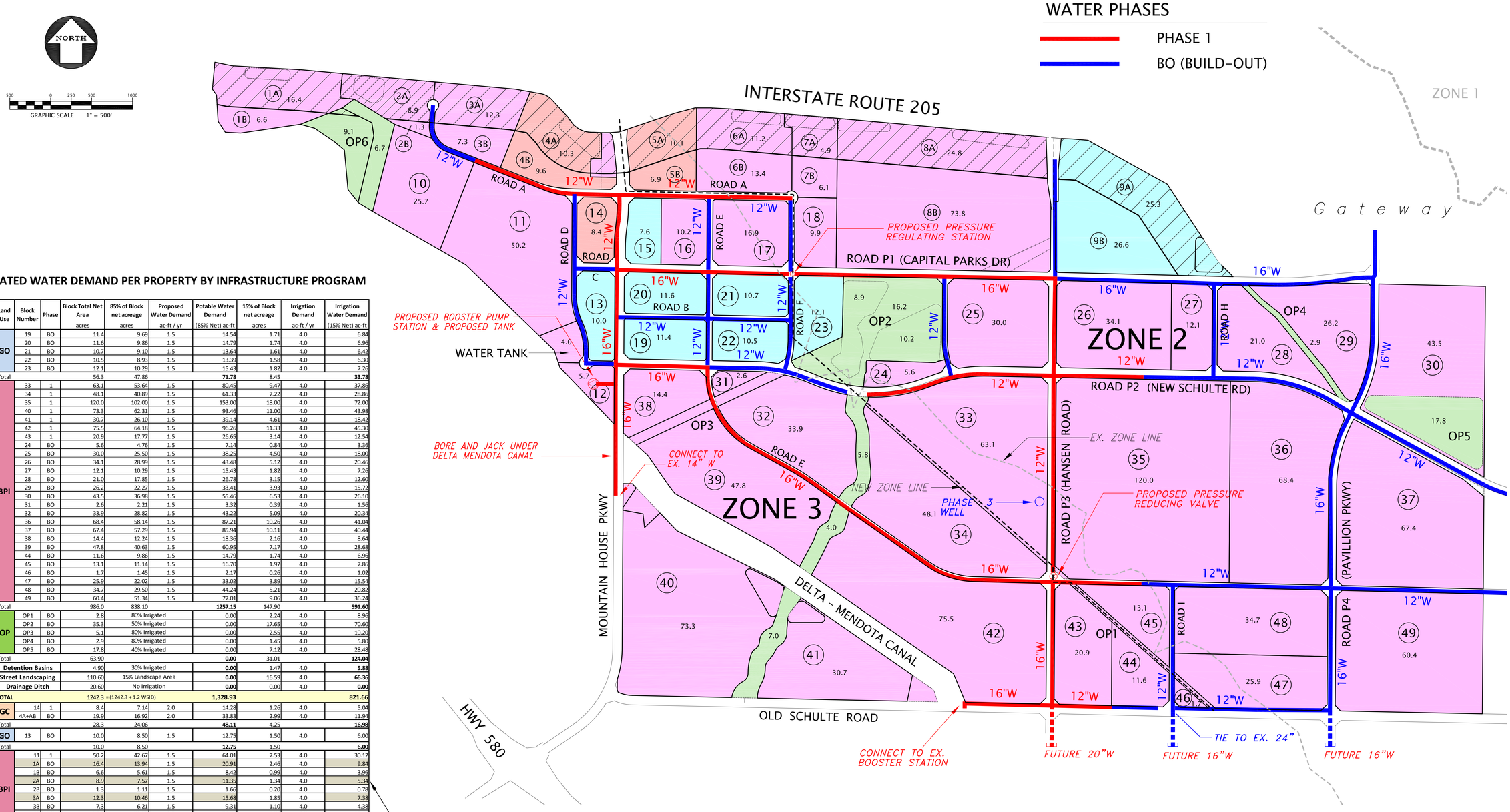
ATTACHMENT B

Revised Data Received from Kier and Wright on October 16, 2012



ESTIMATED WATER DEMAND PER PROPERTY BY INFRASTRUCTURE PROGRAM

Property Owner	Land Use	Block Number	Phase	Block Total Net Area acres	85% of Block net acreage acres	Proposed Water Demand ac-ft / yr	Potable Water Demand (85% Net) ac-ft	15% of Block net acreage acres	Irrigation Demand ac-ft / yr	Irrigation Water Demand (15% Net) ac-ft
CROSSROADS BUSINESS CENTER AT CORDES RANCH	GO	19	BO	11.4	9.69	1.5	14.54	1.71	4.0	6.84
		20	BO	11.6	9.86	1.5	14.79	1.74	4.0	6.96
		21	BO	10.7	9.10	1.5	13.64	1.61	4.0	6.42
		22	BO	10.5	8.93	1.5	13.39	1.58	4.0	6.30
		23	BO	12.1	10.29	1.5	15.43	1.82	4.0	7.26
	Total			56.3	47.86		**71.78**	8.45		**33.78**
	BPI	33	1	63.1	53.64	1.5	80.45	9.47	4.0	37.86
		34	1	48.1	40.89	1.5	61.33	7.22	4.0	28.86
		35	1	120.0	102.00	1.5	153.00	18.00	4.0	72.00
		40	1	73.3	62.31	1.5	93.46	11.00	4.0	43.98
		41	1	30.7	26.10	1.5	39.14	4.61	4.0	18.42
		42	1	75.5	64.18	1.5	96.26	11.33	4.0	45.30
		43	1	20.9	17.77	1.5	26.65	3.14	4.0	12.54
		24	BO	5.6	4.76	1.5	7.14	0.84	4.0	3.36
		25	BO	30.0	25.50	1.5	38.25	4.50	4.0	18.00
		26	BO	34.1	28.99	1.5	43.48	5.12	4.0	20.46
		27	BO	12.1	10.29	1.5	15.43	1.82	4.0	7.26
		28	BO	21.0	17.85	1.5	26.78	3.15	4.0	12.60
		29	BO	26.2	22.27	1.5	33.41	3.93	4.0	15.72
		30	BO	43.5	36.98	1.5	55.46	6.53	4.0	26.10
		31	BO	2.6	2.21	1.5	3.32	0.39	4.0	1.56
		32	BO	33.9	28.82	1.5	43.22	5.09	4.0	20.34
		36	BO	68.4	58.14	1.5	87.21	10.26	4.0	41.04
		37	BO	67.4	57.29	1.5	85.94	10.11	4.0	40.44
		38	BO	14.4	12.24	1.5	18.36	2.16	4.0	8.64
		39	BO	47.8	40.63	1.5	60.95	7.17	4.0	28.68
		44	BO	11.6	9.86	1.5	14.79	1.74	4.0	6.96
		45	BO	13.1	11.14	1.5	16.70	1.97	4.0	7.86
		46	BO	1.7	1.45	1.5	2.17	0.26	4.0	1.02
		47	BO	25.9	22.02	1.5	33.02	3.89	4.0	15.54
		48	BO	34.7	29.50	1.5	44.24	5.21	4.0	20.82
		49	BO	60.4	51.34	1.5	77.01	9.06	4.0	36.24
	Total			986.0	838.10		**1257.15**	147.90		**591.60**
	OP	OP1	BO	2.8	80% Irrigated		0.00	2.24	4.0	8.96
		OP2	BO	35.3	50% Irrigated		0.00	17.65	4.0	70.60
		OP3	BO	5.1	80% Irrigated		0.00	2.55	4.0	10.20
		OP4	BO	2.9	80% Irrigated		0.00	1.45	4.0	5.80
		OP5	BO	17.8	40% Irrigated		0.00	7.12	4.0	28.48
	Total			63.90			**0.00**	31.01		**124.04**
	Detention Basins			4.90	30% Irrigated		**0.00**	1.47	4.0	**5.88**
	Street Landscaping			110.60	15% Landscape Area		**0.00**	16.59	4.0	**66.36**
	Drainage Ditch			20.60	No Irrigation		**0.00**	0.00	4.0	**0.00**
	TOTAL			1242.3	=(1242.3 +1.2 WSID)		**1,328.93**			**821.66**
GBC GLOBAL INVESTMENTS	GC	14	1	8.4	7.14	2.0	14.28	1.26	4.0	5.04
		4A+AB	BO	19.9	16.92	2.0	33.83	2.99	4.0	11.94
	Total			28.3	24.06		**48.11**	4.25		**16.98**
	GO	13	BO	10.0	8.50	1.5	12.75	1.50	4.0	6.00
	Total			10.0	8.50		**12.75**	1.50		**6.00**
	BPI	11	1	50.2	42.67	1.5	64.01	7.53	4.0	30.12
		1A	BO	16.4	13.94	1.5	20.91	2.46	4.0	9.84
		1B	BO	6.6	5.61	1.5	8.42	0.99	4.0	3.96
		2A	BO	8.9	7.57	1.5	11.35	1.34	4.0	5.34
		2B	BO	1.3	1.11	1.5	1.66	0.20	4.0	0.78
		3A	BO	12.3	10.46	1.5	15.68	1.85	4.0	7.38
		3B	BO	7.3	6.21	1.5	9.31	1.10	4.0	4.38
		10	BO	25.7	21.85	1.5	32.77	3.86	4.0	15.42
		12	BO	5.7	4.85	1.5	7.27	0.86	4.0	3.42
	Total			134.4	114.24		**171.36**	20.16		**80.64**
	OP	OP6	BO	9.1	40% Irrigated		0.00	3.64	4.0	14.56
	Detention Basins			6.20	30% Irrigated		**0.00**	1.86	4.0	**7.44**
	Street Landscaping			15.40	15% Landscape Area		**0.00**	2.31	4.0	**9.24**
	TOTAL			203.4	=(203.2 + 4.0 Water Tank + 2.7 PG&E		**232.22**			**134.86**
DELTA PROPERTIES	GC	5A+5B	1	17.0	14.45	2.0	28.90	2.55	4.0	10.20
	Total			17.0	14.45		**28.90**	2.55		**10.20**
	GO	15	BO	7.6	6.46	1.5	9.69	1.14	4.0	4.56
	Total			7.6	6.46		**9.69**	1.14		**4.56**
	BPI	6A	1	11.2	9.52	1.5	14.28	1.68	4.0	6.72
		6A	1	13.4	11.39	1.5	17.09	2.01	4.0	8.04
		7A	BO	4.9	4.17	1.5	6.25	0.74	4.0	2.94
		7A	BO	6.1	5.19	1.5	7.78	0.92	4.0	3.66
		16	BO	10.2	8.67	1.5	13.01	1.53	4.0	6.12
		17	BO	16.9	14.37	1.5	21.55	2.54	4.0	10.14
		18	BO	9.9	8.42	1.5	12.62	1.49	4.0	5.94
	Total			72.6	61.71		**92.57**	10.89		**43.56**
	Detention Basins			3.80	30% Irrigated		**0.00**	1.14	4.0	**4.56**
	Street Landscaping			13.60	15% Landscape Area		**0.00**	2.04	4.0	**8.16**
	TOTAL			114.6			**121.47**			**66.48**
TWL INVESTORS LLC	BPI	8A	1	24.8	21.08	1.5	31.62	3.72	4.0	14.88
		8B	1	73.8	62.73	1.5	94.10	11.07	4.0	44.28
	Detention Basins			4.60	30% Irrigated		**0.00**	1.38	4.0	**5.52**
	Street Landscaping			4.90	15% Landscape Area		**0.00**	0.74	4.0	**2.94**
	TOTAL			108.1			**125.72**			**67.62**
LOPEZ / ADAMS / GILLON / COUGHLIN / OWEBER	GO	9A+9B	BO	51.9	44.12	1.5	66.17	7.79	4.0	31.14
	Detention Basins			2.20	30% Irrigated		**0.00**	0.66	4.0	**2.64**
	Street Landscaping			4.30	15% Landscape Area		**0.00**	0.65	4.0	**2.58**
	TOTAL			58.4			**66.17**			**36.36**
GRAND TOTAL				1726.8			**1,874.51**			**1,126.98**

No impact on Water Demand for the I-205 Overlay Zone over BPI Zoning
Proposed Water Demand is the same for GO and BPI (1.5 ac-ft/yr)

OVERALL WATER DEMAND CALCULATIONS

Land Use	Description	Master Plan Water Demand (ac-ft/ac/yr)	Master Plan Area (Gross)	Percentage of Acerage requiring Potable Water	Master Plan FAR	Master Plan Building Square Footage	Master Plan Total Water Demand	Demand per Square Footage of building ac-ft/yr/sf	Weighted Demand per Square Footage of building	Specific Plan Area (Net)	Specific Plan FAR	Specific Plan Potable Water Demand (Based on Net Acres)	Percent Reduction from Master Plan Based on Acreage	Specific Plan Building Square Footage	Potable Water Demand based on building square footage	Percent Reduction from Master Plan Based on Bldg SF
GC	General Commercial	2.0	85	85%	0.30	1,110,780	145	**0.000130**	**0.105219**	45.3	0.30	91	**37.30%**	591,980	77	**46.71%**
GO	General Office	1.5	150	85%	0.45	2,940,300	191	**0.000065**	**0.000065**	125.8	0.45	189	**1.33%**	2,465,932	160	**16.13%**
BPI	Business Park Industrial	1.5	1,488	85%	0.50	32,408,640	1,897	**0.000059**	**0.048485**	1,291.4	0.50	1,937	**-2.10%**	28,126,692	1,647	**13.21%**
			1,723			36,459,720	2,233			1,462.5		2,216	**0.74%**	31,184,604	1,884	**15.63%**

LAND USE LEGEND

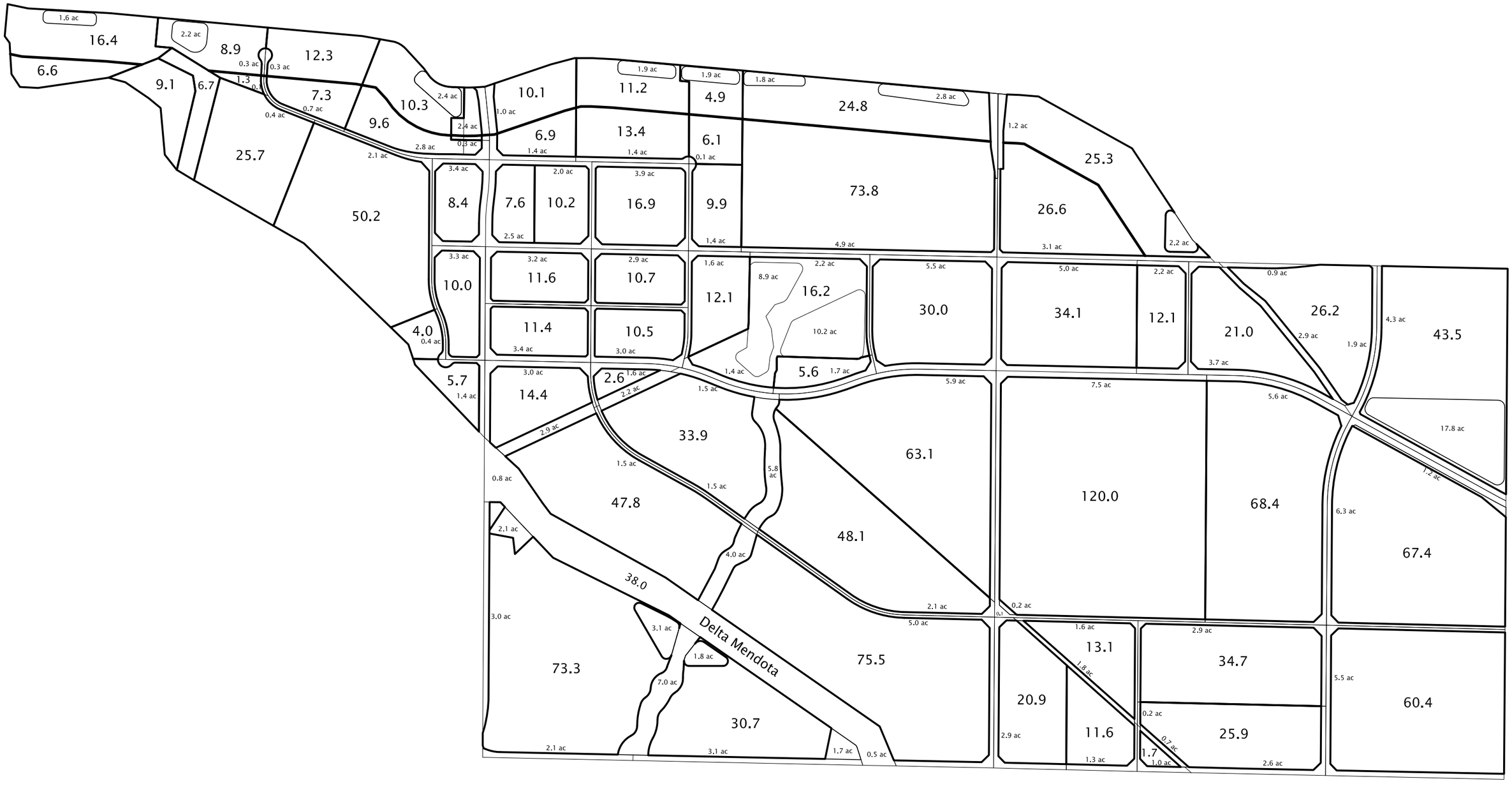
- GC — GENERAL COMMERCIAL
- GO — GENERAL OFFICE
- BPI — BUSINESS PARK INDUSTRIAL
- OP — OPEN SPACE / PARKS
- I-205 OVERLAY ZONE

REVISION / BY / NO.

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2870 Gateway Oaks Drive, Suite 150
Sacramento, California 95833
(916) 263-3658
Fax (925) 245-8796
Livermore, California 94551

WATER - INFRASTRUCTURE PROGRAM
ESTIMATED IMPACTS PER PROPERTY BY INFRASTRUCTURE PROGRAM
CORDES RANCH
TRACY CALIFORNIA

DATE	10/16/2012
SCALE	1" = 500'
DESIGNER	M.F.B.
JOB NO.	A09500
SHEET	W
OF	SHEETS



KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

NET AREA CALCULATIONS

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	10/16/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	I-205 AREA

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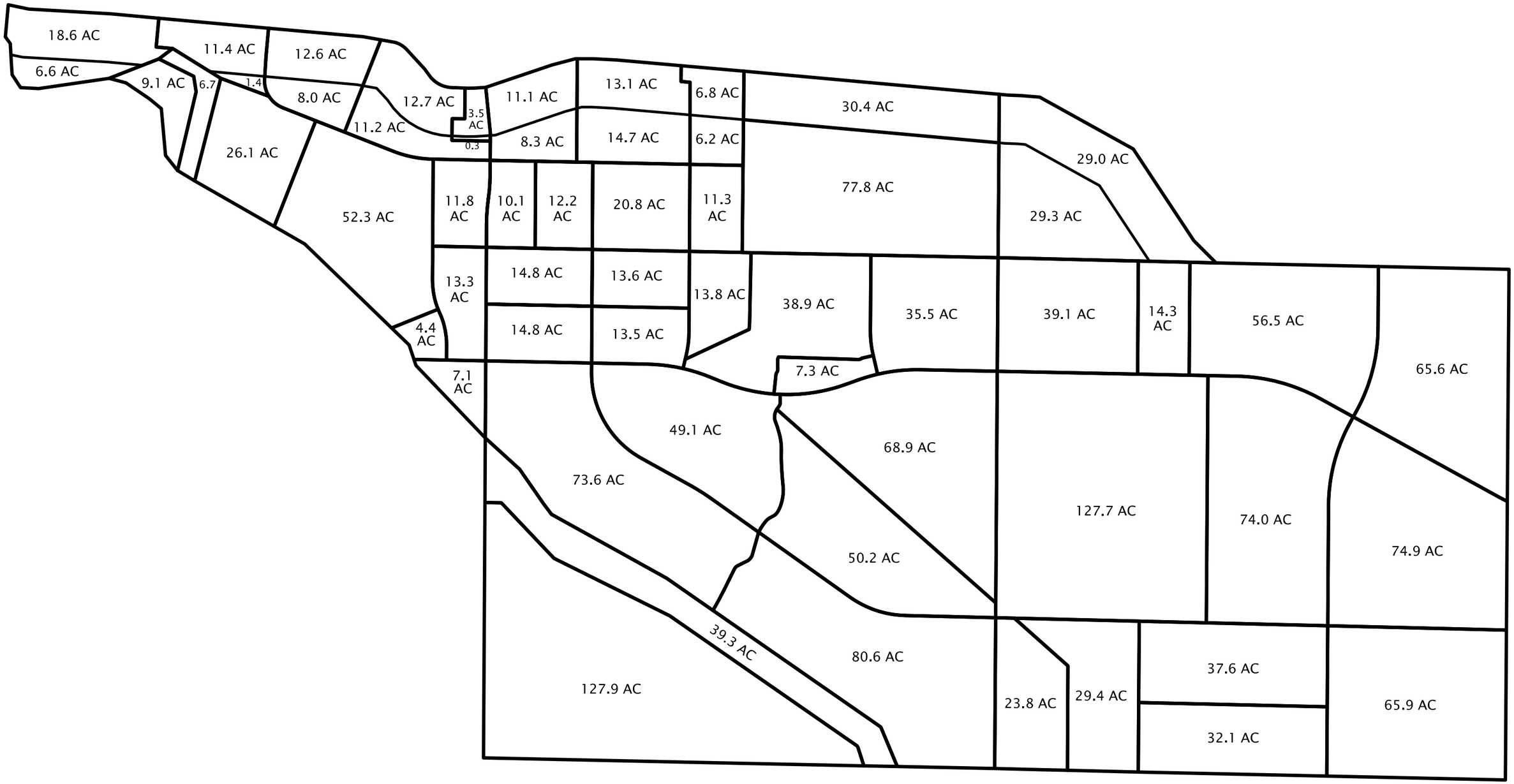

KIER & WRIGHT
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2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

GROSS AREA CALCULATIONS

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	10/16/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	I-205 AREA

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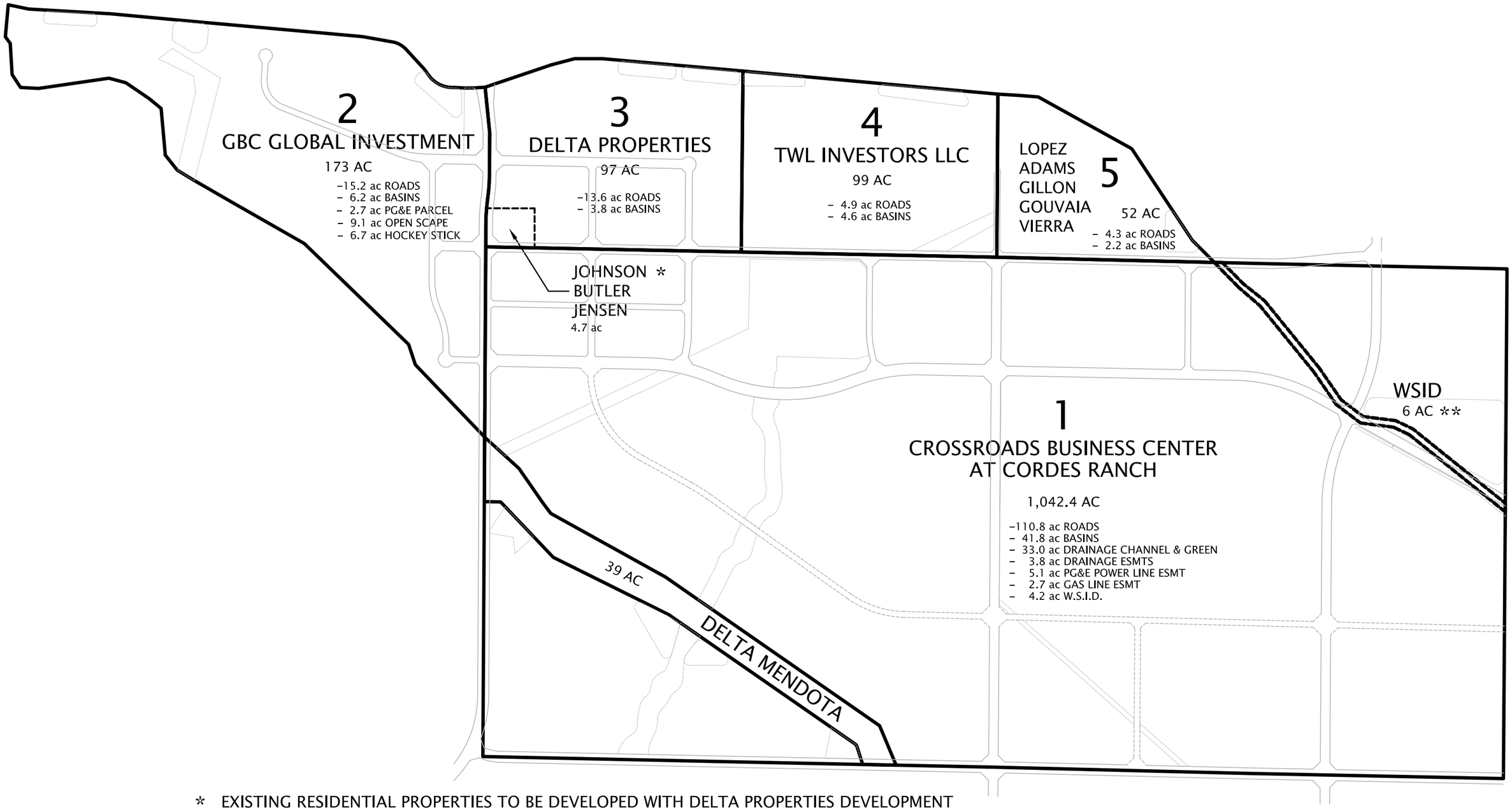


* EXISTING RESIDENTIAL PROPERTIES TO BE DEVELOPED WITH DELTA PROPERTIES DEVELOPMENT

** 2 AC OF WSID ARE WITHIN PROPOSED ROAD RIGHT-OF-WAY

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

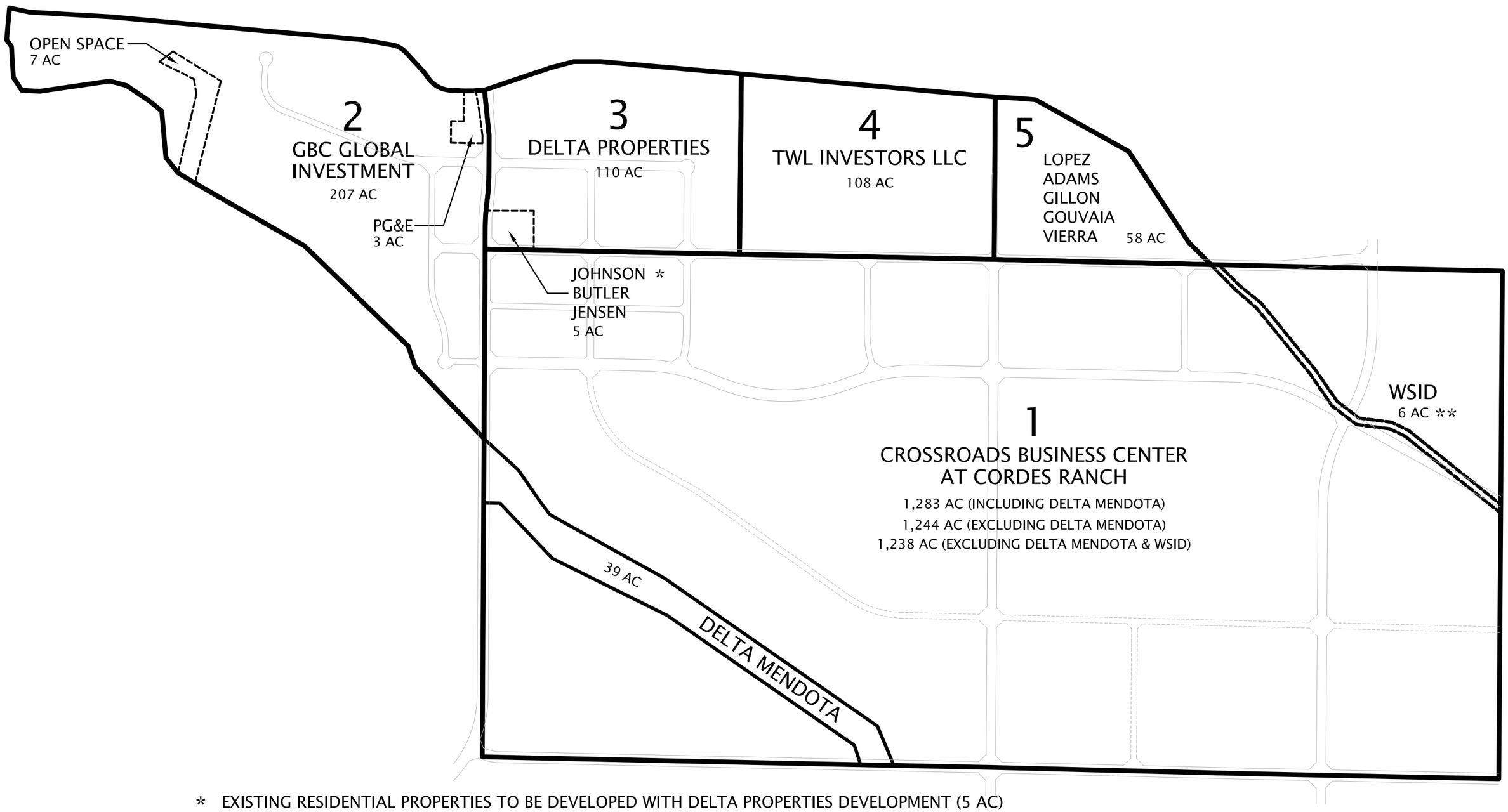
TOTAL NET AREA
1,464 ACRES

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	10/16/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	TOTAL NET

Z:\2009\A09500\AREAS-PHASING.dwg 10/16/2012 10:36:40 AM PDT



* EXISTING RESIDENTIAL PROPERTIES TO BE DEVELOPED WITH DELTA PROPERTIES DEVELOPMENT (5 AC)

** 2 AC OF WSID ARE WITHIN PROPOSED ROAD RIGHT-OF-WAY

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

TOTAL GROSS AREA
1,774 ACRES

CORDES RANCH
AREA CALCULATIONS EXHIBIT

TRACY CALIFORNIA

DATE	10/16/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	TOTAL GROSS

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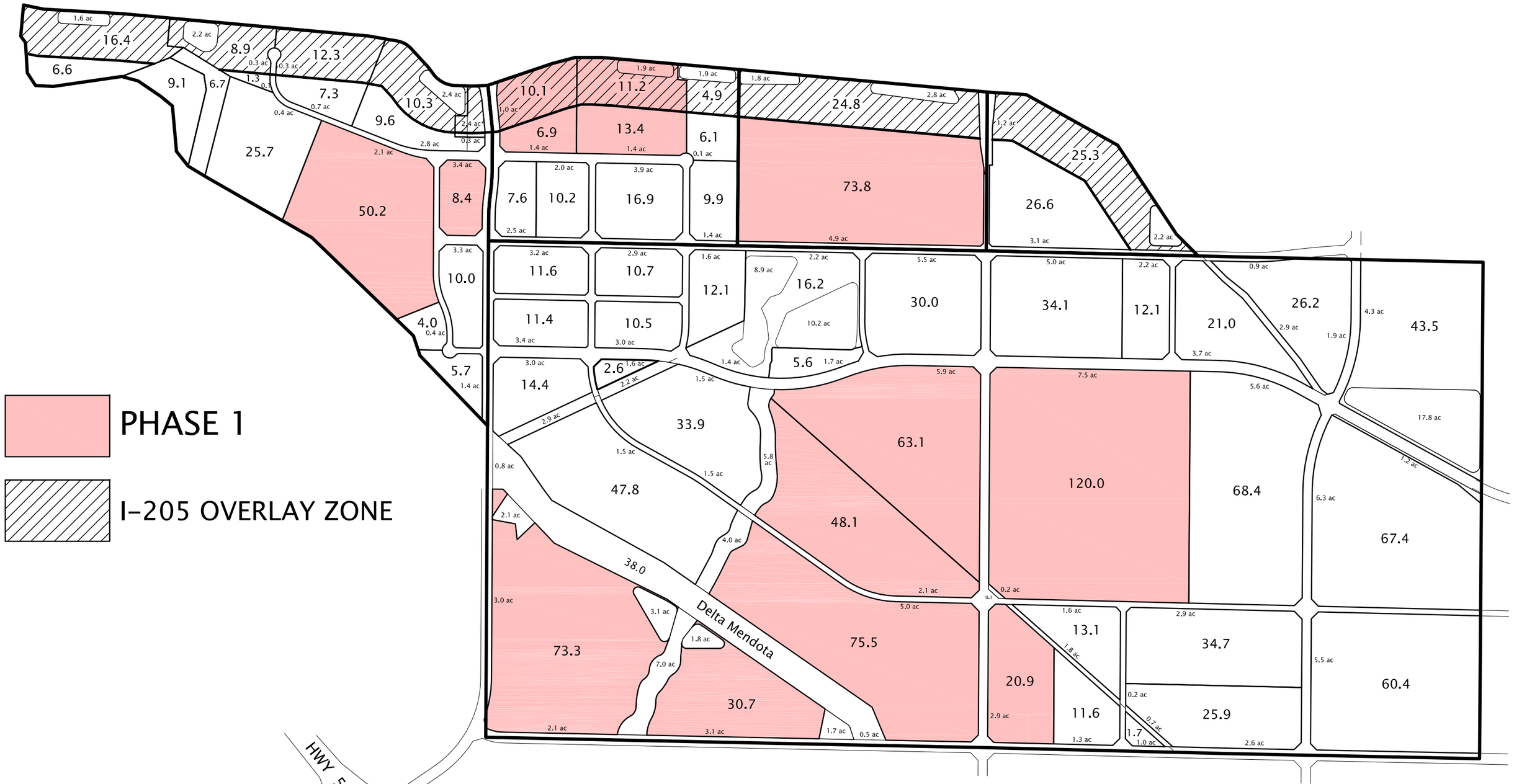

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

0 500 1000 2000
GRAPHIC SCALE 1" = 1000'

NORTH

NET PHASING EXHIBIT

CORDES RANCH
NET - PHASING EXHIBIT

TRACY CALIFORNIA

DATE	10/16/2012
BY	M.F.B.
JOB NO.	A09500
SCALE	1" =1000'
SHEET	PHASING - NET

Z:\2009\A09500\AREAS-PHASING.dwg 10/16/2012 10:36:40 AM PDT

ATTACHMENT C

Detailed Water Demand Calculations by Parcel

Table C-1. Summary of Projected Potable and Recyled Water Demands by Block Number - Buildout [a]

Land Use Designation	Property Owner	Phase	Block Number	Gross Area, acres [b]	Potable Water Acres [c]	Unit Water Demand Factor, af/ac/yr [d]	Potable Water Demand, af/yr	Percent Irrigated	Recycled Water Acres [e]	Unit Water Demand Factor, af/ac/yr [d]	Recycled Water Demand, af/yr
Office	Crossroads Business Center	BO	19	14.8	12.58	1.5	18.87	15%	2.22	4.0	8.88
Office	Crossroads Business Center	BO	20	14.8	12.58	1.5	18.87	15%	2.22	4.0	8.88
Office	Crossroads Business Center	BO	21	13.6	11.56	1.5	17.34	15%	2.04	4.0	8.16
Office	Crossroads Business Center	BO	22	13.5	11.48	1.5	17.21	15%	2.03	4.0	8.10
Office	Crossroads Business Center	BO	23	13.7	11.65	1.5	17.47	15%	2.06	4.0	8.22
Industrial	Crossroads Business Center	1	33	69.0	58.65	1.5	87.98	15%	10.35	4.0	41.40
Industrial	Crossroads Business Center	1	34	50.2	42.67	1.5	64.01	15%	7.53	4.0	30.12
Industrial	Crossroads Business Center	1	35	65.8	55.93	1.5	83.90	15%	9.87	4.0	39.48
Industrial	Crossroads Business Center	1	40	78.4	66.64	1.5	99.96	15%	11.76	4.0	47.04
Industrial	Crossroads Business Center	1	41	33.8	28.73	1.5	43.10	15%	5.07	4.0	20.28
Industrial	Crossroads Business Center	1	42	80.6	68.51	1.5	102.77	15%	12.09	4.0	48.36
Industrial	Crossroads Business Center	1	43	23.8	20.23	1.5	30.35	15%	3.57	4.0	14.28
Industrial	Crossroads Business Center	BO	24	7.3	6.21	1.5	9.31	15%	1.10	4.0	4.38
Industrial	Crossroads Business Center	BO	25	35.5	30.18	1.5	45.26	15%	5.33	4.0	21.30
Industrial	Crossroads Business Center	BO	26	39.1	33.24	1.5	49.85	15%	5.87	4.0	23.46
Industrial	Crossroads Business Center	BO	27	14.3	12.16	1.5	18.23	15%	2.15	4.0	8.58
Industrial	Crossroads Business Center	BO	28	24.7	21.00	1.5	31.49	15%	3.71	4.0	14.82
Industrial	Crossroads Business Center	BO	29	29.0	24.65	1.5	36.98	15%	4.35	4.0	17.40
Industrial	Crossroads Business Center	BO	30	47.8	40.63	1.5	60.95	15%	7.17	4.0	28.68
Industrial	Crossroads Business Center	BO	31	4.2	3.57	1.5	5.36	15%	0.63	4.0	2.52
Industrial	Crossroads Business Center	BO	32	36.9	31.37	1.5	47.05	15%	5.54	4.0	22.14
Industrial	Crossroads Business Center	BO	36	135.7	115.35	1.5	173.02	15%	20.36	4.0	81.42
Industrial	Crossroads Business Center	BO	37	74.9	63.67	1.5	95.50	15%	11.24	4.0	44.94
Industrial	Crossroads Business Center	BO	38	17.4	14.79	1.5	22.19	15%	2.61	4.0	10.44
Industrial	Crossroads Business Center	BO	39	49.3	41.91	1.5	62.86	15%	7.40	4.0	29.58
Industrial	Crossroads Business Center	BO	44	12.9	10.97	1.5	16.45	15%	1.94	4.0	7.74
Industrial	Crossroads Business Center	BO	45	14.7	12.50	1.5	18.74	15%	2.21	4.0	8.82
Industrial	Crossroads Business Center	BO	46	2.7	2.30	1.5	3.44	15%	0.41	4.0	1.62
Industrial	Crossroads Business Center	BO	47	28.7	24.40	1.5	36.59	15%	4.31	4.0	17.22
Industrial	Crossroads Business Center	BO	48	37.6	31.96	1.5	47.94	15%	5.64	4.0	22.56
Industrial	Crossroads Business Center	BO	49	65.9	56.02	1.5	84.02	15%	9.89	4.0	39.54
Open Space	Crossroads Business Center	BO	OP1	2.5				80%	2.00	4.0	8.00
Open Space	Crossroads Business Center	BO	OP2	38.9				50%	19.45	4.0	77.80
Open Space	Crossroads Business Center	BO	OP3	5.1				80%	4.08	4.0	16.32
Open Space	Crossroads Business Center	BO	OP4	2.9				80%	2.32	4.0	9.28
Open Space	Crossroads Business Center	BO	OP5	17.8				40%	7.12	4.0	28.48
Detention Basin	Crossroads Business Center	1	--	4.9				30%	1.47	4.0	5.88
Drainage Ditch	Crossroads Business Center	BO	--	20.6				0%	-	4.0	-
Commercial	GBC Global Investment	1	14	11.8	10.03	2.0	20.06	15%	1.77	4.0	7.08
Commercial	GBC Global Investment	BO	4	22.7	19.30	2.0	38.59	15%	3.41	4.0	13.62
Office	GBC Global Investment	BO	13	13.3	11.31	1.5	16.96	15%	2.00	4.0	7.98
Industrial	GBC Global Investment	1	11	52.3	44.46	1.5	66.68	15%	7.85	4.0	31.38
Industrial	GBC Global Investment	BO	1	23.0	19.55	1.5	29.33	15%	3.45	4.0	13.80
Industrial	GBC Global Investment	BO	2	11.0	9.35	1.5	14.03	15%	1.65	4.0	6.60
Industrial	GBC Global Investment	BO	3	19.9	16.92	1.5	25.37	15%	2.99	4.0	11.94
Industrial	GBC Global Investment	BO	10	26.4	22.44	1.5	33.66	15%	3.96	4.0	15.84
Industrial	GBC Global Investment	BO	12	7.1	6.04	1.5	9.05	15%	1.07	4.0	4.26
Open Space	GBC Global Investment	BO	OP6	9.1				40%	3.64	4.0	14.56
Detention Basin	GBC Global Investment	BO	--	6.2				30%	1.86	4.0	7.44
Commercial	Delta Properties	1	5	19.4	16.49	2.0	32.98	15%	2.91	4.0	11.64
Office	Delta Properties	BO	15	10.1	8.59	1.5	12.88	15%	1.52	4.0	6.06
Industrial	Delta Properties	1	6	26.0	22.10	1.5	33.15	15%	3.90	4.0	15.60
Industrial	Delta Properties	BO	7	11.0	9.35	1.5	14.03	15%	1.65	4.0	6.60
Industrial	Delta Properties	BO	16	12.2	10.37	1.5	15.56	15%	1.83	4.0	7.32
Industrial	Delta Properties	BO	17	20.8	17.68	1.5	26.52	15%	3.12	4.0	12.48
Industrial	Delta Properties	BO	18	11.3	9.61	1.5	14.41	15%	1.70	4.0	6.78
Detention Basin	Delta Properties	1	--	1.9				30%	0.57	4.0	2.28
Detention Basin	Delta Properties	BO	--	1.9				30%	0.57	4.0	2.28
Industrial	TWL Investors LLC	1	8	103.5	87.98	1.5	131.96	15%	15.53	4.0	62.10
Detention Basin	TWL Investors LLC	1	--	4.6				30%	1.38	4.0	5.52
Office	Lopez/Adams/Gillon/Gouvaia/Vierra	BO	9	56.2	47.77	1.5	71.66	15%	8.43	4.0	33.72
Detention Basin	Lopez/Adams/Gillon/Gouvaia/Vierra	BO	--	2.2				30%	0.66	4.0	2.64
			Total	**1,727.2**	**1,367.31**		**2,074**		**286.41**		**1,146**
			Total with UAFW [f]				**2,242**				**1,239**

[a] Based on data provided by Kier and Wright on May 9, 2012.
[b] Includes proposed acreage from Streets.
[c] Equal to 85 percent of gross area from Commercial, Office and Industrial land uses.
[d] Adopted unit water demand factors established in the Citywide Water System Master Plan, prepared by West Yost Associates and dated December 2012.
[e] Calculated based on portion of "percent irrigated" from the gross area.
[f] Unaccounted-for water (UAFW) equal to 7.5 percent.

Table C-2. Summary of Projected Potable and Recyled Water Demands by Block Number - Phase 1 [a]

Land Use Designation	Property Owner	Phase	Block Number	Gross Area, acres [b]	Potable Water Acres [c]	Unit Water Demand Factor, af/ac/yr [d]	Potable Water Demand, af/yr	Percent Irrigated	Recycled Water Acres [e]	Unit Water Demand Factor, af/ac/yr [d]	Recycled Water Demand, af/yr
Industrial	Crossroads Business Center	1	33	69.0	58.65	1.5	87.98	15%	10.35	4.0	41.40
Industrial	Crossroads Business Center	1	34	50.2	42.67	1.5	64.01	15%	7.53	4.0	30.12
Industrial	Crossroads Business Center	1	35	65.8	55.93	1.5	83.90	15%	9.87	4.0	39.48
Industrial	Crossroads Business Center	1	40	78.4	66.64	1.5	99.96	15%	11.76	4.0	47.04
Industrial	Crossroads Business Center	1	41	33.8	28.73	1.5	43.10	15%	5.07	4.0	20.28
Industrial	Crossroads Business Center	1	42	80.6	68.51	1.5	102.77	15%	12.09	4.0	48.36
Industrial	Crossroads Business Center	1	43	23.8	20.23	1.5	30.35	15%	3.57	4.0	14.28
Detention Basin	Crossroads Business Center	1	--	4.9				30%	1.47	4.0	5.88
Commercial	GBC Global Investment	1	14	11.8	10.03	2.0	20.06	15%	1.77	4.0	7.08
Industrial	GBC Global Investment	1	11	52.3	44.46	1.5	66.68	15%	7.85	4.0	31.38
Commercial	Delta Properties	1	5	19.4	16.49	2.0	32.98	15%	2.91	4.0	11.64
Industrial	Delta Properties	1	6	26.0	22.10	1.5	33.15	15%	3.90	4.0	15.60
Detention Basin	Delta Properties	1	--	1.9				30%	0.57	4.0	2.28
Industrial	TWL Investors LLC	1	8	103.5	87.98	1.5	131.96	15%	15.53	4.0	62.10
Detention Basin	TWL Investors LLC	1	--	4.6				30%	1.38	4.0	5.52
			Total	**626.0**	**522.41**		**797**		**95.61**		**382**
			Total with UAFW [f]				**862**				**413**

[a] Based on data provided by Kier and Wright on May 9, 2012.

[b] Includes proposed acreage from Streets.

[c] Equal to 85 percent of gross area from Commercial, Office and Industrial land uses.

[d] Adopted unit water demand factors established in the Citywide Water System Master Plan, prepared by West Yost Associates and dated December 2012.

[e] Calculated based on portion of "percent irrigated" from the gross area.

[f] Unaccounted-for water (UAFW) equal to 7.5 percent.

APPENDIX M
UTILITIES

M.2: Water Supply Assessment

CITY OF TRACY

WATER SUPPLY ASSESSMENT FOR THE CORDES RANCH SPECIFIC PLAN

FINAL REPORT

Prepared for

City of Tracy

January 2013

WEST YOST ASSOCIATES
Consulting Engineers

404-02-11-90

WEST YOST ASSOCIATES
consulting engineers

WATER WASTEWATER STORMWATER

CITY OF TRACY

CORDES RANCH SPECIFIC PLAN
SB 610 WATER SUPPLY ASSESSMENT

Prepared for

City of Tracy

January 2013

WEST YOST ASSOCIATES
Consulting Engineers

404-02-11-90

Elizabeth Drayer

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EXECUTIVE SUMMARY

The Cordes Ranch Specific Plan Project (Proposed Project) is one of the City of Tracy's (City) future service areas as defined in the City's General Plan Sphere of Influence (SOI). The Proposed Project consists of 1,774 acres on the western side of the City's SOI, just outside of the City's current City limits. The Proposed Project meets the definition of a "Project" per California Water Code sections 10910 through 10915, as established by SB 610 in 2001, thus requiring the preparation of this Water Supply Assessment (WSA).

The Proposed Project is generally bounded on the north by Interstate 205, on the south by West Schulte Road, on the west by Mountain House Parkway and the Delta Mendota Canal, and on the east by the current City limits. Per the Cordes Ranch Specific Plan, currently being prepared by others, land uses for the Proposed Project consist of a mix of General Commercial (GC), General Office (GO), Business Park Industrial (BPI) and Park/Open Space (P/OS) land uses. No residential land uses are proposed within the Proposed Project.

Development of the Proposed Project will occur over approximately 30 years with buildout by approximately the year 2040. The Cordes Ranch Specific Plan includes approximately 592,000 square feet of General Commercial development, 2.5 million square feet of General Office development, and 28 million square feet of Business Park Industrial development.

As explained more fully herein, the Cordes Ranch Specific Plan and the Citywide Water System Master Plan (based on the City's 2010 Urban Water Management Plan) used slightly different land use assumptions and acreages as they relate to the Proposed Project site. Accordingly, the water demand estimates are slightly different as well. For purposes of ensuring a conservative analysis, this WSA uses the higher of the estimates as follows: the potable water demand for the Proposed Project has been estimated to be 2,233 af/yr (based on the Citywide Water System Master Plan and the City's 2010 Urban Water Management Plan) and the recycled water demand has been estimated to be 1,127 af/yr (based on the Cordes Ranch Specific Plan). The water demands for the Proposed Project will be served using the City's existing and future portfolio of water supplies. Proponents of the Proposed Project will provide their proportionate share of required funding to the City for the acquisition and delivery of treated potable and recycled water supplies to the Proposed Project area.

Pursuant to Water Code section 10910(c)(4), and based on the technical analyses described in this Water Supply Assessment, this Water Supply Assessment demonstrates that the City's existing and additional planned future water supplies are sufficient to meet the City's existing and projected future water demands, including those future water demands associated with the Proposed Project, to the year 2035 under all hydrologic conditions (including Normal Years, Single Dry Years, and Multiple Dry Years).

1.0 INTRODUCTION

1.1 Legal Requirement for Water Supply Assessment

California Senate Bill 610 (SB 610) was approved by Governor Gray Davis on October 9, 2001 and made effective on January 1, 2002. SB 610 amended California state law to improve the link between information on water supply availability and certain land use decisions made by cities and counties. Specifically, certain sections of the California Water Code were amended to require coordination between land use lead agencies and public water purveyors. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

The amended Water Code sections 10910 through 10915 (inclusive) require land use lead agencies to:

- Identify any public water purveyor that may supply water for a proposed development project; and
- Request from the identified purveyor a Water Supply Assessment (WSA).

The purpose of the WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the proposed project, while still meeting the water purveyor's existing and planned future uses. Water Code sections 10910 through 10915 delineate the specific information that must be included in the WSA.

1.2 Need For and Purpose of Water Supply Assessment

The purpose of this WSA is to perform the evaluation required by Water Code sections 10910 through 10915 in connection with the City of Tracy's (City) proposed Cordes Ranch Specific Plan Project (Proposed Project). It is not to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable City policies and procedures, consistent with existing law.

1.3 Water Supply Assessment Preparation, Format and Organization

This WSA for the Proposed Project has been prepared by West Yost Associates (West Yost), as requested by the City, the identified water purveyor for the Proposed Project.

The format of this WSA is intended to follow Water Code sections 10910 through 10915 to clearly delineate compliance with the specific requirements for a WSA. The WSA includes the following sections:

- Section 1: Introduction
- Section 2: Description of Proposed Project
- Section 3: Required Determinations

- Section 4: City of Tracy Water Service Area
- Section 5: City of Tracy Water Demands
- Section 6: City of Tracy Water Supplies
- Section 7: Determination of Water Supply Sufficiency
- Section 8: Water Supply Assessment Approval Process
- Section 9: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this WSA in *italics* to demonstrate compliance with the specific requirements of SB 610.

1.4 Acronyms and Abbreviations Used in this Water Supply Assessment

The following acronyms and abbreviations have been used throughout this WSA.

af	acre-feet
af/ac/yr	acre-feet per acre per year
af/yr	acre-feet per year
ASR	Aquifer Storage and Recovery
BBID	Byron Bethany Irrigation District
BCID	Banta Carbona Irrigation District
BiOps	Biological Opinions
Bookman	Bookman-Edmonston (a.k.a. GEI Consultants and Navigant)
bgs	below ground surface
BMO	Basin Management Objectives
CEQA	California Environmental Quality Act
City	City of Tracy
CVP	Central Valley Project
DMC	Delta-Mendota Canal
DPH	California Department of Public Health
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ET_o	Evapotranspiration
FONSI	Finding of No Significant Impact
GMO	Growth Management Ordinance
GMP	Groundwater Management Plan
gpm	gallons per minute
JJWTP	John Jones Water Treatment Plant
K/J/C	Kennedy/Jenks/Chilton
LAFCo	Local Area Formation Commission
M&I	Municipal and industrial
mgd	million gallons per day

mg/L	milligrams per liter
msl	mean sea level
NEPA	National Environmental Policy Act
Proposed Project	City of Tracy Cordes Ranch Project
PVWD	Plain View Water District
RGA	Residential Growth Allotment
RWQCB	Regional Water Quality Control Board
SB 610	California State Senate Bill 610 of 2001
SCWSP	South County Water Supply Project
Semitropic	Semitropic Water Storage District Groundwater Storage Bank
Sf	square feet
SOI	Sphere of Influence
SSJID	South San Joaquin Irrigation District
TBD	To be determined
TDS	Total Dissolved Solids
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WSID	West Side Irrigation District
West Yost	West Yost Associates
WWTP	Wastewater Treatment Plant

2.0 DESCRIPTION OF PROPOSED PROJECT

2.1 Proposed Project Location

The Proposed Project is located in the City of Tracy's (City) General Plan Sphere of Influence (SOI), and consists of 1,774 acres on the western side of the City's SOI, just outside the City's existing City limits. The Proposed Project is generally bounded on the north by Interstate 205, on the south by West Schulte Road, on the west by Mountain House Parkway and the Delta Mendota Canal, and on the east by the current City limits. Figure 1 illustrates the location of the Proposed Project in relation to the current City Limits and the City's General Plan SOI.

The Proposed Project area is currently owned by a number of different property owners and portions of the Proposed Project overlie the Byron Bethany Irrigation District (BBID) and the West Side Irrigation District (WSID) service areas (see Figure 2).

2.2 Proposed Land Uses and Acreages

Per the Cordes Ranch Specific Plan, currently being prepared by others, land uses for the Proposed Project consist of a mix of General Commercial (GC), General Office (GO), Business Park Industrial (BPI) and Park/Open Space (P/OS) land uses. No residential land uses are proposed within the Proposed Project. Proposed land uses for the Proposed Project based on the Cordes Ranch Specific Plan are summarized in Table 1.

Table 1. Proposed Land Uses for the Cordes Ranch Specific Plan

Proposed Land Use and Developed Square Footage[a]	Cordes Ranch Specific Plan Acres[a]
General Commercial (GC) (approximately 592,000 square feet (sf))	45.3
General Office (GO) (approximately 2.5 million sf)	125.8
Business Park Industrial (BPI) (approximately 28 million sf)	1,291.4
Park/Open Space (P/OS)	73.0
Street Landscaping	148.8
Other Miscellaneous Land Uses within Proposed Project area:	
Detention Basins	21.7
Drainage Ditch	20.6
Total Area (Net)[b]	1,726.6

[a] Based on Cordes Ranch Specific Plan land use data provided by Kier & Wright on May 1, 2012.
[b] Total net area does not include portions of the Delta Mendota Canal and the WSID Canal and a PG&E parcel that are located within the Proposed Project area. Gross acreage including these areas equals 1,774 acres.

The land uses designated in the Specific Plan for the Proposed Project are somewhat different than those assumed for the Proposed Project site in the City's Citywide Water System Master Plan[1], which was based on the projected future water demands included in the City's 2010 Urban Water Management Plan (2010 UWMP)[2]. However, the total area for the Proposed Project is essentially the same under both plans (1,723 gross acres in the Citywide Water System Master Plan versus 1,774 gross acres based on the Cordes Ranch Specific Plan; the difference in acreage reflects the inclusion of the rights of way for the Delta Mendota Canal and WSID Canal) and the land uses, while slightly different, are consistent with the Citywide Water System Master Plan.

Development of the Proposed Project is anticipated to occur over approximately 30 years and will likely occur in several development phases. Phase 1 of the Proposed Project is anticipated to be developed in the next 10 to 12 years. Buildout of the Proposed Project is anticipated to occur around the year 2040.

It should be noted that this WSA evaluates the availability and reliability of the City's water supplies to serve buildout of the Proposed Project; no evaluation of individual development phases is provided.

2.3 Projected Water Demand

2.3.1 Water Use Factors and Assumptions

The projected water demand for the Proposed Project site was calculated as part of the development of the City's Citywide Water System Master Plan. The City adopted unit water use factors for use in projecting potable and recycled water demand based on the proposed future land uses within the City's General Plan SOI[3].

Potable water use factors for various land uses were established based on historical metered water use data for various land use types, taking into consideration reduced water use as a result of new building codes, improved water use efficiency and water conservation measures. The potable water use factor for Commercial land uses was established to be 2.0 acre-feet per acre per year (af/ac/yr), and the potable water use factor for Office and Industrial land uses was established to be 1.5 af/ac/yr. Both of these factors were applied to the gross acres to estimate the total potable water demand.

[1] For the Citywide Water System Master Plan (December 2012) the following land uses were assumed for the Proposed Project site: Industrial: 1,488 acres; Office: 150 acres; Commercial (Retail): 85 acres; Total Gross Acres: 1,723 acres.

[2] City of Tracy 2010 Urban Water Management Plan, adopted by the City of Tracy in May 2011, prepared by Erler & Kalinowski, Inc., May 2011.

[3] As established in the City of Tracy Citywide Water System Master Plan, prepared by West Yost Associates, Final Report dated December 2012, and included in the City's 2010 UWMP.

Exterior recycled water use was assumed to be 4.0 af/ac/yr for irrigated landscape areas, including roadway medians and other landscape areas. Since irrigated landscape areas were not specifically defined for each parcel within the Proposed Project site, it was assumed that 15 percent of the gross acreage for each land use designation within the Proposed Project site would be landscaped and irrigated with recycled water, and would not receive potable water.

Table 2 summarizes the City's adopted unit water use factors for the land use designations applicable to the Proposed Project site.

Table 2. City of Tracy Adopted Water Use Factors

Land Use Designation	Water Use Factor, af/ac/yr[(a,b)]
Commercial	2.0
Business Park	1.5
Industrial	1.5
Landscape Irrigation (using Recycled Water)	4.0

(a) As established in the Citywide Water System Master Plan, prepared by West Yost Associates, Final Report dated December 2012, and included in the City's 2010 UWMP.
(b) Water use factor to be applied based on gross acres. This WSA assumes that 85 percent of the gross acres of the Proposed Project would use potable water and the remaining 15 percent would use recycled water to serve the Proposed Project's non-potable water demand.

2.3.2 Water Demand Calculations

As explained above, the land uses and acreages assumed in the Cordes Ranch Specific Plan and the Citywide Water System Master Plan (based on the 2010 UWMP) are slightly different. The total projected water demand for the Proposed Project site at buildout, as calculated as part of the development of the Citywide Water System Master Plan (based on the City's 2010 UWMP), is presented in Table 3, and is compared to the total projected water demand as calculated in the Cordes Ranch Specific Plan. As shown in Table 3, the Citywide Water System Master Plan (based on the 2010 UMWP) estimates the projected potable water demand for the Proposed Project site to be 2,233 acre-feet per year (af/yr) and the projected recycled water demand to be 1,034 af/yr. This is compared to the Cordes Ranch Specific Plan estimates, which calculate the projected potable water demand for the Proposed Project site to be 1,874 af/yr and the projected recycled water demand to be 1,127 af/yr.

Table 3. Projected Water Demand for Proposed Project Site (as calculated in the Citywide Water System Master Plan)[a]

Land Use Designation	Gross Acres[b]	Water Use Factor, af/ac/yr	Potable Water		Recycled Water	
			Acres[c]	Potable Water Demand, af/yr	Acres[d]	Recycled Water Demand, af/yr
Commercial	85	2.0	72	145		
Business Park	150	1.5	128	191		
Manufacturing/ Distribution (Industrial)	1,488	1.5	1,265	1,897		
Landscape Irrigation		4.0			259	1,034
Total Demand as calculated in the Citywide Water System Master Plan[e]				2,233		1,034
Total Demand as calculated in the Cordes Ranch Specific Plan[f]				1,874		1,127

[a] For buildout of the Proposed Project site, as established in the Citywide Water System Master Plan, prepared by West Yost Associates, Final Report dated December 2012.
[b] Gross acres for the Proposed Project site as assumed in the Citywide Water System Master Plan.
[c] Potable water use acres based on 85% of gross acres for each land use designation.
[d] Recycled water use acres based on 15% of total gross acres for the Proposed Project.
[e] Water demands calculated for the Citywide Water System Master Plan were also used in the City's 2010 UWMP.
[f] Cordes Ranch Specific Plan demand as calculated by Kier & Wright, May 1, 2012.

2.3.3 Comparison with Water Demand Calculations of the Cordes Ranch Specific Plan and the Citywide Water System Master Plan (based on the City's 2010 Urban Water Management Plan)

As shown in Table 3 above, the potable water demand calculated for the Proposed Project in the Cordes Ranch Specific Plan (1,874 af/yr) is lower than the 2,233 af/yr demand calculated in the Citywide Water System Master Plan (based on the City's 2010 UWMP).

However, also as shown in Table 3 above, the recycled water demand calculated for the Proposed Project in the Cordes Ranch Specific Plan (1,127 af/yr) is higher than the 1,034 af/yr demand calculated in the Citywide Water System Master Plan (based on the City's 2010 UWMP). However, this increase in recycled water demand (increase of 93 af/yr) is considered to be nominal. Recycled water facilities recommended in the Citywide Water System Master Plan have been sized to accommodate additional recycled water demands beyond those included in the City's 2010 UWMP and adequate recycled water supplies are anticipated to be available in the future to accommodate the additional recycled water demand associated with the Proposed Project (see Section 6.4.1).

For purposes of ensuring a conservative analysis, this WSA uses the higher of the estimates, as follows: the potable water demand for the Proposed Project has been estimated to be 2,233 af/yr (based on the Citywide Water System Master Plan/2010 UWMP) and the recycled water demand has been estimated to be 1,127 af/yr (based on the Cordes Ranch Specific Plan).

2.4 Projected Water Supply

The water demands for the Proposed Project will be served using the City's existing and future portfolio of water supplies. Proponents of the Proposed Project will provide their proportionate share of required funding to the City for the acquisition and delivery of treated potable and recycled water supplies to the Proposed Project area.

3.0 REQUIRED DETERMINATIONS

3.1 Does SB 610 apply to the Proposed Project?

10910 (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

10912 (a) "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.

Based on the following facts, SB 610 does apply to the Proposed Project.

- The City of Tracy has determined that the Proposed Project is subject to the California Environmental Quality Act (CEQA) and that an Environmental Impact Report (EIR) is required.
- The Proposed Project, with its proposed 592,000 square feet of General Commercial development, 2.5 million square feet of General Office development, and 28 million square feet of Business Park Industrial development, meets the definition of a "Project" as specified in Water Code section 10912(a) paragraph (3) as defined for commercial office buildings and paragraph (5) as defined for industrial, manufacturing, processing plants, or industrial parks.

Also, the Proposed Project has not been the subject of a previously adopted WSA and has not been included in an adopted WSA for a larger project. Therefore, according to Water Code section 10910(a), a WSA is required for the Proposed Project.

3.2 Who is the identified public water system?

10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project

10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…

As shown on Figure 1, the Proposed Project is located within the City's General Plan SOI. The Proposed Project is located outside the current City limits; however, it is anticipated that proponents for the Proposed Project area will seek to have the Proposed Project site annexed to the City in 2013.

The City's water system service area includes all areas within the City limits and the General Plan SOI area as they are annexed into the City. As of December 2010, the City had 23,449 water service connections. Therefore, the City is the identified public water system for the Proposed Project.

3.3 Does the City have an adopted Urban Water Management Plan (UWMP) and does the UWMP include the projected water demand for the Proposed Project?

10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

The City's most recently adopted UWMP (the City's 2010 UWMP) was adopted by the City Council in May 2011 and is incorporated by reference into this WSA[4]. The City's 2010 UWMP included existing and projected water demands for existing and projected future land uses to be developed within the City's General Plan SOI through buildout (estimated to occur in 2040). The water demand projections in the City's 2010 UWMP included existing City water demands (based on 2007 demands[5]), future water demands for developments with approved water supplies (*e.g.*, those projects which have already been approved by the City but have not yet begun construction or have not yet built out), and future water demands for future service areas (including water demands for the Proposed Project site).

[4] City of Tracy 2010 Urban Water Management Plan, prepared by Erler & Kalinowski, Inc., May 2011.

[5] The 2007 water demands were used because they may be more representative of actual existing demands than the currently observed lower demands due to recent drought conditions and economic conditions.

Potable water demands for the Proposed Project site (2,233 af/yr) and recycled water demands for the Proposed Project site (1,034 af/yr) were included in the estimated water demands for development of the project site in the City's 2010 UWMP water demand estimates for future service areas[6].

Recycled water demands calculated for the Proposed Project shown in Table 3 (1,127 af/yr) are higher than the 1,034 af/yr demand included for the Proposed Project site in the City's 2010 UWMP; however, this increase in recycled water demand is considered to be nominal. Recycled water facilities recommended in the Citywide Water System Master Plan have been sized to accommodate additional recycled water demands beyond those included in the City's 2010 UWMP and adequate recycled water supplies are anticipated to be available in the future to accommodate the additional recycled water demand associated with the Proposed Project.

[6] See City of Tracy 2010 Urban Water Management Plan, Table 7. The Proposed Project is included in the Future Service (Planning) Areas as Cordes Ranch (UR 6).

4.0 CITY OF TRACY WATER SERVICE AREA

4.1 Water Service Area

The City is located in San Joaquin County, California, about 70 miles south of Sacramento and 60 miles east of San Francisco. The existing incorporated area of the City encompasses approximately 22 square miles. The SOI is the area outside of the City limits that the City expects to annex and urbanize in the future. It is the expected physical limit of the City based on the most current information. During the City's recent General Plan update process and in response to Local Agency Formation Commission (LAFCo) policies established in 2007, revisions to the City's SOI were made to more accurately reflect locations where the City may grow in the future and locations where no urban growth is expected. The recently adopted revised SOI encompasses an area of approximately 42 square miles and is 20 square miles larger than the current City limits.

The City's water service area is coterminous with the City limits. As future developments within the SOI, but outside the City Limits, are approved, they will be annexed into the City and served by the City water system. Figure 1 illustrates the current City limits and the SOI. The Proposed Project is located outside the City's existing City limits, however, it is anticipated that proponents for the Proposed Project area will seek to have the Proposed Project site annexed to the City in 2013 prior to development.

4.2 Population

The State of California Department of Finance population estimate for the City as of January 1, 2012 was 83,900 people[7]. Population growth has been rapid in the City, with the City growing by 142 percent between 1988 and 2003, a compounded rate of approximately 6 percent per year. The City's population growth, at least in the near-term, is not anticipated to be as rapid as it has been historically. The City adopted a residential Growth Management Ordinance (GMO) in 1987, which was amended in 2000 by Measure A. The objective of the GMO and Measure A was to achieve a steady and orderly growth rate that allows for the adequate provision of services and community facilities, and includes a balance of housing opportunities. Under the GMO, builders must obtain a Residential Growth Allotment (RGA) in order to secure a residential building permit. The GMO Guidelines were adopted by resolution of the City Council.

The City's projected population increase for 2010 through 2025 is based on the City's General Plan, and for 2025 through 2035 is based on assumed buildout of the City's SOI by 2040 (as assumed in the Citywide Water System Master Plan and the City's 2010 UWMP). However, due to the on-going economic conditions in the State and in the Tracy area, it is currently unclear if actual development will occur within this assumed time frame and if populations will increase as assumed. It is more likely that development within the General Plan SOI will occur over a longer period of time with buildout occurring sometime after the year 2040.

[7] State of California, Department of Finance, E-1 Population Estimates for Cities, Counties, and the State with Annual Percent Change—January 1, 2011 and 2012, Sacramento, California, May 2012.

Table 4 shows the City's projected population in five-year increments to the year 2035.

Table 4. City of Tracy Historical and Projected Population

Historical Population[(a)]	1990	32,827
	1995	44,923
	2000	56,447
	2005	78,546
	2010	82,484
Projected Population[(a)]	2015	89,503
	2020	99,440
	2025	109,377
	2030	117,744
	2035	126,110

(a) Source: City of Tracy 2010 UWMP, Table 2 Historical and Projected Service Area Population, May 2011; includes 377 residents served by the City in the Larch Clover County Services District.

4.3 Climate

Spring, summer, and fall are generally hot in the City, with temperatures often climbing to over 100 degrees Fahrenheit on summer days. The City's winters are usually mild, although the dense "Tule fog" can last for weeks. Mean winter temperatures range from 40 to 50 degrees Fahrenheit, with an average of 16 days per year having frost. Most precipitation occurs during the winter. The average annual precipitation from the years 1949 to 2012 is recorded by the Western Regional Climate Center as 9.86 inches.

Table 5 summarizes the City's average temperature and rainfall data.

Table 5. City of Tracy Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
Average Et_o, inches[(a)]	0.95	1.75	3.48	5.37	6.88	7.79	8.29	7.24	5.33	3.63	1.76	1.01	53.48
Average Max Temperature, °F[(b)]	54.1	61.0	66.7	73.1	80.7	88.0	93.6	92.1	87.9	78.5	64.9	54.7	74.6
Average Min Temperature, °F[(b)]	36.7	40.0	42.6	45.5	50.4	55.2	57.1	55.7	53.9	48.7	42.1	36.6	47.0
Average Rainfall, inches[(b)]	1.90	1.72	1.37	0.84	0.45	0.09	0.03	0.09	0.22	0.52	1.10	1.55	9.86

(a) Source: CIMIS Website: wwwcimis.water.ca.gov, Station 167 Tracy, Monthly Average Evapotranspiration (Eto) Report, downloaded November 2012.
(b) Source: Western Regional Climate Center website: www.wrcc.dri.edu, Tracy Carbona Weather Station (No. 048999), Period of Record 10/1/1949 to 7/31/2012.

5.0 CITY OF TRACY WATER DEMANDS

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

As described previously, the water demands for the Proposed Project are included in the City's 2010 UWMP. Therefore, the descriptions provided below for the City's water demands have been taken, for the most part, from the City's 2010 UWMP, which was adopted by City Council in May 2011. Supplemental information from other available reports has been included to provide the most recent data available and to meet the specific requirements of SB 610.

5.1 Historical and Existing Water Demand

The City's water demand has increased by over 100 percent in the last twenty years. In 1986, the City's water demand was 8,104 af/yr and, in 2011, the City's water demand was 16,868 af/yr. Figure 3 shows the City's historical annual water demand (based on water production) from 1986 through 2011. Table 6 shows the City's water demand (based on water production) for 2006 through 2011.

Table 6. Historical Potable Water Demand

	2006	2007	2008	2009	2010	2011
Total UWMP Water Demand, af/yr[(a)]	18,000	19,176	17,118	16,693	16,603	16,868

[(a)] Source: Table 6 Current and Historical Potable Water Demand by Water Demand Sector, City of Tracy 2010 Urban Water Management Plan, May 2011. 2011 data from City water production data.

As shown in Table 6 and Figure 3, the City's 2009 to 2011 potable water demands (based on water production) were about 2,300 to 2,500 af/yr lower than 2007 demands. This reduction in potable water demand is partially due to additional water conservation measures which were implemented during the recent drought and relatively wet conditions in 2010 and 2011. The reduction in 2010 and 2011 demands may also be due to a large number of unoccupied homes and closed businesses due to recent poor economic conditions.

5.2 Future Water Demand

The City's water demand is anticipated to continue to increase as approved projects build out and new developments are approved and constructed within the City's water service area. However, as discussed above, the rate of growth within the City service area has slowed as a result of the Growth Management Ordinance and the current economic downturn. Hence, water demands are not anticipated to increase as rapidly as they have in past years.

The City's projected future water demand was determined based on potable water use factors for various land uses based on historical metered water use data for various land use types, and taking into consideration reduced future water use as a result of new building codes, improved water use efficiency and water conservation measures. Table 7 shows the projected potable and recycled water demand through 2035 as presented in the City's 2010 UWMP.

Table 7. Projected Future Water Demand, af/yr

	2015	2020	2025	2030	2035
Total Potable Water Demand[(a)]	23,000	25,000	28,300	31,000	33,600
Total Recycled Water Demand[(b,c)]	1,200	2,410	3,620	4,830	6,040

(a) Table 8 Projected Potable Water Demand by Water Demand Sector, City of Tracy 2010 Urban Water Management Plan, May 2011. Includes potable water demands for the Proposed Project.
(b) Table 17 Projected Timing of Recycled Water Demand, City of Tracy 2010 Urban Water Management Plan, May 2011.
(c) As discussed in Section 2.3.3, the recycled water demand calculated for the Proposed Project shown in Table 3 (1,127 af/yr) is higher than the 1,034 af/yr demand included for the Proposed Project in the City's 2010 UWMP. However, recycled water facilities recommended in the Citywide Water System Master Plan have been sized to accommodate additional recycled water demands beyond those included in the City's 2010 UWMP and adequate recycled water supplies are anticipated to be available in the future to accommodate the additional recycled water demand associated with the Proposed Project.

Figure 4 illustrates the City's projected water demand through 2035 as presented in the City's 2010 UWMP. As noted previously, buildout of the City's General Plan SOI has been assumed to occur in the year 2040. However, due to the on-going poor economic conditions in the State and in the Tracy area, it is currently unclear if actual development will occur within this assumed time frame and if populations will also increase as assumed. It is likely that development within the General Plan SOI will occur over a longer period of time with buildout occurring sometime after the year 2040.

Table 8 summarizes the City's projected water demand based on existing users, on-going development projects with approved water supply and future service areas. The Proposed Project is considered to be one of the City's future service areas.

Table 8. Projected Future Potable Water Demand by Development Stage

	Existing Water Demand, af/yr	Future Water Demand, af/yr[a]	Total Future Water Demand, af/yr[b]
2007 Existing Users[c]	17,820[c]		19,176[d]
Development Projects with Approved Water Supply		3,839[e]	4,150[f]
Residential Areas Specific Plan		*45*	
Industrial Areas Specific Plan		*574*	
I-205 Corridor Specific Plan		*271*	
Plan "C"		*74*	
Northeast Industrial		*702*	
South MacArthur		*59*	
Downtown Specific Plan		*185*	
Infill		*806*	
Ellis Specific Plan		*1,076*	
Gateway Phase 1		*--[g]*	
Holly Sugar Sports Park		*47*	
Subtotal	17,820	3,839	23,326
Cordes Ranch Specific Plan Project (Proposed Project)		**2,233[g]**	**2,414[g]**
Subtotal (with Proposed Project)			25,740
Other Future Service Areas		9,772[g]	10,564
Westside Residential (URs 5, 7, 8, 9)		*1,169*	
UR 1		*1,237*	
South Linne (UR 11)		*153*	
Tracy Hills		*2,985*	
Gateway PUD (excluding Phase 1)		*-- [h]*	
Bright (UR 4)		*411*	
Catellus (UR 3)		*839*	
Filios (UR 2)		*70*	
I-205 Expansion		*292*	
Westside Industrial		*618*	
Eastside Industrial		*469*	
Larch Clover County Services District		*847*	
Chrisman Road		*150*	
Rocha		*248*	
Berg/Byron		*164*	
Kagehiro		*120*	
Total Potable Water Demand at Buildout	17,820	15,844	36,304

(a) Does not include unaccounted for water.
(b) Represents projected water demands at buildout. Includes 7.5% unaccounted for water (based on City's historical unaccounted for water).
(c) Based on actual water sales data for 2007 (not including unaccounted for water) (reference: City of Tracy Water Inventory Report, February 5, 2008). As noted above, 2007 water demands are used for the evaluation in this WSA, as 2007 water demands more closely represent normal year conditions.
(d) Based on actual water production in 2007 (includes actual water sales and calculated unaccounted for water in 2007 of 7.1%).
(e) See Development Projects with Approved Water Supply in Table 7 Projected Potable Water Demand Itemized by Future Development, City of Tracy 2010 UWMP, May 2011.
(f) Includes 7.5% unaccounted for water (3,839 af/yr divided by 92.5%).
(g) See Future Service (Planning) Areas in Table 7 Projected Potable Water Demand Itemized by Future Development Area, City of Tracy 2010 UWMP, May 2011. Includes the Cordes Ranch Project with a projected potable water demand at buildout of 2,233 af/yr (with 7.5% unaccounted for water equals 2,414 af/yr (2,233 af/yr divided by 92.5%)).
(h) Based on Gateway's participation in the Water Exchange Program.

As shown in Table 8, based on existing users and the development projects with approved water supply, the projected potable water demand is 23,326 af/yr; this projected potable water demand increases to 25,740 af/yr if the Proposed Project is included (includes unaccounted-for water). With the inclusion of other future projects to be developed within the SOI, the projected potable water demand increases to 36,304 af/yr at buildout (assumed to occur in about 2040).

Figure 5 shows the City's projected future potable water demand by development stage based on the currently available water demand estimates.

5.3 Dry Year Water Demand

The City currently has an extensive water conservation program in place, as described in Chapter 6 of the City's 2010 UWMP. The projected future water demand presented in Table 8 includes continued implementation of the City's existing water conservation program, and is based on future normal hydrologic years. In single dry or multiple dry years, the projected future water demand presented in Table 8 does not assume any additional water conservation beyond that assumed in normal years. This is because, as water demands begin to increase in the spring due to the warmer weather conditions, due to the lack of rainfall during the previous winter/spring period, and the subsequent public notification of dry conditions, some water conservation will occur, and summer water demands will likely decrease, essentially balancing out the demands within that year. This is a conservative assumption as additional water conservation may indeed occur in subsequent years as a result of the City's implementation of additional water conservation measures as outlined in the City's Water Shortage Contingency Plan in response to multiple dry years[8]. However, this additional water conservation is not relied upon for purposes of this WSA.

Table 9 presents the projected future dry year potable water demand.

Table 9. Projected Future Dry Year Potable Water Demand, af/yr[(a)]

Hydrologic Condition	Demand Reduction	2015	2020	2025	2030	2035
Single Dry Year	0%	23,000	25,000	28,300	31,000	33,600
Multiple Dry Years[(b)]	0%	23,000	25,000	28,300	31,000	33,600

(a) See Table 8 Projected Potable Water Demand by Water Demand Sector of the City's 2010 UWMP. Includes unaccounted for water of 7.5% based on the City's historical unaccounted for water.
(b) Represents demands for each year of the 3-year multiple dry year period.

[8] The City's Water Shortage Contingency Plan is included as an appendix to the City's 2010 Urban Water Management Plan.

6.0 CITY OF TRACY WATER SUPPLIES

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).

10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts

10910(d)(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

- *(A) Written contracts or other proof of entitlement to an identified water supply.*
- *(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.*
- *(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.*
- *(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.*

10910(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract-holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments..

It is anticipated that the Proposed Project, if approved by the City, would be served from City's existing and future portfolio of water supplies. The water supply for the Proposed Project will have the same water supply reliability and high water quality as the water supply available to all of the City's other existing and future water customers. Proponents of the Proposed Project will provide their proportionate share of required funding to the City for the acquisition and delivery of treated potable and recycled water supplies to the Proposed Project area.

The water demands for the Proposed Project (together with existing water demands and planned future uses) are included in the City's 2010 UWMP. Therefore, the descriptions provided below for the City's water supplies have been taken, for the most part, from the City's 2010 UWMP, which was adopted in May 2011. Supplemental information from other available reports has also been included to provide the most recent data available and to meet the specific requirements of SB 610.

The City's existing water supplies and some of the additional planned future water supplies have undergone previous environmental review. These reviews are referenced in the following descriptions and are incorporated by reference as applicable.

6.1 Existing Potable Water Supplies

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 Water Supply Project (delivered by the South San Joaquin Irrigation District (SSJID)), and
- Groundwater pumped from nine groundwater wells located within the City.

Each of these existing supplies is described below and documentation regarding these supplies (*e.g.*, contracts and agreements) is provided in Appendix A of this WSA. Summary tables listing the City's existing and additional water supplies, and historical and anticipated future quantities, are provided following the discussion of the City's additional water supplies. Figure 6 shows the City's historical use of these water supplies.

The City's Capital Improvement Plan (CIP) for the five-year period from Fiscal Year (FY) 2012/13 through FY 2016/17 for water system improvements to serve existing and future customers is provided in Appendix B.

6.1.1 Central Valley Project Water via the Delta-Mendota Canal

6.1.1.1 M&I-Reliability Supplies from the CVP

In 1974, the City entered into a 40-year contract with the USBR for an annual entitlement of 10,000 af/yr of surface water from the CVP via the Delta-Mendota Canal (DMC). The contract is due to expire in 2014. The City has agreed with the USBR to renew this contract prior to 2014. Contract negotiations are on-going and it is the intent to renew the contract prior to 2014. In the event the contract is not renewed prior to expiration, the City and the USBR will enter into an interim renewal contract to provide water service until the long-term renewal contract is executed. A copy of the City's contract with the USBR is included in Appendix A.

In the CVP system, in accordance with the USBR's Central Valley Project Municipal and Industrial (M&I) Draft Water Shortage Policy dated September 11, 2001, an M&I contractor is eligible for 75 percent M&I reliability applied to the contractor's historical use, with certain adjustments. This M&I reliability may be reduced when the allocation of Ag-reliability water is reduced below 25 percent of contract entitlement. Historical allocations for the M&I-reliability CVP water for the last several years are summarized below:

- 2005: 100 percent allocation
- 2006: 100 percent allocation
- 2007: 75 percent allocation
- 2008: 75 percent allocation
- 2009: 60 percent allocation
- 2010: 75 percent allocation
- 2011: 100 percent allocation
- 2012: 75 percent allocation

The City's allocations of M&I-reliability water in the last five years (2008 to 2012) have averaged 77 percent of the City's contractual entitlement.

Litigation has created uncertainty regarding the reliability of water deliveries through the Bay-Delta. Most of this litigation addresses compliance with the federal and State endangered species acts (see NRDC v. Kempthorne, and Watershed Enforcers v. DWR). In August 2007, the federal court in the Kempthorne case ordered that, as an interim remedy, Delta pumping be curtailed from late December through June to protect the Delta smelt (this became known as the Wanger Decision). In December 2008, a Biological Opinion (BiOp) regarding the Delta smelt was issued by the U.S. Fish and Wildlife Service which applied Delta pumping restrictions that are similar to the August 2007 interim court remedy, and a revised BiOp related to three salmon species was issued in June 2009 which included additional pumping restrictions. After the BiOps were released, numerous parties filed suit. The court overturned the BiOps and remanded the BiOps to the fishery agencies. The final impacts of the BiOps on future SWP and CVP deliveries remain uncertain.

6.1.1.2 Ag-Reliability Supplies from the CVP

In 2004, the USBR approved the assignment of 5,000 af/yr of Ag-reliability CVP contract entitlement to the City from the Banta Carbona Irrigation District (BCID). Also in 2004, the USBR approved the assignment of another 2,500 af/yr of Ag-reliability CVP contract entitlement water to the City from the WSID, with the option to purchase an additional 2,500 af/yr of CVP contract entitlement from the WSID (see discussion under *Section 6.2.1.1 Additional CVP Supplies from WSID)*. For both of these assignments, Negative Declarations were prepared pursuant to the provisions of the California Environmental Quality Act (CEQA) (BCID Assignment: SCH No. 2002072106; WSID Assignment: SCH No. 2002072107) and for each a Finding of No Significant Impact (FONSI) was issued.

Deliveries of Ag-reliability water can vary significantly, and during severe water shortages supply may be reduced as much as 100 percent. Allocations for the Ag-reliability CVP water for the last several years are summarized below:

- 2005: 85 percent allocation
- 2006: 100 percent allocation
- 2007: 50 percent allocation
- 2008: 40 percent allocation
- 2009: 10 percent allocation
- 2010: 45 percent allocation
- 2011: 80 percent allocation
- 2012: 40 percent allocation

Deliveries of Ag-reliability water during the last five years (2008 to 2012) have averaged 43 percent of the contractual entitlement.

6.1.1.3 Treatment of CVP Supplies

The City's CVP water supplies are treated at the City's John Jones Water Treatment Plant (JJWTP), which was originally 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 million gallons per day (mgd). Future additional expansion of the JJWTP is planned in conjunction with buildout of the City's General Plan SOI and is described in the Citywide Water System Master Plan.

The City also treats and serves relatively small quantities of CVP/DMC water purchased by others through a "treatment and wheeling agreement" for use at the Patterson Pass Business Park only. The Patterson Pass Business Park is now built out. In 2011, 527 acre-feet of water from the Plain View Water District (PVWD) (now part of the BBID) USBR allocation was treated at the City's JJWTP and delivered to the Patterson Pass Business Park. Deliveries to the Patterson Pass Business Park in the last several years are shown below:

- 2005: 407 af
- 2006: 354 af
- 2007: 450 af
- 2008: 378 af
- 2009: 363 af
- 2010: 419 af
- 2011: 527 af

A comparable quantity of BBID CVP/DMC water is anticipated to be available for annual delivery to the Patterson Pass Business Park in the future. A copy of the agreement between the City and BBID (PVWD) for this water supply, treatment and wheeling is included in Appendix A.

6.1.2 Stanislaus River Water

The City, in partnership with the cities of Manteca, Lathrop and Escalon, and the 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[9]. A Final EIR for the SCWSP was prepared in May 2000 (SCH No. 98022018).

Treated water deliveries commenced in July 2005, and deliveries have been essentially uninterrupted since then (see Figure 6). In the first few years, SCWSP deliveries were less than the City's full project allotment; however, during these years the City did not require its full SCWSP allotment, even though the full 10,000 acre-feet was available from SCWSP. However, as shown below, since 2009 the City has actually received more than its allotment. Historical deliveries from the SCWSP to the City are shown in Table 10.

[9] An additional amount of SCWSP supplies may be available to the City on an annual basis and in the future; see *Section 6.2.4 Additional Supplies from the SCWSP*.

Table 10. SCWSP Deliveries to City of Tracy and Other Project Participants

Year	SCWSP Deliveries to City of Tracy, af	Total SCWSP Deliveries to All Project Participants, af [(a)]
2005	3,146	6,493
2006	8,918	16,763
2007	9,130	17,139
2008	8,017	16,816
2009	10,401	19,746
2010	10,850	17,430
2011	11,786	[(b)]

(a) Table 4.4 of the SSJID 2010 Urban Water Management Plan, August 2011.
(b) Data not available for 2011.

The Draft and Final EIRs for the SCWSP analyzed the environmental impact of deliveries to the project participants of up to 44,000 af/yr (Draft EIR page 3-13). Total SCWSP deliveries to all project participants during 2006 to 2010 ranged from 16,763 af/yr in 2006 up to a maximum of 19,746 af/yr in 2009. The SCWSP is expected to have high reliability as a result of its senior pre-1914 rights. SSJID's 2010 UWMP[10], adopted by SSJID in September 2011, indicates that it will meet 100 percent of urban demands in normal years, 84.8 to 91.5 percent of urban demands in single dry years (the percent of urban demand met increases in the future as agricultural demands decrease), and 98 to 100 percent of urban demand in multiple dry years. The City has assumed that it will be able to receive 95 percent of its allocation, even during single dry years. This increase in supply reliability is premised upon the other project participants not using their entire project allotment and that water being available to the City.

A copy of the agreement between the City and SSJID for this water supply is included in Appendix A.

[10] Provost & Pritchard Consulting Group, *South San Joaquin Irrigation District 2010 Urban Water Management Plan*, August 2011.

6.1.3 Groundwater

10910(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment.

10910(f)(1) *A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.*

10910(f)(2) *A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.*

10910(f)(3) *A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.*

A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

10910(f)(4) *An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.*

A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

6.1.3.1 Groundwater Overview

The City overlies a portion of the San Joaquin Valley Groundwater Basin-Tracy Sub-basin (Tracy Sub-basin). The City currently operates nine groundwater wells, with a total extraction capacity of about 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), Ball Park Well (Well 7) and Well 8) are located throughout the City and pump water directly into the distribution system after disinfection. The City's newest well, Well 8, located near the intersection of Tracy Boulevard and 6th Street, was designed as an Aquifer Storage and Recovery Well (ASR Well), but has been put into service initially as an extraction well.

Figure 7 shows the locations of the City's wells and the Tracy Sub-basin.

6.1.3.2 Basin Description

The following section describes the Tracy Sub-basin, including its water-bearing formations, water levels, and water quality. Much of the following information has been incorporated from the City's 2010 UWMP. Except where noted, the description of the sub-basin is based largely on information provided in the 2003 California Department of Water Resources (DWR) Bulletin 118, in which the groundwater basin description was last updated in January 2006 (see Appendix C).

The sub-basin consists of unconsolidated to semi-consolidated sedimentary deposits that are bounded by the Diablo Range on the west, the Mokelumne and San Joaquin Rivers on the north, the San Joaquin River to the east, and the San Joaquin-Stanislaus County line on the south. Adjacent to the Tracy Sub-basin are the Eastern San Joaquin Sub-basin to the east, the Delta-Mendota Sub-basin to the south, and the Sacramento Valley Groundwater Basin to the north. The three sub-basins, not including the Sacramento Valley Groundwater Basin, are part of the San Joaquin Valley Groundwater Basin. The San Joaquin River and one of its major west side tributaries, Corral Hollow Creek, provide drainage from the Tracy Sub-basin. The San Joaquin River flows northward into the Sacramento and San Joaquin Delta and discharges into San Francisco Bay.

The Tracy Sub-basin is comprised of continental deposits of Late Tertiary to Quaternary age. These deposits include the Tulare Formation, Older Alluvium, Flood Basin Deposits, and Younger Alluvium. The cumulative thickness of these deposits increases from a few hundred feet near the Coast Range foothills on the west to about 3,000 feet along the eastern margin of the sub-basin.

Each of these formations is described below.

- The Tulare Formation is exposed in the Coast Range foothills along the western margin of the sub-basin and dips eastward toward the axis of the San Joaquin Valley. The Tulare Formation is approximately 1,400 feet thick and consists of semi-consolidated, poorly sorted, discontinuous deposits of clay, silt, and gravel. The Corcoran Clay occurs near the top of the Tulare Formation and confines the underlying fresh water deposits. The eastern limit of the Corcoran Clay is near the eastern boundary of the sub-basin. The Tulare Formation is moderately permeable, with most of the larger agricultural, municipal, and industrial wells completed below the Corcoran Clay and capable of producing up to about 3,000 gallons per minute (gpm). Smaller, domestic wells are typically completed above the Corcoran Clay, where the groundwater is often of poor quality. Specific yield values for the Tulare Formation in the San Joaquin Valley and Delta area range from 7 to 10 percent.
- The Older Alluvium is approximately 150 feet thick and consists of loosely to moderately compacted sand, silt, and gravel deposited in alluvial fans during the Pliocene and Pleistocene eras. The Older Alluvium is widely exposed between the Coast Range foothills and the Delta and is moderately to locally highly permeable.

- The Flood Basin Deposits occur in the Delta portion of the sub-basin and are the distal equivalents of the Tulare Formation and Older and Younger alluvial units. The Flood Basin Deposits consist primarily of silts and clays with occasional interbeds of gravel along the present waterways. Because of their fine-grained nature, the Flood Basin Deposits have low permeability and generally yield low quantities of water to wells. Occasional zones of fresh water are found in the Flood Basin Deposits, but they generally contain poor quality groundwater. The maximum thickness of the Flood Basin Deposits is about 1,400 feet.
- The Younger Alluvium includes those deposits that are currently accumulating, including sediments deposited in the channels of active streams, as well as overbank deposits and terraces of these active streams. The Younger Alluvium, consisting of unconsolidated silt, fine- to medium-grained sand, and gravel, is present to depths of less than 100 ft below ground surface (bgs) along the channel of Corral Hollow Creek. Sand and gravel zones in the Younger Alluvium are highly permeable and, where saturated, yield significant quantities of water to wells.

6.1.3.3 Groundwater Level Trends

The potentiometric surface in the semi-confined aquifer above the Corcoran Clay is located approximately 90 to 150 ft above mean sea level (msl). Review of hydrographs from wells throughout the sub-basin indicates that, except for seasonal variation resulting from recharge and pumping, water levels in most of these wells have remained stable over at least the last 10 years. As discussed below, as part of the City's Groundwater Management Policy, groundwater levels in the Tracy area are being monitored by the City on a semi-annual basis. These measurements indicate that groundwater levels in the City's wells have increased over the last few years, likely as a direct result of reduced groundwater pumpage by the City since 2005.

6.1.3.4 Groundwater Storage

There are no published groundwater storage values for the entire sub-basin (DWR, 2003). However, Hotchkiss and Balding (1971) estimated the groundwater storage capacity for the Tracy-Patterson Storage Unit at 4,040,000 af. The Tracy-Patterson Storage Unit includes the southern portion of the currently-defined Tracy Sub-basin, from approximately one mile north of Tracy to the San Joaquin-Stanislaus County line. Since the Tracy Sub-basin comprises roughly one-third of the Tracy-Patterson Storage Unit, it can be inferred that the approximate storage capacity of the Tracy Sub-basin is on the order of 1,300,000 af.

In an eight-year study conducted by Stoddard & Associates (1996), the average change in the entire sub-basin storage was approximately negative 13,000 af per year. Stoddard & Associates (1996) indicates a major contributor to this sub-basin storage decline was due to rainfall during the study period being well below average. Stoddard concluded that the sub-basin is in a hydrologically-balanced condition and is not overdrafted[11]. Similarly, DWR has not identified the Tracy Sub-basin as being in an overdrafted condition (per DWR Bulletin 118-80).

[11] Page 23, City of Tracy 2010 Urban Water Management Plan, prepared by Erler & Kalinowski, Inc., May 2011.

6.1.3.5 Groundwater Yield

A 1990 Kennedy/Jenks/Chilton (K/J/C) study estimated a perennial groundwater yield of 6,700 af/yr in the Tracy Sub-basin within the Tracy Study Area. However, in 2001, to determine if additional groundwater resources were available in the Tracy Study Area, the City conducted an updated groundwater analysis. The Estimated Groundwater Yield Study, prepared by Bookman-Edmonston Engineering (included as an appendix to the City's Groundwater Management Policy Mitigated Negative Declaration--see Appendix C) provided an evaluation of potential groundwater yield and determined that a 2,300 af/yr increase of the average annual operational groundwater yield above the groundwater yield recommended in the 1990 K/J/C study could be provided within the estimated sustainable yield of the Tracy Sub-basin in the Tracy Study Area, without adverse impact to groundwater resources or quality in the Tracy Study Area over a 50-year timeframe. This expansion of groundwater usage to 9,000 af/yr would be within the City's estimated share of the aquifer's sustainable yield of 22,000 af/yr of the 28,000 af/yr total (which includes groundwater usage within West Side Irrigation District, Naglee-Burk Irrigation District, Plain View Water District (now part of the Byron Bethany Irrigation District), and Banta-Carbona Irrigation District). It was also estimated that this expansion of groundwater usage would result in a groundwater level drop of 10 feet, but would stabilize at this level.

6.1.3.6 Groundwater Quality

Groundwater quality in the Tracy Sub-basin varies spatially and with depth. In general, the northern part of the Tracy Sub-basin is characterized by a sodium water type, and the southern part of the Sub-basin is characterized by calcium-sodium type water. The northern part of the Tracy Sub-basin is also characterized by a wide range of anionic water types, including bicarbonate; chloride; and mixed bicarbonate-chloride. Major anions in the southern part of the Tracy Sub-basin include sulfate-chloride and bicarbonate-chloride.

There is also a difference between the water quality in the water-bearing zones above the Corcoran Clay (termed the "semi-confined aquifer") and below the Corcoran Clay (termed the "confined aquifer"). Generally, the water quality of the confined aquifer is better than that of the semi-confined aquifer. Total Dissolved Solids (TDS) concentrations in well water sampled in the semi-confined aquifer ranged between 1,000 milligrams per liter (mg/L) and 1,500 mg/L, while the measured TDS in the confined aquifer was less than 1,000 mg/L. In the vicinity of Tracy, the TDS of the confined aquifer is between 600 mg/L and 700 mg/L.

Constituents present at elevated concentrations throughout the Tracy Sub-basin in both the semi-confined and confined aquifers include chloride, nitrate, sulfate, and boron. Elevated chloride occurs in several areas near Tracy and along the San Joaquin River. Areas of elevated nitrate occur in the northwestern part of the Tracy Sub-basin and in the vicinity of Tracy. Elevated boron occurs over a large portion of the Sub-basin from south of Tracy extending to the northwest side of the Tracy Sub-basin. Sulfate concentrations of up to 500 mg/L have been detected in Tracy Sub-basin groundwater. The groundwater near Tracy is considered to be very hard.

6.1.3.7 Groundwater Management

The 1992 Groundwater Management Act, AB 3030, established provisions by which local water agencies could develop and implement groundwater management plans (GMPs). GMPs are generally designed to prevent local and regional aquifer overdrafting, which reduces available groundwater resources and which, under certain conditions, can lead to degradation of water quality and to land subsidence. The City has been, and continues to be, involved in both regional and local groundwater management efforts.

6.1.3.7.1 Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area and a Portion of San Joaquin County

In 1996, the City Council adopted the Northern Delta-Mendota Canal Groundwater Management Plan pursuant to Water Code Sections 10750 et seq., also known as AB 3030. The plan was developed in coordination with other DMC northern agencies, including: Banta-Carbona Irrigation District, Byron-Bethany Irrigation District, Del Puerto Water District, Patterson Irrigation District, West Stanislaus Irrigation District, Westside Irrigation District, San Joaquin County, and the City of Tracy. The 1996 GMP included information on groundwater levels and quality, conjunctive management of groundwater and surface water resources, and measures to protect groundwater resources within the plan area.

In 2011, the GMP was revised to include additional information to comply with new provisions adopted by the State Legislature which included:

- The Department of Water Resources (DWR) to establish a priority schedule for monitoring groundwater basins and elevation reports as well as issuing recommendations to local entities to improve water quality;
- Permit local entities to determine best methods of groundwater monitoring to meet local demand;
- The DWR to implement groundwater monitoring if local agencies fail to do so. This will result in loss of eligibility for State grant funds.

The City of Patterson plans to become a northern agency member and the revised GMP will reflect their inclusion.

A public hearing regarding the revised GMP was held on February 7, 2012. The revised GMP was adopted by the Tracy City Council on May 1, 2012.

A copy of the revised GMP is included in Appendix C.

6.1.3.7.2 San Joaquin County Groundwater Export Ordinance

Occasional drought conditions and ongoing restrictions on Delta export pumping have reduced the imported CVP surface water supply available to entities located south of the Delta that rely on DMC/CVP water (Stoddard, 1996). Arrangements for water transfers between entities that receive DMC/CVP water were developed to allocate the reduced DMC/CVP supply to match demand, including pumping of groundwater into the DMC for conveyance and use in other areas.

This additional groundwater extraction, for the purpose of selling it to other DMC/CVP users, raised concerns amongst sub-basin groundwater users regarding groundwater overdraft and quality degradation. In response to these concerns, San Joaquin County enacted a Groundwater Export Ordinance in June 2000 that now requires an entity to secure a permit from San Joaquin County prior to exporting groundwater out of the County (such as by pumping extracted groundwater into the DMC for conveyance to other areas).

6.1.3.7.3 City Groundwater Management Policy and Mitigated Negative Declaration for City Groundwater Production of 9,000 af/yr

On a local level, in 2001, the City adopted a Groundwater Management Policy, and prepared a Groundwater Management Policy Mitigated Negative Declaration (see Appendix C). The Groundwater Management Policy and the Groundwater Management Policy Mitigated Negative Declaration are described below.

As discussed above, in 2001, the City anticipated that, to make up a projected temporary shortfall between supply and demand, groundwater extraction would have to increase from approximately 6,000 af/yr to a maximum of 9,000 af/yr over the three-year period from 2001 through 2004. Prior to 2001, it had been estimated that 6,700 af/yr was the City's sustainable groundwater extraction rate (K/J/C, 1990). However, the 2001 Estimated Groundwater Yield Study by Bookman-Edmonston, revised the estimated average annual operational groundwater yield to 9,000 af/yr. This operational yield, though larger than the earlier estimate, is still well under the City's estimated 22,000 to 28,000 af/yr share of the Tracy Sub-basin's sustainable yield.

Pursuant to the findings of the 2001 Bookman-Edmonston study, the Tracy City Council adopted a Groundwater Management Policy in 2001 that established the City's maximum annual groundwater extraction rate of 9,000 af/yr. To comply with CEQA and to evaluate the potential negative effects of increased groundwater extraction on water quality, water levels, and subsidence, the City also prepared a Groundwater Management Policy Mitigated Negative Declaration (see Appendix C). The Groundwater Management Policy Mitigated Negative Declaration specifies the frequency and type of monitoring and reporting the City must conduct to evaluate the sustainability of the increased groundwater extraction rate.

Consistent with the Groundwater Management Policy Mitigated Negative Declaration, the City has maintained groundwater production rates well below the estimated sustainable yield of 9,000 af/yr. In addition, the City hired Bookman to monitor the impacts of groundwater extraction on groundwater levels, groundwater quality, and land subsidence. Bookman's most recent Mitigation Monitoring Report dated January 23, 2009 covering the period from November 2007 through November 2008 includes well production data, water quality data, hydrographs, and groundwater contour maps for the City's production and monitoring wells (excerpts from this report are provided in Appendix C). As described in the report, there is no indication that pumping by the City is significantly or adversely affecting groundwater levels or water quality at this time. In fact, the report shows that groundwater levels in the City's wells have increased over the last couple of years, likely as a direct result of decreased groundwater pumpage by the City since 2005.

6.1.3.7.4 Tracy Regional Groundwater Management Plan (Regional City GMP)

In addition to participating in the development of the Tracy Sub-basin GMP, in 2005 the City was awarded a DWR grant for approximately $185,000 to prepare a Tracy Regional Groundwater Management Plan (Tracy Regional GMP) for the portion of the Tracy Sub-basin that underlies the City of Tracy. The Tracy Regional GMP was completed in March 2007. A key objective of the Tracy Regional GMP was the development of Basin Management Objectives (BMOs) for groundwater levels, groundwater quality, and land subsidence in the region.

Excerpts from the Tracy Regional GMP are provided in Appendix C.

6.1.3.8 Historical Groundwater Use

As discussed previously, the City currently operates nine groundwater extraction wells (see Figure 6):

- Well 1 (at JJWTP)
- Well 2 (at JJWTP)
- Well 3 (at JJWTP)
- Well 4 (at JJWTP)
- Lincoln Well
- Well 5 (Lewis Manor Well)
- Well 6 (Ball Park Well)
- Well 7 (Park & Ride Well)
- Well 8

The City's newest well, Well 8, was constructed in January 2004 and was permitted by the California Department of Public Health (DPH) for use as a municipal production well in September 2010. Well 8 is ultimately intended for use with the City's future Aquifer Storage and Recovery Program (see discussion under *Section 6.2.4 Aquifer Storage and Recovery*).

Historically, groundwater has accounted for approximately 40 to 50 percent of the City's annual water supply. Prior to 2000, groundwater extraction by the City totaled less than 6,000 af/yr. Between 2000 and 2004, to meet increased demands for water, the City began extracting additional groundwater, with annual usage up to about 7,700 af/yr. In 2005, groundwater extraction decreased to less than 6,000 af/yr primarily because: (1) the SCWSP was completed and the City began receiving Stanislaus River water; and (2) rainfall was above normal, meaning that the City received a higher percentage of its DMC/CVP contractual entitlements. The City's groundwater production over the last seven years is provided in Table 11.

Table 11. City of Tracy Historical Groundwater Production

	2005	2006	2007	2008	2009	2010	2011
Total Groundwater Production[(a)], af/yr	5,826	3,034	3,672	2,598	1,327	498	292

[(a)] Source: Table 11 Current and Historical Potable Water Supply, City of Tracy 2010 UWMP, May 2011 and 2011 Water Production Data.

As noted above, other groundwater users in the Tracy area include the West Side Irrigation District, Naglee-Burk Irrigation District, Plain View Water District (now the Byron Bethany Irrigation District), Banta-Carbona Irrigation District. Although current groundwater pumpage by these users was not available for inclusion in this WSA, 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 in the Tracy area.

6.1.3.9 Projected Future Groundwater Use

As discussed above, the 2001 Estimated Groundwater Yield Study indicated an average annual operational groundwater yield for the City of 9,000 af/yr. The study indicated that this increase in the City's groundwater yield was within the estimated sustainable yield of the groundwater sub-basin within the Tracy Study Area, and could be maintained without adverse impact to groundwater resources or quality in the Tracy Study Area over a 50-year timeframe. However, because the hard, high-TDS groundwater is of poorer quality compared with the City's surface water sources, the City is planning to scale back its future groundwater extractions during normal years. For example, at buildout of the General Plan, groundwater production in normal years is anticipated to be approximately 2,500 af/yr. However, the City will continue to rely on groundwater for peaking, drought, and emergency supplies, and may pump up to 9,000 af/yr or more during single dry or multiple dry years, as needed, to meet demands when surface water supplies may be limited.

The City's existing groundwater wells currently have the capability of pumping 9,000 af/yr. The City has replaced a number of older wells with new wells (*e.g.*, the Tidewater Well was replaced by Well 8). Well 8, which is ultimately intended for use as part of the City's future Aquifer Storage and Recovery Program (see further discussion below), was constructed in 2004, equipped in early 2010 and put into operation as an extraction well in September 2010. In the future, the City will construct new production and emergency supply wells, as needed, to replace and supplement existing, aging production wells and provide additional supply reliability in the event of a drought or other emergency situation.

The City's potential uses of groundwater during droughts are consistent with Tracy's Groundwater Management Policy (discussed above). In the event that the City is unable to secure additional high quality surface water supplies in the future, groundwater remains a sustainable water supply up to 9,000 af/yr. However, by reducing groundwater extraction on an average annual basis to approximately 2,500 af/yr, the City will:

- Increase the overall quality of its drinking water, thus increasing customer satisfaction and reducing system maintenance and repair caused by the lower-quality groundwater;
- Recharge the underlying aquifer, effectively increasing the availability of groundwater during a drought or emergency condition (*i.e.*, the City will effectively be practicing "in-lieu groundwater banking" of its groundwater); and
- Reduce salt loading to the City's wastewater treatment plant, which will help the City comply with wastewater discharge requirements.

If the City decreases future groundwater extraction during normal and wet years, current groundwater levels, groundwater flow directions and gradients, and groundwater quality would be expected to change correspondingly. Further, if the City moves ahead with its proposed future ASR Program (see discussion below), changes in groundwater flow patterns associated with the injection of treated surface water into the confined aquifer zone may occur. Groundwater quality would be expected to improve as a result of the introduction of higher quality surface water into the aquifer.

Table 12 shows the anticipated future groundwater production during a normal year.

Table 12. City of Tracy Projected Future Groundwater Production in Normal Years

	2015	2020	2025	2030	2035
Total Groundwater Production[a,b], af/yr	2,500	2,500	2,500	2,500	2,500

[a] Source: Table 18 Current and Projected Water Supply Allocations-Normal Year, City of Tracy 2010 UWMP, May 2011.
[b] Although the City can sustainably extract up to 9,000 af/yr of groundwater, the City is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. The City will continue to rely on groundwater for peaking and drought and emergency supplies, up to 9,000 af/yr, on an as-needed basis.

6.1.3.10 Groundwater Sufficiency

The City's 2010 UWMP addressed the sufficiency of the City's groundwater supplies, in conjunction with the City's other existing and additional water supplies, to meet the City's existing and planned future uses[12]. Based on the information provided above and that included in the City's 2010 UWMP, the City's groundwater supply, together with the City's other existing and additional planned future water supplies, is sufficient to meet the water demands of the Proposed Project, in addition to the City's existing and planned future uses. As discussed above, the City's use of groundwater over the last few years has significantly declined, primarily due to the availability of new high-quality surface water supplies from the SCWSP. In the future, although the City can sustainably extract up to 9,000 af/yr of groundwater, the City's use of groundwater is anticipated to decrease even further, as additional high-quality surface water supplies become available. As shown in Table 12, in the future, assuming normal year hydrologic conditions, annual groundwater use is anticipated to be as low as 2,500 af/yr by 2015. This anticipated future groundwater pumpage is significantly below the City's historical groundwater pumpage (see Table 11) and the average annual operational yield of 9,000 af/yr.

By reducing groundwater extraction on an average annual basis, the City will: (1) recharge the underlying aquifer, effectively increasing the availability of groundwater during a drought or emergency condition (*i.e.*, the City will effectively be "banking" its groundwater); and (2) increase the overall quality of its drinking water, thus increasing customer satisfaction and reducing system maintenance and repair caused by the lower-quality groundwater.

[12] Chapter 4, City of Tracy 2010 Urban Water Management Plan, May 2011.

6.1.4 Out-of-Basin Water Banking

The Semitropic Groundwater Storage District Groundwater Storage Bank (Semitropic) is a water storage system that began operation in the early 1990s. Located in Kern County between the California Aqueduct and the Delta-Mendota Canal, Semitropic is one of eight California groundwater banking agencies. Semitropic works by having its banking partners deliver their surplus water to Semitropic for groundwater storage. Then, when requested by the banking partner, Semitropic returns the stored water to the California Aqueduct for use by its partners either by exchanging its entitlement or by reversing the intake facility (known as "pumpback"). Through "pumpback", Semitropic can deliver a maximum of 90,000 af/yr of water into the California Aqueduct. The State would then deliver the water to the banking partners.

The total storage capacity at Semitropic is 2.15 million acre-feet and, as listed below, there is still a significant amount of storage capacity which is uncommitted and available. The current Semitropic banking partners and their reserved/available storage capacities are listed below[13]:

- Original Water Bank (1.0 million acre-feet)
  - Metropolitan Water District of Southern California: 350,000 acre-feet
  - Santa Clara Valley Water District: 350,000 acre-feet
  - Alameda County Water District: 150,000 acre-feet
  - Zone 7 Water Agency: 65,000 acre-feet
  - Newhall Land and Farming Company: 55,000 acre-feet
  - San Diego County Water Authority: 30,000 acre-feet
- Stored Water Recovery Unit (650,000 acre-feet)
  - Semitropic's Contribution to Semitropic-Rosamond Water Banking Authority (SRWBA): 300,000 acre-feet (see below)
  - Semitropic Portion of Stored Water Recovery Unit (350,000 acre-feet)
    - Poso Creek Water Company: 60,000 acre-feet
    - Rampage Vineyard: 18,000 acre-feet
    - Uncommitted: 122,000 acre-feet
    - Not Available Until SRWBA is Committed: 150,000 acre-feet
- SRWBA (800,000 acre-feet)
  - Portion Contributed by Semitropic (300,000 acre-feet)
    - San Diego County Water Authority: 15,000 acre-feet
    - Available Storage: 285,000 acre-feet
  - Antelope Valley Water Bank (500,000 acre-feet)
    - San Diego County Water Authority: 25,000 acre-feet
    - Rosamond Community Services District: 30,000 acre-feet
    - Available Storage: 445,000 acre-feet

[13] Based on information provided on Semitropic Water Storage District website: www.semitropic.com, as of September 2010.

6.1.4.1 Pilot Agreement

In June 2006, the City entered into a pilot agreement with Semitropic Water Storage District for 1,000 acre-feet of water storage at Semitropic, which allows for an annual withdrawal of up to 333 af/yr (*e.g.*, 1,000 acre-feet divided by 3). A Negative Declaration was prepared for the pilot agreement pursuant to the provisions of CEQA (SCH No. 2006052049) and a FONSI was issued by USBR (FONSI-05-111). The pilot agreement was intended to establish the procedures for water deposits and withdrawals by the City of Tracy.

A copy of the City's pilot agreement with Semitropic is included in Appendix A. Now that the permanent agreement with Semitropic has been implemented, this pilot agreement has been terminated.

6.1.4.2 Permanent Agreement

On June 5, 2012 the Tracy City Council approved a long-term agreement with Semitropic for 3,500 units of water storage. One unit of water storage allows for a withdrawal of up to 1 af/yr for three years; hence, the agreement would allow for withdrawal of 3,500 af/yr for three years (10,500 af total). To store water in Semitropic, the City would not withdraw its share of CVP water from the DMC, but instead allow this water to continue to move through the DMC and California Aqueduct systems for delivery to and use by Semitropic. This is called "in lieu storage." Upon request by the City, in accordance with the contract, Semitropic would pump the stored water into the California Aqueduct and a like amount of water would be made available to the City directly from the DMC. Though the City could utilize this supply in any year, it would be most valuable during drought years when the City's CVP surface water supplies are reduced. If the City uses water from the Semitropic water bank in any given year, it would work to manage its supplies during subsequent years such that it could "refill" its water bank for future water use. By banking surplus CVP water at Semitropic, the City will increase the quantity of supplies available during drought and/or other emergency conditions, thereby increasing the reliability of its water supply.

The purchase price for capacity in Semitropic was $5,206,961. A Negative Declaration was prepared for the permanent agreement pursuant to the provisions of CEQA (SCH No. 2010092012) and a FONSI (FONSI-09-164) was issued by USBR. A copy of the City's permanent agreement with Semitropic is included in Appendix A.

To date, the City has deposited 7,000 acre-feet of supplies in Semitropic and has withdrawn 200 acre-feet (100 acre-feet in November 2007 and 100 acre-feet in December 2008)[14]. The City's current balance is 6,100 acre-feet[15]; these supplies are available to the City for withdrawal

[14] The City's most recent deposit to Semitropic was made in September 2012.

[15] Semitropic's distribution system, evaporative and aquifer losses are collectively assumed to be 10 percent of the amount of water furnished by banking partners for storage. The City's current balance is calculated as follows per Article 4 of the agreement between Semitropic and the City (see Appendix A): Total deposited (7,000 af) – 10% Losses (700 af) – Withdrawals (200 acre-feet) = Available (6,100 af).

in dry years, if needed. Based on this current balance, it is assumed that 2,033 af will be available for withdrawal in 2015 (6,100 af over three years).

6.2 Additional Planned Future Potable Water Supplies

The City is currently anticipating the following additional planned future potable water supplies in the future:

- Additional surface water from the Delta-Mendota Canal (CVP);
- Surface water from BBID pre-1914 water rights;
- Additional supplies from the SCWSP; and
- Aquifer Storage and Recovery.

Each of these additional planned future water supplies is described below. Summary tables listing the City's existing and additional planned future water supplies, and historical and anticipated future quantities are provided at the end of this section.

6.2.1 Additional Central Valley Project Water via the Delta-Mendota Canal

6.2.1.1 Additional CVP Supplies from WSID

As previously mentioned, the City has an option for an additional assignment of 2,500 af/yr of Ag-reliability CVP contract entitlement water from the WSID. Per the agreement with WSID, the City can execute this assignment at any time before midnight on February 27, 2014. Environmental review and all other required reviews and approvals for this assignment have been completed (as described in Section 6.1.1.2), such that this assignment can be executed with the transfer of the required funds.

A copy of the City's agreement for assignment of this water supply from WSID is included in Appendix A. An amount of $2.5 million has been included in the City's CIP future appropriations for FY13-14 (CIP 75061) for this water supply assignment from WSID.[16] The City plans to exercise this option in late 2013 or early 2014, prior to the February 27, 2014 deadline with the additional supply of 2,500 af/yr being available thereafter.

6.2.1.2 Additional CVP Supplies from BBID

The area served by the former PVWD is now part of BBID. Due to on-going urbanization in portions of BBID's service area (including the Proposed Project), BBID anticipates that it may have CVP contract entitlement water (with Ag-reliability) available for municipal uses in the future. The City and BBID are negotiating a phased option agreement to assign portions of BBID's CVP/DMC contract right to the City. The estimated quantity of contract entitlement water potentially subject to such an agreement is approximately 11,000 af/yr. The exact quantity of BBID CVP water entitlement is the subject of the future agreement between the City and

[16] City of Tracy Capital Improvement Program for FY12-13 through FY16-17, June 2012.

BBID. However, previous discussions have indicated that a contract entitlement quantity of water equal to 3.4 acre-feet per year per acre (af/ac/yr) of converted agricultural land may be available for M&I use.

It is estimated that an agreement between the City and BBID can be achieved within the next few years to allow for the transition of additional CVP supplies to be available to the City starting in 2015 (at 3,000 af/yr) and increasing to 11,000 af/yr by 2030. An approval will be required from the USBR and compliance with CEQA and National Environmental Policy Act (NEPA) will be required. Because the exact quantity of water available and terms of a future agreement are yet to be negotiated, the total cost and financing mechanisms for acquiring this supply have not yet been determined.

The northern and eastern portions of the Proposed Project (approximately 1,080 acres) are located within the former PVWD (now BBID) service area. Conversion of this area of agricultural land in conjunction with the development of the Proposed Project would provide approximately 3,700 af/yr (1,080 acres x 3.4 af/ac/yr) of supply to the City from BBID's CVP water entitlement.

6.2.2 Surface Water from BBID Pre-1914 Water Rights

Part of the proposed Tracy Hills Specific Plan area was annexed into the BBID and is entitled to water service from BBID, using BBID's pre-1914 appropriative water rights. The City anticipates that up to 4,500 af/yr of pre-1914 water rights water could be provided by BBID on a year-round basis (via the DMC with a proposed Exchange Agreement with the USBR) to serve the proposed Tracy Hills Project in the BBID service area.. This supply quantity has been increased from that presented in the City's 2010 UWMP as a result of recent agreements related to the proposed Tracy Hills Project. Because the water supply is based on pre-1914 appropriative rights, the supply is considered to be firm and well-established.

Current and future work to secure this water supply includes: finalizing agreements between the City and BBID; completion of a Water Supply Assessment and required environmental documentation; and execution of an Exchange Agreement with the USBR to provide for a year-round supply to be conveyed to the City's JJWTP via the DMC. The proposed supply will need to meet the City's reliability criteria.

Costs for obtaining the water supply from BBID and delivering the water supply to the City's JJWTP for treatment and use at the Tracy Hills Project will be paid in a manner consistent with the City's applicable fee program requiring fair share participation by the project developer. Required reviews and approvals will likely include the following entities: the City, Tracy Hills Project developer, BBID, and USBR. The City anticipates that the BBID pre-1914 water supply will be available by 2014.

6.2.3 Additional Supplies from the SCWSP

The City is anticipating that an additional 2 mgd of treatment and conveyance capacity, and 3,000 af/yr of treated water supplies will be available from the SCWSP in the future. This additional supply would have the same high reliability as the supply that the City is currently receiving from the SCWSP. Delivery of these additional supplies to the City would be through

the same, existing facilities currently delivering the City's existing SCWSP supplies. Delivery of these additional supplies will be subject to approval and environmental review. An amount of $5.7 million has been included in the City's CIP future appropriations for FY13-14 (Project 75PP-104) for these additional water supplies from the SCWSP.[17] The City anticipates that these additional supplies will be available starting in 2015.

6.2.4 Aquifer Storage and Recovery

The City's proposed ASR Program would allow the City to optimize conjunctive use of its water supplies through injection of surplus treated (potable) drinking water into selected aquifer zones within the groundwater Sub-basin for storage when surplus supplies are available, and recovery of that potable water from the aquifer to optimize water quality and meet seasonal peak demands during drought periods, or when emergency or disaster scenarios preclude the use of imported water supplies.

As discussed above, the City constructed a new well in January 2004 (Well 8) that was designed to allow for both injection and extraction of water supplies in conjunction with the City's proposed ASR Program. In early 2009, the City contracted to construct the above-ground well facilities (including the pump house, pump, motor, SCADA, electrical, telemetry, chemical feed systems, *etc.*) to have Well 8 operational in September 2010, initially as an extraction well, and in the future as part of the City's proposed ASR Program. In addition, the City has already installed two monitoring wells for use in the demonstration project monitoring and testing for the proposed ASR Program.

The City obtained regulatory approval from the Central Valley Regional Water Quality Control Board (RWQCB) to conduct an ASR Demonstration Testing Program. A Negative Declaration was prepared for the project in November 2010 pursuant to the provisions of CEQA (SCH No. 2010112049). The Phase 1 ASR Demonstration Testing was conducted between January 2011 and September 2011 and involved the injection of 233 acre-feet (76 million gallons) of treated SSJID potable water, storage in the confined aquifer and subsequent extraction of 340 acre-feet (111 million gallons) of water[18]. The Phase 2 ASR Testing was initiated in late December 2011 and was completed in September 2012 with injection of 700 acre-feet. The Tracy City Council approved and adopted a CEQA Negative Declaration (SCH No. 2012102013) for the permanent ASR Program on December 4, 2012.

The next step is to obtain approval to operate a permanent ASR Program from the RWQCB. It is estimated that as much as 685 to 915 af/yr of potable water could be injected into the aquifer, assuming a 5-month continuous injection rate of 1.5 to 2.0 mgd. Implementation of the City's ASR Program will occur incrementally (as new ASR wells are constructed) with up to 3,000 acre-feet of high-quality water ultimately (by 2025) being available in drought years to increase the reliability of the City's water supply. Approximately 1,000 af/yr of ASR supply is anticipated to be available starting in 2015 and increasing to 3,000 af/yr by 2025.

[17] City of Tracy Capital Improvement Program for FY12-13 through FY16-17, June 2012.

[18] Interim (Final) Status Report for Well 8 ASR Demonstration Program, Memorandum prepared for City of Tracy by Pueblo Water Resources, dated December 7, 2011.

6.3 Existing Non-Potable Water Supplies

6.3.1 Diversion of Non-Potable Surface Water from Sugar Cut

As described in the Water Supply Assessment for the Holly Sugar Sports Park[19], the City's Holly Sugar property has historically (since at least 1912) been irrigated using untreated surface water diverted from Sugar Cut. Over the years, the Holly Sugar property has been farmed and planted with a variety of crops, including winter wheat, corn, tomatoes, alfalfa and, when the property was owned by Holly Sugar, sugar beets. The Holly Sugar property is currently being farmed and irrigated with untreated surface water diverted from Sugar Cut. The water rights to the untreated surface water from Sugar Cut are considered to be pre-1914 appropriative rights, and may also be classified as riparian rights. Use of the water from Sugar Cut has been continuous on the Holly Sugar property for irrigation purposes since at least 1912.

The continued use of this non-potable water supply from Sugar Cut is proposed for the irrigation of the proposed Holly Sugar Sports Park[20]. This use is considered a continued beneficial use of the supply for essentially the same purpose of irrigation. The use of untreated surface water from Sugar Cut for non-potable water uses for the proposed Holly Sugar Sports Park would be for the interim only, until recycled water supplies become available. Therefore, future use of this non-potable supply, beyond the interim irrigation of the proposed Holly Sugar Sports Park, is not anticipated.

6.4 Additional Planned Future Non-Potable Water Supplies

6.4.1 Recycled Water

In 2002, the City adopted a Recycled and Non-Potable Water Ordinance requiring all new subdivisions, to the extent practicable, to install the required infrastructure (such as dual-distribution pipelines) to provide recycled water to meet non-potable water demands at parks, golf courses, athletic fields, schools, median island landscapes, and industrial sites. As described in Chapter 2 of the Citywide Water System Master Plan, one of the principles developed for sustainable infrastructure in the City is to promote and encourage the use of recycled water for non-potable uses in existing and future publicly landscaped areas in the City, where feasible.

At buildout of the City's General Plan, it is estimated that the recycled water demand for landscape irrigation will be approximately 7,500 af/yr[21]. Based on the City's Citywide Wastewater System Master Plan, the quantity of recycled water supply available is up to 22.4 mgd (25,000 af/yr) at buildout, based on anticipated wastewater flows and the capacity of the City's WWTP[22]. Recycled water will be treated to a tertiary level in accordance with Title 22

[19] Water Supply Assessment for the Holly Sugar Sports Park, prepared by West Yost Associates, June 2009.

[20] Water Supply Assessment for the Holly Sugar Sports Park, prepared by West Yost Associates, June 2009.

[21] City of Tracy Citywide Water System Master Plan, Final Report, prepared by West Yost Associates, December 2012.

[22] Table C-1, Tracy Wastewater Master Plan, Draft Report, prepared by CH2MHill, May 2012.

requirements at the City's WWTP and will be distributed to recycled water use areas within the City's SOI. It is anticipated that adequate recycled water supplies will be available to meet the projected recycled water demands at buildout of the City's General Plan, including those associated with the Proposed Project. Approvals and permits for the production, distribution and use of recycled water will be required from the RWQCB and the California Department of Public Health (DPH).

6.4.2 Shallow Non-Potable Groundwater

As discussed above, the Tracy Sub-basin underlying the City has two aquifers: semi-confined and confined. The uppermost semi-confined aquifer is primarily comprised of alluvial and flood basin formations. The underlying confined aquifer is primarily comprised of the Tulare Formation and it is overlain by the Corcoran Clay, which separates the upper unconfined aquifer from the underlying confined aquifer. The City's production wells draw from the confined aquifer only and the average annual operational groundwater yield of 9,000 af/yr described in previous sections applies only to the confined aquifer. The City does not currently pump any groundwater from the semi-confined aquifer.

The hydraulic characteristics of the semi-confined aquifer are highly variable, based on site-specific conditions. Wells in the semi-confined aquifer produce 6 gpm to 5,300 gpm; however, pump test data are limited. The transmissivity of the semi-confined aquifer, including the recent alluvium and upper portions of the Tulare Formation, ranges between 600 to greater than 2,300 gallons per day per foot (gpd/ft). The storativity is about 0.05. Where thicker sequences of sand are present, the transmissivity may be higher.

Relatively speaking, groundwater levels in the semi-confined aquifer are significantly deeper at the southern end of the City typically measuring about 48 feet below ground surface, whereas groundwater levels at the northern end of the City are as shallow as 5 feet below ground surface. There appears to be a natural groundwater cycle where water levels rise and then lower every few years (in response to pumpage), and there is also a seasonal fluctuation due to seasonal groundwater use and in response to tidal influences. Currently groundwater levels in the semi-confined aquifer appear on the rise at the northern end of the City; however, there are insufficient data in the southern portion of the City to make any conclusions in this regard. Groundwater flow in the semi-confined aquifer is generally from the southeast towards the Old River north of the City.

Groundwater recharge in the semi-confined aquifer occurs from rainfall, applied water that percolates to the water table, and seasonal infiltration by the creeks. The recharge for the shallow semi-confined aquifer is generally from the south, from the Coast Ranges, and moves to the north and west.

The semi-confined aquifer is monitored by other entities at four locations within the City. Static water levels are measured on a quarterly basis and reported to the RWQCB. Groundwater quality is typically monitored just for specific contaminants of concern and does not coincide with the general parameters monitored by the City and others in the confined aquifer.

Current pumping from the semi-confined aquifer is thought to be widespread, via private wells, and used primarily for irrigation of agricultural areas. Current pumpage quantities are unknown; however, the stable groundwater level trends in the semi-confined aquifer indicate that existing pumpage is within the operational yield of the semi-confined aquifer.

Groundwater quality information is limited for the semi-confined aquifer. Most of the available water quality data for the semi-confined aquifer is from data from a 1968 basin-wide study. Groundwater extracted from the semi-confined aquifer is generally classified as being high in salts and not suitable for potable uses, but may be considered suitable for non-potable uses such as agricultural irrigation. The following provides an overview of key water quality constituents in the semi-confined aquifer:

- TDS varies greatly (ranging from 567 mg/L to 2,310 mg/L), but overall is poorer quality than the confined aquifer and exceeds recommended drinking water Maximum Contaminant Levels (MCLs)[23]. The TDS concentrations increase toward the north and to the west.
- Sulfate concentrations in the semi-confined aquifer ranged from less than 100 to over 600 mg/L[24].
- Chloride concentrations in the semi-confined aquifer range from 50 to 850 mg/L, with the lowest concentrations near the Coast Ranges, south of Tracy near the airport[25].
- Boron concentrations in the semi-confined aquifer range from 0.7 to 6.3 mg/L[26]. The lowest concentrations follow a similar pattern as the TDS, with low concentrations near the Coastal Range foothills (to the south).

The shallow groundwater is considered to be suitable for most agricultural irrigation purposes. However, given the relatively poor permeability of the soils in the City, there is concern for the potential accumulation of salts in the soil, leading to soil binding. This could partially be mitigated by planting salt-tolerant turf and plant materials and providing good subsurface drainage; however, this may not be a feasible long-term solution for the City.

[23] The recommended MCL for TDS is 500 mg/L, with an upper limit of 1,000 mg/L if it is not reasonable or feasible to supply water with lower concentrations. Short-term use is allowed for water between 1,000 and 1,500 mg/L.

[24] The recommended MCL for sulfate is 250 mg/L, with an upper limit of 500 mg/L if it is not reasonable or feasible to supply water with lower concentrations. Short-term use is allowed for water up to 600 mg/L.

[25] The recommended MCL for chloride is 250 mg/L, with an upper limit of 500 mg/L if it is not reasonable or feasible to supply water with lower concentrations. Short-term use is allowed for water up to 600 mg/L.

[26] There is no established MCL for boron. However, California DPH has established an Action Level of 1 mg/L for boron.

6.5 Summary of Existing and Additional Planned Future Water Supplies

Table 13 provides a summary of the City's existing and additional planned future water supply entitlements. Table 14 provides a summary of historical water supply deliveries and anticipated existing and additional planned future water supplies during normal years from each of the City's water supplies. A discussion of the future anticipated availability of these existing and additional planned future water supplies during dry years is provided in the next section.

Table 13. Summary of Existing and Additional Planned Future Water Supplies

Supply	Water Right or Available Supply Quantity, af/yr	Supply Ever Used by City
Existing Water Supplies		
USBR CVP Contract (City Contract) (M&I Reliability)	10,000	Yes
USBR CVP (BCID assignment) (Ag Reliability)	5,000	Yes
USBR CVP (WSID assignment) (Ag Reliability)	2,500	Yes
South County Water Supply Project (pre-1914 rights)	10,000	Yes
Groundwater[a]	9,000	Yes
Semitropic Water Storage Bank (Permanent Agreement)[b,c]	3,500	Yes
Additional Planned Future Water Supplies		
USBR CVP (WSID Option) (Ag Reliability)	2,500	No
USBR CVP (BBID contract) (Ag Reliability)	11,000	No
BBID (pre-1914)[c]	4,500	No
Additional SCWSP (pre-1914 rights)	3,000	No
Aquifer Storage and Recovery[d]	3,000	No
Recycled Water[e]	25,000	No

[a] The City is planning to decrease groundwater use to 2,500 af/yr by the year 2015. However, studies described in this WSA have indicated that up to 9,000 af/yr of groundwater is available to the City to make up for shortfalls in the event of a severe drought or other water shortage.
[b] As of June 2012, the Semitropic Permanent Agreement replaced the previous Pilot Agreement.
[c] The future water supply anticipated from BBID (pre-1914) has been increased from 3,000 af/yr (as presented in the City's 2010 UWMP) to 4,500 af/yr based on recent agreements related to the proposed Tracy Hills project.
[d] Supplies from Semitropic and ASR are assumed to be dry year supplies. As such, during normal years, supplies from these sources are assumed to be 0 af/yr.
[e] Based on the total projected recycled water production at buildout (22.4 mgd) (reference: Table C-1, Tracy Wastewater Master Plan, Draft Report, prepared by CH2MHill, May 2012).

Table 14. Quantity of Historical Water Deliveries and Existing and Additional Planned Future Water Supplies in Normal Years

Supply	Historical Water Deliveries, af/yr							Projected Future Available Supplies, af/yr				
	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035
Existing Water Supplies[a,b]												
USBR CVP Contract (City Contract)	5,676	5,734	4,968	8,387	7,785	8,920	5,304	7,500	7,500	7,500	7,500	7,500
USBR CVP (BCID assignment)	0	0	0	0	0	0	0	2,500	2,500	2,500	2,500	2,500
USBR CVP (WSID assignment)	0	0	0	0	0	0	0	1,250	1,250	1,250	1,250	1,250
Total CVP Supplies	5,676	5,734	4,968	8,387	7,785	8,920	5,304	11,250	11,250	11,250	11,250	11,250
South County Water Supply Project (pre-1914 rights)	0	0	0	0	0	3,146	10,850	10,000	10,000	10,000	10,000	10,000
Groundwater[c]	1,980	2,856	5,838	4,310	6,548	5,826	498	2,500	2,500	2,500	2,500	2,500
Semitropic Water Storage Bank (Permanent Agreement)[d]	0	0	0	0	0	0	0	0	0	0	0	0
Total Existing Potable Supplies	**7,656**	**8,590**	**10,806**	**12,697**	**14,333**	**17,892**	**16,652**	**23,750**	**23,750**	**23,750**	**23,750**	**23,750**
Additional Planned Future Water Supplies[b]												
Additional USBR CVP (WSID Option)								1,250	1,250	1,250	1,250	1,250
Additional USBR CVP (BBID contract)								1,500	3,000	4,500	5,500	5,500
BBID (pre-1914)[e]								4,500	4,500	4,500	4,500	4,500
Additional SCWSP Supplies (pre-1914)								3,000	3,000	3,000	3,000	3,000
Aquifer Storage and Recovery[f]								0	0	0	0	0
Recycled Water (non-potable)[g]								12,400	14,900	17,500	19,900	22,500
Total Additional Planned Future Potable Supplies								**10,250**	**11,750**	**13,250**	**14,250**	**12,750**
Total Potable Supplies	**7,656**	**8,590**	**10,806**	**12,697**	**14,333**	**17,892**	**16,652**	**34,000**	**35,500**	**37,000**	**38,000**	**38,000**
Total Additional Planned Future Non-Potable Supplies								**12,400**	**14,900**	**17,500**	**19,900**	**22,500**

(a) Historical supply data based on production data.
(b) Projected additional supplies based on Table 18 Current and Projected Water Supply Allocations – Normal Year, City of Tracy 2010 Urban Water Management Plan, May 2011.
(c) Although the City can sustainably extract up to 9,000 af/yr of groundwater, the City is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. The City will continue to rely on groundwater for peaking and drought and emergency supplies, up to 9,000 af/yr, on an as-needed basis.
(d) In normal years, supply from the Semitropic Water Storage Bank is assumed to be 0 af/yr, as this is considered a dry year supply.
(e) The future water supply anticipated from BBID (pre-1914) has been increased from 3,000 af/yr (as presented in the City's 2010 UWMP) to 4,500 af/yr based on recent agreements related to the proposed Tracy Hills project.
(f) In normal years, supply from the ASR Project is assumed to be 0 af/yr, as this is considered a dry year supply.
(g) Table 15, City of Tracy 2010 Urban Water Management Plan, prepared by Erler & Kalinowski, Inc., May 2011.

6.6 Dry Year Water Supply Availability and Reliability

Water Code section 10910 (c)(4) requires that a WSA include a discussion with regard to "whether total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses." Accordingly, this WSA addresses these three hydrologic conditions through the year 2035.

The reliability of each of the City's existing and additional planned water supplies and their projected availability during normal, single dry, and multiple dry years as described in Section 5 of the City's 2010 UWMP, is described below and summarized in Table 15.

Table 15. Water Supply Reliability in Normal, Single Dry, Multiple Dry Years

Supply Source	Anticipated Reliability (% of Entitlement)		
	Normal Years	Single Dry Years	Multiple Dry Years
Existing Water Supplies			
USBR CVP Contract (City Contract) (M&I Reliability)	75%	65%	40%
USBR CVP (BCID assignment) (Ag Reliability)	50%	15%	10%
USBR CVP (WSID assignment) (Ag Reliability)	50%	15%	10%
South County Water Supply Project (pre-1914 rights)	100%	95%	95%
Groundwater[(a)]	100%	100%	100%
Semitropic Water Storage Bank (Permanent Agreement)[(b)]	--	100%	100%
Additional Planned Future Water Supplies			
USBR CVP (WSID Option) (Ag Reliability)	50%	15%	10%
USBR CVP (BBID contract) (Ag Reliability)	50%	15%	10%
BBID (pre-1914 rights)	100%	90%	90%
Additional SCWSP (pre-1914 rights)	100%	95%	95%
Aquifer Storage and Recovery[(b)]	--	100%	100%
Recycled Water	100%	100%	100%

(a) The City is planning to decrease groundwater use to 2,500 af/yr by the year 2015. However, studies described in this WSA have indicated that up to 9,000 af/yr of groundwater is available to the City to make up for shortfalls in the event of a severe drought or other water shortage.

(b) Supplies from Semitropic and ASR are assumed to be dry year supplies. As such, during normal years, supplies from these sources are assumed to be 0 af/yr.

6.6.1 Normal Years

Normal or wet water years are those water years that match or exceed median rainfall and runoff levels. The following describes the availability and reliability of the City's existing and additional planned future water supplies under normal year conditions:

- Due to recent environmental concerns in the Delta and potential future impacts due to climate change, it has been assumed that the long-term reliability of USBR's CVP supplies in normal years will be 75 percent for M&I-reliability supplies and 50 percent for Ag-reliability supplies. These reliability assumptions are reduced from those previously assumed in the City's 2005 UWMP, but are consistent with reliability reductions estimated by DWR for the State Water Project, which is subject to the same Delta environmental and climate change issues.
- During a normal water year, the City expects to receive 100 percent of its SCWSP water supply allocation, or 10,000 af/yr.
- Pursuant to the Groundwater Management Policy, the City can extract up to 9,000 af/yr of local groundwater. Because of the high TDS and hardness of the City's groundwater, the City hopes to reduce its dependency on groundwater in the future. As additional higher quality water supplies come on line, the City estimates that it may be possible to reduce the quantity of groundwater used during a typical normal or wet year. This reduction, however, is highly dependent on future water supplies and demands and should be viewed as a goal, and not a firm projection. In the event that additional supplies are needed, the City may utilize up 9,000 af of groundwater per year.
- In the future, up to 4,500 af/yr of pre-1914 appropriative water rights water is expected to be available directly or via exchange from BBID. By 2015, the City anticipates being able to receive 100 percent of this supply during normal and wet years.
- In the future, up to approximately 11,000 af/yr of Ag-reliability water from BBID DMC/CVP contract is expected to be available to the City. Therefore, in future normal water years, 5,500 af/yr (50% of 11,000 af) will be available.
- In the future, the City expects to receive 100 percent of a future SCWSP water supply allocation in normal years, or 3,000 af/yr.
- By 2015, 1,000 af/yr of banked water is assumed to be available through the City's ASR program and approximately 1,750 af/yr of banked water is assumed to be available through the City's participation in the Semitropic Water Storage Bank. However, these supplies are considered dry year supplies, and are assumed to be zero in normal years.

The reliability of each of the City's existing and additional planned future water supplies and their projected availability during normal and wet years is shown in Table 16. Figure 8 shows the City's projected future supply versus demand in normal years.

Table 16. Projected Existing and Additional Planned Future Water Supplies Available in Normal Years

Supply	Anticipated Reliability (% of Entitlement)	Projected Future Available Supply, af/yr				
	Normal Years	2015	2020	2025	2030	2035
Existing Water Supplies						
USBR CVP Contract (City Contract)	75%	7,500	7,500	7,500	7,500	7,500
USBR CVP (BCID assignment)	50%	2,500	2,500	2,500	2,500	2,500
USBR CVP (WSID assignment)	50%	1,250	1,250	1,250	1,250	1,250
Total CVP Supplies		11,250	11,250	11,250	11,250	11,250
South County Water Supply Project (pre-1914 rights)	100%	10,000	10,000	10,000	10,000	10,000
Groundwater[a]	100%	2,500	2,500	2,500	2,500	2,500
Semitropic Water Storage Bank (Permanent Agreement)[b]	--	0	0	0	0	0
Additional Planned Future Water Supplies						
USBR CVP (WSID Option)	50%	1,250	1,250	1,250	1,250	1,250
USBR CVP (BBID contract)	50%	1,500	3,000	4,500	5,500	5,500
BBID (pre-1914 rights) [c]	100%	4,500	4,500	4,500	4,500	4,500
Additional SCWSP (pre-1914 rights)	100%	3,000	3,000	3,000	3,000	3,000
Aquifer Storage and Recovery[b]	--	0	0	0	0	0
Recycled Water (non-potable)[d]	100%	12,400	14,900	17,500	19,900	22,500
Total Projected Potable Water Supply		34,000	35,500	37,000	38,000	38,000
% Cutback from Normal Year[e]		--	--	--	--	--
Total Projected Recycled Water Supply[d]		12,400	14,900	17,500	19,900	22,500
% Cutback from Normal Year[e]		--	--	--	--	--

[a] The City is planning to decrease groundwater use to 2,500 af/yr by the year 2015. However, studies described in this WSA have indicated that up to 9,000 af/yr of groundwater is available to the City to make up for shortfalls in the event of a severe drought or other water shortage.

[b] Assumed to be zero in normal years, as Semitropic and ASR are considered to be dry year supplies.

[c] The future water supply anticipated from BBID (pre-1914) has been increased from 3,000 af/yr (as presented in the City's 2010 UWMP) to 4,500 af/yr based on recent agreements related to the proposed Tracy Hills project.

[d] Table 15, City of Tracy 2010 Urban Water Management Plan, prepared by Erler & Kalinowski, Inc., May 2011.

[e] Not applicable as Normal Year supplies are being shown.

6.6.2 Single Dry Years

During a single dry year, or when the DMC/CVP flows must be reduced due to hydrologic and/or environmental impacts, all of the City's existing surface water allotments are subject to some level of reduction. The actual reductions will vary with the severity of the regional water supply shortage and climatic conditions, and the consideration of water and contract rights. The following describes the availability and reliability of the City's existing and additional planned future water supplies under single dry year conditions:

- The City Contract for an annual entitlement of 10,000 ac-ft of USBR water from the DMC/CVP is subject to M&I Reliability. Based on the historical record, it is assumed that during a single-dry year, the City's annual allocation will be 65 percent of its entitlement, or 6,500 af/yr.
- The City currently holds the assignment contracts (BCID and WSID) for an annual entitlement of up to 7,500 af/yr, and plans to purchase an additional 2,500 af/yr of entitlement from WSID, for a total of 10,000 af/yr of entitlements. These contracts pertain to USBR water from the DMC/CVP and are subject to Ag-reliability. Based on the historical record and PROSIM modeling, it is assumed that during a single-dry year, the City's allocation will be 15 percent of its entitlement, 1,125 af/yr (based on the existing 7,500 af/yr of entitlements) and 1,500 af/yr (based on the total 10,000 af/yr of existing and future entitlements).
- During a single-dry year, it is assumed that the City will receive 95 percent of its SCWSP water supply allocation, or 9,500 af/yr.
- Pursuant to the Groundwater Management Policy, the City can extract up to 9,000 af/yr of local groundwater resources. However, as described above, the City may reduce its future groundwater use to 2,500 af/yr by 2015 (based on normal year supply conditions). In the event that groundwater is needed to supplement surface water supplies during a single-dry year, however, the City does intend to call on these supplies up to the maximum sustainable yield of 9,000 af/yr.
- In the future, up to 4,500 af/yr of pre-1914 appropriative water rights water is expected to be available either directly or via exchange from BBID. In single-dry water years by 2015, it is assumed that 4,050 af/yr of BBID Pre-1914 water right water, or 90 percent of the contractual allocation, will be available.
- In the future, up to 11,000 af/yr of Ag-reliability water from the BBID DMC/CVP contract is expected to be available to the City. In future single-dry water years, it is assumed that 1,650 af/yr, or 15 percent of the contractual entitlement, of BBID water will be available.
- In the future, the City expects to receive 95 percent of a future SCWSP water supply allocation in single dry years, or 2,850 af/yr.
- By 2015, 1,000 af/yr of banked water is assumed to be available through the City's ASR program and approximately 2,033 af/yr of banked water is assumed to be available through the City's participation in the Semitropic Water Storage Bank.

The reliability of each of the City's existing and additional planned future water supplies and their projected availability during a single dry year is shown in Table 17. Figure 9 shows the City's projected future supply versus demand in single dry years.

Table 17. Projected Existing and Additional Planned Future Water Supplies Available in Single Dry Years

Supply	Anticipated Reliability (% of Entitlement)	Projected Future Available Supply, af/yr				
	Single Dry Years	2015	2020	2025	2030	2035
Existing Water Supplies						
USBR CVP Contract (City Contract)	65%	6,500	6,500	6,500	6,500	6,500
USBR CVP (BCID assignment)	15%	750	750	750	750	750
USBR CVP (WSID assignment)	15%	375	375	375	375	375
Total CVP Supplies		7,625	7,625	7,625	7,625	7,625
South County Water Supply Project (pre-1914 rights)	95%	9,500	9,500	9,500	9,500	9,500
Groundwater[(a)]	100%	9,000	9,000	9,000	9,000	9,000
Semitropic Water Storage Bank (Permanent Agreement)	100%	2,033	3,500	3,500	3,500	3,500
Additional Planned Future Water Supplies						
USBR CVP (WSID Option)	15%	375	375	375	375	375
USBR CVP (BBID contract)	15%	450	900	1,350	1,650	1,650
BBID (pre-1914 rights)[(b)]	90%	4,050	4,050	4,050	4,050	4,050
Additional SCWSP (pre-1914 rights)	95%	2,850	2,850	2,850	2,850	2,850
Aquifer Storage and Recovery	100%	1,000	2,000	3,000	3,000	3,000
Recycled Water (non-potable)[(c)]	100%	12,400	14,900	17,500	19,900	22,500
Total Projected Potable Water Supply		36,833	39,800	41,250	41,550	41,550
% Cutback from Normal Year[(d)]		0%	0%	0%	0%	0%
Total Projected Recycled Water Supply[(c)]		12,400	14,900	17,500	19,900	22,500
% Cutback from Normal Year[(d)]		0%	0%	0%	0%	0%

(a) The City is planning to decrease groundwater use to 2,500 af/yr by the year 2015. However, studies described in this WSA have indicated that up to 9,000 af/yr of groundwater is available to the City to make up for shortfalls in the event of a severe drought or other water shortage.

(b) The future water supply anticipated from BBID (pre-1914) has been increased from 3,000 af/yr (as presented in the City's 2010 UWMP) to 4,500 af/yr based on recent agreements related to the proposed Tracy Hills project.

(c) Table 15, City of Tracy 2010 Urban Water Management Plan, prepared by Erler & Kalinowski, Inc., May 2011.

(d) Percent cutback from normal year for potable water supplies is zero due to availability of Semitropic in single dry years. No cutback is anticipated for recycled water supplies.

6.6.3 Multiple Dry Years

If there are multiple dry years, the City's surface water allotments, especially from the DMC/CVP, may be significantly reduced. Thus, in the event of drought, the City will have to depend more heavily on conservation efforts, groundwater, SCWSP supplies and other drought contingency supplies (previously banked water). As an example, in 1991, due to prolonged drought, the USBR reduced the City's DMC/CVP surface water allotment by 50 percent, such that the City's 1991 allocation was reduced to 5,000 acre-feet. As a result, the City implemented a water conservation program consistent with its Water Shortage Contingency Plan and relied on its groundwater supply to satisfy a larger portion of the City's water demand. The City now has a broader portfolio of water supplies. However, as described above, CVP supply reliabilities may be reduced even further due to on-going Delta environmental issues and future climate change. The following describes the availability and reliability of the City's existing and additional planned future water supplies under multiple dry year conditions:

- The City Contract for an annual entitlement of 10,000 af/yr of USBR water from the DMC/CVP is subject to M&I Reliability. Based on the historical record, it is assumed that during a multiple dry year period, the City's annual allocation will be 40 percent of its entitlement, or 4,000 af/yr.
- The City currently holds the assignment contracts (BCID and WSID) for an annual entitlement of up to 7,500 af/yr, and plans to purchase an additional 2,500 af/yr of entitlement from WSID, for a total of 10,000 af/yr of entitlements. These contracts pertain to USBR water from the DMC/CVP and are subject to Ag-reliability. Based on the historical record and PROSIM modeling, it is assumed that during multiple dry years, the City's allocation will be 10 percent of its entitlement, 750 af/yr (based on the existing 7,500 af/yr of entitlements) and 1,000 af/yr (based on the total 10,000 af/yr of existing and future entitlements).
- During a multiple dry year period, the City expects to receive 95 percent of its SCWSP water supply allocation, or 9,500 af/yr.
- Pursuant to the Groundwater Management Policy, the City can extract up to 9,000 af/yr of local groundwater resources. However, as described above, the City may reduce its future groundwater use to 2,500 af/yr by 2015 (based on normal year supply conditions). In the event that groundwater is needed to supplement surface water supplies during a multiple dry year period, however, the City does intend to call on these supplies up to the maximum sustainable yield of 9,000 af/yr.
- In the future, up to 4,500 af/yr of pre-1914 appropriative water rights water is expected to be available either directly or via exchange from BBID. In multiple dry water years by 2015, it is assumed that 4,050 af/yr of BBID Pre-1914 water right water, or 90 percent of the contractual allocation, will be available.
- In the future, up to 11,000 af/yr of Ag-reliability water from BBID DMC/CVP contract is expected to be available to the City. In future multiple dry water years, it is assumed that 1,100 af/yr of BBID water, or 10 percent of the contractual entitlement, will be available.

- In the future, the City expects to receive 95 percent of a future SCWSP water supply allocation in single dry years, or 2,850 af/yr.
- By 2015, 1,000 af/yr of banked water is assumed to be available through the City's ASR program and approximately 2,033 af/yr of banked water is assumed to be available through the City's participation in the Semitropic Water Storage Bank.

The reliability of each of the City's existing and additional planned future water supplies and their projected availability during a multiple dry year period is shown in Table 18. Figure 10 shows the City's projected future supply versus demand in multiple dry years.

Table 18. Projected Existing and Additional Planned Future Water Supplies Available in Multiple Dry Years

Supply	Anticipated Reliability (% of Entitlement)	Projected Future Available Supply, af/yr				
	Multiple Dry Years	2015	2020	2025	2030	2035
Existing Water Supplies						
USBR CVP Contract (City Contract)	40%	4,000	4,000	4,000	4,000	4,000
USBR CVP (BCID assignment)	10%	500	500	500	500	500
USBR CVP (WSID assignment)	10%	250	250	250	250	250
Total CVP Supplies		4,750	4,750	4,750	4,750	4,750
South County Water Supply Project (pre-1914 rights)	95%	9,500	9,500	9,500	9,500	9,500
Groundwater[a]	100%	9,000	9,000	9,000	9,000	9,000
Semitropic Water Storage Bank (Permanent Agreement)	100%	2,033	3,500	3,500	3,500	3,500
Additional Planned Future Water Supplies						
USBR CVP (WSID Option)	10%	250	250	250	250	250
USBR CVP (BBID contract)	10%	300	600	900	1,100	1,100
BBID (pre-1914 rights)[b]	90%	4,050	4,050	4,050	4,050	4,050
Additional SCWSP (pre-1914 rights)	95%	2,850	2,850	2,850	2,850	2,850
Aquifer Storage and Recovery	100%	1,000	2,000	3,000	3,000	3,000
Recycled Water (non-potable)[c]	100%	12,400	14,900	17,500	19,900	22,500
Total Projected Potable Water Supply		33,733	36,500	37,800	38,000	38,000
% Cutback from Normal Year[d]		8.5%	0%	0%	0%	0%
Total Projected Recycled Water Supply[c]		12,400	14,900	17,500	19,900	22,500
% Cutback from Normal Year[d]		0%	0%	0%	0%	0%

[a] The City is planning to decrease groundwater use to 2,500 af/yr by the year 2015. However, studies described in this WSA have indicated that up to 9,000 af/yr of groundwater is available to the City to make up for shortfalls in the event of a severe drought or other water shortage.

[b] The future water supply anticipated from BBID (pre-1914) has been increased from 3,000 af/yr (as presented in the City's 2010 UWMP) to 4,500 af/yr based on recent agreements related to the proposed Tracy Hills project.

[c] Table 15, City of Tracy 2010 Urban Water Management Plan, prepared by Erler & Kalinowski, Inc., May 2011.

[d] Percent cutback from normal year for potable water supplies is essentially zero due to availability of Semitropic in multiple dry years. No cutback is anticipated for recycled water supplies.

7.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY

10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

7.1 Findings

Pursuant to Water Code section 10910(c)(4), and based on the technical analyses described in this Water Supply Assessment, the City finds that the total projected water supplies determined to be available for the Proposed Project during Normal, Single Dry, and Multiple Dry water years during a 20-year projection will meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

7.1.1 Existing Conditions with Development Projects with Approved Water Supply and the Proposed Project

Table 19 summarizes the projected availability of the City's existing water supplies, planned additional water supplies and the City's projected water demands in normal, single dry and multiple dry years based on existing demands plus the Proposed Project and Other Development Projects with Approved Water Supply described in Table 8 (see also Figure 11).

Table 19. Water Supply vs. Demand
(Under Existing Conditions + Proposed Project + Other Development Projects with Approved Water Supply)

Supply	Current Dry Year Water Supply Availability, af/yr		
	Normal Years	Single Dry Year	Multiple Dry Years
Potable Water Supplies			
Existing Water Supplies			
USBR CVP Contract (City Contract)	7,500	6,500	4,000
USBR CVP (BCID assignment)	2,500	750	500
USBR CVP (WSID assignment)	1,250	375	250
Total CVP Supplies	*11,250*	*7,625*	*4,750*
South County Water Supply Project (pre-1914 rights)	10,000	9,500	9,500
Groundwater[a]	2,500	9,000	9,000
Semitropic Water Storage Bank (Permanent Agreement)[b]	--	2,033	2,033
Subtotal Existing Potable Water Supplies	*23,750*	*28,158*	*25,283*
Additional Planned Future Water Supplies			
USBR CVP (WSID Option)[c]	1,250	375	250
USBR CVP (BBID contract)[d]	1,850	555	370
BBID (pre-1914 rights)[e]	0	0	0
Additional SCWSP (pre-1914 rights)	3,000	2,850	2,850
Aquifer Storage and Recovery[b]	--	0	0
Subtotal Additional Planned Future Potable Water Supplies	*6,100*	*3,780*	*3,470*
Total Potable Water Supply	29,850	31,938	28,753
Existing Potable Water Demand (2007)	19,176	19,176	19,176
Additional Potable Water Demand for Development Projects with Approved Water Supply including the Proposed Project (see Table 8)	6,564	6,564	6,564
Total Potable Water Demand	25,740	25,740	25,740
Potable Water Supply Shortfall	0	0	0
Non-Potable Water Supplies			
Additional Planned Future Water Supplies			
Recycled Water[d]	9,900	9,900	9,900
Subtotal Additional Planned Future Non-Potable Water Supplies	9,900	9,900	9,900
Total Recycled Water Supply[f]	9,900	9,900	9,900
Total Recycled Water Demand[f]	1,960	1,960	1,960
Recycled Water Supply Shortfall	0	0	0

[a] The City is planning to decrease groundwater use to 2,500 af/yr by the year 2015. However, studies described in this WSA have indicated that up to 9,000 af/yr of groundwater is available to the City to make up for shortfalls in the event of a severe drought or other water shortage. Therefore, groundwater pumpage during a dry year conditions assumed to be up to 9,000 af/yr per average annual operational yield of 9,000 af/yr.

[b] The Semitropic Water Storage Bank and Aquifer Storage and Recovery are considered to be dry year supplies and are therefore considered to be zero in normal years. Current available dry year supply of 2,033 af is based on the City's current available storage (6,100 af) as of January 2013.

[c] This option will be exercised by the City by early 2014.

[d] Additional CVP Surface Water (BBID USBR assignment) assumes annexation of 1,080 acres in conjunction with Cordes Ranch Specific Plan (Proposed Project); 1,080 acres x 3.4 af/ac/yr = 3,700 af/yr.

[e] The future water supply anticipated from BBID (pre-1914) has been increased from 3,000 af/yr (as presented in the City's 2010 UWMP) to 4,500 af/yr based on recent agreements related to the proposed Tracy Hills project.

[f] Recycled water supply based on 2010 wastewater flows. Recycled water demand = Gateway Phase 1 (84 af/yr) + Holly Sugar Sports Park (485 af/yr) + Ellis Specific Plan (116 af/yr) + Cordes Ranch Specific Plan (1,127 af/yr) = 1,812 af/yr + 7.5% UAFW = 1,960 af/yr.

As shown, the following additional planned future water supplies will be required to serve the water demands associated with the Proposed Project:

- USBR CVP (WSID Option): 2,500 af/yr
- USBR CVP (BBID contract in conjunction with annexation of 1,080 acres of agricultural land for the Proposed Project): 3,700 af/yr
- Additional SCWSP supplies: 3,000 af/yr

Assuming these additional water supplies are available to the City, the following summarizes the supply availability in Normal, Single Dry and Multiple Dry Years:

- In Normal Years, the City's 23,750 af/yr of existing potable water supplies plus the planned future additional supply of 1,250 af/yr from the WSID Option agreement, 1,850 af/yr from the BBID CVP contract, and 3,000 af/yr of additional supply from the SCWSP would leave a surplus of 4,110 af/yr after meeting the projected total potable demand of 25,740 af/yr.
- In Single Dry Years, the City's 28,158 af/yr of existing potable water supplies plus the planned future additional supply of 375 af/yr from the WSID Option agreement, 555 af/yr from the BBID CVP contract, and 2,850 af/yr of additional supply from the SCWSP would leave a surplus of 6,198 af/yr after meeting the projected total demand of 25,740 af/yr.
- In Multiple Dry Years, the City's 25,283 af/yr of existing potable water supplies plus the planned future additional supply of 250 af/yr from the WSID Option agreement, 370 af/yr from the BBID CVP contract and 2,850 af/yr of additional supply from the SCWSP would leave a surplus of 3,013 af/yr after meeting the projected total demand of 25,740 af/yr.

Furthermore, the surplus potable water supplies available under Normal Year, Single Dry Year and Multiple Dry Year conditions are sufficient to meet the projected recycled water demand of 1,960 af/yr in the event that recycled water infrastructure has not yet been constructed to allow for delivery of recycled water supplies to the Proposed Project and other recycled water use areas located throughout the City. However, the use of potable water supplies to meet projected recycled water demands for the Proposed Project will only be allowed in the interim period before recycled water infrastructure is constructed to provide for distribution of recycled water supplies.

7.1.2 2035 Conditions

Table 20 summarizes the projected availability of the City's existing and planned future additional water supplies and the City's projected water demands in normal, single dry and multiple dry years based on existing demands plus the Proposed Project, Other Development Projects with Approved Water Supply and potential future development described in Table 8 (see also Figure 12).

As shown, the City's existing and planned future additional sources of water supply are sufficient to meet existing demand plus the projected year 2035 demand from build-out of the Proposed Project, Other Development Projects with Approved Water Supply and additional potential future development (identified by Table 8 as "Future Service Areas").

The following summarizes the supply availability in Normal, Single Dry and Multiple Dry Years:

- In Normal Years, the City's 38,000 af/yr of existing potable water supplies and planned future additional supplies would leave a surplus of 4,400 af/yr after meeting the projected total potable demand of 33,600 af/yr.
- In Single Dry Years, the City's 41,550 af/yr of existing potable water supplies and planned future additional supplies would leave a surplus of 7,950 af/yr after meeting the projected total potable demand of 33,600 af/yr.
- In Multiple Dry Years, the City's 38,000 af/yr of existing potable water supplies would leave a surplus of 4,400 af/yr after meeting the projected total potable demand of 33,600 af/yr.

Table 20 also indicates that the future recycled water supply is sufficient to meet the projected 2035 recycled water demand.

Table 20. Water Supply vs. Demand (2035 Conditions)

Supply	Year 2035 Dry Year Water Supply Availability, af/yr		
	Normal Years	Single Dry Years	Multiple Dry Years
Potable Water Supplies			
Existing Water Supplies			
USBR CVP Contract (City Contract)	7,500	6,500	4,000
USBR CVP (BCID assignment)	2,500	750	500
USBR CVP (WSID assignment)	1,250	375	250
Total CVP Supplies	*11,250*	*7,625*	*4,750*
South County Water Supply Project (pre-1914 rights)	10,000	9,500	9,500
Groundwater[(a)]	2,500	9,000	9,000
Semitropic Water Storage Bank (Permanent Agreement)[(b)]	--	3,500	3,500
Subtotal Existing Potable Water Supplies	*23,750*	*29,625*	*26,750*
Additional Planned Future Water Supplies			
USBR CVP (WSID Option)	1,250	375	250
USBR CVP (BBID contract)	5,500	1,650	1,100
BBID (pre-1914 rights)[(c)]	4,500	4,050	4,050
Additional SCWSP (pre-1914)	3,000	2,850	2,850
Aquifer Storage and Recovery[(b)]	--	3,000	3,000
Subtotal Additional Planned Future Potable Water Supplies	*14,250*	*11,925*	*11,250*
Total Potable Water Supply	38,000	41,550	38,000
Projected 2035 Potable Water Demand[(e)]	33,600	33,600	33,600
Potable Water Supply Shortfall	0	0	0
Non-Potable Water Supplies			
Additional Planned Future Water Supplies			
Recycled Water[(c)]	22,500	22,500	22,500
Subtotal Additional Planned Future Non-Potable Water Supplies	*22,500*	*22,500*	*22,500*
Total Recycled Water Supply[(d)]	22,500	22,500	22,500
Projected 2035 Recycled Water Demand[(d)]	6,165	6,165	6,165
Recycled Water Supply Shortfall	0	0	0

(a) The City is planning to decrease groundwater use to 2,500 af/yr by the year 2015 (based on normal year supply conditions). However, studies described in this WSA have indicated that up to 9,000 af/yr of groundwater is available to the City to make up for shortfalls in the event of a severe drought or other water shortage.

(b) Supply from Semitropic Water Storage Bank and Aquifer Storage and Recovery (ASR) assumed to be zero during normal years.

(c) The future water supply anticipated from BBID (pre-1914) has been increased from 3,000 af/yr (as presented in the City's 2010 UWMP) to 4,500 af/yr based on recent agreements related to the proposed Tracy Hills project.

(d) Tables 15 and 17, City of Tracy 2010 Urban Water Management Plan, May 2011. Actual recycled water demands may be higher based on actual recycled water use within future projects. Recycled water demand shown is 6,040 af/yr (per Table 17 of 2010 UWMP) + additional demand for Ellis (116 af/yr) + 7.5% UAFW = 6,165 af/yr.

(e) Projected 2035 water demand includes projected water demand for the Proposed Project.

8.0 WATER SUPPLY ASSESSMENT APPROVAL PROCESS

10910 (g)(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

10911 (b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.

The Tracy City Council must approve this WSA at a regular or special meeting. Furthermore, the City must include this WSA in the Draft Environmental Impact Report (EIR) being prepared for the Proposed Project.

9.0 REFERENCES

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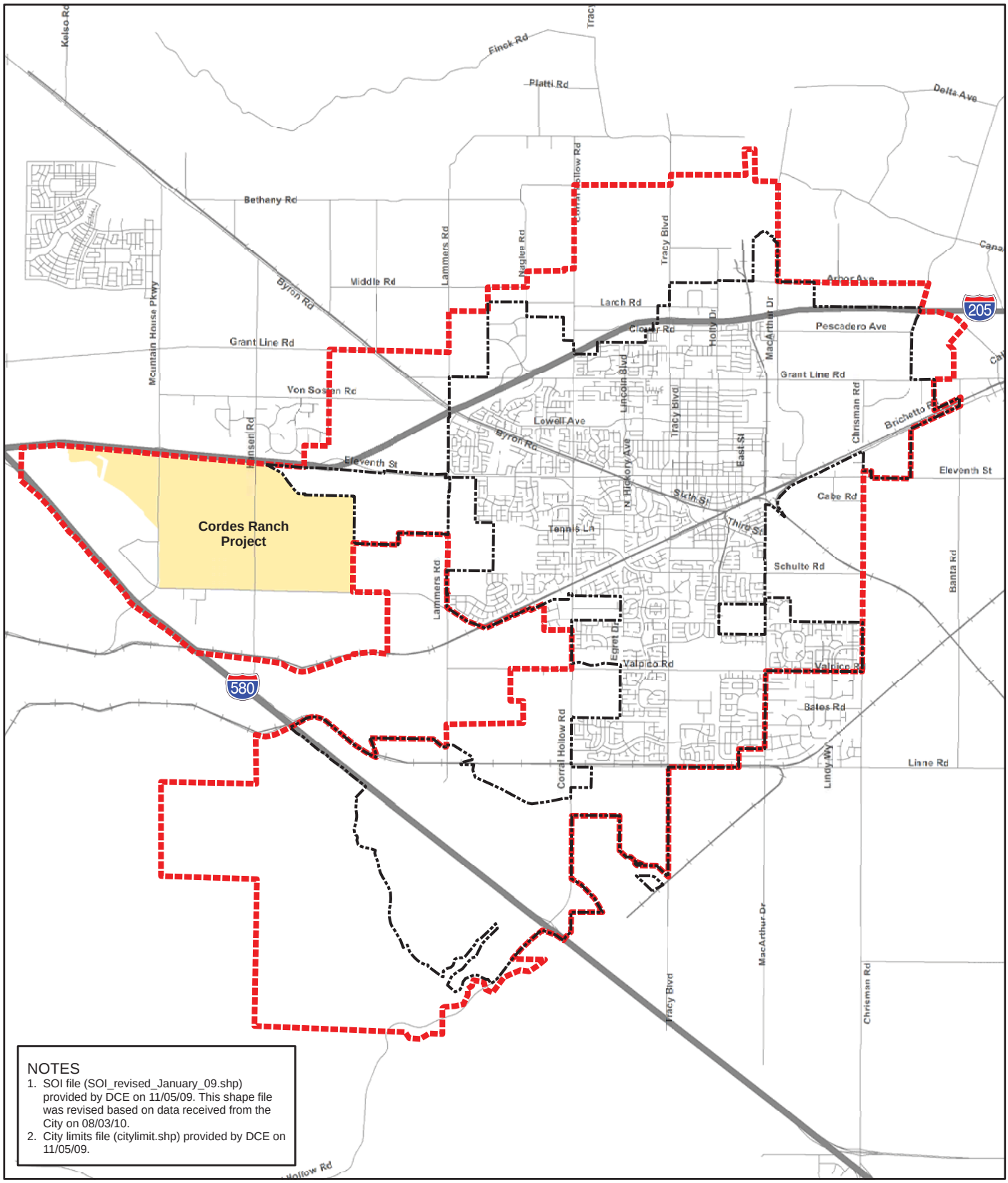

NOTES
1. SOI file (SOI_revised_January_09.shp) provided by DCE on 11/05/09. This shape file was revised based on data received from the City on 08/03/10.
2. City limits file (citylimit.shp) provided by DCE on 11/05/09.

LEGEND:
- Cordes Ranch Project
- City Limits
- SOI
- Railroad
- Highway
- Existing Street

N

0 3,750 7,500
Scale in Feet

FIGURE 1

City of Tracy
Water Supply Assessment
for the Cordes Ranch Project

PROPOSED PROJECT LOCATION

WEST YOST ASSOCIATES
Consulting Engineers

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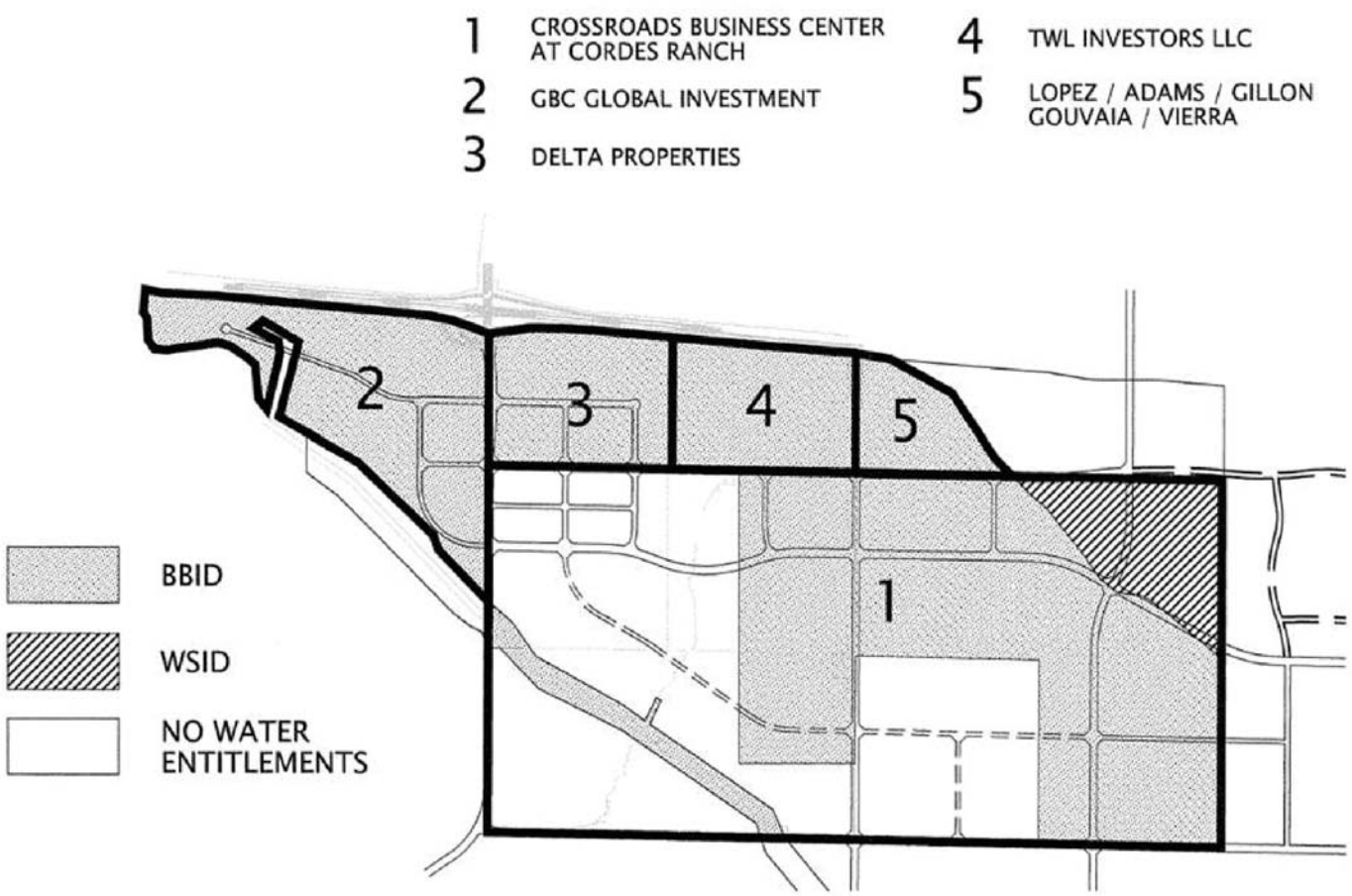


NOTES
1. Source: DRAFT Proposed Water Supply for the Cordes Ranch Project, June 2011, WJM Consulting Engineering.

FIGURE 2

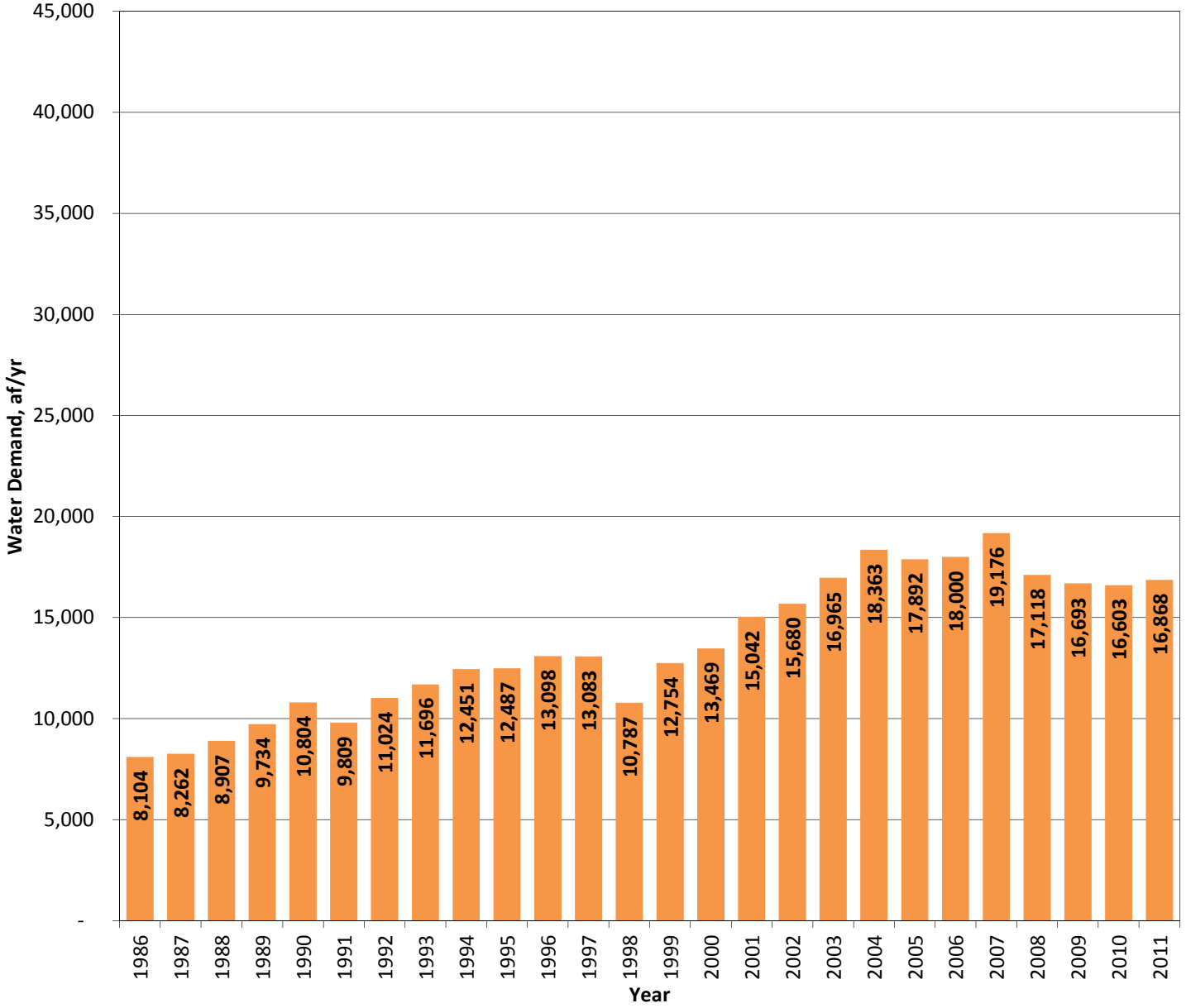
WEST YOST ASSOCIATES
Consulting Engineers

City of Tracy
Water Supply Assessment
for the Cordes Ranch Project

PROPOSED LAND OWNERSHIP AND IRRIGATION DISTRICT SERVICE AREAS

O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Water Supply Assessment\Fig 2_Districts.mxd 6/11/2012

Figure 3. City of Tracy Historical Potable Water Demand



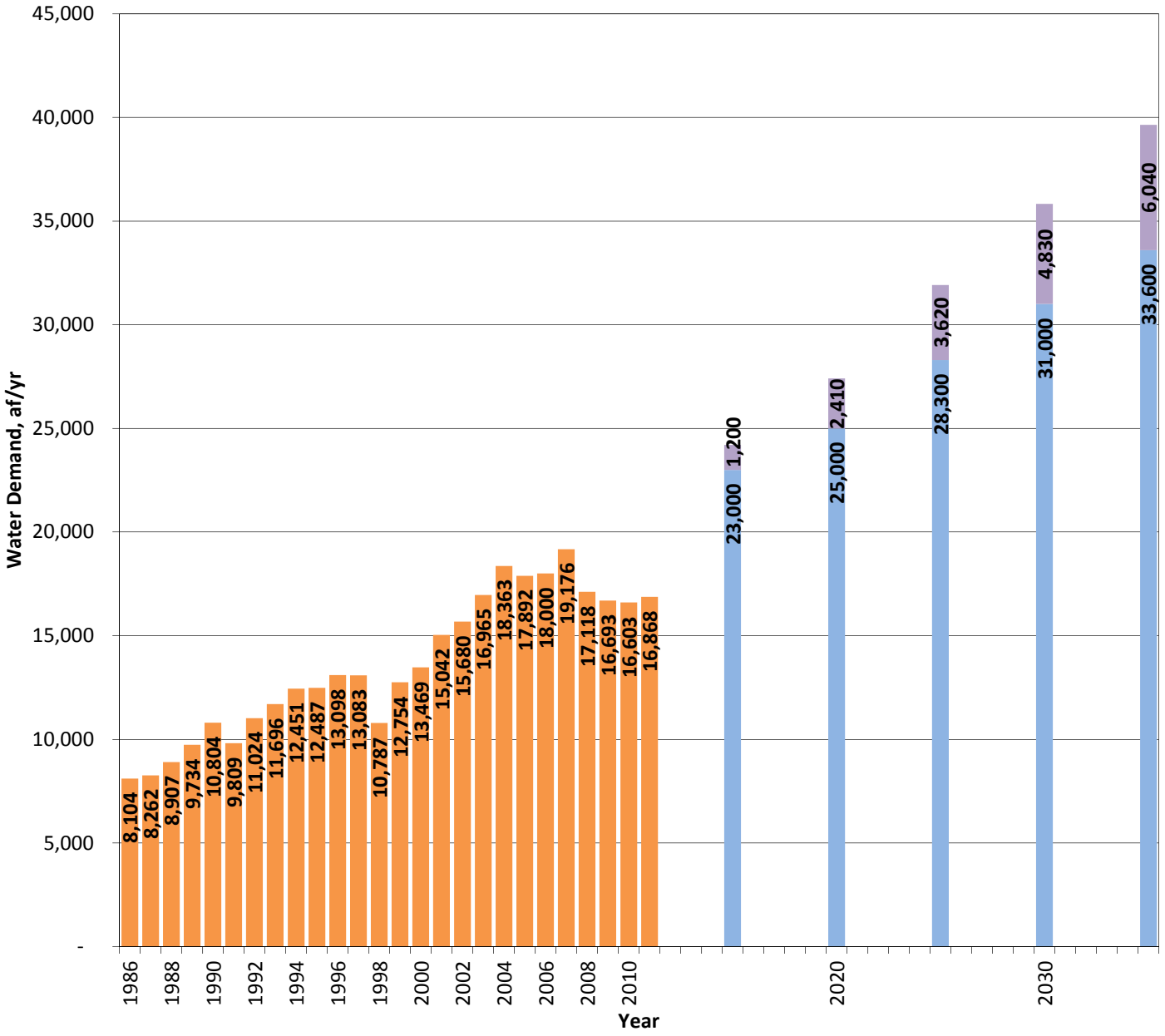
Legend:

Historical Potable Water Demand

Notes:

(1) Source: City of Tracy Water Inventory Reports, Annual Production Reports, and Table 6 Current and Historical Potable Water Demand by Water Demand Sector of the City of Tracy 2010 UWMP, May 2011.

Figure 4. City of Tracy Historical and Projected Future Water Demand



Legend:

- Projected Future Recycled Water Demand (per 2010 UWMP)
- Projected Future Potable Water Demand (per 2010 UWMP)
- Historical Potable Water Demand

Notes:

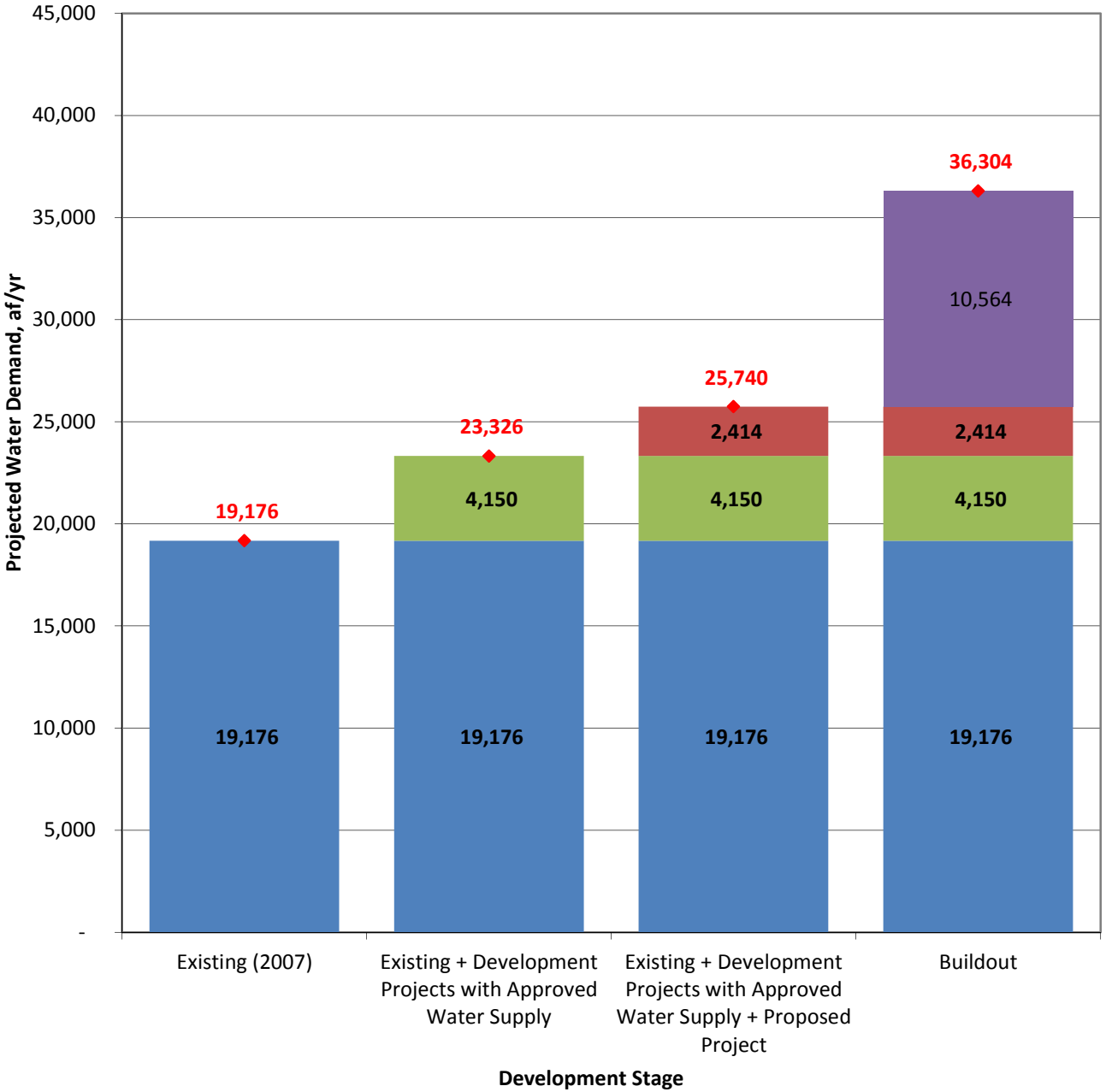
(1) Historical water demand . Source: City of Tracy Water Inventory Reports, August 1, 2006 and February 6, 2007, annual production reports, and Table 6 of the City of Tracy 2010 UWMP, May 2011.

(2) Projected future demands include projected water demands for existing users, development projects with approved water supply and future service areas. Source: Table 8 of the City of Tracy 2010 UWMP, May 2011. Recycled water demands from Table 17 of the City of Tracy 2010 UWMP. See Table 7 of this WSA for additional information.

(3) Projected future water demands include unaccounted for water.

(4) For the purposes of the City's 2010 UWMP and this WSA, buildout of the City's General Plan has been assumed to occur in the year 2040. Due to the on-going economic conditions in the State and in the Tracy area, it is currently unclear if actual development will occur within this assumed time frame and if demands will increase as shown. However, it is likely that development within the General Plan SOI will occur over a longer period of time with buildout occurring sometime after the year 2040.

Figure 5. City of Tracy Projected Future Potable Water Demand by Development Stage



Legend:

- Other Future Service Areas
- Cordes Ranch Project (Proposed Project)
- Development Projects with Approved Water Supply
- Existing Users (2007)
- ◆ **Total Potable Water Demand**

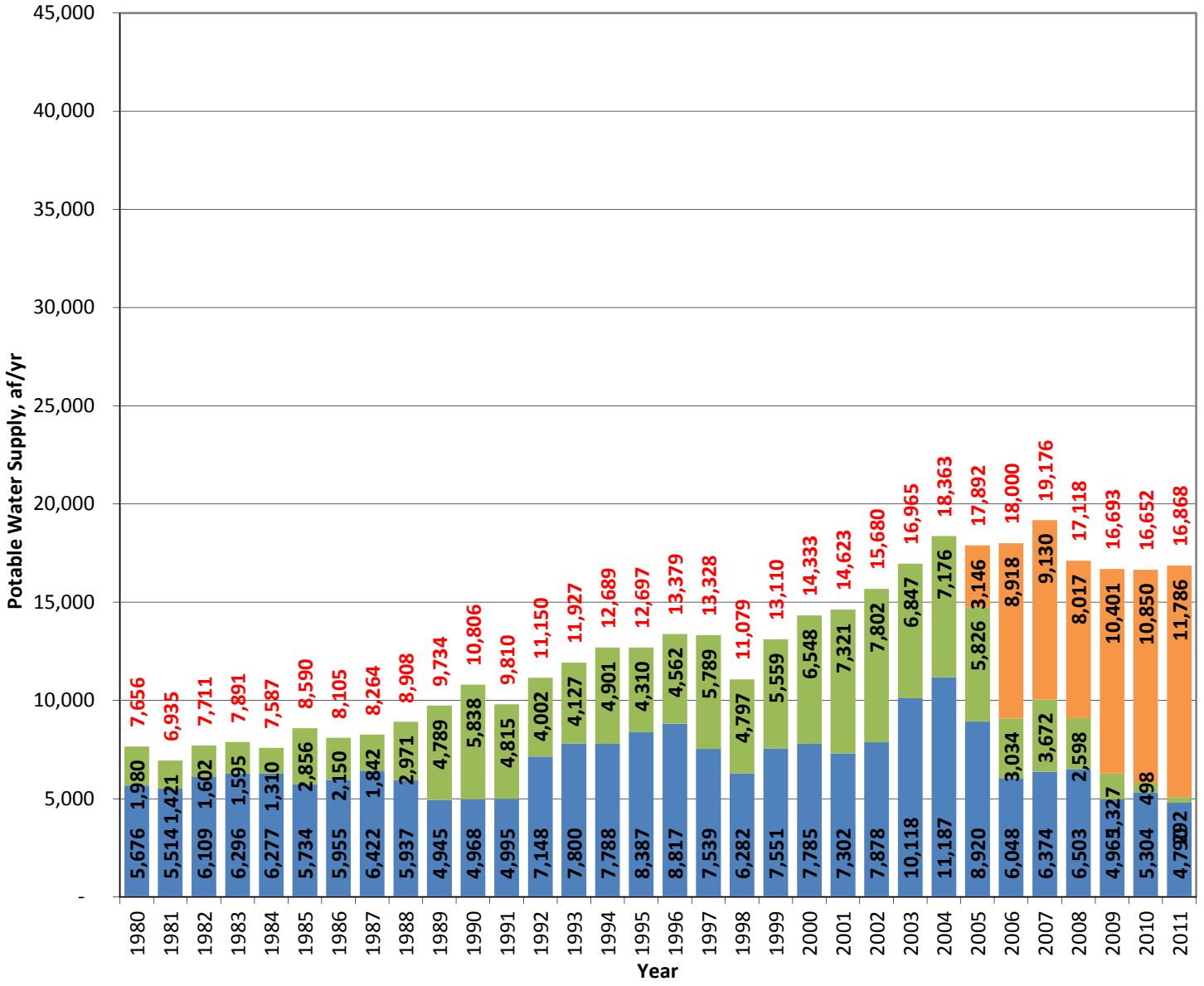
Notes:

(1) Projected water demands are per Table 7 Projected Potable Water Demand Itemized by Future Development, City of Tracy 2010 UWMP, May 2011.

(2) Projected water demands include unaccounted for water.

(3) For the purposes of the City's 2010 UWMP and this WSA, buildout of the City's General Plan has been assumed to occur in the year 2040. Due to the on-going economic conditions in the State and in the Tracy area, it is currently unclear if actual development will occur within this assumed time frame and if demands will increase as shown. However, it is likely that development within the General Plan SOI will occur over a longer period of time with buildout occurring sometime after the year 2040.

Figure 6. City of Tracy Historical Potable Water Supplies



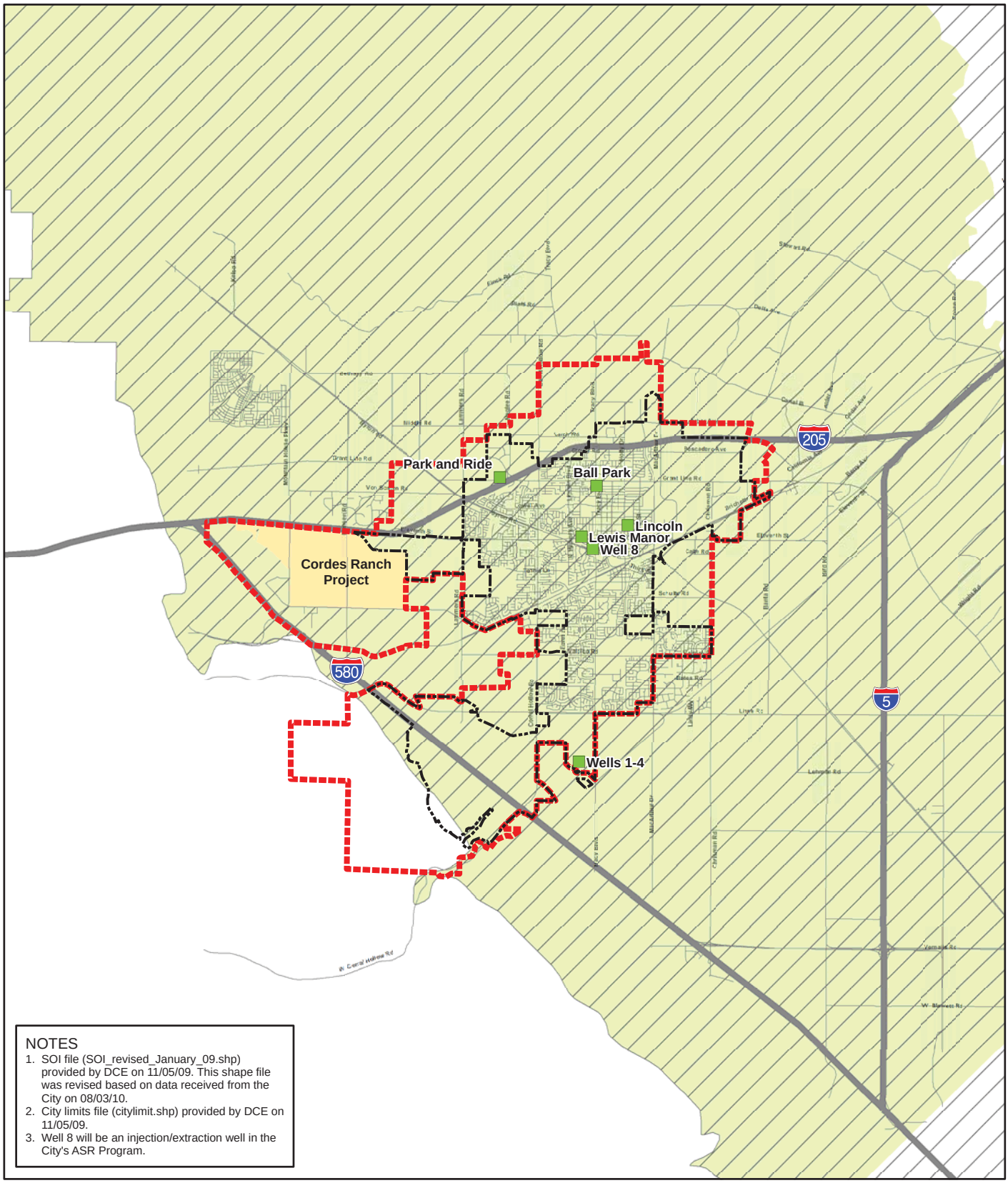
Legend:

- SSJID (SCWSP)
- Groundwater
- CVP Deliveries
- **Total Supply**

Notes:

(1) Source: City of Tracy Annual Water Delivery Schedule (1998-2004). 2005-2010 data based on Table 11 of City of Tracy 2010 UWMP, May 2011. 2011 data based on City production data.

(2) Data for 1980 to 1997 based on historical Ciy groundwater pumpage and CVP deliveries.



NOTES

1. SOI file (SOI_revised_January_09.shp) provided by DCE on 11/05/09. This shape file was revised based on data received from the City on 08/03/10.
2. City limits file (citylimit.shp) provided by DCE on 11/05/09.
3. Well 8 will be an injection/extraction well in the City's ASR Program.

LEGEND:

- Cordes Ranch Project
- Groundwater Well
- San Joaquin Valley Basin
- Tracy Sub-basin
- City Limits
- SOI
- Highway

N

0 6,250 12,500

Scale in Feet

FIGURE 7

City of Tracy
Water Supply Assessment
for the Cordes Ranch Project

GROUNDWATER BASIN AND WELL LOCATIONS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\404 City of Tracy\02-11-90 Cordes Ranch Specific Plan Support-Tier 2\GIS\Figures\Water Supply Assessment\Fig 7_Groundwater.mxd 1/25/2012

Figure 8. City of Tracy Future Potable Water Supply vs. Demand in Normal Years

Notes:

(1) Water demand projection includes water demands for the Proposed Project.

(2) Though the City can sustainably extract up to 9,000 af/yr of groundwater, the City is planning to reduce its groundwater extraction in future years to increase the overall quality of its water supply. The City will continue to rely on groundwater for peaking and drought and emergency supplies, up to 9,000 af/yr, on an as-needed basis.

(3) Source: Table 18 Current and Projected Water Supply Allocations-Normal Year, City of Tracy 2010 UWMP, May 2011.

(4) CVP deliveries include those from the City's CVP Contract and Assignments from BCID and WSID. Includes 10,000 af @ M&I normal year reliability of 75 percent and 7,500 af @ Ag normal year reliability of 50 percent.

(5) Supplies from Semitropic Water Storage Bank and ASR are considered to be dry year supplies and are assumed to be zero in normal years.

Figure 9. City of Tracy Future Potable Water Supply vs. Demand in a Single Dry Year

Legend:

- Future ASR Water Banking
- Future BBID (pre-1914 rights)
- Additional SCWSP
- Additional CVP Surface Water (BBID USBR assignment)
- Additional CVP Surface Water (WSID USBR Option)
- Semitropic Water Storage Bank
- SSJID (SCWSP)
- Groundwater
- CVP Surface Water Deliveries
- **Projected Water Demand**
- **Total Supply**

Notes:

(1) Though the City can sustainably extract up to 9,000 af/yr of groundwater, the City is planning to reduce its groundwater extraction in future years to increase the overall quality of its water supply. The City will continue to rely on groundwater for peaking and drought and emergency supplies, up to 9,000 af/yr, on an as-needed basis.

(2) Source: Table 19 Current and Projected Water Supply Allocations-Single Dry Year, City of Tracy 2010 UWMP, May 2011.

(3) CVP deliveries include those from the City's CVP Contract and Assignments from BCID and WSID. Includes 10,000 af @ M&I single dry year reliability of 65 percent and 7,500 af @ Ag single dry year reliability of 15 percent.

(4) In 2012, the City entered into a permanent agreement with Semitropic Water Storage Bank which provides for up to 10,500 af of storage for the City of Tracy in the Semitropic Water Storage Bank, allowing for annual withdrawals of up to 3,500 af/yr when needed (as shown on this figure for a single dry year).

Figure 10. City of Tracy Future Potable Water Supply vs. Demand in Multiple Dry Years

Legend:

- Future ASR Water Banking
- Future BBID (pre-1914 rights)
- Additional SCWSP
- Additional CVP Surface Water (BBID USBR assignment)
- Additional CVP Surface Water (WSID USBR Option)
- Semitropic Water Storage Bank
- SSJID (SCWSP)
- Groundwater
- CVP Surface Water Deliveries
- Projected Water Demand
- Total Supply

Notes:

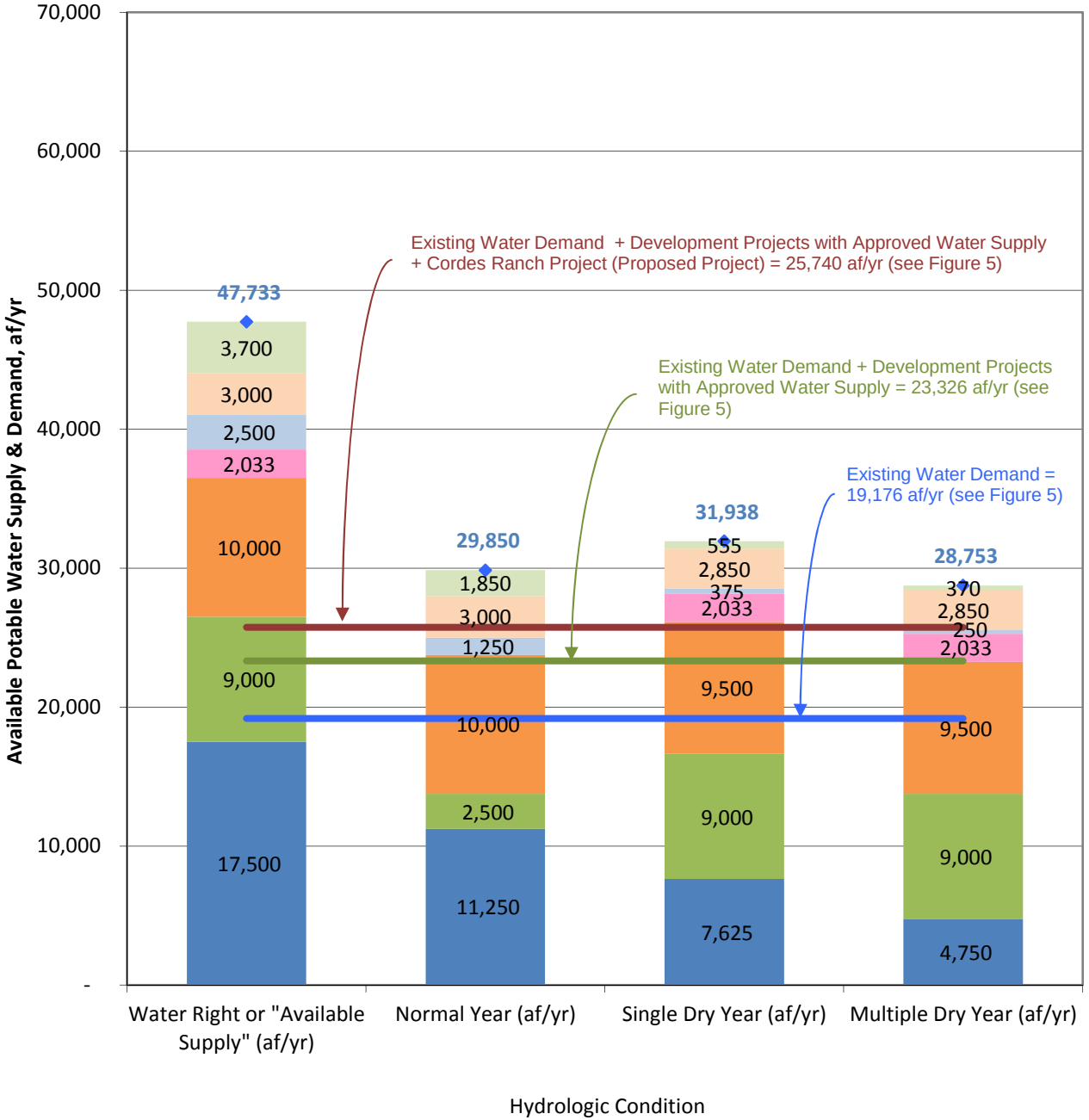
(1) Though the City can sustainably extract up to 9,000 af/yr of groundwater, the City is planning to reduce its groundwater extraction in future years to increase the overall quality of its water supply. The City will continue to rely on groundwater for peaking and drought and emergency supplies, up to 9,000 af/yr, on an as-needed basis.

(2) Source: Table 20 Current and Projected Water Supply Allocations-Mulitple Dry Years, City of Tracy 2010 UWMP, May 2011.

(3) CVP deliveries include those from the City's CVP Contract and Assignments from BCID and WSID. Includes 10,000 af @ M&I multiple dry year reliability of 40 percent and 7,500 af @ Ag multiple dry year reliability of 10 percent.

(4) In 2012, the City entered into a permanent agreement with Semitropic Water Storage Bank which provides for up to 10,500 af of storage for the City of Tracy in the Semitropic Water Storage Bank, allowing for annual withdrawals of up to 3,500 af/yr when needed (as shown on this figure for multiple dry years).

Figure 11. City of Tracy Existing Potable Water Supplies vs. Demand with Proposed Project



Legend:

- Additional CVP Surface Water (BBID USBR assignment)
- Additional SCWSP Supplies
- Additional CVP Surface Water (WSID USBR Option)
- Semitropic Water Storage Bank
- SSJID (SCWSP)
- Groundwater
- CVP Surface Water Deliveries
- Existing Water Demand
- Existing Water Demand + Development Projects with Approved Water Supply
- Existing Water Demand + Development Projects with Approved Water Supply + Cordes Ranch
- Total Potable Water Supply

Notes:

(1) Source: Tables 18, 19, and 20, City of Tracy 2010 UWMP, May 2011.

(2) CVP deliveries include those from the City's CVP Contract and Assignments from BCID and WSID.

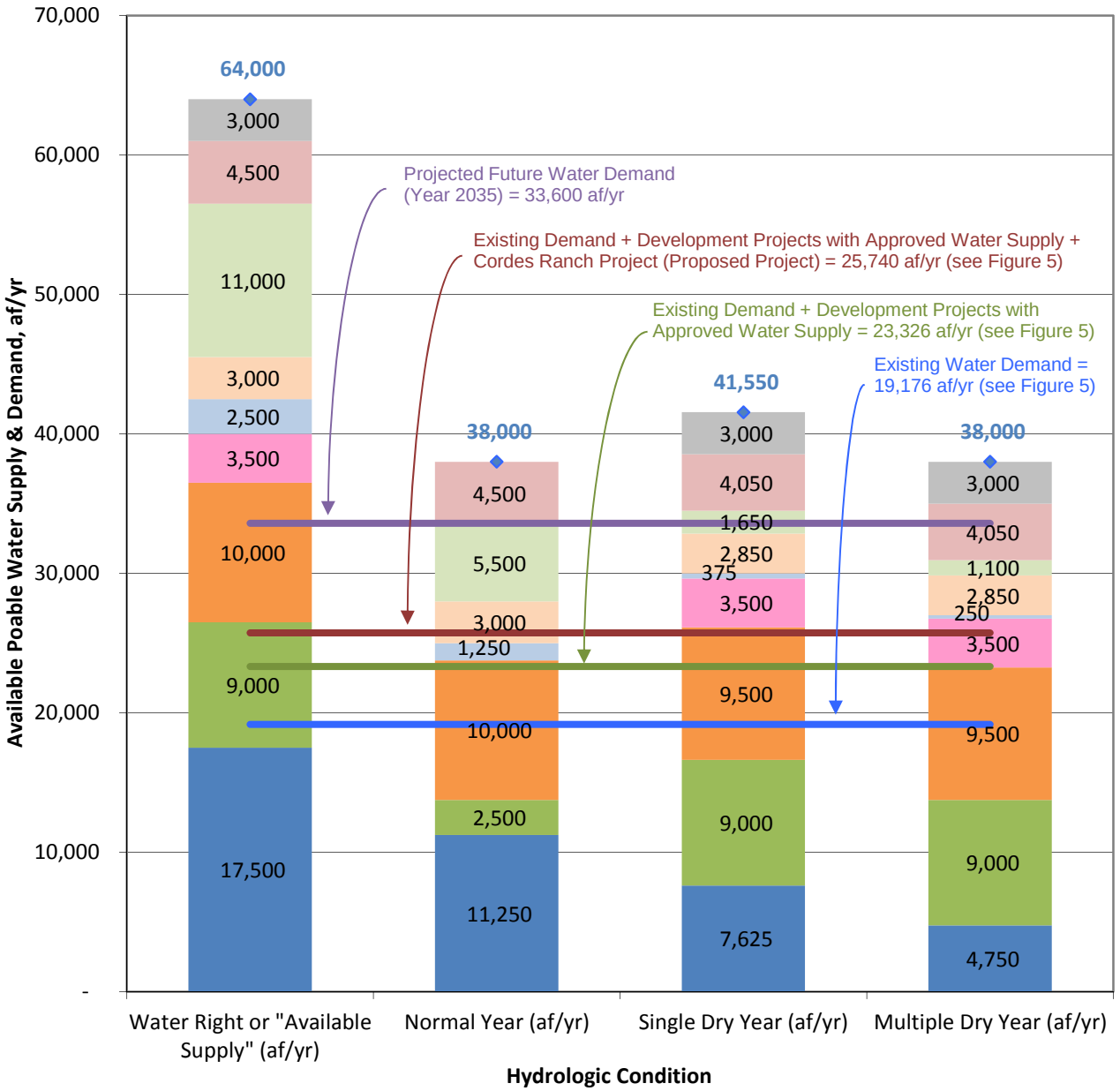
(3) Supplies from Semitropic Water Storage Bank are considered to be dry year supplies and are assumed to be zero in normal years.

(4) In 2012, the City entered into a permanent agreement with Semitropic Water Storage Bank which provides for up to 10,500 af of storage for the City of Tracy in the Semitropic Water Storage Bank, allowing for annual withdrawals of up to 3,500 af/yr when needed. 2,033 af/yr is assumed to be currently available from Semitropic based on the City's deposits to date.

(5) Though the City can sustainably extract up to 9,000 af/yr of groundwater, the City is planning to reduce its groundwater extraction in future years to increase the overall quality of its water supply. The City will continue to rely on groundwater for peaking and drought and emergency supplies, up to 9,000 af/yr, on an as-needed basis.

(6) Additional CVP Surface Water (BBID USBR assignment) assumes annexation of 1,080 acres in conjunction with Cordes Ranch Specific Plan.

Figure 12. City of Tracy Existing and Additional Potable Water Supplies at Year 2035 vs. Demand



Legend:

- Future ASR Water Banking
- Future BBID (pre-1914 rights)
- Additional CVP Surface Water (BBID USBR assignment)
- Additional SCWSP Supplies
- Additional CVP Surface Water (WSID USBR Option)
- Semitropic Water Storage Bank
- SSJID (SCWSP)
- Groundwater
- CVP Surface Water Deliveries
- Existing Water Demand
- Existing Water Demand + Development Projects with Approved Water Supply
- Existing Water Demand + Development Projects with Approved Water Supply + Cordes Ranch
- Projected Future Water Demand (Year 2035)
- Total Potable Water Supply

Notes:

See notes on Figure 11.

APPENDIX M
UTILITIES

M.3: Wastewater Master Plan Technical Memorandum

Final Draft Report

Wastewater Master Plan Tier 2 – Cordes Ranch Specific Plan Application Review

Prepared for

City of Tracy, California

January 2013

CH2MHILL

Contents

Acronyms and Abbreviations

ADWF	average dry weather flow
BOD	biochemical oxygen demand
BPI	Business Park Industrial
City	City of Tracy
EDU	equivalent dwelling unit
FAR	floor area ratios
gpd	gallon(s) per day
mgd	million gallons per day
TSS	total suspended solids
WWMP	Tracy Wastewater Master Plan
WWTP	wastewater treatment plant

SECTION 1

Introduction

In January 2013, the City of Tracy (City) completed a Citywide Wastewater Master Plan (WWMP) to evaluate the major wastewater collection system and treatment needs to serve buildout of the City's General Plan. The Cordes Ranch (hereinafter referred to as Project Applicant) Specific Plan area was included in the Citywide WWMP as one of the City's future service areas within the City's sphere of influence.

The purpose of this report is to document the Project Applicant Specific Plan application.

SECTION 2

Specific Plan Land Use Analysis

Wastewater flow generations factors were developed as part of the Citywide WWMP, and equivalent dwelling units (EDU) were assigned to each category of anticipated growth (see Table 2-1). Because the expected concentrations of biochemical oxygen demand (BOD) and total suspended solids (TSS) are identical for each user group, the number of EDUs is proportional to flow.

TABLE 2-1
Wastewater Flow Generation Factors
Wastewater Master Plan Tier 2 – Cordes Ranch Specific Plan Application Review

Flow Parameter	Adopted Flow Generation Values	Number of EDUs per Unit (based on gross acres)
Per Capita Flow	80 gpcd	
Residential – VLD	264 gpd/unit	1.0 per dwelling unit
Residential – LD	264 gpd/unit	1.0 per dwelling unit
Residential – MD	216 gpd/unit	0.82 per dwelling unit
Residential – HD	176 gpd/unit	0.667 per dwelling unit
Industrial	1,056 gal/gross acre/day	4.0 per gross acre
Office, Retail, and Commercial	1,140 gal/gross acre/day	4.32 per gross acre

Notes:
gal = gallons
gpcd = gallon(s) per capita per day
gpd = gallon(s) per day
HD = high density (2.2 residents per unit)
LD = low density (3.3 residents per unit)
MD = medium density (2.7 residents per unit)
VLD = very low density (3.3 residents per unit)

The assumed floor area ratios (FAR) used to establish wastewater flow and loading generation factors for non-residential users are as follows:

- Commercial – assumed FAR of 0.3
- Office – assumed FAR of 0.45
- Industrial – assumed FAR of 0.5

Proposed buildout conditions, including land use designations and acreage, were provided to the City by the Project Applicant during the development of the Citywide WWMP. The Project Applicant has provided land use designations and acreage, generally consistent with the WWMP, as part of the Specific Plan application as shown in Table 2-2.

TABLE 2-2
Cordes Ranch Specific Plan Overview
Wastewater Master Plan Tier 2 – Cordes Ranch Specific Plan Application Review

Flow Parameter	Buildout	Phase 1
Industrial Areas (gross acres)	1,328.5	606.8
I-205 Overlay Zone (gross acres)	79.1	11.2
Office Areas (gross acres)	150.0	0.0
Commercial Areas (gross acres)	53.9	31.2
Total Gross Area (gross acres)	1,611.5	649.2
ADWF (mgd)[a]	1.72	0.69
PDWF (mgd)[b]	5.15	2.05
Groundwater Infiltration (mgd)[c]	0.05	0.04
Rainfall-induced Inflow (mgd)[d]	0.64	0.24
PWWF (mgd)[e]	5.84	2.33
PWWF:ADWF	3.41	3.39

[a]The ADWF is based on the wastewater generation factors shown in Table 2-1, with the exception of the I-205 Overlay Zone. The Project Applicant determined the wastewater flow rate for the I-205 Overlay Zone by using the Citywide WWMP generation rate for the office land use designation (1,140 gallons per gross acre per day) and modifying the corresponding FAR from 0.45 to 0.40 (that is, an 11 percent reduction).

[b]Based on a PDWF peaking factor of 3.

[c]Based on 3 percent of ADWF.

[d]Based on 400 gpd per gross acre

[e]Summation of PDWF, groundwater infiltration, and rainfall-induced inflow.

Abbreviations:

ADWF = average dry weather flow
mgd = million gallons per day
PDWF = peak dry weather flow
PWWF = peak wet weather flow

As noted in Table 2-2, a portion of the proposed properties within the Specific Plan area is categorized as the I-205 Overlay Zone. A general description of the I-205 Overlay Zone, provided by the Project Applicant, is as follows:

> The purpose of the I-205/Business Park Industrial (BPI) Overlay Zone is to accommodate a broad range of uses to provide flexible development opportunities by allowing a blend of office with light assembly, manufacturing, and ancillary distribution uses.
>
> Differences with regular BPI zoning are as follows:
>
> - Higher amount of office space than typical BPI zoning
> - High-visibility location from adjacent roadways and regional freeways to allow easy access for employees and visitors

- A professional work environment that will attract and retain skilled workers in high-paying positions
- A range of small to mid-sized buildings with enhanced building features and architectural details

Possible Attraction Targets: Service-related office industries including renewable energy, advanced manufacturing, assembly, and regional service centers with a larger percentage of office.

Properties within the I-205 Overlay Zone (see Appendix A) will also produce wastewater at a rate that differs from other land uses established in the Citywide WWMP. The Project Applicant has proposed that the I-205 Overlay Zone will have a reduced FAR but higher wastewater generation rate than that assumed in the Citywide WWMP for the commercial land use. The FAR and wastewater generation rate for properties within the I-205 Overlay Zone are proposed to be 0.40 and 1,013 gallons per gross acre per day, respectively. The Project Applicant determined the wastewater flow rate for the I-205 Overlay Zone by using the Citywide WWMP generation rate for the office land use designation (1,140 gallons per gross acre per day) and modifying the corresponding FAR from 0.45 to 0.40 (that is, an 11 percent reduction). These changes are consistent with direction to the Project Applicant from the City.

Appendix B includes land-use designations and distribution estimates of wastewater flow rates for the Specific Plan area, which have been prepared by the Project Applicant.

SECTION 3

Wastewater Collection System Plan for Buildout Condition

The Project Applicant has developed a conceptual layout of the wastewater collection system within the Specific Plan area for buildout (see Appendix A, prepared by Project Applicant). As illustrated, all wastewater associated with the Specific Plan area at buildout will be conveyed to Node 6W (this is the point of beginning of the Citywide WWMP offsite improvements for the wastewater collection system in the vicinity of the Cordes Ranch Specific Plan area).

The Project Applicant is proposing to utilize the existing 21-inch-diameter pipeline (referred to as the Hansen Trunk Sewer) for a portion of the flows generated within the Cordes Ranch Specific Plan area. The segment of the Hansen Trunk Sewer that traverses the Specific Plan area has a relatively steep gradient (pipe slope is generally about 0.01 foot per foot), resulting in hydraulic capacity that is not otherwise available in the downstream reaches of the Hansen Trunk Sewer. Available hydraulic capacity within the Specific Plan area can be used as long as all Specific Plan flows are transferred from the Hansen Trunk Sewer to Node 6W. Use of the Hansen Trunk Sewer within the Specific Plan area at buildout is summarized in Table 3-1 and reference is made to "Block Number" as referred to in the Specific Plan application. Use of the Hansen Trunk Sewer beyond that identified in Table 3-1 will require approval by the City Engineer. Long-term use of the Hansen Trunk Sewer should be subject to an impact fee that is not part of this report, because the use of this existing pipeline will obviate the need for other onsite pipelines. It is assumed that payment provisions for such use will be included as part of the Development Agreement.

TABLE 3-1
Use of Hansen Trunk Sewer within Specific Plan Area
Wastewater Master Plan Tier 2 – Cordes Ranch Specific Plan Application Review

Block Number	ADWF (mgd)
40 and 41	0.12

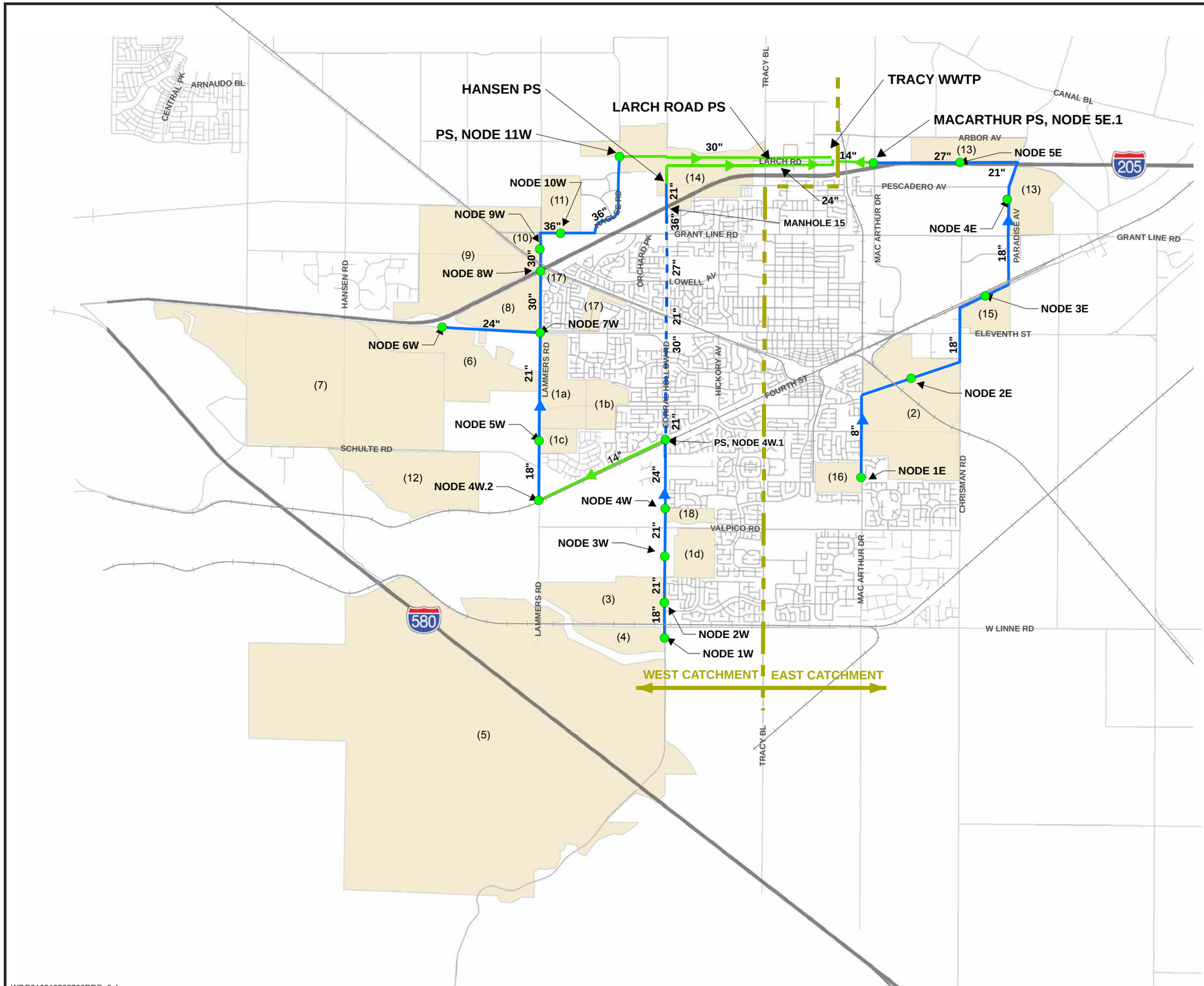
Note:
Block number and ADWF are based on the Specific Plan application.

Buildout collection system capacity will consist of the collection system construction that is required within the Cordes Ranch Specific Plan area (see Appendix A for onsite conveyance layouts) plus other offsite collection system improvements required to convey the wastewater to the existing wastewater treatment plant (WWTP) located at Holly Drive. Those offsite improvements were developed in the Citywide WWMP; for the Cordes Ranch Specific Plan area, those improvements will start at Node 6W (see Figure 3-1, located at the end of this section) and proceed all the way to the WWTP. Although the offsite improvements shown on Figure 3-1 will be used by Cordes Ranch and others as described

in the Citywide WWMP, all of the illustrated improvements (specifically downstream of Node 6W) will be required to be in place before flows from the Cordes Ranch Specific Plan area exceed the interim capacity limitations discussed later in this report.

The Specific Plan area collection system was sized by the Project Applicant and reviewed for compliance with City standards, including consideration for the acceptable range of flow velocities (that is, 2 to 10 feet per second) in gravity pipelines, depth of flow to pipe diameter ratio of 0.7 or less, and the minimum pipe diameter (8 inches). The conceptual layout and sizing of the Specific Plan area collection system conform to City standards.

The Project Applicant should not make any direct connections of sewer laterals to the existing Hansen Trunk Sewer. In the event that connections for more than Block Numbers 40 and 41 are proposed in the future, those connections shall be made at existing manholes or new manholes constructed to accommodate the onsite improvement, as required by the City. The use of drop manholes for onsite improvements shall be avoided unless approved by the City Engineer. The new sewer collection system shall be designed and constructed to avoid multiple drop manholes to the Hansen Trunk Sewer at the Project Applicant's expense. Onsite improvements that cross or parallel the Hansen Trunk Sewer should include special considerations, such as pipe support and appropriate backfill.



LEGEND

- Future Service Areas
- Node # (point of wastewater contribution)
- Proposed Force Main
- Proposed Gravity Main
- Proposed Gravity Main, Replacement
- 18" — Pipe Diameter (See pipe schedule)

FUTURE SERVICE AREAS INDEX

(1a) UR 5 (Bright)
(1b) UR 7 (Bright)
(1c) UR 8 (Fahmy)
(1d) UR 9 (Keenan)
(2) UR 1 (Alvarez & others)
(3) UR 10 (Ellis)
(4) South Linne
(5) Tracy Hills
(6) Gateway (excluding Phase 1)
(7) Cordes Ranch
(8) Bright
(9) Catellus
(10) Filios
(11) I-205 Expansion
(12) Westside Industrial
(13) Eastside Industrial
(14) Larch Clover
(15) Chrisman Road
(16) Rocha
(17) Berg/Byron
(18) Kagehiro

ABBREVIATIONS

EXST	EXISTING
FM	FORCE MAIN
PS	PUMP STATION
WWTP	WASTEWATER TREATMENT PLANT

N

0 0.5 1
Miles

FIGURE 3-1
MAJOR WASTEWATER CONVEYANCE FACILITIES (OFFSITE)
TRACY WASTEWATER MASTER PLAN TIER 2 – CORDES RANCH SPECIFIC PLAN APPLICATION REVIEW

WBG010213202736RDD_3-1

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SECTION 4

Wastewater Collection System Phasing Plan

The Hansen Trunk Sewer traverses the Cordes Ranch Specific Plan area. The pipeline extends from the northeast property boundary to Hansen Road and continues to the southern boundary at Old Schulte Road, and continues to the west to the intersection of Old Schulte Road and Mountain House Parkway.

The Project Applicant has developed a conceptual layout of major wastewater conveyance facilities within the Specific Plan area for Phase 1 (see Appendix A). As illustrated, the Phase 1 Specific Plan area wastewater collection system relies heavily on use of the Hansen Trunk Sewer within the Specific Plan area.

The City's existing wastewater collection system is sufficiently sized (both in terms of capacity and areal extent) to serve those lands currently within the existing City limits, but completely new and additional collection system capacity will be required to serve buildout of Phase 1 and the ultimate buildout capacity requirements of the Cordes Ranch Specific Plan. The Hansen Trunk Sewer is currently underutilized, although the pipeline capacity is formally allocated to other users. Table 4-1 includes a summary of a 2006 capacity evaluation of the Hansen Trunk Sewer by Ruark and Associates. Many of the committed users of this pipeline have not yet fully developed, and interim capacity is available. The City may allow some of this interim capacity to be accessed for a portion of the Phase 1 demands created by the Cordes Ranch Specific Plan area.

TABLE 4-1
Hansen Trunk Sewer Users
Wastewater Master Plan Tier 2 – Cordes Ranch Specific Plan Application Review

Ruark and Associates Designation	Current City Designation	Committed Peak (mgd)
Patterson Pass Business Park	-	1.05
Tracy Lammers School (originally Tracy Learning Center)	Westside Residential	0.20
I-205	-	2.00
Huntington Park	-	0.29
Westgate	-	0.33
Berg Avenue	Berg/Byron	0.35
Presidio	-	0.41
Tracy Gateway (Phase 1)	-	0.78
Eastgate and the "Gap" Area	-	0.11
Corral Hollow (between Grant Line and I-205)	-	0.05
Ellis	Ellis	1.00
Subtotal, Current Commitments		**6.57**
Total Available Capacity		**6.58**

Note:
Based on *Capacity Analysis of the Hansen Sewer Collection System for Tracy Gateway*, Ruark and Associates (December 2006).

Upon verification of existing Hansen Sewer Capacity, the City will allow 0.145 mgd (145,000 gallons per day) of dry weather flow into the Hansen Trunk Sewer on an interim basis. It is recommended that the Project Applicant dedicate three flow measuring devices to monitor the actual flows delivered into the existing collection system from all sources in order to verify available capacity, and to monitor the impacts of added flow from the Cordes Ranch Specific Plan area prior to the completion of the Lammers Trunk Sewer. Flow measuring devices are recommended at the following general locations:

- 10-inch-diameter pipe near the eastern edge of Block Number 41 (see Appendix A for all flow measuring device locations)
- Existing 21-inch-diameter pipe (Hansen Trunk Sewer) immediately north of the intersection of Old Schulte Road and Hansen Road
- Existing 21-inch-diameter pipe (Hansen Trunk Sewer) near the northern edge of Block Number 9A

The current recommendation is that the 0.145-mgd interim flow rate noted above will constitute a "trigger point," and that flows above this amount will require construction of other elements of conveyance system infrastructure as described in the Citywide WWMP. However, the dedicated flow measuring devices can be used to evaluate the then-current flow rates in the system from both the Phase 1 Cordes Ranch users and other service areas, and a decision can be made in the future as to whether an addition to the 0.145-mgd trigger flow rate can be made.

The proposed offsite conveyance improvements, including connection of the Specific Plan area collection system to Node 6W, shall be available to receive wastewater flow at, or before, the time that discharges from the Cordes Ranch Specific Plan area reach 0.145 mgd of dry weather flow. Once the offsite improvements are in place, all interim connections to the Hansen Trunk Sewer shall be terminated by the Project Applicant (with the exception of those connections identified in Table 3-1 that are diverted to the offsite improvements through the previously mentioned transfer manhole).

SECTION 5

Wastewater Treatment Plant Requirements

As part of the Citywide WWMP, the City has developed plans for the incremental expansion of the WWTP to meet the demands to be imposed by the buildout of the City's General Plan. The current schedule constraint for additional WWTP capacity is related to the construction of new outfall capacity, but the City has already commenced the design and permitting of the outfall, and other plant improvements are not seen as impediments to the orderly buildout of the Cordes Ranch Specific Plan area.

Although treatment plant capacity is not a current constraint to the development of the Cordes Ranch Specific Plan area (specifically, Phase 1), the capacity of the existing outfall to the Old River is a constraint. The existing outfall has a capacity of 9 mgd (for dry weather flow), and a proportionate wet weather flow capacity that is required to convey the higher flow rates that occur during storm events. The outfall capacity can be extended by the use of "flow equalization" for the incremental Cordes Ranch Specific Plan area Phase 1 flow rates. Because storm events are relatively short in duration (measured in days or sometimes weeks), the additional flow generated during those storm events can be sent to basins, reservoirs, or tanks that store those flows until the storm passes. Once flow rates decrease, the stored volume is then discharged into the outfall. Either primary effluent (the partially treated waste stream after primary clarification) or fully treated effluent (because treatment plant capacity is available) can be stored during periods of higher flow rates. The treatment plant's existing 2-million-gallon storage reservoir (for primary effluent) or the existing emergency storage basins (for fully treated effluent) can be used for this purpose. The interim capacity of Phase 1 average dry weather flow discussed for the collection system flow rate trigger is also appropriate for the outfall, and any increase in interim capacity greater than 0.145 mgd (ADWF) should be evaluated in the future before any increase is allowed.

SECTION 6

Determination of Wastewater Impact Fee

Both treatment and conveyance capacity are proposed to be allocated in units associated with individual housing, or dwelling units. One EDU represents the flow, BOD, and TSS loading that one would associate with a single-family home (all constituents are considered for treatment capacity impacts, and only flow is considered for conveyance capacity). As noted in the Citywide WWMP, an EDU consists of a typical low-density, single-family home, with 3.3 people, a flow rate of 264 gallons per day, a BOD loading of 0.594 pound per day, and a TSS loading of 0.693 pound per day. Flow and loading from residential, commercial, industrial, and retail users can be correlated to EDUs, and appropriate development impact fees calculated (for both conveyance and treatment facilities).

Development impact fees for wastewater conveyance and treatment are described in the *Tracy Wastewater Conveyance and Treatment Development Impact Fee Study* (CH2M HILL, January 2013) and summarized as follows:

- Wastewater Conveyance Development Impact Fee – $1,610 per EDU
- Wastewater Treatment Development Impact Fee – $6,727 per EDU

These fees are applicable to the conveyance costs for trunk sewers (pipelines that are "offsite" of individual development projects, and generally, but not always, greater than 18 inches in diameter), and treatment and disposal costs associated with the main WWTP located at Holly Drive. As such, "onsite" wastewater collection system improvements that are required to serve the Specific Plan area are assumed to be paid for and constructed by the Project Applicant.

Changes to the assumed FAR will require adjustments to the recommended development impact fees presented in Table 6-1. Table 6-1 presents the development impact fees for the entire Cordes Ranch Specific Plan area, and uses flow as the common wastewater constituent for the allocation of costs, because the other wastewater constituents of concern are assumed to be proportional to flow.

Table 6-2, using the same assumptions noted for Table 6-1, represents the wastewater development impact fees for the proposed Phase 1 development of the Cordes Ranch Specific Plan area.

As noted in the *Tracy Wastewater Conveyance and Treatment Development Impact Fee Study* (January 2013), the cost per EDU for the next plant expansion is considerably greater than the average cost per EDU for all phases of planned construction. The use of this average cost per EDU, as requested by the City, will result in cash flow shortcomings in the initial phases of expansion unless some method of supplemental funding for this shortfall is found. No similar evaluation of wastewater conveyance costing by phase was performed, but it is assumed that a shortfall in funding is possible for that element as well.

The development impact fees are based on March 2012 estimates and will be updated on a regular basis to reflect current cost estimates. In addition, the fees will need to be updated to

reflect incremental costs associated with the phasing of projects or increased costs due to new regulatory requirements.

As noted in Section 3, long-term use of the Hansen Trunk Sewer by the Project Applicant should be subject to an impact fee that is not part of this report, because the use of this existing pipeline will both reduce other onsite conveyance requirements that are the obligation of the Project Applicant and consume capacity in the Hansen Trunk Sewer. It is assumed that payment provisions for such use will be included as part of the mapping and project approval process for the various phases of the Cordes Ranch Specific Plan area; this supplemental fee shall be a fair share contribution of that portion of the Hansen Trunk Sewer used by Cordes Ranch.

TABLE 6-1
Wastewater Conveyance and Treatment Facilities Development Impact Fee Recommendations (Buildout)
Wastewater Master Plan Tier 2 – Cordes Ranch Specific Plan Application Review

Land Use	Adopted Flow Generation Values	Number of EDUs per Gross Acre	Gross Acres	Number of EDUs per Gross Acre	Total Conveyance Development Impact Fee[b] ($)	Total Treatment Development Impact Fee ($)	Total Wastewater Development Impact Fee ($)
Industrial	1,056 gal/gross acre/day	4.0	1,328.5	5,314.0	8,555,540	35,747,278	**44,302,818**
I-205 Overlay Zone[a]	1,013 gal/gross acre/day	3.84	79.1	303.6	488,822	2,042,426	**2,531,248**
Office	1,140 gal/gross acre/day	4.32	150.0	647.7	1,042,841	4,357,261	**5,400,102**
Commercial	1,140 gal/gross acre/day	4.32	53.9	232.8	374,728	1,565,709	**1,940,437**
Total	**-**	**-**	**1,611.5**	**6,498.1**	**10,461,930**	**43,712,675**	**54,174,605**

[a]FAR and wastewater generation rates differ from the Citywide WWMP as noted in Section 2.
[b] Does not include fair share cost for use of the Hansen Trunk Sewer

TABLE 6-2
Wastewater Conveyance and Treatment Facilities Development Impact Fee Recommendations (Phase 1)
Wastewater Master Plan Tier 2 – Cordes Ranch Specific Plan Application Review

Land Use	Adopted Flow Generation Values	Number of EDUs per Gross Acre	Gross Acres	Number of EDUs per Gross Acre	Total Conveyance Development Impact Fee[b] ($)	Total Treatment Development Impact Fee ($)	Total Wastewater Development Impact Fee ($)
Industrial	1,056 gal/gross acre/day	4.0	606.8	2,427.2	3,907,792	16,327,774	**20,235,566**
I-205 Overlay Zone[a]	1,013 gal/gross acre/day	3.84	11.2	43.0	69,214	289,193	**358,407**
Commercial	1,140 gal/gross acre/day	4.32	31.2	134.7	216,911	906,310	**1,123,221**
Total	**-**	**-**	**649.2**	**2,604.9**	**4,193,917**	**17,523,278**	**21,717,194**

[a]FAR and wastewater generation rates differ from the Citywide WWMP as noted in Section 2.
[b] Does not include fair share cost for use of the Hansen Trunk Sewer

Appendix A
Onsite Wastewater Conveyance Facilities

NORTH

500 0 250 500 1000

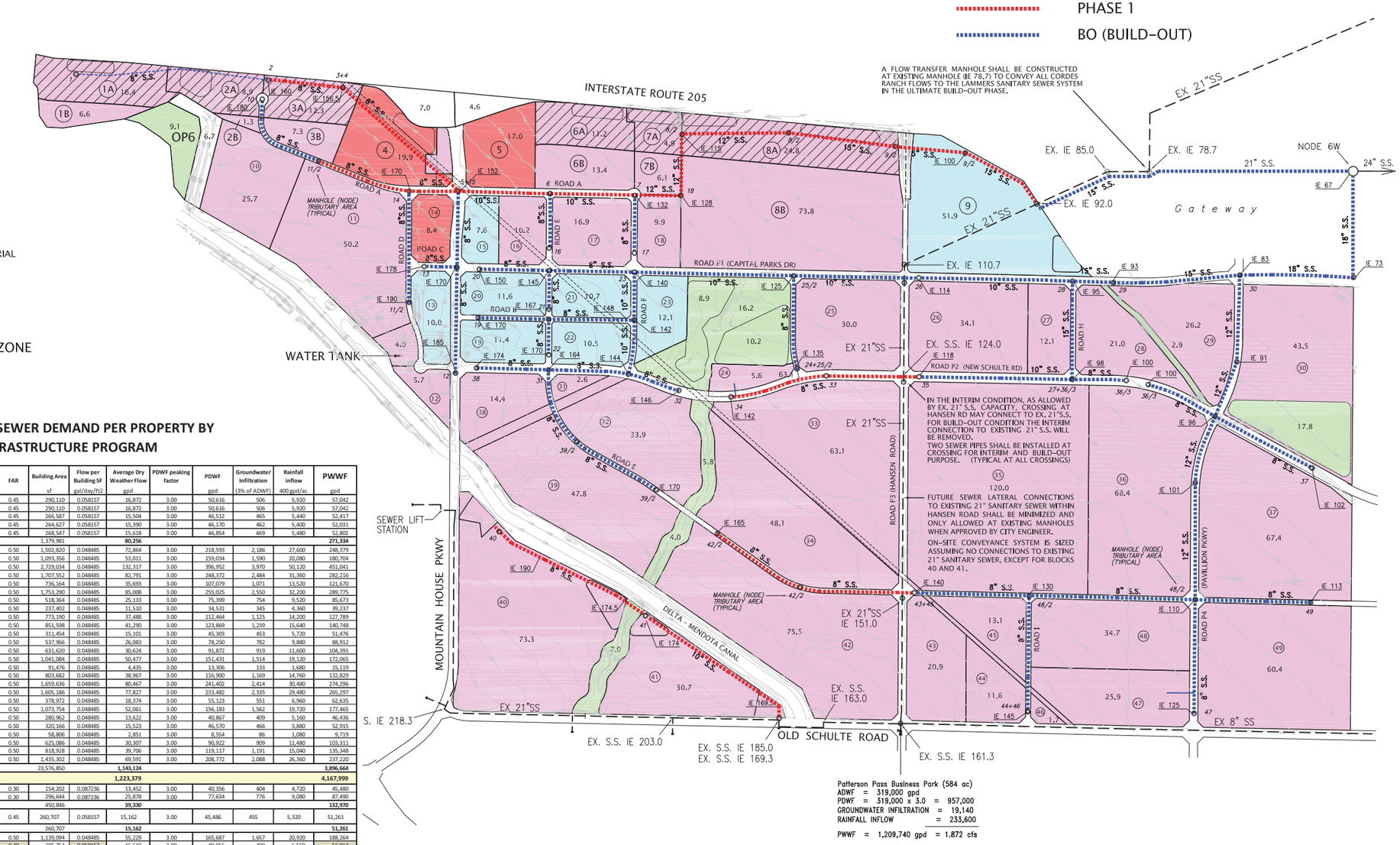
GRAPHIC SCALE 1" = 500'

LAND USE LEGEND

- GC — GENERAL COMMERCIAL
- GO — GENERAL OFFICE
- BPI — BUSINESS PARK INDUSTRIAL
- OP — OPEN SPACE / PARKS
- I-205 OVERLAY ZONE

SEWER PHASES

- PHASE 1
- BO (BUILD-OUT)



I-205 Overlay Zone over BPI zoning:
FAR reduced from 0.50 to 0.40 and Generation Rate has been adjusted per Overall Sewer Demand Calculation table below

ESTIMATED SEWER DEMAND PER PROPERTY BY INFRASTRUCTURE PROGRAM

Property Owner	Land Use	Block Number	Phase	Block Total Net Area (acres)	Roads Area (acres)	Block Total Gross Area (acres)	FAR	Building Area (sf)	Flow per Building SF (gal/day/ft2)	Average Dry Weather Flow (gpd)	PDWF peaking factor	PDWF (gpd)	Groundwater Infiltration (3% of ADWF)	Rainfall inflow 400 gpd/ac	PWWF (gpd)
CROSSROADS BUSINESS CENTER AT CORDES RANCH	GO	19	BO	11.4	3.4	14.8	0.45	290,110	0.058157	16,872	3.00	50,616	506	5,920	57,042
		20	BO	11.6	3.2	14.8	0.45	290,110	0.058157	16,872	3.00	50,616	506	5,920	57,042
		21	BO	10.7	2.9	13.6	0.45	266,587	0.058157	15,504	3.00	46,512	465	5,440	52,417
		22	BO	10.5	3.0	13.5	0.45	264,627	0.058157	15,390	3.00	46,170	462	5,400	52,031
		23	BO	12.1	1.6	13.7	0.45	268,547	0.058157	15,618	3.00	46,854	469	5,480	52,802
	Total			56.3	14.1	70.4		1,379,981		**80,256**					**271,334**
	BPI	33	1	63.1	5.9	69.0	0.50	1,502,820	0.048485	72,864	3.00	218,593	2,186	27,600	248,379
		34	1	48.1	2.1	50.2	0.50	1,093,356	0.048485	53,011	3.00	159,034	1,590	20,080	180,704
		35	1	120.0	5.3	125.3	0.50	2,729,034	0.048485	132,317	3.00	396,952	3,970	50,120	451,041
		40	1	73.3	5.1	78.4	0.50	1,707,552	0.048485	82,791	3.00	248,372	2,484	31,360	282,216
		41	1	30.7	3.1	33.8	0.50	736,164	0.048485	35,693	3.00	107,079	1,071	13,520	121,670
		42	1	75.5	5.0	80.5	0.50	1,753,290	0.048485	85,008	3.00	255,025	2,550	32,200	289,775
		43	1	20.9	2.9	23.8	0.50	518,364	0.048485	25,133	3.00	75,399	754	9,520	85,673
		24	BO	5.6	5.3	10.9	0.50	237,402	0.048485	11,510	3.00	34,531	345	4,360	39,237
		25	BO	30.0	5.5	35.5	0.50	773,190	0.048485	37,488	3.00	112,464	1,125	14,200	127,789
		26	BO	34.1	5.0	39.1	0.50	851,598	0.048485	41,290	3.00	123,869	1,239	15,640	140,748
		27	BO	12.1	2.2	14.3	0.50	311,454	0.048485	15,101	3.00	45,303	453	5,720	51,476
		28	BO	21.0	3.7	24.7	0.50	537,966	0.048485	26,083	3.00	78,250	782	9,880	88,912
		29	BO	26.2	2.8	29.0	0.50	631,620	0.048485	30,624	3.00	91,872	919	11,600	104,391
		30	BO	43.5	4.3	47.8	0.50	1,041,084	0.048485	50,477	3.00	151,431	1,514	19,120	172,065
		31	BO	2.6	1.6	4.2	0.50	91,476	0.048485	4,435	3.00	13,306	133	1,680	15,119
		32	BO	33.9	3.0	36.9	0.50	803,682	0.048485	38,967	3.00	116,900	1,169	14,760	132,829
		36	BO	68.4	7.8	76.2	0.50	1,659,636	0.048485	80,467	3.00	241,402	2,414	30,480	274,296
		37	BO	67.4	6.3	73.7	0.50	1,605,186	0.048485	77,827	3.00	233,482	2,335	29,480	265,297
		38	BO	14.4	3.0	17.4	0.50	378,972	0.048485	18,374	3.00	55,123	551	6,960	62,635
		39	BO	47.8	1.5	49.3	0.50	1,073,754	0.048485	52,061	3.00	156,183	1,562	19,720	177,465
		44	BO	11.6	1.3	12.9	0.50	280,962	0.048485	13,622	3.00	40,867	409	5,160	46,436
		45	BO	13.1	1.6	14.7	0.50	320,166	0.048485	15,523	3.00	46,570	466	5,880	52,915
		46	BO	1.7	1.0	2.7	0.50	58,806	0.048485	2,851	3.00	8,554	86	1,080	9,719
		47	BO	25.9	2.8	28.7	0.50	625,086	0.048485	30,307	3.00	90,922	909	11,480	103,311
		48	BO	34.7	2.9	37.6	0.50	818,928	0.048485	39,706	3.00	119,117	1,191	15,040	135,348
		49	BO	60.4	5.5	65.9	0.50	1,435,302	0.048485	69,591	3.00	208,772	2,088	26,360	237,220
	Total			986.0	96.5	1082.5		23,576,850		**1,143,124**					**3,896,664**
	TOTAL			1042.3	110.6	1152.9				**1,223,379**					**4,167,999**
GBC GLOBAL INVESTMENTS	GC	14	1	8.4	3.4	11.8	0.30	154,202	0.087236	13,452	3.00	40,356	404	4,720	45,480
		4	BO	19.9	2.8	22.7	0.30	296,644	0.087236	25,878	3.00	77,634	776	9,080	87,490
	Total			28.3	6.2	34.5		450,846		**39,330**					**132,970**
	GO	13	BO	10.0	3.3	13.3	0.45	260,707	0.058157	15,162	3.00	45,486	455	5,320	51,261
	Total			10.0	3.3	13.3		260,707		**15,162**					**51,261**
	BPI	11	1	50.2	2.1	52.3	0.50	1,139,094	0.048485	55,229	3.00	165,687	1,657	20,920	188,264
		1A	BO	16.4	0.0	16.4	0.40	285,754	0.058157	16,619	3.00	49,856	499	6,560	56,914
		1B	BO	6.6	0.0	6.6	0.50	143,748	0.048485	6,970	3.00	20,909	209	2,640	23,758
		2A	BO	8.9	0.3	9.2	0.40	160,301	0.058157	9,323	3.00	27,968	280	3,680	31,928
		2B	BO	1.3	0.1	1.4	0.50	30,492	0.048485	1,478	3.00	4,435	44	560	5,040
		3A	BO	12.3	0.3	12.6	0.40	219,542	0.058157	12,768	3.00	38,304	383	5,040	43,727
		3B	BO	7.3	0.7	8.0	0.50	174,240	0.048485	8,448	3.00	25,344	253	3,200	28,798
		10	BO	25.6	0.8	26.4	0.50	574,992	0.048485	27,878	3.00	83,635	836	10,560	95,032
		12	BO	5.7	1.8	7.5	0.50	163,350	0.048485	7,920	3.00	23,760	238	3,000	26,998
	Total			134.3	6.1	140.4		2,891,513		**146,633**					**500,457**
	TOTAL			172.6	15.6	188.2				**201,125**					**684,687**
DELTA PROPERTIES	GC	5	1	17.0	2.4	19.4	0.30	253,519	0.087236	**22,116**	3.00	66,348	663	7,760	74,771
	Total			17.0	2.4	19.4		253,519		**22,116**					**74,771**
	GO	15	BO	7.6	2.5	10.1	0.45	197,980	0.058157	11,514	3.00	34,542	345	4,040	38,927
	Total			7.6	2.5	10.1		197,980		**11,514**					**38,927**
	BPI	6A	1	11.2	0.0	11.2	0.40	195,149	0.058157	11,349	3.00	34,048	340	4,480	38,868
		6B	1	13.4	1.3	14.7	0.50	320,166	0.048485	15,523	3.00	46,570	466	5,880	52,915
		7A	BO	4.9	0.0	4.9	0.40	85,378	0.058157	4,965	3.00	14,896	149	1,960	17,005
		7B	BO	6.1	0.0	6.1	0.50	132,858	0.048485	6,442	3.00	19,325	193	2,440	21,958
		16	BO	10.2	2.0	12.2	0.50	265,716	0.048485	12,883	3.00	38,650	386	4,880	43,916
		17	BO	16.9	3.9	20.8	0.50	453,024	0.048485	21,965	3.00	65,895	659	8,320	74,874
		18	BO	9.9	1.4	11.3	0.50	246,114	0.048485	11,933	3.00	35,799	358	4,520	40,676
	Total			72.6	8.6	81.2		1,698,404		**85,060**					**290,213**
	TOTAL			97.2	13.5	110.7				**118,690**					**403,912**
TWL INVESTORS LLC	BPI	8A	BO	24.8	0.0	24.8	0.40	432,115	0.058157	25,131	3.00	75,392	754	9,920	86,065
		8B	1	73.8	4.9	78.7	0.50	1,714,086	0.048485	83,107	3.00	249,322	2,493	31,480	283,296
	TOTAL			98.6	4.9	103.5				**108,238**					**369,361**
DUPEZ / ADAMS / GELION DOLAN	GO	9	BO	51.9	4.3	56.2	0.45	1,101,632	0.058157	64,068	3.00	192,203	1,922	22,480	216,605
	TOTAL			51.9	4.3	56.2				**64,068**					**216,605**
GRAND TOTAL				1462.6	148.9	1611.5				**1,715,500**					**5,842,564**

OVERALL SEWER DEMAND CALCULATIONS

Land Use	Description	Master Plan Flow Generation Factor	Master Plan Area (Gross)	Master Plan FAR	Master Plan Building Square Footage	Master Plan Total Sewer Flow	Flow per Square Footage of building gal/day/ft²	Specific Plan Flow Generation Factor	Specific Plan Area (Gross)	Specific Plan FAR	Specific Plan Total Sewer Flow (Based on Gross Acres)	Percent Reduction from Master Plan Based on Acreage	Specific Plan Building Square Footage	Total Sewer based on building square footage	Percent Reduction form Master Plan Based on Bldg SF
GC	General Commercial	1,140	85	0.30	1,110,780	96,900	**0.087236**	1,140	53.9	0.30	61,446	**36.59%**	704,365	61,446	**36.59%**
GO	General Office	1,140	150	0.45	2,940,300	171,000	**0.058157**	1,140	150.0	0.45	171,000	**0.00%**	2,940,300	171,000	**0.00%**
BPI	Business Park Industrial	1,056	1,488	0.50	32,408,640	1,571,328	**0.048485**	1,056	1,328.5	0.50	1,402,896	**10.72%**	28,934,730	1,402,896	**10.72%**
BPI I-205 overlay	BPI Within the I-205 Overlay Zone	1,140	0	0.45	0	0	**0.058157**	1,013	79.1 *	0.40	80,154	**0.00%**	1,378,238	80,155	**0.00%**
			1,723		36,459,720	1,839,228			1,611.5		1,715,496	**6.73%**	32,579,395	1,715,497	**6.73%**

* Gross Area within Specific Plan includes roads only and excludes open space, drainage channels and basins, or any other undeveloped property within specific plan.

NO.	BY	REVISION

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2355 Crow Canyon Road, Suite 250
Livermore, California 94551
Phone (925) 245-8788
Fax (925) 245-8796

SEWER – INFRASTRUCTURE PROGRAM
ESTIMATED IMPACTS PER PROPERTY BY INFRASTRUCTURE PROGRAM
CORDES RANCH
TRACY CALIFORNIA

DATE	01/03/2013
SCALE	1" = 500'
DESIGNER	M.F.B.
JOB NO.	A09500
SHEET	SS
OF	SHEETS

Z:\2009\A09500\AREAS-PHASING.dwg 1/3/2013 3:53:13 PM PST

Appendix B
Estimated Sewer Demand Calculations

ESTIMATED SEWER DEMAND PER PROPERTY BY INFRASTRUCTURE PROGRAM

Property Owner	Land Use	Block Number	Phase	Block Total Net Area acres	Roads Area acres	Block Total Gross Area acres	FAR	Building Area sf	Flow per Building SF gal/day/ft2	Average Dry Weather Flow gpd	PDWF peaking factor	PDWF gpd	Groundwater Infiltration (3% of ADWF)	Rainfall inflow 400 gpd/ac	PWWF gpd
CROSSROADS BUSINESS CENTER AT CORDES RANCH	GO	19	BO	11.4	3.4	14.8	0.45	290,110	0.058157	16,872	3.00	50,616	506	5,920	57,042
		20	BO	11.6	3.2	14.8	0.45	290,110	0.058157	16,872	3.00	50,616	506	5,920	57,042
		21	BO	10.7	2.9	13.6	0.45	266,587	0.058157	15,504	3.00	46,512	465	5,440	52,417
		22	BO	10.5	3.0	13.5	0.45	264,627	0.058157	15,390	3.00	46,170	462	5,400	52,031
		23	BO	12.1	1.6	13.7	0.45	268,547	0.058157	15,618	3.00	46,854	469	5,480	52,802
	Total			56.3	14.1	70.4		1,379,981		**80,256**					**271,334**
	BPI	33	1	63.1	5.9	69.0	0.50	1,502,820	0.048485	72,864	3.00	218,593	2,186	27,600	248,379
		34	1	48.1	2.1	50.2	0.50	1,093,356	0.048485	53,011	3.00	159,034	1,590	20,080	180,704
		35	1	120.0	5.3	125.3	0.50	2,729,034	0.048485	132,317	3.00	396,952	3,970	50,120	451,041
		40	1	73.3	5.1	78.4	0.50	1,707,552	0.048485	82,791	3.00	248,372	2,484	31,360	282,216
		41	1	30.7	3.1	33.8	0.50	736,164	0.048485	35,693	3.00	107,079	1,071	13,520	121,670
		42	1	75.5	5.0	80.5	0.50	1,753,290	0.048485	85,008	3.00	255,025	2,550	32,200	289,775
		43	1	20.9	2.9	23.8	0.50	518,364	0.048485	25,133	3.00	75,399	754	9,520	85,673
		24	BO	5.6	5.3	10.9	0.50	237,402	0.048485	11,510	3.00	34,531	345	4,360	39,237
		25	BO	30.0	5.5	35.5	0.50	773,190	0.048485	37,488	3.00	112,464	1,125	14,200	127,789
		26	BO	34.1	5.0	39.1	0.50	851,598	0.048485	41,290	3.00	123,869	1,239	15,640	140,748
		27	BO	12.1	2.2	14.3	0.50	311,454	0.048485	15,101	3.00	45,303	453	5,720	51,476
		28	BO	21.0	3.7	24.7	0.50	537,966	0.048485	26,083	3.00	78,250	782	9,880	88,912
		29	BO	26.2	2.8	29.0	0.50	631,620	0.048485	30,624	3.00	91,872	919	11,600	104,391
		30	BO	43.5	4.3	47.8	0.50	1,041,084	0.048485	50,477	3.00	151,431	1,514	19,120	172,065
		31	BO	2.6	1.6	4.2	0.50	91,476	0.048485	4,435	3.00	13,306	133	1,680	15,119
		32	BO	33.9	3.0	36.9	0.50	803,682	0.048485	38,967	3.00	116,900	1,169	14,760	132,829
		36	BO	68.4	7.8	76.2	0.50	1,659,636	0.048485	80,467	3.00	241,402	2,414	30,480	274,296
		37	BO	67.4	6.3	73.7	0.50	1,605,186	0.048485	77,827	3.00	233,482	2,335	29,480	265,297
		38	BO	14.4	3.0	17.4	0.50	378,972	0.048485	18,374	3.00	55,123	551	6,960	62,635
		39	BO	47.8	1.5	49.3	0.50	1,073,754	0.048485	52,061	3.00	156,183	1,562	19,720	177,465
		44	BO	11.6	1.3	12.9	0.50	280,962	0.048485	13,622	3.00	40,867	409	5,160	46,436
		45	BO	13.1	1.6	14.7	0.50	320,166	0.048485	15,523	3.00	46,570	466	5,880	52,915
		46	BO	1.7	1.0	2.7	0.50	58,806	0.048485	2,851	3.00	8,554	86	1,080	9,719
		47	BO	25.9	2.8	28.7	0.50	625,086	0.048485	30,307	3.00	90,922	909	11,480	103,311
		48	BO	34.7	2.9	37.6	0.50	818,928	0.048485	39,706	3.00	119,117	1,191	15,040	135,348
		49	BO	60.4	5.5	65.9	0.50	1,435,302	0.048485	69,591	3.00	208,772	2,088	26,360	237,220
	Total			986.0	96.5	1082.5		23,576,850		**1,143,124**					**3,896,664**
	TOTAL			1042.3	110.6	1152.9				**1,223,379**					**4,167,999**
GBC GLOBAL INVESTMENTS	GC	14	1	8.4	3.4	11.8	0.30	154,202	0.087236	13,452	3.00	40,356	404	4,720	45,480
		4	BO	19.9	2.8	22.7	0.30	296,644	0.087236	25,878	3.00	77,634	776	9,080	87,490
	Total			28.3	6.2	34.5		450,846		**39,330**					**132,970**
	GO	13	BO	10.0	3.3	13.3	0.45	260,707	0.058157	15,162	3.00	45,486	455	5,320	51,261
	Total			10.0	3.3	13.3		260,707		**15,162**					**51,261**
	BPI	11	1	50.2	2.1	52.3	0.50	1,139,094	0.048485	55,229	3.00	165,687	1,657	20,920	188,264
		1A	BO	16.4	0.0	16.4	0.40	285,754	0.058157	16,619	3.00	49,856	499	6,560	56,914
		1B	BO	6.6	0.0	6.6	0.50	143,748	0.048485	6,970	3.00	20,909	209	2,640	23,758
		2A	BO	8.9	0.3	9.2	0.40	160,301	0.058157	9,323	3.00	27,968	280	3,680	31,928
		2B	BO	1.3	0.1	1.4	0.50	30,492	0.048485	1,478	3.00	4,435	44	560	5,040
		3A	BO	12.3	0.3	12.6	0.40	219,542	0.058157	12,768	3.00	38,304	383	5,040	43,727
		3B	BO	7.3	0.7	8.0	0.50	174,240	0.048485	8,448	3.00	25,344	253	3,200	28,798
		10	BO	25.6	0.8	26.4	0.50	574,992	0.048485	27,878	3.00	83,635	836	10,560	95,032
		12	BO	5.7	1.8	7.5	0.50	163,350	0.048485	7,920	3.00	23,760	238	3,000	26,998
	Total			134.3	6.1	140.4		2,891,513		**146,633**					**500,457**
	TOTAL			172.6	15.6	188.2				**201,125**					**684,687**
DELTA PROPERTIES	GC	5	1	17.0	2.4	19.4	0.30	253,519	0.087236	**22,116**	3.00	66,348	663	7,760	74,771
	Total			17.0	2.4	19.4		253,519		**22,116**					**74,771**
	GO	15	BO	7.6	2.5	10.1	0.45	197,980	0.058157	11,514	3.00	34,542	345	4,040	38,927
	Total			7.6	2.5	10.1		197,980		**11,514**					**38,927**
	BPI	6A	1	11.2	0.0	11.2	0.40	195,149	0.058157	11,349	3.00	34,048	340	4,480	38,868
		6B	1	13.4	1.3	14.7	0.50	320,166	0.048485	15,523	3.00	46,570	466	5,880	52,915
		7A	BO	4.9	0.0	4.9	0.40	85,378	0.058157	4,965	3.00	14,896	149	1,960	17,005
		7B	BO	6.1	0.0	6.1	0.50	132,858	0.048485	6,442	3.00	19,325	193	2,440	21,958
		16	BO	10.2	2.0	12.2	0.50	265,716	0.048485	12,883	3.00	38,650	386	4,880	43,916
		17	BO	16.9	3.9	20.8	0.50	453,024	0.048485	21,965	3.00	65,895	659	8,320	74,874
		18	BO	9.9	1.4	11.3	0.50	246,114	0.048485	11,933	3.00	35,799	358	4,520	40,676
	Total			72.6	8.6	81.2		1,698,404		**85,060**					**290,213**
	TOTAL			97.2	13.5	110.7				**118,690**					**403,912**
TWL INVESTORS LLC	BPI	8A	BO	24.8	0.0	24.8	0.40	432,115	0.058157	25,131	3.00	75,392	754	9,920	86,065
		8B	1	73.8	4.9	78.7	0.50	1,714,086	0.048485	83,107	3.00	249,322	2,493	31,480	283,296
	TOTAL			98.6	4.9	103.5				**108,238**					**369,361**
LOPEZ / ADAMS / GILLON	GO	9	BO	51.9	4.3	56.2	0.45	1,101,632	0.058157	64,068	3.00	192,203	1,922	22,480	216,605
	TOTAL			51.9	4.3	56.2				**64,068**					**216,605**
	GRAND TOTAL			1462.6	148.9	1611.5				**1,715,500**					**5,842,564**