APPENDIX F

WATER SUPPLY ASSESSMENT

PUBLIC WORKS
DEPARTMENT
ENGINEERING
DIVISION

Memo

To: Erica Durrer

From: Keith Conarroe

CC: Mark Houghton, Frederic Clark, Phil Govea, Mark McCovy

Date: December 7, 2009

Re: Austin Road Business Park Water Supply Assessment/Verification

Introduction

This memorandum presents the water supply assessment and verification for the Austin Road Business Park Development. A water supply assessment and a water supply verification are required to comply with water supply planning requirements of the California Water Code and Government Code. Water supply assessments and verifications are similar but different documents required for developments that exceed 500 dwelling units. As the conditions and requirements similar this document will serve as both the Water Supply Assessment and Water Supply Verification for the development. The Austin Road Business Park Development includes 2,358 single-family residences and 1,840 multifamily residences (See Attachment 1).

The water supply assessment evaluates the ability of the City of Manteca to meet the water supply demand associated with the proposed land uses of the Austin Road Business Park Development. The water supply assessment was prepared in accordance with requirements of Section 10910, et seq, of the Water Code, which requires a water supply assessment as part of the environmental review process for new development projects

California Government Code Section 66473.7 requires completion of a water supply verification for approval of a residential project Tentative Map. The water supply verification documents the availability of a sufficient supply of water to serve the project.

Much of the information required in the Water supply Assessment and Water supply verification is included in the City of Manteca 2005 Urban Water Management Plan. Additional information is contained in the City of Manteca Water Master Plan. Both documents have been used in the completion of this water supply assessment and verification.

Summary Findings

The findings of the water supply evaluation are that the City has a sufficient supply of groundwater and surface water to serve the proposed development. However, without water system improvements the development's peak hour demand of 5,134 gallons per minute will exceed the water systems peak hour distribution capacity. To mitigate this, the project will have to construct peaking facilities such as tanks, booster pumps, or wells sufficient to increase the systems overall peak distribution capacity by 5,134 gallons per minute. The peak capacity can be provided by any suitable combination of these facilities. Extension of existing water mains will also be required to convey water to the development and provide connections for other developments. The water system improvements required for the Austin Road Business Park Development water supply will be funded by the developer.

Water Demand

The Austin Road Business Park water demand consists of potable and landscape irrigation demands. The estimated peak-hour demand plus a 15 percent redundancy for the development is 5,134 gallons per minute. The water will be supplied by the City of Manteca water system.

The water demand is based on a gross residential demand of 0.474 gallons per minute per single family dwelling unit and 0.258 gallons per minute for multi family dwelling unit. The gross demand is based on the City of Manteca's historical per capita water demand of 214 gallons per day and includes commercial and industrial demand. The use of the gross demand in the residential water supply planning allocates water for commercial, institutional and industrial uses serve the community. A peak to average demand ratio of 2.8 is applied to the average demand to determine the peak hour demand. The peak hour demand is increased by 15 percent for water supply reliability. Table 1 provides a summary of the Austin Road Business Park Development water demand.

Table 1

Austin Road Business Park Development Water Demand

Dwelling Type	Average Day Demand, GPD	Maximum Day Demand, GPD	Peak Hour Demand, GPM
Multi Family	789,428	1,578,857	1,535
Single Family	1,850914	3,701,829	3,599
Total	2,640,342	5,280,686	5,134

Water Supply Assessment Requirements

The water supply assessment evaluates the water demand of the proposed development and the sufficiency of the water supply for the next 20 years for the demands of the project, existing users and other future users in normal, single and multiple dry year conditions. The evaluation must document the quantity of water available from existing and future water sources during the 20 year planning period. Where groundwater is used, a description of the aquifer must be provided along with the information on regarding overdraft of the basin aquifer. The governing body must also approve the water supply assessment.

The water supply assessment requirements are discussed further below. Most of the information required in the water supply assessment is included in the City of Manteca 2005 Urban Water Management Plan and Water Master Plan. Copies of the City of Manteca 2005 Urban Water Management Plan and the Water Master Plan are available for review at the City of Manteca Public Works office.

Water Supply Verification Requirements

The California Government Code requires a written water supply verification that finds there is or will be a sufficient water supply during single and multiple dry years within a 20 year planning period to meet the water demand projected for the development in addition to the existing and planned future uses. The water supply verification must consider the following:

- Historical record of at least 20 years
- Urban Water Shortage Contingency Analysis
- Supply Reduction for specific use sectors per supplier's resolution, ordinance or contract
- Amount of water that can be reasonably relied upon from specified water supply projects

The information required in the water supply verification is discussed further below. The City of Manteca 2005 Urban Water Management Plan and Water Master Plan contain most of the information required in the water supply verification. A copy of the 2005 Urban Water Management Plan and Water Master Plan is available at the City of Manteca Public Works office.

Water Supply Sufficiency

There is sufficient water available from the existing and planned water sources for the Austin Road Business Park Development. The sources of water are existing and

future groundwater supplies from the City, and surface water from the South San Joaquin Irrigation District. These water sources in combination with water conservation and development of reclaimed water use will result in a sufficient water supply for the Austin Road Business Park Development along with other residential, commercial and industrial developments in the City. The water supply planning are discussed in the City's 2005 Urban Water Management Plan and are summarized below.

Water Supply Planning

The City of Manteca 2005 Water Master Plan and the 2005 Urban Water Management Plan document the City's water supply planning. The City limits the number of new residential sewer connections to 3.9 percent per year. A lower growth rate for water demand of 3.4 percent is used in both the 2005 Water Master Plan and the 2005 Urban Water Management Plan to project future water demand. Both the 2005 Water Master Plan and 2005 Urban Water Management Plan include local groundwater and the South County Surface Water Supply Project as sources of water for the City of Manteca.

The 2005 Urban Water Management Plan was adopted in December of 2005. The 2005 Urban Water Management Plan includes water supply and demand comparisons through 2030 assuming the 3.4% growth in water demand. During the planning period water is supplied by groundwater from City wells and surface water from the South County Water Supply Project. The 2005 Urban Water Management Plan also contains the single and multiple dry year water demand-supply comparisons and the water supply shortage contingency planning. The water supply and demand comparisons from the 2005 Urban Water Management Plan are included in Attachment 2. The water supply – demand comparison in Table 9 of the Urban Water Management plan shows that the water demand will exceed projected supply by 1,145 acre feet in the year 2030 or 3.3 percent without conservation. The increase in future water supply is provided by the planned increase in surface water deliveries and drilling of new wells to meet water demands. Conservation and the implementation of reclaimed water use during the planning period will reduce potable water demand such that the water supply will exceed demand by 2030. A 20 percent State mandated water conservation is expected to reduce demand by 6,900 acre feet in 2030. Reclaimed water use above the currently planned 2,300 acre-feet in 2030 can provide an additional reduction in potable water demand in Manteca.

The water supply planning in the 2005 Urban Water Management Plan and Water Master Plan consider increased water demand for future developments such as the Austin Road Business Park.

Groundwater Supply. The City of Manteca draws groundwater from the Eastern San Joaquin County Groundwater Basin (ESJCGB), which is a sub basin of the San Joaquin Valley Groundwater Basin. The California Department of Water Resources identified the ESJCGB as a basin in a state of overdraft in DWR Bulletin 160-98. The

basin is described in the 2005 Urban Water Management Plan and is included in Attachment 2.

The agricultural, municipal and industrial groundwater extraction in Eastern San Joaquin Groundwater Basin is estimated at 867,600 acre-feet per year in the Eastern San Joaquin Groundwater Basin Groundwater Management Plan. The estimate is based on land use and reported groundwater pumping. Land use information is used to estimate groundwater extraction where groundwater pumping is not reported. The estimated basin overdraft is 150,700 acre-feet per year.

Modeling conducted for the Eastern San Joaquin Groundwater Basins Groundwater Management Plan showed a continued decline in groundwater levels and loss of aquifer storage at the estimated basin overdraft. The Integrated Regional Management Plan for the groundwater basin was developed and adopted in 2007 presented a water management strategy and course of action to implement an integrated conjunctive use program to manage and restore the groundwater resource in the basin.

The 2005 Water Master Plan includes the construction of 11 new wells in its capital improvement plan. These wells provide water for future developments. The City of Manteca will limit groundwater extraction to the safe aquifer yield of 1 acre ft per acre per year by the use of surface water from the South County Water Supply Project.

Existing wells and new wells will be constructed to support future growth. The developers are required to fund construction of new wells and other water distribution system improvements to provide water to their development. The wells and water distribution system become part of the City water system. Anticipated maximum groundwater extraction of 13,790 acre-feet per year is expected to be reached by 2027 based on projected city growth and the City's Primary Urban Service Area (PUSA) of 13,790 acres as defined in the City's General Plan. City growth beyond the PUSA will allow greater groundwater extraction.

Agricultural and some industrial water users located in the Manteca planning area also use locally produced groundwater. Agricultural water use is expected to decline as Manteca's residential development is displacing the local agriculture. The net impact on agricultural water supply is neutral, as agricultural and residential water use on an annual basis is similar. Industrial users should benefit from Manteca's conjunctive water use as the groundwater extraction is reduced to the safe aquifer yield.

Surface Water. The City of Manteca, along with the Cities of Escalon, Lathrop and Tracy contracted with the South San Joaquin Irrigation District in 1995 for treated surface water. The contract entitles the City to 11,500 acre-ft of surface water per year in Phase1 and 18,500 acre-ft of surface water in Phase 2. Construction of the

water treatment plant and transmission lines were completed in 2005. Surface water deliveries began in July of 2005.

The surface water deliveries are scheduled to increase until full capacity of 18,500 acre feet per year is reached. The project is planned in two phases. Phase 1 provides up to 11,500 acre feet through 2010. Phase 2 would be constructed after 2010 and would provide up to 18,500 acre feet by 2027. Timing of Phase 2 will be depend on the water demand in each of the participating cities. At present Phase 2 has not been designed or funded and is not required for the Austin Road Business Park Development.

Reclaimed Water. The Urban Water Management Plan and includes reclaimed water in future water planning. Reclaimed water requires construction of tertiary filters and disinfection facilities to meet Title 22 Reclamation Criteria. A reclaimed water distribution system is also required. Recent NPDES disposal and treatment requirements require the construction of tertiary filters and disinfection facilities. The treatment requirements make the use of reclaimed water for landscape irrigation feasible in some areas of the City but actual use is limited due to the lack of a reclaimed water distribution system. At present, reclaimed water is available for construction sites and is planned for irrigation of the Big League Dream sports complex. Additional landscape irrigation with reclaimed water is anticipated in the future and is projected reach 2,300 acre feet per year by 2030. The use of reclaimed water for landscape irrigation will reduce the City's water demand and help extend the available water supply.

The use of reclaimed water in the Austin Road Business Park Development is not currently planned but may be available in the future. Development planning should include the installation of separate non-potable water line (purple pipe) for public landscape and park irrigation using non-potable water. The public landscape and park irrigation requirements should be provided by non-potable irrigation well or wells. The non-potable irrigation wells will be funded by the developer. The landscape and park irrigation systems can be converted to reclaimed water if it becomes available in the area.

Groundwater Management. The San Joaquin County Flood Control and Water Conservation District adopted a groundwater management plan for San Joaquin County in 2004, which includes much of the ESJCGB. The City of Manteca participated in the development of the groundwater management plan. A major objective of the groundwater management plan is to stabilize the groundwater level in the central and eastern portions of the basin.

The City of Manteca plans to manage its groundwater use to meet the safe aquifer yield for the area, which has been estimated at 1 acre-ft/acre/year. Historically, Manteca has been extracting groundwater at a rate of 2.4 acre-ft/acre/year. Both the Water Master Plan and the Urban Water Management Plan recognize the overdraft

in the basin. To reduce Manteca's overdraft, the City obtained surface water from the South County Water Supply Project in the 2005. The City began reducing its groundwater extraction to the safe aquifer yield when the surface water became available.

Water Supply Reliability. Water supply reliability is addressed in the Urban Water Management Plan. In past droughts, the groundwater supply has been very reliable. Groundwater levels have dropped during severe droughts but recovered in subsequent years. However, there has been a long-term drop in groundwater levels (approximately 4 feet since 1964) in the Manteca area. The drop in groundwater is due to both the local groundwater pumping and the severe overdraft in the central and eastern portions of the groundwater basin. The combined effort of Manteca to reduce groundwater overdraft and the San Joaquin County Groundwater Management Plan should help maintain the historical reliability of Manteca's groundwater. The City's water supply history from 1960 through 2008 is included in Table 2.

The South San Joaquin Irrigation District supplies surface water to the South County Water Project from Stanislaus River and has pre-1914 water rights to this water source. With the construction of New Melones Reservoir, the SSJID entitlement was negotiated with the DWR to 300,000 acre-ft per year. The entitlement is subject to reductions when the New Melones inflow is less than 600,000 acre-feet. An examination of the inflows between 1922 and 2000 indicated that SSJID would have received its full allocation of 300,000 acre-ft in all but 16 years during this period. The severity of possible reductions was estimated by examining the three lowest inflow years of 1977, 1924 and 1988, which would have reduced SSJID's location by 37, 24 and 23 percent, respectively. Conservation and increased groundwater development can sustain reductions of this order. Based on SSJID water rights and minimal reductions in past low flow years, the surface water supply is considered a reliable source. Manteca plans to construct additional groundwater wells to maintain full water supply with a 50% reduction in surface water supply. The Long term overdraft of the basin groundwater poses a water supply reliability threat from the intrusion of saline water. Surface water supplies will enable groundwater pumping to be reduced the in Manteca area and reduce the intrusion of saline water into the area.

Changes in water quality standards have the potential to reduce available groundwater available to the City. The Federal Maximum Contaminant Level (MCL) for arsenic was lowered from 50 ug/l to 10 ug/l in 2001. The State of California is also evaluating the arsenic MCL, which could be lower than the Federal MCL. The revised arsenic MCL became effective in 2006. Eleven of the City wells exceed the revised Federal arsenic MCL, with concentrations ranging from 12 to 19 ug/l. Manteca has installed arsenic treatment at five wells and plans to install arsenic treatment at the remaining six wells by August of 2010.

Table 2
City of Manteca Water Production History

		Developed Area	Total City Area	Annual Groundwater Use		Annual Surface Water Use		Annual Average Day Use
Year	Population	Acres	Acres	AF	MG	AF	MG	MGD
1960	8242	1117	1176	2,277	742			2.03
1961	8662	1225	1289	2,486	810			2.22
1962	9350	1272	1339	2,575	839			2.30
1963	10175	1338	1408	2,225	725			1.99
1964	10700	1338	1408	2,461	802			2.20
1965	11200	1467	1544	2,467	804			2.20
1966	12000	1540	1621	2,777	905			2.48
1967	12550	1540	1621	2,547	830			2.27
1968	12950	1747	1839	2,802	913			2.50
1969	13500	1831	1927	3,004	979			2.68
1970	13824	1831	1927	3,115	1,015			2.78
1971	14600	1976	2196	3,225	1,051			2.88
1972	15650	2068	2298	3,710	1,209			3.31
1973	16350	2377	2641	3,646	1,188			3.25
1974	17050	2414	2682	3,621	1,180			3.23
1975	17750	2466	2835	3,901	1,271			3.48
1976	18000	2519	2964	4,478	1,459			4.00
1977	18400	2884	3475	3,830	1,248			3.42
1978	20107	3014	3676	4,619	1,505			4.12
1979	21600	3046	3807	5,472	1,783			4.88
1980	23150	3169	4063	5,785	1,885			5.16
1981	25641	3187	4086	6,485	2,113			5.79
1982	27009	3316	4251	6,319	2,059			5.64
1983	27891	3316	4251	6,604	2,152			5.90
1984	29027	3344	4287	8,124	2,647			7.25
1985	32545	3353	4299	8,621	2,809			7.70
1986	35437	3968	5087	9,099	2,965			8.12
1987	37125	4238	5433	9,437	3,075			8.42
1988	38220	4253	5453	8,881	2,894			7.93
1989	39664	4253	5453	10,124	3,299			9.04
1990	40733	4300	6320	9,873	3,217			8.81
1991	41632	4350	6533	8,940	2,913			7.98
1992	42147	4400	6912	9,695	3,159			8.65
1993	43469	4450	6951	10,272	3,347			9.17
1994	44236	4525	7288	10,290	3,353			9.19
1995	44111	4600	7372	10,631	3,464			9.49
1996	44961	4725	9504	11,014	3,589			9.83
1997	45930	4850	9713	11,939	3,890			10.66
1998	47111	4985	9939	10,545	3,436			9.41
1999	49255	5411	10126	12,273	3,999			10.96
2000	51655	5837	10126	12,608	4,108			11.25
2001	55288	6126	10216	12,975	4,228			11.58
2002	57526	6415	10269	13,515	4,404			12.06
2003	60176	6704	10269	14,450	4,708			12.90
2004	61809	6993	10322	14,930	4,865			13.33
2005**	63389	7281	10975	11,275	3,674	3,667	1,194.8	13.34
2006	64488	8393	10975	8,062	2,627	6,739	2,195.8	13.21
2007	66123	8393	11211	9,119	2,971	6,364	2,073.5	13.82
2008	67754	8426	11318	8,557	2,788	6,884	2,243.1	13.78

**Surface water delivery began in 2005

Nitrate in local groundwater also has the potential to reduce the amount of groundwater available to the City. Three City wells exceeded the nitrate MCL in 2006. The affected wells were shut down until the elevated nitrate problem was resolved. Well modifications were completed at two wells in 2008 and restored 3,500 gpm of the lost production capacity. A water blending project will be completed in 2010 that will restore an additional 1,100 gpm of lost production capacity. There was a loss of 500 gpm in well capacity due to the sealing of strata with the high nitrate concentrations in Well 24.

Conclusion

The City of Manteca's water supply is sufficient for the Austin Road Business Park Development but water distribution system improvements are necessary to supply the peak hour water demand 5,134 gallons per minute to the development. Surface water in combination with existing and planned groundwater supplies will provide potable water for the development. The specific water distribution improvements for the development will be identified during the tentative map review and approval process.

To reduce the reliance on the potable water system, non-potable water lines should be installed for public landscape and park irrigation. A non-potable landscape irrigation well is required to for the public landscape and park irrigation. The public landscaping should be converted to reclaimed water if it becomes available. Conversion of park irrigation to reclaimed water will be evaluated and implemented if deemed acceptable.

The City is addressing issues that may affect the reliability of its potable water supply, which include the lower arsenic MCL and nitrate contamination. Additional information on Manteca's water supply planning is available in the 2005 Water Master Plan and the 2005 Urban Water Management Plan.