CITY OF TRACY

Urban Water Management Plan

December 2005

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LIST OF ABBREVIATIONS AND ACRONYMS

AB 3030	Groundwater Management Act, Assembly Bill 3030
ac-ft	acre-feet
Act	Urban Water Management Planning Act
ADWF	Average Dry Weather Flow
ASR	Aquifer Storage and Recovery
BBID	Byron-Bethany Irrigation District
BCID	Banta-Carbona Irrigation District
BEC	Bookman-Edmonston
BMO	Basin Management Objectives
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
DAF	Dissolved air flotation
DEIR	Draft Environmental Impact Report
DGWTP	Nick C. DeGroot Water Treatment Plant
DHS	State of California Department of Health Services
DMC	Delta-Mendota Canal
DPWD	Del Puerto Water District
DWR	State of California Department of Water Resources
EC	specific conductance, measured by electrical conductivity
EIR	Environmental Impact Report
EKI	Erler & Kalinowski, Inc.
ft bgs	feet below ground surface
ft msl	feet above Mean Sea Level
FY	Fiscal year
GMO	Growth Management Ordinance
GMP	Groundwater Management Plan
GPM	Gallons per minute
GPS	Global Positioning System
ISP	Industrial Specific Plan
JJWTP	John Jones Water Treatment Plant
M&I	municipal and industrial
MCL	maximum contaminant level
MG	million gallons
mg/L	milligrams per liter
MGD	million gallons per day

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LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas & Electric
PROSIM	Project Simulation Model
PUD	Planned Unit Developments
PVWD	Plain View Water District
PWD	Patterson Water District
RGA	Residential Growth Allotment
RMF	Residential multifamily
RRA	Reclamation Reform Act of 1982
RSF	Residential single family
SB	Senate Bill
SCSWSP	South County Surface Water Supply Project
SEMS	Standardized Emergency Management System
SJCFCID	San Joaquin County Flood Control and Irrigation District
SLDMWA	San Luis & Delta-Mendota Water Authority
SOI	Sphere of Influence
SSJID	South San Joaquin Irrigation District
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
THM	trihalomethanes
TMC	City of Tracy Municipal Code
Tracy	City of Tracy
UAW	Unaccounted-for water
ULFT	Ultra-Low-Flush Toilets
USBR	United States Bureau of Reclamation
UWMP Act	Urban Water Management Planning Act
UWMP	Urban Water Management Plan
WCC	Water Conservation Coordinator
WCRP	Water Conservation and Rationing Plan
WEP	Water Exchange Program
West SID	West Stanislaus Irrigation District
WSCP	Water Shortage Contingency Plan
WSERP	Water System Emergency Response Plan
WSID	West Side Irrigation District
WUDS	Water Usage Data System
WWTP	Wastewater Treatment Plant

1. INTRODUCTION

In 1983, California enacted the Urban Water Management Planning Act ("UWMP Act") (Water Code Sections 10610 - 10656). The UWMP Act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should ensure water service reliability to meet the needs of its customers during normal, dry, and multiple-dry years. The UWMP Act requires urban water suppliers to update their Urban Water Management Plan ("UWMP") for submittal to the Department of Water Resources ("DWR") every five years. In accordance with the UWMP Act, Erler & Kalinowski, Inc ("EKI") has, on behalf of the City of Tracy ("City" or "Tracy"), prepared this 2005 update to the Tracy Urban Water Management Plan.

Tracy's 2005 UWMP describes how the City intends to manage its current and future water resources and demands to continue to provide its customers with an adequate and reliable water supply. This updated UWMP reflects changes to the City's water supply portfolio and water demands, as well as the following significant revisions that have been made to the UWMP Act since 2000. The most recent version of the UWMP Act is included for reference as Appendix A.

- Pursuant to Senate Bill 610 ("SB 610"), Costa, 2001:
  - If groundwater is identified as a source of available water, the UWMP must include (1) a copy of a groundwater management plan, if available, (2) a description of the groundwater basin, including any adjudication information, and (3) a description and analysis of the amount and location of groundwater pumped for the past five years, along with an evaluation of projected pumping.
  - The UWMP must describe all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use identified.
- Pursuant to AB 901, Daucher, 2001: The UWMP must include information, to the extent practicable, relating to the quality of existing sources of available water over given time periods and describing the manner in which water quality affects water management strategies and supply reliability.
- Pursuant to SB 672, Machado, 2001: The UWMP must describe water management tools and options used by the urban water supplier that will maximize identified resources and minimize the need to import water from other regions.
- Pursuant to SB 1518, Torlakson, 2002: The UWMP must describe the actual use of recycled water in comparison with previously-projected usage rates. Additionally, an UWMP must describe discharged quantities of treated wastewater meeting recycled water standards that would otherwise be available for use in a recycled water project.
- Pursuant to SB 318, Alpert, 2004: The UWMP must describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Tracy has prepared this UWMP in accordance with the format suggested in the DWR's *Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan*, dated 18 January 2005. In each of the following sections, this document repeats the relevant paragraph of the UWMP Act, followed by information pertinent to current and projected conditions for the City of Tracy. Supporting documentation is provided in Appendices A through N. Other sources for the information contained herein are provided in the References section of this document.

1.1 AGENCY COORDINATION

10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

Tracy derives most of its water supply from multiple surface water sources through contracts with the federal government, and surrounding irrigation and water districts. The remainder of Tracy's water supply comes from groundwater extracted from the local Tracy Groundwater Basin, management of which is coordinated by multiple overlying and appropriative groundwater users.

Tracy coordinates water supply and management efforts with the following agencies, grouped according to common water supply source:

- *Delta Mendota Canal /Central Valley Project ("DMC/CVP") Water*
  - U.S. Bureau of Reclamation ("USBR") - San Luis & Delta-Mendota Water Authority ("SLDMWA")
  - Banta-Carbona Irrigation District ("BCID")
  - West Side Irrigation District ("WSID")
  - Byron-Bethany Irrigation District ("BBID")
- *South County Surface Water Supply Project ("SCSWSP")*
  - South San Joaquin Irrigation District ("SSJID")
  - City of Manteca
  - City of Lathrop
  - City of Escalon
- *Tracy Basin Assembly Bill 3030 ("AB 3030") Regional Groundwater Management Plan*
  - Plain View Water District ("PVWD"), which is now part of BBID;
  - BCID
  - Del Puerto Water District ("DPWD")
  - Patterson Water District ("PWD")
  - WSID
  - West Stanislaus Irrigation District ("West SID")
  - San Luis & Delta-Mendota Water Authority
  - San Joaquin County Flood Control and Irrigation District ("SJCFCID")

Tracy entered into a 40-year Municipal and Industrial ("M&I") contract with the USBR (Contract No. 14-06-200-7858A, or the "Tracy Contract") in 1974 for an annual entitlement of 10,000 acre-feet ("ac-ft") of surface water from the Central Valley Project ("CVP") via the Delta-Mendota Canal ("DMC") (conjunctively referred to as the "DMC/CVP") (Kennedy/Jenks, 1994; Pacific Municipal Consultants, 2000; City of Tracy, 2005 Draft General Plan). Tracy is working to renew the Tracy Contract with the USBR prior to the Tracy Contract's 2014 expiration date.

On February 27, 2004, Tracy, the USBR, and the Banta-Carbona Irrigation District entered into an agreement for an assignment of 5,000 ac-ft of Agricultural reliability ("Ag-reliability") water from the BCID to Tracy (Contract No. 14-06-200-4305A or "BCID Contract").[1] Also on February 27, 2004, Tracy, the USBR, and the West Side Irrigation District entered into an agreement for an assignment of 2,500 acre-feet of Ag-reliability water from the WSID to Tracy (Contract No. 7-07-20-W0045-B "WSID Contract').[2] Tracy also has the option to exercise the right to a future assignment of an additional 2,500 acre-feet of Ag-reliability water now under WSID's existing contract with USBR. These contracts have a 40-year term and will expire in 2044. As part of the Tracy Contract renegotiations, the USBR is considering combining its three separate contracts with Tracy into a single contract with a likely term of 40 years.

Tracy is also involved in a collaborative effort with the Cities of Manteca, Escalon, and Lathrop and with the SSJID for the development and operation of the South County Surface Water Supply Project. As part of the SCSWSP, Tracy has been allocated 10,000 ac-ft per year of Stanislaus River water and 15 million gallons per day ("MGD") of treatment capacity in the SCSWSP Water Treatment Plant. The construction of the SCSWSP Water Treatment Plant and transmission pipeline and Tracy's new 21 MGD Linne Road Booster Station and 7.2 million gallons ("MG") capacity Linne Road Reservoir was completed in May 2005. Tracy began receiving deliveries of Stanislaus River water in August 2005. Tracy's ongoing coordination efforts with the entities involved in the SCSWSP will include sharing the costs of operating and maintaining the associated water treatment plant and distribution system.

Tracy also coordinates with several other agencies in the DMC/CVP Service Area (i.e., Byron-Bethany Irrigation District, Banta-Carbona Irrigation District, Del Puerto Water District, Patterson Water District, West Side Irrigation District, West Stanislaus Irrigation District, San Luis & Delta-Mendota Water Authority, and the San Joaquin County Flood Control and Irrigation District) in the management of the Tracy Groundwater Basin ("Basin"). These Basin stakeholders collectively developed a Regional Ground Water Management Plan ("Regional GMP") for the Basin pursuant to the 1992 Groundwater Management Act, AB 3030.[3] The stated objective of the GMP is to manage the Basin such that sustained use of groundwater can be optimized without adverse impacts to water quality and yield. Tracy adopted the Regional GMP via Ordinance No.

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[1] http://www.usbr.gov/mp/cvpia/3404c/lt_contracts/2004-05_foc/2004foc_banta_carbona_id_09-24-04.pdf

[2] http://www.usbr.gov/mp/cvpia/3404c/env_docs/final_ea_fonsi/dmc/dmc_ea_chap03-01_feb2005.pdf

[3] Provisions to AB 3030 have been added since its original passage in 1992. For example, the Machado Amendment (SB 1938) added specific requirements regarding what must be included in a GMP for an entity to be eligible for state funds administered by the Department of Water Resources for the construction of groundwater projects or groundwater quality projects.

511 on 21 May 1996. The Regional GMP is scheduled to be updated in 2006 to bring it into compliance with SB 1938.

A summary of the UWMP coordination process between Tracy and relevant agencies is provided in Table 1 and the notification process is described in Section 1.2.1. A sample of the agency notification letters described herein and the list of agencies that received notification are provided in Appendix B.

1.2 NOTIFICATION OF UWMP PREPARATION

Tracy began preparation of this updated UWMP in July 2005 and has encouraged stakeholder interaction throughout the process. A description of the notifications that Tracy has sent to the public and to the agencies that the City coordinates with is provided below. The UWMP was completed and adopted by City Council Resolution No. 2005-305 on 6 December 2005.

1.2.1 Agency Notification

Prior to preparing its updated UWMP, on 22 August 2005, the City sent a letter to agencies identified in Appendix B to inform them that the City was in the process of updating its UWMP and was soliciting their input.

Two weeks prior to publishing the draft 2005 UWMP for public review, on 21 October 2005, the City sent a letter to each of the above-mentioned agencies informing them when and where the document would be available for review and welcoming their input and comments on the document. The draft 2005 UWMP was available for public review at the Tracy Public Library, the Tracy Public Works Department, and the City Clerk's Office for 20 business days (i.e., between 8 November 2005 and 6 December 2005).

Three weeks prior to holding a public hearing on the 2005 UWMP, on 15 November 2005, the City sent a letter to the agencies it is coordinating with informing them that the public hearing would be held at City Hall on 6 December 2005 and welcoming their input and comments on the draft 2005 UWMP.

Copies of the UWMP were delivered to all entities that requested a copy.

1.2.2 Public Notification

Consistent with Government Code 6066,[4] Tracy notified the public and solicited the public's input throughout the 2005 UWMP preparation process. A sample version of each of the public notifications described below is provided in Appendix B.

[4] Government Code Section 6066. Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

During the preparation of its UWMP, on 26 August 2005 and 2 September 2005, the City published a notice in the Tracy Press informing the public that the City was in the process of updating its UWMP and soliciting their input during the update process.

Prior to publishing a draft 2005 UWMP for public review, on 25 October 2005 and 8 November 2005, Tracy published a notice in the Tracy Press informing the public that the 2005 UWMP would be available for public review at the Tracy Public Library, the Tracy Public Works Department, and the City Clerk's Office. The document was available for public review for 20 business days (between 8 November 2005 and 6 December 2005).

Two weeks prior to holding a public hearing on the 2005 UWMP, on 18 November and 25 November, 2005, Tracy published a notice in the Tracy Press informing the public that the 2005 UWMP public hearing would be held at Tracy Community Center on 6 December 2005 at 6:00 PM.

1.3 WATER MANAGEMENT TOOLS

10620 (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

As described above and in Section 4, Tracy conjunctively uses its surface water and groundwater resources to meet its water demands and to increase the redundancy and reliability of its water supply. Tracy has been proactive in securing surface water rights, while relying on groundwater for peaking during the summer and for supplemental drought supplies. Tracy is currently pursuing increased management of its groundwater supplies through development of a pilot Aquifer Storage and Recovery ("ASR") program and a Groundwater Management Plan specific to the City's needs.

Additionally, Tracy is currently investigating options to purchase water storage space in the Semitropic Water Bank; this would increase the City's water supply reliability during drought conditions. Tracy is also developing agreements with the Byron-Bethany Irrigation District for acquisition of (1) the right to delivery of 4,500 ac-ft per year of water to which BBID is entitled based upon its pre-1914 appropriative water rights, and (2) the option to acquire BBID CVP contract rights to approximately 11,000 ac-ft per year of Ag-reliability DMC/CVP water.

Tracy is managing its water resources with the goal of mitigating the need to import water through water conservation efforts and planned use of recycled water to offset potable water demand for irrigation purposes within the City. Additional information related to these water management efforts is provided in Sections 7 and 8.

2. SERVICE AREA INFORMATION

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
(a) Describe the service area of the supplier; including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

Tracy is located in San Joaquin County, 68 miles south of Sacramento and 60 miles east of San Francisco (Figure 1). The City lies east of the Coastal Range that separates California's Central Valley from the San Francisco Bay Area. Interstate 205 runs through the northern-most part of the City and connects I-580 to I-5, a major north-south interstate corridor east of Tracy.

Included below is information provided in the Draft version of Tracy's 2005 General Plan related to the City's development, population, and demographic projections.[5] In addition, this section describes local climate and geography.

2.1 CITY LIMITS AND SPHERE OF INFLUENCE INFORMATION

The existing incorporated area of the City encompasses approximately 22 square miles (Draft General Plan, 2005). The Sphere of Influence ("SOI") is the area outside of the City limits that Tracy expects to annex and urbanize in the future, including the expected physical limit of the City based on the most current available information (Figure 2) (Draft General Plan, 2005). During the Tracy General Plan update process, revisions to the SOI were made to more accurately reflect locations where Tracy may grow in the future and locations where no urban growth is expected.[6] The revised SOI is approximately 51 square miles, or 29 square miles larger than the current City limits.

2.2 SPECIFIC PLANS AND LARGE PLANNED UNIT DEVELOPMENTS

Tracy's proximity to the San Francisco Bay Area and Silicon Valley has made it an attractive place for home buyers who want to live in a place with "small town" atmosphere and affordable housing, while maintaining access to the fast-growing Bay Area economy. Numerous Specific Plans and large-scale Planned Unit Developments ("PUDs") have been adopted within the Tracy City limits and SOI to accommodate growth demands. Descriptions of each plan or development and its geographic area and adopted uses are outlined below. The location of each plan area is shown in Figure 3.

[5] Tracy's Draft General Plan is currently in the public review and comment period and is scheduled for adoption in Spring 2006.
[6] The revised 2005 SOI is approximately two square miles larger than the previous SOI.

- *Tracy Residential Areas Specific Plan*. Created in 1987, the Plan guides the development of 1,480 acres within the City limits. The land is grouped into three planning areas or neighborhoods, two on the southern side of the City and one in the northwest. These areas are largely built out.
- *Plan C*. Formed in 1998, Plan C represents an infrastructure financing area comprised of approximately 1,417 acres located in the west, south and southeast portions of the City. Plan C is comprised of several separate PUDs that are designed to guide the development of single-family homes with accompanying parks and schools. Plan C is largely built out; however, there are several vacant parcels zoned for multifamily housing and commercial development.
- *I-205 Corridor Specific Plan*. The I-205 Corridor Specific Plan includes approximately 714 acres of land on the northwest and northeast sides of Tracy, adjacent to I-205. The Specific Plan includes development of shopping centers, auto plazas, and light industrial uses. The Plan also includes approximately 200 acres of residential development, including 216 high-density units and 733 medium and low-density units. Build-out of the I-205 Corridor Specific Plan is near completion.
- *Northeast Industrial PUD*. Anticipated land uses on the 870-acre PUD in the northeast corner of the City include a mixture of manufacturing, warehousing, and distribution uses including rail-dependent industries and "flex-tech" light industrial.
- *Industrial Areas Specific Plan ("ISP")*. The ISP covers approximately 685 acres of land, mostly in the northeast quadrant of the South Tracy Boulevard-Linne Road intersection and the northeast quadrant of the MacArthur Drive-Eleventh Street intersection. This ISP area is designated for general, light industrial, office, and "flex-tech" uses. The Edgewood Corporate Center and South Tracy Business Park, which cater to small- to medium-sized companies, have already been developed in the ISP area.
- *South Schulte Specific Plan*. Approved in 1998, the South Schulte Specific Plan covers 1,844 acres located outside of the City limit on the southwest side of the City, northwest of the Airport. Approximately 1,090 acres of the South Schulte Specific Plan area is designated for residential uses and will accommodate a maximum of 5,700 dwelling units. An area of approximately 423 acres is zoned for industrial and commercial uses, 173 acres is designated for schools, parks and public facilities, and the remaining 157 acres is allocated for roads. Tracy is currently evaluating revisions to the South Schulte Specific Plan.
- *Tracy Gateway PUD*. The 538-acre Tracy Gateway project is located at the western edge of the incorporated City boundary, south of I-205 at the Eleventh Street off-ramp. The proposed development consists of 5.8 million square feet of office, commercial, and retail uses that support the Tracy community and an anticipated 20,000-person business population. The proposed project also includes a multi-story hotel and a golf course.
- *Tracy Hills Specific Plan*. The Tracy Hills Specific Plan area, located on the southwest side of the City, includes 6,175 acres. Of the 2,700 acres within the City limits, proposed land uses include approximately 1,300 acres at a mixture of densities with a maximum of 5,499 residential units. Approximately 600 acres with up to six million square feet of space

are planned for commercial, office and industrial uses. Roughly half of the remaining 800 acres of the Specific Plan area within the City limits is designated to accommodate neighborhood parks, schools, recreational uses and other open space, while the other half is devoted to roads and canals. The remainder of the Specific Plan area (approximately 3,550 acres), located outside the City limits and within the SOI, is planned to remain permanent open space for habitat conservation and managed grazing.

- *Cordes Ranch*. The Cordes Ranch Project is currently in the permit application process. The Cordes Ranch Project proposes to develop approximately 1,700 acres located west of the current City limits and adjacent to the Patterson Pass Business Park area as an industrial park with ancillary commercial uses and highway-oriented commercial uses at key intersections, as well as flexible office and industrial space along I-205.

2.3 POPULATION

Approximately 80,000 people currently live in Tracy. Population growth has been rapid in Tracy, with the City growing by 142% between 1988 and 2003, a compounded rate of 6% per year. The State Department of Finance population estimate for Tracy as of January 1, 2005 was 78,310 (DEP, 2005). It is estimated that this figure will increase to 80,500 by January 2006.[7]

Tracy's future population growth, at least in the near-term, is not anticipated to be as rapid as it has been historically. Tracy adopted a residential Growth Management Ordinance ("GMO") in 1987, which was amended in 2000 by the voter-initiated Measure A. The objective of the GMO and Measure A is 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 limits the number of RGAs and building permits to an average of 600 housing units per year for market rate housing, with a maximum of 750 units in any single year, although there are exceptions for affordable housing (Draft General Plan, 2005). While properties with vested development rights are allowed to continue to develop under the prior limits, these permits must be counted toward the new 600 per year average. As such, it is projected that there could be years where relatively few single family home permits can be obtained in order to reduce the total issued since January 1, 2000 to the 600 per year average.[8] The City's anticipated schedule for issuing residential permits is shown in Table 2.

The GMO Guidelines were adopted by resolution of the City Council (City Ordinances 10.12.140 and 10.12.200). Through implementation of this General Plan and the GMO,[9] Tracy's population

[7] City of Tracy Adopted Program Budget, Fiscal Year 2005-2006 (City of Tracy, 2005b)
[8] http://www.ci.tracy.ca.us/departments/finance/budget/
[9] From the 2005 Tracy General Plan: Implementation of the GMO is intended to meet the goals and policies of the General Plan, including concentrated growth, infill development, and affordable housing as high priorities. The GMO Guidelines include a map that establishes an "RGA Eligibility Area" showing the area where property owners are

is expected to increase at a compounded rate of less than 1% per year until 2013 and at a rate of 2% per year from 2013 to 2030. Table 3 lists Tracy's projected population in five-year increments to the year 2025. Tracy's population is expected to grow by approximately 30,700 between 2005 and 2025. When this population growth is added to the 2005 population of 78,300 (as reported by the State Finance Department and DEP, 2005), Tracy is projected to have a total future population of approximately 109,000 people by the year 2025 (Draft General Plan, 2005).

2.4 DEMOGRAPHICS

Except as noted, the following demographic information was taken from the Tracy website and the 2000 Census data:[10]

- The average household size in Tracy is 3.21 persons;
- Median age of residents is 31;
- Average annual household income is $63,000;
- Greater than 50% of the population commutes for longer than 41 minutes to work, and more than 64% of Tracy residents commute to the Bay Area;[11]
- Job to housing ratio is approximately 1:3; and
- 72% of housing units are owner-occupied and 28% are renter-occupied.

2.5 GEOGRAPHY

Tracy, which lies along the western border of the San Joaquin Valley, has annexed a portion of the neighboring foothills (see Figure 1). Ground surface elevations in Tracy range from 600 feet above mean sea level ("ft msl") in the foothills along the southwestern boundary of the current Tracy SOI to 9 ft msl at the northern boundary (Kennedy/Jenks, 1994). Tracy lies adjacent to the State Water Project's California Aqueduct, the DMC/CVP, and the Old River. The Old River flows east to west just north of Tracy.

2.6 CLIMATE

Spring, summer, and fall are generally hot in Tracy, with temperatures often climbing to over 100° Fahrenheit ("F") on summer days. Tracy's winters are usually mild, although the dense "Tule fog" can last for weeks. Mean winter temperatures range from 40°F to 50°F, with an average of 16 days per year having frost. Most precipitation occurs during winter. The average annual

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eligible to apply for RGAs. The Guidelines also include specific qualitative and quantitative criteria for the allocation of RGAs with said criteria periodically updated as provided by the resolution

[10] http://www.ci.tracy.ca.us/about/demographics/ and http://censtats.census.gov/data/CA/1600680238.pdf

[11] Approximately 42% commute to Alameda County, 21% commute to Santa Clara County, 5.1% commute to San Francisco, and 5.6% commute to the San Francisco Peninsula (http://www.ci.tracy.ca.us/departments/economic_development/docs/state_of_the_city.pdf).

precipitation during the years 1949 to 2005 is recorded by the Western Regional Climate Center as 9.94 inches.[12]

2.7 WATER UTILITY SERVICE AREA AND INFRASTRUCTURE

Tracy serves water within a 44 square-mile area that includes the City limits and portions of the SOI. The extent of the SOI and the current potable water system infrastructure are shown on Figure 2 and Figure 4, respectively. Details of the potable water supply system are provided below.

2.7.1 Service Connections

Tracy provides water service to all of its residents within the City limits, plus approximately 400 residents of the Larch-Clover County Services District as well as the unincorporated Patterson Business Park. Tracy currently serves 22,740 metered service connections. These connections are distributed by customer sector as follows: 21,060 single-family residential, 739 multi-family residential, 494 commercial, 33 industrial, 111 institutional, and 303 landscape irrigation accounts. On an annual average basis, residential uses account for 69% of total water demand, while the remaining 31% is divided between commercial, industrial, and governmental uses and water system losses.

2.7.2 Pressure Zones

Due to the several hundred foot difference in elevation throughout its service area, Tracy has established three pressure zones for its treated water distribution system. Figure 4 shows the area encompassed by the three existing pressure zones (Zones 1, 2, and 3), as well as the water distribution infrastructure and groundwater well locations. To support the development proposed in the foothills, two additional pressure zones (Zones 4 and 5) have been proposed for future use.

The three existing pressure zones include over 390 miles of water mains that vary in diameter up to 36 inches. The age of the pipes also varies, dating from about 1910 to the present. The three existing pressure zones are interconnected by pressure reducing valves, pressure sustaining valves, and a number of normally-closed interconnection valves (Kennedy/Jenks, 1994). Several booster pump stations regulate the pressure differences between the three existing zones and, along with the pressure control valves, regulate flow between zones (Kennedy/Jenks, 1994).

Zone 1, the most developed of the three existing zones, is supplied water from a 36-inch transmission main that extends north from the John Jones Water Treatment Plant ("JJWTP") along Tracy Boulevard, and from Zone 2 via five pressure sustaining valves. Zone 2, comprised of residential and light industrial water users, is supplied from the Zone 2 Booster Pump Station located at the JJWTP and from the Linne Road Booster Pump Station located near the intersection of Linne Road and MacArthur Drive.

[12] http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?catrpp+nca

The Safeway and Patterson Pass Business Park developments in Zone 3 are supplied water from the Safeway Booster Pump Station located on Schulte Road east of Patterson Pass Road. The elevations and pressures within each of the three existing and two future pressure zones are summarized in Table 4.

2.7.3 Storage facilities

Tracy has five storage reservoirs. Three of these reservoirs are located adjacent to the JJWTP, with a total storage capacity of approximately six MG. Additional storage is provided by the Northeast Industrial reservoir, with a capacity of 2.2 MG. The fifth storage reservoir is the new 7.2 MG capacity reservoir located on Linne Road that was completed in May 2005.

2.7.4 Water Treatment Facilities

As described in Section 4, Tracy's surface water supplies are treated at the JJWTP and at the SSJID Water Treatment Plant. Groundwater is either treated at the wellhead or at the JJWTP.

2.7.5 SCSWSP Line

SCSWSP is a partnership between the cities of Tracy, Manteca, Lathrop, and Escalon and the SSJID which has developed a surface water treatment plant and pipeline system delivering water from the Stanislaus River to each participating agency. The alignment of the SCSWSP line and its connection into the Tracy water supply system are shown on Figures 4 and 5.

3. WATER DEMAND

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

Water demand is dependent on climate, population, industry, and the types of development present in a community. Sections 3.1 and 3.2 describe Tracy's historical and projected water demands for residential, commercial, industrial, institutional, and landscape irrigation purposes within the City. This discussion does not include demands for the water use sectors G through I described above. A discussion of these water use sectors is provided in Section 3.3.

3.1 CURRENT AND HISTORIC WATER DEMAND

Tracy's current and historic total water demands include the water consumed by metered accounts in the City ("metered water consumption") and the water that is lost or unaccounted for within the system ("unaccounted-for water" or "UAW"). Currently there are limited non-potable water demands within the City.

The City's Water Resource Coordinator maintains records of Tracy's historic water demand. Three major trends in Tracy's water use have been observed:

- *Seasonal fluctuations in demand*: Tracy typically experiences dry summers and wet winters. Tracy's water use has correspondingly been highest June, July, and August, and lowest in December, January, and February. This seasonal trend in water use for the years 1990 through 2005 is shown in Table 5.
- *Annual fluctuations in demand*: Since California's precipitation patterns vary from one year to the next, Tracy's water demand fluctuates annually based on local rainfall. In hotter, drier years, irrigation and cooling needs can increase the City's potable water demand above what is needed during cooler or wetter years.
- *Increase in total demand*: As described in Section 2, Tracy is predominately a residential community, but has been focusing on expanding its commercial and industrial sectors.

Like many other California cities, Tracy has experienced a rise in water use in recent years that coincides with the growth of its population.

The following sections provide additional detail regarding Tracy's water demands for the five-year period 2000 through 2005. [13]

3.1.1 Water Use Sectors

To more fully understand patterns of water use within Tracy, the metered accounts were divided into the water use sectors described below. Trends in water use within each customer sector were tracked using data from the City's Inspironix Water Usage Data System ("WUDS").

- The *Residential Single Family ("RSF")* and *Residential Multi-Family ("RMF")* sectors include all residences within the City's SOI.
- The *Commercial* sector includes food-related businesses, such as bakeries and restaurants, and non-food related businesses such as laundromats and car washes.
- The *Industrial* sector includes hotels, mortuaries, dry cleaners, and larger businesses such as Leprino Foods.
- The *Institutional* sector primarily includes government-related services, such as the police and fire departments and City Hall, as well as religious and educational buildings.
- The *Irrigation* sector includes all dedicated irrigation meters at City parks and schoolyards.

3.1.2 Water Demand Patterns

The residential sectors (*RSF* and *RMF*) account for most of the City's potable water demand (Table 6). The *RSF* sector accounted for an average of 61% of the City's total water demand from 2000 through 2005 and the *RMF* sector accounted for 8% of the City's total water demand over the same period. Accounts with dedicated irrigation meters, the *Irrigation* sector, accounted for nearly 10% of the City's water demand, while the *Commercial* and *Industrial* sectors accounted for 7.4% and 5% respectively. *Institutional* users accounted for only 1.3% of the total water demand within the City. The remaining demand is a result of UAW (described below). According to the WUDS water consumption data for the period 2000 through 2005, the relative percentage of the total water demand represented by each sector has not changed significantly.

Although the relative proportion of water consumed by each water use sector has remained nearly constant during this period (2000 through 2005), Tracy's annual water demand increased by 28% (i.e., from 13,300 ac-ft in 2000 to a normalized total annual water use of 17,045 ac-ft in 2005,[14] Table 6). This increase in water demand results from Tracy's population growth as described in Section 2, as well as growth in the City's CII sector. Although restrictions have been adopted to

[13] Water demands for January 2000 through August 2005 are actual water use, while September through December 2005 are estimated based on the average percent of total water use for each sector from 2000 through 2004.

[14] Actual water consumption for 2005 may differ from the quantity estimated herein. Total water use for 2005 is estimated from actual water use January through August 2005, and average historic water use in September through December during the years 2000 through 2004.

control Tracy's residential growth and encourage infill development (i.e., Measure A), the City still anticipates significant future growth, both in population and in the CII sector with a corresponding increase in the quantity of water needed to serve these additional demands. Future water demand projections for the years 2010 to 2025 are described below, in Section 3.2.

3.1.3 Unaccounted-for Water

Tracy's total water demand is equivalent to the metered water consumption plus water that is lost, or unaccounted for, within the system. The UAW includes water used for fire hydrant flushing and testing, for water main flushing, and for construction water. This volume of UAW is estimated by comparing metered water use (i.e., consumption) against total water purchases and groundwater production. As summarized in Table 6, the average UAW since 2001 within the Tracy system has been 7.5%. Typically, water suppliers try to maintain UAW at less than 10% of total demand. If UAW is greater than 10% of total demand, water suppliers typically perform a system-wide water audit to find and repair major leaks. The City did conduct a system-wide water audit as described in Section 7.1.3.

3.2 PROJECTED WATER DEMAND

As discussed in Section 2, it is estimated that Tracy's population will reach approximately 109,000 people by 2025. Numerous developments have been proposed within the City's SOI to accommodate this growth and will require water to service the additional residential and CII developments. Prior to receiving the City's approval, to the extent required by SB 610 and SB 221 (referred to as the Kuehl-Costa amendments), each of these proposed developments is mandated to estimate its future water demands and to identify water supplies that may be used to meet its demands.[15] This water supply assessment process is intended to ensure that adequate water supplies exist to support proposed developments, and that these water supplies are sufficiently reliable.

The recent passage of Measure A has slowed the pace of development within Tracy, making it difficult to predict when specific development projects will come online, for economic and other reasons. For this reason, the following sections describe Tracy's projected water demand using two methods. Method 1 projects water demand estimated at full build-out, as described in the Draft General Plan, based on the assumed water demand for each proposed development and specific plan, (indicated in the City's August 2005 Water Inventory Report). Method 2 projects future water demands in five-year increments from 2005 to 2025 based on the 2005 General Plan Draft Environmental Impact Report ("DEIR") (DCE, 2005). This method incorporates Measure A residential building permit restrictions and anticipated CII and irrigation growth by 2025. Additional future water demands for recycled water are discussed in Section 8 of this UWMP.

[15] The Kuehl-Costa amendments mandate, among other things, that development projects with water demand greater than, or equivalent to 500-dwelling-units and residential subdivisions of more than 500-dwelling-units to identify existing water supply entitlements, water rights or water service contracts relevant to the water supply.

3.2.1 Projected Water Demand at Build-out

Table 7 presents the approved, anticipated, and proposed developments and specific plans in and around the City, as well as the anticipated water demand associated with each development at full build-out.[16] Future water demands for these developments are based on estimated demand factors (i.e., ac-ft of water per acre of development) for residential and commercial developments and the total acreage included by each proposed development and specific plan. This is the same methodology employed in Tracy's Water Inventory Report projections. Total potable water demand for these proposed developments and specific plans is estimated to be approximately 17,000 ac-ft at full build-out. If this 17,000 ac-ft of projected demand is added to Tracy's 2005 normalized water demand of 18,500 ac-ft (City of Tracy, 2005), [17] Tracy's total projected future water demand, at build-out, is greater than 35,000 ac-ft per year.

3.2.2 Projected Water Demand in 2025 by Customer Sector

Due to Measure A building permit restrictions and economic factors that control growth and are difficult to predict, the City does not have a timeline for when each of these developments or specific plans will be built and does not anticipate that all of the projects listed in Table 7 will reach build-out by 2025 (the planning horizon for this UWMP). In it's DEIR (DCE, 2005) however, the City evaluates projected potable water demand for 2025 based on the total number of acres that will be developed as high and low density residential and/or as CII by 2025, multiplied by their associated demand factors. This method does not identify which developments or specific plans may reach build-out by 2025.

The City's projected water demands were estimated based on the following general assumptions:

- Residential building permits will be issued in accordance with the stipulations of the City's GMO and Measure A RGAs, and all allocated building permits will be used. Specifically, it is estimated that 100 permits for market value homes will be issued each year between 2006 and 2012, 263 permits will be issued in 2013, and 600 plus permits will be issued each year between 2014 and 2025.[18] These estimates are consistent with the Measure A requirements for an average of 600 market value residential permits per year beginning in 2000 (see Section 2). Also in accordance with Measure A, an additional 1,200 permits for affordable homes are estimated to be issued by 2025 (DEIR). For the purposes of this UWMP, allocation of these permits are anticipated at a rate of 60 permits per year..

[16] Information on water demands for Tracy's current and future developments and specific plans is from the City's Water Inventory Report (August, 2005).

[17] The City estimated that total water demand for 2005 would be approximately 18,500 ac-ft in its 2 August Water Inventory Report. This estimate is projected based on water demand in early 2005 and historic water demand patterns and is considered a normalized total water demand. Because 2005 was a normal or wet year, Tracy's actual potable water demand may be less than 18,500 ac-ft.

[18] Market value residential building permit estimates through 2025 were provided by Tracy's Planning Department. Building permits for affordable homes are based on a total of 1,200 permits issued from 2005 to 2025, estimated by the DEIR, 2005.

- The allocation of residential building permits between single-family and multi-family dwellings are based on the allocation of *RSF* and *RMF* permits in the DEIR (DCE, 2005). The DEIR assumes that approximately 62% of the total residential building permits issued from 2005 to 2025 are allocated to *RSF* units and the remaining 38% are for *RMF* units.
- Residential water use demand factors are based on the estimated housing type (i.e., *RSF* or *RMF*) and density specified in the DEIR (DCE, 2005). Each new *RSF* unit is estimated to use a weighted average of approximately 0.75 ac-ft of water per year and each new *RMF* unit is estimated to use a weighted average of approximately 0.18 ac-ft of water per year;
- The *CII* sector is assumed to grow uniformly at a rate equivalent to an increased water demand of 119 ac-ft per year, consistent with assumptions used the DEIR (DCE, 2005).
- The Irrigation demand is estimated to increase at a rate equivalent to an increased water demand of 31 ac-ft per year, consistent with assumptions used the DEIR (DCE, 2005).
- The percentage of UAW will remain constant at 7.5% of the City's total potable water demand per year.[19]

Based on the assumptions listed above, *RSF* water use is projected to increase from 12,530 ac-ft per year in 2005 to approximately 17,400 ac-ft per year by 2025 (Table 8). *RMF* water use is projected to increase from 980 ac-ft per year in 2005 to 2,140 ac-ft per year by 2025 (Table 8).

The City's projected future water demand in the *CII* sector is based on anticipated future commercial, industrial, and institutional development described in the Draft General Plan. *CII* water use was estimated to grow at an average rate of 119 ac-ft of water demand per year (DCE, 2005). Actual *CII* growth may vary in any given year. Total *CII* water use is projected to increase from 2,095 ac-ft per year in 2005 to 4,480 ac-ft per year by 2025.

It is anticipated that dedicated irrigation water demand will increase at a rate of 31 ac-ft per year in future years. Based on this assumption, it is projected that future irrigation water demands will be approximately 2,060 ac-ft per year by 2025.

Based on application of the assumptions detailed above, it was estimated for the purposes of this UWMP that the City's water demand will increase by 9,028 ac-ft (i.e., from approximately 18,500 ac-ft per year in 2005 to approximately 28,200 ac-ft per year by 2025). The estimate of future total water demands developed in this UWMP is higher than the DEIR future water demand projections (DCE, 2005) because the UWMP projection includes approximately 2,100 ac-ft of UAW.

3.3 WATER USE SECTORS NOT INCLUDED IN THE DEMAND PROJECTIONS

This section addresses historical and projected water demands for the water use sectors described in Section 10631(e)(1) (G) through (I) and listed below:

[19] This assumption is considered valid because the City continues performs main replacements to replace aging infrastructure.

- Sales to other agencies.
- Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
- Agricultural.

Water demands for these sectors were not included in Tracy's water demand calculations for the reasons described below:

3.3.1 Sales to Other Agencies

Tracy does sell excess CVP supplies on an "as available basis" to other agencies, such as Westlands Water District, however, these sales are not appropriate to include in a water demand estimate for Tracy because (1) the sales only occur when Tracy has surplus water supplies and (2) Tracy has no obligation to sell the water.

3.3.2 Saline water intrusion barriers, groundwater recharge, and conjunctive use

Tracy does not use water for saline barriers and does not currently participate in active groundwater recharge activities. Though the City anticipates that its future groundwater management activities will include in lieu groundwater recharge and the potential development of an ASR program (see Section 4.2), the exact quantity of water demanded by such actions is unknown at this time, nor are such actions expected to increase Tracy's water demand. Tracy will continue to conjunctively manage its water resources (i.e., by using groundwater for peaking purposes during the summer months), but again, such conjunctive management activities are not expected to increase Tracy's water demand.

3.3.3 Agricultural

Tracy does not sell water to agricultural customers and does not expect to in the future.

4. WATER SUPPLY SOURCES

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). . .

The City obtains water from both surface water and groundwater sources. The amount of water that Tracy uses from each of its water supply sources to make up its total water demand varies from year to year based on contractual agreements, annual precipitation, and City policy about how to expand, utilize, and manage its water resources. As detailed in Table 9, Tracy's current maximum annual water supply amounts to over 33,500 ac-ft per year from its USBR contractual entitlements to DMC/CVP water, its groundwater sources, and its allocation of Stanislaus River water via the SCSWSP. Future agreements between Tracy and BBID may increase Tracy's total water supply entitlements to approximately 48,000 ac-ft annually. Potential ASR and out-of-basin water banking opportunities may increase Tracy's future water supply an additional 6,500 ac-ft annually, to be used during drought and emergency situations. Additional water is also potentially available to Tracy through purchase on the open market, either on a one-year basis or through multi-year contracts.

4.1 CURRENT WATER SUPPLY SOURCES – SURFACE WATER

Surface water has historically comprised between 50 to 60% of the City's total water supply. However, with the recent completion of the SCSWSP, Tracy intends to supplement some of its groundwater supply with high-quality surface water, thereby increasing the percentage of surface water use. The City's two wholesale surface water suppliers are the USBR (providing CVP water via the DMC) and the SSJID (providing Stanislaus River water). Information related to the contractual entitlement, reliability, and treatment processes for these surface water sources is provided below.

4.1.1 Central Valley Project Water via the Delta-Mendota Canal

Tracy's contractual entitlements to each portion of its current supply of DMC/CVP water are discussed below and summarized in Table 9. As discussed more fully in Section 5, the reliability of each of these supplies is anticipated to vary.

4.1.1.1 DMC/CVP Contractual Information

Tracy entered into a 40-year M&I contract with the USBR in 1974 for an annual entitlement of 10,000 ac-ft of surface water from the CVP via the Delta-Mendota Canal (City of Tracy, 2005a). In the CVP system, an M&I contractor is eligible for a minimum shortage allocation equal to 75% of adjusted historical use.[20] This minimum shortage allocation may be reduced when allocation of Ag-reliability water is reduced below 25% of contract entitlement (see the CVP M&I Water

[20] Allocation of M&I water will be based on a contractor's historical use of CVP M&I water, adjusted for growth, extraordinary water conservation measures, and non-CVP water. See Appendix C for further explaination.

Shortage Allocation Plan, Appendix C). Tracy's average deliveries of M&I-reliability water in the last five years have been 91% of the Tracy Contract entitlement (City of Tracy, 2005a). In 2005, Tracy is anticipated to receive 100% of its Tracy Contract entitlement.

In 2004, Tracy was assigned 5,000 acre-feet of Ag-reliability CVP contract entitlement from the BCID. Also in 2004, Tracy was assigned another 2,500 acre-feet of Ag-reliability CVP contract entitlement water from the WSID, with the option to purchase an additional 2,500 acre-feet of CVP contract entitlement from the WSID. Deliveries of Ag-reliability water can vary significantly, and during severe water shortage supply may be reduced as much as 100% (Appendix C). Average deliveries of Ag-reliability water during the last five years have been 66% of the contractual entitlement, somewhat higher than the long-term average deliveries of 58% of the contractual entitlement for Ag-reliability water. In 2005, Tracy will have received an estimated 85% of its current contractual entitlements to Ag-reliability water from the DMC/CVP, or 6,375 ac-ft.

Tracy also treats and serves DMC/CVP water purchased by others. In 2005, an estimated 380 ac-ft of water from the PVWD's (now BBID's) USBR allocation was treated at the JJWTP and delivered to the Patterson Pass Business Park through Tracy's water distribution system. A comparable quantity of BBID water is anticipated to be delivered annually to the Patterson Pass Business Park in the future.

4.1.1.2 DMC/CVP Treatment Process

Tracy's DMC/CVP water is treated at the John Jones Water Treatment Plant, located at the southern end of the City just east of the DMC and the California Aqueduct. Construction of the JJWTP was completed in 1979. In 1989, the JJWTP treatment capacity was expanded from 10 MGD to the current capacity of 15 MGD (Kennedy/Jenks, 1994). In anticipation of Tracy's future potable water demands, the JJWTP is currently being upgraded and expanded to 30 MGD.[21] The JJWTP upgrade is scheduled for completion in 2007. The increased capacity will allow the plant to process all of Tracy's surface water supplies, excluding the SCSWSP water, which is treated at the SCSWSP water treatment plant.

A schematic of the current JJWTP facility and treatment process is shown on Figure 6. The treatment process at the JJWTP includes chemical oxidation, temperature equilibration, coagulation, flocculation, filtration, and disinfection.[22] In this process, chemicals are added for treatment, including potassium permanganate (pre-oxidation), aluminum sulfate (coagulation), a cationic polymer (flocculation promoter), polyphosphates (corrosion suppressants), and powdered activated carbon and potassium permanganate (removal of taste and odor-causing compounds) (Kennedy/Jenks, 1994). Tracy currently uses chloramines to reduce production of trihalomethanes ("THMs"), a byproduct of free chlorine disinfection that can be detrimental to health if consumed over long periods (City of Tracy, 2000). The upgrade of the JJWTP will add granulated activated

[21] The plant is designed for an ultimate capacity of 45 MGD. The piping, UV equipment, and other common components are hydraulically designed for the future expanded plant capacity.
[22] http://www.ci.tracy.ca.us/departments/public_works/water_quality/

carbon adsorption and ultraviolet light disinfection.[23] A process schematic of the expanded treatment plant is included as Appendix D.

4.1.2 Stanislaus River Water

Information related to the contractual entitlements and treatment process of the Stanislaus River water that Tracy currently receives from the SCSWSP is provided below and in Table 9.

4.1.2.1 SCSWSP Contractual Information

SSJID has senior pre-1914 appropriative water rights to the Stanislaus River, coupled with an agreement with the USBR to store water in the New Melones reservoir. As part of the SCSWSP, Tracy has been allocated up to 10,000 acre-feet per year of water based upon SSJID's senior water rights. This SCSWSP water is expected to have high reliability, with Tracy anticipating being able to receive at least 90% of its allocation, even during dry years.

4.1.2.2 SCSWSP Treatment Process

The Stanislaus River water is treated at the Nick C. DeGroot Water Treatment Plant ("DGWTP")[24] located near Woodward Reservoir in San Joaquin County. The DGWTP incorporates high-rate dissolved air flotation ("DAF") and submerged membrane filtration.[25] The DGWTP will have an initial capacity of 36 MGD and a final build-out capacity of 60 MGD. The water treatment process for the SCSWSP is shown on Figure 7.

4.2 CURRENT WATER SOURCES – GROUNDWATER

Currently, the remaining portion of the Tracy water supply is extracted from the 539 square mile Tracy Groundwater Sub-Basin (City of Tracy, 2005a). The primary groundwater source for Tracy is the lower water-bearing zones of the Tulare Formation, which is part of a regional aquifer system in the San Joaquin subregion of the Central Valley groundwater basin. These water-bearing zones occur at depths of 300 to 700 feet below ground surface ("ft bgs") and are confined by an extensive clay stratum known as the Corcoran Clay (Kennedy/Jenks, 1994). Tracy currently operates nine groundwater wells, with a total extraction capacity of 15 MGD. The locations of these wells are shown on Figure 4. The four wells located near the JJWTP (Production Wells 1, 2, 3, and 4) pump directly into the JJWTP's clearwells, where the groundwater is blended with treated surface water. The outlying groundwater wells pump water directly into the distribution system after chloramination.

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[23] Granulated activated carbon will remove dissolved organic compounds. Ultraviolet light is a disinfection technology that creates no disinfection byproducts. (http://www.ci.tracy.ca.us/city_council/meetings/agendas/2005/08/02/01b.pdf)

[24] The South County Surface Water Supply Project Treatment Plant was named the Nick C. DeGroot Water Treatment Plant on July 14, 2005.

[25] Black & Veatch Corporation, August 18, 2005.

Pursuant to the UWMP Act, the following Section 4.2 provides information regarding the Basin, the groundwater management plans that have been prepared within the Basin, groundwater management efforts by Tracy and others, and Tracy's historic and projected future uses of groundwater.

4.2.1 Groundwater Basin Description

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. 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 urban water supplier 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 official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

The following section describes the Tracy Groundwater Sub-Basin, including its water-bearing formations, water levels, and water quality. Except where noted, the description of the Sub-Basin is based largely on information provided in *California DWR Bulletin 118*, last updated in February 2003 (DWR, 2003).

4.2.1.1 Tracy Groundwater Sub-Basin Description

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 Groundwater 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 (Figure 8). 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 westside tributaries, Corral Hollow Creek, provide drainage from the Tracy Groundwater Sub-Basin. The San Joaquin River flows northward into the Sacramento and San Joaquin Delta and discharges into San Francisco Bay.

4.2.1.2 Tracy Groundwater Sub-Basin Geology

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 ft 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 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.

4.2.1.3 Tracy Sub-Basin Groundwater Level Trends

The potentiometric surface in the semi-confined aquifer above the Corcoran Clay is located approximately 90 to 150 ft msl (Stoddard, 1996). 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.

4.2.1.4 Tracy Sub-Basin Groundwater Storage

There are no published groundwater storage values for the entire Sub-Basin (DWR, 2004). However, Hotchkiss and Balding (1971) estimated the groundwater storage capacity for the Tracy-Patterson Storage Unit at 4,040,000 ac-ft. The Tracy-Patterson Storage Unit includes the southern

portion of the currently-defined Tracy Groundwater Sub-Basin, from approximately one mile north of Tracy to the San Joaquin-Stanislaus County line. Since the Sub-Basin comprises roughly one-third of the Tracy-Patterson Storage Unit, it can be inferred that the approximate storage capacity of the southern portion of the Basin is on the order of 1,300,000 ac-ft.

In an eight-year study conducted by Stoddard & Associates (1996), the average change in Sub-Basin storage was negative 13,000 ac-ft per year. Stoddard & Associates (1996) notes that rainfall during the study period was well under average. In Stoddard's view, the Sub-Basin is in a hydrologically-balanced condition and is not overdrafted.

4.2.1.5 Tracy Sub-Basin Groundwater Quality

Groundwater quality in the Sub-Basin varies spatially and with depth. In general, the northern part of the Sub-Basin is characterized by a sodium water type, and the southern part of the Sub-Basin is characterized by calcium-sodium type water (Sorenson, 1981). The northern part of the 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 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" in the following discussion) and below the Corcoran Clay (the "confined aquifer") (see Table 12 of Appendix E). Generally, the water quality of the confined aquifer is better than that of the semi-confined aquifer (Stoddard, 1996). 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 (Stoddard, 1996). In the vicinity of Tracy, the TDS of the confined aquifer is between 600 mg/L and 700 mg/L (Stoddard, 1996).

Analytes present at elevated concentrations throughout the 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 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 Sub-Basin. Sulfate concentrations of up to 500 mg/L have been detected in Sub-Basin groundwater. The groundwater near Tracy is considered to be very hard (Stoddard, 1996).

4.2.2 Basin Groundwater Management Plan

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
(b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for 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.

Tracy has been, and continues to be, involved in both regional and local groundwater management efforts. Tracy participated in the development of a Groundwater Management Plan for the entire Tracy Groundwater Sub-Basin in 1996, called the Regional GMP, and is currently involved in the updating of this document. A description of the objectives and content of the Regional GMP is provided below in Section 4.2.2.1, with excerpts included as Appendix E. In addition, information regarding the San Joaquin County Groundwater Export Ordinance is provided.

4.2.2.1 Tracy Sub-Basin Regional Groundwater Management Plan

The Regional GMP, developed in 1996 in response to concerns regarding the declining quality of Sub-Basin groundwater, encompasses the area shown on Figure 2 of Appendix E. Other participants in the development and implementation of the Regional GMP include the agencies that overly and, in some cases, extract water from the Tracy Groundwater Sub-Basin within the DMC/CVP's northern service area. These agencies include the Plain View Water District (now part of the Byron-Bethany Irrigation District), Banta-Carbona Irrigation District, Del Puerto Water District, West Stanislaus Irrigation District, Patterson Water District, West Side Irrigation District, and the San Joaquin County Flood Control and Irrigation District. The location of these districts is shown on Figure 9.

Based on a hydraulic inventory of the Sub-Basin, the Regional GMP is designed to monitor groundwater impacts to the Sub-Basin and to promote the sustained use of groundwater resources. The Regional GMP discusses:

- Control of saline water intrusion
- Identification and management of wellhead protection areas
- Migration of contaminants in groundwater
- Administration of a well abandonment and well destruction program
- Mitigation of groundwater overdraft
- Replenishment of extracted groundwater

- Monitoring of groundwater levels and storage
- Facilitation of conjunctive use
- Well construction
- Construction and operation of groundwater management facilities
- Relationships with State and Federal regulating agencies
- Review of land use plans to assess risk of groundwater contamination.

The Regional GMP is currently being updated to present new data related to water levels and water quality and to bring the document into compliance with SB 1938, which was passed in 2002.[26] SB 1938 establishes criteria for topics are to be included in a GMP, including (1) establishment of basin management objectives ("BMOs"), (2) involvement of other local agencies in a cooperative planning effort, and (3) adoption of monitoring protocols that promote efficient and effective groundwater management.

4.2.2.2 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 evolved 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.[27]

4.2.3 Tracy Groundwater Management

On a local level, in 2001 Tracy adopted a *Groundwater Management Policy*, and prepared a *Groundwater Management Policy Mitigated Negative Declaration*. In 2005, Tracy was awarded a DWR grant to develop a Tracy-specific Groundwater Management Plan ("Tracy GMP"). The

[26] In September 2002, SB 1938 was signed into law. The act amends existing law related to groundwater management by local agencies. The law requires any public agency seeking State funds administered through DWR for the construction of groundwater projects or groundwater quality projects to prepare and implement a groundwater management plan with certain specified components. Prior to SB 1938, there were no required plan components. The requirements apply to agencies that have already adopted groundwater management plans as well as agencies that do not overlie groundwater basins identified in Bulletin 118 and its updates. The requirements do not apply to funds administered through the Local Groundwater Management Assistance Act or to funds authorized or appropriated prior to September 1, 2002.

[27] http://207.104.50.39/pubworks/Docs/Groundwater%20Management%20Plan%20Presentation.pdf

Groundwater Management Policy, the *Groundwater Management Policy Mitigated Negative Declaration*, and the objectives and proposed content of the Tracy GMP are described below. Tracy's efforts to develop an ASR project are also discussed.

4.2.3.1 Tracy Groundwater Management Policy and Mitigated Negative Declaration

In 2001, Tracy anticipated that, to make up a projected shortfall between supply and demand, groundwater extraction would have to increase from approximately 6,000 ac-ft per year to a maximum of 9,000 ac-ft per year over the three-year period 2001 through 2004.[28] Prior to 2001, it had been estimated that 6,700 ac-ft per year was Tracy's sustainable groundwater extraction rate (Kennedy/Jenks, 1990). However, a groundwater study by Navigant Consulting, completed in 2001, revised the estimated average annual operational groundwater yield to 9,000 ac-ft per year. This operational yield, though larger than the earlier estimate, is still well under the City's estimated 22,000 to 28,000 ac-ft per year share of the Sub-Basin's sustainable yield (PMC, 2001).

Pursuant to the findings of the Navigant (2001) study, the Tracy City Council adopted a Groundwater Management Policy in 2001 that established Tracy's maximum annual groundwater extraction rate at 9,000 ac-ft per year. To comply with the California Environmental Quality Act ("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* (Appendix F). The *Groundwater Management Policy Mitigated Negative Declaration* specifies, among other things, 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*, Tracy has maintained groundwater production rates well below the estimated sustainable yield of 9,000 ac-ft per year. In addition, Tracy has hired a consultant (Bookman-Edmonston or "BEC") to monitor the impacts of the increased groundwater extraction (at rates up to approximately 8,000 ac-ft per year) on groundwater levels, groundwater quality, and land subsidence. The findings of BEC's most recent *Mitigation Monitoring Report* (BEC, 2005) are summarized below and in Appendix G.

Background: In Tracy, groundwater is extracted primarily from the Tulare Formation, which is divided by the Corcoran Clay into an upper, semi-confined zone and a lower, confined aquifer. Pursuant to the Groundwater Management Policy Mitigated Negative Declaration, the lower aquifer was further subdivided into four zones (Zone A through Zone D). The upper aquifer, approximately 200 feet thick beneath Tracy, consists of lenticular deposits of sand, gravel, and clay (Padre, 2002). The lower aquifer is approximately 500 feet thick beneath Tracy and consists of individual beds of sand and gravel that are not always laterally extensive and that can be highly variable (Zones A through D; Padre, 2002). An upward vertical gradient exists between the lower and upper aquifers.

[28] According to the Navigant (2001) study, 9,000 ac-ft per year is the sustainable yield of the aquifer beneath Tracy.

Monitoring Network and Monitoring Frequency: To conduct hydrogeologic monitoring and assessment of the portion of the Sub-Basin underlying Tracy, the City installed several monitoring wells that are screened through Zones A through D as follows:

- Four nested monitoring wells (PW-5A through PW-5D) were installed adjacent to Production Well 5;
- Six sets of three nested wells were installed around Tracy (MW-1 through MW-6) in late 2003 through early 2004; and
- Two monitoring wells were installed adjacent to Production Well 8.

These monitoring well locations are shown on Figure 4 and the construction details are provided in Appendix E. Water level measurements from the production and monitoring wells are collected monthly and recorded to the nearest 0.01 foot. Water level trends are compared with the San Joaquin Valley Water Year Index published by DWR to isolate local groundwater extraction impacts from regional trends in groundwater elevation. Water quality samples are collected biannually.[29] Benchmarks have been established at each monitoring and production well using global positioning system ("GPS") technology that allows for accuracy within two centimeters. An annual benchmark survey was conducted in 2005, and additional surveys will be conducted each year to monitor for subsidence.

Summary of Findings: Since 2001, eight reports monitoring impacts from increased groundwater extraction had been prepared by BEC on behalf of Tracy. Recent findings by BEC (2005) are summarized below and in Appendix G:

- *Groundwater Contours*. In Zone A (the aquifer located directly below the Corcoran Clay), groundwater generally flows from recharge areas in the northeast and south towards Production Wells 1 through 4. In Zone B (the intermediate aquifer), groundwater flows from the east toward the pumping tough in the vicinity of Production Wells 1 through 4. In Zone C (the deep aquifer), groundwater flows from east to west beneath the City. Pumping depressions are located in the vicinity of the active production wells, which are typically screened through all three of these productive zones.
- *Groundwater Storage*. Groundwater levels have generally been stable to slightly increasing beneath Tracy. Based on pump tests results between April 2004 and April 2005, groundwater storage in the vicinity of Tracy increased by 8 ac-ft.
- *Groundwater Quality*. Key water quality parameters have remained consistent over the monitoring period. In the production wells, concentrations of TDS and sulfate exceeded their respective secondary maximum contaminant levels ("MCLs") of 500 mg/L and 250 mg/L.[30] Several monitoring wells also have TDS, chloride, sulfate, iron, and manganese above secondary MCLs.
- *Land Subsidence*. Little, if any, subsidence occurred between benchmark elevations surveyed in April 2003 and those surveyed in April and June 2005. All stations showed a

[29] Groundwater is sampled for major cations and anions, plus nitrate, boron, selected metals, and alpha activity.
[30] http://www.epa.gov/safewater/consumer/2ndstandards.html

slight decrease in elevation, suggesting that, if subsidence is occurring, it is regional and not associated with pumping at any City extraction well.

4.2.3.2 Tracy Groundwater Management Plan

In addition to participating in the development of the Regional GMP, in 2005 Tracy was awarded a DWR grant to prepare a Groundwater Management Plan for the portion of the Tracy Groundwater Sub-Basin that underlies the City of Tracy. As currently envisioned by the City, the Tracy GMP development and implementation will facilitate a coordinated, regional approach to groundwater management in the Tracy Sub-Basin. The City is receiving consultant proposals to prepare the Tracy GMP.

The Tracy GMP's objectives are to (1) comply with protocols established by SB 1938, (2) develop a conjunctive use program to optimize Tracy's use of its surface and groundwater supplies, and (3) develop effective and implementable BMOs that reflect current and projected future Sub-Basin conditions and groundwater use and that will protect groundwater resources. Topics will include:

- Current and future regional land and water use settings;
- Water supply setting, including information related to available water supplies, groundwater use trends, known groundwater impairments, and future water supply options;
- Hydrogeologic setting, including soil and near-surface geologic conditions, aquifer systems, water level and water quality data, and land subsidence information;
- Basin Management Objectives, including BMOs regarding groundwater protection, groundwater use/recharge, and definition of groundwater management areas;
- The Groundwater Monitoring Plan; and
- The Tracy GMP Implementation Plan.

4.2.3.3 Aquifer Storage and Recovery

The City's proposed ASR program would allow Tracy to optimize conjunctive use of its water supplies through injection of treated (potable) drinking water into selected aquifer zones within the Sub-Basin for storage when surplus supplies are available, and recovery of that potable water from the aquifer to optimize water quality, meet seasonal peak demands, during droughts, or when emergency or disaster scenarios preclude the use of imported water supplies (Padre, 2004). Tracy is currently working with the Central Valley Regional Water Quality Control Board ("CVRWQCB") to secure permits for a pilot ASR project.

4.2.4 Historic Groundwater Use

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631. (b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

Tracy operates nine groundwater extraction wells, including the Lincoln Well, Production Wells 1, 2, 3, 4, 5 (Lewis Manor), 6 (Ball Park), and 7 (Park & Ride).[31] The City constructed a new, ninth well in January 2004 (Production Well 8) that is intended for ASR purposes. The locations of the production wells are shown on Figure 4.

Historically, groundwater has accounted for approximately 40 to 50% of the City's water supply. Prior to 2001, groundwater extraction in Tracy totaled less than 6,000 ac-ft per year. Between 2001 and 2004, in order to meet increased demands for water, Tracy began extracting additional groundwater, ranging from 6,878 ac-ft and 7,717 ac-ft each year. In 2005, groundwater extraction decreased to approximately 6,000 ac-ft because (1) the SCSWSP was completed and Tracy began receiving Stanislaus River water, and (2) rainfall was above normal, meaning that Tracy received a high percentage of its DMC/CVP contractual entitlements. Individual well production data are provided in Table 10. As described in Section 4, Tracy's use of groundwater is expected to decrease in the future.

4.2.5 Projected Future Groundwater Use

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631. (b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

A recent assessment of the aquifer beneath Tracy indicates an average annual operational yield of 9,000 ac-ft per year (Navigant, 2001). Because the hard, high-TDS groundwater is of low quality compared with Tracy's surface water sources, Tracy is planning to scale back its groundwater extraction. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things. As can be seen in Table 9, groundwater extraction will continue to occur at selected production wells, but Tracy anticipates that total extraction during a normal year may decrease to approximately 4,000 ac-ft per year by 2010 and to 2,500 ac-ft per year by 2015. By reducing groundwater extraction on an average annual basis, the City will (1) increase the overall quality of its drinking water, thus increasing customer satisfaction and reducing system maintenance and repair caused by the lower-quality groundwater; and (2) recharge the underlying aquifer, effectively increasing the availability of groundwater during a drought or emergency condition (i.e., Tracy will effectively be "banking" its groundwater). These potential uses of groundwater during droughts are consistent with Tracy's *Groundwater Management Policy* (PMC, 2001). In the event that Tracy is unable to secure additional high quality surface water supplies in the future, groundwater remains a viable water supply up to 9,000 ac-ft per year.

[31] The Tidewater well is currently out of service due to sanding problems (BEC, 2005).

If Tracy decreases future groundwater extraction during normal and wet years, the current patterns of water levels, groundwater flow directions, and groundwater quality would be expected to change correspondingly. Further, if Tracy moves ahead with its proposed ASR program, changes in groundwater flow patterns associated with the introduction of treated water into aquifer zones may occur. In this way, a focused groundwater recharge area would be created. Groundwater quality would be expected to improve as a result of the introduction of higher quality surface water into the aquifer.[32]

4.3 CURRENT OR PROJECTED SUPPLY INCLUDES WHOLESALE WATER

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c), An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

Tracy purchases most of its water from two wholesale water suppliers, the USBR and the SSJID. Tracy's contractual entitlements to the USBR's CVP water via the DMC are described above in Section 4.1.1 and in Table 9. For the purposes of this 2005 UWMP, the DWR/USBR Central Valley Project Simulation Model ("PROSIM") was used to predict water supply availability for the DMC/CVP water source during normal and drought years (see Section 5). Additional information related to the reliability of the DMC/CVP water is provided in Section 5 and in the USBR M&I Water Shortage Policy, which is included as Appendix C.

The terms of the City's contract with SSJID allow Tracy the right to purchase as much as 10,000 ac-ft of water annually from the SSJID. As discussed above and in Section 5, the water from SSJID is effectively 100% reliable, although for planning purposes, a 90% reliability has been assumed.

4.4 POTENTIAL WATER SUPPLY PROJECTS AND PROGRAMS

10631 (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply

[32] From Padre (2004): The injection source water is characterized as low salinity water, sodium bicarbonate/sulfate dominated, with low alkalinity and hardness... The superior quality of the injected water will be both easily tracked and beneficial to overall basin water quality.

that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

Planned and potential future sources of Tracy's water are outlined in Table 9.

4.4.1 Future Surface Water Supplies

As described below, Tracy is currently negotiating additional surface water supplies from the Byron-Bethany Irrigation District.

4.4.1.1 Byron Bethany Irrigation District DMC/CVP Water

The area served by the former Plain View Water District is now part of BBID. Due to ongoing urbanization in portions of BBID, BBID anticipates that it may have CVP contract entitlement available for municipal uses in the future. Tracy and BBID are discussing the possibility of entering into a phased option agreement to assign portions of that CVP/DMC contract right to the City. The estimated volume of contract entitlement water potentially subject to such an agreement is approximately 11,000 acre-feet per year. The exact quantity of BBID CVP water entitlement is the subject of a future agreement and the exact quantity has not yet been determined. Agreements between Tracy, BBID and the USBR and environmental compliance would need to occur before such a transaction could take place.

4.4.1.2 Byron Bethany Irrigation District Pre-1914 Water

Because part of the Tracy Hills Specific Plan area was annexed into the Byron-Bethany Irrigation District, Tracy anticipates purchasing up to 4,500 ac-ft of Pre-1914 water right water on an annual basis from BBID to serve future developments in BBID service area (City of Tracy, 2005a). Future work to secure this water source includes finalized agreements between Tracy and BBID, completion of an environmental document, and construction of an 11-mile transmission pipeline from BBID to the City's water treatment plant. The planning, design, and construction of the pipeline will take a minimum of two years to complete once begun. Tracy is currently developing an agreement with BBID and anticipates that this water supply source will come on-line by 2015.

4.4.2 Aquifer Storage and Recovery

As described above in Section 4.2.3.3, Tracy is planning to pilot test an ASR program. The goal of the ASR program is to store surplus treated surface water in the confined aquifer beneath Tracy and extract that water to meet peak demands or supplement surface water sources during dry years. Currently the ASR project is on hold, pending CVRWQCB approval. If Tracy does secure needed permits to conduct ASR, it is estimated that as much as 685 ac-ft to 915 ac-ft per year of potable water could be injected into the aquifer, assuming a 5-month continuous injection rate of 1.5 to 2.0 MGD at Production Well 8 (Padre, 2002).

As can be seen in Table 9, Tracy anticipates that, under an ASR program, approximately 3,000 ac-ft of high-quality groundwater would be available in drought years, thereby increasing the

reliability of Tracy's water supply and closing the potential future gap between supply and demand during drought or emergency conditions.

4.4.3 In Lieu Recharge

In the future, Tracy intends to increase the use of its surface water resources in lieu of increased groundwater pumping. In lieu recharge allows groundwater levels to rise because groundwater that would have otherwise been extracted now remains in the basin, thus increasing the quantity of groundwater in storage. This water is then available for subsequent use during drought years, or under other circumstances when surface water sources are insufficient for Tracy's needs, unavailable or otherwise utilized.

4.4.4 Out-of-Basin Water Banking

Tracy has preliminarily evaluated the potential to bank water in one of the Kern County water banks (City of Tracy, 2005a). Water storage capacity is reportedly available in the Semitropic Water Bank ("Semitropic"). In order to store water in Semitropic, Tracy would not withdraw its share of CVP water from the DMC, such that this water would move through the DMC and California Aqueduct systems for delivery to Semitropic. During a drought, Semitropic would pump the stored water into the California Aqueduct and a like amount of water would be available to Tracy to pump from the DMC. Tracy has not purchased any out-of-area storage at this time, but is currently in negotiations with Semitropic to purchase up to 10,500 ac-ft of storage volume (Bayley, personal communication, 2005). If this storage were secured, it would provide Tracy with up to 3,500 ac-ft of water annually for three years. Though the City could utilize this supply in any year, it would be most valuable during drought years when the City's surface water supplies are reduced. If Tracy 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 use.

As described in Section 5, Tracy anticipates that, by banking water at Semitropic, Tracy will increase the reliability of Tracy's water supply and help close the potential future gap between supply and demand during drought or other emergency conditions.

4.4.5 Water Exchange Program

In October 2001, as part of its Water Supply Evaluation Criteria, the City implemented a Water Exchange Program ("WEP") that involves the phased conversion of several City parks and other irrigated areas to recycled/non-potable water for irrigation. The conversion of these sites to recycled/non-potable water will free potable water currently being used for irrigation, allowing its use elsewhere. The City is prepared to make these potable water supplies available for new developments, under the condition that the proponents of such developments provide an equivalent amount of recycled water for irrigation purposes within the City. Currently, Tracy is working with the Gateway Development Project to develop the City's first WEP.

The potential amount of recycled water use, and thus the amount of potable water supplies made available through this program, will depend on the number and extent of irrigation sites converted. Preliminary estimates indicate that over 780 ac-ft per year of potable water supplies may eventually become available through this program (West Yost, 2002). The WEP is expected to develop in phases, initially utilizing untreated water supplies, such as those available from WSID, in the interim period before Title 22 recycled water becomes available in the City. Additional discussion regarding the WEP is provided in Section 8.4.2.1.

4.4.6 Recycled Water

As described in more detail in Section 8, pursuant to the Recycled and Non-Potable Water Ordinance adopted by the City Council in 2002 (Ordinance No. 1035, TMC 11.30, see Appendix H), all new subdivisions are currently required, 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. At the maximum buildout scheduled for 2045, it is estimated that Tracy may be capable of reusing recycled water to offset potable water demand within Tracy at flow rates potentially exceeding 5 MGD (Kennedy/Jenks, 1994). Other potential future projects include use of up to 8.1 MGD of recycled water for evaporative cooling, processing, and landscape irrigation at the Tesla Power Plant.

For the purposes of this UWMP, recycled water has not been quantitatively counted as a current or projected future "water supply". Once the infrastructure is in place within Tracy and recycled water is being used within the City to offset potable water demands, the City will revisit this conservative assumption and may begin counting recycled water as a water supply.

4.5 DEVELOPMENT OF DESALINATED WATER

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

At this time, Tracy is not contemplating development of a desalinated water program.

4.6 TRANSFER AND EXCHANGE OPPORTUNITIES

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The DMC/CVP surface water supply that is subject to M&I- and Ag-reliability can be reduced significantly during drought conditions. As such, Tracy supplements its surface water supply from other sources, including Stanislaus River water through the SCSWSP as well as groundwater, which are considered to be less dependent on climatic factors and available at more consistent levels. Further, the SCSWSP DGWTP serves as a backup in the event that the JJWTP is temporarily not in operation.

Tracy currently exercises its options to purchase and sell water on the water market.[33] Traditionally, Tracy has sold its surplus USBR project water to Westlands Water District in Fresno County through this annual transfer process (Bayley, 2000). During drought periods, Tracy has the ability to purchase water on the spot market as necessary.

[33] A water market exists so that, subject to USBR approval, agencies can sell to or buy water from other water users that have an excess supply of water or may need additional water to support demand. These annual transfers are subject to USBR approval and are for one year only.

5. RELIABILITY OF SUPPLY

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:
(1) An average water year.
(2) A single-dry water year.
(3) Multiple-dry water years.
For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

The reliability of each DMC/CVP water supply was estimated based on the USBR PROSIM model. This model projects annual delivery quantities from the CVP taking into consideration historical hydrologic conditions, current environmental restrictions and regulatory constraints, and Delta improvements over a 71-year period (1922-1993) (WestYost, 2002). Based on the PROSIM model, during an average hydrologic year, Tracy can expect to receive approximately 85% of its M&I-reliability water supply and 58% of its Ag-reliability water from the USBR's allotment of CVP water via the DMC (plus the small volume of BBID water that is managed through Tracy's treatment and distribution system on behalf of Patterson Pass Business Park) (DWR/USBR, 2002).[34]

During droughts, the cutbacks on Tracy's DMC/CVP supply are projected to be even greater. When CVP/DMC supplies are thus reduced, Tracy can increase its use of SCSWSP water and local groundwater. The availability of these sources is considered to be less dependent on climatic factors and is likely to be available at more consistent levels. In addition, the City hopes to further increase the reliability of its water supply during drought years through the purchase of space in the Semitropic water bank and potential future implementation of an ASR program (see Section 4.4).

During a single-dry year, or when the DMC/CVP flows must be reduced due to environmental impacts, among other things, all of Tracy's existing surface water allotments are subject to 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 (Tracy holds both M&I- and Ag-reliability contracts to DMC/CVP water and contracts for pre-1914 water rights water). The contractual conditions for M&I- and Ag-reliability DMC/CVP water and the potential for

[34] Models of the California water resources complex have been developed by the USBR and DWR. The most prominent efforts are the USBR's Project Simulation Model (PROSIM) and the DWR's Simulation Model (DWRSIM). Both are descriptive models that simulate the operations of the Central Valley Project and State Water Project (SWP), the major water projects in California. The DWR and USBR use the PROSIM Model to model existing and future conditions under which the CVP and SWP will operate. PROSIM simulates monthly CVP and SWP operations within the geographical area affected by CVP and SWP facilities, including the Delta. PROSIM is a traditional water balance approach with a monthly time step, to simulate a system represented by 50 nodes that include 11 reservoirs. Monthly streamflow data is input at 24 of the nodes for a 57-year (1922-1978) simulation period.

reductions are outlined in Appendix C. For the purposes of this 2005 UWMP, it was assumed that Tracy would receive approximately 90% of its pre-1914 water rights water, 75% of its M&I-reliability water supply, and 25% of its Ag-reliability water from the USBR's allotment of DMC/CVP water during a single dry year.[35]

If there are successive dry years, Tracy's surface water allotments, especially from the DMC/CVP, may be significantly reduced. Thus, in the event of drought, Tracy will have to depend more heavily on conservation efforts and its groundwater and SCSWSP supplies.

As an example, in 1991, due to prolonged drought, the USBR reduced Tracy's DMC/CVP surface water allotment by 50%, such that Tracy's 1991 allocation was reduced to 5,000 ac-ft. As a result, Tracy implemented a water conservation program consistent with its Water Shortage Contingency Plan included as Appendix C, and relied on its groundwater supply to satisfy a larger portion of the water demand. Tracy now has a broader portfolio of water supplies. For the purposes of this UWMP, it was assumed that Tracy would receive approximately 90% of its pre-1914 water rights water, 50% of its M&I-reliability water supply, and 25% to 13% of its Ag-reliability water from the USBR's allotment of DMC/CVP water during a multiple-dry year period.[36]

The reliability of each of Tracy's current and future water supplies and their projected availability during normal, single-dry, and multiple-dry years is described below and summarized in Tables 11 through 14.

5.1 NORMAL YEAR

Normal or wet water years are those water years that match or exceed median rainfall and runoff levels. The reliability of each of Tracy's current and future water supplies and their projected availability during normal and wet years is outlined below and in Table 11.

- The Tracy 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 historic record, Tracy's long-term average allocation of DMC/CVP water pursuant to this contract is anticipated to be at least 75% of the total entitlement or, 7,500 ac-ft per year. Tracy's allocations since 2000 have averaged 91% of its 10,000 ac-ft per year entitlement--in 2005, Tracy was allocated 100% of its entitlement (City of Tracy, 2005a). For projection purposes, it has been assumed that Tracy will receive 85% of its entitlement during normal water years, or 8,500 ac-ft per year.
- Tracy has been assigned contracts (BCID and WSID) for an annual entitlement of up to 7,500 ac-ft per year of USBR water from the DMC/CVP. Tracy also holds an option to purchase an additional 2,500 acre-feet per year of DMC/CVP contract entitlement from WSID. These contracts are subject to Ag-reliability. Since 2000, average deliveries of

[35] The reliability assumptions set forth in this plan are for planning purposes, and do not alter Tracy's contractual or other legal rights.
[36] Based on average deliveries of CVP water during historic drought periods (1929-1934 and 1987-1992) (West Yost, 2002).

DMC/CVP water pursuant to Ag-reliability have been 66% of the total entitlement. In 2005, Tracy was allocated 85% of its entitlement, or 6,375 ac-ft (City of Tracy, 2005a). Tracy is conservatively estimating that it will receive 58% of its Ag-reliability contractual entitlement in future normal water years, or a total of 4,350 ac-ft (0.58 x 7,500) per year prior to 2014 and 5,800 ac-ft (0.58 x 10,000 ac-ft) per year after 2014.

- During a normal water year, Tracy expects to receive 100% of its SCSWSP water supply allocation, or 10,000 ac-ft per year.
- Pursuant to the Groundwater Management Policy, Tracy can extract up to 9,000 ac-ft per year of local groundwater (Navigant, 2001). Because of the high TDS and hardness of Tracy's groundwater, the City hopes to reduce its dependency on groundwater in the future. As additional higher quality water supplies come on line, Tracy 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, Tracy may utilize up 9,000 ac-ft of groundwater per year.
- In the future, up to 4,500 ac-ft per year of pre-1914 appropriative water rights water is expected to be available for purchase from BBID. After 2015, Tracy anticipates being able to receive 100% of this supply during normal and wet years.
- In the future, up to approximately 11,000 ac-ft per year of Ag-reliability water from BBID DMC/CVP contract is expected to be available to Tracy.[37] Therefore, in future normal water years, as much as 6,380 ac-ft per year (0.58 x 11,000 ac-ft) will be available.
- By 2015, 3,000 ac-ft per year of banked water is assumed to be available through Tracy's ASR program and by 2010, approximately 3,500 ac-ft per year (for three consecutive years) of banked water through the Semitropic water bank.

5.2 SINGLE-DRY YEAR

A single-dry year is generally considered to be the lowest annual runoff for a watershed recorded since the 1903-04 water year. For the purposes of this UWMP, the DWR/USBR PROSIM model was used to predict water supply availability for DMC/CVP water under such conditions. The reliability of each of Tracy's current and future water supplies and their projected availability during a single-dry year are outlined below and in Table 12.

- The Tracy 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 historic record, it is assumed that during a single-dry year, Tracy's annual allocation will be 75% of its entitlement, or 7,500 ac-ft.
- Tracy holds the assignment contracts (BCID and WSID) for an annual entitlement of up to 7,500 ac-ft per year prior to 2014 and 10,000 ac-ft per year after 2014. These contracts pertain to USBR water from the DMC/CVP and are subject to Ag-reliability. Based on the

[37] As described in Section 4.4.1.1, the exact quantity of BBID CVP water entitlement is the subject of a future agreement, it may be acquired in increments, if at all, and the exact quantity has not yet been determined.

historic record and PROSIM modeling, it is assumed that during a single-dry year, Tracy's allocation will be 25% of its entitlement, 1,875 ac-ft per year prior to 2014 and 2,500 ac-ft per year after 2014.

- During a single-dry year, it is assumed that Tracy will r receive 90% of its SCSWSP water supply allocation, or 9,000 ac-ft per year.
- Pursuant to the Groundwater Management Policy, Tracy can extract up to 9,000 ac-ft per year of local groundwater resources (Navigant, 2001). However, as described above, Tracy may reduce its future groundwater use to 2,500 ac-ft per year by 2015. 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 ac-ft per year.
- In the future, up to 4,500 ac-ft per year of pre-1914 appropriative water rights water is expected to be available from BBID. In single-dry water years after 2014, it is assumed that 4,050 ac-ft per year of BBID Pre-1914 water right water, or 90% of the contractual allocation, will be available.
- In the future, up to 11,000 ac-ft per year of Ag-reliability water from the BBID DMC/CVP contract is expected to be available to Tracy. In future single-dry water years, it is assumed that as much as 2,750 ac-ft per year, or 25% of the contractual entitlement, of BBID water will be available.
- By 2015, 3,000 ac-ft per year of banked water is assumed to be available through Tracy's ASR program and by 2010, approximately 3,500 ac-ft per year (for three consecutive years) of banked water through the Semitropic water bank.[38]

5.3 MULTIPLE-DRY YEAR PERIOD

A multiple-dry year period is generally considered to be the lowest average runoff recorded for a consecutive multiple year period (three years or more) for a watershed since 1903. For example, 1928-1934 and 1987-1992 were the two multi-year periods of lowest average runoff during the 20th Century in the Central Valley Basin. The reliability of each of Tracy's current and future water supplies and their projected availability during a multiple-dry year period are outlined below and in Table 13.

- The Tracy Contract for an annual entitlement of 10,000 ac-ft per year of USBR water from the DMC/CVP is subject to M&I Reliability. Based on the historic record, it is assumed that during a multiple-dry year period, Tracy's annual allocation will be 50% of its entitlement, or 5,000 ac-ft per year.
- Tracy holds the BCID and WSID Contracts for an annual entitlement of up to 7,500 ac-ft per year prior to 2014 and 10,000 ac-ft per year after 2014. These contracts, which cover USBR water from the DMC/CVP, are subject to Ag-reliability. Based on the historic

[38] Tracy's ASR program proposes to inject treated drinking water during years of excess deliveries. This water would then be pumped out of the aquifer as needed in future years. Water banked with Semitropic however, would be pulled directly out of the DMC and replenished back to the DMC by Semitropic.

record and PROSIM modeling, it is assumed that during multiple-dry years, Tracy's allocation will be 25% of its entitlement, equivalent to 1,875 ac-ft per year prior to 2014 and 2,500 ac-ft per year after 2014.

- During a multiple-dry year period, Tracy expects to receive 90% of its SCSWSP water supply allocation, or 9,000 ac-ft per year.
- Pursuant to the Groundwater Management Policy, Tracy can extract up to 9,000 ac-ft per year of local groundwater resources (Navigant, 2001). However, as described above, Tracy may reduce its future groundwater use to 2,500 ac-ft per year by 2015. 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 ac-ft per year.
- In the future, up to 4,500 ac-ft per year of pre-1914 appropriative water rights water is expected to be available for purchase from BBID. In multiple-dry water years after 2014, it is assumed that 4,050 ac-ft per year of BBID Pre-1914 water right water, or 90% of the contractual allocation, will be available.
- In the future, up to 11,000 ac-ft per year of Ag-reliability water from BBID DMC/CVP contract is expected to be available to Tracy. In future multiple-dry water years, it is assumed that as much as 2,750 ac-ft per year of BBID water, or 25% of the contractual entitlement, will be available.
- In the future, up to 3,000 ac-ft per year of banked water is assumed to be available through Tracy's ASR program and approximately 3,500 ac-ft per year for three consecutive years of banked water is anticipated to be available through Semitropic.

5.4 EXTREME DRY YEAR PERIOD

Based on the historical record, and on PROSIM modeling, Tracy's Ag-reliability water could be cut to as little as 13% of its contractual allotment. For purposes of comparison, Tracy has included this extreme dry year scenario. The reliability of each of Tracy's current and future water supplies and their projected availability during an extreme-dry year are outlined below and in Table 14.

- The Tracy 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 historic record, it is assumed that during an extreme-dry year, Tracy's annual allocation will be 50% of its entitlement, or 5,000 ac-ft.
- Tracy holds the BCID and WSID Contracts for an annual entitlement of up to 7,500 ac-ft per year prior to 2014 and 10,000 ac-ft per year after 2014. These contracts, which pertain to USBR water from the DMC/CVP, are subject to Ag-reliability. Based on the historic record, it is assumed that during an extreme-dry year, Tracy will receive 13% of its entitlement, equivalent to 975 ac-ft per year prior to 2014 and 1,300 ac-ft after 2014.
- During an extreme-dry year period, Tracy still expects to receive 90% of its SCSWSP water supply allocation, or 9,000 ac-ft per year.

- Pursuant to the Groundwater Management Policy, Tracy can extract up to 9,000 ac-ft per year of local groundwater resources (Navigant, 2001). However, as described above, Tracymay reduce its future groundwater use to 2,500 ac-ft per year by 2015. In the event that groundwater is needed to supplement surface water supplies during a extreme-dry year period however, the City does intend to call on these supplies up to the maximum sustainable yield of 9,000 ac-ft per year.
- In the future, up to 4,500 ac-ft per year of pre-1914 appropriative water rights water is expected to be available for purchase from BBID. In extreme-dry water years after 2014, it is assumed that as much as 4,050 ac-ft per year of BBID Pre-1914 appropriative water right water, or 90% of the contractual allocation, will be available.
- In the future, up to 11,000 ac-ft per year of Ag-reliability water from BBID DMC/CVP contract is expected to be available to Tracy. In future extreme-dry water years, it is assumed that as much as 1,430 ac-ft per year of BBID water, or 13% of the contractual entitlement, will be available.
- In the future, up to 3,000 ac-ft per year of banked water is assumed to be available through Tracy's ASR program and approximately 3,500 ac-ft per year for three consecutive years of banked water through Semitropic.

5.5 WATER QUALITY IMPACTS ON RELIABILITY

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

The potable water that Tracy delivers to its customers complies with all state and federal drinking water requirements. Appendix I contains the Tracy 2004 Water Quality Report (City of Tracy, 2004). However, there are occasional aesthetic concerns with Tracy's water supply because the groundwater is heavily mineralized and the DMC/CVP water periodically has taste and odor problems resulting from algae blooms in the Delta.

Tracy began receiving high-quality Stanislaus River water through the SCSWSP in 2005, improving the aesthetic quality for Tracy's water customers. If Tracy is able to develop its ASR program as proposed, the aesthetic quality of the extracted groundwater may also improve in the future.

Specific information related to the quality of each of Tracy's surface water and groundwater sources is provided below.

5.5.1 DMC/CVP Water Quality

An assessment of the drinking water sources for Tracy's potable water system was completed in Fall 2005 (EKI, 2005). The sources that were found to be most vulnerable to airport maintenance and fueling areas, gas stations (historic and current), mining (active and historic), and septic and

waste landfill dumps (historic and current).[39] While significant problems have not been encountered to date, there is also potential for a variety of water quality issues in the Delta that could make the water less suitable for municipal use. Potential issues include levee failures, toxic spills, and salinity.

At the urging of the State Department of Health Services ("DHS"), the City studied the possibility of obtaining a portion of its raw water from the State Water Project ("SWP") California Aqueduct, rather than from the DMC, with the idea that the SWP water could be of better quality than the DMC water.[40] As part of the study, an extensive water quality analysis was done on water from both the California Aqueduct and the DMC.

The study showed that both the DMC and the SWP have highly variable and similar water quality; therefore, DHS and Tracy determined that there was no clear benefit from Tracy changing its surface water source from the DMC to the SWP. In the future, except in the event of a levee failure, a toxic spill, or a significant increase in salinity of the Delta, the quality of the DMC water is not expected to change significantly. Further, as described above, the introduction of the high quality SCSWSP water is likely to enhance water quality in Tracy, as well as provide a redundant supply of water in the event that the quality of another one of the surface water sources, such as the DMC, is degraded.

5.5.2 Stanislaus River Water Quality

Available raw water quality data for the SSJID water are summarized and analyzed in SSJID's most recent Sanitary Survey Update (Black & Veatch, 2005) as well as in Tracy's 2005 Sanitary Survey Update (EKI, 2005). A summary of raw water quality data collected from January 1998 through July 2004 is presented in Appendix J (Tables 8.1 and 8.2). The data summarized in Appendix J does not include the period between June 2001 and May 2004. No data are available for this time period because the Woodward Reservoir and a portion of the South San Joaquin Main Canal at the reservoir were shut down and drained for construction of the intake pipelines.

In general, the water quality of SSJID surface water is better than that of the DMC. Turbidity within the SSJID water supply averaged at 4.91 NTU, while the levels in the DMC water supply averaged at 11 NTU. Of the parameters monitored and reported in the SSJID 2005 Survey Update, almost all of the compounds were detected at concentrations below applicable water quality standards.

Results from the City's Sanitary Survey indicate that cattle in the vicinity of the main canal are likely contributing to elevated levels of total and fecal coliform between the Goodwin Dam and the Woodward Reservoir, and that recreational activity near the reservoir may be causing additional contamination. The elevated coliform levels do not appear to threaten the current operation of the watershed, but may be a concern for fresh-water beaches, as indicated in SSJID

[39] http://www.ci.tracy.ca.us/departments/public_works/water_quality/
[40] http://www.ci.tracy.ca.us/city_council/meetings/agendas/2003/03/18/07b.pdf

2005 Survey Update. In the future SSJID will have to closely monitor and regulate the occurrence of elevated levels of total and fecal coliform.

5.5.3 Groundwater Quality

Generally, the City's groundwater has high levels of TDS and sulfate and very high hardness. Therefore, the City is managing its water sources conjunctively in order to preferentially use its higher quality, surface sources and minimize its dependence on local groundwater, which has lower quality compared with available surface sources. Additional information related to groundwater quality is presented as part of the bi-annual groundwater monitoring that the City conducts as part of the Mitigation Monitoring Program pursuant to the City's *Groundwater Management Policy Mitigated Negative Declaration*.

Groundwater quality data collected to date is summarized in Appendix F and in the following sections. Unless otherwise noted, the information presented below is from BEC (2005).

5.5.3.1 Production Wells

According to BEC (2005), none of the water quality parameters from the production wells exceed California Primary Drinking Water Standards (also called MCLs). TDS, specific conductance (measured by the water's electrical current, or "EC"), and sulfate have consistently been measured at levels above the California Secondary Recommended MCLs. At Production Wells 1, 2, 3, 4, and 7, there appears to be a slight upward trend in TDS concentrations. Other constituents, such as nitrate, arsenic, chromium, boron, and chloride, are present in Tracy's groundwater at levels that are elevated but in compliance with MCLs.

5.5.3.2 Monitoring Wells

Similarly to the data collected from production wells, none of the water quality parameters from Tracy's monitoring wells exceeded California Primary MCLs. Several monitoring wells have concentrations of TDS, EC, chloride, sulfate, iron, and manganese that exceeded California Secondary Recommended MCLs. Generally, groundwater quality appears to be better in the Zone A aquifer (the shallow aquifer located directly beneath the Corcoran Clay) than in the deeper zones, with the exception of arsenic. The poorest quality water is present at monitoring well MW-5C, screened in the deep aquifer, where the TDS exceeds 1,000 mg/L. In general, current patterns of groundwater extraction by Tracy do not appear to be negatively impacting groundwater quality (BEC, 2005).

6. WATER SUPPLY VS. DEMAND

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple-dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single-dry water year, and multiple-dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

As discussed previously, Tracy's water demand projections and the volume and reliability of its water supplies are expected to vary as a function of time and hydrologic conditions. The following sections compare Tracy's projected potable water supplies and demands for years with normal and less than normal precipitation over a period of 20 years (see Tables 15 through 18). Based on Tracy's water supply projections described in Section 4 and the potable water demand projections explained in Section 3, the City is projected to have sufficient potable water supplies to meet all of its projected demands through the year 2025 during years of normal precipitation (see Table 15). This projection is based on the assumptions described in Section 4. These assumptions include Tracy's ability to secure and utilize its options to purchase the additional WSID and BBID DMC/CVP and Pre-1914 appropriative water, and some reduction of groundwater extraction to as little as 2,500 ac-ft per year by 2015.

6.1 PROJECTED SINGLE-DRY-YEAR SUPPLY AND DEMAND COMPARISON

Comparison of Tracy's single-dry year water supply projections to its water demand projections indicates that the City will likely have sufficient water supplies to meet projected potable water demands through 2020 using the City's current and expected available supplies listed in Section 5 and shown in Table 12. It is important to note that this analysis assumes that Tracy has acquired the additional WSID and BBID DMC/CVP and Pre-1914 water rights described in Section 4 and has reduced its groundwater use.

6.2 PROJECTED MULTIPLE-DRY-YEAR SUPPLY AND DEMAND COMPARISON

Comparison of Tracy's multiple-dry year water supply projections with projected water demands indicates that the City will likely have sufficient water supplies to meet projected potable water demands through 2015 using the City's current and expected available supplies listed in Section 5 and shown in Table 12, but will encounter supply shortfalls of up to 9% by 2025. It is important to note that this analysis assumes that Tracy has acquired the additional WSID and BBID DMC/CVP and Pre-1914 water rights described in Section 4 and has reduced its groundwater use. The City may be able to achieve such cutbacks in demand through implementation of its Water Shortage Contingency Plan (see Section 9), but such cutbacks would likely have significant impacts on the City's economy, among other negative impacts.

It is anticipated that Tracy could make up this shortfall in supply if it were able to purchase water on the spot market or if Tracy could draw upon additional water supplies it had banked for drought supply purposes.

Tracy is currently working to develop two water banking programs. First, additional drought water supply could come from potable water that is stored in the aquifer beneath Tracy as a result of implementation of an ASR program. Under the second program, Tracy would purchase space in the Semitropic Water Bank to store water for use during times of drought (see Table 16). If Tracy is able to implement these two water banking programs, the City should have sufficient water supplies to meet demand during a multiple-dry year period. Another option the City retains is to use groundwater to make up any shortfall.

6.3 PROJECTED EXTREME-DRY-YEAR SUPPLY AND DEMAND COMPARISON

In the event of an extreme dry-year, where Tracy's DMC/CVP water supply allocation is reduced to 13% of the contractual entitlement (Section 5), the City should be able to meet potable water demands through about the year 2025 by maximizing the use of all other water sources, including water banked through development of an ASR program and from purchasing space in the Semitropic water bank. It is important to note that this analysis assumes that Tracy has acquired the additional WSID and BBID DMC/CVP and Pre-1914 water rights described in Section 4 and is using reduced amounts of groundwater.

Comparison of projected total water supply (without water banking) and potable water demand indicate that the City may not have sufficient water to meet all potable water demands in future years during an extreme dry year. For example, if an extreme dry year were to occur in 2010, City-wide water-use would have to be reduced by 3% (see Table 18). Such a cutback in water use can be achieved through a public information campaign. However, if the City is not able to draw upon water supplies that it can bank through ASR or in Semitropic, then the City may experience significant supply shortfalls in a future extreme dry year (i.e., as great as 21% in 2025). The City can potentially achieve such cutbacks in demand through implementation the more drastic stages of its Water Shortage Contingency Plan (see Section 9), but such cutbacks would likely have significant impacts on the City's economy, among other negative impacts. Another option the City retains to avoid such impact is to use groundwater to make up some or all of such a shortfall.

7. DEMAND MANAGEMENT MEASURES

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

- *A) Water Surveys for Single-Family and Multi-Family Residential Customers*
- *B) Residential Plumbing Retrofit*
- *C) System Water Audits, Leak Detection, and Repair*
- *D) Metering*
- *E) Large Landscape Conservation Program and Incentives*
- *F) High-Efficiency Appliance Promotion Programs*
- *G) Public Information Programs*
- *H) School Education Programs*
- *I) Conservation Programs for Commercial, Industrial, Institutional Customers*
- *J) Wholesale Agency Assistance Programs*
- *K) Non-Promotional Water Pricing Programs*
- *L) Water Conservation Coordinator*
- *M) Waste Water Prohibition*
- *N) Residential Ultra Low Flush Toilet Replacement*

In accordance with the Reclamation Reform Act of 1982 ("RRA"), the City prepared and submitted a Water Conservation Plan to the USBR in 2002. The RRA states that all parties that contract with the USBR for M&I water supplies greater than 2,000 ac-ft per year, or Agricultural water supplies that cover over 2,000 irrigable acres, are required to prepare and submit Water Conservation Plans to the USBR every five years. As described in Section 4, the City currently holds multiple contracts with the USBR in excess of these quantities.

Tracy's Water Conservation Plan includes, among other items, a copy of the City's water-related ordinances and City Code sections, an inventory of the City's water resources and quality, and a description of the City's water conservation efforts. These conservation efforts include implementation of the California Urban Water Conservation Council's ("CUWCC") 14 Best Management Practices ("BMPs").

As described in Tracy's Water Conservation Plan, Tracy is committed to water conservation and efficient use of water. The City has implemented the majority of the 14 CUWCC BMPs, which are equivalent to the "Demand Management Measures", or "BMPs", defined in the UWMP Act. For the purposes of this 2005 UWMP, we refer to the UWMP Act Demand Management Measures as BMPs.

7.1 BEST MANAGEMENT PRACTICES

The following sections summarize actions taken by the City's past and current Water Conservation Coordinators to encourage water conservation pursuant to each of the 14 BMPs. Tracy's options for future implementation of BMP management, potentially including outsourcing to specialty consultants, are discussed where applicable. BMP actions are described by fiscal year ("FY"); for example, "FY 2001" refers to the period July 1, 2000 through June 30, 2001.

7.1.1 BMP 1 - Residential Water Surveys

In 2002, CTSI, a City consultant, distributed 230 residential survey kits to elementary school children as part of a coordinated Residential Survey, Residential Retrofit, and School Education BMP implementation program (see Section 7.1.8 and Table 19).

The City's current residential survey program focuses on personal visits from the City's Water Conservation Coordinator ("WCC") to identify leaks and offer water- saving ideas. Tracy offers its residential survey program free-of-charge to its single-family and multi-family water customers. Customers who participate in the residential survey program may receive free water-saving information and equipment, including low-flow showerheads and faucet aerators. During a residential survey, the WCC will also evaluate the customer's landscape and irrigation systems and furnish suggestions for conservation.

Advertisement for Tracy's residential surveys is done primarily through utility bill inserts and community events such as the Bean Festival, which attracts over 88,000 visitors over two days each August.

The City has obtained a software program that will allow the WCC to identify the top 20% of the single-family or multi-family users and target them for conservation evaluations. The software program will allow the City to identify top water users and include information on customer bills regarding general and customer-specific water use trends.

7.1.2 BMP 2 - Residential Retrofits

In FY 2000, as part of a pilot plumbing retrofit program, the City distributed 1,000 low-flow showerheads to residences in the service area that were constructed prior to 1980. The City also distributed water conservation kits as fundraising events for the local high school. Kit contents included low-flow showerheads, faucet aerators, dye tablets for toilet tank leak detection, and water bags for toilet tank displacement. In FY 2001, the City distributed 320 water conservation kits during a Tracy High School fundraiser. Ultra-low flow toilets ("ULFTs") were also distributed at this event as discussed in Section 7.1.14.

7.1.3 BMP 3 - System Water Audits and Leak Detection

The City's estimated average unaccounted-for water between FY 2000 and 2005 was estimated to be 7.6% (Table 6). Since the City's UAW is less than 10%, the City is currently exempt from having to implement this BMP. However, the City conducted a water audit in 1999 to determine

if a portion of this water loss was due to pipeline leakage. The leak detection survey, conducted by Utility Services Associates, covered 20 lineal miles of streets in the older areas of the City. One small pinhole leak in a fire hydrant assembly was detected (USA, 1999). The leak was repaired.

7.1.4 BMP 4 – Metering

Tracy presently meters all 21,258 of its customers. Since its 2000 UWMP, Tracy has completed installation of meters at all previously-unmetered parks and government property.

While the majority of the older meters are manual or touch-read models, the City is replacing these with radio-capable meters when the old meters break. All new connections are required to install radio-capable meters, and 3,000 of the City's meters are now radio-enabled. The ability to perform meter reading remotely via radio will enhance data acquisition. Such radio-capable meters can alert customers or the City when there is a leak, potentially reducing wasted water.

The City charges its customers a base service rate depending on meter size. Meter service charges range from $9.85 per month for a 5/8-inch or 3/4-inch diameter meter, to $1,740 for a 10-inch meter. Table 20 gives the full range of service charges based on meter size.

Water is billed using Tracy's tiered rate structure. The City bills customers based on the volume of water consumed, in units of one hundred cubic feet (748 gallons). For more information on Tracy's rate schedule, see BMP 11, Section 7.1.11.

7.1.5 BMP 5 - Landscape

In response to 1990's Assembly Bill 325, the City Council adopted Resolution No. 91-136 and established Guidelines for Water Efficient Landscape Design, Development, and Maintenance ("Landscape Guidelines") (Appendix K). Tracy's Landscape Guidelines outline a point system based on landscape and irrigation techniques. The Landscape Guidelines define several water-conserving practices, such as limiting turf area, grouping plants according to their watering needs, and installing automatic irrigation controls, and distribute points for each action. The Landscape Guidelines specify that all landscape plans must have a minimum of 60 points for landscaping criteria and 60 points for irrigation criteria in order to meet guideline approval. Table 21 summarizes the practices outlined in the Landscape Guidelines.

The City engaged Annette Henneberry Schermesser, P.E. in 2003 to conduct a landscape audit of four City parks, namely Alden Park, Hoyt Park, Ceciliani Park, and Dr. Powers Park. The landscape audit results included both specific recommendations for individual parks (such as implementing computer-controlled irrigation systems in Dr. Powers and Alden Parks) as well as general observations (such as sprinkler heads do not rise high enough in all four parks). A summary of the Landscape Water Audit is included in Appendix L.

7.1.6 BMP 6 - Clothes Washers

The City offers its high-efficiency clothes washing machine rebate program free of charge to its single-family and multi-family customers. The City offers a $50 rebate for Energy Star-rated, high-efficiency washing machines.[41] This voucher program may be used jointly with PG&E's rebate programs. This rebate is valid for new high-efficiency clothes washing machines listed in the Voucher Product list published by the Consortium for Energy Efficiency.[42]

Tracy offers the washer rebate program on a first come, first served basis, budgeting up to $10,000 in rebates per fiscal year. Increased marketing efforts by the WCC and recent coordinated efforts with Sears have increased the demand for rebates in the past year. Starting in March of 2005, when Sears began distributing rebate applications at the time of sale, rebate applications rose, with 27 rebates for high-efficiency washers granted between March and June of 2005 for a total rebated amount of $1,350 (Table 19). The City anticipates a further increase in customer demand for washer rebates in the future.

7.1.7 BMP 7 - Public Information

Tracy distributes information about water conservation to the public through bill inserts, brochures, community speakers, paid advertising, school education programs, and community events. Tracy also maintains a website providing water conservation tips, rebate applications for high-efficiency clothes washers, and information regarding the residential water survey program.[43]

This public information program is managed by the City's WCC, Stephanie Reyna. In FY 2005, Mrs. Reyna visited two community groups and maintained water information in the City's monthly news update "CityScape". Mrs. Reyna is currently coordinating with homeowner associations and local non-profit organizations to provide additional water conservation material and speakers. She maintains a booth at Tracy's annual Bean Festival where information is distributed regarding the City's water conservation programs.

The City also promotes water conservation through television, radio, and cinema advertisements. During FY 2005, the City spent $5,795 to run two slides before every movie on all 14 screens at the Tracy Cinemark from October 2004 to September 2005 (Table 19).

7.1.8 BMP 8 - School Education

Tracy continues to promote water and other resource conservation at schools. City consultants visited elementary school classrooms to distribute water conservation information and residential water survey kits, with 230 water conservation kits distributed in FY 2001.

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[41] High-efficiency washers use one-third less water and one-fourth less energy to clean clothes compared with conventional machines. Instead of agitating clothes back and forth, high-efficiency washers gently lift, toss, and tumble clothing during the spin and rinse cycles and extract more water during the spin cycle.
[42] Qualifying high-efficiency washing machines are listed at www.cee1.org.
[43] http://www.ci.tracy.ca.us/departments/public_works/water_resources/

In 2005, Tracy's WCC initiated a new School Education Program to cover all of Tracy's fifth grade classrooms, including visits by the WCC upon request. The educational materials include teacher's guides and student workbooks provided by the DWR, such as the Captain Hydro comic books and videos. Information is also provided on safe conduct near canals. Mrs. Reyna conducted five 45-minute presentations to fifth grade classrooms in FY 2005.

Tracy plans to continue working with the school districts and private schools in its service area to provide instructional assistance, educational materials, and classroom presentations that emphasize local urban, agricultural, and environmental issues related to water use.

7.1.9 BMP 9 - Commercial, Industrial, and Institutional (CII) Accounts

Tracy is currently working to upgrade the CII water conservation program software that the City purchased in 2004. The new software will track the top ten consumers in each meter size category, as well as perform the following functions:

- Identify commercial, industrial, and institutional customers;
- Rank commercial, industrial, and institutional customers according to annual water use;
- Audit the targeted number of Commercial, Industrial, and Institutional accounts;
- Replace the targeted number of toilets with Ultra-Low Flush units;
- Monitor the effectiveness of implemented audit recommendations; and
- Identify incentives programs that encourage the implementation of remaining cost-effective audit recommendations.

7.1.10 BMP 10 - Wholesaler Incentives (Revised March 10, 2004)

This BMP does not apply to Tracy because Tracy is not a wholesale water agency.

7.1.11 BMP 11 - Water Pricing to Encourage Conservation

In addition to the water meter monthly service charge described in BMP 4 (Section 7.1.4), the City also employs a tiered rate structure based on the quantity of water consumed by each customer. Four tiers are defined by the number of units of water use, with one unit equal to 100 cubic feet (748 gallons). Table 20 shows the unit rates for the City's four pricing blocks, and the cost per unit for the Winter and Summer rating structure.

To compensate for revenue losses and the resultant fiscal impacts during the low-flow winter months and during periods of water conservation, the City varies its water rates seasonally (see Table 20) Additionally, the City Council maintains the authority to adopt conservation pricing and water use surcharges in times of need (TMC 11.28.220 and 11.28.230).

7.1.12 BMP 12 – Water Conservation Coordinator

The duties of the WCC are currently fulfilled by Stephanie Reyna. Mrs. Reyna took over the position of Water Resource Coordinator in January 2004 following the retirement of the previous Coordinator, Terry Ronneberg.

As Tracy's overall Water Resource Coordinator, Mrs. Reyna's responsibilities are divided 40% to water conservation efforts in the role of Water Conservation Coordinator, 40% to storm water management, and 20% to groundwater management. The duties of the WCC include coordination and oversight of conservation programs and BMP implementation, preparation and submittal of the USBR Annual Update, communication and promotion of water conservation issues to senior City management, coordination of agency conservation programs with operations and planning staff, and preparation of the annual water conservation budget.

7.1.13 BMP 13 - Waste Prohibitions

Tracy established a water waste prohibition as part of its Water Conservation and Rationing Plan (TMC Chapter 11.28) (Appendix H). Water waste prohibitions include restrictions on landscape irrigation at certain times (see Section 7.1.5), prohibition of "flagrant water waste or excessive runoff", proper maintenance of plumbing and irrigation systems, prudent conservation measures, and swimming pool and hot tub covers to limit evaporation. Flagrant water waste or excessive water runoff is defined as any water that flows directly from a tap connected to the City water system that leaves the property of origin in a continuous flow of any dimension for 150 feet from the property, or for more than five minutes in duration. Prudent water conservation measures include actions such as hand-held "trigger" nozzle handle sprayers, the use of drought-tolerant landscaping, and watering during non-windy times to prevent excess water loss.

Tracy's Water Conservation and Rationing Plan also dictates measures that the City can implement to reduce or eliminate water waste during periods of extreme dryness. These measures, described in more detail in Section 7.1 of this UWMP, include restrictions on landscape irrigation, sidewalk and car washing, and other residential, recreational, and commercial uses of water.

Enforcement of the water waste prohibitions is done by the Water Conservation Coordinator. The WCC issues Courtesy Notices informing customers regarding violations of the Water Management Ordinance. Usually the first Courtesy Notice induces compliance. If the first Notice does not work, Tracy issues two more. If those do not result in compliance, the WCC writes a letter, delivered by certified mail, warning that if the customer does not comply, Tracy will issue a citation.

7.1.14 BMP 14 - Ultra Low Flow Toilets

In accordance with the California Building Code, beginning in 1992 all new and remodeled buildings are required to install 1.6-gallon per flush ULFT toilets. Only ULFTs are available for purchase at stores. Since the California Building Code does not require residents to replace their pre-existing high-flow toilets with ULFTs, many cities offer rebate or replacement programs to

induce residents to voluntarily replace their older toilets with ULFTs. The City spent $45,000 for design and implementation of the City's ULFT replacement program, with ULFTs offered free of charge. In 2002, City consultants coordinated with Tracy High School to distribute 400 ULFTs at a school fundraising event. The City is currently exploring options for reinstating the replacement program, potentially including a rebate program for the purchase of ULFTs by customers who live in pre-1992 residences.

7.2 SCHEDULE OF IMPLEMENTATION

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (f)(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

As described above, all of the aforementioned BMPs are currently being implemented by the City or are scheduled for implementation within the timeline indicated under each individual BMP.

7.3 EFFECTIVENESS OF IMPLEMENTATION

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (f)(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

Tracy meters customer water use and has recently acquired software that enables the City to track each customer's water consumption. By comparing specific customer accounts before and after the implementation of a particular BMP, such as residential surveys, retrofits, clothes washer replacements, CII audits, and ULFTs, the City will endeavor to evaluate the effectiveness of that particular BMP. Compensating for climatic, land use, or other changes at an individual account may make such determination of BMP-specific water savings imperfect.

7.4 CONSERVATION SAVINGS

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (f)(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

Methods for quantifying the water saved by BMPs could include development of a database that would allow the City to track those accounts that have retrofitted their plumbing fixtures as part of a BMP, such as water-efficient clothes washers and other low-flow equipment, and comparing water use at those accounts pre- and post-retrofit.

7.5 EVALUATION OF DEMAND MANAGEMENT MEASURES NOT IMPLEMENTED

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.
(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

Tracy currently implements or plans to implement 13 of the 14 BMPs described by the CUWCC and the UWMP Act. The remaining BMP, the Wholesaler Incentives (BMP 11), does not apply to Tracy because Tracy is not a water wholesaler.

8. RECYCLED WATER PLAN

Water recycling can offset the use of potable supplies and reduce the quantity of discharged wastewater. Recycling, or reclaiming, water involves treating wastewater to an acceptable level such that it can be reused for irrigation, cooling, and other non-potable applications.

The regulatory requirements for recycled water are defined in the California Code of Regulations, Title 22, Article 3. The extent of treatment needed varies for different permitted uses (Table 22). Because recycled water is treated wastewater, its availability is closely linked to the treatment capability of the City's Wastewater Treatment Plan ("WWTP").

The following sections describe Tracy's current and planned wastewater treatment and water recycling facilities and discuss current and projected uses of recycled water. A description of Tracy's efforts to increase recycled water use in existing and proposed developments is included, as well as an account of Tracy's plans to supply the nearby Tesla Power Project with recycled water for evaporative cooling, processing, and landscape irrigation.

8.1 COORDINATION

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

The City is currently the sole agency responsible for water, wastewater, groundwater, and planning within Tracy's service area. However, Tracy's efforts to increase use of recycled water has required coordination between the City other relevant agencies and stakeholders. To provide the Tesla Power Project with recycled water, Tracy is coordinating with the project proponents, Midway Power LLC ("Midway Power"), and the Contra Costa Water District. To increase recycled water use within new and existing developments, Tracy's Department of Public Works is coordinating with proponents of the proposed Tracy Gateway and Tracy Hills developments

8.2 WASTEWATER SYSTEM DESCRIPTION

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

Tracy's WWTP is located north of Interstate 205, between MacArthur Drive and Holly Drive. The WWTP is under construction with its most recent expansion project. The City's wastewater treatment, disposal, and expansion plans are summarized in the following sections.

8.2.1 Wastewater Treatment and Disposal

The WWTP has a National Pollutant Discharge Elimination System ("NPDES") permit that allows the City to discharge up to 9.0 MGD average dry weather flow ("ADWF") of treated effluent to the Old River. The City is awaiting approval of an amended permit to allow discharge of an additional 7 MGD to meet future wastewater flows, for a total of 16 MGD. The amended permit, which is administered by the Central Valley Regional Water Quality Control Board, will set forth the maximum allowable discharge rate, effluent quality requirements, discharge prohibitions, receiving water limitations, pretreatment program requirements, biosolids disposal requirements, and self-monitoring guidelines.

The WWTP provides secondary-level treatment followed by disinfection. Equipment at the WWTP includes primary clarifiers, bio-towers, and biotower trickling filters. The City's major industrial wastewater producer, the Leprino Cheese factory, conveys its wastewater through a separate force main to a pre-treatment pond that is operated by Leprino and located on WWTP property. A significant portion of the biochemical oxygen demand ("BOD") is removed in this pre-treatment pond before the cheese factory wastewater is conveyed to the WWTP. The main treatment processes at the WWTP are described below and are shown schematically on Figure 10:

- Aerated holding ponds partially treat the Leprino Cheese factory industrial flows before treatment;
- Pre-treatment removes coarse solids and grit;
- Primary treatment removes most settleable and floatable material;
- Secondary treatment in biotowers reduces levels of soluble organic material and suspended solids;
- Chlorination disinfects treated wastewater, followed by sulfonation for dechlorination;
- Treated plant effluent is discharged to the Old River; and
- Solids are thickened, dewatered, and then spread in sludge drying beds.

After treatment, wastewater is disinfected and dechlorinated and then conveyed by a 3.5-mile, 33-inch outfall pipeline to a submerged diffuser for discharge into the Old River. The outfall is designed for a peak flow of about 22.0 MGD.

Waste solids from the wastewater treatment processes are collected and conditioned for disposal. The treatment process for solids includes thickening, digestion, and dewatering. Dried biosolids are hauled off-site and used as alternative daily cover at sanitary landfills. This off-site hauling and disposal practice is expected to continue in the future.

8.2.2 Wastewater Treatment Plant Expansion

In 1985-1987, a WWTP expansion, including an upgrade to the solids handling facilities, increased the rated treatment capacity from 5.5 MGD to 9 MGD (CH2M HILL, 1994). The Final Environmental Impact Report ("EIR") for the expanded WWTP was published in September 2002. The City submitted all required documentation to the CVRWQCB in 2003. The revised permit is pending.

The current WWTP expansion project includes improvements to the City's existing treatment facilities, construction of additional facilities at the existing WWTP site, as well as construction of a second outfall pipe and diffuser in the Old River. These improvements will increase treatment capacity from the existing 9 MGD to 16 MGD, and provide tertiary-level treatment meeting Title 22 requirements.

The proposed expansion will be completed in four phases. Phase 1 of the construction is expected to be completed in Spring 2007. The remaining phases will be constructed to match future projected increases in wastewater flows. A flow diagram for the expanded treatment processes is shown in Figure 11.

8.3 WASTEWATER QUANTITY, QUALITY AND CURRENT USES

10633 (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

The current treatment capacity of the WWTP is 9 MGD. The average daily flow rate of wastewater collected and treated at the WWTP between 2000 and 2004 was 7.43 MGD. The City's wastewater discharge has increased over the past several years, from a daily average of 6.7 MGD in 2000 to 8.35 MGD in 2004, and is expected to continue growing as future developments come online. With Tracy's current growth rate, wastewater flow is projected to increase to approximately 14.5 MGD by the year 2025 (Table 23).[44] To meet projected future demand, Tracy is expanding its WWTP facilities to handle an average daily flow of 16 MGD (see Section 8.2.2).

Though the current WWTP facilities do not yet have tertiary treatment capability, the City has historically utilized secondary-treated recycled water for irrigation on the WWTP premises. As the current WWTP expansion project has reduced the WWTP's landscaped area, recycled water is not currently being used for irrigation at the WWTP.

8.4 POTENTIAL AND PROJECTED RECYCLED WATER USE

10633 (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
10633 (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

[44] Assuming an average of 125 gallons per capita per day of domestic wastewater flow and an average allowance for industrial flows (CH2M HILL, 1994).

The City is pursuing use of recycled water in and around Tracy. Measures include (1) a potential program to supply Midway Power with recycled water from Tracy's WWTP to meet the Tesla Power Project's cooling, process, and landscaping water needs, (2) a City ordinance mandating that all new developments include non-potable pipelines for irrigation, and (3) a program to exchange portions of the City's potable water supply, used in City parks and dedicated irrigation areas, for non-potable water from proposed developments such as the Tracy Gateway Project. These three programs are described in more detail below.

8.4.1 Potential Recycled Water Use

Potential locations for recycled water use are described below.

8.4.1.1 Tesla Power Project

The following discussion of the Tesla Power Project is based on information from the California Energy Commission's Tesla Power Plant Project Documents Page and the City staff report on the Recycled Water Agreement for the Proposed Tesla Power Project, dated July 2003.[45]

The Tesla Power Project was proposed in 2001 by Midway Power, a subsidiary of Florida Power & Light. Effective June 16, 2004, the Energy Commission issued an order authorizing Midway to proceed with the Tesla Power Plant.[46] The project is located on a 60-acre site in Alameda County, approximately one-half mile north of the Pacific Gas & Electric ("PG&E") Tesla Substation and west of the San Joaquin County line.

The Tesla Power Project is proposed to be a 1,120-megawatt, combined-cycle generation station using four natural gas turbine generators, two heat-recovery steam generators, and two steam-turbine generators. The Tesla Power Plant is expected to cost $600 million to $700 million and provide electricity for more than one million Central Valley families.

The annual water requirements for the Tesla Power Project will be up to 5,900 ac-ft per year. Most of this water was originally proposed to come from the SWP, provided under agreement with the Rosedale-Rio Bravo Water Storage District in Kern County via a 1.7 mile water line from the California Aqueduct. In May 2004, the California Energy Commission approved Midway Power's proposal under the condition that water used for the cooling system come from recycled wastewater rather than from potable SWP water. In accordance with this condition, Tracy has proposed to provide Midway Power with up to 8.1 MGD of recycled water from the WWTP.

The agreement proposed between Tracy and Midway Power will provide reuse of up to 8.1 MGD of wastewater. Midway Power will fund and implement the design, permitting, and construction of the pipeline, pump stations, and all other infrastructure to convey the recycled water to the

[45] The Tesla Power Project Documents can be found at http://www.energy.ca.gov/sitingcases/tesla/documents.

[46] The Commission required, among other things, that the plant use recycled water from the City as water for the Power Plant's evaporative cooling towers, processing, and landscape irrigation. If for any reason Midway Power and the City are unable to agree on the recycled water supply, Midway Power must file a proposed amendment with the Energy Commission that includes other cooling water options.

Tesla Plant.[47] At the City's request, Midway Power will oversize the recycled water conveyance pipeline and install turnouts where requested by the City at the incremental cost. This will allow the City to expand recycled water infrastructure within City boundaries to provide for additional recycled water use in the future.

8.4.1.2 Water Exchange Program

As described in Section 4.4.5, Tracy has developed a Water Exchange Program in an effort to allocate its available potable water resources to the highest and best uses. The WEP facilitates the exchange of potable water supplies that are currently being used to meet irrigation demands within the built-out portion of Tracy for recycled water or for non-potable water that is treated at wastewater treatment plants located in new residential and CII developments. The potable water that was being formerly used for irrigation purposes within Tracy will then be allocated to the new developments.

Several schools, parks, and other areas within the City have been identified as potential candidates for conversion to recycled water. In order to provide the selected areas with recycled water, the City's current recycled water infrastructure must be expanded to connect the selected areas with WWTPs associated with these new developments. Expansion of the recycled water infrastructure will involve the installation of recycled water distribution mains in several of the City's arterial streets, including Tracy Boulevard, Lammers Road, Corral Hollow Road, MacArthur Drive, and Eleventh Street. Recycled water pump stations and storage reservoirs may also be required. The expansion of the City's recycled water infrastructure will be completed in phases as additional developers participate in the WEP.

The 538-acre Gateway Project is the first development to engage in the WEP with the City. The Gateway Project is planning to build a wastewater recycling plant to supply 29 potential sites within Tracy with 780 ac-ft per year of recycled water (West Yost, 2002). These 29 sites and their estimated irrigation demands are described in Table 24. Irrigation demands at these sites will be converted to recycled water in phases. A preliminary phasing plan for the conversion of these sites to recycled water is also included in Table 24.[48] During Phase 1 of the Gateway Project, untreated raw water supplies purchased from the WSID may be used to meet irrigation demands at these sites until completion of Gateway's wastewater recycling facilities.

8.4.1.3 Recycled Water Distribution System Requirement for New Developments

New developments in Tracy are required to include recycled water distribution systems in accordance with the City's Recycled and Non-Potable Water Ordinance (TMC Chapter 11.30; see Appendix H). The requirements of the Recycled and Non-Potable Water Ordinance facilitate the future use of recycled or other non-potable water for irrigation purposes within the new

[47] The proposed designs will be reviewed and inspected by the City to ensure that the facilities are constructed to meet City standards.

[48] For most of the parks, a unit water use of 2.75 AF per ac-ft per year has been assumed to determine the amount of water available for the exchange. For Presidio Park, a unit water use of 4.5 AF/ac-ft per year has been used as the City has already assigned equivalent customer units ("ECUs") to Presidio Park based on this value (West Yost, 2002).

development. The Tracy Gateway Project, for example, anticipates a recycled/non-potable water demand of 760 ac-ft per year for a golf course, landscaping, and roadway medians within the Gateway Project development itself (Table 25). This irrigation demand is projected to be met with recycled water from Gateway's proposed wastewater recycling plant or with untreated water from WSID's Upper Main Canal.

The plans for the Tracy Hills development also provide for a wastewater recycling plant that will provide approximately 3,300 ac-ft per year of tertiary-treated recycled water to offset potable water demands for irrigation within this development (Nolte, 2000b). Due to the City's growth control ordinance (Measure A), completion of the Tracy Hills development is likely to be delayed until after 2013.

8.4.2 Projected Recycled Water Use

Table 25 tabulates all of the projected recycled/non potable water demand estimates for the Tesla Power Project, City parks, and landscaped areas that will be supplied with recycled water pursuant to the WEP.[49] Also compiled are the projected recycled/non-potable water demands from new developments such as the Gateway Project and Tracy Hills.

Recycled water demand from the Tesla Power Plant is expected upon completion of the project and construction of the recycled water infrastructure connecting the Tesla Power Plant and Tracy's WWTP. The City expects to begin supplying the Tesla Power Project with up to 5,900 ac-ft/yr of recycled water by approximately 2010.

The exchange of potable and non-potable water between City parks and Tracy's Gateway Project is expected to begin by 2010. Although construction of recycled water infrastructure would begin during Phase I of the Gateway Project construction, park irrigation demands would be satisfied by the potable water system until the construction of the water system infrastructure is completed. In the future, approximately 780 ac-ft per year of irrigation demand is anticipated to be met with recycled water.

Recycled/non-potable water use within the Gateway Project is expected to begin in 2010. Recycled water demands within the Tracy Hills development are expected to begin after 2013. As described in Section 8.4.1, because Tracy Hills is a primarily residential development, its growth will be impacted by the residential growth restrictions pursuant to Measure A. As shown in Table 25, once completed, the Gateway and Tracy Hills projects are expected to use 760 ac-ft per year and 3,300 ac-ft per year of recycled/non-potable water respectively.

8.4.3 Actions to Encourage Recycled Water Use

10633 (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

[49] The projections for Tracy's future use of recycled water provided in this 2005 UWMP update are consistent with programs described in the 2000 UMWP.

As described above in Sections 8.4.1 and 8.4.2, the City has taken numerous steps to encourage the use of recycled water within and around Tracy. In accordance with the City's 2002 Recycled and Non-Potable Water Ordinance (see Appendix H), new developments are required to install pipelines and dual distribution systems to supply recycled or non-potable water to landscaped areas for irrigation and to facilities for industrial cooling or processing. The City's Water Exchange Program is designed to convert existing City parks and other large irrigated areas to non-potable water as opportunities arise.

8.4.4 Plan to Optimize Recycled Water Use

10633 (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

Tracy wishes to increase its future use of recycled/non-potable water. The City's proposed agreement with Midway Power, the new WEP and associated cooperation with proposed developments, and the City's Recycled and Non-Potable Water Ordinance encourage the use of recycled water. The City has been closely involved with these projects as they develop, and remains committed to working toward significant water recycling in the future.

9. WATER SHORTAGE CONTINGENCY PLAN

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier: (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

Tracy established its Water Shortage Contingency Plan ("WSCP") in 1992, following a period of severe drought, to provide City staff and City water customers with guidelines for reducing water consumption in the event of another drought (Appendix M). Tracy's WSCP includes an analysis of current and projected water demands and supplies, a water conservation and rationing plan with mandatory prohibitions and penalties, and an analysis of projected revenues and expenditures.

The WSCP was incorporated into the Water Management Chapter of the TMC as codified in Chapter 11.28, Article 5 - Drought and Other Water Emergency, and Article 6 - Water Conservation and Rationing Plan, Water Emergency Plan, Variances and Appeals ("WCRP"). The WCRP sections of the TMC since been amended to incorporate changes in rate schedules, penalties, among others. Because the WCRP sections of the TMC incorporate the most recent version of the amendments to the WSCP, for the purposes of this UWMP, all water conservation and water emergency/drought mandates reference the WCRP sections of the TMC rather than the WSCP.

Tracy's WCRP includes provisions for five Stages of Action (referred to as "Phases" in the TMC and as "Stages" in this UWMP). The following sections describe the measures to be taken in each of the five Stages, the prohibitions, penalties, and consumption reduction methods for each stage, and enforcement mechanisms for ensuring that the desired cutbacks are achieved.

Implementation of the WCRP can be triggered by four different scenarios: (1) decline of groundwater basin level to 30 feet below sea level; (2) cutback of CVP water supplies; (3) drought declaration by the Governor of California; and (4) any unusual situation that affects the quantity or quality of the City's water supply. In the event that any of the aforementioned triggers occur, the City Council is granted the authority to declare a drought and direct the City Manager to implement the WCRP. Transitions between the conservation phases outlined in the WCRP are implemented by resolution of the City Council

9.1 STAGES OF ACTION

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier: (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

The five Stages of Action ("Stages") outlined in the City's WCRP (TMC 11.28. Article 6) are intended to promote the proper management and distribution of water supplies during a drought or emergency situation. Each of the five Stages describes specific actions to be taken by individual water customer sectors to achieve the water conservation requirement of that particular Stage. All of the Stages allow for adequate water to protect public health and safety and satisfy the fire protection needs of the City.

Each of the five Stages corresponds to a specific City-wide potable water demand reduction goal. These potable water demand reduction goals are based on the City's potential supply cutbacks during times of drought, with up to a 50% supply reduction as mandated by the UWMP Act. The five Stages and their associated cutbacks are described in Table 26.

The first Stage, Stage I, represents a potable water demand reduction goal of less than 10%. Stage I reflects a scenario where the City may maintain sufficient supplies to meet normal year potable water demands, but calls for voluntary reductions in water use to help alleviate potential impacts of more severe supply reductions in subsequent years. Stage I prohibits flagrant water waste, mandates swimming pool covers and proper maintenance of plumbing and irrigation systems, and encourages the use prudent water conservation measures for landscapes. These actions are listed in Table 26.

The actions outlined in Stage II are to be implemented when the City requires a 10% reduction in potable water demand during dry year periods. Stage II calls for landscape irrigation and outdoor water use conservation measures, including the development of a landscape irrigation schedule for single-family residences, restrictions on non-essential water uses such as sidewalk washing and car washing, and the addition of water above operational requirements for pools and hot tubs (Table 26).

Stage III water conservation and rationing measures are geared toward a 15% reduction in City-wide potable water demand. The steps to achieve a Stage III reduction include all of the steps outlined in Stage II, as well as the additional mandates described in Table 26. A 15% reduction in potable water demand should be achievable through increased restrictions on landscape irrigation and non-essential water uses, as well as increased emphasis on implementation of a public information campaign.

The fourth WCRP Stage, Stage IV, includes the actions outlined above in Stages I through III combined with additional restrictions necessary to achieve a 25% reduction in potable water demand within the City. These restrictions target non-essential water uses by commercial

facilities and industries. Measures would include car washing practices for auto dealerships and additional public information notices in commercial businesses.

Stage V identifies mechanisms by which the City can reduce total potable water demand by more than 25% (with up to a 50% cutback for the purposes of this UWMP). To achieve a reduction in potable water demand exceeding 25%, the City would prohibit all water use except as required for public health and safety (50 gallons per capita per day). Reductions in Stage V would include a 100% cutback in recreation and irrigation water use.

9.2 ESTIMATE OF MINIMUM SUPPLY FOR NEXT THREE YEARS

10632 (b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

Tracy's estimate of the minimum water supply available during the next three years is conservatively assumed to be equal to the quantity of water that Tracy can expect to receive during an extreme-dry year period as described in Section 5 of this UWMP. It is estimated that the City's minimum supply for the next three years (2006 to 2008) will be 20,975 ac-ft per year, which is more water than the City's normalized 2005 total potable water demand of 18,500 ac-ft per year.

9.3 CATASTROPHIC SUPPLY INTERRUPTION PLAN

10632(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

In response to the requirements of the Public Health, Security and Bioterrorism Preparedness and Response Act of 2002 ("Bioterrorism Act"), Section 1433 amendment to the Safe Drinking water Act, Tracy has prepared a Water System Emergency Response Plan ("WSERP") (West Yost, 2004). The City's WSERP provides a framework for emergency response by the City's Public Works Department ("Department") by describing the Department's emergency management organization, roles, and responsibilities and emergency policies and procedures. Excerpts from Tracy's WSERP can be found in Appendix N. In accordance with the aforementioned goals, the WSERP:

- Describes the Departments' emergency management organization;
- Identifies of the types of emergencies that the Department may need to respond to for its water system;
- Outlines the roles and responsibilities the Department and its staff during emergency response and recover; and
- Compiles and organizes water system emergency response protocols and procedures.

Prior to the 2003 WSERP, the City had developed numerous emergency planning and procedures documents which provide information on emergency roles and responsibilities and specific emergency procedures for the City's water supply and distribution facilities. Tracy's 2003

WSERP is not intended to replace these documents, but is designed to work in conjunction with existing plans. Additional water supply emergency plans adopted by the City include:

- *City of Tracy Emergency Plan*, prepared in cooperation with the Tracy Fire and Police Departments, 1997;
- *Emergency Response Handbook*, prepared by the City's Safety Coordinator, last updated 2002;
- *City of Tracy General Standby Procedures*, prepared by the City in February, 1998;
- *Process Safety Management Program*, prepared by Base Associates, 1996;
- *Emergency Action Plan for City of Tracy Fresh Water Treatment Plant and Associated Well Sites*, prepared by the City in 1997 to be updated when the JJWTP Expansion Project is completed;
- *Department of Health Services Water Quality Emergency Notification Plan*, prepared by the City in March 2000 to be updated as needed;
- *Water Treatment Plant Operations Manual*, prepared by Kennedy/Jenks/Chilton, 1990;
- *Water Treatment Plant Operations Plan*, prepared by the City, 2000;
- *Risk Management and Prevention Program Risk Management Plan for City of Tracy Fresh Water Treatment Plant*, prepared by Base Associates, 1994;
- *Hazardous Materials Business Plan*, prepared by the City, January 1994, with annual updates.

A more complete description of these plans can be found in the WSERP.

9.3.1 Types of Emergencies

Several types of emergencies can occur which could impact the City's water system and its operations. Tracy's WSERP is designed to assist the City in quick response to water system emergencies that may include the following natural or man-made causes:

- Earthquake
- Fires
- Contamination or loss of water supply
- Hazardous materials spills or leaks
- Severe storms or floods
- Landslides
- Pipelines, reservoir, tank and/or building failure
- Civil unrest, vandalism, or terrorist action or threat
- National security emergency
- Widespread power outage
- Airplane crash
- Traffic/highway accidents
- Intrusion through Supervisory Control and Data Acquisition system

It is important to note that there are a number of events, such as large earthquakes or fires, which occur infrequently, but have a very high impact potential. There are also events, such as severe storms and floods, which have less of an impact potential, but occur more frequently. Although the planning basis for Tracy's WSERP is for a major emergency, the principles outline in the WSERP can be applied to any type or magnitude of event.

9.3.2 Emergency Categories and Response Levels

Four response categories have been defined in the WSERP to provide a common method of describing the type of event, area affected, and the extent of coordination or assistance needed. These categories include (0) Readiness/Routine Response, (1) Local Emergency, (2) Local Disaster, and (3) Major Disaster (see Table 6, Appendix N).

Depending on the severity of a given emergency, the situation may warrant response from different levels of government consistent with the Standardized Emergency Management System ("SEMS"). Tracy's WSERP identifies these levels as State, Regional, Operational Area (San Joaquin County), Local (City of Tracy), or Field (Public Works Staff). The extent of each levels' responsibilities is described in Figure 1 of Appendix N and their involvement in each of the four emergency response categories are outlined in Table 6 of Appendix N.

9.3.3 Plan Activation, Response, and Deactivation

Table 9 in Appendix N gives the response categories, triggers and potential response actions to be implemented to the extent required by the nature and scope of the emergency. The activation process includes plan triggers, staff responsibilities, mutual aid or assistance availability and damage assessment. Responses are coordinated in accordance with the severity and extent of the emergency.

Table 10 of Appendix N identifies deactivation triggers and potential actions to be implemented once the emergency situation has been corrected and water quality is established. The deactivation process is in the reverse order of the activation process, starting with the highest category attained in the activation process.

9.4 CONSUMPTION REDUCTION METHODS, PROHIBITIONS, AND PENALTIES

10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. (f) Penalties or charges for excessive use, where applicable.

9.4.1 Consumption Reduction Methods and Prohibitions

Consumption reduction methods and prohibitions for the five Stages of Action described in Tracy's Water Conservation and Rationing Plan are described above in Section 9.1 and in

Table 26. During Stage V, the most restrictive Stage, the City intends to reduce water use by prohibiting the following actions:

- No recreational water use allowed
- No irrigation water use allowed
- All water uses not required for public health and safety and fire protection are prohibited
- Notices of drought conditions posted in all facilities with restrooms

Prohibitions against specific water use practices for Stages I through IV are outlined in Table 26 and in the WCRP (see Appendix M). Specific restrictions for each Stage of Action are outlined in the WCRP, including those restrictions applying to irrigation using potable water, car washing, filling swimming pools, and building new developments during droughts. Practices such as using potable water for construction purposes are also prohibited when the City is required to cutback water use significantly.

9.4.2 Penalties

In accordance with TMC 11.28.070, a customer who violates any of the provisions of Stage I through Stage V of Tracy's WCRP, or fails to comply with an order or permit made thereunder, is guilty of an infraction. Under Section 1.04.030 of the TMC, an infraction is punishable by:

(1) A fine not exceeding $100 for a first violation.
(2) A fine not exceeding $200 for a second violation within a twelve month period.
(3) A fine not exceeding $500 for each additional violation of within a twelve month period.
(4) If a person is found to have violated the same Code provision at least twice within a twelve month period, the offense, which would otherwise be an infraction, is considered a misdemeanor.[50]

Additional actions that are penalized in TMC Section 11.28.070 include the unauthorized drawing of water from a fire hydrant, the drawing from a fire hydrant for construction purposes after receiving notice that reclaimed water is available and required, or the construction of a bypass around a water meter. Such actions are subject to a $500 fine.

Four violations within the same six month period will result in the installation of a meter service flow restrictor at the customer's expense. The flow restrictor is to remain in place for the remainder of the drought or water emergency. Failure to pay assessed fines will result in termination of water service until payment in full of all fines and usual reconnection charges are collected from the customer.

[50] A misdemeanor is punishable by a fine not exceeding $1,000, or imprisonment not exceeding six months, or both. (Ord. 996 § 1 (part), 1999)

9.5 ANALYSIS OF REVENUE IMPACTS OF REDUCED SALES DURING SHORTAGES

10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

Since Tracy bills its customers per unit volume of water consumed, the City would experience a reduction in revenue upon implementation of the Water Conservation and Rationing Plan. As described in Section 7.1.11, to compensate for the expected revenue reduction cause by water conservation, the City Council reserves the authority to adopt a temporary rate increase and institute an excess water surcharge (TMC 11.28.220 and 11.28.230).

9.6 DRAFT ORDINANCE AND USE MONITORING PROCEDURE

10632 (h) A draft water shortage contingency resolution or ordinance.
10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

A copy of the City's Water Shortage Contingency Plan, its Water Conservation and Rationing Plan, and the associated Articles 5 and 6 of Tracy's Municipal Code ("TMC") Chapter 11.28 (see Appendix H). In order to determine the actual reduction in water use during water shortage periods, the City plans to increase the frequency at which it conducts meter readings to ensure that customers are conserving water. By frequently monitoring water use at its residential and CII accounts, the City will ensure compliance with water shortage rationing and be able to impose penalties on those who are not complying with the Water Conservation and Rationing Plan or the Stage of Action being enforced. Non-compliance with the required water conservation will result in the penalties described in Section 9.2, potentially including fines, flow restriction devices, and termination of service.

10. ADOPTION AND IMPLEMENTATION OF UWMP

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code.. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

As described in Section 1.3, the City informed the public and the appropriate agencies of (1) its intent to prepare this updated 2005 UWMP, (2) when and where the UWMP was available for public review, and (3) when the public hearing regarding the UWMP would be held. All notifications were completed in compliance with Section 6066 of the Government Code.

This updated 2005 UWMP was adopted by Resolution No. 2005-305 by the City Council during its 6 December 2005 City Council meeting.

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Table 1
Coordination with Appropriate Agencies and the Public (a)
City of Tracy, California

Action	DMC/CVP Agencies	SCSWSP Agencies	GW Basin Management Agencies	Public
Sent notice of intention to prepare UWMP (b)	8/22/2005	8/22/2005	8/22/2005	8/26 & 9/2/2005
Participated in UWMP development				
Notice of Public Review Period (c)	10/21/2005	10/21/2005	10/21/2005	10/21/2005
Received copy of draft UWMP	(d)	(e)		11/8/2005
Commented on the draft UWMP				
Attended public meetings				12/6/2005

Abbreviations:
CVP = Central Valley Project
DMC = Delta Mendota Canal
GW = Groundwater
UWMP = Urban Water Management Plan
SCSWSP = South County Surface Water Supply Project

Notes:
(a) The individual agencies included in the DMC/CVP Agencies, SCSWSP Agencies, and the GW Basin Management Agencies columns are listed in the text and in Appendix B.
(b) Notice of intention to prepare the UWMP was sent to agencies on August 22, 2005. Public notice was published in the Tracy Press on August 26, 2005 and September 2, 2005.
(c) Notice of public review was sent to agencies on October 21, 2005. Public notice was published in the Tracy Press on October 25, 2005 and on November 8, 2005.
(d) Byron-Bethany Irrigation District requested and was provided with a copy of Tracy's draft UWMP.
(e) The City of Lathrop requested and was provided with a copy of Tracy's draft UWMP.

Table 2
Historic and Projected Allocation of Residential Building Permits
City of Tracy, California

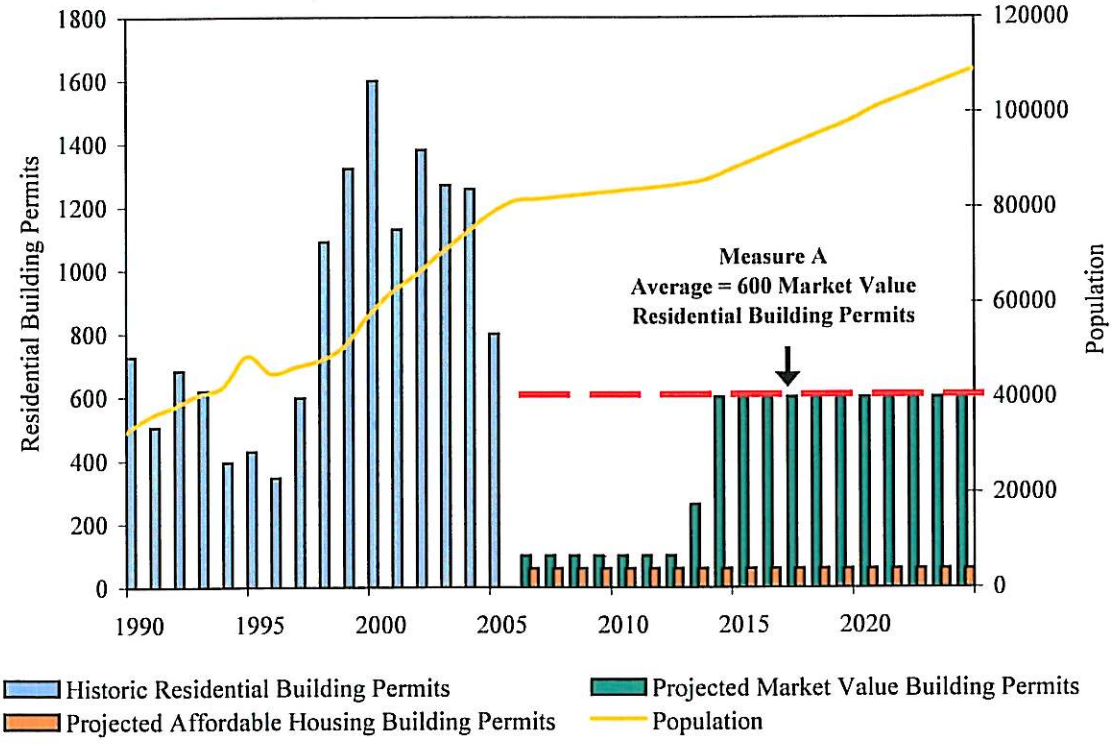
	Year	Residential Building Permits (a)		
		Market Value	Affordable	Total Residential
Historic	1990	727	--	--
	1995	429	--	--
	2000	1,599	--	--
	2001	1,130	--	--
	2002	1,381	--	--
	2003	1,270	--	--
	2004	1,257	--	--
	2005	800	--	--
Projected	2006	100	60	160
	2007	100	60	160
	2008	100	60	160
	2009	100	60	160
	2010	100	60	160
	2011	100	60	160
	2012	100	60	160
	2013	263	60	323
	2014	600	60	660
	2015	600	60	660
	2020	600	60	660
	2025	600	60	660

Abbreviations:
-- Data not available or not applicable
DEIR = Draft Environmental Impact Report

Notes:
(a) Historical and projected residential building permit allocations are based on Measure A building restrictions. Estimated allocations of market value building permits were provided by the Tracy Planning Department. The total quantity of affordable housing building permits from 2005 to 2025 is estimated to be 1,200 (from Tracy's 2005 DEIR, written in coordination with the Planning Department). Actual allocation of permits may vary in any given year.

Table 3
Historic and Projected Service Area Population
City of Tracy, California

	Historic			Projected				
Year	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**
Population (a)	32,730	48,570	57,000	78,300	83,100	87,800	98,400	109,000



Abbreviations:
DEIR = Draft Environmental Impact Report

Notes:
(a) Historic population estimates are from the 2005-2006 Fiscal Year Adopted Program Budget (based on the California Finance Department) and the 2000 U.S. Census. Population projections are based on Measure A building permit allocations for market value homes (Tracy Planning Department) and an estimated 1,200 additional building permits for affordable housing (2005 DEIR). An average household size of 3.21 persons (also from the 2000 U.S. Census) was multiplied by the number of estimated building permits to project future populations. The actual allocation of permits may vary in any given year.

Table 4
Pressure Zone Elevations and Static Pressures (a)
City of Tracy, California

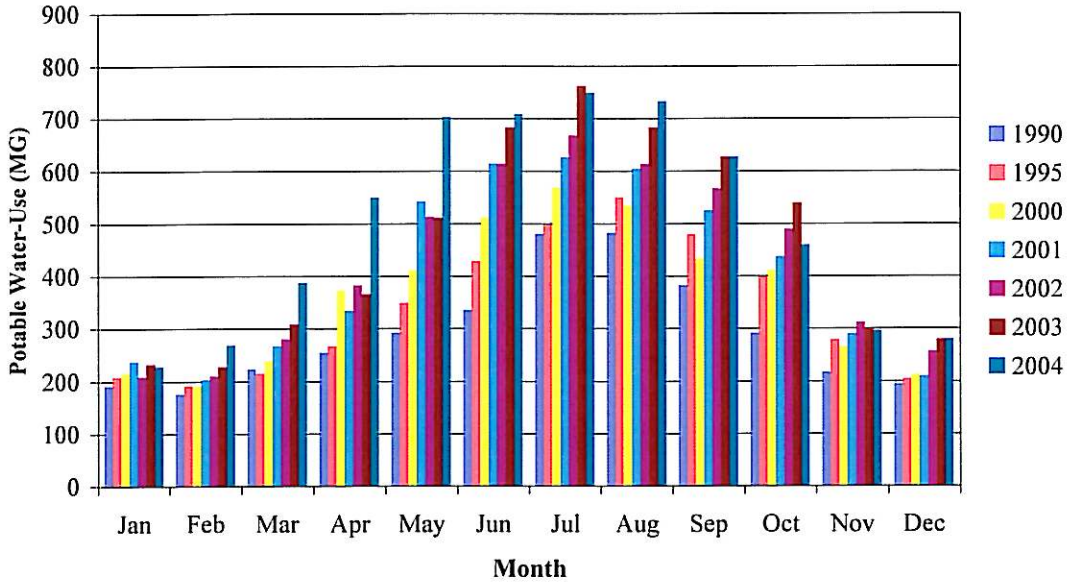
Pressure Zones	Service Elevation Range (ft)	Static Pressure Range (psi)
Zone 1	0-75	55-85
Zone 2	75-150	50-85
Zone 3	150-300	40-85
Zone 4	300-420	40-90
Zone 5	420-540	40-90

Abbreviations:
ft = Feet
psi = Pounds per square inch

Notes:
(a) Adapted from City of Tracy Water Management Plan (Kennedy/Jenks, 1994).

Table 5
Current and Historic Monthly Potable Water Use
City of Tracy, California

Month	Potable Water Use (MG) (a)							
	1990	1995	2000	2001	2002	2003	2004	2005
January	191	208	216	237	209	233	228	234
February	176	192	191	203	210	228	268	236
March	223	215	240	267	280	308	387	306
April	255	267	373	334	382	366	549	417
May	292	349	412	542	513	511	703	545
June	336	429	512	614	614	683	708	670
July	481	498	569	626	668	762	749	706
August	483	550	535	604	613	683	733	680
September	382	480	434	525	567	627	627	--
October	291	399	412	437	489	539	459	--
November	217	278	266	289	311	298	295	--
December	194	204	212	209	257	279	279	--
Total (MG)	3,521	4,069	4,372	4,887	5,113	5,517	5,985	--
Total (ac-ft)	10,806	12,487	13,417	14,998	15,691	16,931	18,369	--

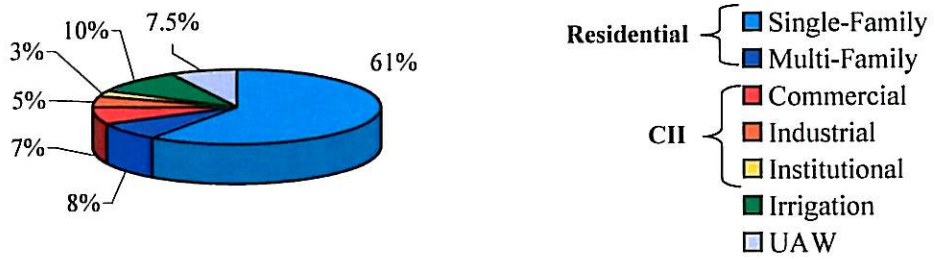


Abbreviations:
-- Data not available or not applicable
ac-ft = Acre-feet
MG = Millions of gallons

Notes:
(a) Water use data were provided by Tracy's Finance Department and do not include Unaccounted-for water. Data are not complete for 2005.

Table 6
Current and Historic Potable Water Demand by Water Use Sector
City of Tracy, California

Water Use Sector	Potable Water Demand (ac-ft/yr) (a) (b)						
	2000 (a)	2001	2002	2003	2004	2005 (c)	Average
Single-Family	7,000	8,667	9,368	10,259	11,569	12,530	9,899
Multi-Family	2,500	997	1,126	1,057	1,093	980	1,292
Subtotal Residential	*9,500*	*9,664*	*10,490*	*11,320*	*12,660*	*13,510*	*11,190*
Commercial	1,300	1,117	1,206	1,253	1,279	1,091	1,207
Industrial	1,200	668	663	690	770	639	772
Institutional	200	468	478	460	532	366	417
Subtotal CII	*2,700*	*2,253*	*2,347*	*2,402*	*2,581*	*2,095*	*2,396*
Irrigation	1,100	1,529	1,983	1,849	2,043	1,449	1,659
Total Water Use	**13,300**	**13,450**	**14,820**	**15,570**	**17,280**	**17,050**	**15,240**
UAW (d)	1.3%	10.6%	5.5%	8.2%	5.9%	7.8%	7.5%
Total Water Demand (e)	**13,469**	**15,042**	**15,680**	**16,965**	**18,363**	**18,500**	**16,337**



Abbreviations:
-- Data not available or not applicable
ac-ft/yr = Acre-feet per year
CII = Commercial, Industrial, and Institutional
UAW = Unaccounted-for water

Notes:
(a) Estimates of water use by customer sector for 2000 were made by the City's previous Water Resources Coordinator. Estimates for 2001 through 2005 were made using Tracy's Water Usage Data System software, aquired in 2001. This change in methodologies can be seen in the multi-family residential, commercial, and industrial sectors as well as in the UAW. Water use for the industrial sector may also show a decline due to the loss of the Heinz plant in 2001.
(b) Subtotals may not add exactly due to rounding.
(c) Water use estimates for October through December 2005 are projected using historic water use patterns.
(d) Unaccounted-for water is the quantity of water purchased and produced by the City, less the known quantity of water used by metered accounts. Reported as a percent of the total water demand. The average UAW does not include UAW from 2000 because of changes in the reporting methodologies.
(e) Total water demand is the projected quantity of purchased surface water supplies plus the quantity of water produced by the City's groundwater wells. Based on data from the Deputy Director of Public Works, Steve Bayley.

Table 7
Projected Potable Water Demand Itemized by Future Development
City of Tracy, California

	Development/Plan Name	Water Use Sector	Projected Potable Water Demand at Buildout (ac-ft/yr) (a) (b)
Approved Developments	Measure A RGA - Issued	Residential	258
	Measure A RGA - Secured	Residential	446
	I-205 Corridor (Commercial)	CII	24
	Northeast Industrial	CII	87
	Infill Commercial	CII	80
	Tracy Blvd Infill	Residential	14
	District 87-3 - Approved	Various	53
	District 87-3 - Other	Various	1,148
	Presidio	CII	0
	Eastgate	CII	67
	Subtotal Approved Develoments		***2,177***
Anticipated Developments	Plan C	Residential	0
	South MacArthur	Residential	0
	Soucheck	Residential	100
	Kagehiro	Residential	125
	Castro	Residential	165
	NWC Valpico & MacArthur	Residential	50
	Saddlebrook	Residential	300
	Filios	Residential	238
	I-205 Corridor (Finance Areas)	CII	185
	Northeast Industrial	CII	1,878
	Tracy Gateway	CII	1,009
	Subtotal Anticipated Developments		***4,050***
Specific Plans	Tracy Hills	Res/CII	5,500
	South Schulte	Res/CII	3,500
	Cordes Ranch	CII	2,000
	North Schulte	Res/CII	-- (c)
	Lammers	Res/CII	-- (c)
	Patterson Pass	Res/CII	-- (c)
	Banta	Residential	-- (c)
	Subtotal Specific Plans		***11,000***
	Projected Potable Water Demand Growth (2005 to build-out)		17,200
	2005 Normalized Potable Water Demand (d)		18,500
	Total Projected Potable Water Demand at Build-Out		**35,700**

Table 7
Projected Potable Water Demand Itemized by Future Development
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
CII = Commercial, Industrial, and Institutional
Res = Residential
ac-ft/yr = Acre-feet per year

Notes:
(a) Projected water uses for the identified developments and specific plans are taken from the City of Tracy Water Inventory Report, 2 August 2005. Water demands were calculated by the Department of Public Works based on the total acreage of each development/plan and CII, Residential, and Irrigation demand factors.
(b) Subtotals may not add exactly due to rounding.
(c) Not yet annexed by the City. Projected water demands not provided by the 2 August 2005 Water Inventory Report.
(d) Normalized potable water demand for 2005 is from the Water Inventory Report, August 2005 (see Table 8).

Table 8
Projected Potable Water Demand by Water Use Sector
City of Tracy, California

Water Use Sector	Potable Water Demand (ac-ft/yr) (a)				
	2005	2010	2015	2020	2025
Single-Family	12,530	13,000	14,500	16,300	17,400
Multi-Family	980	1,090	1,440	1,870	2,140
Subtotal Residential	*13,510*	*14,100*	*15,900*	*18,100*	*19,500*
Commercial	1,091	1,300	1,510	1,720	1,930
Industrial	639	954	1,270	1,590	1,900
Institutional	366	436	506	576	646
Subtotal CII	*2,095*	*2,690*	*3,290*	*3,880*	*4,480*
Irrigation	1,449	1,600	1,750	1,910	2,060
Total Water Use	**17,050**	**18,400**	**21,000**	**23,900**	**26,100**
UAW (b)	7.8%	7.5%	7.5%	7.5%	7.5%
Total Water Demand (c)	**18,500**	**19,900**	**22,700**	**25,900**	**28,200**

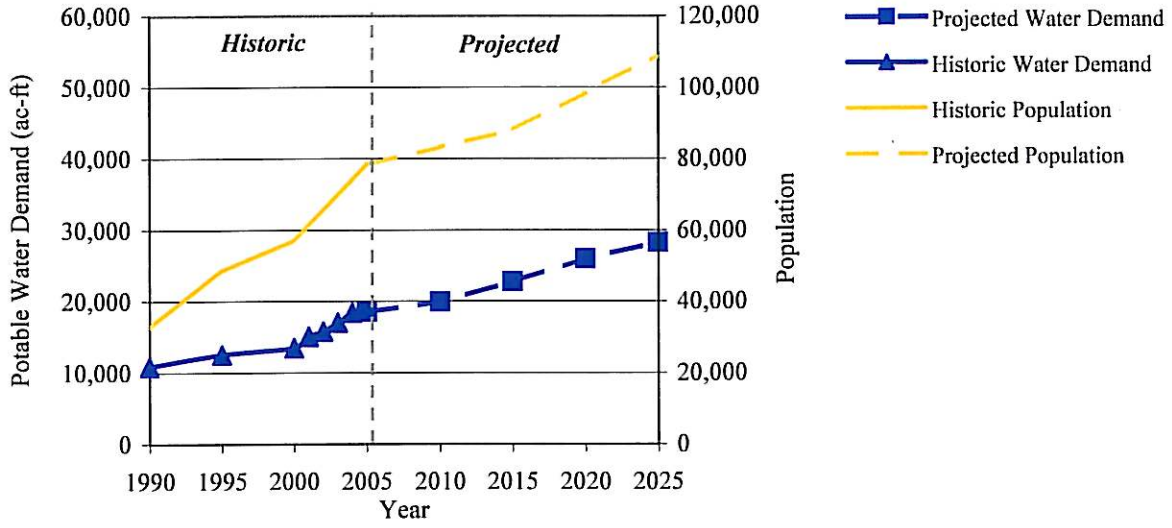


Table 8
Projected Potable Water Demand by Water Use Sector
City of Tracy, California

Abbreviations:
ac-ft = Acre-feet
CII = Commercial, Industrial, and Institutional
UAW = Unaccounted-for water

Notes:
(a) The total quantity of water estimated to be consumed by new development from 2005 to 2025 is approximately 9,000 ac-ft (from the 2005 DEIR). Water use was estimated for each sector based on assumed growth and water use per acre. Water use in the CII and irrigation sectors are projected linearly from 2005, while water use in the residential sectors are projected based on Measure A building restrictions.
(b) Unaccounted-for water is projected based on the average UAW from 2000 through 2005 (7.5%, see Table 6).
(c) Total water demand is the projected quantity of purchased surface water supplies plus the quantity of water produced by the City's groundwater wells.

Table 9
Current and Projected Contractual Water Supply Entitlements
Excluding Reliability Factors
City of Tracy, California

	Water Source (a)	Water Right/Contract	Quantity of Water Right/Contractual Entitlement (ac-ft/yr) (b) 2005	2010	2015	2020	2025
Current	DMC/CVP	USBR Tracy Contract	10,000	10,000	10,000	10,000	10,000
	DMC/CVP	USBR BCID Contract	5,000	5,000	5,000	5,000	5,000
	DMC/CVP	USBR WSID Contract	2,500	2,500	2,500	2,500	2,500
	SCSWSP	Pre-1914 Rights	10,000	10,000	10,000	10,000	10,000
	Groundwater (c)	Over/Approp. Rights	6,000	4,000	2,500	2,500	2,500
Expected	DMC/CVP	USBR BBID Contract	0	3,000	6,000	9,000	11,000
	DMC/CVP	USBR WSID Contract	0	0	2,500	2,500	2,500
	Clifton Court Forebay	BBID Pre-1914 Rights	0	0	4,500	4,500	4,500
Total Projected Available Supply			**33,500**	**34,500**	**43,000**	**46,000**	**48,000**
	Semitropic (d)	Water Banking	0	3,500	3,500	3,500	3,500
	ASR	Water Banking	0	0	3,000	3,000	3,000
Total Projected Drought Supply (e)			**0**	**3,500**	**6,500**	**6,500**	**6,500**
Total Projected Supply			**33,500**	**38,000**	**49,500**	**52,500**	**54,500**

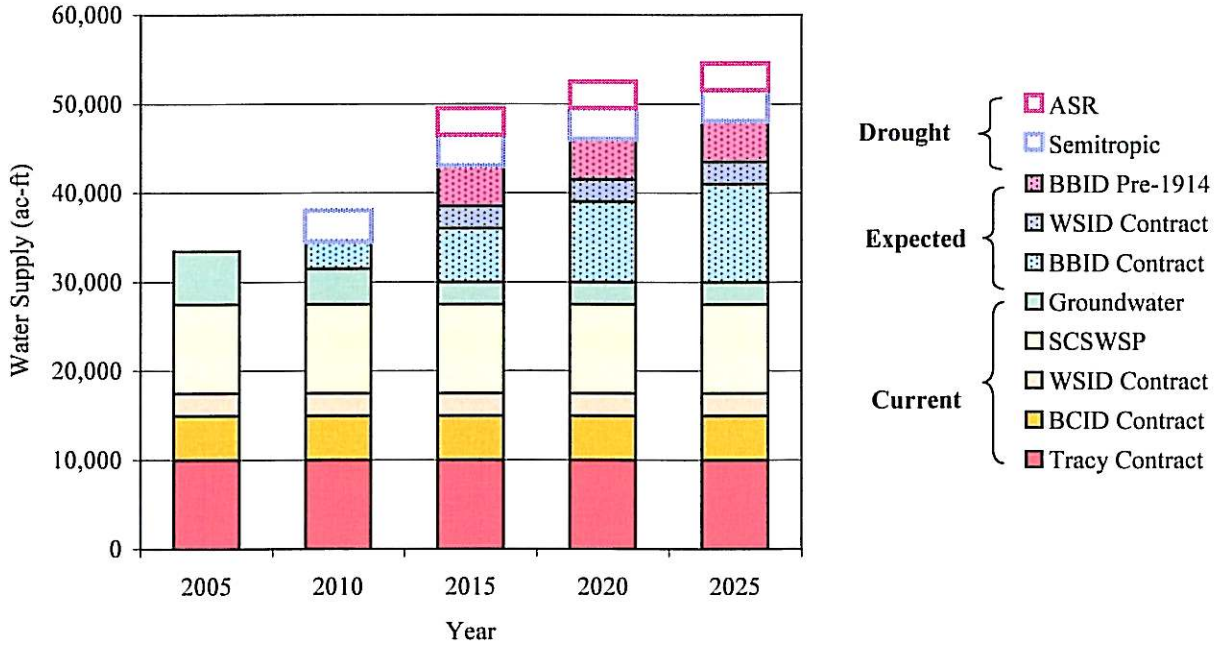


Table 9
Current and Projected Contractual Water Supply Entitlements
Excluding Reliability Factors
City of Tracy, California

Abbreviations:
ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCSWSP = South County Surface Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:
(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Section 4 of text.
(b) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCSWSP contracts.
(c) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(d) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with with up to 3,500 ac-ft of water annually. If Tracy were to use 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 use (see Section 4.4.4 of text).
(e) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 10
Groundwater Well Production
City of Tracy, California

Date		Well Production (ac-ft) (a) (b)											
		Lincoln	Tidewater	PW 1	PW 2	PW 3	PW 4	PW 5	PW 6	PW 7	PW 8	Monthly	Annual (c)
2001	Jan	148.4	99.3	81.1	93.9	83.0	--	--	--	--	--	505.8	--
	Feb	186.9	38.4	62.7	116.9	147.1	--	--	--	--	--	552.1	--
	Mar	180.7	109.2	62.1	133.7	147.9	--	--	--	--	--	633.6	--
	Apr	142.6	105.5	84.0	60.4	48.3	--	--	--	--	--	440.8	--
	May	239.3	165.7	107.1	103.6	69.1	--	--	--	--	--	684.7	--
	June	276.5	199.2	137.6	136.2	127.0	22.7	--	--	--	--	899.2	--
	July	268.8	175.6	133.8	139.5	135.5	68.7	--	--	--	--	921.8	--
	Aug	245.0	155.6	119.8	95.3	99.1	58.9	--	--	--	--	773.7	--
	Sep	195.1	106.0	79.2	77.7	75.4	40.6	--	--	--	--	574.1	--
	Oct	132.3	--	103.7	131.8	127.1	59.5	--	--	--	--	554.6	--
	Nov	30.7	--	96.1	65.3	68.8	29.6	--	--	--	--	290.5	--
	Dec	132.7	--	1.7	146.9	132.9	75.9	--	--	--	--	490.1	7,321
2002	Jan	200.7	121.4	1.7	171.8	162.1	--	--	--	--	--	657.6	--
	Feb	187.8	82.7	125.2	128.8	124.9	--	--	--	--	--	649.3	--
	Mar	70.5	47.8	112.1	111.6	106.4	--	--	--	--	--	448.5	--
	Apr	163.4	50.9	157.7	117.1	117.8	2.2	--	--	--	--	609.1	--
	May	234.1	82.0	174.5	153.9	151.9	3.7	48.7	--	--	--	848.8	--
	June	127.8	167.3	161.3	148.5	119.8	27.2	227.1	--	--	--	979.1	--
	July	262.1	72.3	152.3	136.7	142.3	2.7	223.2	--	--	--	991.7	--
	Aug	204.8	25.5	140.8	107.6	115.2	0.1	225.9	--	--	--	819.8	--
	Sep	62.4	54.2	114.6	69.1	112.4	2.1	213.0	--	--	--	627.8	--
	Oct	123.3	1.7	141.5	0.1	129.4	0.7	185.1	--	--	--	581.8	--
	Nov	25.7	2.9	66.5	--	78.8	--	45.5	--	--	--	219.5	--
	Dec	32.0	--	101.2	--	37.0	--	113.6	--	--	--	283.8	7,717
2003	Jan	61.0	--	167.3	--	168.0	--	116.5	4.5	67.1	--	584.4	--
	Feb	91.8	--	99.4	--	70.5	--	92.2	15.1	37.4	--	406.4	--
	Mar	183.7	--	37.5	--	24.6	--	79.9	14.9	32.7	--	373.2	--
	Apr	116.3	--	75.7	--	36.1	--	127.7	17.8	28.7	--	402.3	--
	May	171.3	--	64.5	--	88.0	--	143.1	75.3	67.5	--	609.8	--
	June	196.3	22.8	112.1	--	129.9	--	217.6	87.0	143.7	--	909.4	--
	July	241.1	40.0	134.3	--	151.1	--	224.5	128.9	116.6	--	1036.6	--
	Aug	179.0	36.8	110.8	--	102.7	--	182.3	82.7	96.9	--	791.1	--
	Sep	189.9	23.8	80.2	--	93.7	--	136.9	36.3	98.0	--	658.7	--
	Oct	69.9	3.3	80.4	--	76.8	--	73.5	66.4	61.2	--	431.6	--
	Nov	45.1	--	34.5	--	44.5	--	89.0	19.7	33.9	--	266.6	--
	Dec	131.0	--	21.2	--	40.6	--	196.0	8.9	9.9	--	407.5	6,878

Table 10
Groundwater Well Production
City of Tracy, California

Date		Well Production (ac-ft) (a) (b)											
		Lincoln	Tidewater	PW 1	PW 2	PW 3	PW 4	PW 5	PW 6	PW 7	PW 8	Monthly	Annual (c)
2004	Jan	140.1	1.5	159.8	--	189.5	--	180.6	23.0	21.2	--	715.9	--
	Feb	140.1	1.5	27.6	--	52.5	--	41.4	21.6	77.1	--	361.9	--
	Mar	185.3	7.9	21.1	--	34.8	--	139.8	63.3	87.0	--	539.2	--
	Apr	116.7	0.0	138.0	--	21.0	--	113.4	41.2	29.7	--	460.1	--
	May	177.8	--	54.0	--	73.5	--	201.5	72.1	95.3	--	674.2	--
	June	237.8	--	93.5	77.3	124.8	--	255.7	57.2	123.5	--	969.8	--
	July	217.2	--	116.7	131.5	121.8	--	205.7	--	128.0	--	920.9	--
	Aug	198.9	--	96.6	104.0	95.9	77.0	230.2	--	123.2	--	925.7	--
	Sep	140.4	--	70.9	74.4	37.1	36.5	170.7	21.9	129.6	--	681.6	--
	Oct	94.2	--	42.1	22.8	11.4	15.8	24.2	1.1	31.3	--	243.0	--
	Nov	12.4	--	14.8	16.4	3.8	3.5	1.9	0.5	0.6	--	53.7	--
	Dec	30.2	--	89.0	69.0	82.2	58.1	12.4	1.7	0.6	--	343.2	6,889
2005	Jan	64.5	--	145.3	132.1	110.3	129.9	81.3	6.1	22.7	--	692.2	--
	Feb	130.3	--	63.3	70.4	71.9	68.7	--	17.7	51.0	--	473.3	--
	Mar	77.9	--	21.0	31.6	25.8	34.8	--	29.6	37.6	--	258.4	--
	Apr	110.0	--	62.0	3.1	12.9	69.8	40.2	38.5	46.9	--	383.3	--
	May	38.6	--	54.8	31.9	41.9	51.9	151.0	59.0	94.6	--	523.8	--
	June	135.4	--	70.7	71.9	78.7	38.7	194.9	94.2	133.4	--	817.9	--
	July	201.4	--	89.4	71.5	99.6	91.5	203.0	95.5	155.0	--	1006.9	--
	Aug	152.5	--	116.6	76.8	104.3	51.8	170.5	69.3	127.3	--	869.1	--
	Sep	55.7	--	41.1	23.9	34.7	31.2	56.3	16.0	14.8	--	273.5	5,298

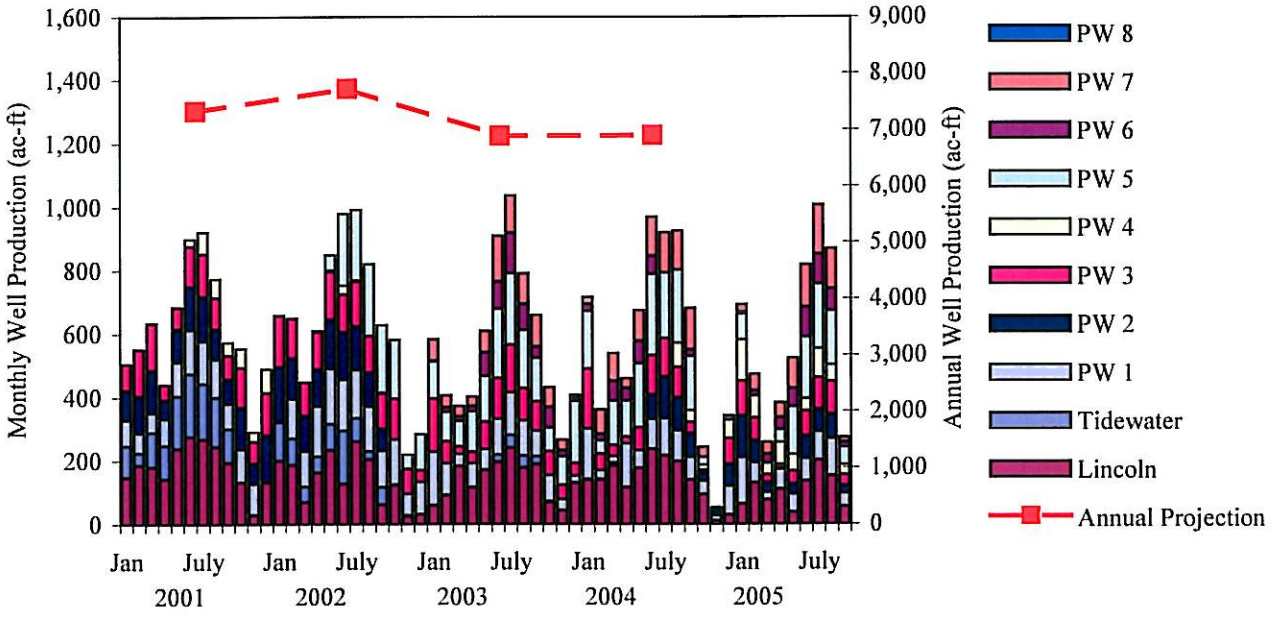


Table 10
Groundwater Well Production
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
ac-ft = acre-feet
PW = Production well

Notes:
(a) Well production data for January 2001 through March 2005 from Mitigation Monitoring Report (BEC, 2005) and for April 2005 through September 2005 from the City of Tracy Well Production tables which were submitted electronically to EKI on 13 October 2005. Please note that there is a slight discrepancy in well production rates for 2004 and 2005 between these sources.
(b) See Figure 4 for well locations.
(c) Data for 2005 are not complete.

Table 11
Current and Projected Water Supply Allocations - Normal Year
City of Tracy, California

	Water Source (a)	Water Right/Contract	Reliability Factor (b)	Estimated Supply Allocation (ac-ft/yr) (c) (d) 2005	2010	2015	2020	2025
No Water Banking	Current Supplies							
	DMC/CVP	USBR Tracy Contract	85%	8,500	8,500	8,500	8,500	8,500
	DMC/CVP	USBR BCID Contract	58%	2,900	2,900	2,900	2,900	2,900
	DMC/CVP	USBR WSID Contract	58%	1,450	1,450	1,450	1,450	1,450
	SCSWSP	Pre-1914 Rights	100%	10,000	10,000	10,000	10,000	10,000
	Groundwater (e)	Over/Approp. Rights	100%	6,000	4,000	2,500	2,500	2,500
	Expected Supplies							
	DMC/CVP	USBR BBID Contract	58%	0	1,740	3,480	5,220	6,380
	DMC/CVP	USBR WSID Contract	58%	0	0	1,450	1,450	1,450
	Clifton Court Forebay	BBID Pre-1914 Rights	100%	0	0	4,500	4,500	4,500
	Total Projected Available Supply		--	**28,850**	**28,590**	**34,780**	**36,520**	**37,680**
	% Cutback from Normal Year		--	**0%**	**0%**	**0%**	**0%**	**0%**
Water Banking	Semitropic (f)	Water Banking	100%	0	3,500	3,500	3,500	3,500
	ASR	Water Banking	100%	0	0	3,000	3,000	3,000
	Total Projected Drought Supply (g)			**0**	**3,500**	**6,500**	**6,500**	**6,500**
	Total Projected Supply			**28,850**	**32,090**	**41,280**	**43,020**	**44,180**
	% Cutback from Normal Year			**0%**	**0%**	**0%**	**0%**	**0%**

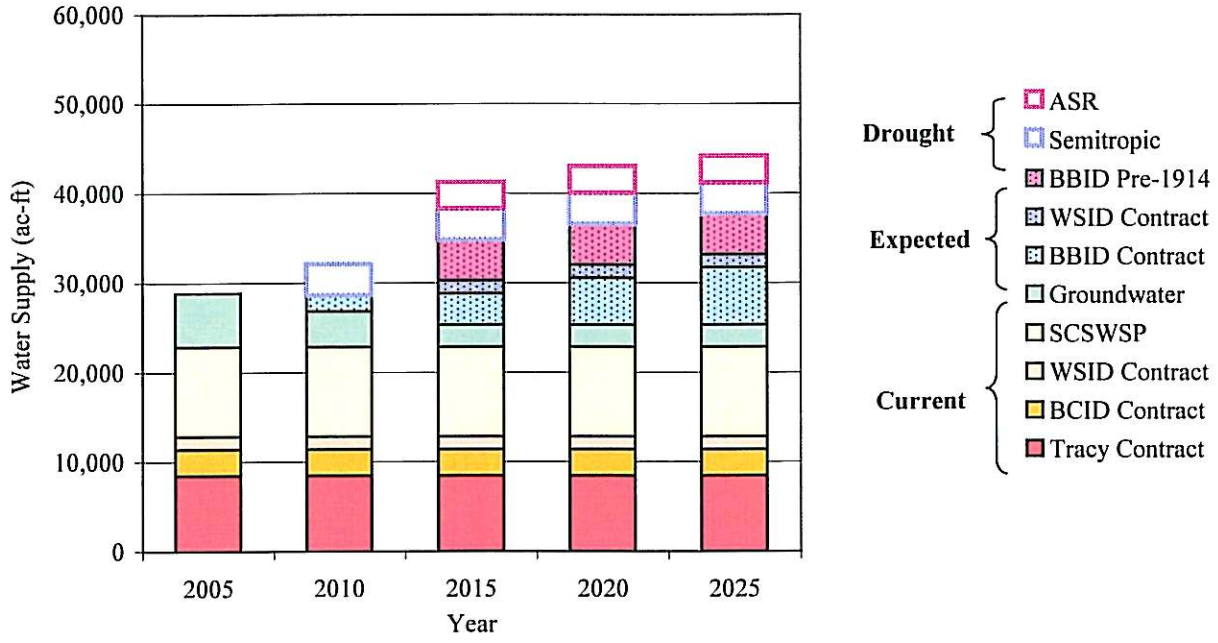


Table 11
Current and Projected Water Supply Allocations - Normal Year
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCSWSP = South County Surface Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:
(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Sections 4 and 5 of text.
(b) Reliability factors have been applied to the water quantities shown in Table 9. These factors are based on the average supply allocations for municipal and industrial ("M&I") and agricultural ("Ag") reliability contracts south of the Delta during normal and wet year periods.
(c) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCSWSP contracts.
(d) Subtotals may not add exactly due to rounding.
(e) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(f) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with with up to 3,500 ac-ft of water annually. If Tracy were to use 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 use (see Section 4.4.4 of text).
(g) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 12
Current and Projected Water Supply Allocations - Single-Dry Year
City of Tracy, California

	Water Source (a)	Water Right/Contract	Reliability Factor (b)	Estimated Supply Allocation (ac-ft/yr) (c) (d) 2005	2010	2015	2020	2025
No Water Banking	Current Supplies							
	DMC/CVP	USBR Tracy Contract	75%	7,500	7,500	7,500	7,500	7,500
	DMC/CVP	USBR BCID Contract	25%	1,250	1,250	1,250	1,250	1,250
	DMC/CVP	USBR WSID Contract	25%	625	625	625	625	625
	SCSWSP	Pre-1914 Rights	90%	9,000	9,000	9,000	9,000	9,000
	Groundwater (e)	Over/Approp. Rights	100%	6,000	4,000	2,500	2,500	2,500
	Expected Supplies							
	DMC/CVP	USBR BBID Contract	25%	0	750	1,500	2,250	2,750
	DMC/CVP	USBR WSID Contract	25%	0	0	625	625	625
	Clifton Court Forebay	BBID Pre-1914 Rights	90%	0	0	4,050	4,050	4,050
	Total Projected Available Supply		--	**24,375**	**23,125**	**27,050**	**27,800**	**28,300**
	% Cutback from Normal Year		--	**16%**	**19%**	**22%**	**24%**	**25%**
Water Banking	Semitropic (f)	Water Banking	100%	0	3,500	3,500	3,500	3,500
	ASR	Water Banking	100%	0	0	3,000	3,000	3,000
	Total Projected Drought Supply (g)			**0**	**3,500**	**6,500**	**6,500**	**6,500**
	Total Projected Supply			**24,375**	**26,625**	**33,550**	**34,300**	**34,800**
	% Cutback from Normal Year			**16%**	**17%**	**19%**	**20%**	**21%**

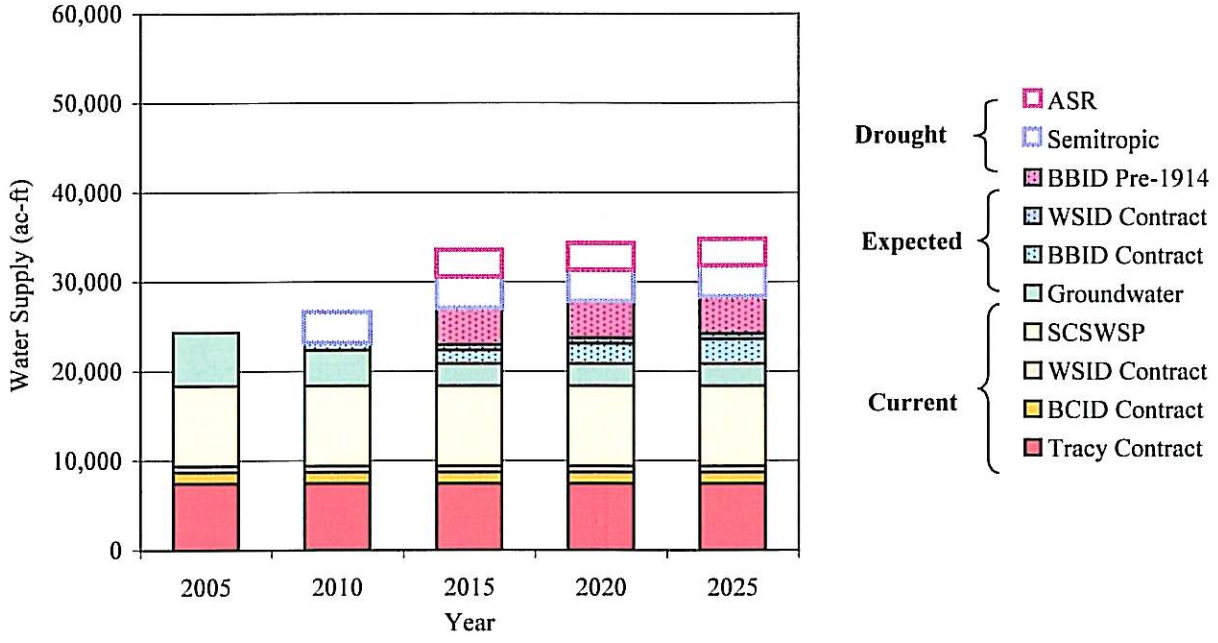


Table 12
Current and Projected Water Supply Allocations - Single-Dry Year
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCSWSP = South County Surface Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:
(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Sections 4 and 5 of text.
(b) Reliability factors have been applied to the water quantities shown in Table 9. These factors are based on the average supply allocations for municipal and industrial ("M&I") and agricultural ("Ag") reliability contracts south of the Delta during normal and wet year periods.
(c) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCSWSP contracts.
(d) Subtotals may not add exactly due to rounding.
(e) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(f) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with with up to 3,500 ac-ft of water annually. If Tracy were to use 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 use (see Section 4.4.4 of text).
(g) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 13
Current and Projected Water Supply Allocations - Multiple-Dry Years
City of Tracy, California

	Water Source (a)	Water Right/Contract	Reliability Factor (b)	Estimated Supply Allocation (ac-ft/yr) (c) (d) 2005	2010	2015	2020	2025
No Water Banking	Current Supplies							
	DMC/CVP	USBR Tracy Contract	50%	5,000	5,000	5,000	5,000	5,000
	DMC/CVP	USBR BCID Contract	25%	1,250	1,250	1,250	1,250	1,250
	DMC/CVP	USBR WSID Contract	25%	625	625	625	625	625
	SCSWSP	Pre-1914 Rights	90%	9,000	9,000	9,000	9,000	9,000
	Groundwater (e)	Over/Approp. Rights	100%	6,000	4,000	2,500	2,500	2,500
	Expected Supplies							
	DMC/CVP	USBR BBID Contract	25%	0	750	1,500	2,250	2,750
	DMC/CVP	USBR WSID Contract	25%	0	0	625	625	625
	Clifton Court Forebay	BBID Pre-1914 Rights	90%	0	0	4,050	4,050	4,050
	Total Projected Available Supply		--	**21,875**	**20,625**	**24,550**	**25,300**	**25,800**
	% Cutback from Normal Year		--	**24%**	**28%**	**29%**	**31%**	**32%**
Water Banking	Semitropic (f)	Water Banking	100%	0	3,500	3,500	3,500	3,500
	ASR	Water Banking	100%	0	0	3,000	3,000	3,000
	Total Projected Drought Supply (g)			**0**	**3,500**	**6,500**	**6,500**	**6,500**
	Total Projected Supply			**21,875**	**24,125**	**31,050**	**31,800**	**32,300**
	% Cutback from Normal Year			**24%**	**25%**	**25%**	**26%**	**27%**

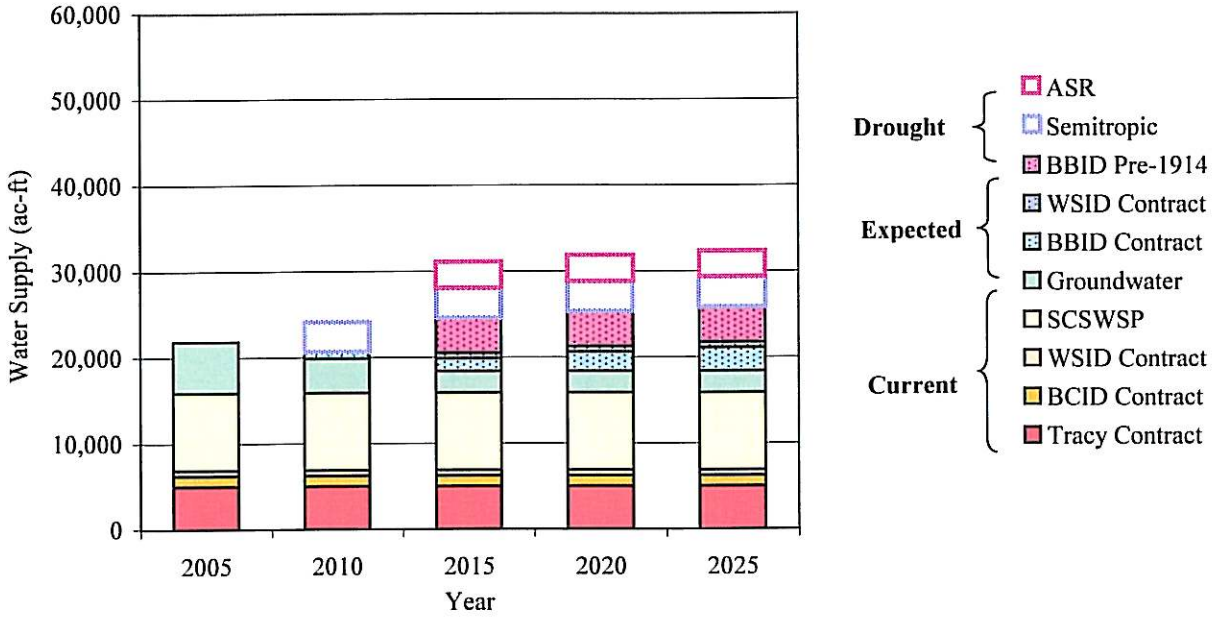


Table 13
Current and Projected Water Supply Allocations - Multiple-Dry Years
City of Tracy, California

Abbreviations:
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Notes:
(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Sections 4 and 5 of text.
(b) Reliability factors have been applied to the water quantities shown in Table 9. These factors are based on the average supply allocations for municipal and industrial ("M&I") and agricultural ("Ag") reliability contracts south of the Delta during normal and wet year periods.
(c) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCSWSP contracts.
(d) Subtotals may not add exactly due to rounding.
(e) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(f) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with with up to 3,500 ac-ft of water annually. If Tracy were to use 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 use (see Section 4.4.4 of text).
(g) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 14
Current and Projected Water Supply Allocations - Extreme-Dry Year
City of Tracy, California

	Water Source (a)	Water Right/Contract	Reliability Factor (b)	Estimated Supply Allocation (ac-ft/yr) (c) (d) 2005	2010	2015	2020	2025
No Water Banking	Current Supplies							
	DMC/CVP	USBR Tracy Contract	50%	5,000	5,000	5,000	5,000	5,000
	DMC/CVP	USBR BCID Contract	13%	650	650	650	650	650
	DMC/CVP	USBR WSID Contract	13%	325	325	325	325	325
	SCSWSP	Pre-1914 Rights	90%	9,000	9,000	9,000	9,000	9,000
	Groundwater (e)	Over/Approp. Rights	100%	6,000	4,000	2,500	2,500	2,500
	Expected Supplies							
	DMC/CVP	USBR BBID Contract	13%	0	390	780	1,170	1,430
	DMC/CVP	USBR WSID Contract	13%	0	0	325	325	325
	Clifton Court Forebay	BBID Pre-1914 Rights	90%	0	0	4,050	4,050	4,050
	Total Projected Available Supply		--	**20,975**	**19,365**	**22,630**	**23,020**	**23,280**
	% Cutback from Normal Year		--	**27%**	**32%**	**35%**	**37%**	**38%**
Water Banking	Semitropic (f)	Water Banking	100%	0	3,500	3,500	3,500	3,500
	ASR	Water Banking	100%	0	0	3,000	3,000	3,000
	Total Projected Drought Supply (g)			**0**	**3,500**	**6,500**	**6,500**	**6,500**
	Total Projected Supply			**20,975**	**22,865**	**29,130**	**29,520**	**29,780**
	% Cutback from Normal Year			**27%**	**29%**	**29%**	**31%**	**33%**

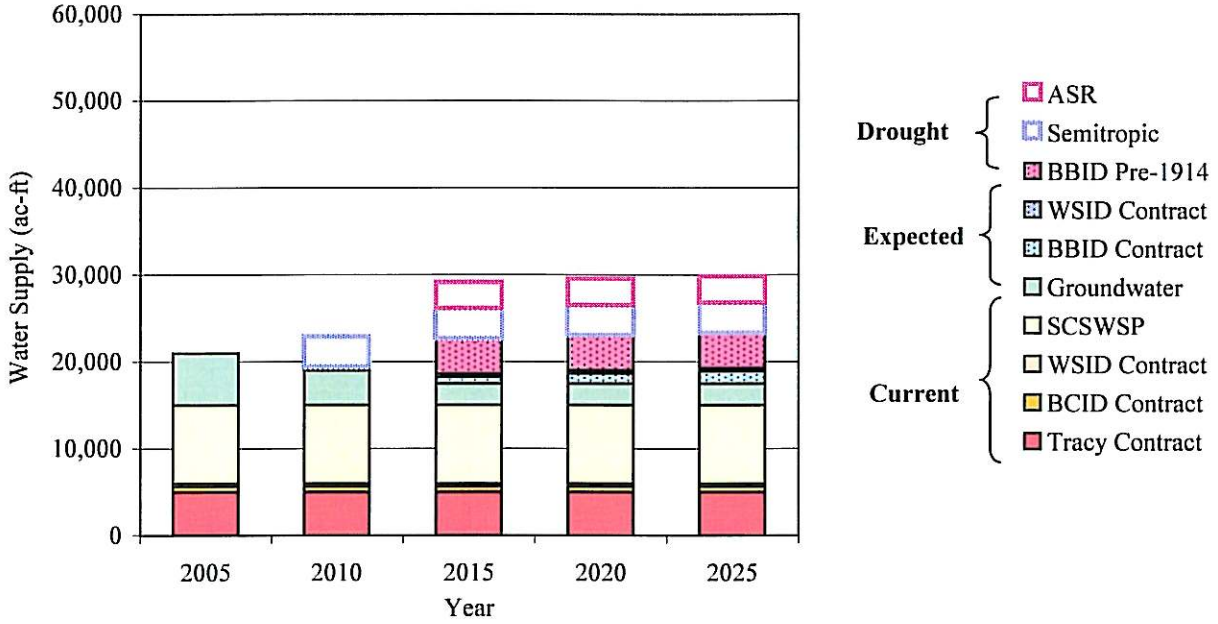

Table 14
Current and Projected Water Supply Allocations - Extreme-Dry Year
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
ac-ft/yr = Acre-feet per year
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BCID = Banta-Carbona Irrigation District
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(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Sections 4 and 5 of text.
(b) Reliability factors have been applied to the water quantities shown in Table 9. These factors are based on the average supply allocations for municipal and industrial ("M&I") and agricultural ("Ag") reliability contracts south of the Delta during normal and wet year periods.
(c) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCSWSP contracts.
(d) Subtotals may not add exactly due to rounding.
(e) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(f) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with with up to 3,500 ac-ft of water annually. If Tracy were to use 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 use (see Section 4.4.4 of text).
(g) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 15
Current and Projected Potable Water Supply vs. Demand
Normal Year
City of Tracy, California

	Water Supply and Demand	Estimated Potable Water Supply and Demand (ac-ft/yr) (a)				
		2005	2010	2015	2020	2025
No Water Banking	Projected Available Supply (b)	28,900	28,600	34,800	36,500	37,700
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***10,400***	***8,690***	***12,100***	***10,600***	***9,480***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***
Water Banking	Projected Available Supply	28,900	28,600	34,800	36,500	37,700
	Projected Drought Supply (d)	0	3,500	6,500	6,500	6,500
	Subtotal Potable Water Supply	28,900	32,100	41,300	43,000	44,200
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***10,400***	***12,200***	***18,600***	***17,100***	***16,000***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***

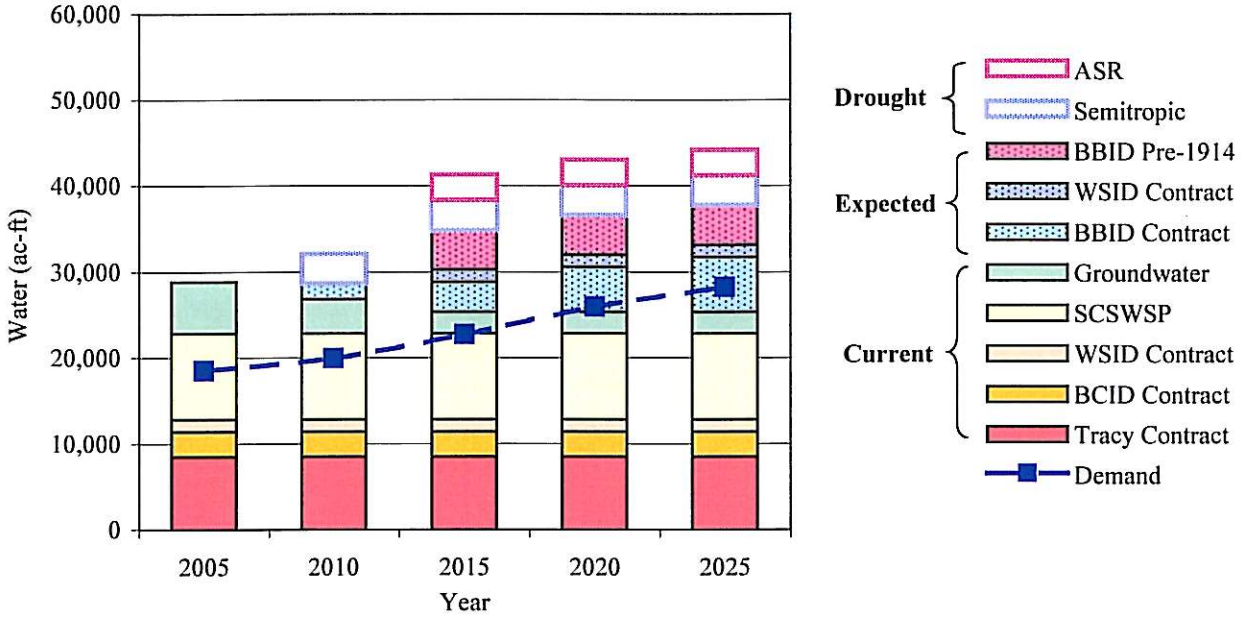

Table 15
Current and Projected Potable Water Supply vs. Demand
Normal Year
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCSWSP = South County Surface Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:
(a) Subtotals may not add exactly due to rounding.
(b) Projected available supplies include both current and expected supplies described in Table 11.
(c) Total potable water demand is described in Tables 7 and 8.
(d) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought. See Tables 11 through 14 for a detailed explanation.

Table 16
Current and Projected Potable Water Supply vs. Demand
Single-Dry Year
City of Tracy, California

	Water Supply and Demand	Estimated Potable Water Supply and Demand (ac-ft/yr) (a)				
		2005	2010	2015	2020	2025
No Water Banking	Projected Available Supply (b)	24,400	23,100	27,100	27,800	28,300
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***5,880***	***3,230***	***4,350***	***1,900***	***100***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***
Water Banking	Projected Available Supply	24,400	23,100	27,100	27,800	28,300
	Projected Drought Supply (d)	0	3,500	6,500	6,500	6,500
	Subtotal Potable Water Supply	24,400	26,600	33,600	34,300	34,800
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***5,880***	***6,730***	***10,900***	***8,400***	***6,600***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***

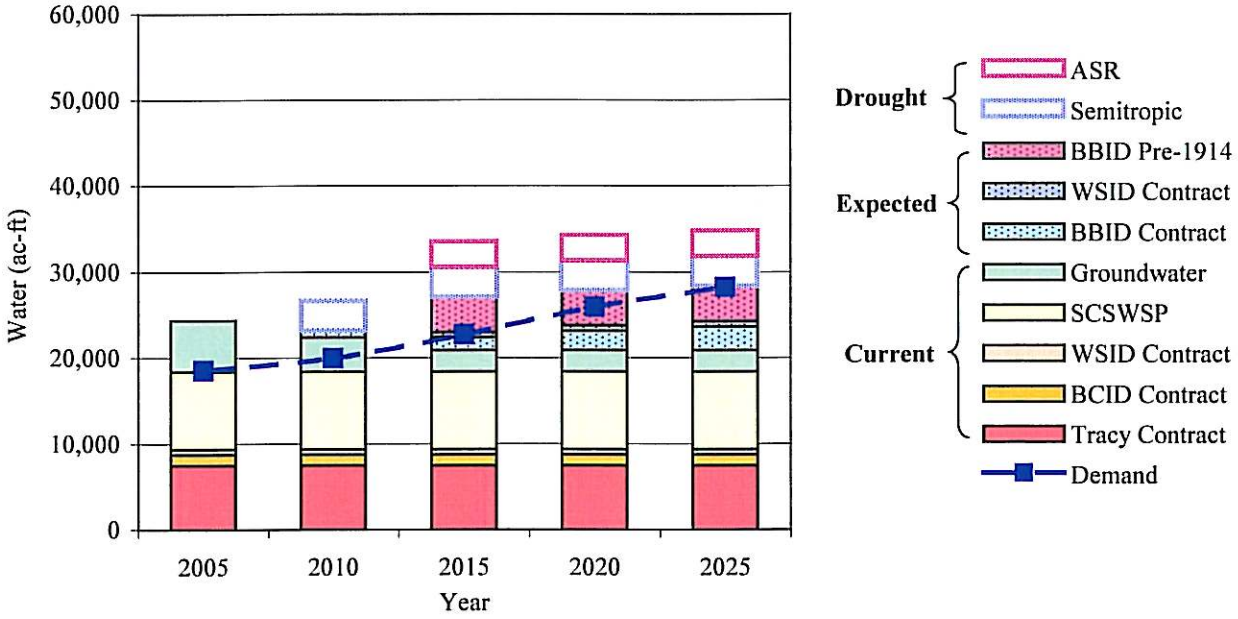

Table 16
Current and Projected Potable Water Supply vs. Demand
Single-Dry Year
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCSWSP = South County Surface Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:
(a) Subtotals may not add exactly due to rounding.
(b) Projected available supplies include both current and expected supplies described in Table 12.
(c) Total potable water demand is described in Tables 7 and 8.
(d) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought. See Tables 11 through 14 for a detailed explanation.

Table 17
Current and Projected Potable Water Supply vs. Demand
Multiple-Dry Year
City of Tracy, California

	Water Supply and Demand	Estimated Potable Water Supply and Demand (ac-ft/yr) (a)				
		2005	2010	2015	2020	2025
No Water Banking	Projected Available Supply (b)	21,900	20,600	24,600	25,300	25,800
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***3,380***	***725***	***1,850***	***-600***	***-2,400***
	Percent Cutback	***0%***	***0%***	***0%***	***-2%***	***-9%***
Water Banking	Projected Available Supply	21,900	20,600	24,600	25,300	25,800
	Projected Drought Supply (d)	0	3,500	6,500	6,500	6,500
	Subtotal Potable Water Supply	21,900	24,100	31,100	31,800	32,300
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***3,380***	***4,230***	***8,350***	***5,900***	***4,100***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***

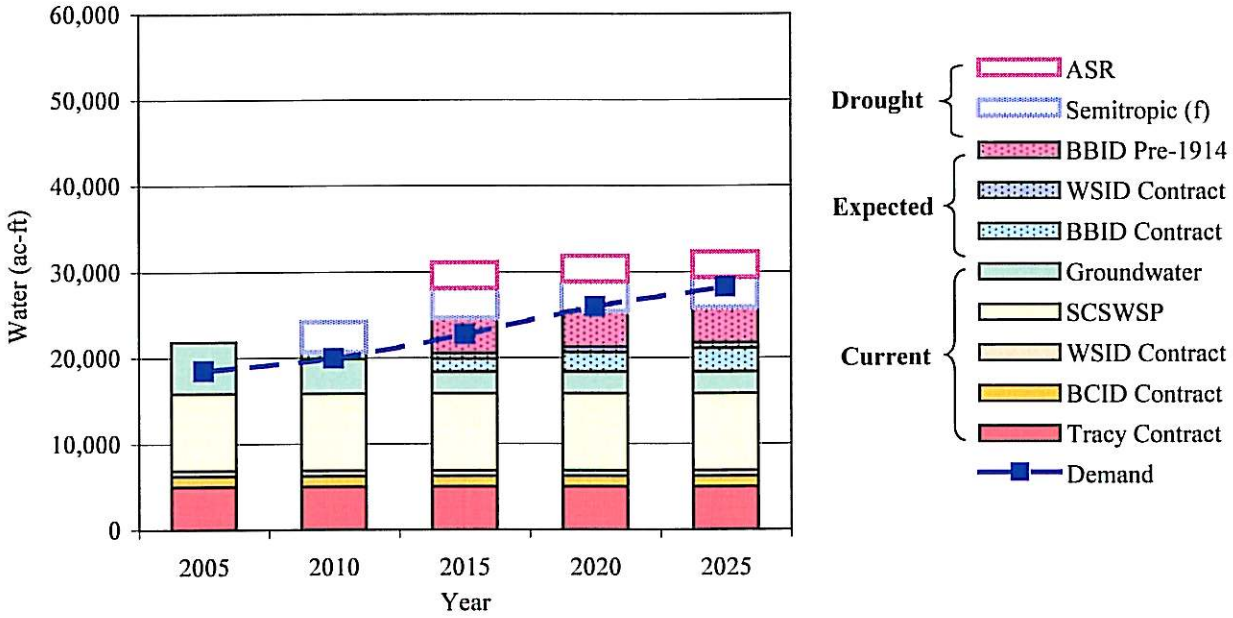

Table 17
Current and Projected Potable Water Supply vs. Demand
Multiple-Dry Year
City of Tracy, California

Abbreviations:

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ac-ft/yr = Acre-feet per year
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Notes:

(a) Subtotals may not add exactly due to rounding.
(b) Projected available supplies include both current and expected supplies described in Table 13.
(c) Total potable water demand is described in Tables 7 and 8.
(d) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought. See Tables 11 through 14 for a detailed explanation.

Table 18
Current and Projected Potable Water Supply vs. Demand
Extreme-Dry Year
City of Tracy, California

	Water Supply and Demand	Estimated Potable Water Supply and Demand (ac-ft/yr) (a)				
		2005	2010	2015	2020	2025
No Water Banking	Projected Available Supply (b)	21,000	19,400	22,600	23,000	23,300
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***2,480***	***-540***	***-70***	***-2,900***	***-4,900***
	Percent Cutback	***0%***	***-3%***	***-0.4%***	***-13%***	***-21%***
Water Banking	Projected Available Supply	21,000	19,400	22,600	23,000	23,300
	Projected Drought Supply (d)	0	3,500	6,500	6,500	6,500
	Subtotal Potable Water Supply	21,000	22,900	29,100	29,500	29,800
	Total Potable Water Demand (c)	18,500	19,900	22,700	25,900	28,200
	Difference	***2,480***	***2,970***	***6,430***	***3,620***	***1,580***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***

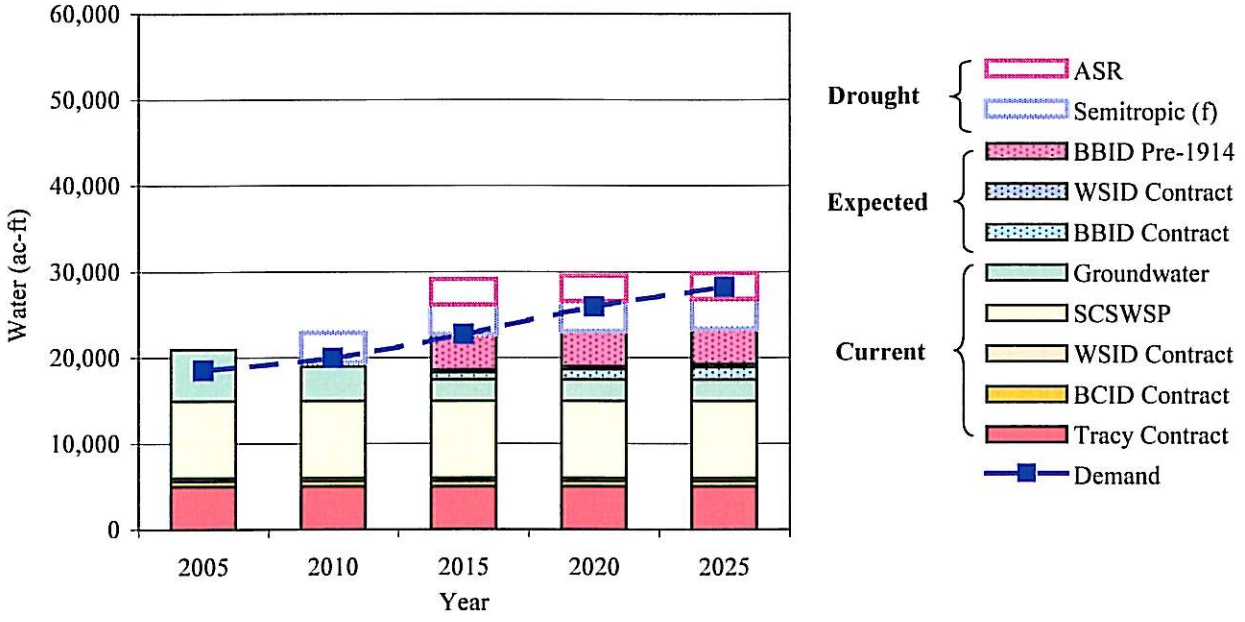

Table 18
Current and Projected Potable Water Supply vs. Demand
Extreme-Dry Year
City of Tracy, California

Abbreviations:
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Notes:
(a) Subtotals may not add exactly due to rounding.
(b) Projected available supplies include both current and expected supplies described in Table 14.
(c) Total potable water demand is described in Tables 7 and 8.
(d) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought. See Tables 11 through 14 for a detailed explanation.

Table 19
Water Conservation Activities
City of Tracy, California

Water Conservation Action	Water Conservation Actions and Expenditures (a) (b)					
	2001	2002	2003	2004	2005	Total
Retrofit Kits						
# of Kits	320	--	--	5	--	325
Retrofit Kit Cost (c)	$1,280	--	--	--	--	$1,280
Landscape Audit						
Audit (d)	--	--	1	--	--	1
Public Information						
Bill Insert (e)	1	--	--	--	--	1
Newsletter Advertisement (e)	1	--	--	--	--	1
Cinema Advertisements (f)	--	--	--	--	2	2
Public Information Cost	$1,500	--	--	--	$5,795	$7,295
Washer Rebates						
# of Washers	--	--	--	4	27	31
Washer Rebate Cost (g)	--	--	--	$200	$1,350	$1,550
School Education / Residential Survey						
# of Kits (h)	230	--	--	--	1980	2210
Classroom visits (i)	6	--	--	--	3	9
Education Program Cost	$5,313	--	--	--	$0	$5,313
ULFT Replacement (j)						
# of ULFT	400	--	--	--	--	400
ULFT Program Cost	--	--	--	--	--	$45,113

Abbreviations:
-- Data not available or not applicable
ULFT = Ultra low flow toilet

Notes:
(a) Values are reported in five-year increments for fiscal years ("FY") 2001 through 2005.
(b) Water conservation actions and expenditures are based on data from CTSI Corporation invoices to the City of Tracy, Public Works Department (June 30, 2000 and May 2, 2001) and personal communication with Water Resources Coordinator, Stephanie Reyna.
(c) Based on an individual retrofit kit cost of $5.
(d) Landscape audit expenditures are unknown.
(e) Bill insert and newsletter advertisement was designed by CTSI Corporation staff.
(f) In October 2004, the City began running two slides before every movie on all 14 screens at the Tracy Cinemark.
(g) Washer rebate is $50 per high efficiency washer (annual rebate expenditure not to exceed $10,000).
(h) School kits were distributed to 5th grade classrooms. Kits distributed during FY 2001 included residential surveys for students to perform their own home surveys. Kits distributed during FY 2005 included teacher guides and student workbooks provided free from the California Department of Water Resources ("DWR"). DWR kits were distributed by Water Resources Coordinator, Stephanie Reyna.
(i) Classroom visits during FY 2001 were performed by CTSI staff. Visits during FY 2005 were performed by Water Resources Coordinator, Stephanie Reyna.
(j) ULFT program was organized by CTSI and distributed as a fundraiser for Tracy High School students.

Table 20
Monthly Meter Service Charges and Seasonal Water Rates
City of Tracy, California

Meter Size	Monthly Charge (a)
1"	$17.15
3"	$156.50
4"	$278.35
6"	$626.25
8"	$1,113.50
10"	$1,739.85

Block Number	Winter Block Units (b)	Summer Block Units (c)	Block Rates (d)
Block 1	0-12 units	0-18 units	$0.85
Block 2	13-19 units	19-29 units	$1.20
Block 3	20-191 units	29-287 units	$1.40
Block 4	over 191 units	over 287 units	$1.50

Notes:
(a) Water meter service charges are from the City of Tracy Website.
(b) Winter block units are effective November through April.
(c) Summer block units are effective May through October.
(d) Prices are per 100 cubic feet of water.

Table 21
Guidelines for Water Efficient Landscape Design, Development, and Maintenance (a)
City of Tracy, California

Landscaping Technique - 60 point minimum	Points
• Water conserving plants used in 75% or more of total planted area. (b)	20
• Turf limited as follows: Residential projects - 45% of total planted area. All other projects 25% of total planted area.	20
• Plants placed or grouped according to their watering needs.	10
• Hardscape (non-irrigated surfaces, such as alluvial rock or decorative paving) used in 10% or more of total planted areas.	10
• Permeable paving used in 5% of total planted area.	5
• Where turf is used, utilize proven varieties of low-water-requirement turf, such as Marathon.	5
• Where no groundcover is used, utilize wood chips, bark, or other much, to a depth of three inches on top of exposed soil, such as underneath shrubs, or install landscape fabric under soil.	5
• Soil amendments to improve water holding capacity of soil, where soil conditions merit.	5
Irrigation Technique - 60 point minimum	
• Low gallonage irrigation system, or higher gallonage systems with automatic controller capable of repeat cycling, used for more than 75% of total planted area.	20
• Automatic controller for irrigation system.	20
• Irrigation system designed to water plants according to their water needs.	10
• Soil moisture sensors used in conjunction with automatic controller.	10
• Rain sensors used in conjunction with automatic controller.	5
• Wind sensors used in conjunction with automatic controller.	5
• Irrigation is sensitive to slope factors or project has no slopes greater that five feet in height that require landscaping.	5
• Use of recycled water.	5

Notes:

(a) Summary of Landscape and Irrigation Criteria for all developments from City Resolution No. 91-136, Guidelines for Water Efficient Landscape Design, Development, and Maintenance.

(b) Planted area includes the total area of the site not covered by buildings, parking lots, driveways, or streets. As defined in Resolution No. 91-136.

Table 22
Recycled Water Uses Allowed in California under California Code of Regulations, Title 22, Article 3 (a)
City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
IRRIGATION					
• Food crops where recycled water contacts the edible portion of the crop, including all root crops • Parks and playgrounds • School yards • Residential landscaping • Unrestricted access golf courses • Any other irrigation uses not prohibited by other provisions of the California Code of Regulations	Allowed	Not allowed	Not allowed	Not allowed	Coagulation unnecessary provided filter effluent turbidity ≤ 2 NTU, turbidity of influent is continuously measured, influent turbidity > 5 NTU for ≤ 15 min and never > 10 NTU, and that there is capability to automatically activate chemical addition or divert the wastewater if the filter influent turbidity > 5 NTU for > 15 min.
• Food crops where edible portion is produced above-ground and not contacted by recycled water	Allowed	Allowed	Not allowed	Not allowed	--
• Cemeteries • Freeway landscaping • Restricted access golf courses • Ornamental nursery stock and sod farms where access by general public is not restricted • Pasture for animals producing milk for human consumption • Nonedible vegetation with access control to prevent use as a park, playground or school yard	Allowed	Allowed	Allowed	Not allowed	
• Orchards with no contact between edible portion and recycled water • Vineyards with no contact between edible portion and recycled water	Allowed	Allowed	Allowed	Allowed	--

Table 22
Recycled Water Uses Allowed in California under California Code of Regulations, Title 22, Article 3 (a)
City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
IRRIGATION (continued)					
• Non food-bearing trees, including Christmas tree farms not irrigated less than 14 days before harvest and restricting access to the public • Fodder and fiber crops and pasture for animals not producing milk for human consumption • Seed crops not eaten by humans • Food crops that undergo commercial pathogen-destroying processing before consumption by humans • Ornamental nursery stock and sod farms not irrigated less than 14 days before harvest, retail sale, or allowing access by the general public	Allowed	Allowed	Allowed	Allowed	--
COOLING AND AIR CONDITIONING					
• Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, or spraying that creates a mist	Allowed (c)	Not allowed	Not allowed	Not allowed	If the cooling system uses a cooling tower or otherwise creates a mist that could come into contact with employees or the public, it shall also comply with the following: a) a drift eliminator shall be used whenever the cooling system is in operation. b) a chlorine, or other biocide, shall be used to treat the cooling system recirculating water.
• Industrial or commercial cooling or air conditioning not involving a cooling tower, evaporative condenser, or spraying that creates a mist	Allowed	Allowed	Allowed	Not allowed	--

Table 22
Recycled Water Uses Allowed in California under California Code of Regulations, Title 22, Article 3 (a)
City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
IMPOUNDMENT					
• Non-restricted recreational impoundments, with supplemental monitoring for pathogenic organisms	Allowed (b)	Not allowed	Not allowed	Not allowed	1) Total coliform bacteria, measured at a point between the disinfection process and the point of entry to use impoundment must have a: a) median concentration ≤ MPN of 2.2 per 100 mL over last 7 days; AND b) total ≤ 23 per 100 mL in all but one sample in a 30-day period. 2) a) Conventional tertiary treatment OR b) Monitored for presence of pathogenic organisms in accordance with the following: 1) Sampled and analyzed monthly for Giardia, enteric viruses, and Cryptosporidium during first 12 months of operation and use. Sampled and analyzed quarterly thereafter. Sampling may be discontinued after two years. 2) Samples shall be taken at a point following disinfection and prior to the point where the recycled water enters the use impoundment. Results shall be submitted quarterly to the regulatory agency.
• Restricted recreational impoundments and publicly accessible fish hatcheries	Allowed	Allowed	Not allowed	Not allowed	--
• Landscape impoundments without decorative fountains	Allowed	Allowed	Allowed	Not allowed	--

Table 22
Recycled Water Uses Allowed in California under California Code of Regulations, Title 22, Article 3 (a)
City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
OTHER USES					
• Groundwater recharge	Allowed under special case-by-case permits by RWQCBs (d)				--
• Flushing toilets and urinals • Priming drain traps • Industrial process water that may contact workers • Structural firefighting • Decorative fountains • Commercial laundries • Consolidation of backfill around potable water pipelines • Artificial snow making for commercial outdoor use • Commercial car washes, including hand washes if the recycled water is not heated, where the general public is excluded from the washing process.	Allowed	Not allowed	Not allowed	Not allowed	Coagulation unnecessary provided filter effluent turbidity < 2 NTU, turbidity of influent is continuously measured, influent turbidity > 5 NTU for < 15 min and never > 10 NTU, and that there is capability to automatically activate chemical addition or divert the wastewater if the filter influent turbidity > 5 NTU for > 15 min.
• Industrial boiler feed • Nonstructural fire fighting • Backfill consolidation around non-potable piping • Soil compaction • Mixing concrete • Dust control on roads and streets • Cleaning roads, sidewalks and outdoor work areas • Industrial process water that will not come into contact with workers	Allowed	Allowed	Allowed	Not allowed	--
• Flushing sanitary sewers	Allowed	Allowed	Allowed	Allowed	--

Table 22
Recycled Water Uses Allowed in California under California Code of Regulations, Title 22, Article 3 (a)
City of Tracy, California

Abbreviations:
-- Data not available or not applicable
min = Minutes
mL = Milliliters
MPN = Most probable number
NTU = Nephelometric turbidity units
RWQCB = Regional Water Quality Control Board

Notes:
(a) Summary from the Title-22 California Water Recycling Criteria (September 1998).
(b) With "conventional tertiary treatment." Additional monitoring for two years or more is necessary with direct filtration.
(c) Drift Eliminators and/or biocides are required if public or employees can be exposed to mist.
(d) Refer to Groundwater Recharge Guidelines, California Department of Health Services.

Table 23
Historic and Projected Wastewater Flows
City of Tracy, California

	Year	Average Daily Flow MGD	Annual Flow MG	Annual Flow ac-ft
Historic (a)	2001	6.72	2,454	7,530
	2002	7.22	2,634	8,084
	2003	8.14	2,971	9,118
	2004	8.35	3,057	9,381
	2005 (b)	9.62	2,338	7,175
Projected (c)	2010	8.50	3,103	9,521
	2015	9.75	3,559	10,921
	2020	11.00	4,015	12,322
	2025	12.75	4,654	14,282
	2030	14.50	5,293	16,242

Abbreviations:
ac-ft = Acre-feet
MG = Millions of gallons
MGD = Millions of gallons per day

Notes:
(a) Current and historic wastewater flow data were provided by the City Department of Public Works.
(b) Data for 2005 do not represent the entire annual flow, but only through August.
(c) Wastewater flow projections were provide by Vijay Kumar, CH2M Hill, 2005.

Table 24
Water Exchange Program - Gateway Project Potential Sites
City of Tracy, California

Park Name	Approximate Irrigated Area (acres)	Unit Water Use (af/ac/yr)	Total Annual Water Use (af/yr)	Total Potable Water Available for Exchange by Phase (af/yr)
Phase 1				
Presidio Park	26.6	4.5	119.7	175
Plasencia Field	20	2.75	55.0	
Phase 2				
Cecliniani Park	10	2.75	27.5	
Patzer Park	1	2.75	2.8	
Daniel Busch Park	5	2.75	13.8	
Fabian Park	2	2.75	5.5	142
Zanussi Park	5	2.75	13.8	
Souza Family Park	5	2.75	13.8	
Verner Hanson Park	3.5	2.75	9.6	
Merrill West High School	20	2.75	55.0	
Phase 3				
West Valley Mall	20	2.75	55.0	
Kenner Park	10	2.75	27.5	
Dr. Powers Park	10.6	2.75	29.2	
Tracy Park Apartments	10	2.75	27.5	245
Monte Vista Ball Park	9.4	2.75	25.9	
Central School	3.3	2.75	9.1	
Lincoln Park	14.3	2.75	39.3	
Tracy Ball Park	11.5	2.75	31.6	
Phase 4				
El Pescadero Park	14.5	2.75	39.9	
south School Park	10	2.75	27.5	
Hoyt Park	7	2.75	19.3	110
Tracy Press Park	1.5	2.75	4.1	
Barboza Park	2	2.75	5.5	
Gretchen Talley Park	5	2.75	13.8	
Phase 5				
Hirsch Elementary School	7.5	2.75	20.6	
larsen Park	5	2.75	13.8	
Thoming Park	5	2.75	13.8	109
Garden Court Park	7	2.75	19.3	
Veterans Park	15	2.75	41.3	
Total for all Phases			780	

Abbreviations:
af/yr = Acre-feet per year
af/ac/yr = Acre-feet per acre per year

Notes:
(a) Modified from Tracy Gateway Project: Revised Water Supply Analysis (West Yost, 2002)

Table 25
Projected Future Recycled Water Demand (a)
City of Tracy, California

	Demand Source	Projected Recycled Water Demand (ac-ft/yr) 2010	2015	2020	2025
In-Project Recycled Water Use	Gateway Project (a)				
	Golf Course	335	335	335	335
	Landscaped Areas	361	361	361	361
	Roadway/Parkway	67	67	67	67
	Subtotal Gateway	763	763	763	763
	Tracy Hills Project (b)				
	Commercial	0	0	141	141
	Golf course	0	0	1500	1500
	I-580	0	0	51	51
	Light industrial	0	0	193	193
	Parks and Green Belts	0	0	509	509
	Roadways	0	0	310	310
	Highschool	0	0	227	227
	K-8 school	0	0	370	370
	Subtotal Tracy Hills	0	0	3,301	3,301
	Subtotal In-Project	763	763	4,064	4,064
WEP	Gateway (a)	780	780	780	780
	Tracy Hills (b)	0	0	0	0
	Subtotal Water Exchange	780	780	780	780
Tesla Power Project (c)		5,900	5,900	5,900	5,900
Total		**7,443**	**7,443**	**10,744**	**10,744**

Abbreviations:
ac-ft/yr = Acre feet per year
WEP = Water Exchange Program

Notes:
(a) Estimates for future recycled water use for the Gateway Project are from Tech Memo No. 1 - Water Infrastructure (Revised), March 18, 2002 (West Yost, 2002).
(b) Estimates for future recycled water use for the Tracy Hills Project are from the Tracy Hills Recycled Water Distribution System Master Plan (Nolte, 2002).
(c) Recycled water demands for the Tesla Power Project were estimated by Florida Power & Light (2003).

Table 26
Water Conservation and Rationing Plan - Stages of Action (a)
City of Tracy, California

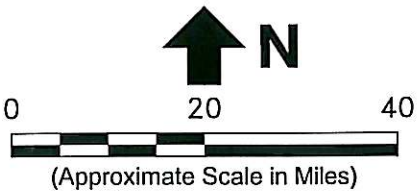
Stage	% Reduction (b)	Reduction Method (c)	
Stage I	< 10%	Voluntary	
		• Flagrant water waste or excessive runoff	Prohibited
		• Maintenance of plumbing and irrigation systems	Mandated
		• Prudent water conservation measures:	
		Hand-held trigger handle sprayers	Encouraged
		Drought tolerant landscape	Encouraged
		Watering during windy periods	Discouraged
		• Pool covers	Mandated
Stage II	10%	Mandatory: Landscape irrigation and outdoor water use	
		• Landscape irrigation prohibited unless:	
		7pm-9am May to September or 4pm-10am October to April	Accepted
		Person is present outdoors and in view of irrigated area	Accepted
		A drip or bubbler system is used	Accepted
		• Non-commercial sidewalk washing	Prohibited
		• Commercial sidewalk washing	Discouraged
		• Addition of water above health and operational requirements for pools and hot tubs	Prohibited
		• Car washing (except with trigger spray)	Prohibited
Stage III	15%	Mandatory	
		• Landscape irrigation prohibited unless:	
		May-September:	
		Odd addresses Mon, Wed, Sat 7pm-9am,	Accepted
		Even addresses Tue, Thur, Sun 7pm-9am	Accepted
		October-April:	
		Odd addresses Mon, Wed, Sat 4pm-10am	Accepted
		Even addresses Tue, Thur, Sun 4pm-10am	Accepted
		• Landscape irrigation during high wind	Prohibited
		• Commercial sidewalk washing, except on Friday	Prohibited
		• Restaurants may serve water only upon request	Mandated
		• Manager/Owners of commercial lodgings must post notice of drought conditions in every guest room	Mandated
Stage IV	25%	Mandatory: Reduction based on base year usage	
		• Car washing (except with bucket)	Prohibited
		• Auto dealerships may wash vehicles with trigger nozzle only on Friday or on the day before or day of delivery	Mandated
		• Car washing with recycled water facility not restricted	Accepted
		• Manager/Owner of every facility with restroom must post notice declaring drought condition	Mandated
Stage V	>25%	Mandatory: Emergency reductions (d)	
		• Water use other than required for public health and safety and fire protection	Prohibited
		• Landscape irrigation	Prohibited
		• Recreational water use	Prohibited

Table 26
Water Conservation and Rationing Plan - Stages of Action (a)
City of Tracy, California

Abbreviations
DMC/CVP = Central Valley Project water delivered via the Delta Mendota Canal

Notes:
(a) Stages of action and reduction methods are summarized from Tracy's Water Conservation and Rationing Plan, Municipal Code Section 11.28.170-290, based on the City's Water Shortage Contingency Plan (Kennedy/Jenks, 1994).
(b) Percent reduction refers to City-wide potable water demand reduction goals.
(c) Excess water surcharge/rate structure may be adopted during times of drought or water emergency by resolution of the City Council.
(d) Emergency supply reductions may be caused by the inability to draw groundwater, contamination, natural disaster, floods, sabotage, or any other unusual circumstance that affects the quality or reliability of the City's water supply.

Source: Figure 1-1, *Regional Location*, *City of Tracy Draft General Plan Introduction*, 30 June 2005.



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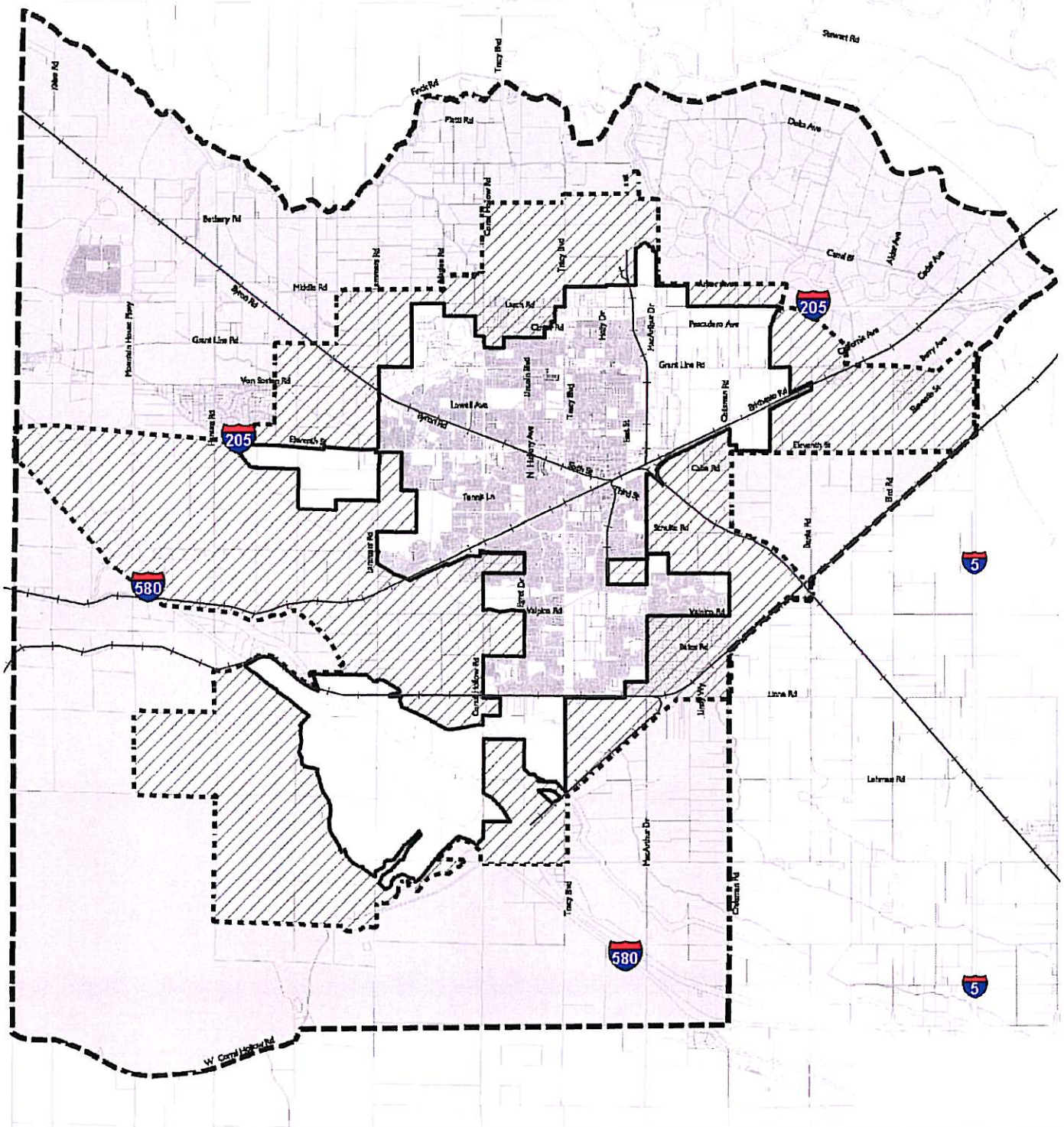
Regional Location

City of Tracy
Tracy, CA
December 2005
EKI A00070.03

Figure 1



Source: Figure 1-2, *Tracy City Limits Sphere of Influence and Planning Area, City of Tracy Draft General Plan Introduction*, 30 June 2005.

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Legend:

- City Limits
- Sphere of Influence
- Planning Area

N

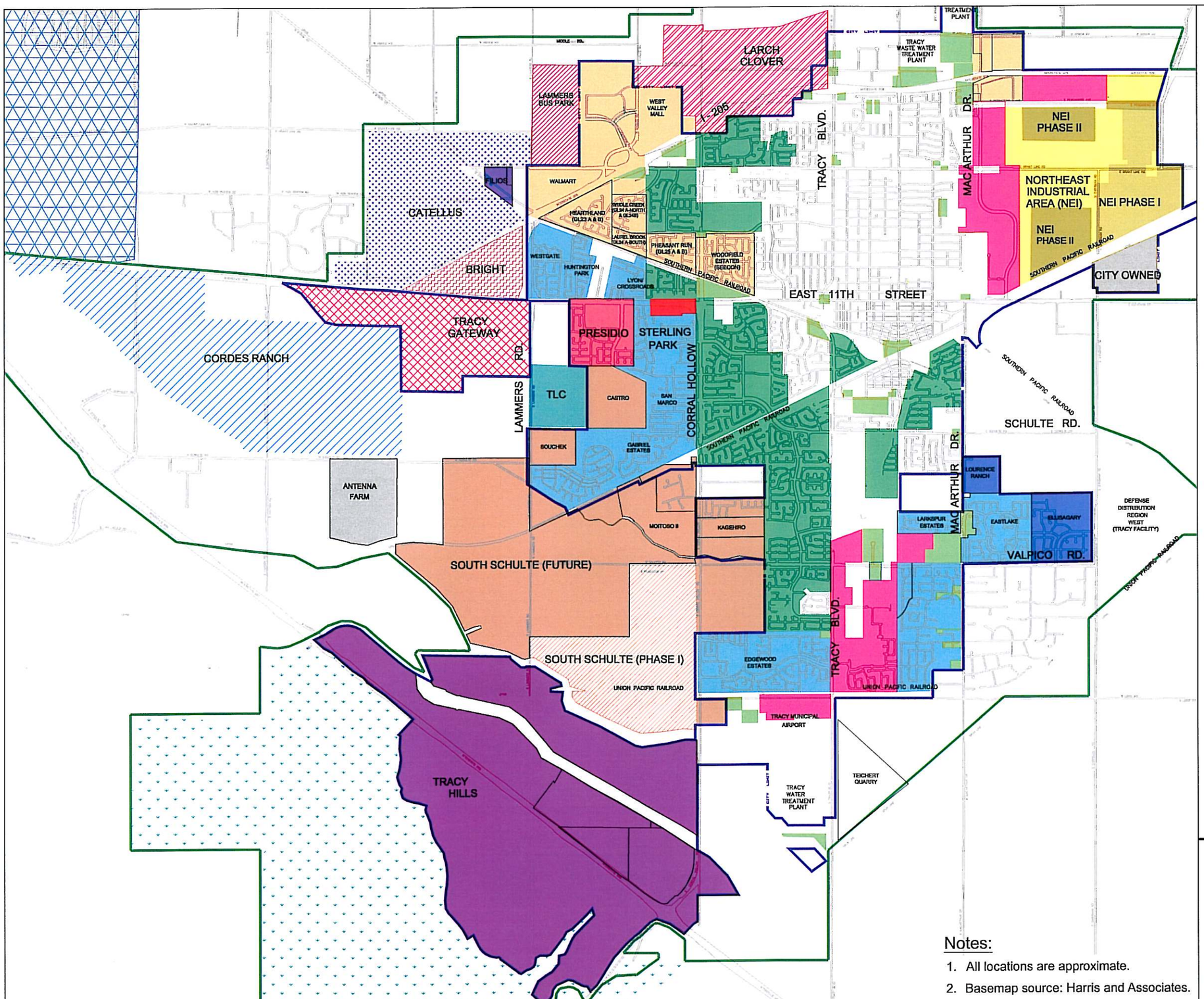
0 0.5 1 Miles

Tracy City Limits
Sphere of Influence and
Planning Area

City of Tracy
Tracy, CA

December 2005
EKI A00070.03

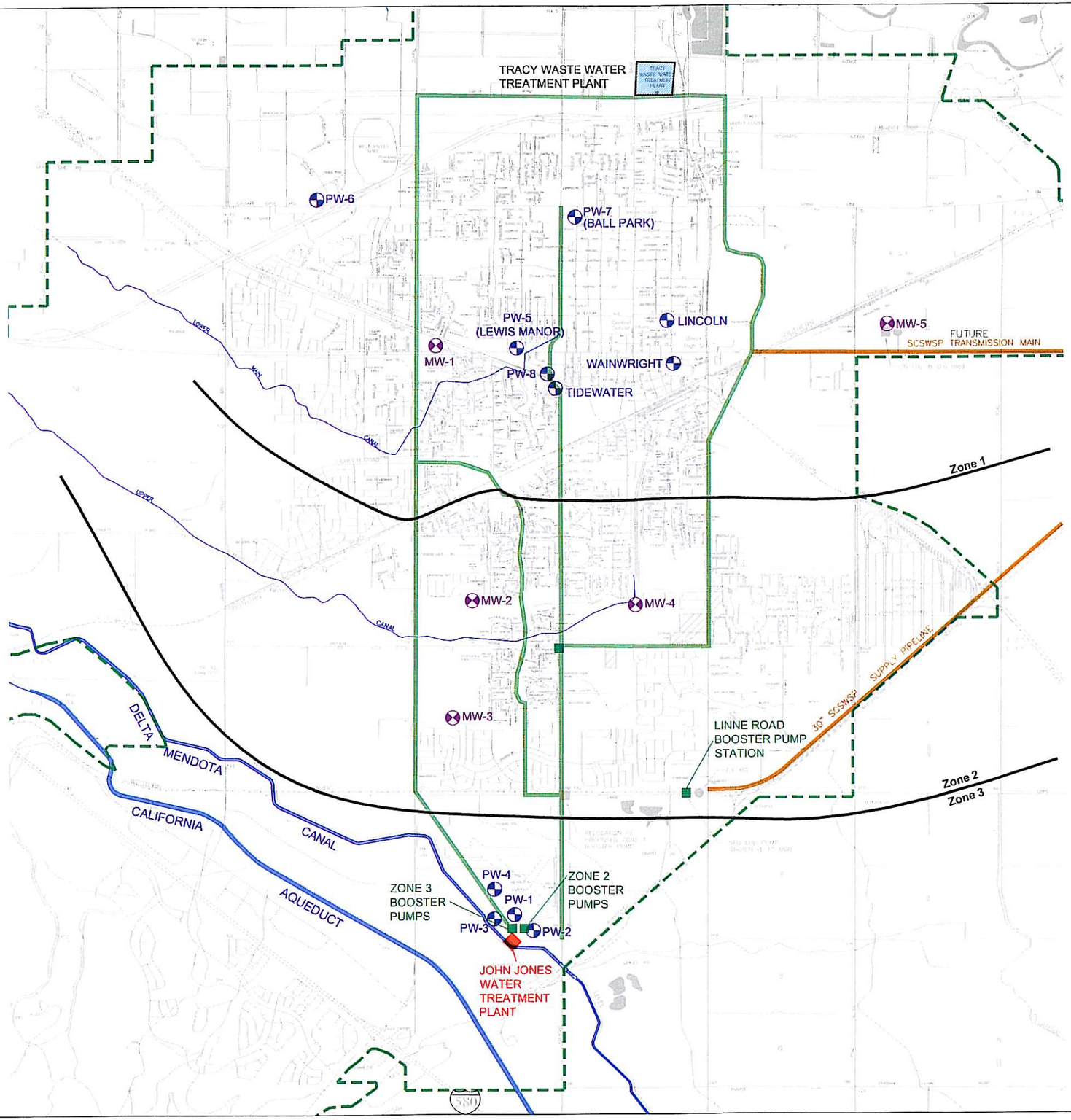
Figure 2



Planning Areas in Tracy

City of Tracy
Tracy, CA
December 2005
EKI A00070.03

Figure 3



N

0 4000 8000

(Approximate Scale in Feet)

Legend:

- Booster Pump Station
- Monitoring Well Location
- Extraction Well
- Pressure Zone Line
- Canal
- Existing Distribution Mains
- SCSWSP Supply Pipeline/Transmission Main
- Sphere of Influence
- Wastewater Treatment Plant
- John Jones Water Treatment Plant

Abbreviations:

PW - Extraction (Pumping) Well

MW - Monitoring Well

SCSWSP - South County Surface Water Supply Project

Notes:

1. All locations are approximate.
2. Figure adapted from map provided by West Yost and Associates.

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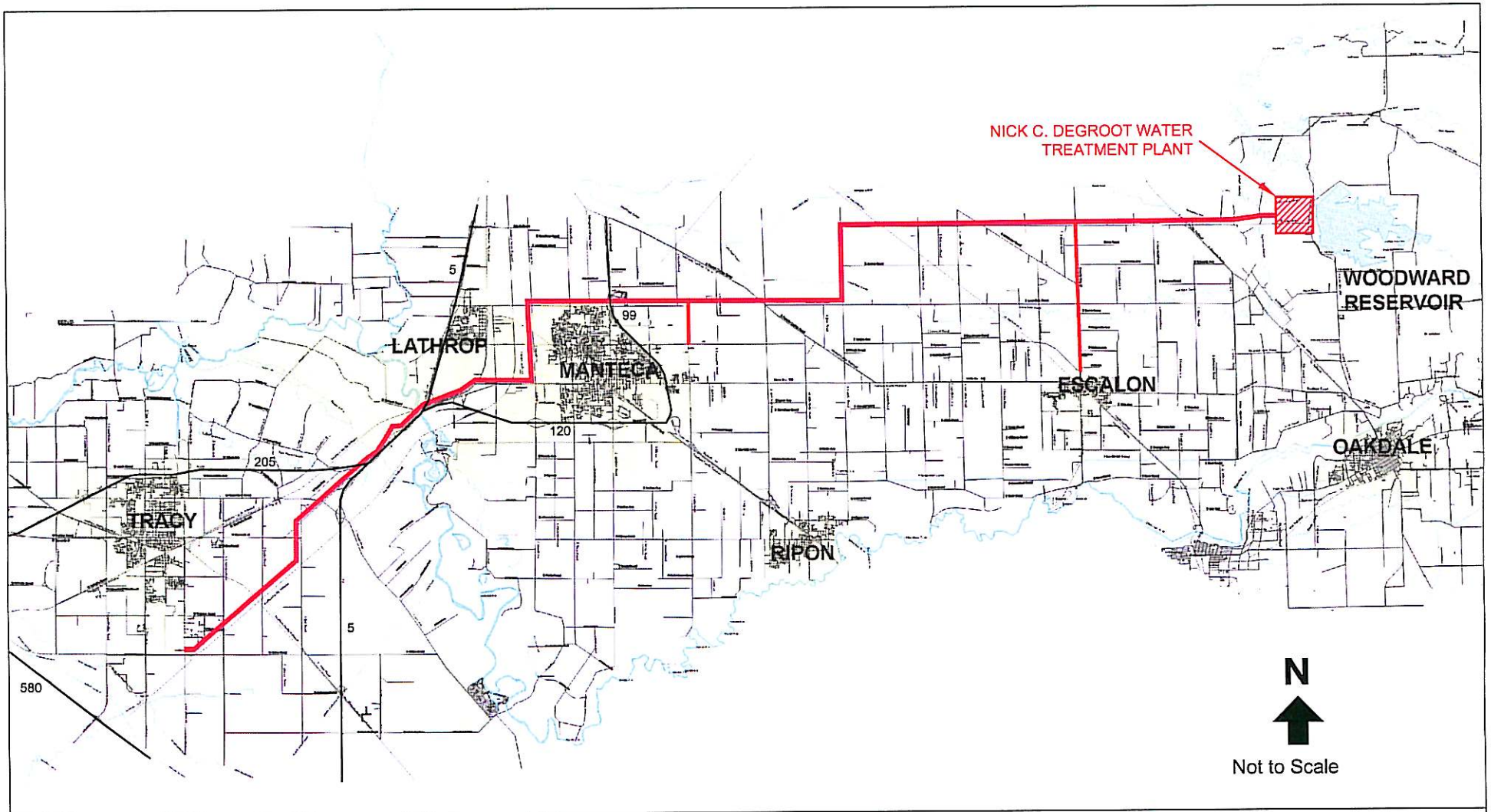
Water Supply Infrastructure

City of Tracy
Tracy, CA

December 2005
EKI A00070.03

Figure 4



LEGEND

SCSWSP Pipeline Route

Notes:

1. Figure adapted from Black & Veatch, 1998.
2. SCSWSP = South County Surface Water Supply Project, a partnership of the South San Joaquin Irrigation District and the Cities of Manteca, Escalon, Lathrop & Tracy.

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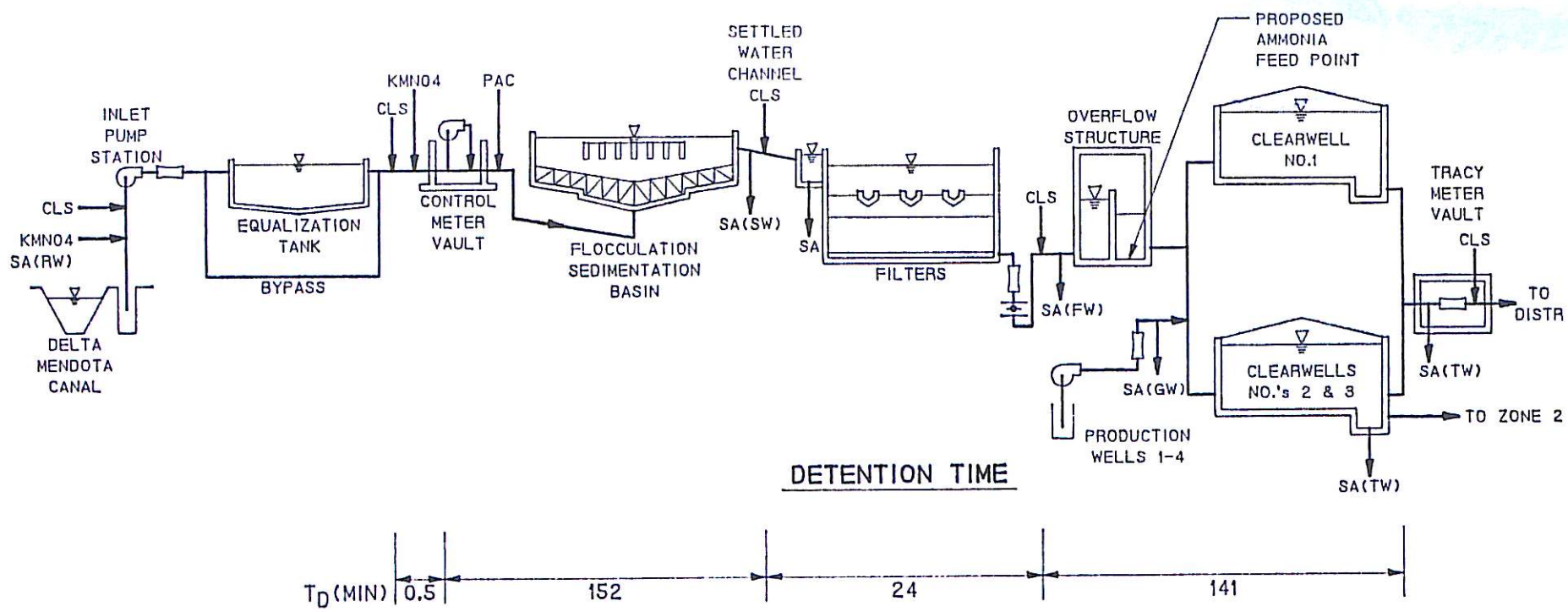
SCSWSP Pipeline Route

City of Tracy
Tracy, CA
December 2005
EKI A00070.03

Figure 5



LEGEND:

CLS	- Chlorine Feed Point
KMNO4	- Permanganate Feed Point
SA (GW)	- Groundwater Well Sample
PAC	- Powdered Activated Carbon Feed Point
SA (FW)	- Filtered Water Sample (Grab)
SA (RW)	- Raw Water Sample (Grab)
SA (SW)	- Settled Water Sample (Grab)
SA (TW)	- Treated Water Sample
T_D	- Hydraulic Detention Time

Notes:

1. Kennedy/Jenks Consultants, City of Tracy Chloramination Study, 1992.
2. Detention times estimated between points shown for flow of 10 mgd, three filters in service, and low clearwell level.

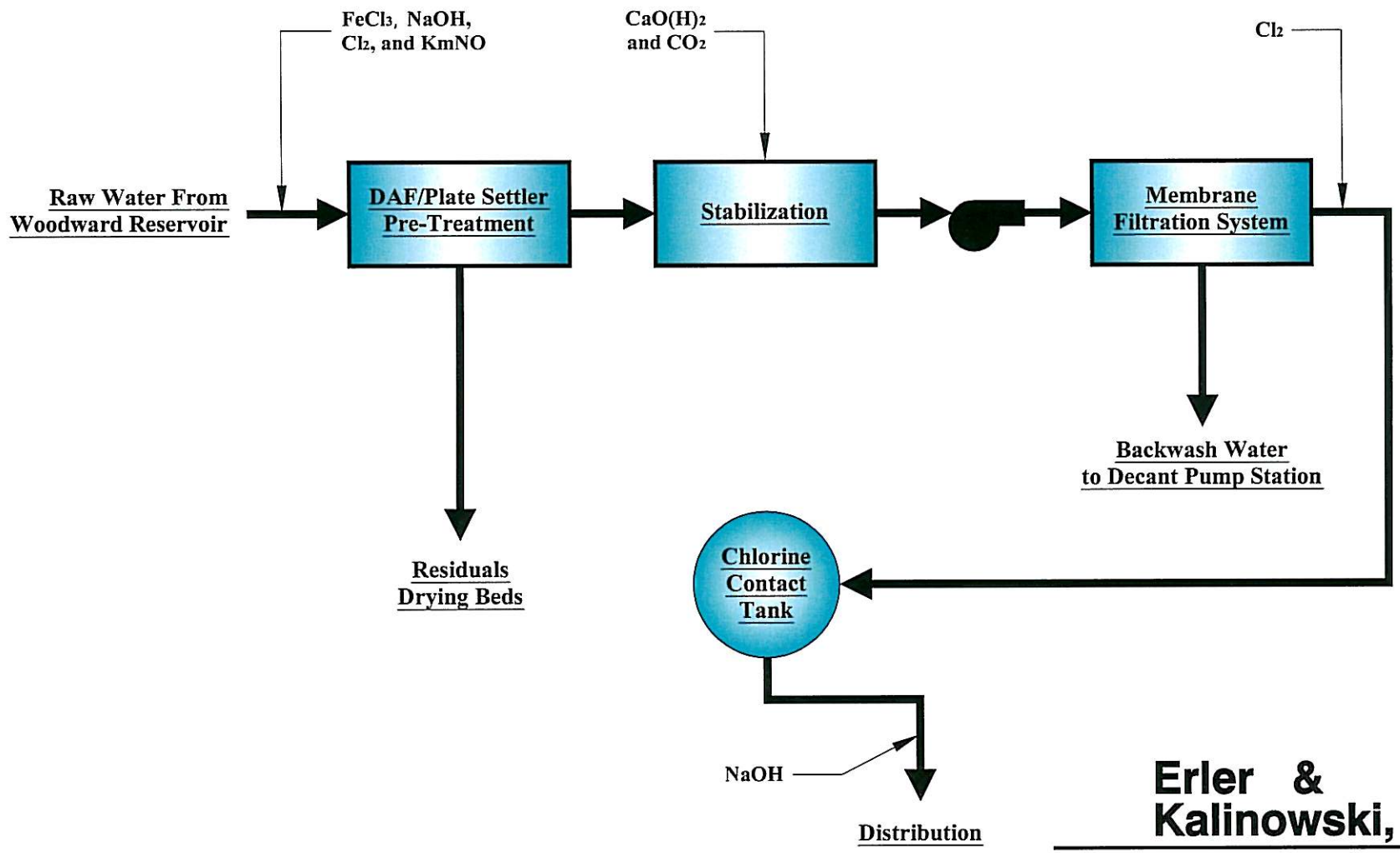
Erler & Kalinowski, Inc.

Current Process Schematic of
John Jones Water Treatment Plant

City of Tracy
Tracy, CA

December 2005
EKI A00070.03

Figure 6



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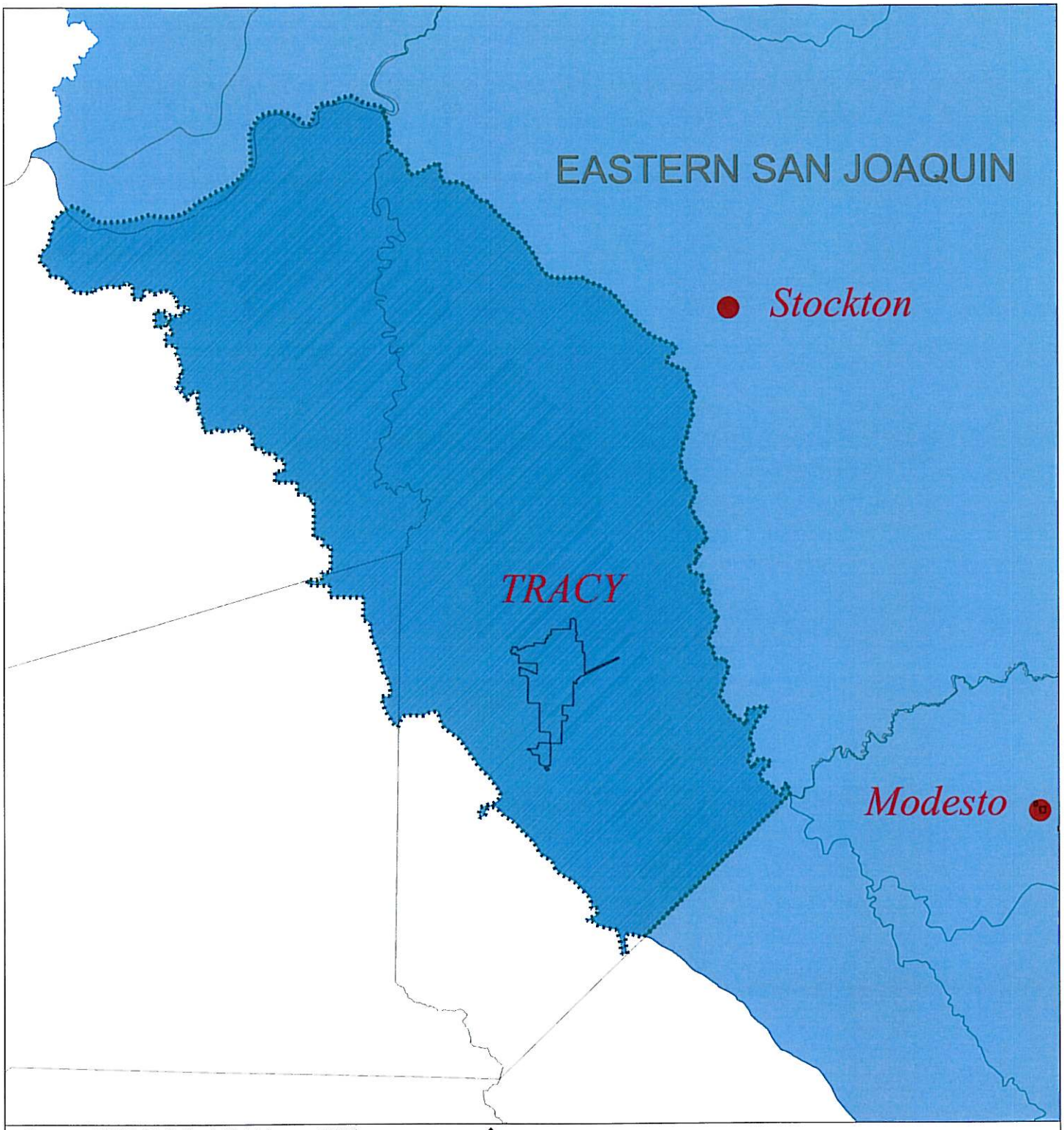
Process Schematic of
SCSWSP Treatment Plant

City of Tracy
Tracy, CA
December 2005
EKI A00070.03
Figure 7

Notes:

1. Figure adapted from Black & Veatch, 2002
2. SCSWSP = South County Surface Water Supply Project, a partnership of the South San Joaquin Irrigation District and the Cities of Manteca, Escalon, Lathrop & Tracy.



Source: DWR, Bulletin 118, February 2004.

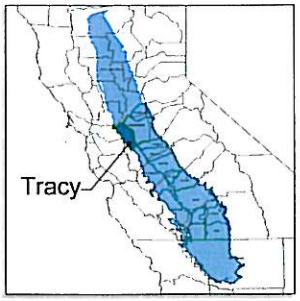
N

0 10000 20000

(Approximate Scale in Feet)

Erler & Kalinowski, Inc.

Tracy Sub-Basin



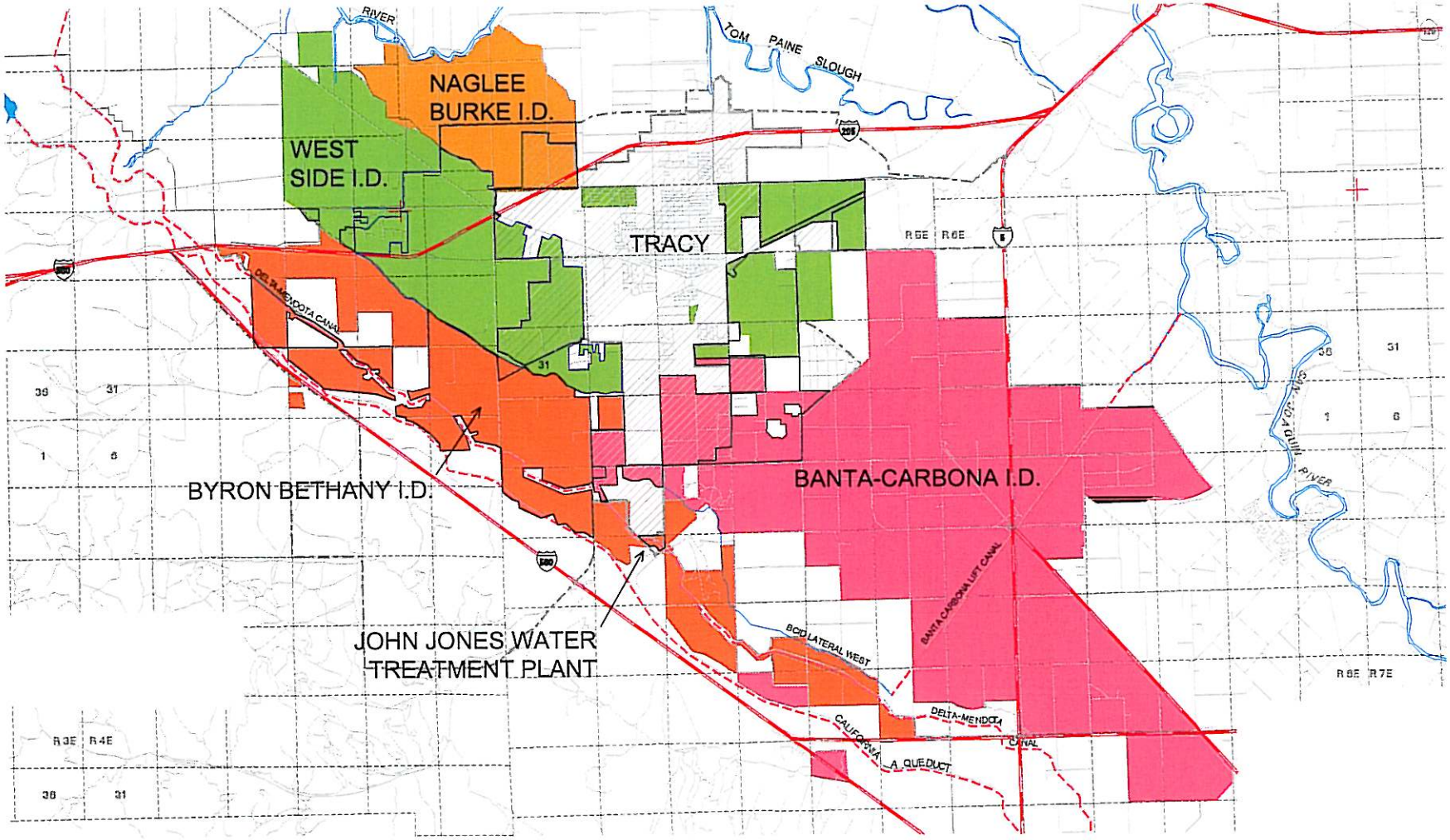
Legend:

San Joaquin/Sacramento Groundwater Basin

Tracy Sub-Basin

City of Tracy
Tracy, CA
December 2005
EKI A00070.03

Figure 8



Legend:

- Tracy Urban Growth Boundary
- Tracy City Limits
- Canal
- Major Highway
- Road

N

0 12000 24000

(Approximate Scale in Feet)

Erler & Kalinowski, Inc.

Irrigation and Water Districts Surrounding the City of Tracy

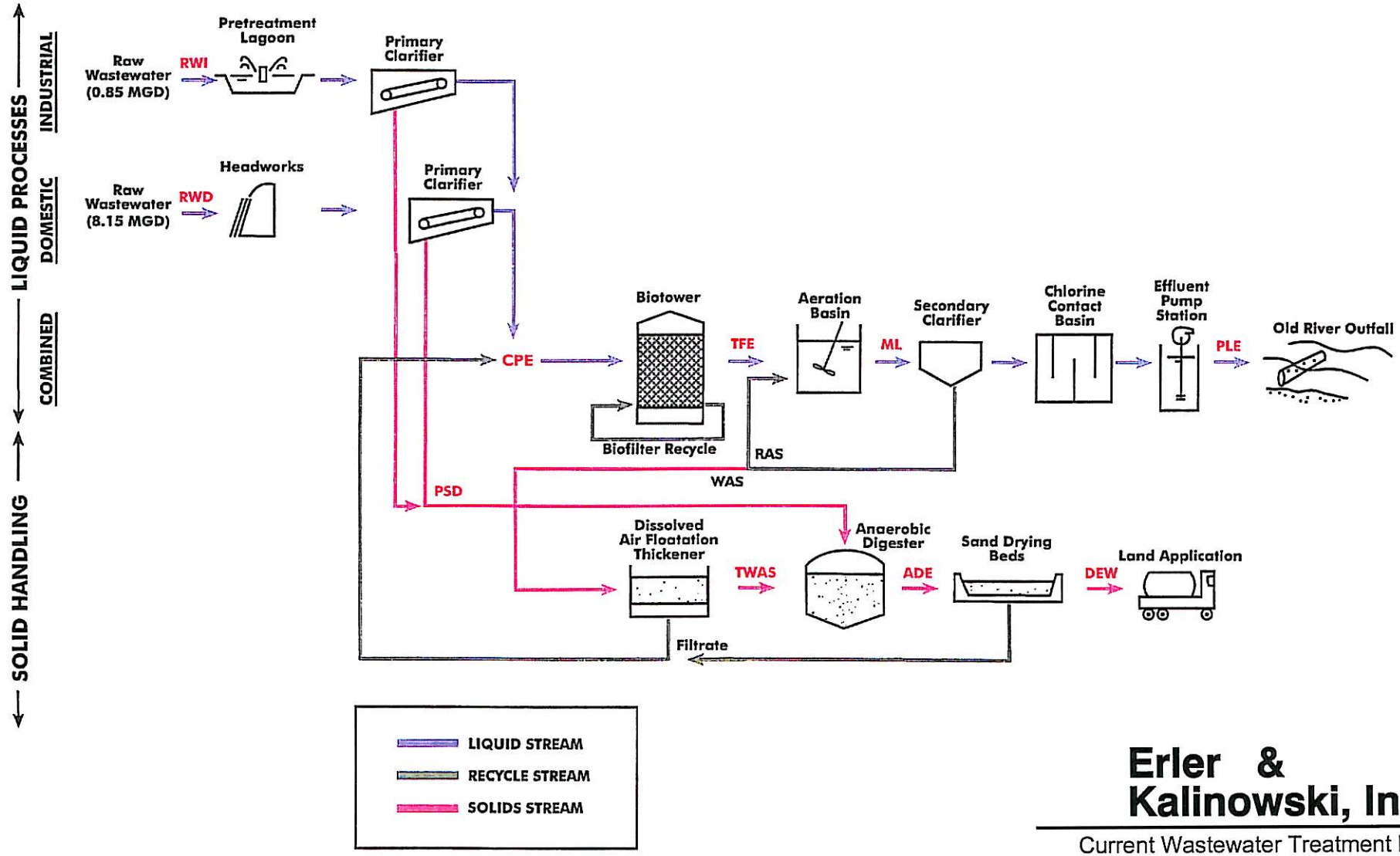
City of Tracy
Tracy, CA

December 2005
EKI A00070.03

Figure 9

Notes:

1. All locations are approximate.
2. Figure adapted from map provided by West Yost and Associates.



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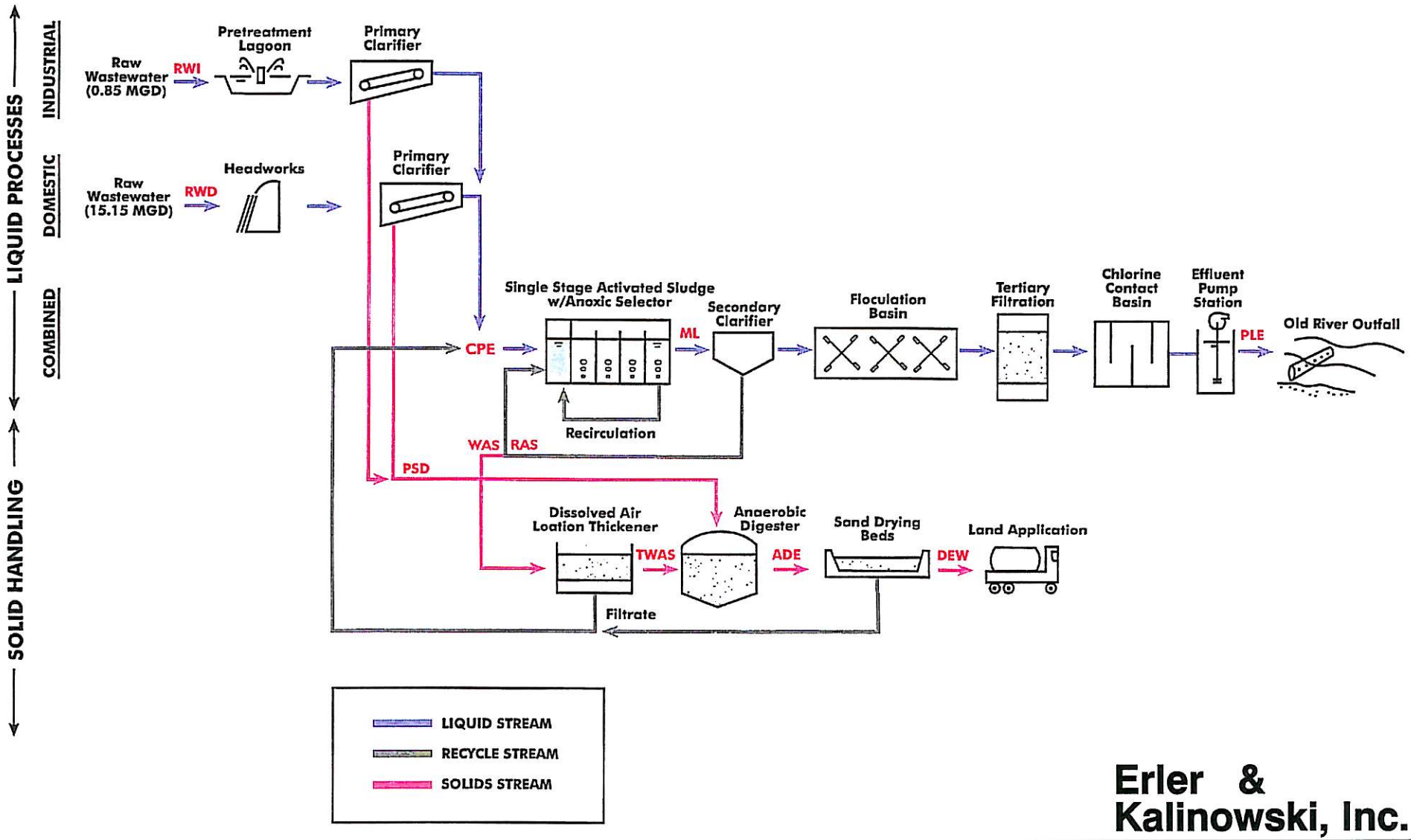
Current Wastewater Treatment Plant Flow Diagram

City of Tracy
Tracy, CA
December 2005
EKI A00070.03
Figure 10

Notes:

1. All locations are approximate.
2. Source: *Figure 2-4.fh10, City of Tracy Facilities* by CH2MHILL January 2003.



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Future Wastewater Treatment Plant
Flow Diagram Post-Expansion

City of Tracy
Tracy, CA
December 2005
EKI A00070.03
Figure 11

Notes:

1. All locations are approximate.
2. Source: *Figure 5-17.fh10, City of Tracy Facilities* by CH2MHILL January 2003.

Appendix A

California Urban Water Management Planning Act
California Water Code, Division 6, Part 2.6, July 2005

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Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384, Costa, 2002
SB 1518, Torlakson, 2002
AB 105, Wiggins, 2004
SB 318, Alpert, 2004

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in

its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS
Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. 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 urban water supplier 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 official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council

in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including,

but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Articl 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644.

(a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the

plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

Appendix B

Notification Letters

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CITY OF TRACY

Public Works Department
520 Tracy Boulevard
Tracy, CA 95376

Telephone: (209) 831-4420
Fax: (209) 831-4472

August 22, 2005

«Company»
«Address1»
«City», «State» «PostalCode»

Gentlemen:

RE: NOTICE OF PREPARATION OF URBAN WATER MANAGEMENT PLAN – 2005 UPDATE

The Urban Water Management Plan Act (Water Code Section 10610 – 10657) requires the City of Tracy ("City") to update its Urban Water Management Plant ("UWMP") in 2005. The City is currently reviewing our existing UWMP, which was updated in 2002, and considering revisions to the document. We invite your agency's participation in this revision process.

A draft of the 2005 UWMP will be made available for public review and a public hearing will be scheduled later this year. In the meantime, if you would like more information regarding Tracy's 2002 UWMP and our schedule for preparing the 2005 UWMP, or if you would like to participate in the preparation of the 2005 UWMP, please contact Steve Bayley at:

City of Tracy Public Works Department
520 Tracy Boulevard
Tracy, California 95376
(209) 831-4420
steveb@ci.tracy.ca.us

Sincerely,

Steve Bayley
Deputy Director of Public Works

01-082205kl

City of Lathrop
390 Towne Center Drive
Lathrop, California 95330

City of Manteca
1001 W. Center Street
Manteca, CA 95337

Mountain House Community Services District
11 S. San Joaquin St. - 7th Floor
Stockton, California 95202

Banta-Carbona Irrigation District
3514 W Lehman Road/ P. O. Box 299
Tracy, California 95378-0299

Byron Bethany Irrigation District
3944 Main Street/P. O. Box 160
Byron, California 94514

The West Side Irrigation District
1320 Tracy Boulevard/P.O. Box 177
Tracy, California 95378-0177

San Joaquin Co. Dept. of PW
1810 E. Hazelton Ave.
P.O. Box 1810
Stockton, California 95201

South Delta Water Agency
4255 Pacific Avenue, Suite 2
Stockton, California 95207

San Luis & Delta-Mendota Water Authority
Route One/Box 35-F
Byron, California 94514

South San Joaquin Irrigation District
P. O. Box 747
Ripon, California 95366-0747

Naglee Burk Irrigation District
P. O. Box 1129
Tracy, California 95378-1129

Independent Mutual Water Company
P. O. Box 1129
Tracy, California 95378-1129

Pescadero Reclamation District
3650 W. Canal Boulevard
Tracy, California 95376

CITY OF TRACY

Public Works Department
520 Tracy Boulevard
Tracy, CA 95376

Telephone: (209) 831-4420
Fax: (209) 831-4472

October 21, 2005

«Company»
«Address1»
«City», «State» «PostalCode»

Gentlemen:

Re: **Notice of Availability of Draft Urban Water Management Plan - 2005 Update**

The Urban Water Management Plan Act (California Water Code Section 10610 – 10657) ("Act") requires the City of Tracy ("Tracy") to update its Urban Water Management Plan ("UWMP") in 2005. Additionally, Section 10620(d)(2) of the Act requires that "*Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source,...*". Tracy has prepared a draft of the 2005 update to our UWMP and we invite your agency's participation in reviewing the draft document.

The draft UWMP will be made available for public review on November 8, 2005 at the Tracy Main Library located at 20 East Eaton Avenue, Tracy, California 95376 and at the City Public Works Department located at 520 Tracy Boulevard, Tracy, California 95376. Comments on the draft UWMP plan should be submitted in writing to Mr. Steven Bayley by December 6, 2005 at the address below. If you have any questions regarding the draft UWMP, please contact:

City of Tracy Public Works Department
520 Tracy Boulevard
Tracy, California 95376
(209) 831-4420
SteveB@ci.tracy.ca.us

Yours very truly,

Steven Bayley, P.E.
Deputy Director of Public Works

01-102105kl

:ity of Lathrop
90 Towne Center Drive
athrop, California 95330

City of Manteca
1001 W. Center Street
Manteca, CA 95337

Mountain House Community
Services District
11 S. San Joaquin St. - 7th Floor
Stockton, California 95202

lanta-Carbona Irrigation District
:514 W Lehman Road/ P. O. Box
:99
Tracy, California 95378-0299

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3944 Main Street/P. O. Box 160
Byron, California 94514

The West Side Irrigation District
1320 Tracy Boulevard/P.O. Box 177
Tracy, California 95378-0177

San Joaquin Co. Dept. of PW
810 E. Hazelton Ave.
P.O. Box 1810
Stockton, California 95201

South Delta Water Agency
4255 Pacific Avenue, Suite 2
Stockton, California 95207

San Luis & Delta-Mendota Water
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Route One/Box 35-F
Byron, California 94514

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P. O. Box 747
Ripon, California 95366-0747

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P. O. Box 1129
Tracy, California 95378-1129

Independent Mutual Water
Company
P. O. Box 1129
Tracy, California 95378-1129

Pescadero Reclamation District
3650 W. Canal Boulevard
Tracy, California 95376

CITY OF TRACY

Public Works Department
520 Tracy Boulevard
Tracy, CA 95376

Telephone: (209) 831-4420
Fax: (209) 831-4472

November 15, 2005

«Company»
«Address1»
«City», «State» «PostalCode»

Dear Sir:

RE: NOTICE OF PUBLIC HEARING FOR DRAFT URBAN WATER MANAGEMENT PLAN - 2005 UPDATE

The Urban Water Management Plan Act (California Water Code Section 10610 – 10657) requires the City of Tracy to update its Urban Water Management Plan (UWMP) in 2005. Additionally, Section 10620(d)(2) of the Act requires that "*Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source*". Tracy is conducting a public hearing prior to the City Council's adoption of the 2005 UWMP and we invite your agency's participation in this process.

The public hearing will be held at 7:00 pm on Tuesday, December 6, 2005 at the Tracy Community Center, City Council Chambers, located at 300 East 10th Street, Tracy, California 95376. Comments on the draft 2005 UWMP may be made prior to the public hearing to Mr. Steven Bayley at the address below, or at the public hearing. A draft of the 2005 UWMP is available for review at the at the Tracy Main Library located at 20 East Eaton Avenue, Tracy, California 95376 and at the City's Public Works Department located at 520 Tracy Boulevard, Tracy, California 95376. If you have any questions regarding the draft 2005 UWMP, please contact:

City of Tracy Public Works Department
520 Tracy Boulevard
Tracy, California 95376
(209) 831-4420
SteveB@ci.tracy.ca.us

Yours very truly,

THE CITY OF TRACY
Dr. Nicholas Pinhey
Director of Public Works

By_____
Steven Bayley, P.E.
Deputy Director of Public Works

04-110705kl

ity of Lathrop
90 Towne Center Drive
athrop, California 95330

City of Manteca
1001 W. Center Street
Manteca, CA 95337

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. O. Box 747
ipon, California 95366-0747

Naglee Burk Irrigation District
P. O. Box 1129
Tracy, California 95378-1129

Independent Mutual Water
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P. O. Box 1129
Tracy, California 95378-1129

escadero Reclamation District
650 W. Canal Boulevard
racy, California 95376

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of San Joaquin

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a part to or interested in the above entitled matter; I am the principal clerk of the printer of the Tracy Press, a newspaper of general circulation, printed and published six times a week on Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday in the City of Tracy, California, County of San Joaquin, and which of newspaper has been adjudged a newspaper of general circulation by the Superior Court, Department 4, of the County of San Joaquin, State of California, under the date of June 30,1952, Case Number 53686; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and no in any supplement thereof on the following dates, to-wit;

August 26, and September 2

all in the year 2005

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Tracy, California, this 15th

day of September 2005

Sylvia A. Holster

Signature

This space is for the County Clerk's Filing Stamp

Proof of Publication

Public Notice # 881

City of Tracy

Notice of Preparation

PUBLIC NOTICE

No. 881

NOTICE OF PREPARATION OF URBAN WATER MANAGEMENT PLAN – 2005 UPDATE

The City of Tracy ("Tracy") will be reviewing and updating our Urban Water Management Plan ("UWMP") during 2005. Our UWMP has been developed in order to help ensure a reliable water supply sufficient to meet the needs of our customers. Tracy's current UWMP was updated in 2002 and, as required by California law, must be updated in 2005. We encourage all of our customers to participate in this review and revision process.

A draft of the 2005 UWMP will be made available for public review and a public hearing will be scheduled later this year. In the meantime, if you would like more information regarding Tracy's 2002 UWMP and our schedule for preparing the 2005 UWMP, or if you would like to participate in the preparation of the 2005 UWMP, please contact:

Steve Bayley
Deputy Director of Public Works
City of Tracy Public Works Department
520 Tracy Boulevard
Tracy, California 95376
(209) 831-4420
Steveb@ci.tracy.ca.us

Publish: August 26, September 2, 2005

PROOF OF PUBLI N

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of San Joaquin

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a part to or interested in the above entitled matter; I am the principal clerk of the printer of the Tracy Press, a newspaper of general circulation, printed and published six times a week on Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday in the City of Tracy, California, County of San Joaquin, and which of newspaper has been adjudged a newspaper of general circulation by the Superior Court, Department 4, of the County of San Joaquin, State of California, under the date of June 30,1952, Case Number 53686; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and no in any supplement thereof on the following dates, to-wit;

October 25

all in the year 2005

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Tracy, California, this 27th

day of October 2005

Signature

This space is for the County Clerk's Filing Stamp

Proof of Publication

Public Notice # 1105

City of Tracy

Notice of Availability for Public Review

Urban Water Mgmt Plan Update

PUBLIC NOTICE

No. 1105

NOTICE OF AVAILABILITY FOR PUBLIC REVIEW
URBAN WATER MANAGEMENT PLAN 2005 UPDATE

The City of Tracy ("Tracy") has prepared a draft update of its Urban Water Management Plan ("UWMP"). UWMPs are developed by cities in order to help ensure a reliable water supply sufficient to meet the future needs of their customers. Tracy's current UWMP was prepared in 2002 and, as required by California law, must be updated every 5 years, in years ending in 0 and 5.

A draft of the 2005 UWMP will be made available for public review on November 9, 2005 at the Tracy Main Library located at 20 East Eaton Avenue, Tracy, California 95376 and at the City Public Works Department located at 520 Tracy Boulevard, Tracy, California 95376. Comments on the draft UWMP plan should be submitted in writing to Mr. Steve Bayley at the address below or made at the public hearing currently scheduled as part of the December 6, 2005 City Council meeting. A separate notice will be distributed in advance of the public hearing. If you have any questions regarding the draft UWMP, please contact:

Steven Bayley
Deputy Director of Public Works
City of Tracy Public Works Department
520 Tracy Boulevard

Legals 5

Tracy, California 95376
(209) 831-4420
SteveB@ci.tracy.ca.us

Publish: October 25, 2005

PROOF OF PUBLICATION

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of San Joaquin

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a part to or interested in the above entitled matter; I am the principal clerk of the printer of the Tracy Press, a newspaper of general circulation, printed and published six times a week on Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday in the City of Tracy, California, County of San Joaquin, and which of newspaper has been adjudged a newspaper of general circulation by the Superior Court, Department 4, of the County of San Joaquin, State of California, under the date of June 30,1952, Case Number 53686; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and no in any supplement thereof on the following dates, to-wit;

November 8

all in the year 2005

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Tracy, California, this 15th

day of November 2005

Signature

This space is for the County Clerk's Filing Stamp

Proof of Publication

Public Notice # 1169

City of Tracy

2nd Notice Availability for Public Review

Urban Water Mgmt Plan Update

PUBLIC NOTICE

No. 1169

NOTICE OF AVAILABILITY FOR PUBLIC REVIEW OF URBAN WATER MANAGEMENT PLAN - 2005 UPDATE

The City of Tracy ("Tracy") has prepared a draft update of its Urban Water Management Plan ("UWMP"). UWMPs are developed by cities in order to help ensure a reliable water supply sufficient to meet the future needs of their customers. Tracy's current UWMP was prepared in 2002 and, as required by California law, must be updated every 5 years, in years ending in 0 and 5.

A draft of the 2005 UWMP will be made available for public review on November 8, 2005 at the Tracy Main Library located at 20 East Eaton Avenue, Tracy, California 95376 and at the City Public Works Department located at 520 Tracy

TUESDAY, NOVEMBER 8, 2005

Legals 5

Boulevard, Tracy, California 95376. Comments on the draft UWMP plan should be submitted in writing to Mr. Steve Bayley at the address below or made at the public hearing currently scheduled as part of the December 6, 2005 City Council meeting. A separate notice will be distributed in advance of the public hearing. If you have any questions regarding the draft UWMP please contact:

Steven Bayley
Deputy Director of Public Works
City of Tracy Public Works Department
520 Tracy Boulevard
Tracy, California 95376
(209) 831-4420
SteveB@ci.tracy.ca.us

PUBLISH: 11/8/05

PROOF OF PUBLICATION

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
COUNTY OF SAN JOAQUIN

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of twenty one years, and not a part to or interested in the above entitled matter; I am the principal clerk of the printer of the Tracy Press, a newspaper of general circulation, printed and published six times a week on Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday in the City of Tracy, California, County of San Joaquin, and which of newspaper has been adjudged a newspaper r of general circulation by the superior court, department 4, of the County of San Joaquin, State of California, under the date June 30, 1952, Case Number 53686; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit;

November 18, 25

all in the year 2005 .

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Tracy, California, this 25th

day of November .

Sylvia A. Holsten

Signature

This space is for County Clerk's Filing Stamp

Proof of Publication

Public Notice # 1210

City of Tracy

Notice of Public Hearing

Urban Water Management Plan-05 Update

PUBLIC NOTICE

Legals 5

No. 1210

NOTICE OF PUBLIC HEARING
URBAN WATER MANAGEMENT
PLAN - 2005 UPDATE

The City of Tracy has prepared a draft update of its Urban Water Management Plan (UWMP). Water agencies develop UWMPs in order to help ensure a reliable water supply sufficient to meet the future needs of their customers. The current UWMP was prepared in 2000 and, as required by California law, must be updated every five years.

The public hearing will be held at 7:00 pm on Tuesday, December 6, 2005 at Tracy Community Center, City Council Chambers, located at 3000 East 10th Street, Tracy, California 95376. Comments on the draft 2005 UWMP may be made prior to the public hearing to Mr. Steven Bayley at the address below, or at the public hearing. A draft of the 2005 UWMP is available for review at the at the Tracy Main Library located at 20 East Eaton Avenue, Tracy, California 95376 and at the City Public Works Department located at 520 Tracy Boulevard, Tracy, California 95376. If you have any questions regarding the draft 2005 UWMP, please contact:

Steven Bayley
Deputy Director of Public Works
City of Tracy Public Works Department
520 Tracy Boulevard
Tracy, California 95376
(209) 831-4420
SteveB@ci.tracy.ca.us

PUBLISH: November 18, 2005
November 25, 2005

PROOF OF P ON

Appendix C

Central Valley Project Water Shortage Allocation Policy
USBR, 2001

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Central Valley Project
M&I Water Shortage Policy, September 11, 2001
D R A F T -

The CVP (Central Valley Project) is operated under Federal statutes authorizing the CVP and by the terms and conditions of water rights acquired pursuant to California law. During any year, there may occur constraints on the availability of CVP water for an M&I (municipal and industrial) contractor under its contract. Thus, the purposes of this policy are to:

- Define water shortage terms and conditions applicable to all CVP M&I contractors
- Establish a minimum water supply level that (a) with M&I contractors' water shortage water conservation measures and other water supplies would sustain urban areas during water shortages, and (b) during severe or continuing water shortages would, as much as possible, protect public health and safety
- Provide information to help M&I contractors develop water shortage contingency plans

Currently, many M&I contractors are not using the full M&I portion of their contract total. If the M&I water shortage allocation were applied to full contract entitlements, the resulting allocation for some contractors would exceed their current demand. M&I water demands within the CVP are continually increasing. Therefore, the provision for "75 percent M&I reliability" will be applied to a contractor's historical use, with certain adjustments, up to the CVP projected M&I demand as of September 30, 1994. Reclamation recognizes that as water conservation measures are implemented there is a hardening of demand that lessens an M&I contractor's ability to reduce demand during shortages.

The capability of the CVP to meet the water supply levels addressed by this policy is subject to the availability of CVP water supplies. M&I water shortage allocation may differ between divisions of the CVP. Generally, the allocation (percentage) to the various divisions will be the same, unless specific operational constraints on Reclamation require otherwise.

Reclamation explored the concept of two tiers of M&I water supply reliability as proposed by contractors in the CVPIA (Central Valley Project Improvement Act) Administrative Proposal on Urban Water Supply Reliability. Although Reclamation determined not to adopt two tiers, it will

facilitate the sale of CVP water from willing sellers to M&I contractors when necessary.

Definitions

Historical use - The average quantity of CVP water put to beneficial use within the service area during the last 3 years of water deliveries, unconstrained by the availability of CVP water. Reclamation and the contractor will negotiate the calculated historical use, to be outlined in a contract exhibit that can be modified during the contract period (but that will not require formal contract amendment). Reclamation recognizes that certain circumstances may require adjustment of the historical use such as growth, extraordinary water conservation measures, or use of non-CVP water supplies. Also, Reclamation may agree to adjust the historical use on the basis of unique circumstances, after consultation with the contractor. An example of a unique circumstance is the year following a water shortage year, in which water users are still using extraordinary water conservation measures, or the converse, in which a contractor may use more water than historically used in order to recharge ground water.

Adjusted for growth - An adjustment to the contractor's historical use quantity to account for demand increases within the contractor's service area to include (but not be limited to) increases due to population growth and to the number or demand of industrial, commercial, and other entities the contractor serves, provided the contractor provides required documentation to Reclamation.

Adjusted for extraordinary water conservation measures - An adjustment to the contractor's historical use quantity to account for conservation measures that exceed applicable best management practices adopted by the California Urban Water Conservation Council. A water conservation measure considered extraordinary in 2001 may be a mandatory best management practice in 2010 and thus would not be considered extraordinary in 2010.

Adjusted for Non-CVP water - An adjustment to the contractor's historical use quantity to account for water sources other than the CVP used to satisfy M&I demand within the contractor's service area, subject to written documentation from the contractor that shows the extent to which use of the non-CVP water actually reduced the contractor's use of CVP water in other years.

Public health and safety - M&I uses to which water is allocated consistent with criteria established by the State of California, or as established by Reclamation consistent with criteria applied by similarly situated California M&I water supply entities, as applicable, during declared water shortage emergencies.

Terms and Conditions

1. Allocation of M&I water will be based on a contractor's historical use of CVP M&I water, adjusted for (a) growth, (b) extraordinary water conservation measures, and (c) non-CVP water, subject to Term and Condition 3. At the contractor's request, Reclamation will consult

with the contractor to adjust the contractor's historical use on the basis of (a) growth, (b) extraordinary water conservation measures, and (c) use of non-CVP water. Term and Condition 1 is intended to encourage contractors to use non-CVP water first and rely on CVP water as a supplemental supply. Reclamation will adjust the historical-use calculation to reflect the effect of non-CVP water used in lieu of use of the contractor's CVP water. Crediting for this non-CVP water will be based on 1 acre-foot for 1 acre-foot, unless Reclamation and the contractor agree otherwise in considering unique circumstances. The contractor must fully document use of non-CVP water to clearly show how much that water use actually reduced the contractor's use of CVP water in other years, and submit the documentation in writing to Reclamation.

2. For an M&I contractor to be eligible for the "minimum shortage allocation" of 75 percent of adjusted historical use, the contractor's water service contract must reference M&I water shortage policy. In addition, the water service contractor must (a) have developed and be implementing a water conservation plan that meets CVPIA criteria and (b) be measuring such water consistent with section 3405(b) of the CVPIA. Reclamation intends to incorporate in all new, renewed, and amended water service contracts, a provision that references the CVP M&I water shortage policy.

3. This M&I water shortage policy applies only to that portion of the CVP water identified as projected M&I demand as of September 30, 1994, as shown for year 2030 on Schedule A-12 of the 1996 Municipal and Industrial Water Rates book and for those contract quantities specified in section 206 of Public law 101-514. Subject to these limitations, except as provided for public health and safety levels (Term and Condition 7), irrigation water transferred or converted to M&I use after September 30, 1994, will be subject to shortage allocation as irrigation water. For CVP water transferred or assigned, a CVP contractor may request that the CVP water so obtained be eligible for M&I reliability. Before Reclamation may approve such a request, the transferee or assignee must fully mitigate any adverse impacts to agricultural water supplies. Further, for CVP water converted, an M&I contractor may request a permanent conversion from agricultural shortage criteria to M&I shortage

criteria, provided there are no adverse impacts to agricultural or other M&I water supply contracts.

4. Before allocation of M&I water to a contractor will be reduced, allocation of irrigation water will be reduced below 75 percent of contract entitlement, as shown here:

Irrigation Allocation	M&I Allocation
100%	100%
95%	100%
90%	100%
85%	100%
80%	100%
75%	100%

5. When allocation of irrigation water has been reduced below 75 percent and still further water supply reductions are necessary, both the M&I and irrigation allocations will be reduced by the same percentage increment. The M&I allocation will be reduced until it reaches 75 percent of adjusted historical use, and the irrigation allocation will be reduced until it reaches 50 percent of contract entitlement. The M&I allocation will not be further reduced until the irrigation allocation is reduced to below 25 percent of contract entitlement, as shown in the following tabulation.

Irrigation Allocation	M&I Allocation
70%	95%
65%	90%
60%	85%
55%	80%
50% - 25%	75%

6. When allocation of irrigation water is reduced below 25 percent of contract entitlement, Reclamation will reassess both the availability of CVP water supply and CVP water demand. Due to limited water supplies, during these times M&I water allocation to contractors may be reduced below 75 percent of adjusted historical use.

7. Reclamation will deliver CVP water to an M&I contractor at not less than a public health and safety water supply level, provided CVP

water is available, if (a) the Governor declares an emergency due to water shortage applicable to that contractor or (b) Reclamation, in consultation with the contractor, determines that an emergency exists due to water shortage. The contractor will calculate the public health and safety level using criteria developed by the State of California and submit the calculated level to Reclamation along with adequate support documentation for review. Reclamation will ensure that the calculated level is consistent with such criteria. If State criteria do not exist, the contractor will apply criteria developed by Reclamation (in consultation with the contractor) that will be consistent with relevant criteria used by similarly situated California M&I water entities. Reclamation will provide a water supply at the public health and safety level to all CVP M&I contractors, including contractors with allocation of irrigation water transferred or converted to M&I use after September 30, 1994. At times of extraordinary circumstance, Reclamation may determine that it is necessary to vary the allocation of M&I water among contractors, taking into consideration a contractor's available non- CVP water.

8. Each M&I contractor will provide to Reclamation its water shortage contingency plan designed to protect public health and safety. The contractor may provide a copy of its Urban Water Management Plan (UWMP) or water conservation plan (WCP) to Reclamation in lieu of a separate water shortage contingency plan so long as the UWMP or WCP contains the contractor's water shortage contingency plan.

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Appendix D

Process Schematic of the Expanded John Jones Water Treatment Plant
Carollo Engineers, 2002

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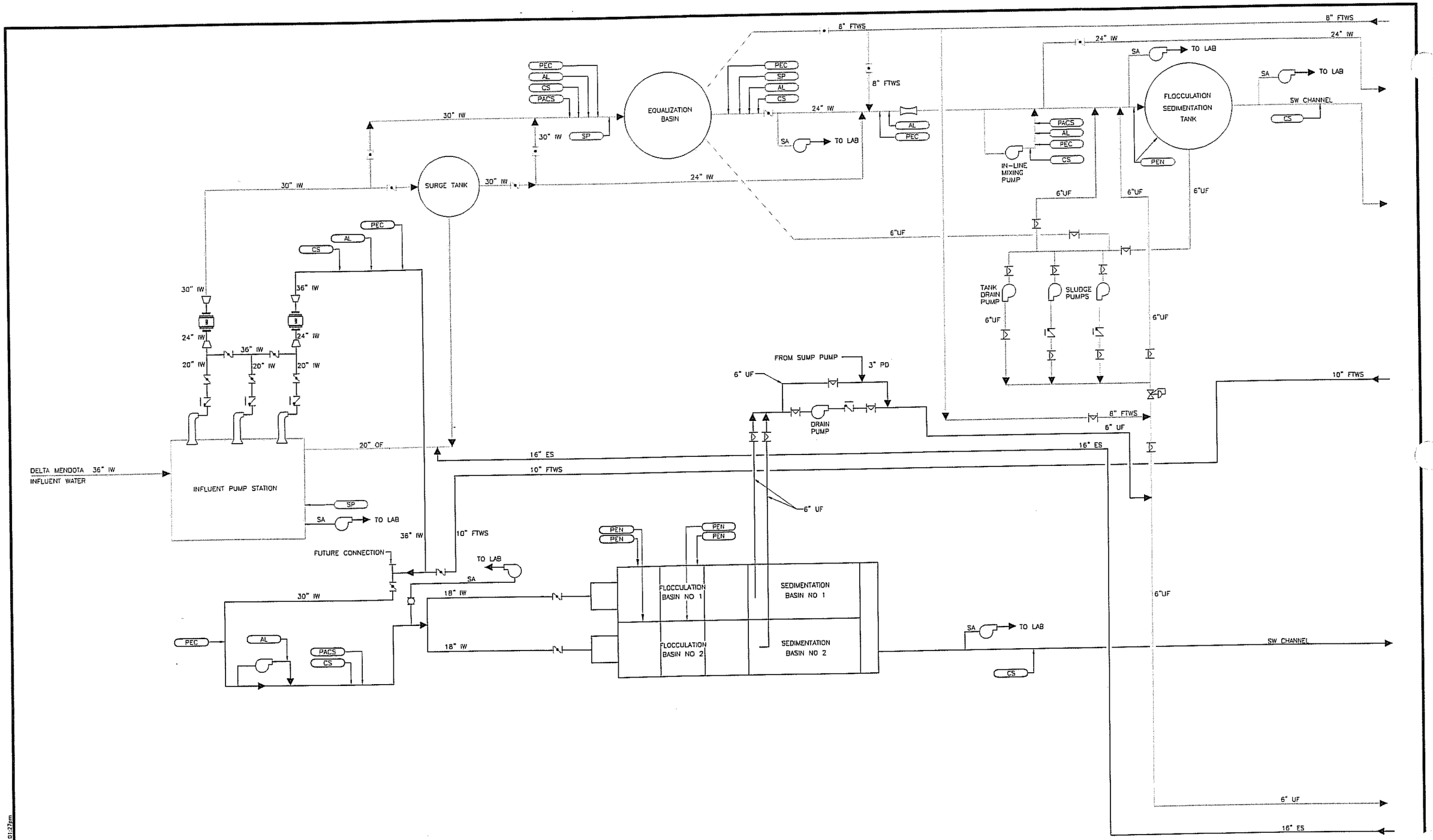

			CONFORMED DOCUMENTS FOR CONSTRUCTION	DESIGNED MAL	DISCIPLINE ENGINEER	ORIGINAL STAMPED BY MATHEW AXEL LARSON	PROJECT ENGINEER	ORIGINAL STAMPED BY SUZAN K. ENGLAND	PARTNER	ORIGINAL STAMPED BY KENNETH WILKINS	carollo engineers	CITY OF TRACY	VERIFY SCALES	JOB NO. 6456C
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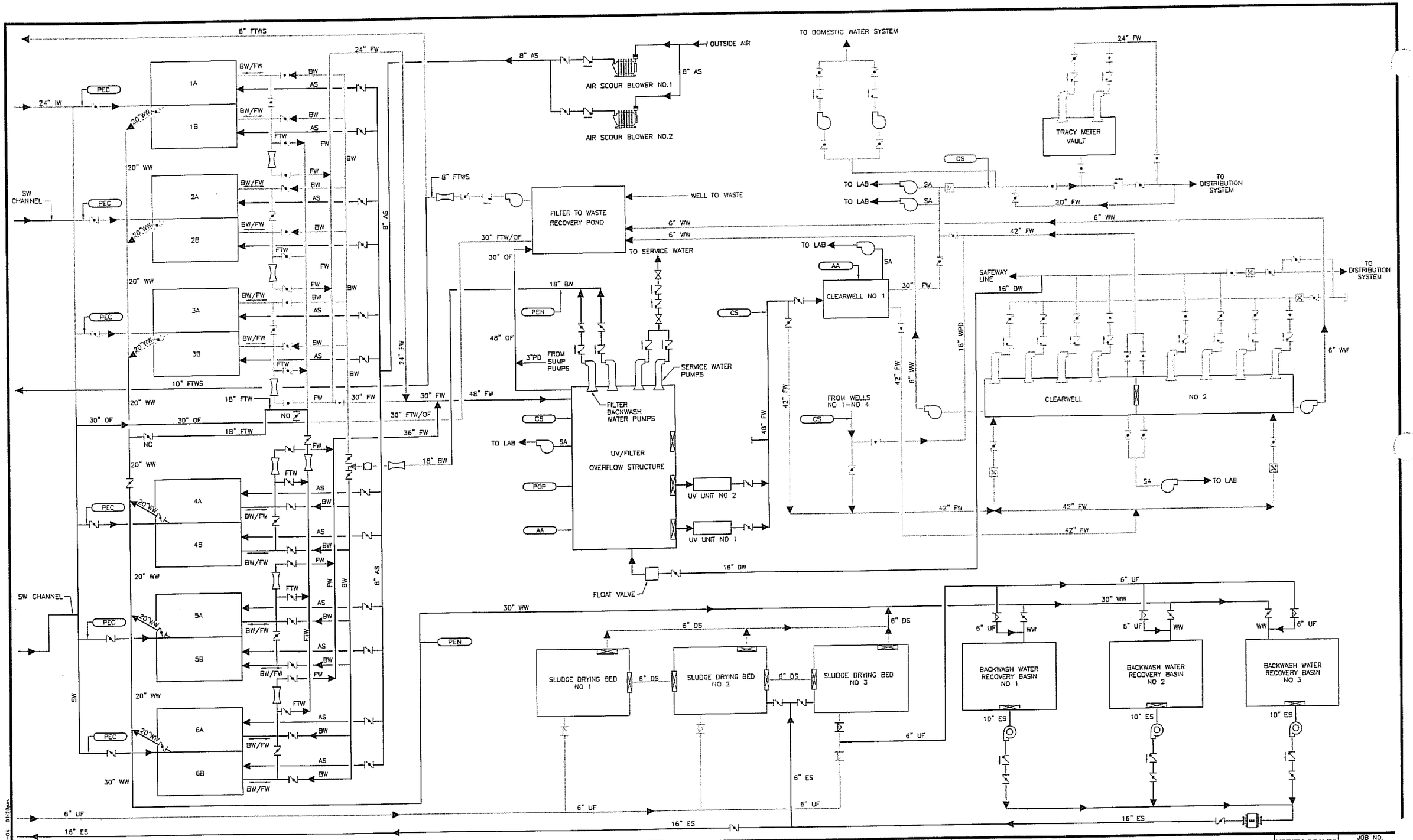

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CONFORMED DOCUMENTS FOR CONSTRUCTION

DESIGNED MAL
DRAWN SJB
CHECKED BTF
DATE MAR 2005

DISCIPLINE ENGINEER: ORIGINAL STAMPED BY MATHEW AXEL LARSON
PROJECT ENGINEER: ORIGINAL STAMPED BY SUZAN K. ENGLAND
PARTNER: ORIGINAL STAMPED BY KENNETH WILKINS

carollo engineers

CITY OF TRACY

JOHN JONES WTP – EXPANSION PROJECT

GENERAL
PROCESS SCHEMATIC
SHEET 2 OF 2

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Appendix E

Excerpts from: *Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area and a Portion of San Joaquin County*
Stoddard & Associates, 1996

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ORDINANCE 511

ADOPTION OF AB 3030 GROUNDWATER MANAGEMENT PLAN

WHEREAS, Groundwater resources are vitally important to the community, and

WHEREAS, As such, the State Legislature adopted AB 3030 to allow local management of groundwater, and

WHEREAS, On January 3, 1995, pursuant to California Water Code Sections 10750 - 10755.4, the City Council adopted Resolution No. 95-003, a Resolution of Intention to prepare a Groundwater Management Plan in conjunction with seven other agencies:

Plain View Water District
Banta Carbona Irrigation District
West Side Irrigation District
Del Puerto Water District
Patterson Water District
West Stanislaus Irrigation District
San Joaquin County

and,

WHEREAS, The San Luis and Delta-Mendota Water Authority coordinated the preparation of a plan, and

WHEREAS, The regional approach provides coordinated management of the groundwater, and economies of scale for each participant's share of the costs, and

WHEREAS, A public hearing pursuant to California Water Code Sections 10750 - 10755.4 was held on April 25, 1996, and

WHEREAS, The plan provides for:

1. Establishment of a plan implementation committee.

2. Establishment of activity groups interested in implementation elements of the plan.

3. Preparation of an annual summary of management activities that has taken place.

NOW, THEREFORE, The City Council of the City of Tracy does ordain as follows:

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SECTION 1: The Groundwater Management Plan ("the Plan") for the Northern Agencies in the Delta-Mendota Canal Service Area and a portion of San Joaquin County, dated October, 1995 and Revised April, 1995, is hereby adopted.

SECTION 2: This ordinance, with a summary of the Plan, shall be published in the Tracy Press, a newspaper of general circulation, within fifteen (15) days after its final passage and adoption, in accordance with California Government Code Section 36933. This ordinance shall go into effect and be in full force thirty (30) days after its final passage and adoption.

* * * * * * * *

The foregoing Ordinance was introduced at a regular meeting of the City Council of the City of Tracy held on the 7th day of May, 1996, and finally passed and adopted by said Council at the regular meeting held on the 21st day of May, 1996, by the following vote:

AYES: COUNCIL MEMBERS: IVES, SERPA, STROUP, BILBREY
NOES: COUNCIL MEMBERS: NONE
ABSENT: COUNCIL MEMBERS: MATTHEWS

Dan Bilbrey
Mayor

ATTEST:

Sharon Smith
City Clerk

04-0422.96k

GROUNDWATER MANAGEMENT PLAN FOR THE NORTHERN AGENCIES IN THE DELTA-MENDOTA CANAL SERVICE AREA AND A PORTION OF SAN JOAQUIN COUNTY

OCTOBER 1995
Revised APRIL 1996

GROUNDWATER MANAGEMENT PLAN FOR THE NORTHERN AGENCIES IN THE DELTA-MENDOTA CANAL SERVICE AREA AND A PORTION OF SAN JOAQUIN COUNTY

Prepared For:

SAN LUIS & DELTA-MENDOTA
WATER AUTHORITY
Post Office Box 2157
Los Banos, California 93635

Prepared By:

STODDARD & ASSOCIATES
CIVIL ENGINEERS
1120 West I Street, Suite C
Los Banos, California 93635

OCTOBER 1995
Revised APRIL 1996

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AB 3030	Groundwater Management Act, Assembly Bill 3030
CIMIS	California Irrigation Management System
CU	Crop Water Use
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
DMC	Delta-Mendota Canal
DOHS	Department of Health Services
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
E_P	Effective Precipitation
EPA	U.S. Environmental Protection Agency
ET_c	Evapotranspiration of an Individual Crop
ET_o	Monthly Reference Evapotranspiration
GMA	Groundwater Management Area
GMP	Groundwater Management Plan
HSA	Hydrologic Study Area
HUA	Hydrologic Unit Area
K_c	Monthly Crop Coefficient
mg/L	Milligrams Per Liter
N	Nitrogen, Nitrate, Dissolved
Ordinance	Groundwater Export Ordinance, San Joaquin County
RCD	West Stanislaus Resources Conservation District
RWQCB	Regional Water Quality Control Board
Se	Selenium
SLDMWA	San Luis & Delta-Mendota Water Authority
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
µg/L	Micrograms Per Liter
USBR	U.S. Bureau of Reclamation
USDANRCS	U.S. Department of Agriculture Natural Resources Conservation Service
USGS	U.S. Geological Survey
WPP	Wellhead Protection Program

Table 1

List of Agencies Participating in the Groundwater Management Plan

AUTHORITY

Water or Irrigation District:

- Banta Carbona Irrigation District
- Del Puerto Water District (newly organized) includes:
  - Del Puerto Division
  - Davis Water Division
  - Foothill Water Division
  - Hospital Water Division
  - Kern Canon Water Division
  - Mustang Water Division
  - Orestimba Water Division
  - Quinto Water Division
  - Romero Water Division
  - Salado Water Division
  - Sunflower Water Division
- Patterson Water District
- Plain View Water District
- West Stanislaus Irrigation District
- Westside Irrigation District

Cities:

- City of Tracy

Non-District Lands:

- San Joaquin County Flood Control and Water Conservation District

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of another local agency supplying water to the area without agreement of the local agency. San Joaquin County effectively curtailed export pumping from the county in 1994 under this ordinance.

The Groundwater Export Ordinance (Ordinance), which is being considered for adoption by San Joaquin County, requires that a county permit be obtained to extract and export groundwater from the county. The Ordinance is said to be needed to provide protection from the harmful use of the groundwater basins. Under the Ordinance, the county seeks to foster prudent water management practices to avoid significant adverse overdraft and related environmental, social, and economic impacts. The Ordinance is very controversial with many water agencies in the county and is said by some to conflict with AB 3030, which provides for groundwater management by local water agencies. If adopted, the Ordinance would require a permit to export groundwater with consideration given to AB 3030 plans.

The RCD, in cooperation with the U.S. Department of Agriculture Natural Resources Conservation Service (USDANRCS) and other agencies, is engaged in the HUA project to address the non-point source pollution problem in western Stanislaus County. The pollution occurs from sediment and agricultural chemicals transported in return flows entering the San Joaquin River. This program concentrates on implementation of irrigation best management practices for reduction of these contaminants that negatively affect the beneficial uses of the San Joaquin River. Sediment can damage aquatic habitat, increase maintenance costs of canals and ditches, and increase on-farm maintenance costs. The districts in Stanislaus County (West Stanislaus Irrigation District, Patterson and Del Puerto Water Districts) participate in the program through the RCD. The districts receive assistance from the staff of the HUA in identifying irrigation best management practices, soil moisture monitoring, and installation of tailwater return systems.

Individual water districts in the GMA have also been putting effort into increasing water use efficiency to preserve their water resources. All the federal districts in the GMA have completed water conservation plans pursuant to the CVPIA. In these plans, water conservation practices have been identified to maximize beneficial use of the water supply. Practices include better irrigation management, physical improvements, and institutional adjustments. Irrigation management practices include on-farm water management and district water

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was used to interpolate between data points. Volumes were calculated using the trapezoidal rule and multiplying by the average specific yield of the aquifer.

Maps indicating lines of equal elevation of water in wells for the springs of 1986, 1989, and 1994 are given in Figures 4 through 6. Maps delineating lines of equal change of water level in wells from 1986 through 1989, from 1989 through 1993, and from 1993 through 1994 are given in Figures 7 through 9, respectively.

Average water level changes and changes in groundwater storage in the study area for the study period are given in Table 9. The results indicate that from 1986 through 1993 water levels have declined in the subbasins, but from 1993 through 1994, water levels rose throughout the study area, demonstrating recovery in the groundwater storage system.

Table 9

Change In Groundwater Storage Using Specific Yield Method				
Northern Subbasin				
Drought Periods	Average Change In Water Level (feet)	Change In Storage (ac-feet)	Average Storage Change/Yr	Cumulative Change In Storage (ac-feet)
1986-1989	-2.7	-53,000	-18,000	-53,000
1989-1993	-5	-102,000	-25,000	-155,000
1993-1994	+2.5	+50,000	+50,000	-105,000

Note: (-ve) indicates decrease and (+ve) indicates increase.

The average change in storage over the 8-year study period is 13,000 acre feet. Recognizing that rainfall over the study period was significantly less than normal, the study area can be said to be in a hydrologically balanced condition.

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Table 12

Chemical Analysis of Selected Constituents in Groundwater

Upper Zone						
State Well No.	Sampling Date	Sulfate	TDS (mg/L)	N	Boron	Se (µg/L)
2S/5E-13P1	3/28/85	320	1400	9.1	2.2	4
3S/6E-7E1	3/11/85	230	1100	6.4	1.6	2
4S/7E-33B1	3/12/85	370	1400	0.13	0.90	10
5S/7E-1M2	5/01/85	120	750	18	0.58	2
5S/8E-22C1	4/30/85	1200	2400	0.9	2.2	13
6S/8E-4P1	5/16/85	540	1300	15	0.51	4
7S/8E-13N1	3/26/85	300	1900	11	0.64	<1
8S/8E-1H1	3/27/85	120	750	11	0.48	2

Lower Zone						
State Well No.	Sampling Date	Sulfate	TDS (mg/L)	N	Boron	Se (µg/L)
2S/5E-21D1	3/27/85	220	650	2.3	1.3	3
2S/6E-20L2	5/21/85	140	510	<.10	0.57	<1
3S/5E-20A2	3/28/85	330	920	1.4	3.0	2
3S/6E-26Q1	3/12/85	120	710	5.6	0.79	1
4S/6E-9M1	3/13/85	44	340	9.1	0.43	2
4S/7E-36Q3	3/13/85	120	690	8.3	0.59	1
5S/7E-27B1	5/16/85	190	760	16	1.2	5
5S/8E-32K3	4/30/85	530	1000	4	0.67	11
6S/7E-1R1	5/16/85	630	1300	9.6	0.86	6
6S/8E-3R2	5/16/85	360	820	6.4	0.41	8
7S/8E-27Q1	5/13/85	56	650	10	0.47	<1

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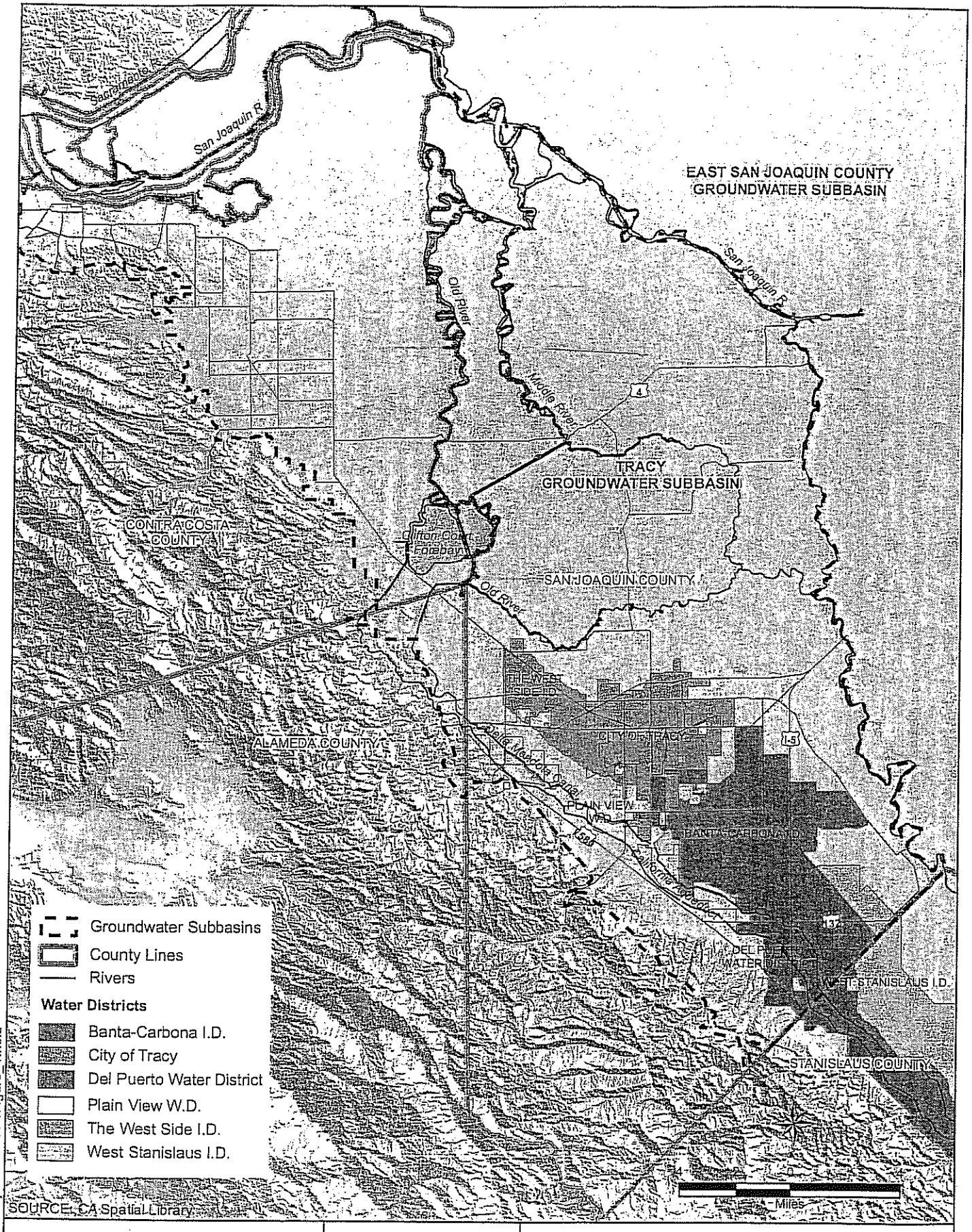

Tracy Regional Groundwater Management Plan	Bookman-Edmonston A Division of GEI Consultants	TRACY GROUNDWATER SUBBASIN
San Joaquin County, California		DECEMBER 2004 FIGURE 1

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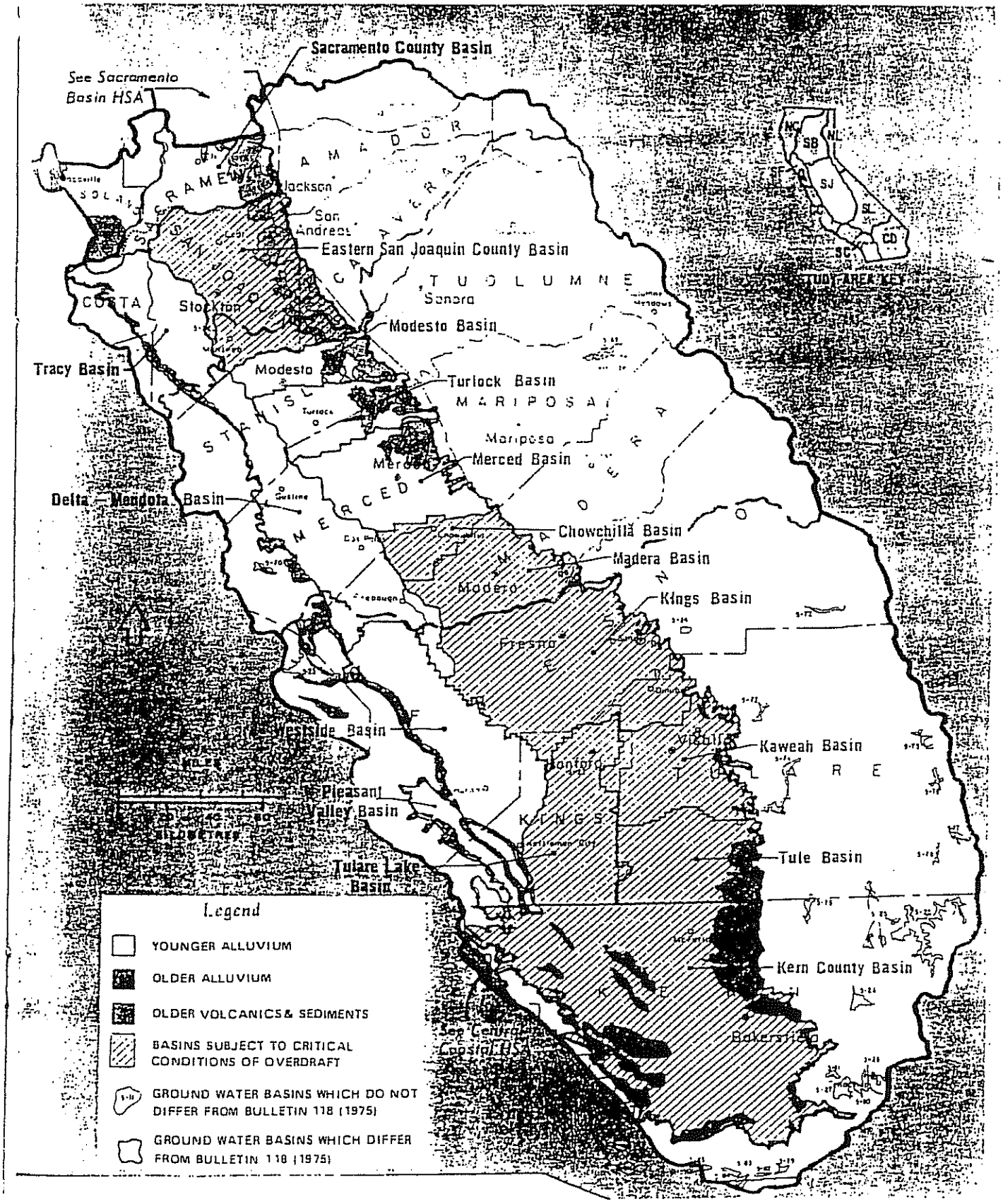

Figure 2. Groundwater Basins, San Joaquin Hydrologic Study Area, California (from DWR, 1980).

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Appendix F

Groundwater Management Policy Mitigated Negative Declaration
City of Tracy, 2001

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GROUNDWATER MANAGEMENT POLICY

MITIGATED NEGATIVE DECLARATION

PREPARED FOR:

CITY OF TRACY
520 TRACY BOULEVARD
TRACY, CA 95376

PREPARED BY:

PMC
PACIFIC MUNICIPAL CONSULTANTS

10461 OLD PLACERVILLE ROAD, SUITE 110
Sacramento, CA 95827
916-361-8384

APRIL 2001

MITIGATED NEGATIVE DECLARATION

FOR THE

GROUNDWATER MANAGEMENT POLICY

CITY OF TRACY

Prepared for:

CITY OF TRACY
Development and Engineering Department
520 Tracy Boulevard
Tracy, CA 95376

Prepared by:

PACIFIC MUNICIPAL CONSULTANTS
10461 Old Placerville Road, Suite 110
Sacramento, CA 95827
916.361.8384
Fax: 916.361.1574

APRIL 2001

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Appendix A City of Tracy Estimated Groundwater Yield Study

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2.1 PROJECT LOCATION

The Tracy Planning Area, as considered by the 1993 General Plan/Urban Management Plan (UMP), includes the City of Tracy, as well as approximately 63,000 acres of adjacent land located within San Joaquin County. The City of Tracy regional location is shown in **Figure 2-1.** The Tulare Formation, the City of Tracy's groundwater resource, consists of groundwater-bearing materials composed of poorly sorted gravelly material, including clay, sand, and silt underlying the Tracy Planning Area. These materials, which contain fresh groundwater, are referred to as the Tulare Formation of the Central Valley groundwater basin. Corcoran clay, laterally expansive clay up to 100 feet thick, separates the upper aquifer zone, which is up to 200 feet thick, from the lower aquifer zone, which is up to 650 feet thick.

2.2 BACKGROUND

The City of Tracy currently obtains water from both surface water and groundwater sources. The City, as a public purveyor of water, excises its appropriative right to utilize groundwater for beneficial use by the public. However, the UMP identified constraints to planned growth associated with water supply and the City's continued reliance on groundwater. The 1993 UMP EIR and the 1994 Water Master Plan suggested gradual phase out of groundwater as a regular water supply for the City after additional surface water supplies have been identified and acquired. Although additional surface water supplies have been identified and appear adequate to meet the City's need at projected UMP buildout, the final acquisition of these new surface water supplies would likely occur over the next two to five years.

The groundwater resources available in the Tracy Planning Area were analyzed in 1990. Based on a report prepared by Kennedy/Jenks/Chilton, the City recognized a "safe yield" from the Tulare Formation of 6,700 acre-feet a year (AFY), and adopted the report's recommendation that the City produce no more than 6,000 AFY in groundwater from the formation. The safe yield identified by Kennedy/Jenks/Chilton was based on the maximum historical withdrawal of 5,200 AFY, plus 1,500 AFY based on abandonment of a well by the West Side Irrigation District. Since 1974, total groundwater production from the Tulare Formation for use in the Tracy Planning Area has ranged from approximately 500 AFY to 5,800 AFY.

The City of Tracy adopted and certified the Urban Management Plan (UMP) and Environmental Impact Report (UMP EIR) in September 1993 (State Clearinghouse No. 19092060). The UMP directs growth in the Tracy Planning Area (TPA) to ensure well planned and managed growth for the benefit of current and projected future populations of the City at ultimate buildout. The UMP EIR noted that the City obtains surface water from the Delta-Mendota Canal and groundwater from City-owned wells. The UMP EIR included a series of mitigation measures intended to prevent overdraft conditions and phase out the use of and reliance upon groundwater for water supply as new surface water supplies were acquired. However, as noted in the UMP EIR, the Tulare Formation had not experienced overdraft conditions in the TPA.

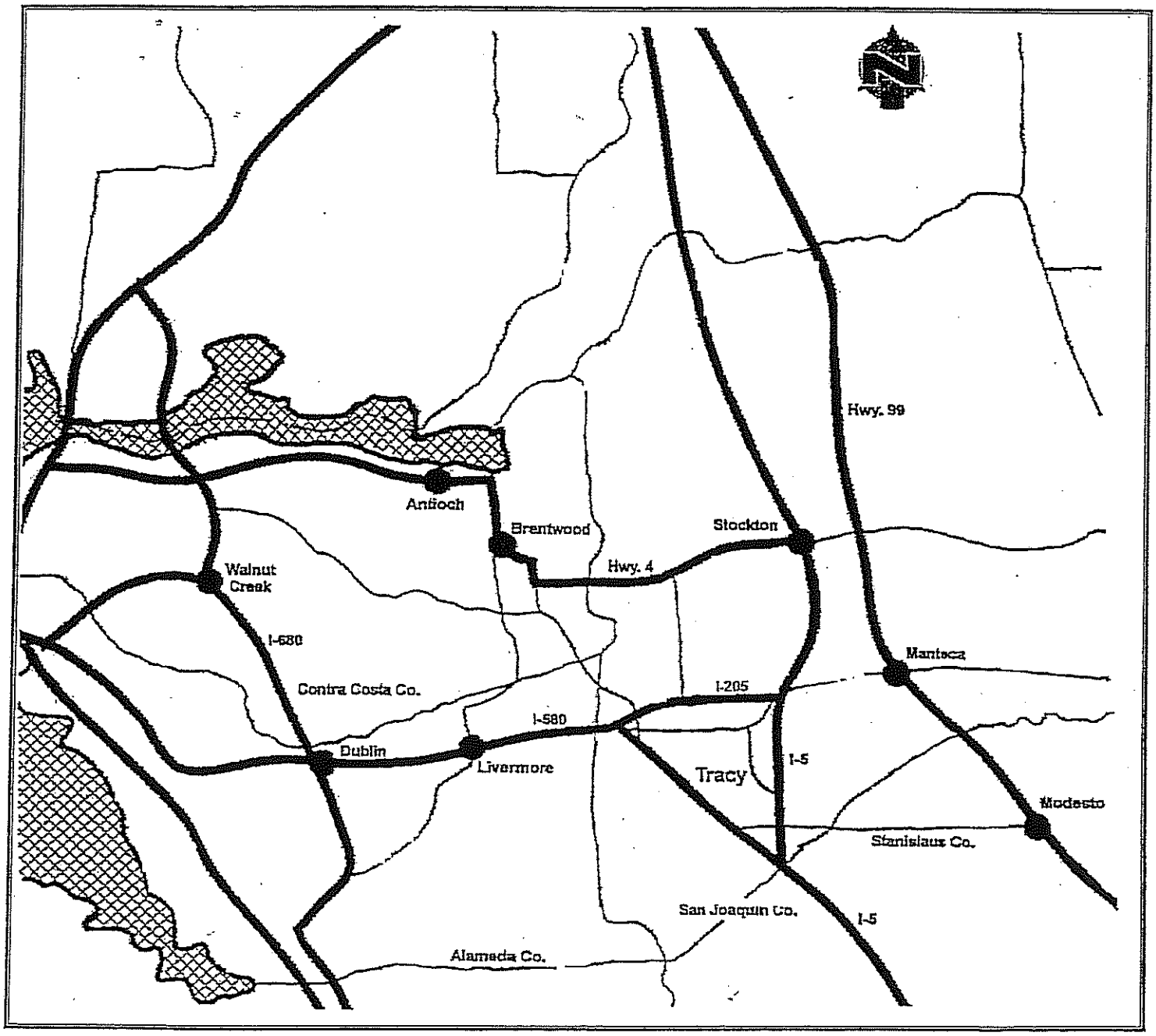

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FIGURE 2-1
REGIONAL LOCATION MAP

The City's 1994 Water Master Plan recommended that the coordinated management and use of groundwater and surface water resources ("conjunctive use") continue until additional surface water supplies were acquired, with a gradual phase out of groundwater as a supply. The Water Master Plan noted that the biggest challenge to the City would be securing enough surface water supplies to meet the needs of projected growth.

A groundwater management plan for eight governmental entities, including the City of Tracy, was completed in April 1996. The Groundwater Management Plan (GMP) is titled, "Groundwater Management Plan for Northern Agencies in the Delta-Mendota Canal Service Area and a Portion of San Joaquin County" and prepared by Stoddard & Associates for the San Luis & Delta-Mendota Water Authority. The City adopted this plan under Ordinance No 511. The plan included a hydrologic inventory of the and was designed to assess impacts to the groundwater basin and optimize sustained use of groundwater resources. Various elements of the plan included; monitoring of groundwater levels and storage, facilitating conjunctive use operations, coordination with state and federal regulating agencies, regulation of contaminant migration into groundwater of the northern sub-basin, well construction, construction and operation of groundwater management facilities, mitigation of groundwater overdraft, etc.

Based on recommendations of the 1993 Urban Management Plan (UMP) and 1994 Water Master Plan, the City of Tracy typically requires that all new major developments to secure sufficient surface water supplies. Existing and projected surface water supplies have been identified and appear adequate to meet the City's needs on a long-term basis. However, the final acquisition of these new surface water supplies is anticipated to occur over the next two to five years.

2.3 PROPOSED PROJECT

Additional surface water supplies have been identified and appear adequate to meet the City's need. However, the final acquisition of these new surface water supplies is anticipated to occur over the next two to five years. The City is proposing as a policy to utilize additional groundwater above the City's current production rate in order to provide an interim water source until new surface water sources are secured as well as provide the City with an emergency water supply source in the event of failure or contamination of the City's surface water supply sources. This additional water source may be utilized as a permanent source if adequate surface water sources never become available.

In order to determine if additional groundwater resources are available in the Tracy area, the City conducted a groundwater analysis. The Estimated Groundwater Yield Study, prepared by Bookman-Edmonston Engineering (see **Appendix A**) provides an evaluation of potential groundwater yield and determined that a 2,300 AFY increase of the average annual operational groundwater yield over the yield recommended in the 1990 Kennedy/Jenks/Chilton study can be provided within the estimated sustainable yield without adverse impact to groundwater resources or quality in the Tracy area over a fifty year timeframe. This expansion of groundwater usage to 9,000 AFY would be within the City's estimated share of the aquifer's sustainable yield of 22,000 AFY of the 28,000 AFY total (this includes groundwater usage by West Side Irrigation District, Naglee-Burk Irrigation District, Plain View Water District and Banta-Carbona Irrigation

District) and would result in groundwater level drop of 10 feet, but would stabilize at this level (Bookman-Edmonston, 2001). The additional groundwater production would be an operational change and would not require the construction of additional wells or distribution facilities.

The Estimated Groundwater Yield Study was based on quantitative and qualitative analyses, historic rates of groundwater use and changes in groundwater conditions, as well as utilization of prior groundwater studies including the following:

- G.H. Davis et al., *Groundwater Conditions and Storage Capacity in the San Joaquin Valley, California,* USGS Water Supply Paper 1469, 1959.
- W.R. Hotchkiss and G.O. Balding, *Geology, Hydrology, and Water Quality of the Tracy-Dos Palos Area, San Joaquin Valley, California,* USGS Open File Report 72-169, August 6, 1971.
- U.S. Geology Survey, *Groundwater Flow in the Central Valley, California, Regional Aquifer System Analysis,* Professional Paper 1401-D.
- Kennedy/Jenks/Chilton, *Tracy Area Groundwater Yield Evaluation: Final Report,* November 1990.

The Estimated Groundwater Yield Study also considered cumulative groundwater usage in the study area by the City and adjacent irrigation districts (West Side Irrigation District, Naglee-Burk Irrigation District, Plain View Water District and Banta-Carbona Irrigation District).

In addition to identification of increased groundwater production in the Tracy area, Bookman-Edmonston Engineering recommends the establishment of groundwater monitoring network for groundwater quality and subsidence, which is included in the proposed Policy. Specifically, up to six monitor well sites would be installed around the City as shown in **Figure 2-2**. A typical cross-section of the monitor well is shown in **Figure 2-3**. Each monitor well would be a multiple completion well and would consist of three separate 12-inch diameter holes with 6-inch casings and 2 by 2.5 foot above ground concrete caps installed within 50 feet of each other and would monitor three specific portions of the aquifer below the Corcoran Clay confining layer. These monitored portions of the aquifer would be shallow (380 to 480 feet in depth), intermediate (610 to 690 feet in depth) and deep (780 to 870 feet in depth). Five wells are located near roadways including; Grant Line Road, Byron Road, Valpicao Road, corner of Valpico and MacArthur, and the corner of East 11th Street and Chrisman Road. The sixth monitor well would be located at the Tracy Airport.

These wells would be constructed in two phases. The first phase would be the three well sites west of the City. The second phase would install the remaining well sites. Water level readings would be taken at each monitor well and water supply well each month, while water quality sampling would be taken quarterly from each monitor well and would sample for the following constituents:

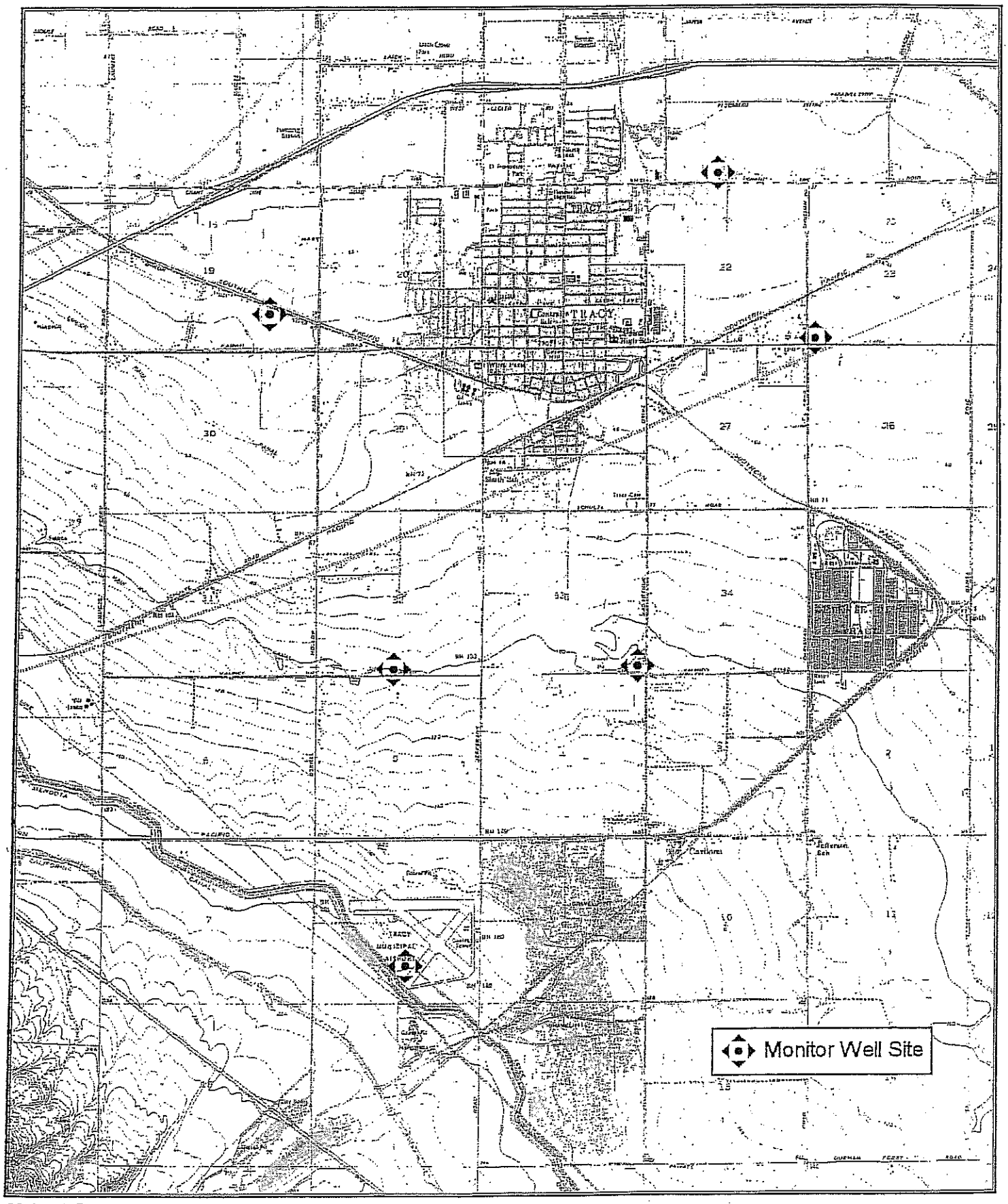

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FIGURE 2-2
PROPOSED MONITOR WELL SITES

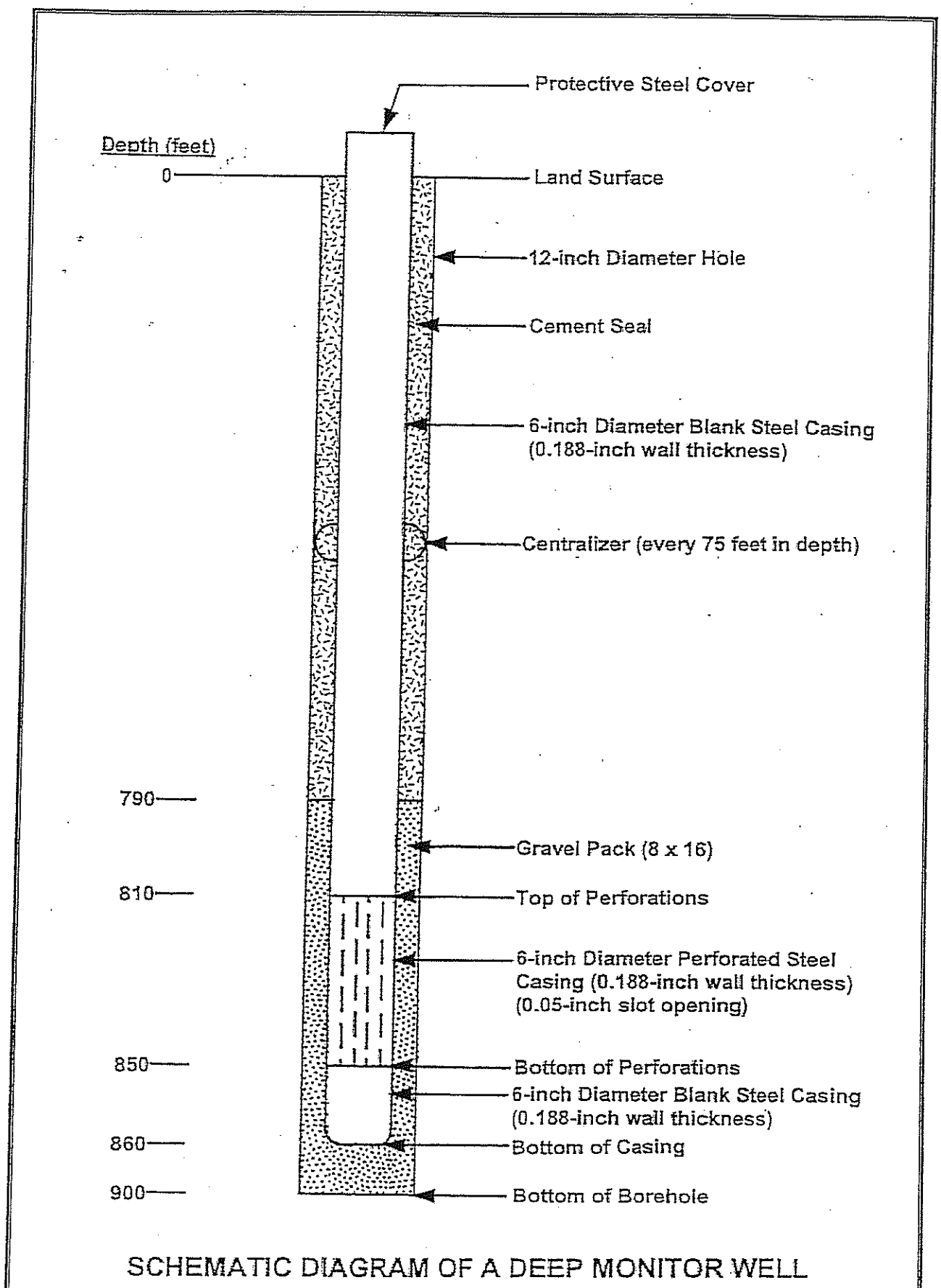

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FIGURE 2-3
TYPICAL CROSS-SECTION OF A MONITOR WELL

- Major cations
- Major anions
- Iron
- Manganese
- Arsenic
- Chromium
- Fluoride
- Alpha activity
- Boron
- PH
- Total dissolved solids
- Electrical conductivity

In addition to water quality monitoring, ground survey monitoring would be conducted to evaluate potential land subsidence from increased groundwater production. This would involve the installation of a benchmark at each monitor well and active production well. If significant subsidence is observed, a compaction well may be installed to further evaluate subsidence impacts.

Adoption of this proposed Policy would implement recommendations of the Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area and a Portion of San Joaquin County, which identified the need for groundwater analysis and monitoring at the local level in the region.

2.4 PROJECT APPROVALS

Based on the results and recommendations of the Estimated Groundwater Yield Study, the Tracy City Council would adopt the following policy associated with increased groundwater production:

GROUNDWATER MANAGEMENT POLICY

> Based on the results of the Estimated Groundwater Yield Study prepared by Bookman-Edmonston Engineering, the City intends to increase groundwater production to provide an interim water source until new surface water sources are secured as well as provide the City with an emergency water supply source in the event of failure or contamination of the City's surface water supply sources. This additional water source may be utilized as a permanent source if adequate surface water sources never become available. The City Council hereby adopts this Policy for the extraction and allocation of 9,000 AFY of groundwater. The proposed 9,000 AFY extraction rate represents an increase of 3,200 acre-feet above the current base extraction rate of 5,800 AFY of groundwater. Of this 9,000 AFY, 6,700 AFY has already been allocated through the actions of the City of Tracy

Capacity Allocation Review Board (CARB) established pursuant to Section 11.16.120 of the City of Tracy Municipal Code. Therefore, the extraction of up to 9,000 AFY represents a potential increased extraction of 2,300 AFY over the 6,700 acre-feet per year currently allocated by the CARB. This groundwater would be extracted from the lower confined aquifer and allocated to specific land uses approved by the City. Details of this Policy are presented below:

A. Process for the Extraction of Groundwater

Groundwater in the City of Tracy is currently extracted by eight existing production wells. Generally, these wells and structures occupy no more than one-quarter acre of land. All well pumping equipment is enclosed in single story physical structures. No new production wells are expected to be added to increase groundwater production. However, up to six monitor wells will be installed within and adjacent to the City to monitor changes in groundwater conditions as a result of increased groundwater production.

B. Process for the Monitoring of Groundwater Extraction

While the Estimated Groundwater Yield Study identifies that no significant adverse impacts to groundwater resources are expected, increasing the extraction of groundwater from the aquifer could impact groundwater water levels, ground subsidence, and groundwater quality. In terms of groundwater levels, increasing the extraction could result in declining groundwater storage to levels at a rate that could exceed the recharge capacity of the basin. Reducing the amount of groundwater in storage could also lead to the dewatering of fine-grained geological strata, thus resulting in land subsidence and a potential reduction in the storage capacity of the aquifer. Finally, increasing groundwater extraction could potentially decrease groundwater quality by increasing or changing the concentrations of organic and inorganic chemical substances, or constituents within the aquifer.

1. Groundwater Level and Subsidence Monitoring

   The following process is established to monitor for groundwater level changes and subsidence.

   a. Benchmarks shall be established at each monitor well and active production well and tied to an established local bench circuit to provide the appropriate datum points for elevation measurements.

   b. Groundwater levels shall be measured monthly at each monitor well and active production well and related to the benchmarks to determine changes in groundwater elevation.

c. On an annual basis the bench circuit, which includes the benchmark at each well site (both production and monitor wells), shall be surveyed to determine if there has been any differential settlement resulting from the increase in groundwater extraction.

d. A qualified hydrogeologist shall review the groundwater level and ground elevation measurements annually. Contour maps shall be prepared (for the base year and each subsequent year monitoring occurs) and compared to the prior year's maps for evidence of subsidence or adverse changes in groundwater levels or quality. Should adverse changes be noted, recommended operational changes at each production well shall be implemented (e.g., shut down of specific wells, reduction in groundwater extraction rates) if the monitoring results indicate adverse impacts in order to avoid groundwater overdraft and subsidence conditions.

e. All monitor wells installed in accordance with this Policy will follow all sampling frequencies and protocols outlined in this Policy.

2. Groundwater Quality Monitoring

The following protocols are established to monitor for potential groundwater quality changes due to increased extraction rates:

a. Groundwater shall be sampled and tested on a quarterly basis for the following constituents.

- Major Cations
- Major Anions
- Iron
- Manganese
- Arsenic
- Chromium
- Fluoride
- Alpha Activity
- Boron
- PH
- Total Dissolved Solids
- Electrical Conductivity

b. Monitoring for the constituents listed above shall be conducted to ensure that any changes in constituent levels do not exceed the established maximum contaminant

levels (MCL) or public health goals for each identified constituent. Should adverse water quality conditions be noted, recommended operational changes at each production well (e.g., installation of treatment facilities, shut down of specific wells) shall be implemented to protect public health.

c. Monitoring at all newly constructed monitor wells shall follow the process established above.

C. Allocation of the Groundwater to Development Projects

The City intends to allocate this water to various development projects within the City. A total of 2,300 additional AFY of water (to serve approximately 4,600 "equivalent consumer units") is available from this expanded extraction process, for allocation to approved development projects. In all cases, these projects will be consistent with the City's Urban Management Plan, approved Specific Plans, Development Agreements, Planned Unit Developments, Vesting Tentative Maps, etc., that have received all necessary approvals and are eligible for other findings as part of the CARB/RGMP process forth below. Certain criteria, which will guide the City's allocation of groundwater, are as follows:

1. The City may increase its groundwater production from its current "cap" of 6,700 AFY to 9,000 AFY. This increased production is to provide an interim water source until new surface water sources are secured as well as provide the City with an emergency water supply source in the event of failure or contamination of the City's surface water supply sources. This additional water source may be utilized as a permanent source if adequate surface water sources never become available.

2. The allocation should further the goal to provide a balanced distribution of land uses between residential population, jobs, and ability to provide services. In this context, and yet recognizing current inventory of vested residential projects, approximately 70 percent of the extracted groundwater may be allocated to residential uses, and the remaining 30 percent may be allocated to non-residential uses. Infill projects, whether residential or non-residential, may receive allocations under the above approximate proportions.

3. A maximum of 1,200 equivalent consumer units ("ECUs") of water capacity may be allocated on an annual basis. Water capacity shall not be allocated unless the necessary wastewater capacity is available to the project. The actual number of ECUs may vary from year to year.

4. The project receiving an allocation of groundwater is consistent with the Urban Management Plan.

5. The allocation of groundwater to residential uses should be conducted in accordance with Chapter 10.12 of the Tracy Municipal Code ("Growth Management Ordinance", which establishes and defines RGAs) as amended by Measure A, Chapter 11.16 of the Tracy Municipal Code ("Wastewater Treatment Facilities Capacity Regulation and Allocation", which defines ECUs, and establishes the Capacity Allocation Review Board), as well as the City's Growth Management Guidelines.

6. The allocation of groundwater to non-residential uses should be conducted in accordance with Chapter 11.16 of the Tracy Municipal Code ("Wastewater Treatment Facilities Capacity Regulation and Allocation", which defines ECUs, and establishes the Capacity Allocation Review Board).

2.5 ALTERNATIVE WATER SUPPLY SOURCES

The City is pursuing several sources of additional water supply to meet the needs of planned growth. These sources of water could be expected to be available over varying timeframes and could provide adequate water sources for planned growth in the City without the use of groundwater. These water supply sources are summarized below:

- **Groundwater Banking** - This would involve use of the groundwater basin for water storage and could occur under two options. The first option would involve maximizing the use of surface water resources in lieu of groundwater pumping (i.e., In-Lieu Banking). The groundwater not used would then be available for subsequent use during years when surface water resources are completely utilized. The second option would be to inject surplus water into the groundwater basin for later consumption using the City's existing distribution and well system (i.e., Aquifer Storage and Recovery). The City is currently moving forward with a pilot project to test inject treated surface water into the groundwater basin. The City has received a CALFED grant to pursue groundwater banking.

- **Kern Water Bank (and other Kern County Suppliers)** - The Kern Water Bank (KWB) is located in Kern County, at the southern end of the San Joaquin River valley. The KWB has approximately 50,000 ac-ft of water available for sale on an annual basis for either long-term or short-term deal. The water is highly reliable in all water years. They also have the ability to bank water. They utilize water from the California Aqueduct, Friant-Kern Canal and the Kern River. Kern has an interest in selling water to the City of Tracy either on annual basis or for a long-term contract. Consecutive annual purchases or a long-term water contract would require the CEQA/NEPA process that would likely take two years. Single year water purchased would most likely not require any environmental review to be completed. The City would need to expand its water treatment plant for this water source. California Department of Health Services requirements on the water treatment plant expansion would require the City to construct an intake on the California Aqueduct. On an interim basis, potential water transferred to

the City would require a third party to become involved in the transfer, because of the City's current location of water intakes are on the Delta Mendota Canal and not on the California Aqueduct. The Santa Clara Valley Water District (SCVWD) has been used in discussion as the potential third party because they have rights to both the CA and the DMC and thus a transfer could be made through them. The City is also investigating the potential for the purchase of other long-term water supplies from suppliers in the Kern County area.

- **Purchase of Long-Term Water Contracts** – The City is negotiating with local irrigation districts (e.g., West Side Irrigation District and Banta Carbona Irrigation District) for the purchase of portions of their Bureau of Reclamation contracts. The combined total for the assigned contracts would provide the City with up to 10,000 acre-feet of water per year. This water has agricultural reliability, meaning that the quantity of water delivered would vary significantly year to year depending on hydrologic conditions and endangered species impacts (e.g., 0 to 100 percent reliability). Agreements have been drafted with the districts. Future work includes a CEQA/NEPA environmental document and Bureau approval. These items are anticipated to require two years to complete. This water supply has the potential to supplement City supplies on an annual basis, or to be utilized with a groundwater banking program.

- **BBID** - BBID has pre-1914 water rights. The water is also highly reliable in all water years. BBID takes water from the Sacramento-San Joaquin Delta (Delta) just up stream of the State Water Project (SWP) pumps on the California Aqueduct (CA). Use of BBID water by the City would require a water treatment plant expansion. BBID is currently taking the lead in the design and construction of a pipeline from BBID's intake to City WTP. The pipeline is likely to be completed in the next 2 to 3 years.

- **SSJID** – The City is currently participating in the South San Joaquin County Irrigation District (SSJID) South County Surface Water Supply Project. The City would receive up to 10,000 acre-feet annually of treated surface water by 2004 under best-case conditions. However, the EIR is currently under litigation, which will likely delay the project.

Even if the City ultimately utilizes one or more of the above sources, increased groundwater production is considered necessary to provide an interim water source until these sources are secured as well as provide the City with an emergency water supply source in the event of failure or contamination of the City's surface water supply sources.

Appendix G

Mitigation Monitoring Report, November 2004 through April 2005
Bookman-Edmonston, 2005

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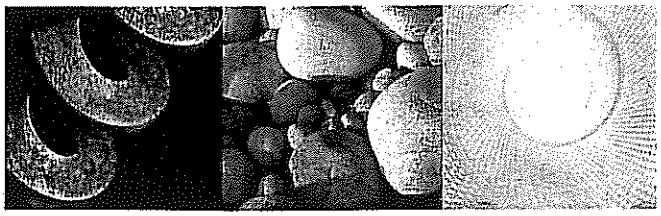


GEI Consultants

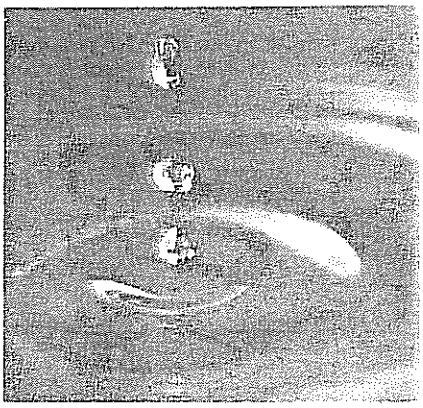
Geotechnical
Environmental and
Water Resources
Engineering

Mitigation Monitoring Report

November 2004 Through April 2005

Prepared for:
City of Tracy

Date: August 8, 2005
Project No: 042540



Bookman-Edmonston
A Division of GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

August 8, 2005
Project No. 042540

Mr. Nick Pinhey
Director of Public Works
City of Tracy
520 Tracy Boulevard
Tracy, CA 95377

Dear Mr. Pinhey:

Re: Mitigation Monitoring Report, November 2004 Through April 2005

Bookman-Edmonston Engineering, a division of GEI Consultants, Inc., is pleased to submit this Mitigation Monitoring Report in compliance with requirements contained in the Groundwater Management Policy, Mitigated Negative Declaration. This report describes the monitoring network, presents monitoring data, and interprets the data.

If you have any questions pertaining to this report, please contact Mr. Shatz at 916-631-4566.

Sincerely,

BOOKMAN-EDMONSTON

Richard W. Shatz, C.HG. 84
Senior Hydrogeologist

Naser Bateni
Managing Engineer

Enclosure

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Currently, the City obtains water from both surface water and groundwater sources. As a public water purveyor, it exercises its appropriative and overlying rights to use groundwater for beneficial use by the public. The City obtains surface water from the Delta-Mendota Canal and groundwater from City-owned groundwater supply wells.

The City requires that all new major developments secure sufficient surface water supplies. Current and projected new surface water supplies have been identified and appear adequate to meet Tracy's needs in the long term. However, the final acquisition of these new surface water supplies is anticipated to occur between 2001 and 2006. The City proposed to use additional groundwater above the City's current production rate to provide an interim water source until the new surface water sources were secured. This will also provide the City with an emergency water supply source in the event of the failure or contamination of its surface water supply sources.

The City prepared the *Groundwater Management Policy, Mitigated Negative Declaration* (PMC 2001) to assess the potential effects of increasing its groundwater extractions. While the study identified no significant adverse impact to groundwater resources, increasing the extraction of groundwater from the aquifer could potentially affect groundwater levels, ground subsidence, and groundwater quality.

The City proposed mitigation monitoring in response to these potential impacts (PMC 2001). In summary, the mitigation monitoring consists of the following:

- Groundwater Level and Subsidence Monitoring
    - Benchmarks shall be established at each monitoring well and at active production wells and tied to an established local bench circuit.
    - Groundwater levels at each monitoring well and at active production wells shall be measured monthly and related to the benchmarks to determine changes in groundwater elevations.
    - The bench circuit, which includes the benchmark at each production or monitoring well site, shall be surveyed annually to determine if the increase in groundwater extraction has resulted in any differential settlement.
    - A qualified hydrogeologist shall review the groundwater level and ground elevation measurements annually. Contour maps shall be prepared for the base year and subsequent year and compared to the prior year's maps for evidence of subsidence or adverse changes in groundwater levels or quality. To avoid groundwater overdraft and subsidence, recommended operational changes at each production well shall be implemented if adverse changes are noted or if the monitoring results indicated adverse impacts.

- All monitoring wells installed in accordance with this policy will follow all sampling frequencies and protocols outlined in the policy.

- Groundwater Quality Monitoring

  - Groundwater shall be sampled and tested quarterly for the following constituents: major cations, major anions, iron, manganese, arsenic, chromium, fluoride, boron, pH, total dissolved solids (TDS), electrical conductivity, and alpha activity.

  - Monitoring for the constituents listed above shall be conducted to ensure that any changes in constituent levels do not exceed the established maximum contaminant levels (MCLs) or public health goals for each identified constituent. Should adverse water quality conditions be noted, recommended operational changes at each production well shall be implemented to protect public health.

Prior to increasing groundwater production beyond 6,700 acre-feet per year, the mitigation monitoring program should be fully implemented.

The City successfully completed the assignment of up to 10,000 acre-feet per year of water from neighboring irrigation districts during 2003. Additionally, the South County Surface Water Supply Project (SCSWSP) became operation during July 2005. The City began to take delivery of a portion of the SCSWP water in August 2005. The addition of these surface water supplies will enable the City reduce its use of groundwater and allow groundwater to be reserved for emergency use and to peak water demands during the summer months. Finally, it should be noted that the City did not increase its extraction of groundwater to the maximum of 9,000 acre-feet per year as allowed by its Groundwater Management Policy, Mitigated Negative Declaration (PMC 2001).

4 Findings

The following sections discuss the results of the groundwater monitoring for the reporting period, November 1, 2004, through April 30, 2005.

4.1 Water Year Index

A comparison of the Water Year Index to regional groundwater levels in the San Joaquin Valley is shown in Figure 6. Regional groundwater levels correlated with San Joaquin Valley Water Year Index show groundwater levels based on the availability of surface water are expected to decrease by about four feet in 2005, whether the City is pumping or not.

4.2 Groundwater Production

The wells pumped during this reporting period include the Lincoln well and Production Wells 1, 2, 3, 4, 5, 6, and 7. The Tidewater well is out of service because of sanding problems and Production Well 8 has not been activated. Figures 7 through 16 show the production totals by month for each well. Appendix B contains monthly production totals for each well. The figures and data show that:

- Total annual groundwater production for 2004 was about 6,900 acre-feet, similar to production totals for 2003.
- Cumulative production thus far in 2005 is about 2,000 acre-feet, slightly below the historic average at this time of year.
- Groundwater production during November 2004 through April 2005 (reporting period) was about 2,400 acre-feet.
- Monthly groundwater production at Well 7 reached a historic high in January 2005.
- Monthly production in January was about double that of other months during this reporting period.

Groundwater extractions will be significantly reduced during 2005, when the South County Surface Water Supply Project becomes operational.

4.3 Groundwater Levels

Groundwater level measurements for this reporting period were obtained from eight production wells and 18 clustered monitoring wells. Some monthly measurements were not obtained at production wells because of access issues or pumping could not be stopped for a 24-hour period. Figures 7 through 34 show groundwater level data by month for each well. The groundwater level data from the production wells and clustered monitoring wells indicate the following:

4.3.1 Production Wells

- Groundwater levels rose in all production wells by 8 to 25 feet, as would be expected with increased recharge from precipitation and a regional decrease in pumping.
- Groundwater levels reached or exceeded historic high (since monitoring began in 2001) in most wells.

4.3.2 Clustered Monitoring Wells

As previously indicated, monitoring wells at each site have been completed into a different aquifer (i.e., shallow, intermediate, and deep, as monitored, respectively, by Zone A, Zone B, and Zone C wells) in part to assess the gradient between the aquifers.

- Groundwater levels in most monitoring wells show a similar trend to the production wells.
- Groundwater levels generally rose by 3 to 12 feet in all monitoring wells between November 2004 and April 2005. Some wells showed a slight decline in water levels in April.
- Most Zone A monitoring wells showed a continuous rise in groundwater levels throughout the monitoring period.
- Most Zone B and C monitoring wells showed a saw-toothed or stepped pattern that appears to be related to pumping by City wells. Water levels in most wells declined in January apparently due to doubling groundwater pumping to 900 acre-feet per month.
- MW-1A showed a saw-toothed or stepped pattern, indicating the production well(s) are affecting the shallow aquifer in this area. MW-6A was slightly affected. Both wells are in the western and northern portions of the City, suggesting that the Lincoln well or Production Wells 5, 6, or 7 may be the cause. Based on the screen intervals in the production wells (see Table 1), Production Well 5 likely caused this effect.

- Similar to previous measurements, most monitoring wells showed a downward vertical gradient of about 2 to 8 feet between the Zone A wells and the Zone B wells.

- The vertical gradient between the Zone B and Zone C wells varies. At the MW-1, MW-3, and MW-4 sites, there is a slight downward gradient of 0.02 to 1.7 feet. At the other monitoring wells, there is an upward gradient between the two zones, ranging between 0.2 to 6 feet, with the highest head difference seen at MW-2 and MW-6. In January, pumping by the City reversed the head between these zones and created a downward head in MW-2 and MW-6.

4.4 Groundwater Contours

Groundwater contours show the horizontal direction of flow in the aquifers. The groundwater flow direction can be different in isolated aquifers. Regional groundwater contours prepared for each aquifer monitored by the clustered wells show different flow directions.

Figure 2 shows the regional groundwater contours for the shallow aquifer (Zone A clustered monitoring wells), the aquifer immediately beneath the E-clay. The contours show that this aquifer receives recharge from the south and from the northeast with an east-west-trending trough near Production Wells 1 through 4. The trough suggests these production wells are having an effect on the shallow aquifer. The Lincoln well and Production Wells 1, 2, 3, 4, and 5 obtain water from this aquifer. The contours also show a flattening of the contours in the central portion of the City.

In comparison to the shallow aquifer, the intermediate aquifer (Zone B monitoring wells) is more strongly influenced by sources east of Tracy, but still has a slight recharge component from the south. The trough is present but has shifted more to the south. The arcuate shape of the contours suggests that pumping may be affecting the aquifer. Figure 3 shows the groundwater contours for the intermediate aquifer. All production wells obtain water from this aquifer.

Groundwater contours for the deep aquifer (Zone C monitoring wells) are similar to the intermediate aquifer (Zone B) with recharge to the aquifer from the east and little to no recharge from the south. Production Wells 1 through 4 appear to be affecting the groundwater flow direction in this zone. Figure 4 show the regional groundwater contours for the deep aquifer. All production wells obtain water from this aquifer.

Figure 5 shows groundwater contours for April 2005, based on water level measurements from those production wells perforated below the E-clay and supplemented with measurements from the shallow aquifer (Zone A) clustered monitoring wells. The contours show groundwater is moving in a radial pattern from the south, east, west, and north toward pumping depressions beneath central portion of the City. The pumping has

depressed the water surface by about 29 feet at the center of the depression (at Production Well 7). The depth of the cone is likely being influenced in part by allowing the wells to rest only a minimum of 24 hours after pumping. The gradient is steeper on the north side of the depression, suggesting the presence of lower permeability aquifers or a recharge source. A recharge source is more probable.

Another pumping depression is centered around Production Well 6. The depth of this depression is almost equal to that of the depression at Production Well 7. Although the pumping depressions at these wells could merge, it is our opinion that these are two separate pumping depressions. Production Well 6 pumped only 30 million gallons while Production Well 7 produced 118 million gallons in 2005. Therefore, the pumping depression at Production Well 6 should be smaller. The volume pumped also does not agree with the depth of the depression. The lower groundwater level in Production Well 6 could be the result of the well penetrating into a low head aquifer, one below those monitored by the clustered monitoring wells, or the sediments in that area have a lower permeability.

Another pumping depression is centered over Production Well 1, near the airport. This pumping depression has been present since monitoring began, but the size of the depression is poorly constrained (few or no monitoring wells south, west, or east of the well field).

4.5 Change in Storage

When compared over a period of time, groundwater contours can indicate regionally where groundwater storage has increased or has been depleted. Broad, uniform changes are often associated with the regional use of the aquifers. Localized changes are often associated with production from wells, which is a common effect when pumping from an aquifer.

The change in storage is calculated by comparing two sets of groundwater contours and subtracting the difference in the water levels. Previous reports have estimated the change in storage based on six-month intervals. This report assesses the annual (spring to spring) change in storage, which is more reflective of the health of the aquifers. Figure 35 shows the change in water levels from April 2004 to April 2005. The area affected by the change is then measured and multiplied by the change in water levels. This volume is then multiplied by the storage coefficient.

In confined aquifers, such as those present beneath Tracy, changes in pressure produce only small changes in storage (Todd 1980). This is because the sediments are fully saturated and the change in water level is only reflective of a change in pressure, or the amount that the water can be compressed into the pores. The storage coefficient or storativity is obtained through aquifer tests, such as the testing at Production Well 8. The storativity is about 0.0001 (Padre 2004).

Groundwater levels for the most part rose between April 2004 and April 2005. Beneath the central portion of the City the pumping depression continues to be present but groundwater has partially refilled the depression. Near Production wells 1 , 2, 3, and 4 the groundwater surface did not recover but is lower than in 2004. Overall groundwater storage increased by about 8 acre-feet.

4.6 Water Quality

Groundwater quality samples were collected in January and April 2005 from the Lincoln well and Production Wells 1, 2, 3, 4, 5, 6, and 7. No water samples were collected from the Tidewater well during this reporting period. Groundwater quality samples were also collected from the clustered monitoring wells at sites MW-1 through MW-6. Background water quality research indicated that boron, chloride, sulfate, nitrate, and TDS are key indicator parameters that are sufficiently different in the shallow and deep aquifers. Figures 7 through 34 show the concentrations of these key parameters versus water level and production data, which are used to evaluate whether there is a direct correlation between water quality and pumping. These analyses show the following:

4.6.1 Production Wells

- The water quality parameters from the production wells did not exceed California Primary Drinking Water Standards (MCLs).

- Concentrations for TDS and specific conductance (EC) exceeded California Secondary Recommended MCLs in all production wells, as they have since monitoring began, except at Production Well 5, where the concentrations in April were below the MCL.

- Sulfate concentrations have consistently been above and continue to exceed the California Secondary Recommended MCL in Production Wells 1 and 2. In the Lincoln well and Production Wells 3, 6, and 7, the sulfate levels hover at the MCL, at times exceeding and at times at or just below the MCL. Production Wells 4 and 5 have remained below the MCL.

- The key water quality indicator parameters for the Lincoln well and Production Wells 1, 3, 4, 5, 6, and 7 remain unchanged. The water quality in these wells appears to be unaffected by pumping or water level changes.

- At Production Well 2, concentrations of most constituents increased in January and decreased in April. The concentrations have remained within their normal historic range.

- At Production Well 4, concentrations of nitrate increased slightly in January and then decreased in April. Again the concentrations have remained within their

normal historic range. TDS are showing a slight upward trend since 2003 but are still within their historic range.

- At Production Well 5, most concentrations were similar to results obtained since monitoring began, except in April, when TDS, sulfate, boron, and nitrate decreased to below historic levels. Based on the correlation of the groundwater levels in the Zone A aquifer to pumping from Production Well 5, the decrease in concentrations may be related to the Zone A aquifer contributing water to the well.

- At Production Wells 1, 2, 3, and 4, near the airport, there appears to be a slight upward trend in TDS concentrations over the three years of monitoring data. Concentrations at sites MW-3 and 4, the closest monitoring wells to these production wells, show declining concentrations in the three aquifers. This suggests that the increasing concentrations are either from the east or south where monitoring wells are not present or from upwelling from deeper aquifers.

- Production Well 7 is also displaying a slight upward trend in TDS. There is a slight upward trend in sulfate and chloride. The intermediate or deep aquifer could be contributing to this increasing trend.

- Concentrations of nitrate (as nitrogen) changed slightly in most production wells during the reporting period. The concentrations appear to be related to the Zone B aquifer, which, based on groundwater contours, obtains water from the east.

4.6.2 Monitoring Wells

- Water quality testing from the monitoring wells shows similar and relatively consistent results.

- The water quality parameters from the clustered monitoring wells did not exceed California Primary Drinking Water Standards MCLs.

- Several monitoring wells have concentrations of TDS, EC, chloride, sulfate, iron, and manganese that exceeded California Secondary Recommended MCLs.

- Arsenic, nitrate (as nitrogen), and chromium have been detected in most groundwater monitoring and production wells. Previously, concentrations of these constituents were below detected limits in most of the recently constructed monitoring wells at the MW-3, MW-4, and MW-6 sites. As postulated, some of these elements are now being detected in the new monitoring wells.

- Analytical results for water samples collected from the shallow aquifer (Zone A wells) at the MW-1, MW-2, MW-3, and MW-4 wells have better quality water

(TDS is less than 500 mg/L) than at MW-5 and MW-6. Pumping by the City is not affecting water quality in the shallow aquifer as there are currently no upward trends in the water quality concentrations that would suggest the poorer quality water is moving towards the City's production wells.

- In the shallow aquifer the best quality water (TDS less than 400 milligrams per liter) is present in the southern portion of the City near MW-3 and MW-4.

- The shallow aquifer (Zone A wells) at the MW-1 and MW-2 well sites have better quality groundwater than in the intermediate (Zone B wells) and deep aquifers (Zone C wells). At MW-5 and MW-6, water quality is the opposite, with poorer quality in the shallow aquifer and better quality water in the intermediate aquifer.

- Nitrate (as nitrogen) concentrations in all shallow aquifer (Zone A) monitoring wells are below detectable limits, except for a one-time detection at MW-6A in January 2005. Variability in the nitrate concentrations in the production wells may be related to the amount of water derived from the shallow aquifer and blended with water from other aquifers where higher nitrate concentrations are present.

- Arsenic concentrations are typically higher in the shallow aquifer (Zone A wells) than in the lower aquifers.

- Water in the intermediate aquifer (Zone B wells) is of good quality (TDS less than 420 mg/L) near MW-3 and MW-4. The water quality is similar to that in the shallow aquifer (Zone A wells) and may indicate the aquifers are connected and a possible nearby recharge source to the aquifers. Water quality characteristics change quickly in just a short distance. Down-gradient of MW-3 is MW-2, where the water quality regularly exceeds secondary MCLs for TDS, EC, sulfate, and iron. For the most part, MW-1, MW-5, and MW-6 have water quality similar to that seen at MW-2.

- Nitrate (as nitrogen) in the intermediate aquifer (Zone B wells) is present at concentrations less than one-half of the MCL. Nitrate concentrations in MW-5B are the highest in any of the monitoring wells and reached a historic high in April. Because nitrate was not detected in the shallow aquifer (Zone A wells), the nitrate does not appear to be moving vertically through the aquifers, but appears to be moving horizontally from areas east of Tracy or is naturally occurring in the sediments in the intermediate aquifer.

- Pumping by the City does not appear to be affecting water quality in the intermediate aquifer other than possibly for nitrate.

- Water quality in the deep aquifer (Zone C wells) is generally similar to that in the intermediate aquifer. The water typically exceeds secondary MCLs for TDS, EC, sulfate, iron, and manganese.

- Water quality changes in the aquifer east and north of Tracy. Sodium-sulfate water is present in MW-1, MW-2, MW-3, and MW-4, while sodium-chloride water is present in MW-5 and MW-6.

- The poorest quality water is present in MW-5C (deep aquifer) where the TDS exceeds 1,000 milligrams per liter. After displaying an upward trend through 2004, the TDS concentrations decreased in 2005. There is not enough long-term water quality data to fully assess the trend and whether pumping by the City is affecting water quality in the deep aquifer.

- The water quality in all aquifers at MW-6 and MW-4 sites shows decreasing concentrations of TDS. This is suggestive of a nearby recharge source or the water in the aquifers near the wells is reaching equilibrium. There is a direct correlation between decreasing TDS and decreasing boron and sulfate concentrations.

- Concentrations of chloride are lower than concentrations of sulfate in all monitoring wells except for MW-3B, MW-5C, and MW-6C. In these wells, chloride exceeds the sulfate concentrations, indicating a different water source. Similar water quality exists in the same aquifer at MW-5C, and MW-6C. However, the source of the chloride at MW-3B is unknown because the deep aquifer (Zone C) at this location does not contain elevated concentrations of chloride.

- Chromium is detected at concentrations typically less than 10 micrograms per liter (ug/L) in all aquifers monitored. The highest concentration detected is 39 micrograms per liter (ug/L) in MW-2B in April 2005. The concentrations of chromium from this well are highly variable. The source and cause of the chromium is unknown.

4.7 Benchmarks

Seven benchmark locations were initially established and their elevations surveyed by April 2003. These elevations represent baseline data that can be used to evaluate annual changes in subsidence. Between April and June 2005, the benchmarks were resurveyed. The elevation data are shown in Table 4. A comparison of the survey results shows very little, if any, subsidence occurred, below the equipment accuracy of 2 centimeters (¾ inch) and should only be used as an indication of a trend. All stations showed a slight decrease in elevation suggesting if subsidence is occurring it is regional and not associated with pumping of any single well by the City. Because of the varying amounts of pumping at

each well, it would be expected that if the pumping was the cause of the subsidence there would be significantly more near wells with higher production. As this is not the case, the apparent subsidence, if any, is regional and is not caused by the City. Long-term trend data are needed to fully assess potential subsidence.

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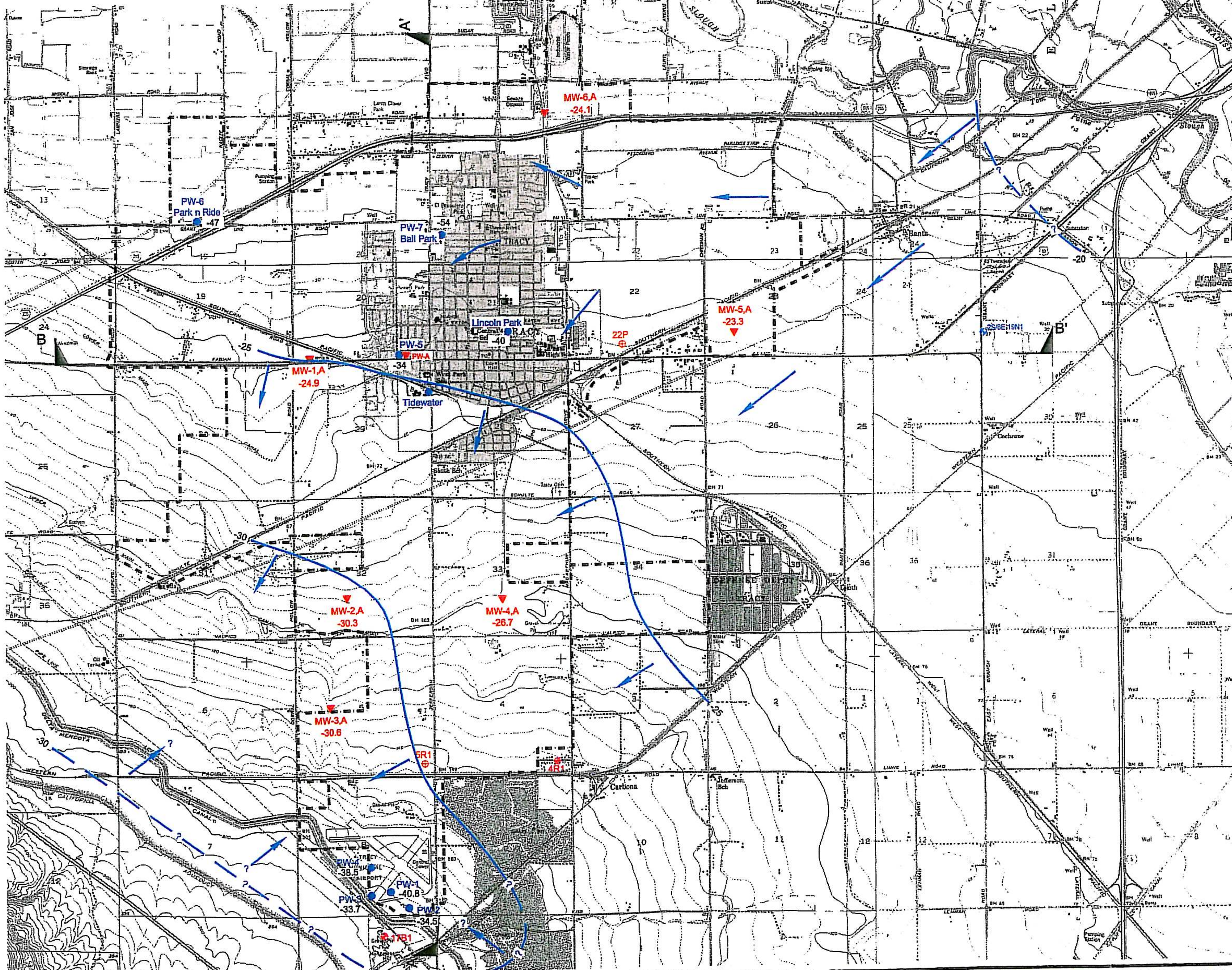

LEGEND:

- Well identified by DWR or USGS with Corcoran Clay, Approximate location
- Well identified by USGS as key well with hydrograph
- Well with Water Quality and screen location known
- City of Tracy Water Supply Well
- Existing Nested or Clustered Monitoring Well location
- -40 Groundwater Elevations (Elevation in feet) Solid where known, Dashed where inferred, Queried where unknown.
- A A' Geologic Section Note: Geologic section contained in Phase 2 Report of Drilling and Construction, July 2004
- Groundwater Flow Direction

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REGISTERED GEOLOGIST RICHARD W. SHATZ No. 1514 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

CITY OF TRACY
SAN JOAQUIN COUNTY, CALIFORNIA

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CITY OF TRACY
MITIGATION MONITORING

REGIONAL GROUNDWATER CONTOURS
ZONE A
APRIL 2005

PROJ. NO: 042540.0002
CONTRACT NO.
ISSUE DATE 05-26-05
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FIGURE 2

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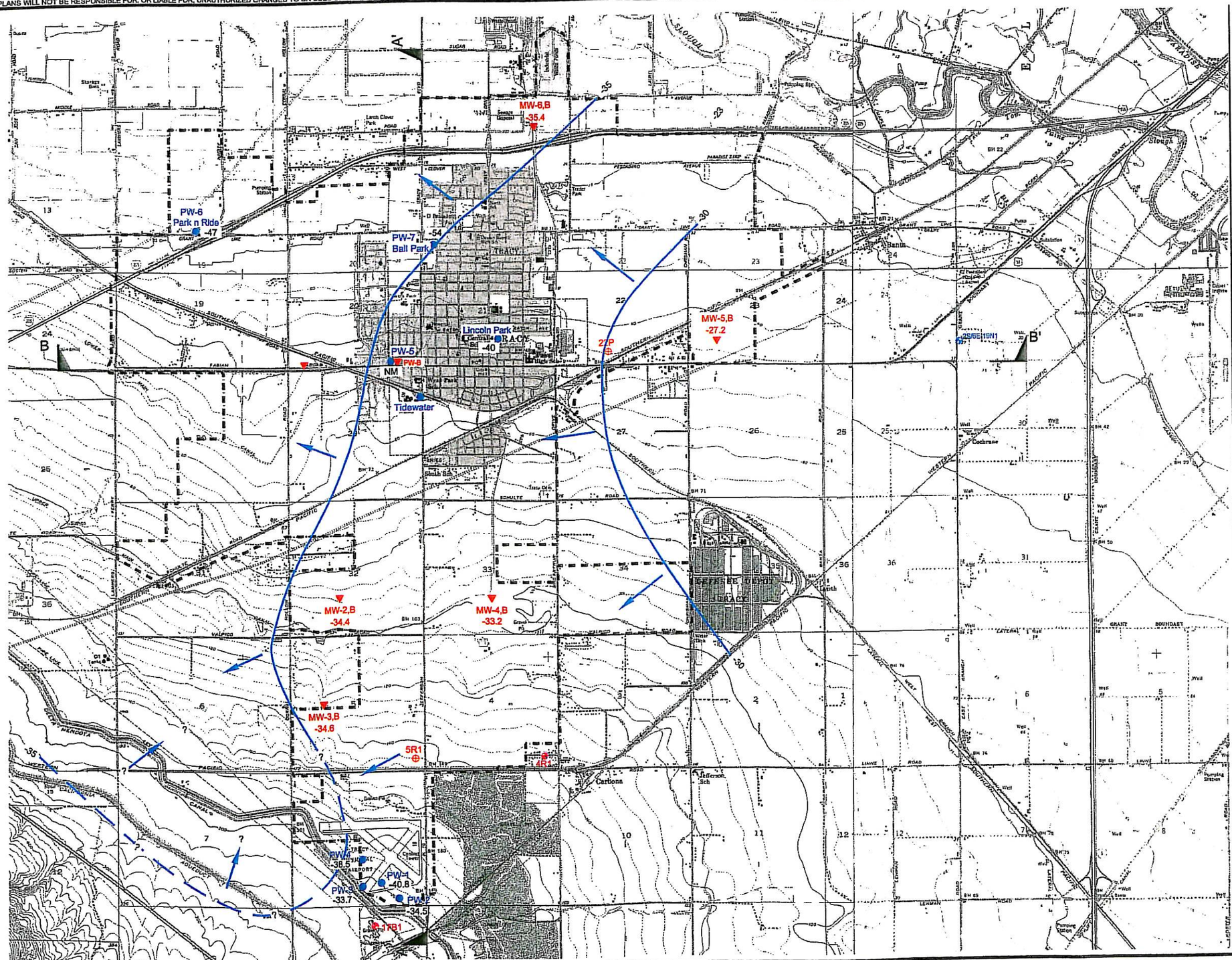

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CITY OF TRACY
SAN JOAQUIN COUNTY, CALIFORNIA

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CITY OF TRACY
MITIGATION MONITORING

REGIONAL GROUNDWATER CONTOURS
ZONE B
APRIL 2005

PROJ. NO: 042540.0002 | CONTRACT NO.
ISSUE DATE 05-26-05 | SUBMITTAL:

FIGURE 3

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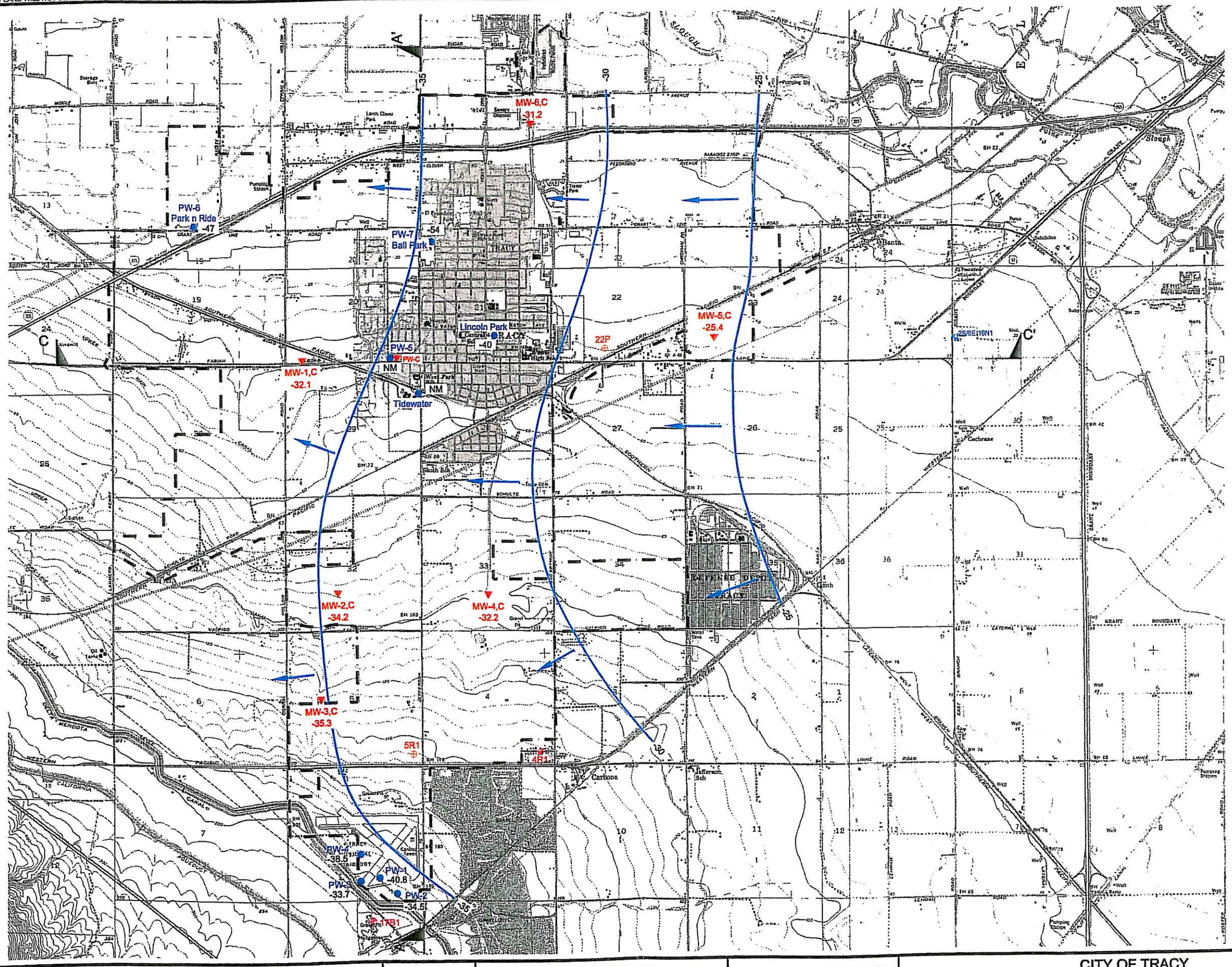

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CITY OF TRACY
MITIGATION MONITORING

REGIONAL GROUNDWATER CONTOURS
ZONE C
APRIL 2005

PROJ. NO. 042540.0002 CONTRACT NO
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FIGURE 4

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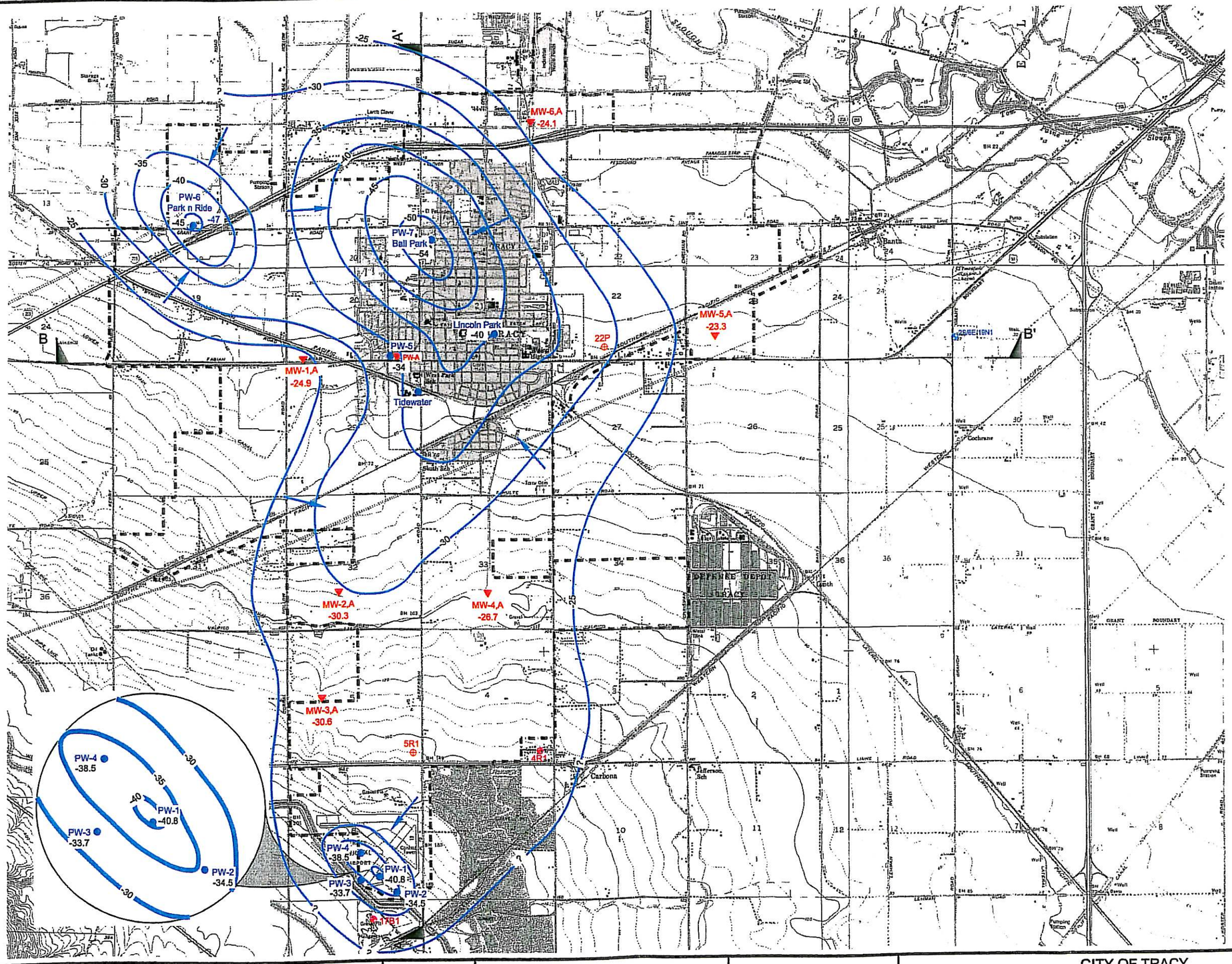

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GRAPHIC SCALE
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NOTE:
USES GROUNDWATER LEVELS FROM ZONE A 2ND PRODUCTION WELL DATA

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A Division of GEI Consultants

CITY OF TRACY
MITIGATION MONITORING

ESTIMATED GROUNDWATER CONTOURS
APRIL 2005

PROJ. NO: 042540.0002 CONTRACT NO:
ISSUE DATE 06-02-05 SUBMITTAL:

FIGURE 5

G:\Water Resource\Projects\042540\0002\Figure_5.dwg Jun 27, 2005 03:56:19 pm

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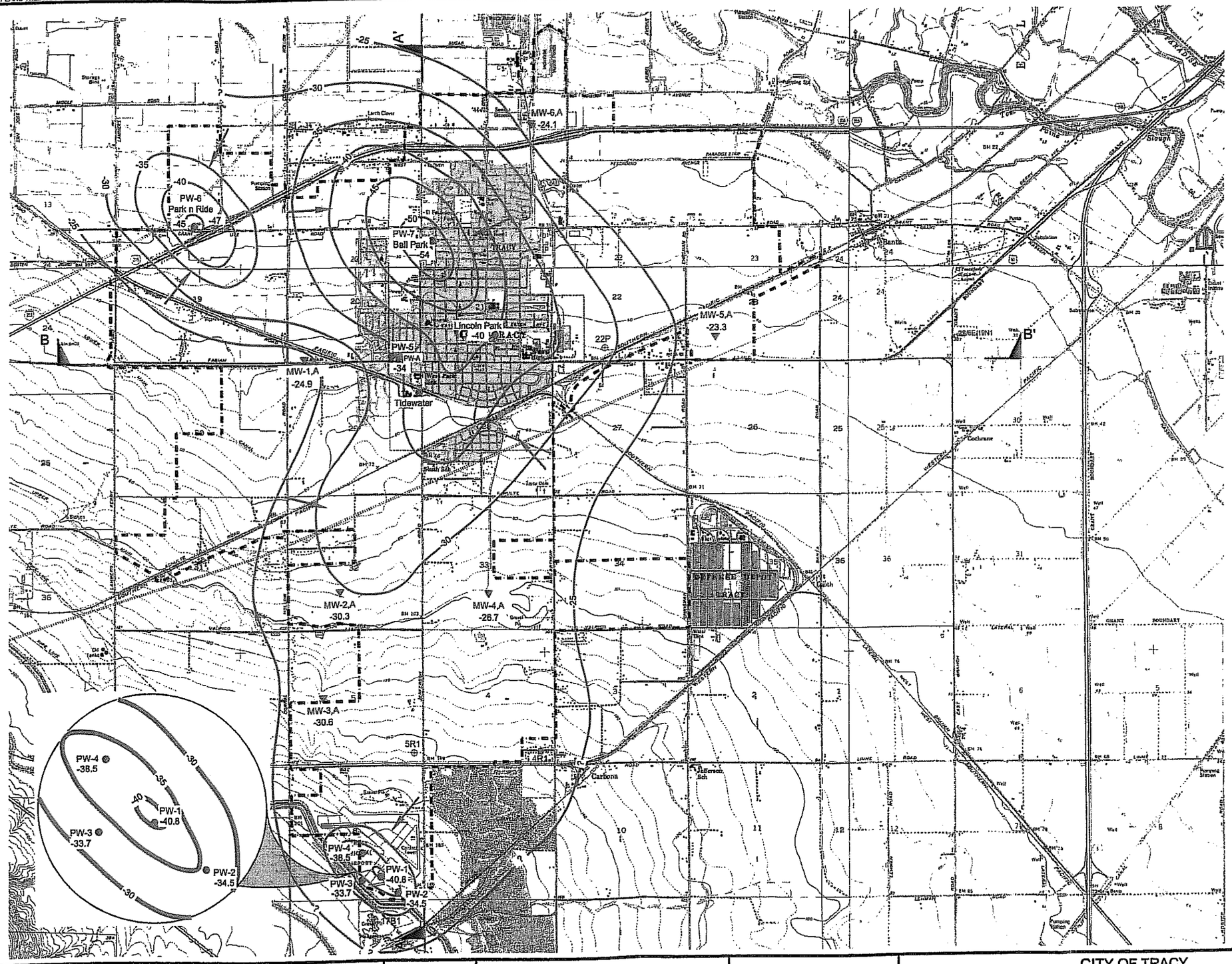
CAUTION: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE ENGINEER OF RECORD.



LEGEND:

- Well identified by DWR or USGS with Corcoran Clay, Approximate location
- Well identified by USGS as key well with hydrograph
- Well with Water Quality and screen location known
- City of Tracy Water Supply Well
- Existing Nested or Clustered Monitoring Well location
- -40 Groundwater Elevations (Elevation in feet) Solid where known, Dashed where inferred, Queried where unknown.
- A A' Geologic Section Note: Geologic section contained in Phase 2 Report of Drilling and Construction, July 2004

-N-

GRAPHIC SCALE
2000 1000 0 2000 4000
IN FEET

NOTE:
USES GROUNDWATER LEVELS FROM ZONE A 2ND PRODUCTION WELL DATA

DESIGNED R. SHATZ CHECKED
DRAWN G. PARKER APPROVED

REV	DATE	DESCRIPTION	SUB	APP'D

REGISTERED GEOLOGIST — RICHARD W. SHATZ No. 1814 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

CITY OF TRACY
SAN JOAQUIN COUNTY, CALIFORNIA

WARNING:
0 1/2 1
THIS BAR SHOULD MEASURE 1" OR DRAWING IS NOT TO SCALE

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CITY OF TRACY
MITIGATION MONITORING

ESTIMATED GROUNDWATER CONTOURS
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FIGURE 5

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TABLE 1
SUMMARY OF WELL CONSTRUCTION DETAILS

WELL NAME	STRATA SEALED (feet)	FILTER PACK INTERVAL (feet)	SCREEN INTERVAL (feet)	CORCORAN CLAY INTERVAL (feet)	AQUIFER MONITORED (DWR defined)	AQUIFER MONITORED (Lower Aquifer Subdivided)
Lincoln	0-250	250-980	490-980	130-380[1]	Lower	Shallow Intermediate Deep Deeper
Tidewater	0-200	200-1159	340-400 404-488 510-637 680-863 886-912 934-978 1031-1159	290-400	Upper Lower	Shallow Intermediate Deep Deeper
Production Well No. 1	0-300	300-980	450-550 580-980	204-293	Lower	Shallow Intermediate Deep
Production Well No. 2	0-250	250-850	420-850	220-270	Lower	Shallow Intermediate Deep
Production Well No. 3	0-250	250-890	420-890	174-270	Lower	Shallow Intermediate Deep
Production Well No. 4	0-250	250-940	380-940	220-270	Lower	Shallow Intermediate Deep
Production Well No. 5 (Lewis Manor)	0-305	305-990	410-480 601-630 650-670 805-830 900-930 965-990	229-390[1]	Lower	Shallow Intermediate Deep Deeper
Production Well No. 6 (Park and Ride)	0-500 690-700 850-870	500-690 700-850 870-1216	550-598 610-636 656-678 738-754 774-796 966-982 1014-1122 1176-1196	250-350	Lower	Intermediate Deep Deeper
Production Well No. 7 (Ball Park)	0-490 750-770	490-750 770-914	550-598 570-732 850-874	200-340	Lower	Intermediate Deep
Production Well No. 8 (ASR)	0-340	340-850	370-460 510-640 680-820	240-360	Lower	Shallow Intermediate Deep

[1] = Clay interval includes Cocoran clay between 310 and 380 feet.
NA = Not available

TABLE 2
SUMMARY OF MONITORING WELL DETAILS

WELL NAME	STRATA SEALED (feet)	FILTER PACK INTERVAL (feet)	SCREEN INTERVAL (feet)	CORCORAN CLAY INTERVAL (feet)	AQUIFER MONITORED (DWR defined)	AQUIFER MONITORED (Lower Aquifer Subdivided)
NESTED MONITORING WELLS						
PW-5A	0-100 390-410	410-580	420-460	229-390[1]	Lower	Shallow[2]
PW-5B	580-590	590-780	610-670	229-390[1]	Lower	Intermediate
PW-5C	780-790	790-870	810-830	229-390[1]	Lower	Deep
PW-5D	870-880	880-1020	910-930 970-990	229-390[1]	Lower	Deeper
CLUSTERED MONITORING WELLS						
MW-1A	0-400	400-480	428-468	300-430	Lower	Shallow
MW-1B	0-590	590-670	618-658	300-430	Lower	Intermediate
MW-1C	0-720	720-800	748-788	300-430	Lower	Deep
MW-2A	0-400	400-480	426-466	234-430	Lower	Shallow
MW-2B	0-614	614-690	634-674	234-430	Lower	Intermediate
MW-2C	0-760	760-820	770-810	234-430	Lower	Deep
MW-3A	0-370	370-415	382-402	210-370	Lower	Shallow
MW-3B	0-530	530-595	540-580	210-370	Lower	Intermediate
MW-3C	0-726	726-820	770-810	210-370	Lower	Deep
MW-4A	0-440	440-505	450-490	240-450	Lower	Shallow
MW-4B	0-660	660-715	680-700	240-450	Lower	Intermediate
MW-4C	0-760	760-820	770-810	240-450	Lower	Deep
MW-5A	0-390	390-460	406-446	290-410	Lower	Shallow
MW-5B	0-560	560-640	576-616	290-410	Lower	Intermediate
MW-5C	0-750	750-820	770-810	290-410	Lower	Deep
MW-6A	0-400	410-450	400-465	320-400	Lower	Shallow
MW-6B	0-560	560-645	590-630	320-400	Lower	Intermediate
MW-6C	0-730	755-810	755-795	320-400	Lower	Deep

1 = Clay interval includes Corcoran clay.
2 = Shallow aquifer as defined as between 380 to 420 is present at a lower depth at this location

Appendix H

Excerpts from the Tracy Municipal Code
Recycled and Non-Potable Water Ordinance - Chapter 11.30
Water Conservation and Rationing Plan - Chapter 11.28

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Chapter 11.30

RECYCLED AND NON-POTABLE WATER

Sections:

11.30.010	Purpose.
11.30.020	Definitions.
11.30.030	Use and distribution of recycled water.
11.30.040	Exemptions.
11.30.050	Appeal.

11.30.010 Purpose.

It is the policy of the City of Tracy that recycled water determined to be available pursuant to section 13550 of the Water Code may be used for non-potable uses within the designated recyled water use areas set forth in this chapter and as permitted by title 22 of the California Code of Regulations. (Ord. 1035 § 1 (part), 2002)

11.30.020 Definitions.

For purposes of this chapter the following words and terms shall be defined as follows, unless the context in which they are used clearly indicates otherwise.

(a) "Common areas" shall include, but not be limited to, golfcourses, parks, greenbelts, landscaped streets, and landscaped medians.

(b) "Development project" means any development as defined in Government Code section 65927 (the Permit Streamlining Act) and includes a project requiring subdivision approval, a use permit, grading permit or building permit.

(c) "Industrial cooling or processing purposes" means evaporative or heat exchange cooling serving industrial processing, or power production, as accomplished by cooling towers, enclosed heat exchange systems, washdown systems, and other similar equipment and devices.

(d) "Non-potable groundwater" means any groundwater that does not conform to federal, state, and local agency standards for human consumption.

(e) "Non-potable water" means water which does not conform to federal, state, and local agency standards for human consumption. It includes groundwater, untreated surface water, and other subsurface or surface water which may be used for a beneficial purpose in compliance with applicable local, state, and federal laws defining standards for non-potable uses.

(f) "Potable water" means water which conforms to federal, state, and local agency standards for human consumption.

(g) "Recycled water" or "reclaimed water" means: 1) water which, as a result of treatment, is suitable for direct non-potable beneficial use or a controlled use that would not otherwise occur, 2) untreated surface water, or 3) non-potable groundwater.

(h) "Recycled water area" or "designated recycled water use area" means all geographic areas located within the City limits of the City of Tracy.

(i) "Recycled water distribution system" or "water reuse system" means a system intended for the delivery of recycled water, including, but not limited to, pipelines, pumps, and reservoirs. The recycled water distribution system is separate from any potable water distribution system. The system controls the recycled water distribution from the source of supply to the point of connection with a building or structural lateral supply pipeline.

(j) "Recycled water use" means irrigation of common areas and use for industrial cooling purposes.

(k) "Untreated surface water" means surface water that has not received the required treatment necessary to conform with federal, state, and local agency standards for human consumption. (Ord. 1035 § 1 (part), 2002)

11.30.030 Use and distribution of recycled water.

(a) All subdivisions for which a tentative map or parcel map is required pursuant to Government Code section 66426 and located within designated recycled water use areas shall be required to install a recycled water distribution system to provide recycled water to the common areas of any subdivision and for any industrial cooling or processing uses in the subdivision.

(b) The water distribution system shall be constructed in conformance with title 22 of the California Code of Regulations.

(c) The recycled water distribution system shall be independent of the plumbing system provided to serve domestic, residential, or other potable water uses within the subdivision.

(d) Recycled water service shall not commence within a designated recycled water use area in any service area of a private utility as defined in section 1502 of the Public Utilities Code or to any service area of a public agency retail water supplier that is not a local agency as defined in subdivision (b) of section 65603, except in accordance with a written agreement between the recycled water producer and the private utility or public agency retail water supplier. (Ord. 1035 § 1 (part), 2002)

11.30.040 Exemptions.

The ordinance codified in this chapter shall not apply in the following circumstances:

(a) The tentative map, as defined in Government Code section 66424.5, or a development, as defined in Government Code section 65927, was approved by the City prior to February 6, 2002.

(b) The subdivision map application was deemed complete pursuant to Government Code section 65943 prior to February 2, 2002.

(c) The subdivider establishes to the satisfaction of the Public Works Director that any of the following circumstances apply:

(1) There is a higher or better use for the recycled water;

(2) Use of recycled water is not economically justified; or

(3) Use of recycled water is not financially and technically feasible. (Ord. 1035 § 1 (part), 2002)

11.30.050 Appeal.

A subdivider may appeal a staff determination that the exemptions of section 11.30.040(c) are inapplicable in accordance with chapter 1.12 of the Tracy Municipal Code. (Ord. 1035 § 1 (part), 2002)

Chapter 11.28

WATER MANAGEMENT

Sections:

Article 1. Purpose, Definitions
11.28.010 Purpose.
11.28.020 Definitions.
11.28.030 Future restrictions.

Article 2. Fees
11.28.040 Fees.

Article 3. Authority, Enforcement, Fines and Property Owner Responsibility
11.28.050 Authority.
11.28.060 Enforcement.
11.28.070 Fines.
11.28.080 Access to service connections.
11.28.090 Unlawful to tamper with service.
11.28.100 Property owners' responsibility.
11.28.110 Termination of service.
11.28.120 Unlawful to provide false information.

Article 4. Water Management (Reserved)

Article 5. Drought and Other Water Emergency Conditions
11.28.130 Drought declaration.
11.28.140 Trigger mechanisms.

Article 6. Water Conservation and Rationing Plan, Water Emergency Plan, Variances and Appeals
11.28.150 Amendments.
11.28.160 Implementation.
11.28.170 Phase I water conservation measures.
11.28.180 Phase II water restrictions—Ten percent city-wide water reduction goal.
11.28.190 Phase III water restrictions—Fifteen percent city-wide water reduction goal.
11.28.200 Phase IV water restrictions—Twenty-five percent city-wide water reduction goal.
11.28.210 Phase V—Water emergency declaration.
11.28.220 Temporary rate increases.
11.28.230 Excess water use surcharge.
11.28.240 Variances on usage restrictions or usage allotments.
11.28.250 Appeals.
11.28.260 Temporary water service.
11.28.270 Residential use without prior history.

Article 7. Drawing Water from Fire Hydrants and Construction Water
11.28.280 Drawing water from fire hydrants.
11.28.290 Construction water usage prohibited during periods of water emergencies.

Article 1. Purpose, Definitions

11.28.010 Purpose.

It is the purpose of this chapter to provide for an effective means to manage the local water supply as necessary for public health, safety, fire protection and recreational needs. (Prior code § 11-7.101)

11.28.020 Definitions.

For the purposes of this chapter, unless otherwise apparent from the context, certain words and phrases used in this chapter are defined as follows:

(a) "Consumer unit" or "unit" means 100 cubic feet of water, or 748 gallons.

(b) "Customer" means owner, tenant or occupant of property receiving City water service.

(c) "Director" means the Public Works Director of the City.

(d) "Drought" means a water shortage as declared by the Governor of California which affects the local water supply; or any unusual situation or circumstance affecting the quantity or quality of the local water supply.

(e) "Flagrant water waste" means any water which flows directly from a tap connected to the City water system that leaves the property of origin in a continuous flow of any dimension for 150 feet from said property, or for more than five (5) minutes in duration.

(f) "Flow restrictor" means any device expressly used to limit water flow or pressure to a water service.

look-up

(g) "Reclaimed water" means non-potable water or treated wastewater.

(h) "Water emergency" means an event, time or situation that requires extraordinary management or restrictions on water use caused as a result of natural events or as an unanticipated manmade event affecting the quantity or quality of the local water supply. (Prior code § 11-7.102)

11.28.030 Future restrictions.

All applicants for water service are hereby put on notice that further restrictions or prohibitions on water use and service may hereafter become necessary; and nothing herein, no application, permit or approval of water service or water service facilities granted pursuant to these rules shall vest in the applicant any right to a particular use or quantity of water; but such applicant shall be subject to all further prohibitions, restrictions, rules and regulations in the same manner and extent as any other consumer or class of consumers similarly situated existing at the time such prohibitions or restrictions are imposed. (Prior code § 11-7.103)

Article 2. Fees

11.28.040 Fees.

Fees charged pursuant to this chapter shall be set by resolution of the City Council. (Prior code § 11-7.201)

Article 3. Authority, Enforcement, Fines and Property Owner Responsibility

11.28.050 Authority.

Pursuant to the provisions of section 836.5 of the State Penal Code, the following officers and employees of the City are hereby authorized to issue citations for enforcement of this chapter:

Public Works Director
Deputy Public Works Director
Water Resources Coordinator
Environmental Control Inspector
Water Patrol
Sworn Peace Officers
Firefighters

(Prior code § 11-7.301)

11.28.060 Enforcement.

The City Manager or his/her designee is charged with primary responsibility in the implementation and enforcement of this chapter. (Prior code § 11-7.302)

11.28.070 Fines.

(a) A person who violates a provision of Phase I through Phase V of article 6 of this chapter, or who fails to comply with an order or permit made thereunder, is guilty of an infraction, punishable as provided in section 1.04.030. In addition, a fourth violation within six (6) months of the first violation shall result in the installation of a meter service flow restrictor at the customer's expense. The meter service flow restrictor shall remain in place for the remainder of the drought or water emergency. Failure to pay assessed fines will result in termination of water service until payment in full of all fines and usual reconnection charges are collected from the customer.

(b) The following violations are cause for fines, as follows:

(1) Drawing water from a fire hydrant without immediate possession of a valid permit issued by the Public Works Director or his or her designee: see chapter 1.04.

(2) Drawing water from a fire hydrant after receiving notice that reclaimed water is available and is required: see chapter 1.04.

(3) Constructing a bypass around a meter: $500.00 fine. (Ord. 1040 § 5 Exh. E (part), 2002: prior code § 11-7.303)

11.28.080 Access to service connections.

Access to service connections and water meters must be provided at all times to designated City personnel in possession of proper identification. Authorized employees of the City shall be admitted at all reasonable hours to all parts of any premises supplied with water, except the interior of dwellings but including the meter box, to ascertain compliance with the regulations contained in this chapter. (Prior code § 11-7.304)

11.28.090 Unlawful to tamper with service.

It shall be unlawful for any person to interfere with the City service lines, valves or meters or to construct a bypass around a meter or service. (Prior code § 11-7.305)

11.28.100 Property owners' responsibility.

Owners of property will be held responsible for water used on their premises, although payments will be accepted from tenants. If the tenants do not pay in accordance with the provisions of this chapter, the service may be disconnected and shall not be restored until the delinquent water charges, including the cost of water delivered, applicable surcharges, as well as the cost of reconnecting the service, have been paid. Owners of property shall be responsible for the maintenance of water pipes, water faucets, water plumbing fixtures, and all other water services

appliances from the point the water meter exits into the plumbing of the property owner. No owner or manager or any other person responsible for the day-to-day operation of any premises shall fail to initiate steps to repair any leaking, broken or defective pipes, faucets, plumbing fixtures, other water appliances, sprinklers, watering or irrigation systems within seventy-two (72) hours after the owner or manager or other responsible person knew or should have known of such leaks, breaks or defects. A written request sent by certified mail to repair such defect or defects from a City representative shall constitute sufficient notice. (Prior code § 11-7.306)

11.28.110 Termination of service.

The City shall terminate service to any customer due to excessive violations of this chapter after written notice to the customer. Said notice shall be posted on the door of the customer by door hanger at least two (2) business days or sent by certified mail three (3) business days prior to the termination of service. For purposes of this chapter, excessive violations shall be considered to be more than four (4) violations within a six (6) month period. (Prior code § 11-7.307)

11.28.120 Unlawful to provide false information.

It is unlawful for any person, firm, partnership, association, corporation, or political entity to use water obtained from the water system of the City through fraud, including misrepresentation made to obtain a particular allocation of water, or for any prohibited or restricted use as herein defined in this chapter. (Prior code § 11-7.308)

Article 4. Water Management (Reserved)

Article 5. Drought and Other Water Emergency Conditions

11.28.130 Drought declaration.

Enactment of the ordinance codified in this chapter shall cause the present implementation of Phase I voluntary conservation as set forth in Section 11.28.170 of Article 6. Phases II through IV are established to achieve subsequent reduction goals in potable water consumption of ten (10%), fifteen (15%) and twenty-five (25%) percent and more as deemed necessary due to drought conditions or other prolonged water emergencies. Phase V is established for water emergency declarations. Phase changes shall be implemented by resolution of the City Council. A duly noticed public hearing shall be required when going from Phase I up to and inclusive of Phase V. Phase changes shall be based upon the trigger mechanisms and criteria set forth in this article. Affected customers shall be notified of phase changes by notice on the utility bill or by actual written notification mailed to the billing address on record with the City Finance Department. (Prior code § 11-7.501)

11.28.140 Trigger mechanisms.

The City Council may declare a drought and direct the City Manager to implement all provisions of Article 6 of this chapter when one or more of the following conditions exist:

(a) The average static groundwater basin level reaches thirty (30') feet below sea level as determined by the Water Production Supervisor by means of monthly groundwater soundings at the water production wells, or if the estimated groundwater demand for the year exceeds 6,000 acre feet, the estimated safe yield for groundwater extraction;

(b) A cutback of available surface water supplies obtained from the Central Valley Project occurs;

(c) A drought is declared by the Governor of California covering the water sources used by the City, and subsequent reductions of water supplied to the City will occur or are likely to occur;

(d) Any unusual situation or circumstance which affects the quantity or quality of the water supply. (Prior code § 11-7.502)

Article 6. Water Conservation and Rationing Plan, Water Emergency Plan, Variances and Appeals

11.28.150 Amendments.

The provisions of this article may be amended from time to time or as deemed necessary by the City Council. (Prior code § 11-7.601)

11.28.160 Implementation.

The City Manager or his/her designee shall be charged with the implementation of the provisions contained

within this chapter, and of any other applicable restrictions or requirements set forth in this chapter. If there is a conflict between two phases, the more restrictive phase shall apply. (Prior code § 11-7.602)

11.28.170 Phase I water conservation measures.

(a) No person, owner, or manager responsible for the day-to-day operation of any premises shall permit flagrant water waste or excessive runoff of water at any time during which Phase I or subsequent phases are imposed.

(b) Proper maintenance of all plumbing and irrigation systems; installation of water-conserving plumbing or attachments; control all leaks within seventy-two (72) hours;

(c) Residents and businesses are to practice prudent water conservation measures at all times. Examples of useful water conservation measures are as follows:

(1) Use of a hand-held sprayer with a self-closing "trigger" handle for all outdoor uses;

(2) The voluntary planting of drought tolerant landscapes; the installation and maintenance of water-efficient irrigation systems such as drip and bubble irrigation, and the installation of sprinkler heads with a low flow rate appropriate for the landscape to prevent overwatering and runoff;

(3) Water in the morning hours during non-windy periods.

(d) All new swimming pools, hot tubs and spas installed after the effective date of the ordinance codified in this section shall have a separation tank and water recovery system installed in the filter backwash system, with a ninety (90%) percent water recovery standard. Nonpermeable floating pool covers shall be required and shall provide ninety (90%) percent surface coverage on all pools, spas and hot tubs. (Prior code § 11-7.603)

11.28.180 Phase II water restrictions—Ten percent city-wide water reduction goal. 10%

In addition to the measures of Phase I, the following restrictions shall apply to landscape irrigation and all other outside water use:

(a) Landscapes, including residential, commercial, industrial, municipal and other public agencies or entities, may be irrigated as follows:

(1) At any time provided that the person irrigating the landscape is present outdoors and maintains a full view of the landscape being irrigated and remains in full control of the water usage;

(i) Unattended between 7:00 p.m. through 9:00 a.m. (May 1 through September 30);

(ii Unattended between 4:00 p.m. through 10:00 a.m. (October 1 through April 30);

(2) At any time providing that drip or bubbler irrigation is used.

(b) The washing of non-commercial sidewalks, driveways, porches, or other outdoor surfaces is prohibited, except in instances where a spill of a hazardous material or other substance which creates a public nuisance occurs and where it is not feasible to clean the affected area in any other manner. The washing of non-commercial, outdoor, hard surfaces utilizing a bucket containing a limited amount of water is allowed at any time.

(c) The washing of commercial sidewalks, driveways, filling stations, parking lots, or other outdoor surfaces is discouraged.

(d) The addition of water above the minimum level necessary to comply with the health or operational requirements for pool, hot tub, or jacuzzi circulation, public or private is prohibited.

(e) Car washing is allowed only with use of a self-closing "trigger" spray nozzle.

(f) No restrictions shall be made with respect to the use of reclaimed water. (Prior code § 11-28.180)

* incentive for reclaim

11.28.190 Phase III water restrictions—Fifteen percent city-wide water reduction goal. 15%

In addition to the restrictions of Phases I and II, the following restrictions shall apply:

(a) Landscapes, including residential, commercial, industrial, municipal and other public agencies or entities, may be irrigated as follows:

(1) May 1 through September 30.

Odd-numbered addresses shall water only on Monday, Wednesday and Saturday after 7:00 p.m. or before 9:00 a.m.

Even-numbered addresses shall water only on Tuesday, Thursday and Sunday after 7:00 p.m. or before 9:00 a.m.

(2) October 1 through April 30.

Odd-numbered addresses shall water only on Monday, Wednesday and Saturday after 4:00 p.m. or before 10:00 a.m.

Even-numbered addresses shall water only on Tuesday, Thursday and Sunday after 4:00 p.m. or before 10:00 a.m.

(b) The irrigation of landscapes during high winds that cause water to blow away from the landscapes being water is prohibited.

(c) The washing of commercial sidewalks, driveways, filling stations, parking lots, or other outdoor surfaces is prohibited, except on: Friday,
and except in instances where a spill of a hazardous material or other substance which creates a public nuisance occurs and where it is not feasible to clean the area in any other manner.

The washing of commercial, outdoor hard surfaces utilizing a bucket containing a limited amount of water is allowed at any time for cleaning food, grease, oil or other stains from surfaces.

(d) No restaurant may serve water except upon customer request. Restaurants shall post at every table and in restrooms notice of drought conditions and water restrictions. Acceptable methods of notification to patrons include notices or tables tents placed on the tables or in the menus and in restrooms in a form approved or provided by the Director.

(e) The owner and manager of every hotel, motel, inn, guest house, and every other short-term commercial lodging shall post notice of drought conditions information in every guest room, in a form approved or provided by the Director. (Prior code § 11-7.605)

11.28.200 Phase IV water restrictions—Twenty-five percent city-wide water reduction goal. 25%

This phase shall establish a goal of twenty-five (25%) percent or more reduction in water usage by the customer. The customer shall be given a reduction goal based upon the base year's usage.

(a) Except as otherwise provided, car washing shall be allowed only with the use of a bucket.

(b) Automobile and recreational vehicle dealerships shall be allowed to continue washing vehicles with a hose and a handheld self-closing "trigger" nozzle under the following conditions:

(1) Automobiles and recreational vehicles may be washed only on Fridays using the method outlined above.

(2) An automobile, motorcycle, boat or motorhome may be washed the day before or the day of delivery to the purchaser.

(c) No restrictions shall be made to laundromats.

(d) No restrictions shall be made to car washes employing the use of water recycling equipment.

(e) The owner and manger of every facility with a restroom on the premises open to the public shall post in every such public restroom a placard or decal with notice of drought condition information in a form approved by the Director. (Prior code § 11-7.606)

11.28.210 Phase V—Water emergency declaration.

(a) The City Council may declare a water emergency and direct the City Manager to implement appropriate water conservation and/or rationing requirements consistent with this chapter when one or more of the following conditions exist:

(1) A decrease in the ability to draw groundwater due to well contamination, well failure or other equipment or system failure, and no alternative source of water is available;

(2) Contamination of the water system;

(3) Natural disasters affecting water deliveries;

(4) During times of floods which would affect water quality;

(5) Sabotage or threats of sabotage against the water system;

(6) Any unusual situation or circumstance which affects the quantity or quality of the water supply.

(b) In addition to the restrictions of Phases I, II, III and IV, the City Council may mandate specific restrictions and reductions which may include but are not limited to:

(1) All water uses not required for public health and safety and fire protection are prohibited.

(2) No lawn and/or landscaping watering or irrigation uses are allowed.

(3) No recreational water uses are allowed. (Prior code § 11-7.607)

11.28.220 Temporary rate increases.

When drought or water emergency conditions are declared by the City Council, it may become necessary to implement a temporary rate increase to cover reduced revenues as a result of conservation. Rates may be increased by resolution of the Council when it is determined that revenues are inadequate to maintain the water enterprise. (Prior code § 11-7.608)

11.28.230 Excess water use surcharge.

(a) During periods of a declared drought or water emergency, the Council may, by resolution, establish a water rate structure which provides incentives (or disincentives) to conserve water use.

(b) Any water user may seek to have the excess water use surcharge waived or forgiven through the variance process set forth in Section 11.28.240(b) of this chapter upon substantial evidence of the following:

(1) The excess water use was beyond the user's control, and was not reasonably correctable due to special and unique circumstances; or

(2) An incident or condition occurred where public health or safety would have been threatened by decreased water usage. (Prior code § 11-7.609)

11.28.240 Variances on usage restrictions or usage allotments.

The Director, or his/her designee, shall document the type and character of any residential, commercial, or industrial user or public authority requesting a variance in the assigned water goal in Phase I, II, III and IV of this chapter. The Director, or his/her designee shall maintain a separate file of each variance request and the response to that request. This file shall be available for public inspection during regular business hours.

(a) No variance request will be considered until a water use has been prohibited or an excess use fee has been assessed on the customer's bill.

(b) The City Manager or his/her designee may grant variances for uses of water otherwise prohibited or adjust any consumer's allotment or billing, if the City Manager or his/her designee finds and determines that to fail to do so would cause an emergency condition affecting health, sanitation, or fire protection or causes undue hardship of the applicant or public.

(c) Should any condition upon which the variance request approval was based cease to exist (e.g., an occupant of the home vacates), the billed user of the home shall be responsible to notify the Finance Department of such change for appropriate adjustment to the user's allotment.

(d) The City may request periodic confirmation from the billed user that all conditions upon which the variance request was approved are still in existence. Failure on the part of the user to respond to any reasonable inquiry shall be grounds for termination of the variance. Supplying false or erroneous information in such an inquiry for the purpose of obtaining or maintaining additional water allotments shall be deemed fraud. (Prior code § 11-7.610)

11.28.250 Appeals.

Any water service customer who considers an action taken by the City under the provisions of this chapter to have been erroneously taken, may appeal such action and decision to the City Council in the following manner:

(a) The appellant shall continue to pay the monthly charge as billed pending the completion of the appeal process;

(b) All appeals shall be filed in writing with the City Clerk and shall state the nature of the appeal and the basis upon which the decision of the City Manager is considered to be in error;

(c) Such appeals, to be effective, must be received by the City Clerk not later than ten (10) business days following the date that the appellant receives or should have received the notice from the City Manager of such action from which the appeal is being taken;

(d) The City Clerk shall schedule the appeal for consideration by the City Council at the earliest available regularly scheduled Council meeting after receipt of the appeal;

(e) The decision of the Council shall be final;

(f) If the City Council grants the appeal, the decision shall provide for timely reimbursement, if any, of the excess use fee charged by the City. (Prior code § 11-7.611)

11.28.260 Temporary water service.

Notwithstanding any other provisions of this chapter, no prohibition is expressly imposed upon applications, approvals, or installations of water service facilities solely for temporary service to those construction works which are entitled to permanent water service facilities under the terms of this chapter. However, the Director may, at his/her discretion, suspend the issuance of water permits for such temporary uses such as construction works, when acceptable alternative nonpotable sources are available. (Prior code § 11-7.612)

11.28.270 Residential use without prior history.

Where there is no prior history of use and notwithstanding any reduction of water use which would otherwise be a goal for residential water users pursuant to the goals as set forth in this chapter, no residential household shall be given a goal to reduce water consumption below the following: The seasonal average consumption customary for that user class or meter class, less than appropriate conservation goal amount. (Prior code § 11-7.613)

Article 7. Drawing Water from Fire Hydrants and Construction Water

11.28.280 Drawing water from fire hydrants.

(a) No person or persons, other than fire department personnel and City personnel, shall open any fire hydrant or attempt to draw water therefrom, except through a

City-owned hydrant meter, and except pursuant to a permit obtained from the City and approved by the Director or his/her designee in control of such hydrant.

(b) A true copy of the permit must, at all times, be in the possession of any person taking water from such hydrant. If any such person fails to display said permit copy upon demand, the City reserves the right to discontinue service and take possession of the City-owned meter and any appurtenances thereto. A service reinstatement fee will be charged to the applicant for reinstatement of such service.

(c) If no City-owned meter is available to the customer, the customer may use load counts and notify the Public Works Department of such each and every Friday.

(d) Regardless of whether a City-owned meter or load count is utilized, a per day fee will be paid by the permittee for each and every day the permit is in effect, including weekends and holidays, regardless of whether water is used or not used. In addition to the per day fee, the permittee will be charged for the amount of water metered or a load or loads counted at the prevailing rate schedule plus an administrative fee.

(e) When a City-owned meter is utilized, a deposit in an amount determined by City Council resolution, shall be required. The deposit will be returned to the permittee upon closure of the water permit and payment of all applicable fees. The City may use the deposit for any of the unpaid fees. (Prior code § 11-7.701)

11.28.290 Construction water usage prohibited during periods of water emergencies.

(a) The use of fresh water for construction uses during period of drought or during water emergencies is prohibited except upon the approval of the City.

(b) Construction water usage. The use of fresh water for dust control or other construction purposes shall be prohibited during a declared drought or water emergency when an alternative approved water source is available. The City's Wastewater Treatment Plant may, in a drought or water emergency, supply reclaimed wastewater or stormwater for construction purposes whenever feasible to water trucks at no charge.

(c) This requirement may be waived on days of extreme winds which cause a dust control problem which, in the opinion of the Director or his/her designee or the Construction Management Superintendent or his/her designee, find and determine that extreme winds are prevalent which are creating a dust control nuisance which must be abated immediately.

In such instances, a one-day permit may be arranged through the Construction Management Superintendent or his designee, or the Director or his/her designee. Said permit will expire at the end of the work day, and usage of potable-quality water will be billed at the per day permit fee, plus actual water consumption, plus an administrative fee. (Prior code § 11-7.702)

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Appendix I

Annual Water Quality Report
City of Tracy, 2004

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2004 CONSUMER CONFIDENCE REPORT
SOURCE WATER DATA SHEET
PRIMARY STANDARDS
Source Water Data Sheet

Analytical Parameter	Untreated Surface Water	Treated Surface Water	Well Water			Regulatory Units		Typical Source
			Avg	Min	Max	MCLG or PHG	MCL	
Primary Standards								
Inorganic (ug/L)								
Aluminum	653	29	ND	ND	ND	600	1000 ug/L	Erosion of natural deposits
Arsenic	2	ND	2	ND	3	0.004	50 ug/L	Erosion of natural deposits
Barium	39	30	26	21	29	2000	1000 ug/L	Erosion of natural deposits
Chromium	2	1	7	2	16	NA	50 ug/L	Erosion of natural deposits
Copper	3	3	2	ND	2	170	1000 ug/L	Erosion of natural deposits
Iron	920	ND	70	ND	270	NA	300 ug/L	Erosion of natural deposits
Manganese	44	ND	18	ND	50	NA	50 ug/L	Erosion of natural deposits
Zinc	8	ND	15	ND	29	NA	5000 ug/L	Erosion of natural deposits
Flouride (mg/L)								
Flouride	0.08	0.07	0.14	0.08	0.21	1	2.0 mg/L	Erosion of natural deposits
Nitrate/Nitrite								
Nitrate (as NO3)1	4	3.7	8.4	2.4	12.8	45	45 mg/L	Runoff from fertilizer use; Erosion of natural deposits
Nitrate + Nitrite (sum as N)	0.9	0.8	1.9	0.6	2.9	10	10 mg/L	
Nitrite (as N)	ND	ND	ND	ND	ND	1	1 mg/L	
Reg Organics (ug/L)								
Trihalomethane								
Total Trihalomethane	ND	34.9	0.4	ND	10.1	NA	80 ug/L	By-product of drinking water chlorination
Radioactivity (pCi/L)								
Gross Alpha	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	NA	15 pCi/L	Erosion of natural deposits
Secondary Standards								
Aesthetic-Related								
Apparent Color (Units)	23	3	3	ND	3	NA	15 Units	Naturally occurring organic materials
Corrosivity Index	0.11	-0.95	0.36	0.07	0.66	NA	Unitless	Naturally occurring
Foaming Agents (MBAS) (mg/L)	ND	ND	ND	ND	ND	NA	0.5 mg/L	Municipal and industrial waste discharge
Odor (TON)	8	4	2.4	1	4	NA	3 TON	Naturally occurring organic materials
Potassium (K) (mg/L)	2.4	2.4	3.6	2.7	4.7	NA	NS	Erosion of natural deposits
Turbidity (NTU)2	11	ND	0.4	0.1	1.4	NA	5 NTU	Soil runoff
Bicarbonate (HCO3) (mg/L)	99	68	178	114	236	NA	NS	Erosion of natural deposits
Carbonate (CO3) (mg/L)	0.4	0.1	0.6	0.3	0.9	NA	NS	Erosion of natural deposits
Hydroxide Alkalinity (OH) (mg/L)	0.01	0.002	0.01	0.01	0.02	NA	NS	Erosion of natural deposits
Total Alkalinity (CaCO3) (mg/L)	81	56	148	93	227	NA	NS	Erosion of natural deposits
Boron (B) (mg/L)	0.3	0.3	1.8	1.1	2.6	NA	NS	Erosion of natural deposits
Calcium (Ca) (mg/L)	26	24	73	40	94	NA	NS	Erosion of natural deposits
Magnesium (Mg) (mg/L)	14	14	28	17	34	NA	NS	Erosion of natural deposits
Sodium (Na) (mg/L)	51	53	137	100	170	NA	NS	Erosion of natural deposits
Total Hardness (CaCO3) (mg/L)	124	114	298	170	375	NA	NS	Erosion of natural deposits
TDS (mg/L)	290	275	760	510	930	NA	1000 mg/L	Erosion of natural deposits
Specific Conductance (umhos/cm)	485	485	1140	811	1320	NA	1600 umhos/cm	Substances that form ions when in water
Chloride (mg/L)	59	68	119	81	170	NA	500 mg/L	Erosion of natural deposits
Sulfate (mg/L)	51	64	257	160	330	NA	500 mg/L	Erosion of natural deposits
pH	7.8	7.1	7.7	7.5	8	NA	6.5 – 8.5 Units	NA
Water Distribution System Data								
Total Trihalomethane	43	36	56	NA	80 ug/L	By-product of drinking water chlorination		
Total Haloacetic Acids	19	16	24	NA	60 ug/L	By-product of drinking water chlorination		

1. Nitrate in drinking water at levels above 45 ppm is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity for the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of skin. Nitrate levels above 45 ppm may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficencies. If you are caring for an infant, or if you are pregnant, you should ask advice from your health care provider.

Notes:

a) http://www.ci.tracy.ca.us/departments/public_works/water_quality/

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Appendix J

Excerpts from: *Sanitary Survey Update – South San Joaquin Irrigation District*
Black & Veatch Corporation, March 2005

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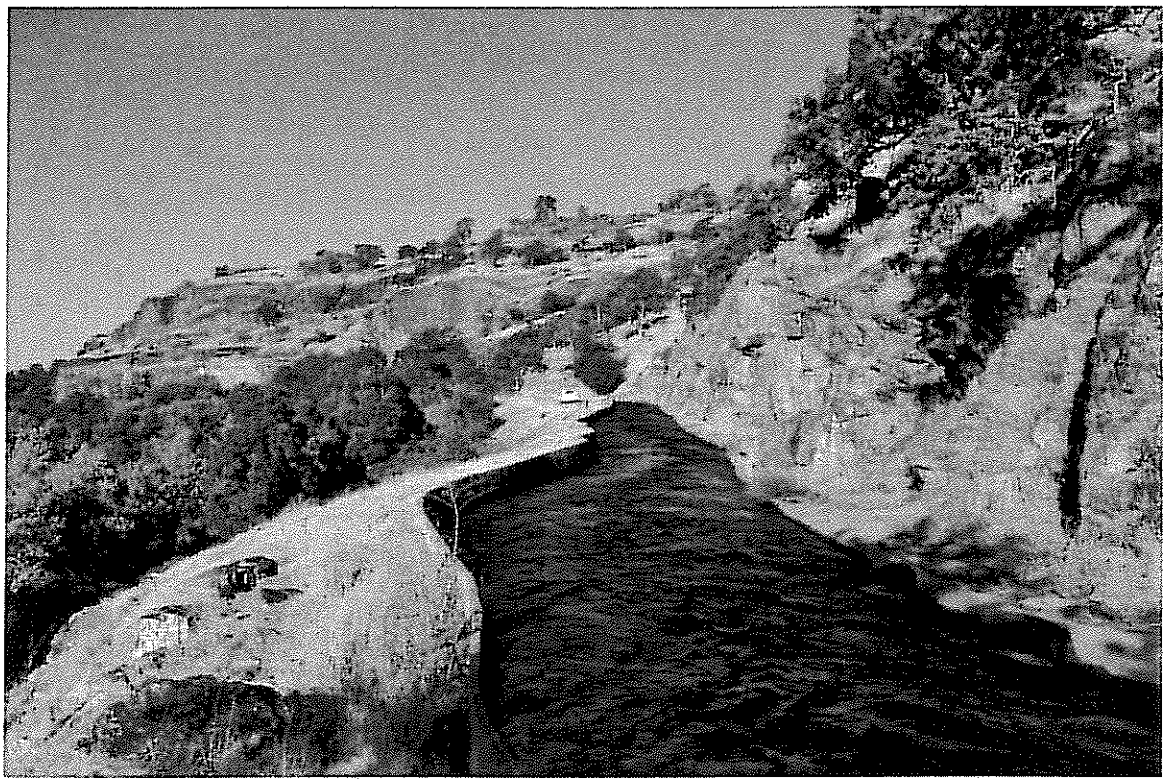
Sanitary Survey Update

South San Joaquin Irrigation District



Submitted by:

BLACK & VEATCH
Corporation

March 2005

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Table 8-1 – Raw Water Quality Data Summary (1998-2004)

Parameter	Reservoir Intake			Canal Intake		
	Average	Maximum	Minimum	Average	Maximum	Minimum
pH	7.59	9.00	6.50	7.45	7.84	6.98
Temperature, °C	17.1	27.3	7.3	13.27	19.7	7.1
TDS, mg/L	50.9	81	16	46.51	72	12
Turbidity, NTU	4.91	14	1	1.12	3.5	0.36
Ca, mg/L as $CaCO_3$	13.83	24	5	16.05	22.9	11.8
Mg, mg/L as $CaCO_3$	4.61	18.25	N.D.	4.97	12.00	N.D.
Total Hardness, mg/L as $CaCO_3$	22.32	33.9	13.0	21.89	29.25	18.35
Total Alkalinity, mg/L as $CaCO_3$	29.27	45.3	18.9	29.44	45	25
SO_4, mg/L	2.53	5	N.D.	2.02	2.7	N.D.
CL^-, mg/L	1.17	2	N.D.	0.97	1.3	N.D.
NO_3^-, mg/L	0.42	1.5	N.D.	N.D.	N.D.	N.D.
Na, mg/L	2.62	5.1	2.00	2.33	2.8	2
K, mg/L	0.88	2.9	N.D.	0.18	1.1	N.D.
NH_3, mg/L	0.55	2.89	N.D.	0.16	0.3	0.01
TOC, mg/L	2.17	4.9	0.60	1.54	2.3	1.3
DOC, mg/L	2.04	4.8	N.D.	1.44	1.7	1.2
UV254, 1/cm	0.09	0.41	0.04	0.04	0.05	0.03
Color	10.98	50	5	8.03	15	3
Odor, TON	10.91	40	N.D.	6.44	17	1
Al, µg/L	284.39	1500	33	30.29	87	N.D.
Fe, µg/L	244.09	1000	N.D.	31.71	95	N.D.
Mn, µg/L	4.34	10	N.D.	6.87	10	3.8
Zn, µg/L	5.45	21	N.D.	---	---	---
MTBE, µg/L	3.31	8.3	N.D.	N.D.	N.D.	N.D.
Copper, µg/L	5.9	15	N.D.	3.45	6.9	N.D.
Lead, µg/L	0.58	1.6	N.D.	N.D.	N.D.	N.D.
Nickel, µg/L	0.5	1	N.D.	N.D.	N.D.	N.D.
Cadmium, µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chromium, µg/L	2.2	3.5	N.D.	N.D.	N.D.	N.D.
Barium, µg/L	19.14	26	17	12.22	14	11
Langlier Index	-1.70	-0.75	-2.41	-1.66	-0.90	-2.36
TTHM TFP, µg/L	97	203	53	74.0	102	50
Title 22 Organics, µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
HAA5 TFP, µg/L	113.65	230	78	87.79	100	75

N.D. – Not Detected

Table 8-2- Total Coliforms Summary at Various Locations in the Watershed

Location	Date Range	# of Samples	Average MPN/100mL	Max MPN/100mL	Min MPN/100mL
Goodwin Dam	4/7/99 - 10/2/00	46	18.4	70	2
SSJMC	4/7/99 - 7/25/04	72	72.5	1600	3
Woodward Reservoir	1/8/98 - 7/25/04	164	71.8	1600	2
Marina	6/1/99 - 7/25/04	15	161	1600	5
Bayview Point	6/1/99 - 7/25/04	15	207	1600	2

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Appendix K

Guidelines for Water Efficient Landscape Design, Development, and Maintenance
City of Tracy Resolution No. 91-136

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ATTACHMENT 1

AB 325

RESOLUTION NO. 91-136

ESTABLISHING WATER CONSERVATION GUIDELINES FOR REVIEW OF LANDSCAPE AND IRRIGATION PLANS

WHEREAS, The State and our local region are currently experiencing a fifth consecutive year of less than average rainfall, and

WHEREAS, During the past five years water conservation has become a bigger part of life for an increasing number of Tracy residents, and

WHEREAS, Water is an increasingly limited and costly resource, and

WHEREAS, The supply of surface water from the U. S. Bureau of Reclamation via the Delta - Mendota Canal to the City of Tracy has been reduced for 1991, and

WHEREAS, The City of Tracy is in the process of establishing a Water Management Program, and

NOW THEREFORE BE IT RESOLVED, The City Council of the City of Tracy does hereby resolve that guidelines and policies for water efficient landscaping and irrigation systems is hereby established for all new projects including single-family homes, and are to be administered by the Community Development Director.

****

The foregoing Resolution No. 91-136 was passed and adopted by the City Council of the City of Tracy on the 21st day of May, 1991, by the following vote:

AYES:	COUNCIL MEMBER:	BILBREY, MORELOS, POMBO, SCHUBERT, BLAND
NOES:	COUNCIL MEMBER:	NONE
ABSENT:	COUNCIL MEMBER:	NONE
ABSTAIN:	COUNCIL MEMBER:	NONE

Clyde Bland
MAYOR

ATTEST:

Sharon Smith
DEPUTY CITY CLERK

May 21, 1991

AGENDA ITEM NO. 1

REQUEST

CONSIDERATION OF GUIDELINES TO REGULATE THE INSTALLATION AND MAINTENANCE OF LANDSCAPING AND IRRIGATION SYSTEMS

DISCUSSION

Because the state and more specifically our local region are currently experiencing a fifth consecutive year of less than average rainfall (and combined with a reduced supply of surface water provided to the City by the U. S. Bureau of Reclamation from the Delta - Mendota Canal), the City of Tracy is dealing with water shortages in providing service to its customers.

One part of the City's overall Water Management Program is to develop guidelines and policies that can be implemented this summer to reduce the amount of water used for newly installed landscaping throughout the City. The Community Development Department is recommending guidelines, that, if adopted, will decrease the amount of water consumption for new development projects. Although not in ordinance format, the guidelines will serve as a precursor to regulations that need to be developed by the City pursuant to AB 325. This new law requires local agencies to adopt a "Water Efficient Landscaping Ordinance" by 1993, or have a state model ordinance imposed. The proposed guidelines and policies are included along with an authorization Resolution and were developed with the assistance of local professionals associated with the landscape industry.

The guidelines apply to all types of new development. All projects will be required to submit a landscape plan for review and approval by the Planning Division of the Community Development Department prior to issuance of a building permit. Single-family residential development will rely on a process of self-certification, wherein homebuyers are asked to sign a statement upon purchase of a home, or upon installation of a new water service, acknowledging receipt of the guidelines, and their intention to comply with the requirements in installing their residential landscapes.

The guidelines do not specify or restrict the species of planting which can be used, but do require the accumulation of points in order to receive an approved plan. While the guidelines are applicable to new development, the standards can also be used for rehabilitation or replanting of existing landscaped areas. Whether following the guidelines as a requirement or voluntarily, the City overall will benefit from long term savings from water usage and maintenance.

Staff has determined that the proposed Resolution and guidelines (project) is Categorically exempt from the California Environmental Quality Act (CEQA) pursuant to guidelines Section 15061.B(3).

RECOMMENDATION

Staff recommends that the City Council approve the attached Resolution adopting guidelines and policies regulating the installation and maintenance of landscape materials for new development with the City of Tracy.

Attachments

1) Resolution No. ____
2) Guidelines

CITY OF TRACY

GUIDELINES FOR WATER EFFICIENT LANDSCAPE DESIGN, DEVELOPMENT AND MAINTENANCE

(Prepared by the Planning Division of the Community Development Department)

Effective July 1, 1991

A. DEFINITIONS:

1. "Permeable Paving" shall mean a paving material that permits water penetration to a soil depth of 18 inches or more, including non-porous surface material poured or laid in sections not exceeding one square foot in area and collectively comprising less than two thirds of the total surface area of the lot and loosely laid materials, such as crushed stone or gravel.

2. "Planted Area" shall mean the total area of the site not covered by buildings, parking lots, driveways, or streets, and shall include patios, plazas, sidewalks, hardcourts, swimming pools, spas, and parkway area.

3. "Turf" shall mean a single-bladed grass or sod.

4. "Water Conserving Plant" shall mean any plant which exhibits drought tolerant characteristics, that is to say, will, in a designed location, survive with limited supplemental water. Marathon or other hybrid fescues and warm season grasses shall be considered water conserving. A listing of these plants shall be available at the Community Development Department.

B. LANDSCAPE CRITERIA:

The Community Development Director or his or her duly authorized representative shall review each project for compliance with the water efficient landscape guidelines at the development review stage.

A project must receive a minimum of 60 points in this category.

Landscape Technique	Points
1. Water conserving plants used in 75% or more of total planted area.	20
2. Turf limited as follows: a. Residential projects - 45% of total planted area b. All other projects - 25% of total planted area	20

3.	Plants placed or grouped according to their watering needs.	10
4.	Hardscape (non-irrigated) surfaces, such as alluvial rock or decorative paving, used in 10% or more of total planted areas.	10
5.	Permeable paving used in 5% of total planted area.	5
6.	Where turf is used, utilize proven varieties of low water requirement turf, such as Marathon.	5
7.	Where no groundcover is used, utilize wood chips, bark, or other mulch, to a depth of 3 inches on top of exposed soil, such as underneath shrubs, or landscape fabric under soil.	5
8.	Soil amendments to improve water holding capacity of soil, where soil conditions merit.	5

C. IRRIGATION CRITERIA

The Community Development Director or his or her duly authorized representative shall review each project for compliance with the water efficient landscape guidelines at the development review stage.

A project must receive a minimum of 60 points in this category.

Irrigation Technique		Points
1.	Low gallonage irrigation system, or higher gallonage systems with automatic controller capable of repeat cycling, used for more than 75% of total planted area. (Drip or trickle may not be used in turf areas).	20
2.	Automatic controller for irrigation system	20

3.	Irrigation system designed to water plants according to their water needs (i.e. - landscape materials which require different watering needs are irrigated by separate control valves)	10
4.	Soil-moisture sensors (e.g. - tensiometer) used in conjunction with automatic controller	10
5.	Rain sensors (e.g. Raincup) used in conjunction with automatic controller.	5
6.	Wind sensors (e.g. - anemometer) used in conjunction with automatic controller	5
7.	Irrigation is sensitive to slope factors (i.e. - low gallonage heads, water basins) or project has no slopes greater than 5 feet in height which require landscaping.	5
8.	Use of reclaimed or recycled water	5

CITY OF TRACY

GUIDELINES FOR WATER EFFICIENT LANDSCAPE DESIGN, DEVELOPMENT AND MAINTENANCE

ASSESSMENT SUMMARY

	POINTS CLAIMED	REFERENCE (Sheet #/Ref. #)
LANDSCAPE [Point Value]		
1. Water conserving plants.[20]		
2. Turf limited to 25% (45% residential.[20]		
3. Plants grouped by watering need.[10]		
4. Hardscape (non-irrigated) surfaces.[10]		
5. Permeable paving.[5]		
6. Low-water turf varieties.[5]		
7. Mulch provided in non-ground cover areas.[5]		
8. Soil amendments.[5]		
Total Points Claimed:	_____	
[Minimum Points Required: 60]		

IRRIGATION [Point Value]		
1. Low gallonage irrigation system.[20]		
2. Automatic controller.[20]		
3. Designed to water plants by watering needs.[10]		
4. Soil moisture sensors.[10]		
5. Rain sensors.[5]		
6. Wind sensors.[5]		
7. Sensitive to slope factors.[5]		
8. Reclaimed or recycled water.[5]		
Total Points Claimed:	_____	
[Minimum Points Required: 60]		

ATTACHMENT 1

AB 325

RESOLUTION NO. 91-136

ESTABLISHING WATER CONSERVATION GUIDELINES FOR REVIEW OF LANDSCAPE AND IRRIGATION PLANS

WHEREAS, The State and our local region are currently experiencing a fifth consecutive year of less than average rainfall, and

WHEREAS, During the past five years water conservation has become a bigger part of life for an increasing number of Tracy residents, and

WHEREAS, Water is an increasingly limited and costly resource, and

WHEREAS, The supply of surface water from the U. S. Bureau of Reclamation via the Delta - Mendota Canal to the City of Tracy has been reduced for 1991, and

WHEREAS, The City of Tracy is in the process of establishing a Water Management Program, and

NOW THEREFORE BE IT RESOLVED, The City Council of the City of Tracy does hereby resolve that guidelines and policies for water efficient landscaping and irrigation systems is hereby established for all new projects including single-family homes, and are to be administered by the Community Development Director.

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AYES: COUNCIL MEMBER: BILBREY, MORELOS, POMBO, SCHUBERT, BLAND
NOES: COUNCIL MEMBER: NONE
ABSENT: COUNCIL MEMBER: NONE
ABSTAIN: COUNCIL MEMBER: NONE

Clyde Bland
MAYOR

ATTEST:

Sharon Smith
DEPUTY CITY CLERK

Appendix L

Landscape Water Audit Summary Report for the City of Tracy
Henneberry Schermesser, 2003

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LANDSCAPE WATER AUDITS SUMMARY REPORT FOR THE CITY OF TRACY

PREPARED UNDER AN AGREEMENT WITH
THE CITY OF TRACY
DEPARTMENT OF PUBLIC WORKS

APRIL 2003

M. ANNETTE HENNEBERRY SCHERMESSER, P.E.
CONSULTING CIVIL ENGINEER

PREPARED UNDER AN AGREEMENT WITH
THE CITY OF TRACY
DEPARTMENT OF PUBLIC WORKS

LANDSCAPE WATER AUDITS SUMMARY REPORT FOR THE CITY OF TRACY

APRIL 2003

M. ANNETTE HENNEBERRY SCHERMESSER, P.E.
CONSULTING CIVIL ENGINEER

TRIDENT

INSTALLATIONS

April 24, 2003

City of Tracy
Public Works Department
Steve Bayley, Deputy Director of Public Works

Dear Mr. Bayley;

Enclosed are two copies of the final report for the large landscape water audits for Professional Services Agreement No. CT2, Large Landscape Water Audit Required by Water Conservation Plan for Alden Park, Dr. Powers Park, Hoyt Park and Cecilliani Park. Also enclosed is the invoice for this project. A copy of this invoice has been forwarded to the finance Department.

It has been a pleasure working with your staff and I look forward to working with you and your staff in the future.

Sincerely,

M. Annette Henneberry Schermesser, P.E.

Cc: Finance Department

1947 GROVE COURT TRACY, CA 95376 VOICE (209) 839-1101 FAX (209) 830 7417

CITY OF TRACY

MAYOR

Dan Bilbery

CITY COUNCIL

Wes Huffman
Brent Ives
Evelyn Tolbert
Suzanne Tucker

CITY STAFF

Fred Diaz, City Manager
Nick Pinhey, Director of Public Works
Steve Bayley, Deputy Director of Public Works
Don Scholl, Parks Supervisor
Terry Ronneberg, Water Conservation Coordinator

ENGINEERING CONSULTANT

M. Annette Henneberry Schermesser

INTRODUCTION

M. Annette Henneberry Schermesser entered into an Agreement dated May 22, 2002, with the City of Tracy to provide services for a large turf area Landscape Water Audit program for four parks. The purpose of this landscape water audit program was (1) improve landscape water use efficiency and (2) to address and comply with the Best Management Practices (BMP) as outlined in the City of Tracy Urban Water Management Plan. This final summary report discusses landscape water audit procedures, the sites audited, audit results and recommendations and water use comparisons. The following sites were selected by the City of Tracy for landscape water audits

- Alden Park
- Hoyt Park
- Cecilliani Park
- Dr. Powers Park

LANDSCAPE WATER AUDIT

A landscape water audit is a method of assessing the effectiveness of an irrigation system to maintain a healthy landscape while using a minimum amount of water. In this case, large turf areas were evaluated. The landscape water audit procedure involves site selection, irrigation system inspection, catch can test, data analysis, results and recommendations. Field data is collected at each park during the irrigation system inspection and catch can tests. Field data and water use data is then analyzed using Landscape Water Management Software developed by Cal Poly, SLO. The software calculates distribution uniformity factors and base irrigation schedule guidelines for each station. The following is a discussion of each stage of the audit procedure.

SITE SELECTION

The audit sites are parks located within the City's service area and are maintained by the Public Works Department. The parks represent a range of ages from the very old, Alden Park and Dr. Powers Park, to the relatively new, Cecilliani Park and Hoyt Park. Each park has a combination of lawn areas and mixed plantings and a variety of recreational uses. Only selected large turf areas were evaluated.

CATCH CAN TESTS

To perform the field precipitation rate test, catch-cans were laid out on uniform patterns in a sub area to catch the spray from the sprinkler heads. The sprinklers were run from 20 to 45 minutes and the volumes were measured and recorded. Two types of catch can tests were used : one for a single station testing group and another for multiple station testing groups. Shown in figures 1 and 2 respectively is sample catch can layouts. The Alden Park catch can tests were performed using the standard multiple station testing groups. Stations 1,2,4,5,6,7,8 and 9 were tested using the method in figure 2. The Dr. Powers Park catch can tests were performed using four single station test groups, similar to figure 1, because of the large areas covered by station 1 and station 2. The sub groups were as follows

1. Station 2 area by west of the berm, bordered by Lowell Avenue, Chester Drive and the Driveway to the south
2. Station 2 area behind the pool and the play ground, in front of the south group picnic area, and west of the bike rack
3. Station 2 area between the playground and Lowell avenue, east of the playground and west of the tennis court
4. Station 1 bordered by the tennis court, the train and Lowell avenue

The catch can tests for Cecilliani Park and Hoyt Park used a combination of the single station testing method and the multiple station test method with a variation. Due to the non-uniform layout of the stations, generally one to three stations were combined to form one station for the purpose of the test. One large single station test at Hoyt Park combined stations 9-10-11-12-29 to form a sub-group as in figure 1. This method was tested because of observed over spray in many locations throughout Hoyt Park. The auditor wanted to compare uniformity factors using both methods. The stations for the respective parks were grouped as follows:

Cecilliani Park

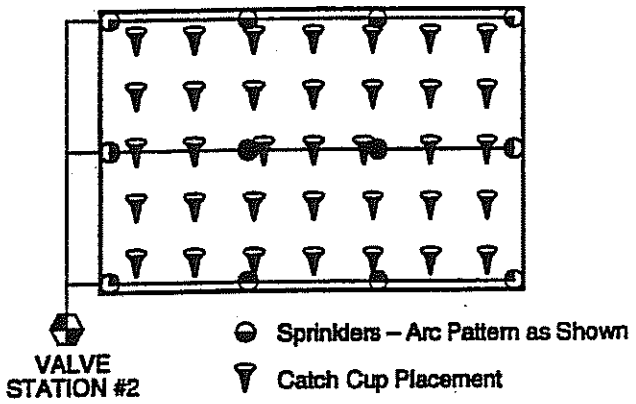
Multiple station test method
Station A: stations 41-44-36
Station B: stations 45-46-34
Station C: stations 49-50

Single station test method
Station D: station 34, perimeter
Station E: 47-48, perimeter

Hoyt Park

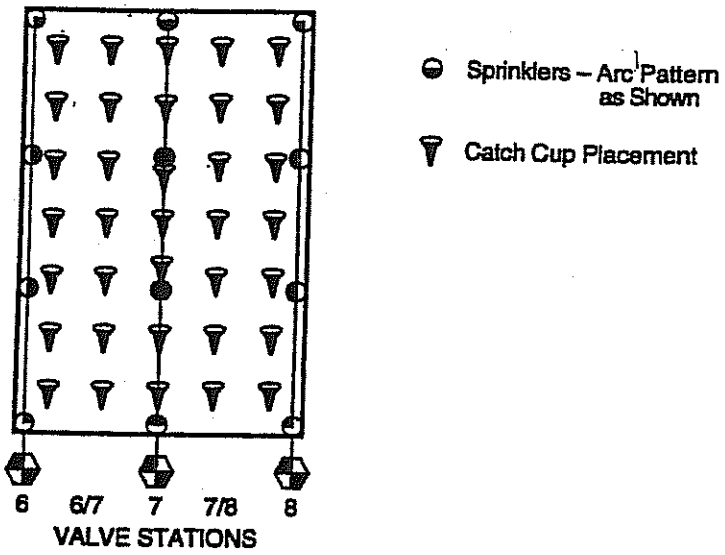
Single station test method
Station A: portions of stations 9-10-11-12-29

Multiple station test method
Station B: stations 31-45
Station C: station 41
Station D: station 23-24
Station E: station 25-26
Station F: station 29
Station G: station 28



· *Catch Can Placement - Single Station, Rectangular*

Figure 1



· *Multiple Station Testing Area with Overlap*

Figure 2

IRRIGATION SYSTEM INSPECTION

During the catch can stage of the audit, irrigation system maintenance items were noted for each station and are summarized and discussed below. Also, lateral line pressures were recorded at the sprinkler heads at the beginning, middle and end of each station. The pressure variation has been summarized. In the event of a poor performing station, these pressure variations can be crossed referenced for further evaluation of the stations performance.

A common problem was mismatched heads. This problem was observed at Alden Park, Dr. Powers Park and Cecilliani Park. Another common problem was sunken sprinkler heads that needed to be raised or dug out. It was common to observe spray deflected due to the surrounding grass blocking the spray. All parks showed a lack of head to head coverage. See figures 3 and 4. Alden Park, Dr.Powers Park, and Cecilliani Park all showed coverage similar to figure 4, diagrams A and B. Alden Park and Dr. Powers Park were by far the worst head to head coverage. This was the number one reason there were many dead turf areas and bare patches of ground. This is a direct result of a very high percentage of mismatched heads. In December, Alden Park and Dr. Powers Park were visited in order to collect controller data. There had been several rain storms and the parks received irrigation from the rain storms. Both parks displayed a vast expanse of uniformly green turf. This was a stark contrast to the appearance of the turf in the summer and fall seasons. The rain provided uniformly distributed irrigation coverage over the turf areas. Alden Park and Dr. Powers Park could look like this all year if the sprinkler heads provided uniform irrigation coverage. Cecilliani Park also had a high percentage of mismatched heads. Hoyt Park had some areas where head to head coverage was prevalent. However, many stations showed neither the coverage shown in figure 3 or 4. Instead, in a number of cases the station overlap sprayed well beyond its neighboring station. Spray was observed several feet into the tennis courts and several feet into the horseshoe pit. In the station A group, station 10 is in the middle of that sub-area. It sprays past station 9 (a perimeter), past the sidewalk and several feet into the playground. This might be corrected by outfitting the heads with another more appropriate size nozzle. Adjusting the spray with the set screw will deflect spray and result in non uniform coverage and is generally not recommended.

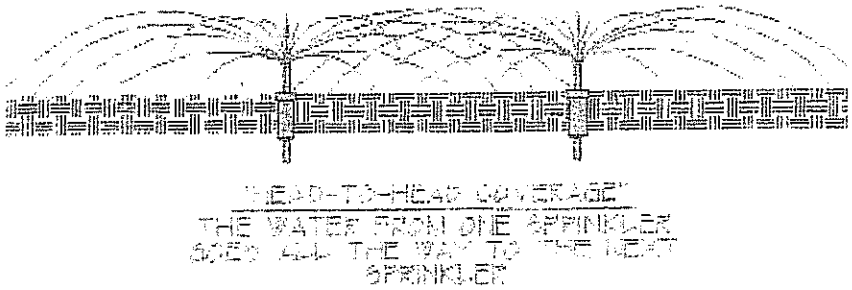


FIGURE 3

The ideal coverage is head to head coverage as in diagram C of figure 4

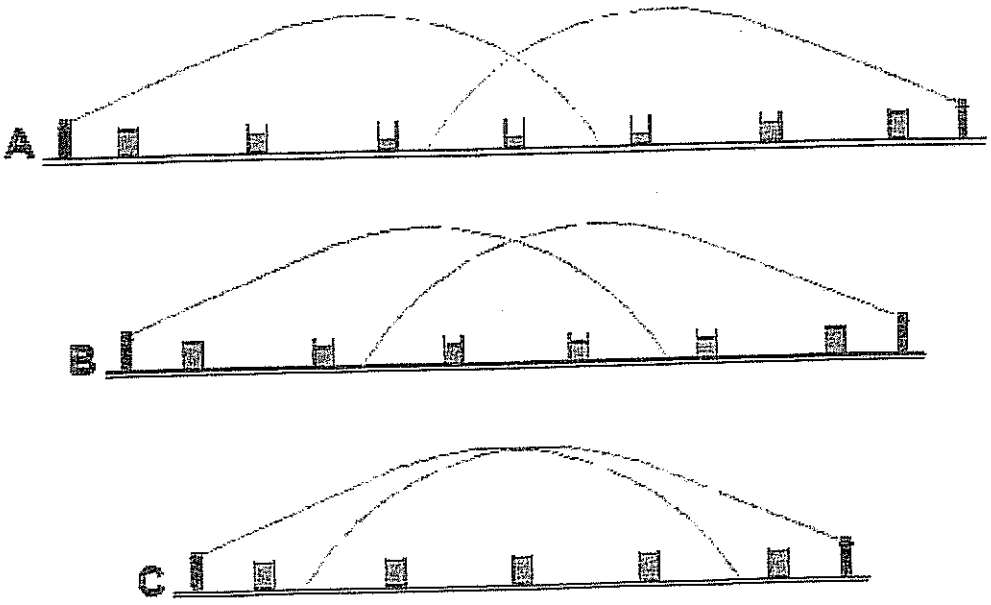


FIGURE 4

The pressure was tested at the sprinkler heads along the lateral lines at the beginning, middle and end of each station. The pressure variation is expressed in percent change. A 0% change is no pressure variation and is desirable. A large pressure variation is a sign of mismatched sprinkler heads, inadequate design of the lateral lines or possibly a valve problem. The specific results of the irrigation system inspection for each park are as follows.

Cecilliani Park

Results of the irrigation system inspection included:

Mismatched heads and weeping along Tennis Lane in stations 47 and 48. These two corners were muddy and wet. Along the western sidewalk from Tennis Lane and north into the park, some heads went on with station 48 and station 34. The following is a summary of the pressure variations along the lateral irrigation lines. Large pressure variations may be due to the mismatched heads

Station A; 41-44-36	41%, 0% and 2.8%
Station B; 45-46-34	16% and 20%
Station C; 49-50	10% and 26%
Station D; 34,perimeter	17%
Station E; 47-48	5% and 2.5%

Hoyt Park

Results of the irrigation system inspection included:

Over spray was observed throughout the park. The ideal coverage is head to head coverage as in figure 3 and diagram C of figure 4. The coverage at Hoyt park is not represented in diagrams A, B, or C of figure 4. The spray from many lines of sprinklers at Hoyt Park shoot past its neighboring station. In some cases, areas that do not need to be irrigated are receiving water. These areas include the tennis courts, the play ground and the horse shoe pits. There were no mismatched heads observed. The pressure at the sprinkler heads was tested along lateral lines. The pressure variations are shown as follows. The pressure variations were at an acceptable level for all stations except station 28. This should be further investigated. Station A (9,10, 11, 12 &29) was not tested due to time constraints.

Station A;	not tested
Station B; 31-45	5.5% and 0%
Station C; 41	5.5%
Station D; 23-24	6.4% and 3.3%
Station E; 25-26	3.2% and 0%
Station F; 29	0%
Station G; 28	14.3% and 16.7% both sides of the valve were tested.

Alden Park

The results of the irrigation system inspection included:

There was a high percentage of mismatched heads in this park. The park was dotted with dead and bare areas of turf due to non-uniform coverage of water. Many heads in this park do not rise high enough and thus hit the nearby grass. This distorts and limits the spray. Many of the stakes that support the catch cans were very difficult to insert into the ground. Highly compacted soils are suspected. Station 1 was swampy at the north west corner on Sequoia Road. Runoff was observed north of the sidewalk heading into the park but not south of the sidewalk. In station 2, the third head east from Sequoia road is broken. Station 9 is the only section in this park irrigated with pop ups. A lot of sidewalk near station 9 is being unnecessarily irrigated. This is likely due to vandals interfering with the sprinklers. These heads should be realigned to spray more grass and less sidewalk. Puddling was observed around station 9. The pressure variations for each station are as follows. The pressure variations are probably the result of mismatched heads.

Station 1:	0% and 6.7% both sides of the valve were tested
Station 2:	11.8%
Station 4:	15%
Station 5	6.7%
Station 6:	5.6%
Station 7:	10.5%
Station 8:	31.2
Station 9:	not tested. The pressure gauge could not accommodate this type of head.

Dr. Powers Park

The results of the irrigation system inspection included:

There were a high percentage of mismatched heads in this park. The park was dotted with dead and bare areas of turf due to non-uniform coverage of water. Many heads in this park do not rise high enough and thus hit the nearby grass. This distorts and limits the spray. Many heads throughout the park have an extremely low out put. This may be due to the large areas covered by stations 1 and 2. Many of the stakes that support the catch cans were very difficult to insert into the ground. Highly compacted soils are suspected. Some heads along the west side of the berm did not rotate. They were fixed. There were some heads near the tennis courts that did not rotate. They were fixed. The sprinkler heads along Chester rotate far into the street and in some cases nearly to the center of the street. This is likely do to vandals playing with the sprinklers. In sample area 2 behind the pool, some heads were observed to be leaking at the base. There are some swampy areas in part because of the heads leaking at the base. There is a broken sprinkler head along the back fence behind the train. This was fixed The pressure along

the main line of station 1 was tested. The pressure variation was 28.6%. This could be due to a combination of problems such as undersized lateral lines and main lines supplying water to a very large area, mismatched sprinkler heads, poor performing valves, corrosion within the galvanized irrigation pipes and sprinkler heads in need of repair. The pressure along the main line of station 2 could not be tested. At the time of testing, station 1 went on when the controller was set at station 1 and when the controller was set at station 2. This happened during the catch can phase of the audit also. The solenoid for station 2 was replaced which solved the problem.

The following station data worksheets summarize maintenance items found at each park.

Alden Park

STATION DATA

Station (Zone) Number	1	2	4	5	6	7	8	9		
Plant Material Type										
Application Technology										
Observed Problems:										
Valve Malfunctions										
Low Pressure										
High Pressure										
Tilted Sprinklers										
Spray Deflection		X	X	X	X	X	X	X		
Sunken Sprinklers		X	X	X	X	X	X	X		
Plugged Equipment										
Arc Misalignment		X						X		
Lateral Line Drainage										
Leaky Seals or Fittings										
Lateral or Drip Line Leaks										
Missing or Broken Heads		X								
Slow Drainage or Ponding	X							X		
Compaction/Thatch/Runoff	X	X	X	X	X	X	X			
Notes and Comments	North of sidewalk									

Dr. Powers Park

STATION DATA Sample areas

Station (Zone) Number	1	2	3	4						
Plant Material Type										
Application Technology										
Observed Problems:										
Valve Malfunctions										
Low Pressure		X		X						
High Pressure										
Tilted Sprinklers										
Spray Deflection	X	X	X	X						
Sunken Sprinklers	X	X	X	X						
Plugged Equipment										
Arc Misalignment	X	X								
Lateral Line Drainage										
Leaky Seals or Fittings		X		X						
Lateral or Drip Line Leaks										
Missing or Broken Heads			X	X						
Slow Drainage or Ponding		X	X							
Compaction/Thatch/Runoff	X	X	X	X						
Notes and Comments	FIXED HEADS ALONG WEST SIDE OF BED									

Cecilliani Park

STATION DATA

Station (Zone) Number	A	B	C	D	E					
Plant Material Type										
Application Technology										
Observed Problems:										
Valve Malfunctions					X					
Low Pressure										
High Pressure	X									
Tilted Sprinklers										
Spray Deflection	X	X	X	X	X					
Sunken Sprinklers	X	X	X	X	X					
Plugged Equipment										
Arc Misalignment										
Lateral Line Drainage										
Leaky Seals or Fittings				X						
Lateral or Drip Line Leaks				X						
Missing or Broken Heads										
Slow Drainage or Ponding				X						
Compaction/Thatch/Runoff										
Notes and Comments				Both corners of tennis lane						

Hoyt Park

STATION DATA

Station (Zone) Number	A	B	C	D	E	F	G			
Plant Material Type										
Application Technology										
Observed Problems:										
Valve Malfunctions										
Low Pressure										
High Pressure										
Tilted Sprinklers										
Spray Deflection										
Sunken Sprinklers										
Plugged Equipment										
Arc Misalignment	X	X	X	X	X		X			
Lateral Line Drainage										
Leaky Seals or Fittings										
Lateral or Drip Line Leaks										
Missing or Broken Heads										
Slow Drainage or Ponding		X								
Compaction/Thatch/Runoff										
Notes and Comments			spray into horseshoe	spray into tennis						

RESULTS OF THE DATA ANALYSIS

After the field inspections and catch can test at each park site, the system performance is analyzed using the Cal Poly, SLO \ DWR landscape water management software. The system performance is described in terms of precipitation rate and distribution uniformity factor. The software estimates the precipitation rate and distribution uniformity factor from the irrigation system tests. The precipitation rate is how fast the irrigation water is being applied and the distribution uniformity factor is how evenly the irrigation water is being applied. The distribution uniformity factor ranking system is as follows:

	Excellent	Very Good	Good	Fair	Poor
Fixed spray	70	65	55	50	40
Rotor	75	70	65	60	50
Stream Rotor	85	80	75	65	55
Impact	75	70	65	60	50

Dr. Powers Park and Alden Park had combinations of rotor heads and impact heads. Alden Park also had fixed spray heads at station 9. Cecilliani Park had a mixture of various types of rotor heads. Hoyt Park had matched rotor heads. The following chart summarizes the precipitation rates in inches per hour and the uniformity factors for each station tested in each park. Please refer to the catch can chapter to cross reference the station label with the actual station number listed on the controller.

Dr. Powers Park Sub-group area	precipitation rate	uniformity factor	rating
1	.22	41%	poor
2	.10	10%	poor
3	.11	14%	poor
4	.20	26%	poor

Alden Park Station number			
1	.20	51%	poor - fair
2	.23	25%	poor
4	.28	30%	poor
5	.23	27%	poor
6	.31	25%	poor
7	.27	25%	poor
8	.41	46%	poor
9	.27	24%	poor

Cecilliani Park			
Sub-group area	precipitation rate	uniformity factor	rating
A	.57	51%	fair - poor
B	.55	57%	fair
C	.45	57%	fair
D	.76	54%	fair - poor
E	.50	54%	fair - poor
Hoyt Park			
Sub-group area			
A	.83	78%	excellent
B	.74	76%	excellent
C	.92	76%	excellent
D	.47	72%	very good
E	.31	72%	very good
F	.38	72%	very good
G	.40	72%	very good

All the sub-areas tested in Dr. Powers Park ranked in the poor performance category. All the stations in Alden Park ranked in the poor performance category. All the sub-areas tested in Cecilliani Park ranked in the poor to fair performance category. All the sub-areas tested in Hoyt Park ranked in the very good to excellent category. Hoyt Parks performance compared to the other parks tested is a dramatic example of how mismatched heads can really throw off the irrigation uniformity.

The landscape water management, LWM, software also generates an irrigation schedule that can be used as a guideline. However, because of the poor performance at Alden Park, Dr. Powers Park and Cecilliani Park the recommended irrigation schedule guidelines are out of scale with a realistic irrigation schedule. A replacement program should be the focus at these parks before recommended irrigation schedules can be developed. The recommended irrigation guidelines the software generates is expressed in minutes per station. The controllers at Cecilliani Park and Hoyt Park express irrigation in amount of water applied and expected flow. The technology of the controllers, used in these two parks, exceed the technology of the software's irrigation guidelines. Comparing water applied schedules to minutes of irrigation schedules is of no value.

The quantity of irrigation water used at each park and a recommended water allocation can be compared. The water management software and City of Tracy water use records were used to develop these comparisons. The water allocation of the LWM software is generated and based on local climate and square foot area irrigated. The reference evapotranspiration for the San Joaquin Valley was used to model the climate. The total park area was referenced from the water use records and includes irrigation, restroom and maintenance usage. The exempted areas were all non-porous areas such as concrete walkways, roofs, pools, parking lots and tennis courts. These areas were estimated from the park irrigation plans. The annual total volume of water allowed in 100 cubic foot units, ccf, was generated from the LWM software and is compared as follows:

Water Use Comparisons, ccf

Park	Water Allowance	Actual Water Records 2001	2002
Dr. Powers	12,658	6375	6830
Alden	4,276	NO WATER METER	
Cecilliani	12,580	8289	8721
Hoyt	5,938	13062	10932

Dr. Powers Park is using less water than a supplier might allocate. However, applying more irrigation water at this park will not improve the condition of the turf. The infrastructure problems should be addressed before a new irrigation schedule is developed. Cecilliani Park appears to be using water efficiently given its poor uniformity ratings. This park will use water even more efficiently as the maintenance staff continues to update the sprinkler heads. Although Hoyt Park received good marks on the uniformity of the irrigation system, the water use records exceed the possible water allowance. The allowance should be re-evaluated to determine if the allowance is adequate. This park could conserve more water. A good place to start would be to work at reducing the over spray where possible

RECOMMENDATIONS

Mismatched heads were a problem at 3 out of 4 parks. A sprinkler head replacement program is underway at a minimal scale already. The advantage of a program like this is that it improves uniformity at the problem parks with poor performance and maintenance of good uniformity at those parks that currently have a good uniformity. Recommended sprinkler head replacement types particular to each park should continue and should be documented and made clear to all park personnel. This should be packaged in an easy to access reference for park personnel as head replacement situations arise. Additionally, the antiquated systems at Dr. Powers Park and Alden Park should be completely replaced including new mainlines and booster pumps.

Sprinkler heads not rising high enough was a wide spread problem at all four parks. Also a variety of maintenance problems were discovered to varying degrees at each park. These included leaky seals on sprinkler heads, valve problems, broken sprinkler heads, sprinkler heads that did not rotate, misaligned sprinkler heads and perimeter sprinkler heads that rotated too far or not far enough. A regular park inspection program is in place and should continue. A regular park inspection program could use station data check lists similar to the ones used in this report. During each inspection, each station should be turned on and maintenance problems should be documented and later fixed during a repair program. However, vandalism, antiquated systems and compensation for prevailing winds impact performance.

Specific recommendations for some parks are as follows. Alden Park would benefit from a water meter so water use can be evaluated. Dr. Powers Park and Alden Park need to be

evaluated by an irrigation specialist. Two stations irrigating Dr. Powers park are insufficient. This park's irrigation system should be broken up into more stations than the two massive stations that currently operate. Both Dr. Powers Park and Alden Park could use entirely new irrigation systems in order to reduce water waste and improve turf conditions It was difficult to insert the catch can stakes into the soil at Dr. Powers Park and Alden Park. The soils are compacted in some areas of these two parks. Aerating the soils may help. Hoyt Parks sprinkler heads do not have head to head coverage. They shoot well past their neighboring station. Adjusting the set screw is generally not recommended because the spray is deflected in such a manner that uniformity is compromised. Many manufacturers make several nozzles of various sizes for each different type of sprinkler head. It may be possible to fit the heads at Hoyt Park with another nozzle to shorten the throw of the water spray to achieve over spray.

Continued use of all the programming features of the controllers at Dr. Powers Park and Alden Park is recommended. The Dr. Powers controller has 3 repeat cycles per day and the Alden Park controller has 6 repeat cycles per day. At the time of the audit, in September and October, this feature was not being used. All the parks would benefit from repeat cycles during irrigation because of the heavy clay soil's slow percolation rate. All the controllers have a skip day feature; however, the lawn areas in most parks are irrigated on several consecutive days. Samples of controller programs have been reviewed. The programming samples from the irrigation controllers are shown in the appendix. Eight of the eleven programming samples for Hoyt Park were lawn areas. Of the eight lawn samples, six showed the lawn areas of Hoyt Park being irrigated 5 days consecutively. Three of the four programming samples for August at Cecilliani Park irrigated 6 days consecutively. Cecilliani Park's January programming samples showed skip days. Alden Park irrigated 5 days consecutively and Dr. Powers Park irrigated 6 days consecutively. Good irrigation practice includes skip days. This reduces run off, gives the water a chance to percolate deeper into the soil and will develop a deeper root structure in the turf. A deeper root structure makes turf areas more able to with stand drought.

The computer controlled irrigation system used at Hoyt Park and Cecilliani Park provides maximum flexibility in programming. This system is evapotransporation (ET) based and theoretically replaces only that water which is used each day. This system should be expanded to Dr. Powers and Alden Park.

SOURCES

Landscape Water Management, Auditing; developed by Irrigation Training and Research Center, Cal Poly, SLO; funded by, Metropolitan Water District of Southern California and California Department of Water Resources, Water Conservation Office; copyright 2000.

Landscape Water Management Software, developed by Irrigation Training and Research Center, Cal Poly, SLO; funded by, Metropolitan Water District of Southern California and California Department of Water Resources, Water Conservation Office; copyright 2000.

Landscape Sprinkler Irrigation Design Tutorial, Jess Stryker; http://www.irrigationtutorials.com/sprinkler00.htm

City of Tracy, Urban Water Management Plan, December 2000, A00088.01

Appendix

Location: 1

Station #	Run time	Start times	M	Tu	W	Th	Fri.	Sat.	Sun.
1	10 min	12 AM	✓	✓			✓	✓	✓
2		2 AM							
3		4 AM							
4		10 PM							
5									
6									
7									
8									
9	10 min								
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									

Location 1

Station #	Run time	Start times	M	Tu	W	Th	Fri.	Sat.	Sun.
1	15 min	10:30 pm	✓	✓		✓	✓	✓	✓
2	15 min	11:45 pm							
3		12:45 Am							
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									

Date: Aug, 19 2002 Time: 01:19:59 PM ALARM PS 25
Field Unit Number: 1

Table of PROGRAMS

First Program Number of Group is 1

START TIME 23.00 11.00 pm STOP TIME . . CYCLES IN DAY 3 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y Y Y Y DAY INTERVAL	

PRG NR.	(Valve) Stations Lawn	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
1	2 3 7	1200 Ga	120.0 Gpm			23.00
2	8 11 12	1200 Ga	120.0 Gpm			.
3						.
4	28 36 29	1220 Ga	122.0 Gpm			23.00
5						.
6	44 45	1000 Ga	100.0 Gpm			.
7	47 48 46	1550 Ga	155.0 Gpm			.
8	49 50	950 Ga	95.0 Gpm			.
9	15 16	850 Ga	85.0 Gpm			.

Give name of irrigation station

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

Date: Aug, 19 2002 Time: 01:20:00 PM ALARM PS 25
Field Unit Number: 1

Table of PROGRAMS

First Program Number of Group is 4

START TIME 23.00 11.00 pm STOP TIME . . CYCLES IN DAY 3 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y Y Y Y DAY INTERVAL	

PRG NR.	(Valve) Stations Lawn	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
10	30S 35	90 Ga	95.0 Gpm			.
11						.
12	5 9 1	1150 Ga	115.0 Gpm			23.00
13						.
14	32S 33S	700 Ga	140.0 Gpm			.
15	10 17 18	960 Ga	96.4 Gpm			23.00
16						22.00
17	19 31S	Ga	33.3 Gpm			.
18						.

Give name of irrigation station

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

Date: Aug, 19 2002 Time: 01:23:54 PM ALARM PS 25
Field Unit Number: 1

Table of PROGRAMS

First Program Number of Group is 16

START TIME 22.00 10.00 pm STOP TIME . . CYCLES IN DAY 2 TIME INTER .	SU MO TU WE TH FR SAT DAY INTERVAL

	PRG NR.	(Valve) Stations	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	19						.
G	20	34 37	1350 Ga	135.0 Gpm			23.00
G	21	50 41	920 Ga	92.0 Gpm			21.50
	22						.
	23						.
G	24	26	770 Ga	77.7 Gpm			22.00
G	25	38	350 Ga	35.0 Gpm			22.00
G	26	40	620 Ga	82.3 Gpm			22.00
	27	39	300 Ga	90.5 Gpm			.

Give name of irrigation station

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll 1w E N

Date: Aug, 19 2002 Time: 01:23:55 PM ALARM PS 25
Field Unit Number: 1

Table of PROGRAMS

First Program Number of Group is 26

START TIME 22.00 10.00 pm STOP TIME . . CYCLES IN DAY 2 TIME INTER .	SU MO TU WE TH FR SAT Y Y Y Y Y Y DAY INTERVAL

	PRG NR.	(Valve) Stations	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	28	42	200 Ga	20.0 Gpm			.
	29	27	650 Ga	65.0 Gpm			.
	30						.
	31						.
G	32	6	150 Ga	. Gpm			23.00
	33						.
	34						.
	35						.
	36						.

Give name of irrigation station

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll 1w E N

Date: Jan, 22 2003 Time: 02:52:30 PM
Field Unit Number: 1Without Communication
Table of PROGRAMS Ceciliani Park
First Program Number of Group is 1

START TIME 23.00 11.00 pm STOP TIME . . CYCLES IN DAY 2 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y DAY INTERVAL	

PRG NR.	(Valve) Stations	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
1	2 3 7	1200 Ga	120.0 Gpm			23.00
2	8 11 12	600 Ga	120.0 Gpm			.
3						.
4	28 36 29	Ga	122.0 Gpm			23.00
5						.
6	44 45	1000 Ga	100.0 Gpm			.
7	47 48 46	Ga	155.0 Gpm			.
8	49 41	930 Ga	92.3 Gpm			.
9	15 16	Ga	85.0 Gpm			.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll 1w E N

ate: Jan, 22 2003 Time: 02:52:31 PM
Field Unit Number: 1Without Communication
Table of PROGRAMS
First Program Number of Group is 4

START TIME 23.00 11.00 pm STOP TIME . . CYCLES IN DAY 3 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y Y DAY INTERVAL	

PRG NR.	(Valve) Stations	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
10	30 35	450 Ga	87.5 Gpm			.
11						.
12	5 9 1	Ga	115.0 Gpm			23.00
13						.
14	32 33	Ga	140.0 Gpm			.
15	10 17 18	960 Ga	98.1 Gpm			23.00
16						22.00
17	19 31	Ga	33.3 Gpm			.
18						.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll 1w E N

Date: Jan, 22 2003 Time: 02:54:13 PM
Field Unit Number: 1Without Communication
Table of PROGRAMS
First Program Number of Group is 16

START TIME 22.00 10.00 pm STOP TIME . . CYCLES IN DAY 2 TIME INTER .	SU MO TU WE TH FR SAT DAY INTERVAL

	PRG NR.	(Valve) Stations	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	19						.
G	20	34 37	Ga	135.0 Gpm			23.00
G	21	50	Ga	. Gpm			21.50
	22						.
	23						.
G	24	26	770 Ga	77.7 Gpm			22.00
G	25	38	350 Ga	35.0 Gpm			22.00
G	26	40	620 Ga	82.3 Gpm			22.00
	27	39	300 Ga	90.5 Gpm			.

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Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll 1w E N

Date: Jan, 22 2003 Time: 02:54:17 PM
Field Unit Number: 1Without Communication
Table of PROGRAMS
First Program Number of Group is 26

START TIME 22.00 10.00 pm STOP TIME . . CYCLES IN DAY 2 TIME INTER .	SU MO TU WE TH FR SAT Y Y Y Y DAY INTERVAL

	PRG NR.	(Valve) Stations	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	28	42	200 Ga	20.0 Gpm			.
	29	27	650 Ga	65.0 Gpm			.
	30						.
	31						.
G	32	6	150 Ga	. Gpm			23.00
	33						.
	34						.
	35						.
	36						.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll 1w E N

Date: Aug, 19 2002 Time: 01:12:11 PM Irrigating
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 1

START TIME .02 12.02 am
STOP TIME . .
CYCLES IN DAY 4 TIME INTER .05

SU MO TU WE TH FR SAT
Y Y Y Y Y
DAY INTERVAL

PRG NR.	(Valve) Stations Lawn	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
1	3 5 9 61	1800 Ga	180.0 Gpm			.02
2	6 8 9 61	1800 Ga	180.0 Gpm			.
3	11 12 23 30 61	1100 Ga	184.0 Gpm			.
4	24 28 32 61	1960 Ga	196.1 Gpm			.
5	33 36 41 34 61	1760 Ga	176.4 Gpm			.
6	38 39 42 61	1680 Ga	168.0 Gpm			.
7	46 47 48 61	1580 Ga	158.4 Gpm			.
8	1 10 25 2 61	1920 Ga	192.4 Gpm			.
9	26 29 31 61	1920 Ga	192.0 Gpm			.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

ate: Aug, 19 2002 Time: 01:12:13 PM Irrigating
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 1

START TIME .02 12.02 am
STOP TIME . .
CYCLES IN DAY 4 TIME INTER .05

SU MO TU WE TH FR SAT
Y Y Y Y Y
DAY INTERVAL

PRG NR.	(Valve) Stations Lawn	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
10	43 44 45 61	1380 Ga	138.4 Gpm			.
11	14 16 18 20 61	1250 Ga	125.0 Gpm			.
12	19 21 35 61	1170 Ga	117.6 Gpm			.
13	15	730 Ga	73.6 Gpm			.
14	17 40	450 Ga	45.0 Gpm			.
15	52 53	580 Ga	29.0 Gpm			22.00
G 16	13 51	360 Ga	. Gpm			16.00
17	4 59 49	400 Ga	. Gpm			.
18	57	1000 Ga	. Gpm			.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

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Date Time Identification Duration Pages Type Result
08-14-02 09:40A 9957229 2 Sent OK

Date: Aug, 19 2002 Time: 01:17:18 PM Irrigating
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 16

START TIME 16.00 4.00 pm STOP TIME . . CYCLES IN DAY 2 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y DAY INTERVAL

	PRG NR.	(Valve) Stations shrubs	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	19	54 56	240 Ga	. Gpm			.
	20	58	250 Ga	. Gpm			.
	21	50 60	520 Ga	26.4 Gpm			.
G	22	7 37	1170 Ga	117.6 Gpm			22.00
G	23	16 18 20 61	Ga	90.0 Gpm			1.00
	24	55	310 Ga	31.0 Gpm			.
G	25	63	. Hr				9.00
G	26	64	.15 Hr				10.00
	27						.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

Date: Aug, 19 2002 Time: 01:17:19 PM Irrigating
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 28

START TIME .05 12.05 am STOP TIME . . CYCLES IN DAY 1 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y Y Y DAY INTERVAL

	PRG NR.	(Valve) Stations	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
G	28	4 24 61	1000 Ga	79.0 Gpm			.05
	29	25 26 61	1000 Ga	120.0 Gpm			.
	30	28 29 61	1000 Ga	124.5 Gpm			.
	31	9 10 11 61	1000 Ga	140.0 Gpm			.
	32	30 31 41 61	1000 Ga	. Gpm			.
	33						.
	34						.
	35						.
	36						.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E

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08-14-02 08:08A 919252843052 07:37 12 Sent OK

Date: Oct, 22 2002 Time: 09:16:28 AM
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 1

START TIME .02 12.02 am														
STOP TIME . .														
CYCLES IN DAY 1 TIME INTER .05														

SU	MO	TU	WE	TH	FR	SAT
		Y	Y	Y	Y	Y

DAY INTERVAL

	PRG NR.	(Valve) Stations Lawn					Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
G	1	3	5	9	61		1800 Ga	180.0 Gpm			.02
	2	6	8	9	61		1800 Ga	180.0 Gpm			.
	3	11	12	23	30	61	1800 Ga	184.0 Gpm			.
	4	24	28	32	61		1800 Ga	196.1 Gpm			.
	5	33	36	41	34	61	1800 Ga	176.4 Gpm			.
	6	38	39	42	61		1800 Ga	168.0 Gpm			.
	7	46	47	48	61		1800 Ga	158.4 Gpm			.
	8	1	10	25	2	61	Ga	192.4 Gpm			.
	9	26	29	31	61		Ga	192.0 Gpm			.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E

Date: Oct, 22 2002 Time: 09:16:30 AM
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 1

START TIME .02 12.02 am														
STOP TIME . .														
CYCLES IN DAY 1 TIME INTER .05														

SU	MO	TU	WE	TH	FR	SAT
		Y	Y	Y	Y	Y

DAY INTERVAL

	PRG NR.	(Valve) Stations Lawn					Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	10	43	44	45	61		1800 Ga	138.4 Gpm			.
	11	14	16	18	20	61	1800 Ga	125.0 Gpm			.
	12	19	21	35	61		1800 Ga	117.6 Gpm			.
	13	15					1000 Ga	73.6 Gpm			.
	14	17	40				450 Ga	45.0 Gpm			.
G	15	52	53				580 Ga	29.0 Gpm			22.00
G	16	13	51				360 Ga	. Gpm			16.00
	17	4	59	49			400 Ga	. Gpm			.
	18	57					1000 Ga	. Gpm			.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E

Date: Oct, 22 2002 Time: 09:18:34 AM
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 16

START TIME 16.00 4.00 pm STOP TIME . . CYCLES IN DAY 2 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y DAY INTERVAL

	PRG NR.	(Valve) Stations shrubs	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	19	54 56	240 Ga	. Gpm			.
	20	58	250 Ga	. Gpm			.
	21	50 60	520 Ga	26.4 Gpm			.
G	22	7 37	1170 Ga	117.6 Gpm			22.00
G	23	16 18 20 61	Ga	90.0 Gpm			1.00
	24	55	310 Ga	31.0 Gpm			.
G	25	63	. Hr				9.00
G	26	64	.15 Hr				11.30
	27						.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E

Date: Oct, 22 2002 Time: 09:18:36 AM
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 28

START TIME .05 12.05 am STOP TIME . . CYCLES IN DAY 1 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y Y Y DAY INTERVAL

	PRG NR.	(Valve) Stations Lawn	Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
G	28	4 24 61	1000 Ga	79.0 Gpm			.05
	29	25 26 61	1000 Ga	120.0 Gpm			.
	30	28 29 61	1000 Ga	124.5 Gpm			.
	31	9 10 11 61	1000 Ga	140.0 Gpm			.
	32	30 31 41 61	1000 Ga	. Gpm			.
	33						.
	34						.
	35						.
	36						.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E

Date: Sep, 10 2001 Time: 09:40:18 AM
Field Unit Number: 14

Table of PROGRAMS Hoyt Park

First Program Number of Group is 1

START TIME .02 12.02 am STOP TIME . . CYCLES IN DAY 2 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y Y DAY INTERVAL	

PRG NR.	(Valve) Stations Lawn					Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
1	3	5	9	61		2200 Ga	180.0 Gpm			.02
2	6	8	9	61		2200 Ga	180.0 Gpm			.
3	11	12	23	30	61	2200 Ga	184.0 Gpm			.
4	24	28	32	61		3920 Ga	196.1 Gpm			.
5	33	36	41	34	61	3520 Ga	176.4 Gpm			.
6	38	39	42	61		3360 Ga	168.0 Gpm			.
7	46	47	48	61		3160 Ga	158.4 Gpm			.
8	1	10	25	2	61	3840 Ga	192.4 Gpm			.
9	26	29	31	61		3840 Ga	192.0 Gpm			.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

Date: Sep, 10 2001 Time: 09:40:21 AM
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 1

START TIME .02 12.02 am STOP TIME . . CYCLES IN DAY 2 TIME INTER .05	SU MO TU WE TH FR SAT Y Y Y Y DAY INTERVAL	

PRG NR.	(Valve) Stations Lawn					Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
10	43	44	45	61		2760 Ga	138.4 Gpm			.
11	14	16	18	20	61	2000 Ga	125.0 Gpm			.
12	19	21	35	61		2340 Ga	117.6 Gpm			.
13	15					1460 Ga	73.6 Gpm			.
14	17	40				1040 Ga	45.0 Gpm			.
15	52	53				580 Ga	29.0 Gpm			22.00
16	13	51				360 Ga	. Gpm			16.00
17	4	59	49			400 Ga	. Gpm			.
18	57					1000 Ga	. Gpm			.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

Date: Sep, 10 2001 Time: 09:42:31 AM
Field Unit Number: 14

Table of PROGRAMS

First Program Number of Group is 16

START TIME 16.00 4.00 pm								SU	MO	TU	WE	TH	FR	SAT	
STOP TIME . .								Y			Y		Y		
CYCLES IN DAY 2 TIME INTER .05								DAY INTERVAL							

	PRG NR.	(Valve) Stations Shrubs				Water to Apply	Expected Flow	Fert to Apply	Water before Fert	Start Time
	19	54	56			240 Ga	. Gpm			.
	20	58				250 Ga	. Gpm			.
	21	50	60			520 Ga	26.4 Gpm			.
G	22	7	37			2300 Ga	117.6 Gpm			22.00
G	23	16	18	20	61	1200 Ga	90.0 Gpm			22.00
	24	55				620 Ga	31.0 Gpm			.
G	25	63				. Hr				9.00
G	26	64				.04 Hr				9.00
	27									.

Give number of schedule to display

Esc Main Menu F6 Program Status F8 Help F9 Up to Top PgUp/PgDn Scroll lw E N

Appendix M

Final Water Shortage Contingency Plan – City of Tracy
Kennedy/Jenks, 1992

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Final Report

Water Shortage Contingency Plan

City of Tracy

K/J 920501.00
February 1992

Kennedy/Jenks Consultants

Kennedy/Jenks Consultants

Engineers and Scientists

Marathon Plaza, Tenth Floor
303 Second Street
San Francisco, California 94107
415-243-2150
FAX 415-896-0999

19 February 1992

Mr. Kevin Tobeck
City of Tracy
520 Tracy Boulevard
Tracy, California 95376

Subject: Water Shortage Contingency Plan
Final Report
K/J 920501.00

Dear Mr. Tobeck:

Per our agreement, enclosed is the Final Water Shortage Contingency Plan prepared for the City of Tracy (City) by Kennedy/Jenks Consultants. This Plan has been developed and based on information and data obtained from you and other City staff. Because there were no public comments received on the Draft Plan, only the City's comments were incorporated into the Final Plan. The Final Plan was adopted by the City Council on 18 February 1992.

If you have any questions regarding this Final Plan, please call me at (415) 243-2452.

Very truly yours,

KENNEDY/JENKS CONSULTANTS, INC.

Elizabeth Teien

Elizabeth Teien, P.E.
Project Engineer

Enclosure

WSCPCVR.LTR/ET-1

WATER SHORTAGE CONTINGENCY PLAN

FINAL REPORT

Prepared for

The City of Tracy

Prepared by

Kennedy/Jenks Consultants
Marathon Plaza, 10th Floor
303 Second Street
San Francisco, CA 94107

February 1992

K/J 920501.00

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B	Tracy Municipal Code: Chapter 7-Water Management
C	Water Conservation Resolutions

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Under recent legislation Sections 10621 and 10631 of the California Water Code were adopted, requiring each California urban water supplier providing municipal water directly or indirectly to more than 3,000 customers, or supplying more than 3,000 acre-feet of water annually, to prepare, adopt and submit a Water Shortage Contingency Plan to the California Department of Water Resources (DWR) by 31 January 1992. The Water Shortage Contingency Plan is considered to be an amendment to the urban water suppliers' Urban Water Management Plan. Per the legislation, an urban water supplier that does not submit the Water Shortage Contingency Plan by the 31 January 1992 date will be ineligible to receive drought assistance from the State until the plan is adopted and submitted to the DWR.

1.2 AUTHORIZATION

In December 1991, the City of Tracy (City) authorized (through Purchase Order No. 3539) Kennedy/Jenks Consultants (K/J) to prepare the City Water Shortage Contingency Plan. The following chapters provide the information required by DWR for the Water Shortage Contingency Plan. The information contained herein is based on data obtained from City personnel and data included in Chapter 7 of the Tracy Municipal Code, which is included in Appendix B.

CHAPTER 2

PLAN COORDINATION

2.1 PLAN COORDINATION

Because the City of Tracy holds a contract with the Bureau of Reclamation for a fixed annual allotment of 10,000 acre-feet of surface water from the Central Valley Project (CVP) via the Delta Mendota Canal, development of the City's water conservation and rationing plan was coordinated with the Bureau of Reclamation. This coordination involved discussions regarding potential reductions in the amount of water delivered to the City in dry years. In these discussions, it was indicated that reductions of up to 75 percent of the City's allotment could occur. It was also indicated that in times of extreme hardship, the City may be able to obtain additional water from the CVP. For purposes of this plan, it has been assumed that the worst case supply from the CVP would be a 25 percent delivery (75 percent reduction).

This situation did in fact occur in 1991 when the City's CVP delivery was reduced to just 25 percent of its 10,000 acre-foot allotment (75 percent reduction); the City then applied for "hardship" water and then received an additional amount of water equal to 25 percent of its allotment (overall 50 percent reduction).

CHAPTER 3

CURRENT AND PROJECTED WATER DEMAND

3.1 CURRENT WATER DEMAND

The total water demand for both municipal and industrial uses in 1991 was approximately 9,810 acre-feet (af), or an average of 8.76 million gallons per day (mgd). In 1991, the lowest and highest daily water uses were 5 mgd on a winter day and 16 mgd on a summer day. Based on the City's meter records, municipal (residential and institutional) demand accounted for approximately 69 percent (6,770 af) of the total production, with the remaining 31 percent (3,040 af) divided among commercial and industrial users. A large portion of the water used by commercial and industrial users is used by the Heinz cannery which uses an estimated 5 mgd from July through October.

Water production has steadily increased since 1986 to meet increasing demands as shown in Table 1.

Table 1
Historic Water Production

Year	Total Water Production (af/yr)
1986	8,104
1987	8,262
1988	8,906
1989[1]	8,353
1990[1]	10,804
1991[1]	9,810

[1] Reflects water conservation measures.

The large increase in demand in 1990 was due to the amount of growth and construction activity in Tracy. However, the total demand in 1990 and 1991 is slightly lower than it would have been in a normal rainfall year, because it reflects conservation efforts during the drought.

Based on the total water demand in 1991 (9,810 af/yr) and an estimated total population of approximately 36,000, the per capita consumption rate is estimated to be approximately 0.27 acre-feet per capita per year (af/cap/yr), or approximately 243 gallons per capita per day (gpcd). When this total demand is adjusted to exclude industrial and commercial uses (approximately 3,040 af/yr), the municipal (residential and institutional) consumption rate is approximately 0.19 af/cap/yr, or 168 gpcd.

A per capita consumption rate of 0.308 af/cap/yr (275 gpcd) was used by the U.S. Bureau of Reclamation (USBR) to evaluate a recent request (1984/85 request for an increase of 15,000 af to the annual CVP allotment) from the City for additional water supply from the Central Valley Project. This rate was based on 1986 water production records and includes industrial and commercial use [Kennedy/Jenks Consultants, 1991].

3.2 PROJECTED WATER DEMAND

A recent planning study completed for the City projected that the City's population would increase to 87,000 by the year 2010. Using this projected annual growth rate (approximately 4.5 percent) and USBR's per capita consumption rate of 0.308 af/cap/yr, the projected water demands for 1992 through 1994 are shown in Table 2.

Table 2
Projected Water Demand

	Actual Demand (af/yr)	Projected Demand (af/yr)		
Year	1991	1992	1993	1994
Projected Population[1]	36,000	37,620	39,320	41,100
Municipal (Residential and Institutional)[2]	6,770	8,000	8,360	8,740
Commercial and Industrial	3,040	3,590	3,750	3,920
Total Water Demand[3]	9,810	11,590	12,110	12,660

1 Based on an estimated population of 87,000 in 2010.
2 Assuming that municipal demand is equal to 69 percent of total water demand. Based on 1990 data taken from meter records.
3 Based on a per capita consumption rate of 0.308 af/cap/yr.

CHAPTER 4

CURRENT AND PROJECTED WATER SUPPLY

4.1 CURRENT WATER SUPPLY

4.1.1 Imported Water

The City of Tracy holds a contract with the Bureau of Reclamation for a fixed allotment of 10,000 af/yr of surface water from the Central Valley Project via the Delta Mendota Canal, which is subject to reductions in dry years. Surface water in the Delta Mendota Canal originates from the Sacramento-San Joaquin Delta and is pumped into the Delta Mendota Canal from the Clifton Court Forebay. The City diverts water from the Delta Mendota Canal directly to its water treatment plant, where it is treated, stored and then released into the distribution system. The surface water drawn from the Delta Mendota Canal is of relatively good quality; it is low in hardness and total dissolved solids (TDS).

4.1.2 Groundwater

The City also operates ten wells which provide the City with groundwater. The production capabilities of the wells range from 500 to 2,500 gallons per minute for a total pumping capacity of approximately 17,500 gallons per minute (older wells require rehabilitation to achieve this pumping capacity). Five of the wells are new and are the City's primary wells. Two of the other five wells are in need of pump and casing rehabilitation.

The source of groundwater is primarily the lower section of the Tulare Formation, part of a regional aquifer system in the San Joaquin subregion of the Central Valley groundwater basin. The Tulare Formation is a water-bearing zone which occurs at a depth of approximately 300 to 700 feet below ground surface, and is confined by an extensive clay stratum known as the Corcoran Clay. Based on a recent groundwater yield study [Kennedy/Jenks/Chilton, 1990], the maximum recommended long-term annual groundwater extraction rate for the City was estimated to be approximately 6,000 af/yr. In general, groundwater in the Tracy area is not as good quality as surface water sources (such as the Delta Mendota Canal). The groundwater is very hard (hardness greater than 180 milligrams per liter, mg/L) and contains high concentrations of TDS (750 to 800 mg/L) and sulfates.

Based on 1991 production data, groundwater wells supplied approximately 49 percent of the total demand in 1991 and the remainder was supplied by treated surface water diversions from the Delta Mendota Canal.

In the past, the City has relied on surface water from the CVP for 70 to 80 percent of its supply when it was available because of its higher quality. During 1988 and

1989, the City was in the process of upgrading the water treatment plant and pumped an increased amount of groundwater. In addition, the City's Delta Mendota allotment has been reduced in recent years (1990 reduction 50 percent; 1991 reduction 75 percent with 25 percent hardship, overall reduction 50 percent), due to the ongoing drought conditions and corresponding curtailment of surface water deliveries, and it has had to rely much more on groundwater as shown in Table 3.

Table 3
Historic Water Supply

Year	Water Supply (acre-feet)		
	Central Valley Project via Delta Mendota Canal	Groundwater	Total
1986	5,954	2,150	8,104
1987	6,421	1,841	8,262
1988	5,936	2,970	8,906
1989	3,565	4,788	8,353
1990	4,967	5,837	10,804
1991[1]	4,995	4,815	9,810

[1] In 1991, the City's deliveries were limited to 50 percent of allotment (75 percent reduction with 25 percent hardship).

4.2 PROJECTED WATER SUPPLY

As mentioned in Chapter 2, deliveries to the City from the Central Valley Project (CVP) water could be reduced by up to 75 percent during drought periods. In fact, in 1991 the City's delivery was reduced by 75 percent; however, the City received 25 percent in hardship relief which results in an overall reduction in deliveries of 50 percent. To make up for the reduced CVP deliveries, even with aggressive conservation activities, the City has had to rely more on its groundwater supplies. However, for the period from 15 June to 15 September each year, the City is highly dependent on CVP water for canning purposes due to the high TDS concentrations in the groundwater.

The current water supply and projected worst case water supply, assuming that CVP deliveries will be reduced by 75 percent, is presented in Table 4.

Table 4
Projected Worst Case Water Supply

Source	Contractual Amount (af/yr)	Actual Supply (af/yr)	Projected Worst Case Supply (af/yr)		
		1991	1992	1993	1994
Central Valley Project	10,000	4,995	2,500[3]	2,500[3]	2,500[3]
Groundwater	6,000[1]	4,815	6,000[1]	6,000[1]	6,000[1]
Total	16,000	9,810	8,500	8,500	8,500
Supply Shortage[2]			3,090	3,610	4,160
Percent Supply Shortage[2]		0 %	27 %	30 %	33 %

1 Recommended long-term annual groundwater extraction rate.
2 As compared with projected demand (see Table 2).
3 75 percent reduction in CVP annual allotment.

The City has also planned for the case where the CVP deliveries are cut off entirely. This emergency situation could occur if service via the Delta Mendota Canal was interrupted due to damage or required long-term maintenance. The projected emergency conditions water supply is presented in Table 4A.

Table 4A
Projected Emergency Conditions Water Supply

Source	Contractual Amount (af/yr)	Actual Supply (af/yr)	Projected Emergency Conditions Supply (af/yr)		
		1991	1992	1993	1994
Central Valley Project	10,000	4,995	0[3]	0[3]	0[3]
Groundwater	6,000[1]	4,815	6,000[1]	6,000[1]	6,000[1]
Total	16,000	9,810	6,000	6,000	6,000
Supply Shortage[2]			5,590	6,110	6,660
Percent Supply Shortage[2]		0 %	48 %	50 %	53 %

1 Recommended long-term annual groundwater extraction rate (annual extraction rate can be increased for short-term periods in the case of emergency conditions).
2 As compared with projected demand (see Table 2).
3 100 percent reduction in CVP annual allotment.

CHAPTER 5

WATER CONSERVATION AND RATIONING PLAN

5.1 STAGES OF ACTION

The City has established a five-stage water conservation and rationing plan to provide for an effective means to manage the local water supply necessary for public health, safety, fire protection and recreational needs. The five stages are summarized in Table 5.

Table 5
Stages of Action

Phase	City-Wide Reduction Goal	Type of Program
Phase I	None established	Voluntary Water Conservation
Phase II	10 percent	Mandatory Restrictions
Phase III	15 percent	Voluntary Reductions and Mandatory Restrictions
Phase IV	25 percent or more	Voluntary Reductions and Mandatory Restrictions
Phase V	Eliminate all uses not related to public health, safety and fire protection needs	Mandatory Restrictions

With the enactment of Chapter 7 of the Tracy Municipal Code, Phase I is automatically implemented. Phases II through IV have been established to achieve subsequent reduction goals in potable water consumption as deemed necessary due to drought conditions or other prolonged water emergencies. Phase V has been established for emergency conditions to eliminate water uses not related to maintaining public health, safety and fire protection needs.

5.2 TRIGGER MECHANISMS

Phase I of the five-stage plan was implemented by the adoption of Chapter 7 of the the Tracy Municipal Code (the Water Management Ordinance). Per Article 5,

"Enactment of [Chapter 7 of the Tracy Municipal Code] shall cause the present implementation of Phase I voluntary conservation."

According to City personnel, one trigger mechanism associated with Phases II, III, IV and V relates to the percent reduction in Central Valley Project water deliveries as shown in Table 6.

Table 6
Trigger Mechanisms

Phase	Percent Reduction in Central Valley Project Deliveries	CVP Deliveries[1] (af/yr)	Ground-water Supply[2] (af/yr)	Total Available Supply[3] (af/yr)	Percent Reduction in Overall Supply[4]
Phase II	25 %	7,500	6,000	13,500	15 %
Phase III	50 %	5,000	6,000	11,000	31 %
Phase IV	75 %	2,500	6,000	8,500	47 %
Phase V	100 %	0	6,000	6,000	62 %

1 Based on contractual amount of 10,000 af/yr.
2 Assumes 6,000 af/yr of groundwater is available during each phase.
3 Central Valley Project deliveries plus groundwater supply.
4 As compared with optimum available amount of 16,000 af/yr (Central Valley Project plus groundwater supplies).

It should be noted that although the percent reduction in overall supply is up to 62 percent, the actual worst case water shortage for 1994 is only 33 percent (53 percent under emergency conditions). This is because the projected demands for 1994 do not require the optimum available quantity of water (10,000 acre-feet of CVP water and 6,000 acre-feet of groundwater). Therefore, under non-emergency water shortage conditions, Phase IV of the City's water conservation and rationing plan is adequate for the projected water shortage. Under emergency conditions ("water emergency" is defined in Tracy City Code Section 11-7.102(b)), as demands approach the optimum available amount and if reductions in CVP deliveries continue, Phase V of the water conservation and rationing plan may need to be implemented.

In accordance with the Chapter 7 of the Tracy Municipal Code, water conservation and rationing plan phase changes are implemented by resolution following a public hearing. Phase changes may occur as a result of either a drought or water emergency declaration by the City Council. The City Council may then direct the

City Manager to implement appropriate water conservation and/or rationing requirements.

With Phase I of the plan already implemented, a drought declaration can be made at any time. Trigger mechanisms associated with a drought declaration are as follows:

- A cutback (25 percent or greater) of available surface water supplies obtained from the Central Valley Project occurs;
- A drought is declared by the Governor of California covering the water sources used by the City, and subsequent reductions of water supplied to the City will occur or are likely to occur;
- Any unusual situation or circumstance (natural disaster, contamination) which affects the quantity or quality of the water supply occurs.

A water emergency can be declared if Phase IV reductions and restrictions are not adequate to maintain water supplies for public health, safety and fire protection. Trigger mechanisms associated with a water emergency declaration are as follows:

- A significant decrease in the ability to pump groundwater due to well contamination, well failure or other equipment or system failure, and no alternative source of water is available;
- Contamination of the water system;
- Natural disasters affecting water deliveries;
- Times of floods which would affect water quality;
- Sabotage or threats of sabotage against the water system;
- Any unusual situation or circumstance which affects the quantity or quality of the water supply.

CHAPTER 6

MANDATORY PROHIBITIONS AND PENALTIES

6.1 PROHIBITIONS AND RESTRICTIONS

The voluntary and mandatory restrictions associated with each of the five conservation and rationing stages discussed in Chapter 5 are summarized in Table 7.

Table 7
Mandatory Restrictions

Phase	Restrictions

Phase I	• No flagrant waste or excessive runoff of water
	• Practice prudent water conservation measures at all times including:
	  • Maintenance of plumbing/irrigation systems (repair all controllable leaks within 72 hours)
	  • Use hand-held sprayer with "trigger" handle
	  • Installation of drought tolerant landscapes and water-efficient irrigation systems
	  • Water in evening hours during nonwindy periods

Phase II	All provisions of Phase I apply, with the following modifications and additions:
	• Provided no unreasonable runoff, landscapes may be irrigated as follows:
	  • Person irrigating must be present and in control of water usage
	  • Unattended between 7:00 pm and 9:00 am (May through September)
	  • Unattended between 4:00 pm and 10:00 am (October through April)
	  • At any time if drip or bubbler irrigation is used
	• Washing of commercial sidewalks, driveways, gas stations, parking lots and other outdoor surfaces is discouraged
	• The addition of water above the minimum level necessary to comply with health or operational requirements for pools, hot tubs or jacuzzi circulation is discouraged
	• No restrictions with respect to reclaimed water use

Phase III	All provisions of Phase I and II apply, with the following modifications and additions: • Irrigation only allowed during certain hours on certain days of the week during nonwindy periods • Washing of commercial sidewalks, driveways, gas stations, parking lots and other outdoor surfaces is prohibited (except on Friday)(except for hazardous materials spills). Use of a bucket is not prohibited at any time • No restaurant may serve water except upon customer request • Hotels, motels, inns, and short-term commercial lodging shall post notice of drought conditions in every guest room • New pools, hot tubs and spas shall have a separation tank and water recovery system installed in the filter backwash system. Floating pool covers required.

Phase IV	All provisions of Phases I, II and III apply, with the following modifications and additions: • Car washing only allowed with a bucket • Auto and RV dealerships can wash vehicles with hose and "trigger" nozzle (only on Fridays or the day before or the day of delivery to purchaser) • No restrictions on laundromats • No restrictions on car washes with water recycling equipment • Facilities with restrooms shall post in each restroom notice of drought condition
Phase V	All provisions of Phases I, II, III and IV apply, with the City Council mandating specific restrictions which may include: • All water uses not required for public health, safety and fire protection are prohibited • No irrigation uses allowed • No recreational water uses allowed

A detailed discussion of the restrictions is provided in Chapter 7, Article 6 of the Tracy Municipal Code (see Appendix B).

Article 6 of the Tracy Municipal Code also sets forth several other prohibitions and restrictions including the following:

- **Temporary water service:** The Public Works Director may suspend the issuance of water permits for such temporary uses such as construction works, when alternative non-potable sources are acceptable and are available.

- **Drawing water from fire hydrants:** No person, other than fire department personnel and City personnel, shall open any fire hydrant or attempt to draw water from a fire hydrant without a permit obtained from the City and approved by the Director of Public Works.

- **Use of fresh water for construction purposes:** The use of fresh water for dust control or other construction purposes shall be prohibited during a declared drought or water emergency when an alternative approved water source is available.

The Tracy Municipal Code also states that further restrictions and/or prohibitions on water use and service may become necessary and that all applicants for water service are subject to all further prohibitions, restrictions, rules and regulations.

6.2 PENALTIES

6.2.1 Rate Structure

The City has adopted two variable rate block structures (one for periods when water conservation is necessary and one for periods when water conservation is no longer necessary). Each rate structure contains both winter and summer consumption ranges. The block rates in dollars per one hundred cubic feet (Ccf) are summarized in Table 8.

Table 8
Rate Structure

Block	Winter Consumption Range (Ccf) (November-April)	Summer Consumption Range (Ccf) (May-October)	Block Rate ($/Ccf)	
			With Conservation	Without Conservation
Block 1	0-12	0-18	$0.60	$0.45
Block 2	13-19	19-29	$0.90	$0.70
Block 3	20-191	30-287	$1.00	$0.80
Block 4	192-10,000	288-15,000	$1.10	$0.90
Block 5[1]	Over 10,000	Over 15,000	$0.45	$0.35

[1] Established for high water users.

Also associated with these rate structures, is a proposed water conservation surcharge for excessive water consumption if voluntary conservation is not sufficient to achieve the City's goals. The water conservation surcharge of $3.00 per Ccf used would be applied when a customer's monthly consumption exceeds prior year seasonal average consumption (i.e. November through April for the winter average and May through October for the summer average). These surcharges would only apply to monthly consumption in excess of 12 Ccf in the winter and 18 Ccf in the summer. This provision minimizes the impact of the surcharge on customers which had previously reduced their water consumption.

6.2.2 Fines

If any of the specific restrictions included within Chapter 7 of the Tracy Municipal Code are violated, the following fines (as described in Chapter 7, Article 3 of the Tracy Municipal Code) shall be assessed:

First violation	$0.00
Second violation	$50.00
Third violation	$100.00
Fourth violation	$200.00

The fourth violation also results in the installation of a meter service flow restrictor at the customer's expense which shall remain in place for the remainder of the drought or water emergency period. Failure to pay the assessed fines will result in termination of service until all fines and reconnection charges are collected.

The following specific violations are not excused from fine or penalty for the first violation:

- Drawing water from a fire hydrant without a valid permit issued by the Public Works Director: Penalty $100.00
- Drawing water from a fire hydrant when a source of reclaimed water is available and is required: Penalty $100.00
- Constructing a bypass around a meter: Penalty $500.00

Excessive violations may also result in termination of service.

CHAPTER 7

REVENUE AND EXPENDITURES ANALYSIS

7.1 PROJECTED REVENUES AND EXPENDITURES

The revenue and expenditures analyses which follow are based on the projected water sales shown in Table 9 for each of the stages of the City's water conservation and rationing plan. The following analyses utilize a base water sales amount of 10,804 af/yr, based on 1990 sales data.

Table 9
Projected Water Sales

Water Conservation and Rationing Plan Phase	Actual 1990	Phase II 10 % Reduction	Phase III 15 % Reduction	Phase IV 25 % Reduction
Projected Water Sales (af/yr)	10,804	9,724	9,183	8,103

A complete Water Revenue and Rate Analysis was prepared for the City in 1991 by Kennedy/Jenks/Chilton. The following information is based on data contained in Kennedy/Jenks/Chilton's final report [Kennedy/Jenks/Chilton, 1991]. The City water department's revenues and expenditures and the projected fiscal impacts of reduced sales due to water conservation and rationing are shown in Table 10.

Table 10
Revenues and Expenditures without Rate Increases

	Actual 1990	Phase II 10 % Reduction	Phase III 15 % Reduction	Phase IV 25 % Reduction
Operating Revenues: Water Sales	$3,150,175	$3,224,872	$3,203,692	$3,053,377
Operating Expenses:				
Purchased Water	$134,010	$100,474	$85,877	$56,739
Maintenance & Operation	$1,968,678	$1,968,678	$1,968,678	$1,968,678
Administration	$173,540	$173,540	$173,540	$173,540
Depreciation	$842,058	$842,058	$842,058	$842,058
Total Operating Expenses	$3,118,286	$3,084,750	$3,070,153	$3,041,015
Surplus or (Deficiency)	$31,890	$140,123	$133,538	$12,362

To offset the financial impact of water conservation and rationing, rate increases are frequently imposed to increase revenues. As discussed in Chapter 6, the City has adopted two different rate structures (one for times without conservation and one for times with conservation). The impacts of the various stages of water conservation and rationing on the City's revenues and expenditures with a rate increase (36 percent increase on variable cost per Ccf and a 25 percent increase on the fixed monthly charge per connection) are shown in Table 11. Other rate scenarios will be reviewed and adopted by the City pending water supply and demand in conjunction with conservation measures.

Table 11
Revenues and Expenditures with Rate Increases

	Actual 1990	Phase II 10 % Reduction	Phase III 15 % Reduction	Phase IV 25 % Reduction
Operating Revenues: Water Sales	$3,150,175	$4,303,851	$4,263,618	$4,047,294
Operating Expenses:				
Purchased Water	$134,010	$100,474	$85,877	$56,739
Maintenance & Operation	$1,968,678	$1,968,678	$1,968,678	$1,968,678
Administration	$173,540	$173,540	$173,540	$173,540
Depreciation	$842,058	$842,058	$842,058	$842,058
Total Operating Expenses	$3,118,286	$3,084,750	$3,070,153	$3,041,015
Surplus or (Deficiency)	$31,890	$1,219,102	$1,193,465	$1,006,279

CHAPTER 8

WATER USE MONITORING PROCEDURES

8.1 MONITORING PROCEDURES

Water use in the City is monitored in three ways:

1. Imported water deliveries from the Delta Mendota Canal are recorded at the City water treatment plant.

2. Daily readings of City of Tracy well production, in gallons, are taken by City of Tracy personnel and summarized on a monthly basis.

3. All of the City's connections are metered and are monitored monthly.

CHAPTER 9

IMPLEMENTATION OF THE PLAN

9.1 ADOPTION OF THE PLAN

The City adopted a Resolution Adopting the Water Shortage Contingency Plan (see Appendix A).

9.2 PLAN ADOPTION STANDARDS

Kennedy/Jenks Consultants prepared this Water Shortage Contingency Plan for the City of Tracy during January 1992. The Plan was adopted on 18 February 1992 and submitted to the Department of Water Resources on 21 February 1992. The Plan includes all the information necessary to meet the requirements of subdivision (e) of the California Water Code Section 10631.

Public meetings and the availability of copies of the Draft Water Shortage Contingency Plan were properly noticed in the City's newspapers. Copies of the Draft Plan were available for public review at City offices and the Public Library. The City held one public meeting on the Water Shortage Contingency Plan.

REFERENCES

Kennedy/Jenks/Chilton, November 1990, "Final Report, Tracy Area Groundwater Yield Evaluation," City of Tracy.

Kennedy/Jenks/Chilton, April 1991, "Final Report, Water Revenue and Rate Analysis," City of Tracy.

Kennedy/Jenks Consultants, April 1991 (revised June 1991), "Existing Conditions Report - Water, Wastewater and Storm Drainage Utilities: Tracy Urban Growth Management Plan," The Planning Center and the City of Tracy.

Tracy Municipal Code, Chapter 7, Water Management.

APPENDIX A

RESOLUTION ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN

RESOLUTION NO. 92-032

WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, Under recent legislation, Sections 10621 and 10631 of the California Water Code were adopted, requiring each California urban water supplier providing municipal water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre feet of water annually to prepare, adopt and submit a Water Shortage Contingency Plan to the California Department of Water Resources, and

WHEREAS, The Water Shortage Contingency Plan is considered to be an amendment to the City's Urban Water Management Plan, and

WHEREAS, The Water Shortage Contingency Plan was prepared by Kennedy Jenks of San Francisco in close coordination with City staff;

NOW, THEREFORE, BE IT RESOLVED That the City Council of the City of Tracy does hereby approve the City's Water Shortage Contingency Plan and authorize the City Manager to file this Plan with the California Department of Water Resources.

****

The foregoing Resolution No. 92-032 was passed and adopted by the Tracy City Council on the 18th day of February, 1992, by the following vote:

AYES: COUNCIL MEMBERS: BILBREY, IVES, MATTHEWS, POMBO, BLAND

NOES: COUNCIL MEMBERS: NONE

ABSENT: COUNCIL MEMBERS: NONE

MAYOR

ATTEST:

DEPUTY CITY CLERK

02-0210.92z
PW

THE FOREGOING DOCUMENT IS CERTIFIED TO BE A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE.
BETTY J. DANI
CITY CLERK, CITY OF TRACY
BY: Sharon Smith, Deputy
DATED: Feb 20, 1992

Appendix N

Excerpts from: *City of Tracy Water System Emergency Response Plan*
West Yost, 2003

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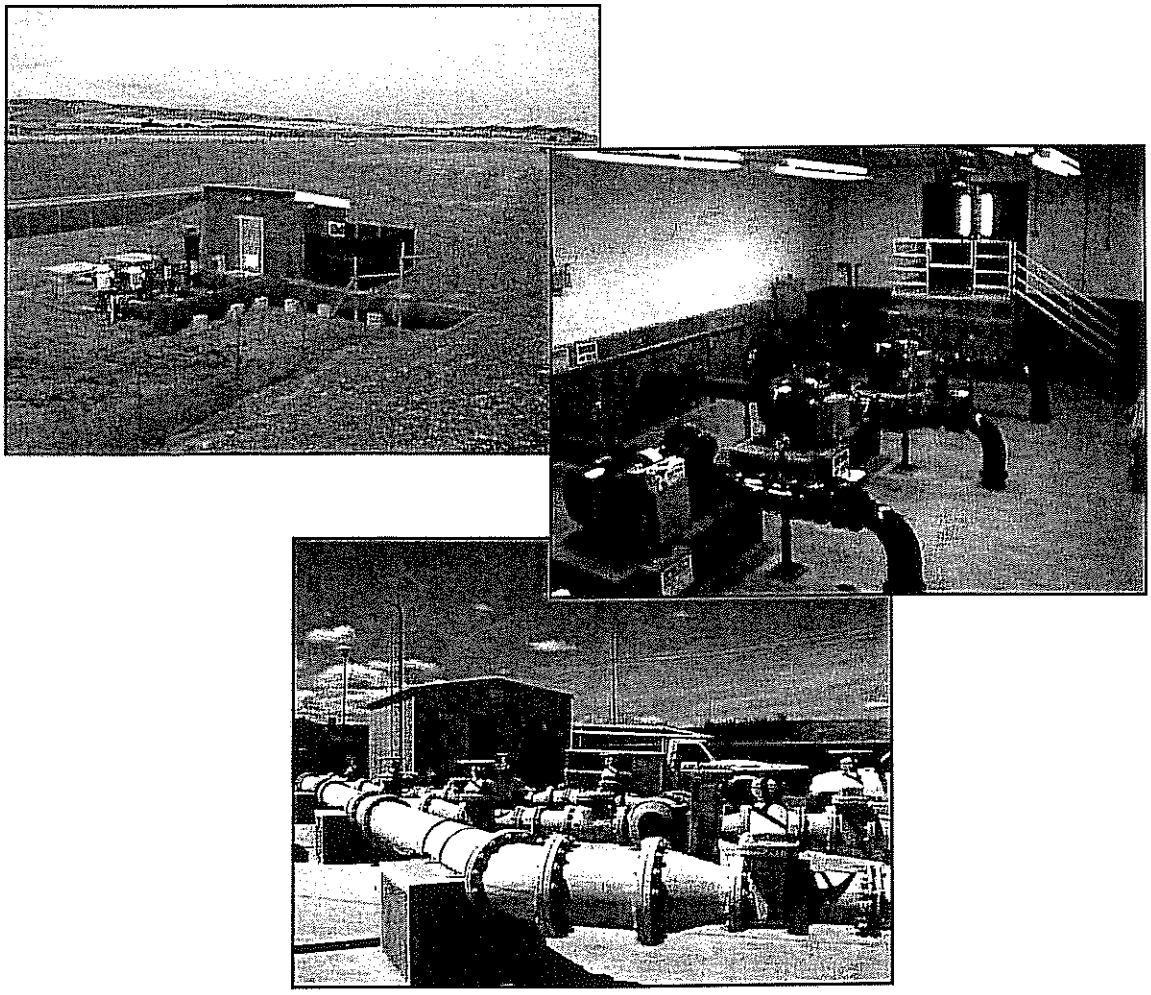
City of Tracy

Water System Emergency Response Plan



Prepared by
West Yost & Associates

June 2004

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Compliance with SEMS

The City's Emergency Plan and Emergency Management Organization is consistent with the Standardized Emergency Management System (SEMS). This Water System ERP is also consistent with SEMS. All local government agencies must use SEMS in multi-jurisdictional or multi-agency emergency responses to be eligible for state reimbursement of response-related costs.

SEMS defines a standard organization with accompanying roles and responsibilities to be used by public agencies in the field and in the Emergency Operations Center (EOC) whenever as emergency requires response from multiple agencies. SEMS utilizes the Incident Command System (ICS), which was originally developed by the fire service for managing emergency response to wildland fires.

The five organizational levels of SEMS are defined in Figure 1. Figure 2 shows the California OES regions. The City is located in OES Inland Region IV.

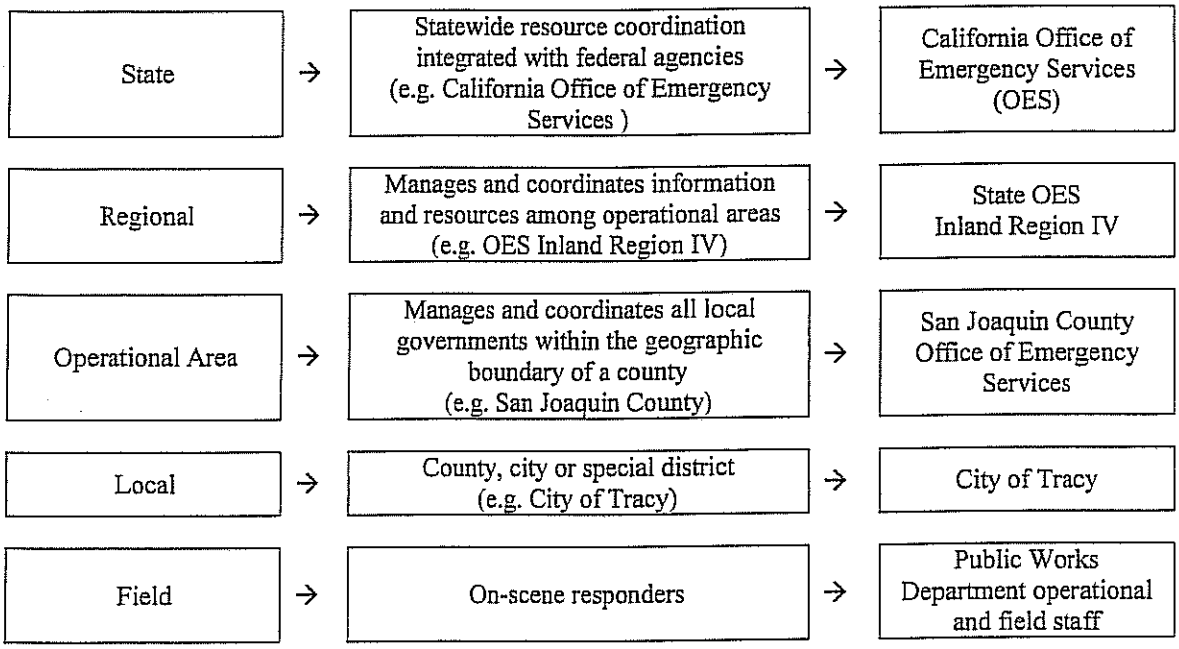


Figure 1. SEMS Organizational Levels

Emergency Categories

Four response categories have been defined for the Public Works Department to provide a common method of describing the type of event, area affected and extent of coordination or assistance needed. These response categories are described in Table 6.

Table 6. Public Works Department Emergency Response Categories

Emergency Response Category	Types of Emergencies	Examples of Possible Emergencies	Agencies Involved
Category 0: Readiness/ Routine Response	On-going response to daily emergency situations	▪ Minor pipe breaks/leaks ▪ Water supply/quality alerts from DMC ▪ Equipment malfunction at City facility	▪ Public Works staff
Category 1: Local Emergency	Situation confined to one location within the City service area and not adversely affecting local services, populations or traffic. Public Works staff may require assistance from another local agency.	▪ Single pipeline break ▪ Single pump station out of service ▪ Localized hazardous materials spills ▪ Localized power outage ▪ Water supply alert from the Bureau requiring the City to shut off supply from DMC for a short amount of time	▪ City Manager, Public Works Director and staff ▪ County hazardous materials response team ▪ PG&E
Category 2: Local Disaster	Situation affecting multiple local services, populations and geographic areas. Coordination is necessary between several local agencies.	▪ Major transmission pipeline break or failure of a storage reservoir ▪ Landslide ▪ Localized fire ▪ Localized flooding ▪ Large hazardous material spill ▪ Widespread power outage ▪ Water supply alert from the Bureau requiring the City to shut off supply from DMC for an extended amount of time	▪ City Manager, Public Works Director and staff ▪ Local fire department ▪ Local police ▪ Highway patrol ▪ County OES ▪ PG&E
Category 3: Major Disaster	Regional disaster involving widespread damage to structures and disruption of services	▪ Major earthquake with widespread damage to water system ▪ Multiple pipeline breaks ▪ Long-term loss of water supply from DMC	▪ City Manager, Public Works Director and staff ▪ Local, County and State agencies

PLAN ACTIVATION

Definition

This plan will be activated to the extent required by the nature and scope of the emergency. This activation process, including plan triggers, staff responsibilities, mutual aid or assistance availability and damage assessment, is covered in this section.

Triggers/Criteria

As described earlier (Table 6), four emergency categories have been defined for the City's Public Works Department. Responses must be coordinated in accordance with these categories. A summary of response categories, potential triggers and potential response actions are listed in Table 9. During an emergency, changing conditions (including water demand, storage and supply) must be closely monitored in order to assess the impact of the emergency on water system operations and customers and the need for additional response actions.

Table 9. Response Categories, Triggers and Potential Response Actions

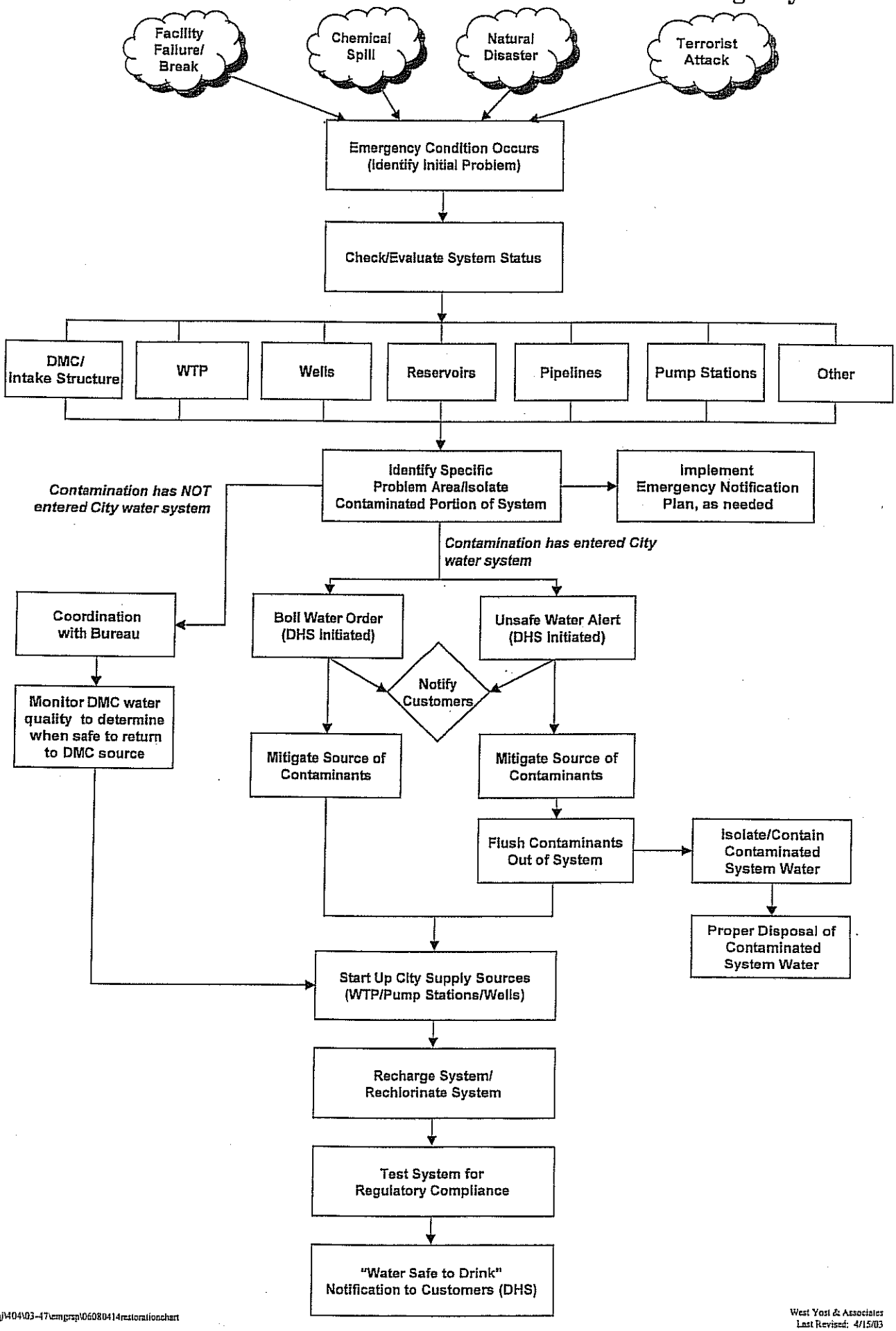
Emergency Response Category	Potential Response Triggers	Potential Response Actions
Category 0: Readiness/ Routine Response	▪ Minor pipe breaks/leaks ▪ Equipment malfunction at a water facility ▪ Water supply/quality alerts from DMC	▪ Assess outage duration and determine if additional supplies or reduced demand is necessary. ▪ Assess and repair problem ▪ If possible, fill and maintain storage reservoirs at full in case water supply issue is escalated ▪ Coordinate with SLDMWA to stay informed on water supply status ▪ Remain alert and ready for potential escalation of water supply problem
Category 1: Local Emergency	▪ Single pipeline break/pipeline split ▪ Single pump station out of service ▪ Localized hazardous materials spills ▪ Localized or short-term power outage ▪ Water supply/quality alert from SLDMWA requiring City to shut off supply from DMC for a short amount of time ▪ Potential impact to private property	▪ Assess outage duration and determine if additional supplies or reduced demand is necessary. ▪ Assess and repair problem ▪ Notify impacted homeowners as necessary ▪ Closely monitor water demands and storage levels ▪ Relocate/utilize emergency generators as needed ▪ Contact County hazardous materials response team as needed ▪ Contact PG&E as needed ▪ Coordinate with SLDMWA to stay informed on water supply status from DMC

Emergency Response Category	Potential Response Triggers	Potential Response Actions
Category 2: Local Disaster	▪ Major transmission pipeline break or failure of a storage reservoir ▪ Landslide ▪ Localized fire ▪ Localized flooding ▪ Large hazardous material spill ▪ Widespread or long-term power outage ▪ Water supply/quality alert from SLDMWA requiring City to shut off supply from DMC for an extended amount of time	▪ Assess outage duration and determine if additional supplies or reduced demand is necessary. ▪ Assess damage and develop and implement a prioritized plan for repairs ▪ Closely monitor storage levels in reservoirs still operational ▪ Relocate/utilize emergency generators as needed ▪ Notify customers of supply outage/interruption, as necessary ▪ Coordinate with local fire and law enforcement, as necessary ▪ Coordinate with County OES ▪ Coordinate with SLDMWA to stay informed on water supply status from DMC
Category 3: Major Disaster	▪ Major earthquake with widespread damage to water system ▪ Multiple pipeline breaks ▪ Major fire ▪ Long-term loss of water supply from DMC	▪ Activate EOC ▪ Assess outage duration and determine if additional supplies or reduced demand is necessary. ▪ Notify customers of supply outage ▪ Stop delivery of potable water to customers (or issue Boil Water Order or Unsafe Water Alert), as necessary ▪ Notify County OES ▪ Notify DHS ▪ Assess damage to City water facilities and establish priorities for repairs ▪ Coordinate with SLDMWA to stay informed on water supply/quality status from DMC ▪ Closely monitor storage levels in any reservoirs still operational ▪ Track all emergency expenditures for possible reimbursement

Staff Recall

City Public Works staff resources are limited and most Public Works employees work normal business hours, Monday through Friday. Only the John Jones Water Treatment Plant and the Wastewater Treatment Plant have personnel on-site 24 hours per day, seven days a week. During normal business hours, Public Works staff maintains communications via cell phones, pagers and vehicle radios. If an incident occurs in the field or at one of City's water system facilities during normal business hours, the first person at the emergency scene automatically becomes the Incident Commander until other Public Works personnel or appropriate authorities replace him/her. During off-hours, field personnel are on-call and are reachable via pager or cell phone in the case of an emergency.

Table 10. Deactivation Triggers and Potential Deactivation Actions

Emergency Response Category	Potential Deactivation Triggers	Potential Deactivation Actions
Category 3: Major Disaster	▪ DMC supply has been partially restored ▪ Major pipeline breaks have been repaired ▪ Primary wells, pump stations and reservoir are operational	▪ Deactivate EOC ▪ Notify customers ▪ Notify County OES ▪ Notify DHS ▪ Start disinfection of transmission mains and purge system of all non-potable water ▪ Start to operate water system in a normal operating mode
Category 2: Local Disaster	▪ Demands can now be met utilizing normal flows from DMC ▪ Suppressed local fire or hazardous materials release ▪ Pipelines/storage tanks have been repaired ▪ Power has been restored ▪ SLDMWA advises that DMC supply has been restored	▪ Stop use of emergency generators ▪ Notify customers/agencies that operations are returning to normal
Category 1: Local Emergency	▪ Repair work has been completed by Public Works personnel ▪ SLDMWA advises that DMC is operating normally	▪ Perform testing to ensure that systems are operating normally ▪ Inform all involved that operations are back to normal
Category 0: Readiness/ Routine Response	▪ Repair work or testing has been completed by Public Works personnel ▪ SLDMWA advises that water supply alert is over	▪ Advise all that operations are back to normal

City of Tracy
Plan for Restoration of Water Service After an Emergency