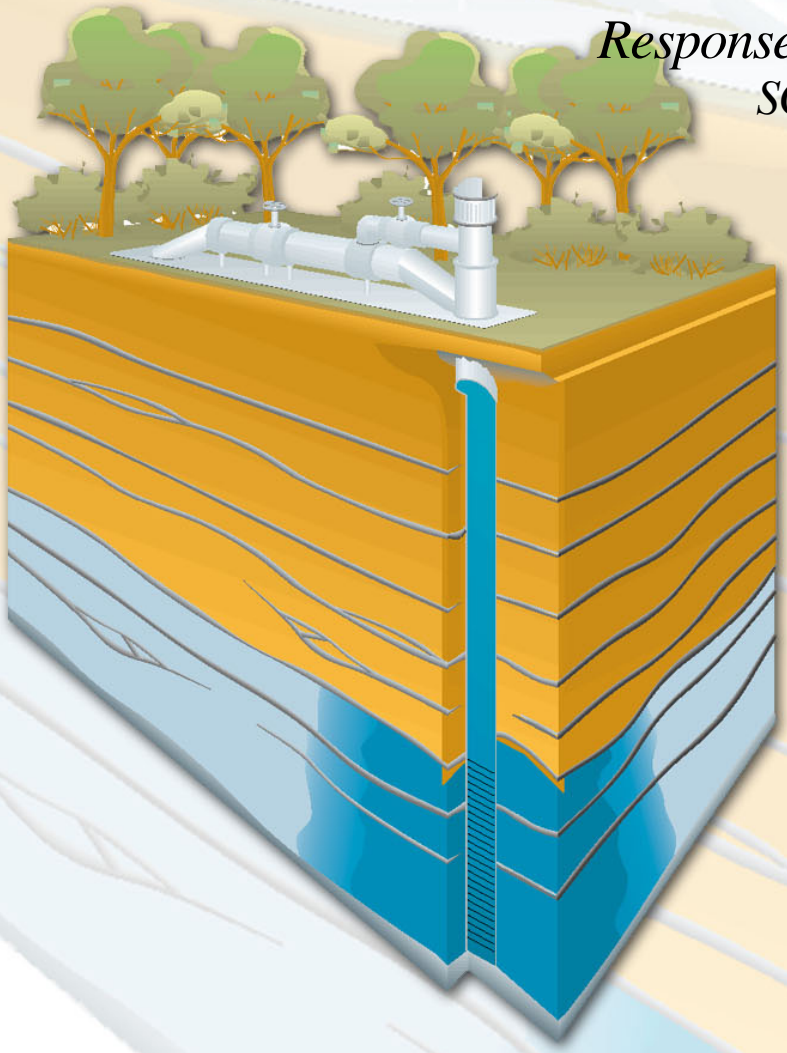
ZONE 7 WATER AGENCY
WELL MASTER PLAN

Final EIR
Responses to Comments
SCH: 2002032163

July 2005



ESA Environmental Science Associates

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Prepared for

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NOTICE OF AVAILABILITY
Zone 7 Water Agency Well Master Plan
Final Environmental Impact Report

In accordance with the California Environmental Quality Act (CEQA: Public Resources Code, Section 21000 et seq.), the Zone 7 Water Agency has prepared a Response to Comments Addendum, Final Environmental Impact Report (EIR) to respond to comments received by Zone 7 on the Well Master Plan Draft EIR (State Clearinghouse No. 2002032163). The Draft EIR was circulated for a 45-day review period which closed on May 28, 2004. The Response to Comments Addendum, in combination with the Draft EIR, constitutes the Final EIR. In accordance with the California Environmental Quality Act (CEQA: Public Resources Code, Section 21000 et seq.) this Final EIR has been made available to the public for a minimum 10-day period, and copies have been forwarded to the individuals and agencies providing written comment.

The Final EIR includes written responses to the comments received during the public review period. Zone 7 will consider certification of the Final EIR, adoption of Findings and Mitigation Monitoring and Reporting Plan (MMRP), and approval of the Well Master Plan, as part of its regularly scheduled Board meeting beginning at 7:00 pm on August 17, 2005 (see address for Zone 7 Water Agency Administration Building below). If you have any questions or comments regarding the information presented in this letter, or would like a copy of the Final EIR, please feel free to contact: Matt Katen, Zone 7 Water Agency, (925) 454-5071.

The Draft EIR and Final EIR are also available online at http://www.zone7water.com.

Additionally, copies of the Final EIR have been distributed to the following public libraries:

Zone 7 Water Agency
Administration Building
100 North Canyons Parkway
Livermore, CA

City of Pleasanton Library
400 Old Bernal Avenue
Pleasanton, California

City of Livermore Library
100 S. Livermore Avenue
Livermore, California

City of San Ramon Library
100 Montgomery Street
San Ramon, California

City of Dublin Library
7606 Amador Valley Blvd.
Dublin, California

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CHAPTER 1.0
INTRODUCTION

This Final Program Environmental Impact Report (Final EIR) has been prepared to respond to comments received by Zone 7 Water Agency (Zone 7) on the Draft Environmental Impact Report (Draft EIR) for the *Well Master Plan* (State Clearinghouse No. 2002032163, April 2004). An Environmental Impact Report (EIR) is an informational document prepared by a Lead Agency, in this case, Zone 7, that provides environmental analysis for public review and for agency decision-makers to consider before taking discretionary actions related to any proposed project that could have a significant effect on the environment.

Before the Zone 7 Board of Directors may approve the Proposed Project, it must certify that the Final EIR: a) has been completed in compliance with CEQA; b) was presented to the Board who reviewed and considered it prior to approving the project, and; c) reflects the Board's independent judgment and analysis.

CEQA Guidelines specify that the Final EIR shall consist of the following:

- the Draft EIR or a revision of that draft;
- comments and recommendations received on the Draft EIR;
- a list of persons, organizations, and public agencies commenting on the Draft EIR;
- the response of the Lead Agency to significant environmental points raised in the review and consultation process; and
- any other information added by the Lead Agency.

This Response to Comments Addendum to the Draft EIR for the *Well Master Plan* presents:

- a list of persons, organizations, and public agencies commenting on the Draft EIR (Table of Contents and Chapter 1);
- the written comments received on the Draft EIR along with a response to each comment (Chapters 2), and
- text revisions to the Draft EIR (Chapter 3).

The Response to Comments Document, in combination with the Draft EIR, completes the Final EIR.

1.1 COMMENTS ON THE DRAFT EIR AND RESPONSES TO COMMENTS

The Draft EIR was circulated for public review from April 12 through May 28, 2004. During this period, Zone 7 held a Public Hearing to provide interested persons with an opportunity to comment orally or in writing on the Draft EIR and the project. The Public Hearing was held at the Zone 7 Administrative Offices on May 13, 2004.

Agencies, organizations, businesses, and individuals that submitted written and oral comments on the Draft EIR during the public review and comment period are listed in Table 1-1. Table 1-2, located at the end of this chapter, provides the author of each comment letter, the author's affiliation, a letter designation of each author's comments, and a brief summary of each comment is provided. The comments and responses themselves are presented in Chapter 2, in the order of the listing in Table 1-1. Responses are keyed to the written comments received as indicated in the right margin of the comment letter.

TABLE 1-1
PERSONS, ORGANIZATIONS, AND PUBLIC AGENCIES COMMENTING IN WRITING

Commenter No.	Comments Received from	COM mentor's Affiliation	Date
A	Terry Roberts	State Clearinghouse	May 27, 2004
B	Tom Pico	City of Pleasanton	May 28, 2004
C	David K. Behrens	Dublin San Ramon Services District	May 26, 2004
D	Pamela Lung. P.E.	City of Livermore	May 26, 2004
E	Steven Hunte	Alameda County Public Works	May 11, 2004
F	Michael Carlin	San Francisco PUC	May 28, 2004
G	Lori H. Schectel	SFPUC Water Supply & Treatment	May 28, 2004
H	Margaret J. Tracy	Resident	May 28, 2004

1.2 CORRECTIONS AND ADDITIONS TO THE DRAFT EIR

In general, revisions of the Draft EIR are developed in response to comments received during the review process. However, the EIR authors also made text revisions to update information presented in the DEIR and to provide minor corrections and revisions in order to improve writing clarity and grammar. These revisions are presented in Chapter 3, and are organized by the Chapter and page number as they appear in the Draft EIR. Additions, deletions and corrections to the Draft EIR are made by indicating the page, and paragraph to be revised and a description of the text changes. Additions are indicated by a double underline, deletions are indicated by a "strike-out" where practical. For example, in the following sentence the numerical "two" is replaced by "to":

To~~Two~~ improve readability and minimize redundancy in response, the comments are organized generally by type of agency.

1.3 PUBLIC PARTICIPATION PROCESS

Interactions with the public have included a public scoping meeting held on April 24, 2002, and a public hearing held on May 13, 2004. Additionally, two Retailer Workshops were held during preparation of administrative draft, and periodic updates were provided at Zone 7 Board of Director meetings. During these meetings and presentations, Zone 7 staff and its engineering and environmental consultants provided information about the project, the potential environmental impacts, the CEQA review process, and the schedule for project implementation. At each meeting/hearing, members of the public had the opportunity to ask questions and express their concerns and interests for the project. The Notice of Preparation and the Notice of Availability were each distributed to affected public agencies, elected officials, community groups, and other interested parties.

TABLE 1-2
COMMENT LETTER SUMMARY

Date	Commenter	Affiliation	Comment No.	Comment/Topic
State Agencies				
5/27/04	**Terry Roberts**	**State Clearinghouse**	A-1	Draft EIR circulated, no comments received.
Regional Agencies				
NONE				
City, County and Local Agencies				
5/28/04	**Tom Pico**	**City of Pleasanton**	B-1	The purpose statement should be revised due to incompleteness and inaccuracies
			B-2	The final EIR must include mitigation projects for impacts to water quality to take the place of the committed Aquifer Storage and Recovery (ASR) well mitigation within the Water Supply Planning Program (WSPP) EIR.
			B-3	Include a statement that these new wells are needed to serve existing, new daily average day usage, and peak demands on the Zone 7 treated water system.
			B-4	The DEIR is inadequate in its analysis of the impacts to delivered water quality and to groundwater quality demands; during all different hydrological periods, when the SBA is shut down, when water quality problems occur in the SBA, Delta or Del Valle Reservoir, or when Zone 7's two water treatment plants. This needs to be included in the final EIR along with the additional environmental impacts such as, salt buildup.
			B-5	The final EIR must address the impact of voluntary or mandatory cutbacks in water consumption during all water year scenarios as a project alternative.
			B-6	The final EIR must include a review of the appropriateness of the criteria used to size the project before proposing a project or program to implement the criteria.
			B-7	Zone 7 does not have control over the use of existing municipal wells. The final EIR must analyze and address meeting demands if the municipal wells were not being pumped during the four scenarios.
			B-8	The final EIR needs to address the savings in costs between the Proposed project and the Reduced Alternative, including the costs for water quality treatment needed for hardness mitigation.
			B-9	The DEIR does not provide a new water supply that could affect the rate, location, or timing of growth within the Zone 7 service area.
		City of Pleasanton (cont.)	B-10	The final EIR must analyze environmental impacts and issues for recycled water storage and new groundwater production wells located in the same area, and the issue of water mixing if the projects are in the same area, before finalizing the final EIR for the subject project.

TABLE 1-2 (continued)
COMMENT LETTER SUMMARY

Date	Commenter	Affiliation	Comment No.	Comment/Topic
			B-11	The final EIR must state the role of the Chain of Lakes as system storage in relation to the proposed Project, and how build-out will effect basin storage capacities and if this was addressed in the modeling.
			B-12	The DEIR omits the use of projects wells being used for salt mitigation as was stated in the ADEIR.
			B-13	Use of additional groundwater over the main basin adds to the concentration of salt buildup and is a significant environmental issue not discussed in the DEIR
			B-14	The DEIR does not discuss the treatment costs for hardness. This is inconsistent with the recently adopted Zone 7 Water quality Policy and needs to be addressed in the final EIR.
			B-15	Groundwater de-mineralization is not in place as per the SMP.
			B-16	The DEIR does not discuss how and why the groundwater TDS objectives will be consistent with the Basin Plan.
			B-17	The DEIR fails to propose any projects or mitigations so that the new wells meet other "goals" and "policies" of the Zone regarding water quality. Specific projects for mitigation of this significant environmental impact must be part of the final EIR.
			B-18	The final EIR needs to access, analyze, and provide mitigation for adding salts over and into the Main Basin. This was a major oversight of the DEIR.
			B-19	The degradation of the Deep Aquifer water quality due to TDS concentration levels increasing as a result of pumping groundwater currently and the addition of new wells not causing a significant change to this, must be addressed as a significant environmental degradation with identified mitigations in the final EIR.
			B-20	The final EIR must include modeling and mitigations to address the significant environmental impact of changes in delivered water quality.
			B-21	The final EIR must address this issue and provide mitigation for the changes that will take place in groundwater and delivered water quality during the three Project scenarios plus the Average Year-Day-to-Day Operational Needs that these new wells will be providing when other supplies are unavailable.
		City of Pleasanton (cont.)	B-22	It would be useful to clarify the basis for the groundwater drawdown modeling in terms of calibration and verification of results.
			B-23	The City considers the approach of using "historic lows" for the impacts and mitigation of lower water numbers due to pumping to be flawed.

TABLE 1-2 (continued)
COMMENT LETTER SUMMARY

Date	Commenter	Affiliation	Comment No.	Comment/Topic
			B-24	Zone 7 is offering the City pumped ground water to "minimize potential interference". The City considers this a "take" on its existing right to on existing and future wells.
			B-25	The final EIR must analyze and address the impact to the City's well capability to effectively operate prior to concluding this impact to b less than significant by offering us water.
			B-26	The final EIR must clearly state what action Zone 7 will take in the event that water levels are deemed "too low".
			B-27	The mitigation stated by Zone 7 to one of the City's wells does not appear to address the daily operational needs that require the City to be flexible in its operations of its wells.
			B-28	The DEIR does not explain what water level impact or water quality impact would trigger mitigation.
			B-29	The City states that the concept of "historic lows" is a policy parameter, not an environmental impact indicator.
			B-30	The Final EIR must address mitigation to the City for any demonstrated adverse water level or water quality impact caused by pumping from new wells
			B-31	The City believes the final EIR needs to clearly state what mitigation will be proposed if land subsidence causes property damage.
			B-32	The DEIR incorrectly asserts the City's well operational abilities as it applies to amount of head needed over the pump intake.
			B-33	Without identifying wellfield locations more specifically, the DEIR is only a program, not a Project DEIR. [to be handled similar to Mocho 3 and Mocho 4]
			B-34	The City has major concerns regarding the construction, design, noise and traffic impacts of wells located in or near residential areas.
			B-35	A conditional use permit and design approval is required by the City [true?] for each facility before being built.
		City of Pleasanton (cont.)	B-36	Hazardous material storage, delivery, and use must be identified and reviewed for compliance by the Livermore/Pleasanton Fire Department.
			B-37	Any wells considered in the City of Pleasanton should use a 50x50 layout.
5/26/04	**David K. Behrens**	**Dublin San Ramon Services District**	C-1	This section should include a provision that states: the increased groundwater production levels will not further degrade the current level of water quality of the ground water supply, or the treated supply to Zone 7 current or future customers.

TABLE 1-2 (continued)
COMMENT LETTER SUMMARY

Date	Commenter	Affiliation	Comment No.	Comment/Topic
			C-2	This section should also include a provision that states: the increased groundwater production levels will be designed with adequate treatment facilities to obtain equal water quality throughout the service area for all of its current and future users.
			C-3	The Alternatives Section does not include degradation of water quality in the groundwater supply as a measurement in determining the feasibility or desirability of each alternative.
			C-4	The Alternatives Section does not include mandatory deployment of water conservation methods or mandatory cutbacks/ rationing as a means to evaluate and compare different project alternatives.
			C-5	It would be appropriate to include treatment cost effects in each alternative scenario.
			C-6	The WMP DEIR should state what measures or actions will be taken to correct the subsidence or reduced water quality.
			C-7	The WMP DEIR should state exactly what treatment facilities will be installed, and to what MCL levels the facilities will meet.
			C-8	The pumping amounts on pages 2-13 and 2-26 are not the same.
			C-9	There is no mention of the impacts to current and future water quality due to the increase of groundwater production by Zone 7. This needs to be addressed and mitigation measures identified.
5/26/04	**Pamela Lung**	**City of Livermore**	D-1	Include: well spacing, depth, and location; new well proximity to recycled water; and screens and transmission lines to be used
			D-2	Were any additional assumptions used in the well model besides those mentioned in comment D1?
			D-3	Define historic low water level and when established.
		City of Livermore (cont'd)	D-4	Explain how subsidence is monitored and proposed mitigation monitoring will continue or be increased.
			D-5	Clarify how shallow and deep aquifers interact.
			D-6	Address impacts on new developments, such as Oaks Business Park.
			D-7	Update reference on page 3.2-15 (RWQCB Permit).
			D-8	Update references to any land uses in Livermore that were changed as of the February 2004 General Plan Update.

TABLE 1-2 (continued)
COMMENT LETTER SUMMARY

Date	Commenter	Affiliation	Comment No.	Comment/Topic
			D-9	Update page S-15 Item 3.4-7 specifically as follows: *Construction on airport property requires City and FAA review and approval. A 'Notice of Proposed Construction" FAA form #7460-1 must be filed for all construction projects on and in the vicinity of an Airport.*
			D-10	Update page 3.4-26 specifically as follows: *Facilities located on airport property at a location relative to the runway protection zone or adjacent to any operations; such as, taxiways or runways will require FAA & City approval. Property off of the Airport site may require FAA approval for construction/drilling operations per the Federal Aviation Regulation (FAR) Part 77.*
			D-11	Include that many creeks are natural and owned and maintained by LARPD, Zone 7, and private property owners.
			D-12	Note that recycled water is currently used for irrigation north and south of the Las Positas Golf Course and Airport.
5/11/04	**Steven Hunte**	**Alameda County Public Works**	E-1	Wells, structures and pipelines in County Right-of-Way should be evaluated and approved by County.
			E-2	Additional review needed when detailed plans become available.
			E-3	Construction impacts to residents and commuters needs evaluation and mitigation.
5/28/04	**Michael Carlin**	**San Francisco Public Utilities Commission**	F-1	The EIR should acknowledge the SFPUC's groundwater rights in the Bernal Basin and discuss any potential impacts the project may have to groundwater rights.
6/2/04	**Lori H. Schectel**	**San Francisco Public Utilities Commission – WS&T**	G-1	The SFPUC is concerned about the effect new wells may have for the Castlewood system.
5/28/04	**Margaret J. Tracy**	**Livermore Resident**	H-1	DEIR does not address the issue of impacts to groundwater quality when additional groundwater is extracted.
		Livermore Resident (cont'd)	H-2	The 1995 SMP called for correcting the high salt load in the groundwater. No de-mineralization facility has been built.
			H-3	Semantic problems in DEIR include; how can "monitoring" serve as "mitigation", how can "modeling" serve as "mitigation", how can "new" wells not be considered "new" water?
			H-4	There should be no approval or construction of new wells until the present salt overload has been corrected.
			H-5	Use of groundwater to meet ongoing and new demands is unsustainable.

TABLE 1-2 (continued)
COMMENT LETTER SUMMARY

CHAPTER 2.0
MASTER RESPONSES

There are topics that received multiple comments each. In order to provide thorough responses on these topics master responses have been prepared that present a broad and comprehensive discussion of the key items of interest to the commentors. Each individual comment is responded to in Chapter 3.0. If and when one of these major topics is raised in an individual comment, where appropriate, a brief response is provided and the commentor is referred to one of these master responses for a complete discussion.

2.1 PROJECT OBJECTIVES

INTRODUCTION

Comments regarding Project Objectives are addressed here and in the responses to individual comments presented in Chapter 3.0. Relevant comments received on this topic include: B.1, B.12, C.1, C.2, C.4, F.5.

DISCUSSION

It is important to note that the goals and objectives of the Well Master Plan are to provide adequate capacity for Zone 7 to recover stored groundwater supplies to meet its adopted Reliability Policy. This policy has been established in consultation with the Retailer Agencies, and provides for 100% reliability under all hydrologic conditions, including credible worst-case drought years and 75% maximum day demand (MDD) during emergency outages. Given the reliability of the State Water Project, Zone 7 must rely on its groundwater basin to meet demands during drought year and emergency scenarios to meet this policy. The objectives of the Proposed Project are stated on DEIR Page 2-9 as follows:

The main objective of this project is to increase reliability and redundancy of the water system such that treated water is available to Zone 7 customers when SWP water allocation is low during a drought year or in the event of an emergency. The specific project objectives are as follows:

- Provide facilities to recover stored groundwater supplies from the Main Basin at a sufficient rate to meet Zone 7's reliability goals, as established in Resolution 02-2382. These goals are consistent with those used for the Zone 7 Water Supply Planning Program, and include:

  – **Goal 1:** Meet 100% of treated water customers water supply needs in accordance with Zone 7's most current contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan (UWMP), which will be coordinated with Zone 7's M&I Contractors. Zone 7 will

endeavor to meet this goal during an average water year, a single dry water year, and multiple dry water years.

  - **Goal 2:** Provide sufficient Valley-wide groundwater production capacity (including Zone 7's and Contractors wells) to meet at least 75% of the estimated maximum daily M&I water demand.

- Maintain water levels within the Main Basin above the historic lows.

- Design and site proposed facilities to minimize potential interference to nearby wells during operations, to the degree feasible.

- Design and site proposed facilities to minimize potential effects to surrounding land uses during well construction, development and operation, to the degree feasible.

Zone 7, as CEQA Lead Agency, has discretion to establish the objectives for both the CEQA analysis, and for development of the Well Master Plan. Implementation of the Well Master Plan is proposed to meet the goals established in Zone 7's Reliability Policy. It is not proposed to alter, affect, or manage delivered water quality within the Zone 7 Service Area. The Proposed Project examined in the Draft EIR provides adequate capacity to meet both Goal 1 (drought reliability) and Goal 2 (emergency reliability) of Zone 7's Reliability Policy, as stated in the Draft EIR.

It should be noted that the Zone 7 Board of Directors revised its Goal 2 of its Reliability Policy on August 18, 2004. This revision changes the goal's MDD reference from "valley-wide" to "Zone 7's contractual" only and provides direction for the corollary planning, design, and implementation of all Zone 7's major water supply facilities and infrastructure. Additionally, this policy requires periodic review of this reliability goal on an annual basis. Goal 2 of the Zone 7 Reliability Policy is revised as follows:

> **Revised Goal 2.** "Provide sufficient treated water production capacity and infrastructure to meet at least 75% of the maximum daily M&I contractual demands should any one of Zone 7's major supply, production or transmission facilities experience an extended unplanned outage."

This policy would require that major facilities be sized and located to provide sufficient redundancy so that if any one facility was out of service (be it a canal, reservoir, water production facility, transmission main, etc.) the remaining facilities would be capable of providing 75% of Zone 7's maximum contractual M&I deliveries. This revision is consistent with the previous Goal 2, but does not require that 75% MDD of Valley-wide demand be provided solely through groundwater production. Rather, the revision of Goal 2 provides a more comprehensive view of emergency supply planning within the Zone 7 service area, and allows for the integration of all operational facilities to meet emergency demand, rather than reliance solely on the groundwater basin. As noted in the DEIR Section 3.1, Groundwater Hydrogeology and Water Quality, reliance solely on groundwater production to meet the previous emergency goal of 75% MDD of Valley-wide demand may not be prudent within the context of Zone 7's operational policy to maintain groundwater levels above historical lows.

This policy revision is consistent with the impact analysis and conclusions presented in the DEIR, as it represents a reduction in the level of reliability required from the groundwater basin. As such, the proposed project, which identified and analyzed the capacity and corresponding number of wells necessary to meet the original Goal 2, represents a worst-case scenario both in terms of the number of wells and the amount of groundwater produced under emergency conditions. Revision of Goal 2, which would require less reliance on the groundwater basin, would not result in new additional impacts, or increase the severity of impacts identified in the DEIR. Revision of Goal 2 modifies the requirement for Zone 7 to meet its emergency demands solely from the groundwater basin, providing increased flexibility to utilize all remaining operational facilities in an emergency to meet peak day demands. This would reduce the level of well capacity, and therefore, the total number of wells necessary to meet this emergency goal.

Consistent with this revised policy, Zone 7 may elect to implement the Reduced Project, which would meet Goal 1 regarding drought demands, and maintain the current level of emergency capacity provided from groundwater production (approximately 50% of Zone 7's MDD), thereby reducing the total number of wells that would be constructed. This alternative is reviewed in DEIR Section 6.0, Alternatives, which identifies the Reduced Project as: a) meeting Goal 1, Drought Reliability; 2) reducing the total number of wells implemented, and therefore, the construction related impacts associated with implementation; and 3) reducing overall program costs.

The Well Master Plan is designed to be implemented over time, with each well providing an increment of emergency capacity relative to demands. As discussed in DEIR Section 2.0, Project Description, Zone 7's and Retailers existing well capacity currently meets 53% of Valley-wide MDD. As the Well Master Plan is implemented, the relationship between actual well capacity and this reliability goal will depend upon the rate of well implementation and the rate of demand increase over time. As such, Zone 7 will have the ability to review the level of reliability provided by the Well Master Plan as it is implemented. As identified above, Zone 7's Reliability Policy requires annual review of Zone 7's ability to meet its emergency goal, and review of the reliability goal on a five year basis, consistent with its Urban Water Management Plan review. As such, Zone 7 will be able to make informed decisions as to the rate of well construction vis-à-vis this reliability goal, and take actions to increase or reduce the rate of well construction, as appropriate. This implementation timeframe provides the opportunity to implement a more comprehensive review of this reliability goal as it relates to Zone 7's overall facility planning, including surface water conveyance, treatment, and distribution facilities, as well as groundwater storage and production. Such a review, which is identified in Mitigation 3.1-1b, represents a policy and cost/benefit analysis regarding non-CEQA issues, including the definition of a water supply emergency within the Zone 7 Service Area, the duration of such an emergency, and the facilities that would be available to meet demand. This analysis is beyond the scope of environmental impact analysis required under CEQA, and contained in the Draft EIR. In the event that this analysis generates the need for additional facilities or capital improvement projects, Zone 7 would review the need for separate CEQA review.

2.2 ZONE 7 WATER QUALITY MANAGEMENT PROGRAMS

INTRODUCTION

Comments regarding water quality management are addressed here and in the responses to individual comments presented in Chapter 3.0. Relevant comments received on this topic include: B.1, B.2, B.3, B.14, B.15, B.17, B.18, C.1, C.2, C.7, C.9, D.5, F.2, F.4.

DISCUSSION

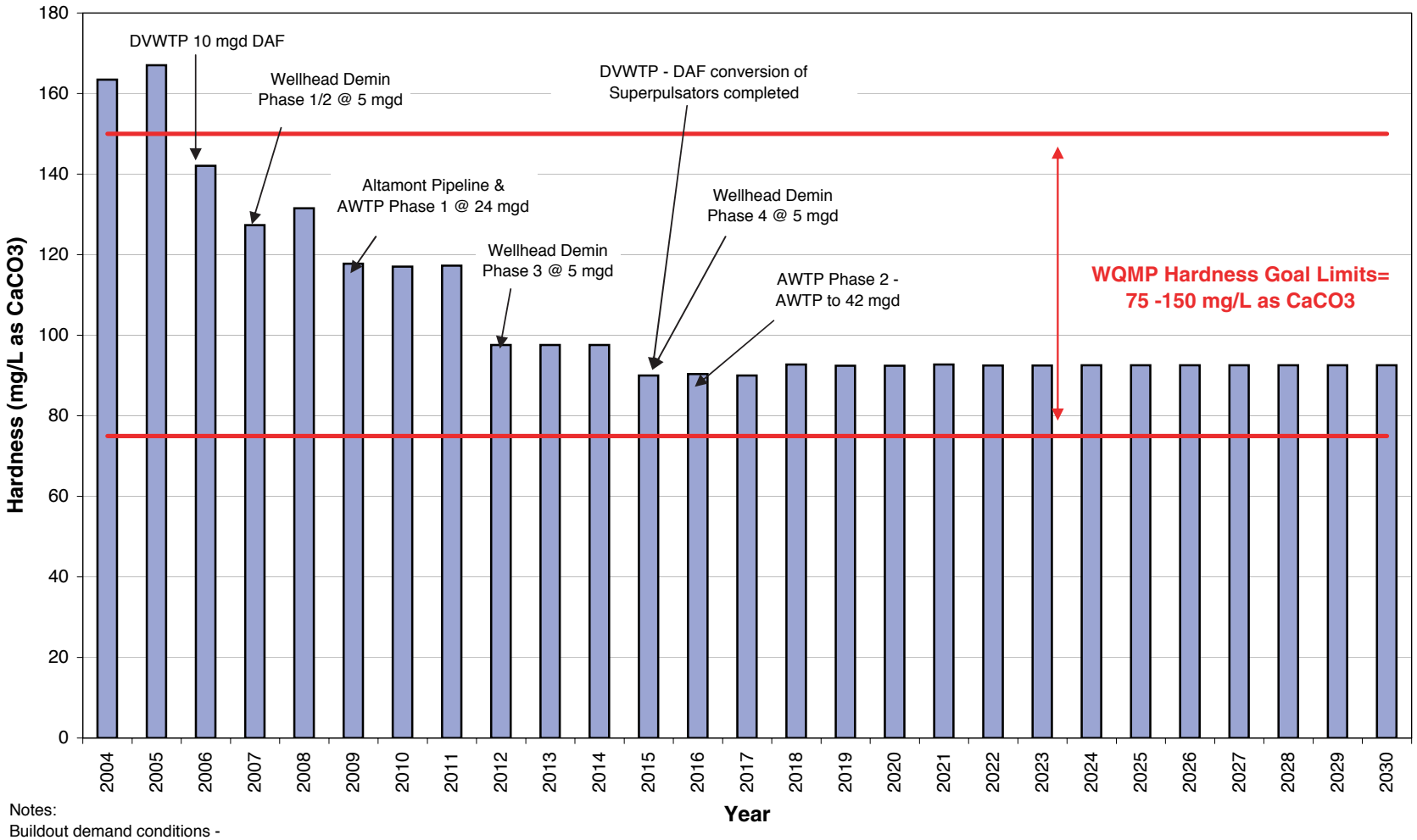
Zone 7 Water Quality Management Programs

Groundwater delivered by Zone 7 currently meets, and will continue to meet, drinking water standards as regulated by U.S. EPA and California Department of Health Service (CDHS), which establish primary and secondary maximum contaminant levels (MCLs) for drinking water quality. U.S. EPA and DHS establish "secondary" MCLs for certain aesthetic parameters, such as total dissolved solids (TDS); however, there is no secondary MCL for hardness. As noted in **DEIR Section 3.1**, Groundwater Hydrogeology and Water Quality, Zone 7 currently meets U.S EPA and CDHS drinking water standards, and project implementation will not substantially alter or reduce delivered water quality. For the purposes of CEQA, these standards serve as thresholds of significance. As such, potential impacts associated with delivered water quality are less than significant, and no mitigation is required.

Since the approval of the Water Supply Planning Program – Program EIR in 1999, Zone 7 has implemented several programs to address delivered water quality. The following discussion presents a chronologic review of individual programs, and their current status. In terms of delivered water quality, Zone 7's Water Quality Policy establishes goals that exceed legal requirements, including a goal of reducing water quality among retailers to "moderately hard", which is between 75-150 mg/L as CaCO3. Facilities currently under development by Zone 7 to meet this goal include the Del Valle WTP DAF facility (anticipated completion in 2005); Demineralization Facility (anticipated completion in 2007) and the Altamont Water Treatment Plant and Pipeline (anticipated completion in 2009). **Figure FEIR-1** depicts the Zone 7 system-wide average hardness based on maximum day demands for 2004 through 2030, and the predicted effect that each of these facilities would have on delivered water quality. As shown in **Figure FEIR-1**, which includes operations under the Well Master Plan, Zone 7's system-wide average hardness would be reduced to the Water Quality Policy goal of 75-150 mg/L CaCO3 through the implementation of these programs. A brief discussion of programs implemented since the WSPP in 1999, and their current status, is provided below.

ASR Pilot Program – 1997–2000

At the time of WSPP EIR approval in June 1999, Zone 7 was in the process of implementing an ASR pilot program to assess the viability of this technology within the Main Basin.



Notes:
Buildout demand conditions -
Total Wellhead Demin = 15 mgd
Buildout AWTP = 42 mgd
Buildout DVWTP = 36 mgd

Date: 7/9/2004
Created by MDL
Checked by JPH and JKK

SOURCE: Zone 7 Water Agency

Figure 1
System-Wide Average Hardness
Based on Maximum Day Demand
2004–2030

Subsequent pilot testing of ASR technology was implemented in 1997 with conversion of Hopyard 6 to provide injection and recovery capability. Results of pilot testing indicated that well operations were well below anticipated recovery rates due to significant well screen plugging. Due to this substantial operational issue and cost parameters, Zone 7 did not pursue conversion of other existing wells to ASR technology, and did not implement ASR designs for future wells considered under the Well Master Plan. While not ruling out the implementation of this technology at some point in the future if it can be demonstrated to be viable within the Main Basin, Zone 7 did not include ASR technology in the design of the Well Master Plan.

Salt Management Plan – 1998–2000

Zone 7 developed a Salt Management Plan (SMP) in 1998 (EOA, Inc) to address the issue of salt accumulation. The SMP was developed through a cooperative effort involving Zone 7 staff, consultants to Zone 7, a Technical Advisory Group (TAG) comprised of local retailers, and the Groundwater Management Advisory Committee (GMAC). The Salt Management Plan was prepared to identify and evaluate salt loading to the groundwater basin, and potential mechanisms for salt removal. The SMP evaluated the water supply, water quality, and cost of several potential strategies available to offset long-term average TDS loading to the main groundwater basin of 2,200 tons/year. These include: 1) Water conservation; 2) Historic groundwater basin management; 3) Maximum stream recharge conjunctive use strategy; 4) paired injection/extraction well conjunctive use; 5) ASR well operation strategy; 6) wellhead demineralization; 7) RO recycled water injection; 8) RO recycled water stream recharge and phased injection; 9) seasonal groundwater export; 10) Chain of Lakes; and 11) Delta Fix that would improve the quality of imported surface waters. As any one strategy would have limitations on the amount of TDS removed or cost factors, composite strategies were also analyzed. The criteria used to screen these 15 basic salt management studies include technical feasibility, timing, economics, delivered water quality, and public and institutional acceptance. One strategy, consisting of a composite of conjunctive use and 5 TAF of wellhead demineralization, demonstrated the ability to eliminate the salt imbalance at the lowest cost, improve or maintain delivered water quality, equalize east-west Valley water quality, and would be acceptable to the public. Therefore, it is the only strategy that met all the screening criteria.

Based upon the results of the SMP analysis, Zone 7 adopted the following policy goals for salt management:

- Offset the current (1998) 2,200 tons per year salt loading plus approximately 200 tons per year projected annual increase;
- Maintain or improve groundwater mineral quality;
- Maintain or improve delivered water quality;
- Provide comparable delivered water quality to all retailers (equalize the east-west water quality;
- Minimize total operational and maintenance costs through an adaptive management process.

To meet these goals, Zone 7 developed a salt management strategy with two immediate and one near-term element:

- Immediately increase recharge of imported low TDS surface water, and
- Immediately increase usage of groundwater storage to remove salt from the groundwater basin by increasing turnover.
- Near term: Implement well demineralization to increase salt removal, and equalize east-west water quality

The SMP was recently submitted to the RWQCB for its review in July 2004, and the SMP was approved by the RWQCB in September 2004. The SMP provides Zone 7 with a number of salt management tools, including conjunctive use, to stabilize annual salt loading to the Main Basin, thereby avoiding continued degradation of groundwater quality due to TDS increase. This management strategy is being used to maintain groundwater quality over time, thereby sustaining delivered water quality to Zone 7 Retailer Agencies. Implementation of demineralization to meet salt removal goals is discussed under the Demineralization Program, below.

Water Quality Management Program 2001–2002

In an effort to address the issue of delivered water quality on Valley-wide basis, Zone 7 implemented preparation of the Water Quality Management Program (WQMP) in 2000. Completed in May, 2003, the purpose of the WQMP was to establish guidelines and policies for potable and non-potable water quality. The WQMP also established goals to effectively manage various water quality issues, guiding operations and assisting in the capital improvement program (CIP) implementation. The goals and policies established were based on discussions with both retailers and end-users. The WQMP was the result of a process that involved public participation, conducting public meetings and workshops, forming a Water Quality Committee, updating and modifying the hydraulic model, identifying water quality parameters of concern and preliminary water quality targets, comparing targets with existing water quality characteristics, reviewing the CIP for planned improvements that could to help meet the water quality targets, develop addition CIP projects that could help meet the water quality targets, identify financing strategies, and develop an implantation plan which addresses the water quality policy and goals, targets to implement the goals, and a financing strategy.

In **April 2003**, the Zone 7's Board of Directors adopted the Zone 7 Water Quality Policy regarding delivered water quality. This policy establishes as goals for Zone 7 that delivered water quality: 1) meets or exceeds the public health requirements for drinking water, which includes continual compliance with all State and federal primary Maximum Contaminant Levels (MCLs) and reach applicable California Department of Health Services' Public Health Goals (PHGs) or Maximum Contaminant Level Goals (MCLGs) as close as is feasible; 2) is aesthetically acceptable by meeting all State and federal secondary MCLs, mitigating earthy-musty taste and odor events from surface water supplies, minimizing chlorinous odor, and reducing hardness to "moderately hard" among retailers. "Moderately hard" is defined by the

industry standard as 75 to 150 mg/L hardness. The policy would also establish a target for delivered water TDS levels at <500 mg/L, which is currently not being met by groundwater supplies.

The most feasible mechanism for achieving both the hardness and TDS goals is continued conjunctive use of the groundwater basin to neutralize salt build up, and the implementation of facilities identified under the Salt Management Plan, primarily a demineralization facility to provide a low TDS and hardness source for blending produced groundwater supplies. Please see discussion of Zone 7's Demineralization Program below.

Del Valle WTP DAF Project

In order to increase the reliable surface water production capacity before the first phase of AWTP is completed, improvements to the reliability of DVWTP's maximum production capacity are proposed. The existing Superpulsator clarification units at DVWTP do not perform consistently under all source water quality conditions, which limits the plant's production capacity, especially during peak summer demand periods. The current reliable production capacity at DVWTP is 26 mgd during the peak summer demand periods. Zone 7 recently completed the DVWTP Clarification Study, which recommends the Superpulsators be replaced with an alternative treatment clarification process. The preferred treatment alternative is Dissolved Air Floatation (DAF) based on the pilot study performed as part of the Clarification Study. The design and construction of a new 10 mgd DAF facility is planned in the next fiscal year (FY 2005/06). This new DAF facility would provide 10 mgd of additional reliable surface water production and would be completed 2007. This would increase the reliable surface water production to 36 mgd during peak demand periods, thereby reducing groundwater pumpage requirements. Additionally, Zone 7 proposes to replace the existing Superpulsators with DAF units or some other improved clarification process after AWTP Phase 1 is in-service. This planned capital improvement project is anticipated to bring the capacity of DVWTP up to 40 mgd in 2015.

Demineralization Program

In **2000,** Carollo Engineers was hired to prepare an Engineering Report for the Demineralization Project identified under the Salt Management Plan as a preferred near-term mechanism to increase salt removal. At that time, the project envisioned a Demineralization Facility sized to meet SMP goals. Carollo's analysis focused on technical design issues relating to facility siting alternatives, treatment technology, and brine disposal mechanisms. Results of this analysis, completed in **2000**, identified a 5 mgd facility with brine disposal via connection to the LAVWMA Export Pipeline, as the potential project for implementation. Zone 7 identified the Mocho Well No. 4 site, owned by DSRSD, as a potential site for implementation. Following circulation of the Feasibility Report to the Retailer Agencies, several concerns were noted, most prominently institutional concerns regarding disposal

capacity issues in the LAVWMA Export Pipeline. Zone 7 met with the LAVWMA TAC during 2002/03 in an attempt to resolve these issues, and Carollo prepared subsequent technical data to address concerns raised regarding NPDES issues and effluent quality. These were presented to the LAVWMA TAC in **Spring 2003**. With substantial resolution of institutional issues, Zone 7 is implementing project development and pre-design activities for the Demineralization Facility. Project Development activities are anticipated to be completed by December, 2004 and CEQA documentation is anticipated to be completed by Summer 2005. The project has been funded in Zone 7's FY 2005/2006 Capital Improvements Program (CIP) adopted by the Board in August, 2004. As such, implementation of the Demineralization Facility is currently anticipated to begin in mid 2005, with the facility online by mid-2007.

Zone 7 proposes to install 7.7 million gallons per day (mgd)Mocho Demineralization Facility, in the City of Pleasanton, adjacent to Arroyo Mocho off of Stoneridge Drive and Santa Rita Road to remove salts from the groundwater basin at the point of extraction. Demineralization would occur through the use of a reverse osmosis (RO) membrane-based treatment, producing water with TDS in the range of 10 - 15 mg/l, depending on source water quality. Source water for the facilities would be provided by four existing potable supply wells located on or immediately adjacent to the site; Mocho 1, Mocho 2, Mocho 3, and Mocho 4. The RO treatment would achieve a lower TDS and hardness level than other Zone 7 water sources, and would provide a blending supply to improve delivered water quality. Following RO treatment, the resulting treated water or the "permeate" would have a TDS level of approximately 15 mg/l and hardness level of approximately 3 mg/L. Zone 7 would blend permeate with other groundwater (non-demineralized) and/or surface water before delivery to achieve a target TDS or hardness level. The concentrate solution resulting from the RO process would flow into the Livermore Interceptor. Zone 7 would operate the facility on a nine month operational program to include peak groundwater pumping periods (typically the summer "dry" months May through October) and match concentrate generation with available capacity of the Livermore Interceptor.

It should be noted that the purposes of the Demineralization Facility are both a salt management tool and for delivered water quality. Over time, as Zone 7 implements this and other programs under the Salt Management Plan, including the Future Phase Groundwater Demineralization Facility, salt loading to the Main Basin would be reduced to a "net-zero" level. In addition, and in light of the objectives established under Zone 7's Water Quality Management Plan, permeate generated by this facility represents a low-TDS supply source that can be blended with Zone 7 groundwater supplies to improve delivered water quality.

Altamont Water Treatment Plant and Altamont Pipeline

The Treated Water Facilities Master Plan identified a need to construct a new water treatment plant with a potential maximum capacity of 42 MGD and an additional potable water transmission pipeline, which would connect the new water treatment plant to the existing Zone 7 transmission system. The Altamont Water Treatment Plant (AWTP) Phase 1 will provide an additional 24 mgd of treated surface water to the existing system. AWTP Phase 1

would be constructed with provisions for an ultimate treatment capacity up to 42 mgd. The construction of the Altamont Pipeline would involve the installation of approximately twelve miles of up to 48-inch diameter potable water transmission pipeline from the future AWTP to connections with the existing Cross Valley and Vasco Pipelines. The EIR for the Altamont Pipeline is scheduled for certification in February 2005. The estimated in-service date for both AWTP Phase 1 and the associated Altamont Pipeline is 2009. The AWTP Phase 2 would add an additional 12 to 18 mgd of treated surface water to the system and is planned to be online by 2016. As shown in Figure FEIR-1, delivered water quality would be improved through availability of additional treated surface water capacity following completion of both Phase 1 in 2009, and Phase 2 in 2016.

2.3 RELATIONSHIP TO 1999 WSPP EIR

INTRODUCTION

Comments regarding the Well Master Plan's relationship to the *1999 Water Supply Planning Program EIR* are addressed here and in the responses to individual comments presented in Chapter 3.0. Relevant comments received on this topic include: B.2, B.9, F.3.

DISCUSSION

The *Water Supply Planning Program – Program EIR* examined Zone 7's Water Supply Planning Program, which reviewed projected water supply demands under the approved General Plans within the Zone 7 service area, and identified a Near-Term Project and Long-Term Program for acquisition of water supplies to meet projected buildout demands. The EIR also reviewed at a program level the anticipated facility programs, including the Well Master Plan and Salt Management Plan, envisioned by Zone 7. Finally, the EIR examined and disclosed the secondary effects of growth associated with provision of water supplies to meet projected demands under the approved General Plans within the Zone 7 service area.

The EIR was certified by the Zone 7 Board of Directors in June 1999. As part of the public review process, the City of Pleasanton submitted a letter, dated March 17, 1999, one comment of which (Comment H3) expressed concern regarding long-term delivered water quality associated with implementation of the WSPP. The Response to Comment/FEIR responded to this comment by identifying Zone 7's preferred program for managing delivered water quality at that time. The use of Aquifer Storage and Recovery (ASR) wells to inject and recover potable groundwater supplies within the groundwater basin. It was thought that this well technology would have the capability of assisting in the management of groundwater quality, and subsequently, delivered water quality, through the ability to inject and recover stored treated surface water supplies.

Although this program was identified as a response to the issue of delivered water quality, no requirement for mitigation was identified in either the Draft or Final 1999 WSPP EIR with respect to delivered water quality. Implementation of an ASR program was not formally adopted by the Zone 7 Board of Directors as mitigation for delivered water quality. Rather, this program

was identified in the context of Zone 7's continued interest in working with its Retailers on delivered water quality issues. Please refer to Master Response 2.4 for a discussion of Zone 7's water quality management programs.

It should be noted that the Well Master Plan proposes to implement facilities necessary to adequately recover surface water supplies that are annually recharged to the groundwater basin as part of Zone 7's conjunctive use practices. Zone 7 currently has the ability to recover these supplies on an annual basis; however, proposed facilities will allow Zone 7 to recover these supplies at a rate consistent with its Reliability Goals, and in a geographic distribution that will allow recovery consistent with policies relating to the historical low groundwater level of the Main Basin. As such, the Well Master Plan does not proposed extraction of supplies beyond those recharged, and does not provide a new water supply source within the Zone 7 service area. Rather, it provides for the effective recovery of water supplies stored within the Zone 7 service area through conjunctive use, i.e., the recharge and storage of surface water supplies within the Main Basin.

The ability for Zone 7 to meet current and future projected demands has been accomplished, and will continue to be accomplished using a multi-source strategy that relies primarily on purchase and import of surface water supplies. Zone 7 disclosed the potential secondary effects of importing water supplies to meet projected demands associated with build out under the approved General Plans within the Zone 7 service area in the 1999 WSPP EIR (Zone 7, 1999). Groundwater production within Zone 7 does not serve growth. Rather, groundwater storage and recovery through Zone 7's conjunctive use program is used as the mechanism for storage and treatment of these imported supplies, thereby providing the capability to meet Zone 7's reliability goals.

2.4 IMPACTS TO DELIVERED WATER QUALITY

INTRODUCTION

Comments regarding effects to Delivered Water Quality are addressed here and in the responses to individual comments presented in Chapter 3.0. Relevant comments received on this topic include: B.1, B.17, B.20, B.28, C.7, C.9.

DISCUSSION

The Safe Drinking Water Act (SDWA), passed in 1974 and amended in 1986 and 1996, gives the Environmental Protection Agency (EPA) the authority to set drinking water standards. The California Department of Health Services (CDHS) works with the US Environmental Protection Agency (EPA), the State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards (RWQCBs), and a wide variety of other parties interested in the protection of drinking water supplies. California Health and Safety Code §116365(a) requires DHS to establish a contaminant's maximum contaminant level (MCL) at a level as close as is technically and economically feasible to its public health goal (PHG). The PHG is the contaminant's

concentration in drinking water that does not pose any significant risk to health, derived from a human health risk assessment. Standards established by these agencies serve as significance thresholds under CEQA.

Groundwater delivered by Zone 7 currently meets, and will continue to meet, drinking water standards as regulated by U.S. EPA and California Department of Health Service's (CDHS), which establish primary and secondary maximum contaminant levels (MCLs) for drinking water quality. U.S. EPA and DHS establish "secondary" MCLs for certain aesthetic parameters, such as total dissolved solids (TDS); however, there is no secondary MCL for hardness. Implementation of the Well Master Plan will not substantially affect the ratio of groundwater currently used by Zone 7 to meet demands within its service area, or the timing or duration of use, which will be consistent with current operations and dictated by hydrologic conditions. As noted in **DEIR Section 3.1**, Groundwater Hydrogeology and Water Quality, Zone 7 currently meets U.S EPA and CDHS drinking water standards, and project implementation will not substantially alter or reduce delivered water quality. For the purposes of CEQA, these standards serve as thresholds of significance. As such, potential impacts associated with delivered water quality are less than significant, and no mitigation is required.

In addition to these standards, Zone 7 has adopted delivered water quality goals as a result of its Water Quality Management Program (WQMP) to continue to improve delivered water quality above the standards established by U.S. EPA and CDHS. WQMP Goal 1 commits Zone 7 to continually meeting all State and federal primary MCLs for potable water delivered, in accordance with existing water supply agreements. In addition, Zone 7 shall deliver potable water of a quality that is as close as technically feasible and fiscally responsible to the CDHS Public Health Goals (PHGs), which in many cases are more conservative than the MCLs. WQMP Goal 2 states Zone 7 would meet all State and federal secondary MCLs in the potable water delivered to its municipal Contractors' turnouts. In addition, Zone 7 shall, within technical and fiscal constraints, proactively mitigate earth-must taste and odor events from surface water supplies and reduce hardness levels to "moderately hard", defined as 75 to 150 mg/L. Zone 7 shall also optimize its treatment processes to minimize chlorinous odors by maintaining consistent disinfectant dosage and residual.

As noted in **DEIR Section 3.1**, Groundwater Hydrogeology and Water Quality, the amount of groundwater delivered by Zone 7 is based upon hydrologic year type and subsequent deliveries from the State Water Project. As a function of this, the percentage of groundwater produced and delivered as treated water supply varies in a given year. **DEIR Figure 3.1-5** summarized groundwater deliveries from 1974 through 2003 as a percentage of municipal treated water deliveries. Historical groundwater deliveries have fluctuated between 48% and 0% of total treated water deliveries over the last 30 years, have averaged 16% of treated water deliveries since 1990, and have comprised 20-28% of treated water deliveries since 1999. This level of delivery fluctuation would continue irrespective of the Well Master Plan, and, depending upon hydrologic conditions, could result in average annual groundwater deliveries of greater than 30% until completion of the Altamont WTP in 2009.

As noted in the DEIR, groundwater deliveries are dependant upon hydrologic year type, and are mainly limited to periods when treated water demands are greater than available treatment plant capacity, primarily during summer months; supplemental production during non-summer months may also occur to meet salt management goals, accommodate treatment plant or SBA outages, or to meet drought year demands. As such, groundwater deliveries may also be less than has been historically delivered, depending upon hydrologic year type. Regardless, all groundwater deliveries would continue to comply with all applicable drinking water standards as established by U.S. EPA and California Department of Health Services.

As such, the Well Master Plan does not change Zone 7's operational criteria, or delivered water quality. Rather, the Well Master Plan provides a facility plan that will allow Zone 7 to meet its reliability goals for drought year and emergency conditions under current and future demands without exceeding the groundwater basin's historical low groundwater elevations. Additionally, with the geographic distribution identified under the Well Master Plan, implementation would provide the flexibility to optimize groundwater recovery in terms of groundwater quality management and cost optimization. In order to ensure that delivered water quality is not adversely affected by implementation of the Well Master Plan, Zone 7 proposes the following Mitigation Measure 3.1-5b.

> Zone 7 shall commission a "Groundwater Influence on Delivered Water Quality Study" to examine the effects to the aesthetic parameters (TDS, hardness, and other constituents affecting taste and odor) of water quality delivered to Retailer turnouts as a result of Zone 7's groundwater production from the Main Basin, including any wells constructed as part of Zone 7's Well Master Plan program. Zone 7 will provide a draft of the work plan for the Groundwater Influence Study to the Zone 7 Retailers for their review/comment no later than 120 days following the startup of the first well constructed under the Well Master Plan program. Zone 7 shall finalize the work plan after an evaluation of Retailer comments, and proceed with the Study
>
> The Groundwater Influence Study shall be completed before any more than two wells are constructed under the Well Master Plan program. The Study shall be made available to the Zone 7 Retailers in draft form at least 60 days prior to its scheduled presentation to the Zone 7 Board. The Study, whether accepted or not by the Zone 7 Board, shall be deemed, for the purposes of environmental review, to be "new information" as defined in CEQA Guidelines 15162; as such, this information must be considered by the Zone 7 Board as part of the process defined in CEQA Guidelines 15162 prior to any action to approve any more than two wells under the Well Master Plan program.

As noted in **Master Response 2.1,** the objectives of the Well Master Plan are to maintain Zone 7's ability to meet Zone 7's Reliability Policy Goals. Given the reliability of deliveries from the State Water Project, and the establishment of Reliability Policy Goal 1, which requires 100% reliability during credible drought events, it is appropriate for Zone 7 to rely on conjunctive use practices, i.e, groundwater recharge, storage and subsequent withdrawal, to meet drought year and peak demands. As discussed in **DEIR Section 6.0**, Alternatives, options to provide this level of drought year and emergency reliability are limited, other than alteration of Zone 7's Reliability Policy to provide Retailers with less than 100% reliability. This scenario is discussed under the

No Project Alternative in **DEIR Section 6.0**. To date, this No Project Alternative, which would not meet water demands under all credible hydrologic conditions, has not been identified as an acceptable alternative by Retail Agencies.

2.5 IMPACTS TO GROUNDWATER QUALITY

INTRODUCTION

Comments regarding potential impacts to groundwater quality are addressed here and in the responses to individual comments presented in Chapter 3.0. Relevant comments received on this topic include: F.1, B.19

DISCUSSION

Three issues have been raised regarding potential impacts to groundwater quality associated with implementation of the Well Master Plan. The first issue is whether the increased groundwater production and use for urban irrigation would result in additional, and unmitigated, salt loading to the Main Basin. The second issue relates to whether periodic drawdown of the Main Basin during drought years would increase inflow of high TDS groundwater from the Fringe Basin. The third issue relates to whether placement or long-term operation of wells would affect groundwater quality over the long-term.

Salt Loading Associated with Groundwater Use

As noted in **Master Response 2.2**, Zone 7 has prepared and implemented the Salt Management Plan, which provided comprehensive review of salt loading and management issues. The SMP included in its salt balance calculations groundwater pumpage for municipal use, i.e., Zone 7 and Retailer pumpage, and the level of salt loading that would be associated with reapplication of pumped municipal groundwater as irrigation. In general, municipal pumpage represents one of the most efficient salt removal tools, with approximately 90% of the salt removed on an annual basis occurring through municipal pumpage. The SMP identified return salt loading associated with irrigation of pumped municipal supplies at approximately 25-30%, and Zone 7's 2003 Annual Salt Balance identified salt loading associated with irrigation at 34% of annual salt loading (2003). These ratios would remain relatively constant regardless of pumping levels; therefore, increased pumpage would continue to represent approximately 90% of salt removal annually, with substantially lower return load associated with urban irrigation (34%), providing a net salt reduction of more than 55%.. Therefore, although there is incremental salt loading associated with the municipal pumpage and use of groundwater, this practice results in a substantial net salt removal from the Main Basin, and represents one of the most effective salt management tools available to Zone 7. As such, increased groundwater production would not have a detrimental impact on groundwater quality associated with the return of salt load to the Main Basin following irrigation. Rather, increased groundwater production provides a clear salt removal tool that is currently being implemented by Zone 7 to stabilize TDS levels within the Main Basin.

Fringe Basin Influence

The second issue relates to the lowering of Main Basin groundwater levels, and potential effects to groundwater quality associated with the inflow of higher TDS groundwater from the Fringe Basin. This issue was also incorporated into the SMP calculation of annual salt loading. On an annual basis, removal of salt load associated with municipal pumpage would offset any influence from the Fringe Basin. Additionally, although implementation of the Well Master Plan would likely increase the fluctuation of groundwater levels within the Main Basin, the duration of low groundwater levels would be limited due to the recharge of surface water supplies during normal and wet hydrologic years. The short duration of drawdown during drought years would not provide the long-term duration that would be required for substantial alteration of groundwater quality due to Fringe Basin inflow. This condition would be more appropriately associated with long-term overdraft conditions similar to those experienced before Zone 7's recharge program was implemented in 1968.

Long-Term Impacts to Groundwater

Implementation of the Well Master Plan will not affect TDS levels within the Main Basin. As identified in the SMP, groundwater quality within the Main Basin has been steadily degrading due to existing groundwater management practices, irrigation, and natural sources at a long-term average net salt loading rate of approximately 2,200 tons/year. This average is expected to increase to 5,400 tons/year by 2010. This is equivalent to about a 10 mg/L per year increase in TDS in the groundwater. The current average TDS for groundwater within the Main Basin is 450 mg/l. As identified in the SMP, salt loading to the Main Basin is a function of several inputs, including natural rainfall, irrigation with imported supplies, and leakage from the upper aquifer to the lower aquifer. A number of these salt inputs are natural processes that are beyond the control of Zone 7. As identified in the Salt Management Plan, Zone 7 seeks to stabilize TDS levels within the groundwater basin over time through a number of management tools.

Groundwater quality degradation within the Main Basin will occur over time regardless of Well Master Plan implementation. This degradation over time represents a "no project", or baseline, condition against which the proposed project is examined. The analysis presented in the EIR indicates that implementation of the Well Master Plan would not affect TDS levels within the Main Basin. As demonstrated in the DEIR analysis, modeling of TDS levels with and without wells implemented under the Well Master Plan show little effect on TDS levels. Therefore, project implementation would not affect groundwater quality. Zone 7 has conducted and concluded an exhaustive analysis of groundwater quality and salt management in the Salt Management Plan. Goals established in the SMP will assist Zone 7 in maintaining an annual "net zero balance" for salt loading to the Main Basin, and will assist in the stabilization of TDS levels throughout the entire groundwater basin.

CHAPTER 3.0

COMMENTS AND RESPONSES TO COMMENTS ON THE DRAFT EIR

This chapter presents each commentor's letter followed by the corresponding responses. The responses to comments are numbered to correspond to the comment numbers that appear in the margins of the comment letter. Where the responses indicate additions or deletions to the text of the EIR, additions are indicated in underline, deletions in ~~strikeouts~~. All changes to the EIR text are summarized in Final EIR Chapter 4.0.

Comment Letter A

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Jan Boel
Acting Director

RECEIVED
JUN 1 2004
ZONE 7, ACFC&WC

May 27, 2004

Matt Katen
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94550

Subject: Zone 7 Water Agency Well Master Plan
SCH#: 2002032163

Dear Matt Katen:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on May 26, 2004, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

Comment Letter A

SCH# 2002032163
Project Title Zone 7 Water Agency Well Master Plan
Lead Agency Zone 7 Water Agency

Type **EIR** Draft EIR

Description The proposed project is to recover groundwater that has been stored under Zone 7's conjunctive use program at the appropriate rate to meet its reliability goals. In order to do this, Zone 7 proposes to increase its well production capacity by up to 42 million gallons per day (mgd) through the installation of 8 to 15 new production wells. The proposed project would provide 20 mgd of additional sustainable capacity to meet drought year demands, and would provide up to an additional 42 mgd of peak capacity to meet emergency demands. Based upon projected demands, it is anticipated that the wells would be installed over a period of approximately 20 years, with an average of one or two wells being constructed every one to two years, on an as-needed basis. Zone 7 proposes to construct additional well capacity within the Main Basin in order to meet its reliability goals at demand levels associated with 2020 build out within its service area.

Lead Agency Contact

Name Matt Katen
Agency Zone 7 Water Agency
Phone 925-484-2600 x 234 **Fax**
email
Address 5997 Parkside Drive
City Pleasanton **State** CA **Zip** 94550

Project Location

County Alameda
City
Region
Cross Streets Portions of cites of Pleasanton and Livermore and unincorporated Alameda County
Parcel No. Portions of cities of Pleasanton and Livermore and unincorporated Alameda County
Township **Range** **Section** **Base**

Proximity to:

Highways I-580, I-680, SR 84
Airports Livermore Municipal
Railways UPPR
Waterways Chain of Lakes, Arroyo Las Positas, Arroyo del Valle, Pleasanton
Schools Foothill HS, Amador Valley HS, Harvest Park Int
Land Use The project area is located in portions of the Cities of Pleasanton and Livermore, and portions of unincorporated Alameda County. Within the City of Pleasanton, well fields are located in Residential, Commercial / Industrial, Open Space, Community Uses. Livermore land uses include Open Space / Agricultural, Public Uses, Vacant Public Uses, Vacant BCP and Development Commercial. The unincorporated portions of Alameda County are currently used as a quarry and gravel mining areas.

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Noise; Public Services; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Fish and Game, Region 3; Department of Parks and Recreation; Department of Water Resources; Caltrans, District 4; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Board, Region 2; Department of Toxic Substances Control; Native American Heritage Commission; Department of Health Services

Date Received 04/12/2004 **Start of Review** 04/12/2004 **End of Review** 05/26/2004

Note: Blanks in data fields result from insufficient information provided by lead agency.

RESPONSE TO: STATE CLEARINGHOUSE, MAY 27, 2004

A-1 Comment acknowledged. No Response Necessary

THE CITY OF

PLEASANTON©

Comment Letter B

May 28, 2004

Mr. James Concannon, President
& Zone 7 Board of Directors
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588-5127

RE: City of Pleasanton Comments on Zone 7's Draft Environmental Impact Report (DEIR) for the Agency's Well Master Plan.

Dear President Concannon and Members of the Board:

The City of Pleasanton would like to thank you for the opportunity to review and comment on Zone 7's DEIR for the agency's Well Master Plan. While we understand the desire of Zone 7 to construct more wells in the main groundwater basin (Main Basin) to meet future objectives, we believe the stated purpose and portions of the agency's draft environmental review have a number of inconsistencies and flaws. These are discussed in more detail in this comment letter on the DEIR. The comments generally center around (a) the lack of analysis and mitigation projects to mitigate the salt buildup from use of these wells over the Main Basin, (b) the disregard for mitigation to delivered water quality from both Zone 7's existing and proposed new groundwater wells, (c) the purported purpose to only use these wells for drought, emergency or reliability situations, and (d) Zone 7 continuing to develop more groundwater pumping wells before projects are in place to mitigate past water quality differences and salt management policies of the Zone.

Through implementation of the Well Master Plan, Zone 7 will assume a significantly greater role in regulating the location and design of wells based on areas of impact by new Zone 7 wells and the notion that wells must accommodate "historic low" groundwater elevations experienced in the 1960s when the basin was in overdraft. The City considers the increased oversight and the constraints on well owners to be negative consequences of the project that are not justified in the DEIR. On the use of "historic low" groundwater elevations as a means to judge impacts, Zone 7 has introduced what the City views as an unrealistic and unjustified threshold by which to judge impacts.

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Comment Letter B

The following are the City of Pleasanton's comments regarding the information presented in the subject document presented according to the major areas of concern:

Project Objectives, Purpose and Alternatives

1. The stated purpose of the project is to assess the impacts of the expansion in groundwater production facilities by Zone 7 to increase reliability and redundancy of the water system during drought years or in the event of an emergency. The purpose is incomplete and inaccurate. The increase in groundwater usage by Zone 7 was described and acted upon as part of Zone 7's Water Supply Planning Program Environmental Impact Report. In that EIR, Zone 7 increased its use of the Main Basin from solely meeting a drought period or peak summer day demand to a new water supply meeting approximately 20% of the maximum day demand of its treated water customers. This new conjunctive use of the Main Basin was a major concern of the City of Pleasanton in a number of areas. One of these areas was the change in delivered water quality that this change of use would have on water delivered to the City and to the Dublin San Ramon Services District from Zone 7's use of new wells to meet this new conjunctive use supply. At that time, Zone 7 committed that the changes in delivered water quality for this new use would be mitigated by including the use of Aquifer Storage and Recovery (ASR) wells such that these wells would bring the groundwater hardness levels to the same as the surface treated water the Zone was planning on injecting into these wells. Shortly thereafter, Zone 7 drilled and began operating its first ASR well, only to find that this technology failed. However, Zone 7 has continued to drill new groundwater supply wells without any mitigation to the delivered water quality committed to as part of its WSPP EIR. The Final EIR must include projects that will mitigate the impacts to delivered water quality as part of the project to construct these new wells to take the place of the committed ASR well mitigation within the WSPP.

B-1

B-2

2. The Final Environmental Impact Report (Final EIR) must include in the stated purpose that these new wells (as have all the wells that Zone 7 currently own or operate) are needed to serve existing and new average day and peak demands on the Zone 7 treated water system. The purpose is clearly evident in many portions of the DEIR document, and specifically described in Section 3.1. Hence, these new wells, like Zone 7's existing wells, represent a new supply of water from the Zone's historical usage of the Main Basin. The DEIR is inadequate in its analysis of the impacts to delivered water quality and to groundwater quality to meet water demands during all different hydrologic periods (wet years, normal years, etc) from these new project wells and the environmental impacts of developing this new supply need to be addressed in the Final EIR.

B-3

3. The DEIR lacks the acknowledgement that the new project wells will be used by Zone 7 during normal operations under existing and new demand periods when the other imported or treatment plant water supply options are not available to the Zone. With this being the case, the DEIR is inadequate in its analysis of the impacts to delivered water quality and to groundwater quality to meet water demands during not only the different hydrologic periods (wet years, normal years, etc) but also during times of the year when the South Bay Aqueduct (SBA) is shut down, when water quality problems in the SBA, Delta or Lake Del Valle occur, or when Zone 7's two water treatment plants are not operational. Including two of the four uses of these wells in the proposed Project rather than all four uses (prolonged drought, emergency, day-to-day average and peak day demands, and day-to-day operational needs) does not address all of the environmental impacts to the project. The Final EIR must include these other uses and the additional environmental impacts, such as delivered water quality and other groundwater quality impacts, such as salt buildup for periods other than during an emergency or a one or six-year drought, must be addressed. **B-4**

4. The project purports to increase reliability under various drought and emergency scenarios. But left out of the analysis is the reduced demand associated with public awareness during those same periods. The Final EIR must address the impact of voluntary or mandatory cutbacks in consumption during average year, as well as during the single year, multiple-year drought or an emergency. The potential lower demand under average, drought or emergency conditions should be acknowledged and the impacts to the project design should be described and assessed in the Final EIR as a project alternative. **B-5**

5. The DEIR indicates that Zone 7 will review the appropriateness of criteria used to size the project (for example, whether supplying 75 percent of the Valley's maximum day demand, or MDD, is the best project target) as well as to identify other sources to develop reliability. The Final EIR must include this review to fully assess reliability criteria before proposing a project or program to implement the criteria. Secondly, the Final EIR should study and assess the alternatives for developing reliability in one document, rather than a separate, subsequent document. **B-6**

6. The DEIR appears to assume that all of the municipal wells will be used during the various water supply scenarios and then it bases its mitigation on only the incremental increase by Zone 7 of its existing and new wells to meet different demand periods. Since Zone 7 does not have control over the use and timing of use of the existing municipal wells, the Final EIR must analyze and address the Zone having to meet demands as if the municipal wells were not being pumped during the four supply scenarios. **B-7**

7. Since the Reduced Alternative met most of the stated objectives of the Project, we believe the Reduced Alternative may be superior when the costs and environmental mitigation needed to meet the other Project goals and policies of Zone 7 are included. The Final EIR needs to address the savings in costs between the Proposed project and the Reduced Alternative including the costs for water quality treatment needed for hardness mitigation. B-8

8. The DEIR states that the project only relates to the reliability of water supplies but does not provide a new water supply that could affect the rate, location or timing of growth within the Zone 7 service area. However, Zone 7's EIR for its Water Supply Planning Program (WSPP), which is part of the current environmental review by reference, did increase Zone 7's use of the groundwater basin (from just meeting peak day or drought demands to meeting 20-25% of the total treated annual demands) and this change is being used to serve new growth. This fact is also described in a number of areas within the DEIR, and specifically in Section 3. Since environmental impacts on groundwater quality and delivered water quality of this increase use of groundwater by Zone 7 were not mitigated, the Final EIR must contain specific projects that can mitigate the environmental impacts to groundwater and delivered water quality. B-9

9. The DEIR states that Zone 7 is currently proposing both a recycled water storage project and new groundwater production wells in the same general area-the Chain of Lakes area. While this may be able to be "permitted" by regional or state water quality and health agencies, local public opinion regarding mixing of groundwater supplies with any form of recycled water (and this was for reverse osmosis treated wastewater, not tertiary treated wastewater) was recently an extremely contested environmental issue in the Tri-Valley. The Final EIR must analyze these environmental issues if the Zone is proposing these two uses are going to be built in the same area before finalizing the Final EIR for the subject Project. B-10

10. It is noted in the DEIR that at build-out the Chain of Lakes will provide 84,000 acre-feet of storage. The Final EIR must state the role of the Chain of Lakes in Zone 7s water master planning in terms of system storage and capacity in relation to the proposed Project. Furthermore, the Final EIR must analyze whether, at build-out, if basin storage will increase as a result of filling the Chain of Lakes to the extent that current storage (240,000 af) will increase and whether this has been factored into the modeling? B-11

Water Quality Impacts

1. The Administrative Draft EIR for the WMP clearly stated that the project wells will be used for salt mitigation purposes. However, this stated purpose has been omitted from the DEIR. This omission is fatal in that one of the stated Zone 7 salt management strategies is to pump more groundwater and the past practices of the Zone has not differentiated between wells used for salt management and wells used or other purposes. The Final EIR must discuss this fact, since the Zone does B-12

not and we believe cannot (due to its current lack of surface water conveyance and water treatment plant capacities) differentiate their wells between wells being pumped for salt mitigation and those being used for average day and peak day demands, emergency, reliability, or for drought supplies. B-12

2. In relation to the failure to discuss salt mitigation issues, there is no analysis contained in the DEIR that reviews the salt buildup that will occur from irrigation with groundwater from these new wells over the Main Basin, or one of the Fringe Basins that drain or have an impact on salt buildup to the Main Basin. The impact of this additional salt appears to be in direct conflict with the Salt Management Policy approved by the Board on August 18, 1999. The Salt Management Policy directed Zone 7 staff to mitigate the then current 2000 tons per year of salt buildup in the main groundwater basin, and to mitigate the buildup (then projected at 200 tons per year) in future years. Currently, the annual salt buildup in the main groundwater basin is approximately 4,000 tons per year, and there are no mitigating projects approved for construction by Zone 7. Using additional groundwater over the Main Basin also adds to the concentration of salts in the Main Basin, and this significant environmental impact is missing from the DEIR document. The Final EIR must include the analysis and mitigation of the impacts to the Main Basin groundwater quality when these new wells are used for any or all four purposes mentioned above. B-13

3. The DEIR also states that the preferred project is better and perhaps more cost-effective than the Zone relying upon future imported water supplies and additional treatment. However, the DEIR does not address the treatment costs (from a hardness standpoint) needed to pump the additional groundwater during any of the four pumping scenarios for which these new wells will be used. This is inconsistent with Zone 7's recently adopted Water Quality Policy and other contractual conditions of Zone 7's treated water supply. These documents and policies clearly state that Zone 7 will work toward equalizing delivered water quality throughout its treated water delivery system and supply water with hardness in the range of 75 to 150 milligrams per liter. These new wells, without hardness mitigation designed in, are in direct conflict with these stated goals. Hence, the Final EIR needs to add this failure to mitigate hardness as part of the Project and the alternatives. B-14

4. The DEIR states that groundwater pumping by Zone 7 is used for salt management purposes. As stated in Zone 7's past Salt Management Plan (SMP) documents, following the first two years of operation (2000-2002), Zone 7 will include groundwater demineralization to meet its increase in conjunctive use of the groundwater basin to mitigate impact to delivered water quality and salt balances. The continued use of the Main Basin by Zone 7 by constructing these new wells is a significant impact, given the fact that no wellhead demineralization is currently in place or being constructed. Hence, additional conjunctive use of the groundwater by Zone 7 for any purpose will mean a significant environmental impact without identifiable mitigation. The Final EIR must include mitigation for B-15

any increase in pumping from the groundwater basin proposed by Zone 7 as it relates to stated mitigation in the SMP to delivered water quality. B-15

5. From a groundwater quality standpoint, the groundwater quality objectives, currently defined in the Basin Plan, are not to exceed 250 milligrams per liter (mg/l) of total dissolved solids (TDS). The DEIR analysis and modeling purports to be consistent with the Basin Plan, but the DEIR does not indicate how and why it is consistent, especially given the fact that many municipal and private production wells (including Zone 7's) are close to or over the 500 mg/l amounts. The Final EIR for the Project must address and analyze the alternatives based upon how these new wells will be mitigating the impacts to the existing groundwater quality, which is considerably higher than the 250-mg/l standard. B-16

6. The DEIR only analyzes the impacts regarding water quality on "produced" water quality from these new wells. It then concludes that the environmental impact of "delivered water quality differences" is less than significant. The DEIR also discusses water quality treatment in terms of the need to chloraminate the water coming from the wells. Further groundwater pumping by Zone 7 creates water quality degradation to those receiving this groundwater on the west side of the Zone's treated water delivery system. This was noted in the City's past written comments to Zone 7 concerning previous well construction projects, the Notice of Preparation for this DEIR, the Zone's Salt Management Plan, our comments to Zone 7's EIR for its Water Supply Planning Program (WSPP), and our written comments on the Zone's Water Quality Management Program (all of which are included by reference in this correspondence). The DEIR fails to propose any projects or mitigation so that these new wells meet the other "goals" and "policies" of the Zone (including offsetting the current salt loading in the basin, maintaining or improving groundwater mineral quality, maintaining or improving delivered water quality, or providing comparable delivered water quality to all retailers). Merely stating that changes to "delivered water quality" is "Less than Significant with Mitigation", and suggesting that the mitigation is continued coordination with retailers, as well as "pursue implementation" of the Salt Management Plan (with no wellhead demineralization project in sight or approved for construction) is devoid of analysis. Specific projects for mitigation of this significant environmental impact must be part of the Final EIR. B-17

7. The DEIR only analyzes the impacts regarding water quality on "produced" water quality from these new wells. We see no recognition, analysis or mitigation for the groundwater quality and delivered water quality impacts from the concentration of salts over and in the Main Basin by using water from these new wells (or the existing wells constructed to meet Zone 7's 1999 Water Supply Master Plan) for irrigation over the Main Basin. As Zone 7 has stated in a number of studies, use of groundwater within the Main Basin for irrigation purposes only acts to concentrate the salts over the Main Basin (as the water used for irrigation evaporates or transpires, the salts are left behind). Zone 7 does not have projects in place to control the current salt loading other than continued B-18

pumping of groundwater. In addition, as Zone 7 has acknowledged, the salt buildup has doubled by phasing out of past gravel quarry pumping. This is a major oversight of the current DEIR The Final EIR needs to assess, analyze, and provide mitigation for adding the salts over and into the Main Basin from the water that these new wells will contain separately and in conjunction with these other Main Basin salt loading problems. B-18

8. The DEIR indicates, in the Deep Aquifer TDS (total dissolved solids) Concentration Figures, that the deep aquifer water quality will degrade considerably by pumping the existing wells and also when pumping the existing wells and adding the new wells. It then concludes, since there isn't much change between the two scenarios (with existing wells and adding new wells), and the fact that environmental degradation improves with shallow aquifer wells (that have not even gone through the environmental process), that there is no significant environmental issue. However, the fact that this environmental degradation in the deep aquifer TDS concentration is not being mitigated does not warrant the conclusion that these new wells are not making it "that much worse". The Final EIR for these new wells must address this significant environmental degradation and provide projects to mitigate this issue. B-19

9. The Modeling Scenario Conditions (Average Year-Peak Day Demands, Single or Six-Year Drought Demands or Surface Water Outage) do not include the significant environmental impact modeling for changes in delivered water quality. The Final EIR must address this issue and provide mitigation for the changes that will take place in delivered water quality during these three Project scenarios plus the Average Year-Day-to-Day Operational Needs (when the water treatment plants are down for any reason) that these new wells will be providing. B-20

10. The Modeling Scenario Conditions (Average Year-Peak Day Demands, Single or Six-Year Drought Demands or Surface Water Outage) do not include the significant environmental impact modeling for the water quality degradation to the Main Basin of adding additional salts over and into the Main Basin by using additional, saltier groundwater over the Main Basin. The Final EIR must address this issue and provide mitigation for the changes that will take place in groundwater and delivered water quality during the three Project scenarios plus the Average Year-Day-to-Day Operational Needs that these new wells will be providing when the water treatment plants, SBA, or Delta/Lake Del Valle supplies are not available for any reason. B-21

<u>Impacts to Groundwater Levels, Wells and Land Subsidence</u>

1. For impacts under this category, predicted drawdown of groundwater levels is based on Zone 7's groundwater flow model that had been developed previously. While the DEIR does not present a basis on the capability of the model to address the stated purposes of the WMP, (nor does it comment on the level of confidence that Zone 7 views its predictive capabilities) the City has taken the impact B-22

predictions at face value and focused on mitigation measures to assess whether potential impacts are properly addressed. Furthermore, the City has reviewed the mitigation measures and how they might perform if impacts are under-predicted by the modeling effort. Nevertheless, it would be useful to clarify the basis for the modeling work by describing or referencing the status of the model in terms of calibration and verification of results. B-22

2. The analysis in the DEIR on impacts and mitigation for the entire basin's lower water levels during various pumping scenarios is based upon the relative impacts to existing wells in relation to "historic lows". The City considers this approach to be flawed, in that if fails to recognize that many municipal and private wells were not designed to operate at levels close to "historic lows", a proposed criterion based on overdraft in the 1960s before surface water was made available in the Valley. The City considers it to be unreasonable for Zone 7 to assert that existing or new wells should accommodate 1960s groundwater levels and that Zone 7 will not be responsible for impacts induced by its wells as long as they don't exceed drawdowns to those levels. The "historic low" does not have any environmental significance other than as a point in time and it is one that is no longer germane to the setting. B-23

3. The City has informed Zone 7 about problems that past Zone 7 groundwater pumping has had on the City's delivered water quality and production levels from our City owned wells and Zone 7's groundwater pumped into the City's system. However, Zone 7 has not offered any mitigation for these past negative impacts. Now, with the current project of adding more Zone 7 groundwater pumping, the Zone is offering to "minimize potential interference" and offer the City Zone 7 pumped groundwater. This is clearly a "take" of an existing right that the City now enjoys with its existing and any proposed new well that it chooses to develop. B-24

4. The DEIR states that if there is an impact from pumping new project wells and/or lowering the groundwater basin levels to below our City well's capability to effectively operate, the Zone will offer us water. The DEIR fails to recognize that the City's use of our existing wells are made to meet a number of different demand, pressure, water quality and other conditions that may not be possible to be met by Zone 7 just offering to replace the water, from a volume standpoint, from their system. The Final EIR must analyze and address this impact to the City prior to concluding this impact is less than significant. B-25

5. The DEIR analyzes the interference impacts of adding new production wells placed near existing wells only upon their "mutual interference" potential. The DEIR continues to state that this is the only impact that will exist, but as assurance, it proposes to mitigate this potential through "monitoring". Consistent with our comments on the ADEIR, the Final EIR must clearly state what action Zone 7 will take in the event that water levels are induced to levels that are deemed "too low". It is unclear if Zone 7's monitoring will mean that pumping B-26

will be shifted or discontinued, as stated with respect to subsidence under Mitigation 3.3-1b. The Final EIR must address this deficiency. B-26

6. We appreciate that Zone 7 may wish to mitigate this Project's impact to one of our City-owned wells. However, the stated mitigation does not address our daily operational needs that require the City to be flexible in utilizing all or each of its wells at any time and on any given day. The mitigation stated does not appear to offer us this flexibility or the independence we now have and need to meet the water service demands of our system and customers. Further, considering that the modeling used to assess potential impacts would be considered a planning level tool to be upgraded as new data becomes available, mitigation of impacts to operation of any City well at any time (which is what we now enjoy) must be included in the Final EIR. B-27

7. The City has not determined what water level impact or water quality impact is sufficient to trigger mitigation. The DEIR does not provide documentation for a basis for such a trigger and the stated levels of water level influence, for example, may not be satisfactory or appropriate. The Final EIR must address mitigation to the City for any demonstrated adverse water level or water quality impact that pumping these new wells cause. B-28

8. In order to address land subsidence, the DEIR proposes implementing a Subsidence Monitoring Program. Also, it appears that the DEIR is using the fact that the Project, in not drawing levels below "historic lows" (although this is not ruled out in the DEIR) there will not be any subsidence issues (although there are reservations in the DEIR to indicate the opposite may be true). The "historic low", as stated in the DEIR, is a policy parameter, and not an environmental impact indicator. We believe the Final EIR needs to clearly state what mitigation will be proposed if subsidence is induced and causes property damage. Related to this, and equally important, is to know what Zone 7 has determined to be significant with respect to subsidence impacts? The DEIR needs to note that land uses (from farm land to major commercial regional business complexes) and the value of land and improvements in the Tri-Valley area, and especially in Pleasanton, have grown geometrically since the 1960's (the time period given for the historic lows). B-29

9. The DEIR states that mitigation of impacts on future wells will be controlled in part by constraining new well construction (i.e., the elevation of well screens). As this policy potentially impacts the City's ability to locate and pump from new wells, it is seen as an adverse condition with respect to flexibility to operate a distribution system. The Final EIR must offer mitigation for this impact. B-30

10. The City's concerns over water level and water quality influences, subsidence, and constraints on wells point to the need for a more cooperative approach to criteria used in the planning of the subject project. It is not apparent, for example, that the individual well performances and histories were considered in the impact analysis other than the elevation of well screens. Further, 20 feet of influence, apparently allowable in the project design, is not acceptable to the City, given the fact that previous comments on the issues to the City of the Zone lowering the entire basin's water level during past hydrologic or operational cycles. B-31

11. The DEIR appears to incorrectly assert that the City can operate its wells as long as the net positive suction head is maintained for the pump. This threshold is not realistic as neither Zone 7's wells or the City's wells operate without additional head over the pump suction to account for other groundwater fluctuations and the occasional degradation in well specific capacity. For example, in some cases it may be operationally desirable to maintain 20 to 50 feet of head over the pump intake. B-32

Project Implementation

1. The new wellfield areas identified on the DEIR are large and broad. Because we can't identify specific land use or other environmental impacts until more specific locations are identified on a "project" level basis, the current DEIR "wellfield area" approach can only be considered at a "program" level EIR. Without identifying the wellfield locations more specifically, the DEIR is only a Program, not a Project DEIR. B-33

2. The City has major concerns regarding the construction, design, noise and traffic impacts of wells located in or near residential areas. The DEIR states that the construction will require 24 hour drilling and other activities. Depending on the distance to sensitive areas, this could be a significant impact that must be mitigated. The Final EIR should include a noise analysis addressing the impacts and contributors to noise generation and mitigation measures for those well sites adjacent to sensitive areas such as residential neighborhoods. Alternatives to 24-hour drilling need to be explored, or mitigation provided to nearby residents if the 24-hour drilling is required. B-34

3. A conditional use permit and design review approval by the City are required for each of these facilities before they are built. Mitigation for impacts to the residents would include attractively designed facilities that include landscaping on the site. All new equipment outside of a building should be effectively screened. The specific well site location should include compliance with the Americans with Disabilities Act for sidewalk blockage by trucks during construction activities as well as mitigation for commercial driveway widths following construction. B-35

4. Any hazardous materials delivered, stored or used within the wellfield areas or at any of the wellfield locations within the cities of Livermore and Pleasanton must be identified and reviewed to assure compliance with the hazardous material requirements of the Livermore/Pleasanton Fire Department. B-36

5. If new wells are considered in the City of Pleasanton, as additional mitigation for impacts to the residents of Pleasanton, a small footprint for both the well and any related treatment facilities should be used (the 50 by 50 foot layout in lieu of the 100 by 150 foot layout). B-37

We support the goal of Zone 7 to increase reliability and redundancy of the water system during drought years or in the event of an emergency. However, as previously stated, the DEIR does not address many of the impacts nor provide mitigation to Zone 7's current use of the groundwater basin for water supply, let alone providing impacts covered by adding more wells for water supply, emergency, redundancy or reliability.

The purpose of the DEIR is to assure that the options related to meeting these goals will be assessed and that the environmental impacts are fully evaluated. We hope before Zone 7 proceeds with further environmental review or approval of this Program or any specific well Projects, that the City's concerns and issues are addressed so that the Final EIR adequately addresses and provides mitigation for all of the City's concerns.

Sincerely,

Tom Pico

Tom Pico
Mayor

c: Matt Katen, Zone 7
Councilmembers
Deborah Acosta McKeehan, City Manager
Michael Roush, City Attorney
Rob Wilson, Director of Public Works
Brian Swift, Director of Planning and Community Services
Stephen Cusenza, Utility Planning Manager
Tony Rossmann, Attorney at Law

B. RESPONSE TO: TOM PICO, MAYOR, CITY OF PLEASANTON, MAY 28, 2004

B-1 Comment acknowledged. Please refer to **Master Response 2.1, Project Objectives**. The project objectives are clearly stated in Section 2.3 of the DEIR Project Description, page 2-9. Additionally, an extensive discussion of Zone 7's Reliability Goals is provided on pages 2-4 and 2-5. Zone 7, as Lead Agency under CEQA, has discretion to determine the goals and objectives of the proposed project.

B-2 Comment acknowledged. Please refer to **Master Response 2.3, Relationship to 1999 WSSP EIR.** Implementation of an ASR program was not formally adopted by the Zone 7 Board of Directors as mitigation for delivered water quality. Rather, this program was identified in the context of Zone 7's continued interest in working with its Retailers on delivered water quality issues. Please refer to **Master Response 2.2** for further discussion regarding Zone 7's Water Quality Management Programs

B-3 Comment acknowledged. Section 3.0, Groundwater, Hydrogeology, and Water Quality includes discussion of average year operations, single year, drought year, and emergency pumpage scenarios, and provides analysis of groundwater conditions under these scenarios, including resulting effects to groundwater quality. Under the proposed project, Zone 7 would continue to use the groundwater basin to meet peak day demands and its Reliability Goals, as adopted by the Zone 7 Board in May 2002. With respect to delivered water quality, please refer to **Master Response 2.2, Zone 7's Water Quality Management Programs.**

The commenter characterizes implementation of new wells, and Zone 7's conjunctive use of the Main Basin, as a new water supply. The Well Master Plan does not provide a new water supply; rather, it provides a facility plan that will allow Zone 7 to recover the surface water supplies that Zone 7 has stored in the Main Basin's aquifers at appropriate rates to meet its reliability goals under future demands, and to recover them without exceeding the groundwater basin's historical low groundwater elevations.
Zone 7 has been implementing conjunctive use, i.e., recharge of State Water Project supplies through artificial stream recharge, with subsequent recover of stored supplies using wells since completion of the South Bay Aqueduct in 1968. Zone 7 pumps from the amount of water stored through it recharge activities. Currently, this management has increased stored groundwater volumes within the basin by 65 thousand acre-feet (TAF), as identified in Figures 3.1-3 and 3.1-4 of the Draft EIR. As such, the groundwater Zone 7 pumps from the Main Basin is from the volume of surface water that it has previously recharged through its artificial recharge program. This practice of Zone 7 storing surplus surface water in the groundwater basin for subsequent use will continue into the future whether or not the Well Master Plan is implemented.

B-4 Comment acknowledged. Please refer to Response B.3 above. The commenter asserts that peak day or operational outage scenarios are not examined, and that these conditions could result in impacts to groundwater quality due to salt loading. Groundwater modeling conducted to determine resulting groundwater elevations and TDS levels provided in Draft EIR Section 3.0 include an average year scenario, which includes average year peak day demands. Modeling for emergency conditions, which include

treatment plant or SBA outages, include the emergency conditions (facility outage) and capture the scenarios identified by the commenter. As noted in Master Response 2.2 and 2.4, Zone 7 currently meets U.S EPA and CDHS drinking water standards, and project implementation will not substantially alter or reduce delivered water quality. For the purposes of CEQA, these standards serve as thresholds of significance. As such, potential impacts associated with delivered water quality are less than significant, and no mitigation is required. Similarly, analysis of potential changes in groundwater quality associated with Well Master Plan indicated no substantial change in future projected TDS levels within the Main Basin. Therefore, potential impacts are less than significant. However, as noted in **Master Response 2.4, Impacts to Delivered Water Quality**, Zone 7 proposes the following mitigation measure to ensure that delivered water quality is not adversely affected by implementation of the Well Master Plan.

Mitigation Measure 3.1-5b. Zone 7 shall commission a "Groundwater Influence on Delivered Water Quality Study" to examine the effects to the aesthetic parameters (TDS, hardness, and other constituents affecting taste and odor) of water quality delivered to Retailer turnouts as a result of Zone 7's groundwater production from the Main Basin, including any wells constructed as part of Zone 7's Well Master Plan program. Zone 7 will provide a draft of the work plan for the Groundwater Influence Study to the Zone 7 Retailers for their review/comment no later than 120 days following the startup of the first well constructed under the Well Master Plan program. Zone 7 shall finalize the work plan after an evaluation of Retailer comments, and proceed with the Study

The Groundwater Influence Study shall be completed before any more than two wells are constructed under the Well Master Plan program. The Study shall be made available to the Zone 7 Retailers in draft form at least 60 days prior to its scheduled presentation to the Zone 7 Board. The Study, whether accepted or not by the Zone 7 Board, shall be deemed, for the purposes of environmental review, to be "new information" as defined in CEQA Guidelines 15162; as such, this information must be considered by the Zone 7 Board as part of the process defined in CEQA Guidelines 15162 prior to any action to approve any more than two wells under the Well Master Plan program.

B-5 Comment acknowledged. Goal 1 of Zone 7's Reliability Policy is to meet 100% of demands during a credible drought scenario. This policy, as established in cooperation with Zone 7's Retail Agencies, does not account for conservation savings during a drought year. This represents a conservative planning approach, and provides an additional safety factor in Zone 7 reliability planning for drought year conditions. It should be noted that Zone 7's municipal demand is considered "hardened" due to the implementation of conservation measures by the general public, and water demands during historical drought years have not been substantially reduced. However, Goal 2, which is for emergency conditions, does assume 25% conservation under emergency conditions.

Zone 7 encourages water conservation programs, and will continue to support Retailer Agencies in the implementation of these programs. However, from a water supply planning standpoint, Zone 7 will continue to plan according to the Reliability Policies set forth by its Board of Directors, in consultation with Retailer Agencies.

B-6 Comment acknowledged. Well Master Plan identifies a facility plan that meets both Goal 1 and Goal 2 of Zone 7's Reliability Policy as stated in DEIR Section 2.0. Please refer to **Master Response 2.1, Project Objectives** regarding Zone 7's Reliability Policy, and both the Proposed Project and Reduce Project's ability to meet those objectives.

B-7 Comment acknowledged. Zone 7's reliability goals include the groundwater pumpage contractually established for each Retailer. While it is acknowledged that Zone 7 does not have control over the use and timing of municipal wells, it is reasonably anticipated that retailers would pump at least their pumping quotas during average and drought year scenarios, and their maximum capacity, to the degree operationally feasible, during emergency conditions. Pumping quotas for each retailer have been established through contractual agreement; therefore, they have been appropriately accounted for in development of both Zone 7's Reliability Policy, and the groundwater modeling conducted during development of the Well Master Plan. This represents a reasonable approach and is consistent with the previous Retailer delivery requests. Zone 7 does not have the responsibility to maintain additional well capacity in the event that Retailers are not able to pump their allocated capacity during a given hydrologic condition. This approach would result in well capacity beyond that necessary to meet Zone 7's Reliability Policy Goals.

B-8 Comment acknowledged. Please refer to **Master Response 2.1, Project Objectives.** As noted in Section 6.0, Alternatives, implementation of the Reduced Alternative would meet Goal 1 of Zone 7's Reliability Policy, and would provide approximately 50% of the Zone 7 Maximum Day Demand (MDD) at buildout. As noted in Master Response 2.1, Project Objectives, the revision of Zone 7's Reliability Policy Goal 2 provides for consideration of the Reduced Project Alternative. It is anticipated that the Reduced Project Alternative would reduce construction of 3 to 8 potential well sites, depending upon the actual production capacity provided by each individual well implemented. This would reduce the environmental impacts associated with the number of wells implemented. The cost differential between the Proposed Project is provided in Section 6.0, Alternatives. It should be noted that analysis of socioeconomic factors is not required under CEQA, except where they can be demonstrated to have an environmental impact. However, project costs can be included in the consideration of alternatives. Based upon an estimated cost of $2 million per well, implementation of the Reduced Alternative would reduce program implementation costs by between $6 and $16 million. With respect to the request for inclusion of water quality treatment needed for hardness mitigation, no mitigation is required for implementation of the Well Master Plan. As noted in Master Comment 2.2, Water Quality Management Programs, implementation of the Demineralization Facilities would provide ~~an~~ additional salt removal and delivered water quality management tools. The cost associated with these facilities would be roughly equivalent under either the Proposed Project or the Reduced Project Alternative, and is identified in the August 2004 Capital Improvements Program at an estimated cost of $ 60.5 million for all phases.

Implementation of the Reduced Alternative would not provide a "cost savings" that can be dedicated to other uses. Rather, implementation of the Reduced Alternative would reduce the overall capital expenditure of the Well Master Plan over time, including fees passed onto Retailer Agencies and developers.

B-9 Comment acknowledged. Please refer to **Master Response 2.3, Relationship to the Water Supply Planning Program EIR**. Policy decisions relating to the provision of adequate water supply to meet demands within the Zone 7 service area, the potential for growth associated with provision of supplies, and its secondary effects, were made as part of the certification of that EIR, and are not being revised or revisited by the Well Master Plan. Additionally, the use of 20 to 25 percent of groundwater to meet current and projected demands is not a goal relating to growth. The increase in groundwater production is a goal identified in the Salt Management Plan. This goal will assist Zone 7 in maintaining an annual "net zero balance" for salt loading to the Main Basin, and will assist in the stabilization of TDS levels throughout the entire groundwater basin.

The ability for Zone 7 to meet current and future projected demands has been accomplished, and will continue to be accomplished using a multi-source strategy that relies primarily on purchase and import of surface water supplies. Zone 7 disclosed the potential secondary effects of importing water supplies to meet projected demands associated with build out under the approved General Plans within the Zone 7 service area in the WSPP EIR (Zone 7, 1999). Municipal groundwater production within Zone 7 does not serve growth. Rather, groundwater storage and recovery through Zone 7's conjunctive use program is used as the mechanism for storage and treatment of these imported supplies, thereby providing the capability to meet Zone 7's reliability goals.

It should be noted that conjunctive use is a management strategy currently used by Zone 7 to address salt loading associated with use of imported surface water supplies. This approach in and of itself, and coupled with other salt management tools identified in the Salt Management Plan, provides a mechanism for stabilizing annual salt loading to the Main Basin, thereby avoiding continued degradation of groundwater quality due to TDS increase. This management strategy is being used to maintain delivered water quality over time to Zone 7 Retailer Agencies. Please refer to **Response 2.2, Zone 7 Water Quality Management Programs,** for further discussion of water quality management.

B-10 Comment acknowledged. The potential for storage of recycled water within the Chain of Lakes area using one of the gravel mining pits has been previously reviewed by several agencies within the Livermore Valley, including Dublin San Ramon Services District (DSRSD) and Zone 7. In general, Cope Lake has been identified as having the greatest potential for recycled water use, due to its clay lining, which limits connectivity with groundwater. However, no project has ever been formally proposed for recycled water storage within the Chain of Lakes area. Approximately 10 private wells are currently located within the Gravel Pit and Chain of Lakes Wellfields. Establishment of potable water supply wells could present a constraint to the future implementation of recycled water storage within the Chain of Lakes area, as any future storage facility would be required to demonstrate that it would not adversely affect potable municipal and private water supply wells within the vicinity. Demonstration of this would be required irrespective of the construction of additional wells within the Chain of Lakes area, and any future action regarding recycled water storage within the Chain of Lakes would be subject to independent CEQA review.

B-11 Comment acknowledged. The Chain of Lakes will likely provide several water supply, water quality, storage, and flood control benefits; however, the specific configuration and use of the Chain of Lakes has not yet been determined. In their final form, the Chain of Lakes could provide up to 84,000 af of surface water storage. However, this surface

water storage capacity would not increase the available groundwater storage of the Main Basin and surface water within the Chain of Lakes cannot be directly accessed as a supply for wells under the Well Master Plan. Rather, the Chain of Lakes represents a conveyance and recharge facility to move surface water supplies into groundwater storage. As such, the Chain of Lakes represents an important recharge source to the Main Basin, and is included in the groundwater modeling conducted for the Well Master Plan.

B-12 Comment acknowledged. The DEIR circulated on April 12, 2004, with filing of a Notice of Completion and Notice of Availability, is the document of legal record under CEQA. Comments regarding previous courtesy drafts that have been provided to Zone 7 Retailers do not address the analysis of environmental impacts contained in the DEIR of legal record. With respect to the definition of Project Objectives, please refer to **Master Response 2.1, Project Objectives.** Zone 7 does not need additional well capacity to meet salt removal goals established under the Salt Management Plan. The differentiation between salt removal wells and production wells, as requested by the commenter, is not germane to the analysis, as all groundwater pumpage by Zone 7 contributes to the salt removal goals established by the Salt Management Plan.

B-13 Comment acknowledged. Salt loading associated with the use of groundwater over the Main Basin was reviewed as part of Zone 7's Salt Management Plan. As stated on page 5-1 of the SMP:

"Salts are removed from the Main basin as water is pumped from wells or gravel mining pits. Some of the extracted municipal pumpage and associated salt (25-30%) is returned to the basin in that portion used for irrigation over the Main Basin. The remainder of the pumpage and salts is either used inside the home and then exported as wastewater in LAVWMA pipeline....."

As such, the salt load associated return flows from irrigation of groundwater supplies has been accounted for in the modeling, and management tools, established in the Salt Management Plan. Additionally, the salt transport modeling conducted for the Well Master Plan, and presented in Section 3.1, Groundwater Hydrogeology and Water Quality, included adjusted TDS levels to account for the use of groundwater at levels identified under the Well Master Plan. The results of this modeling indicate that implementation of the Well Master Plan is salt neutral, and that implementation of additional wells would not substantially affect TDS distribution or transport within the Main Basin aquifers.

Conjunctive use is a management measure currently used by Zone 7 to address salt loading associated with use of imported surface water supplies. This approach in and of itself, and coupled with other salt management tools identified in the Salt Management Plan, provides a mechanism for stabilizing annual salt loading to the Main Basin, thereby avoiding continued degradation of groundwater quality due to TDS increase. Another management tool identified in the SMP is the use of groundwater demineralization. Zone 7's Mocho Demineralization Facility has been identified and funded within the approved Capital Improvements Program (CIP). Please refer to **Master Response 2.2, Zone 7 Water Quality Management Programs,** for a discussion regarding the implementation status of the Demineralization Facility to further address salt removal goals.

B-14 Comment acknowledged. The analysis provided in Section 6.0, Alternatives, provides a comparison of capital costs for the Well Master Plan versus an alternative consisting of surface water storage and conventional treatment. Treatment and annual operational costs for groundwater supplies or surface water supplies are not examined. As noted in the analysis contained in Section 6.0, implementation of a surface water treatment plant with capacity levels necessary to meet Zone 7's reliability goals would have an estimated capital cost of approximately $60 million, or approximately twice that of the Well Master Plan. From a capital cost standpoint, this alternative is not superior to the proposed project. If this comparison is extended to treatment costs, conclusions are similar due to the comparatively lower cost of groundwater treatment, even when hardness removal is included. Surface water supplies require multi-stage filtering processes (coagulation, settling, sand filtration) prior to disinfection. This results in higher capital costs associated with treatment plant construction, as well as higher life cycle costs associated with this treatment process. It should be noted that this alternative would be dependant upon the acquisition of additional surface water supplies from outside the Zone 7's service area. These supplies would be subject to the same reliability issues during drought years, and would not provide the emergency reliability for storage within the Zone 7 service area. Under drought year and emergency scenarios, groundwater provides a reliable, cost effective, local supply source that meets all Federal and State water quality criteria. Please refer to **Master Response 2.4 Impact to Delivered Water Quality** regarding hardness mitigation.

B-15 Comment acknowledged. See **Master Response 2.2, Zone 7 Water Quality Management Programs,** regarding the current status of the Demineralization Facility project, and Master Response 2.4, Impacts to Delivered Water Quality. The Well Master Plan provides a facility plan that will allow Zone 7 to meet its Reliability Goals without exceeding the groundwater basin's historical low groundwater elevations. Although the Well Master Plan has been developed consistent with other Zone 7 goals, such as salt removal goals, it is not required in order to meet those goals, nor does it alter Zone 7's ability to meet those goals. Therefore, no mitigation is required.

B-16 The commenter cites the San Francisco Bay Basin Plan Water Quality Objective for groundwater within the Alameda Creek Watershed. This Water Quality Objective, is established as a long-term objective for naturally occurring groundwaters. Groundwater quality within the Main Basin has been degrading due to existing irrigation practices and natural inputs. The long-term average net salt loading rate was identified at 4,500 tons/year in 2003. This average is expected to increase to 5,400 tons/year by 2010 as a result of urban and rural growth. This is equivalent to about a 10 mg/L per year increase in TDS in the groundwater. The current term average TDS for groundwater within the Main Basin is 450 mg/l. In issuing the Master Recycled Water Permit, the RWQCB acknowledged that groundwater conditions are not consistent with the stated objective contained within the Basin Plan. The Well Master Plan would not alter or affect TDS levels within the Main Basin, and would not contribute to groundwater degradation; as such, it is consistent with the Basin Plan. Rather, the Well Master Plan allows for conjunctive use of the Main Basin by providing the appropriate number and geographic distribution of well facilities to allow Zone 7 to recover stored water supplies without exceeding historical groundwater levels. Zone 7 has conducted and concluded an exhaustive analysis of groundwater quality and salt management in the Salt Management Plan. Management tools established in the SMP, including conjunctive use and groundwater demineralization, will assist Zone 7 in establishing an annual "net

zero balance" for salt loading to the Main Basin, and will assist in the stabilization of TDS levels throughout the entire groundwater basin.

B-17 Comment acknowledged. Please refer to **Master Response 2.4, Impacts to Delivered Water Quality.** With respect to Zone 7's management of delivered water quality, please refer to **Master Response 2.2, Zone 7 Water Quality Management Programs.** Page 3.1-34, Mitigation Measure 3.1-5b.

B-18 Comment acknowledged. Please refer to **Response B.13** above. The salt content of the applied irrigation water was adjusted in the model and runs according to the percentage of groundwater assumed for Zone 7 deliveries. With respect to Zone 7's management of delivered water quality, please refer to **Master Response 2.2, Zone 7 Water Quality Management Programs.**

B-19 Comment acknowledged. Please see **Master Response 2.5, Impacts to Groundwater Quality**.

B-20 Comment acknowledged. Please see **Master Response 2.4, Impacts to Delivered Water Quality**.

B-21 Comment acknowledged. Please see **Response B.13** above.

B-22 Comment acknowledged. The basis of the Well Master Plan modeling, including discussion of calibration, is described in *Technical Memorandum – Livermore Valley Groundwater Basin Model v2.0,* prepared by CH2M-Hill, June 29, 1998. This document is incorporated by reference in the Well Master Plan, which was circulated to Retailer Agencies with the DEIR. As a Retailer Agency, Pleasanton has been periodically briefed on model development, which has included model versions since the original modeling effort (Version 1.0) for DSRSD in 1995. With respect to calibration, the Main Basin portion of the model was already well-calibrated in Version 1.0 (DSRSD, 1996). Three major changes were made in Version 2.0 (1998) that required additional model calibration: 1) expanding the model area, 2) converting gaining streams and gravel pits to MODFLOW's drain package, and 3) converting Layer 1 to an unconfined layer type and Layers 2 and 3 to convertible confined/unconfined layers. A summary of revisions made to support Version 2 and calibration efforts include:

- Hydraulic conductivity in fringe basins
- Storage coefficients in fringe basins
- Layer Types
- Fault conductance
- Representation of gaining streams and gravel pits as specified fluxes/drains
- Gaining stream gravel pit bottom elevations
- Layer thickness

These parameters were adjusted to match three sets of calibration targets

- Nine calibration wells with observed head data covering the entire 20-year span of the historical simulation
- Horizontal gradients shown in groundwater level maps produced by Zone 7

Conclusions of this TM indicate that Version 2.0 provides a three-dimensional groundwater flow and solute transport model allowing for simulation of groundwater management operations, including analysis of wellfield development alternatives and salt management strategies. Version 2.0 was then translated to Groundwater Vistas (GWV) for the Well Master Plan.

After the Visual MODFLOW (VMOD) model was translated to Groundwater Vistas (GWV), a comparison was made of calculated water levels at select calibration wells. This comparison indicated that water levels for the two models were generally within 5 to 15 feet throughout their runs. The results of this calibration comparison and CH2M Hill's review of the input parameter sensitivities indicated that changes in parameters were not necessary at this time. Therefore, no additional calibration of the GWV model was performed for the Well Master Plan modeling.

B-23 Comment acknowledged. The historical low is not a point in time, as referenced by the commenter. It is a composite of the historical low groundwater elevations experienced within the Main Basin, and included low water levels from the late 1960's through 2000. As noted on DEIR Page 3.1-28, historical groundwater elevations have been approached in portions of the Main Basin following drought periods in 1977 and 1991, and most recently in 2002, following reduced recharge during SBA outages. Zone 7 has established maintenance of groundwater levels above this historical low as an operational practice. In general, Zone 7 recharge operations have maintained, and will continue to maintain, groundwater levels within the same operating zones that have been experienced over the past 30 years, i.e., above historical low groundwater elevations, with groundwater elevations approaching the historical low only during extended drought periods. Without Zone 7 management, the current storage surplus of 65,000 acre feet would not be available within the Main Basin. Zone 7's management would continue to maintain the historical benefit of higher groundwater levels to pumpers within the Main Basin. Zone 7 is not responsible for the effectiveness of individual wells within the Main Basin under any groundwater conditions, including surplus groundwater conditions that have occurred in the Main Basin due to Zone 7 conjunctive use practices.

B-24 Comment acknowledged. Zone 7 is not responsible for ensuring the adequacy of individual wells to operate at the historical low groundwater elevations that have been experienced in the Main Basin. Zone 7's historical conjunctive use practices have maintained a historical benefit to pumpers within the basin. Project implementation would allow Zone 7 to meet its Reliability Goals, which have been established in coordination with, and to the benefit of, Retailer Agencies. Zone 7's management of the Main Basin will continue to benefit pumpers by maintaining groundwater level within an established operating zone. Therefore, no "take", as characterized by the comment would occur.

B-25 Comment acknowledged. Based upon review of Pleasanton's distribution system, the City has three municipal wells located in close proximity to Zone 7's Vineyard pipeline between Pleasanton Turnout No. 1 and Pleasanton Turnout No. 5. These wells are located away from the City's storage reservoirs at Sycamore, Foothill, and Tassajara, which serve Pleasanton's lower pressure zone. Based upon their location relative to storage facilities, it appears that the City's well pumpage is used for peaking purposes

directly into the retailer distribution grid, and not for regularly scheduled time of day pumping into the storage reservoirs. If this is the case, substitution of Pleasanton well water with Zone 7 wholesaler water may not impact demand and pressure, and may in fact improve water quality in Pleasanton's distribution system. Zone 7 will continue to coordinate with the City of Pleasanton regarding this issue to identify potential operational opportunities to maintain service and improve delivered water quality.

B-26 Comment acknowledged. Impacts to individual wells associated with well interference will be avoided through well siting, as identified in DEIR Mitigation Measure 3.1-3a. Groundwater levels will be maintained above historical low levels, through management practices in conformance with **DEIR Mitigation Measure 3.1-1**. It should be noted that in the event lowered groundwater levels affect Pleasanton's well performance during extreme drought conditions, Pleasanton's pumpage, as well as other pumpers in the basin, will have contributed to this groundwater condition. Zone 7 is the only agency that is storing groundwater supplies for subsequent use. The remaining pumpers, including the Retailer Agencies, are pumping from the safe-yield of the basin, and may in fact, as an aggregate, be periodically exceeding the basin's annual natural inflow supply. In the event that groundwater levels affect the Pleasanton's ability to pump its groundwater quota, **DEIR Mitigation Measure 3.1-2a** provides for provision of the quota shortfall with groundwater pumped by Zone 7, in accordance with past practices and service agreements.

B-27 Comment acknowledged. As noted in DEIR Section 3.1, Zone 7 would work with the City of Pleasanton to maintain appropriate levels of water service under varying hydrologic conditions. Analysis of potential average year and drought scenario conditions indicate that resulting groundwater levels, while maintained above the historic low, could affect well operation, depending upon specific well design details. Zone 7 would continue to pump Independent Quotas (IQs) for its retailers, as appropriate, and in conformance with its current water supply contracts. As noted in DEIR Section 3.1, under current California groundwater law, all pumpers are responsible for the maintenance of their individual well facilities. Zone 7 is not responsible for ensuring the adequacy of individual wells to operate at the historical low groundwater elevations that have been experienced in the Main Basin. It should also be noted that these historical low groundwater levels would not be exceeded, due to Zone 7's management of groundwater storage.

B-28 Comment acknowledged. Please refer to **Master Response 2.4, Impacts to Delivered Water Quality, and to Response B.26 and B.27 above.**

B-29 Comment acknowledged. Zone 7 acknowledges the land costs within its service area have substantially increased since the 1960s. Zone 7 will continue to minimize the risk of discernable inelastic subsidence through maintenance of groundwater levels above historical lows. It should be noted that Zone 7 has historically operated the Main Basin above the historical low, and subsidence has not been observed within the basin. Maintenance of groundwater levels above historical lows is a management method being implemented by other agencies within the region, including Santa Clara Valley Water District. Additionally, implementation of the Well Master Plan would allow Zone 7 to geographically shift pumpage to maintain water levels above historical lows. In the event that discernable property damage relating to inelastic subsidence can be conclusively verified and attributed to Zone 7 operations, Zone 7 would be required to

compensate property owners to the extent required by California law and common law. Implementation of the Subsidence Monitoring Program, as required in Measure 3.3-1a through 3.3-1c, will assist Zone 7 in continuing to manage groundwater production and conjunctive use operations to minimize this risk, to the degree feasible.

B-30 Comment acknowledged. Zone 7 currently reviews and issues permits for wells located within the Valley, including review of well screen design. This review is within Zone 7's existing authority, and does not constitute a constraint to well development by either the City of Pleasanton or any other pumper. No mitigation is required.

B-31 Comment acknowledged. Based upon modeling of the six year drought at buildout, it is anticipated that Zone 7 would maintain groundwater levels above the historical low, consistent with current practice. As such, analysis of individual well performance and histories to characterize potential impacts is not required. The potential effect identified by the commenter represents the maximum potential influence based on typical well size, and would only occur in the event new production wells are located within 500 feet of existing wells. The likelihood of actual implementation within this proximity is low; however, it has been identified as a minimum proximity in order to characterize potential impacts. Well placement will include site-specific modeling of individual well sites during the course of Well Master Plan implementation in order to minimize the potential for well interference. With respect to drawdown of the Main Basin under drought year and emergency scenarios, modeling for the Well Master Plan indicates that resulting water levels in the vicinity of the City's wells would be greater than 20 feet above historical low. Therefore, the potential 20 feet of interference that could be associated with siting of a new well within 500 feet of existing facilities would not result in exceedance of historical lows at the City wells. As previously noted in **Response B.27**, all pumpers are responsible for the maintenance of their individual well facilities under current California groundwater law. Zone 7 is not responsible for ensuring the adequacy of individual wells to operate at the historical low groundwater elevations that have been experienced in the Main Basin.

B-32 Comment acknowledged. Based upon modeling of the six year drought at buildout, it is anticipated that Zone 7 would maintain groundwater levels well above the historical low. This will be confirmed and ensured through modeling at specific well sites. As noted in **DEIR Section 3.1**, under current California groundwater law, all pumpers are responsible for the maintenance of their individual well facilities. Zone 7 is not responsible for ensuring the adequacy of individual wells to operate at the historical low groundwater elevations that have been experienced in the Main Basin.

B-33 Comment acknowledged. The project description is developed to a degree of specificity to allow for analysis and full disclosure of the nature and level of environmental impact that would be associated with construction and operation of well sites within each wellfield. This includes mapping of each individual wellfield using existing streets and other appropriate landmarks, and examination of impacts within the context of existing land use and conditions within each wellfield. The EIR establishes mitigation measures to reduce impacts, typically to a less than significant level. Given the level of detail provided regarding well construction, facility design and appearance, and well operation, the use of wellfields to fully disclose impacts and identify appropriate mitigation measures is appropriate. As such, both the project description and analysis

meet the requirements of State CEQA Guidelines 15124, Project Description and State CEQA Guidelines 15161, Project EIR.

Per State CEQA Guidelines 15162, Zone 7 is responsible for review of individual facility location, design, and operation with respect to whether individual well sites and their operation are consistent with the analysis presented in this EIR. As provided for in CEQA Guidelines 15162, a subsequent or supplemental CEQA document would be required if the Lead Agency determines that new significant impacts, or a substantial increase in the severity of the previously identified significant impacts would occur.

B-34 Comment acknowledged. Please refer to **DEIR Sections 3.7, Noise, Section 3.8, Traffic and Circulation, and Section 3.12, Visual Resources**, for a complete analysis of construction related impacts. DEIR Section 3.7, Noise, includes an extensive discussion regarding the need for 24-drilling operations, the equipment types and levels of noise associated with 24-hour drilling, and establishes specific mitigation measures to be implemented to address this short-term impact, including notification of residences within 1,000 feet of drilling locations, installation of temporary sound barriers with a STC of greater than 25, and offer of temporary lodging for residences exposed to greater than 65 dBA DNL, estimated at 400 feet from mitigated drilling location. No additional analysis or mitigation is required for construction related impacts.

B-35 Comment acknowledged. Wellfields identified under the Well Master Plan are located both within and outside of the City of Pleasanton city limits. A Conditional Use Permit (CUP) from the City of Pleasanton is not required in order to implement proposed facilities. Zone 7 is exempt from City of Pleasanton Building and Zoning Ordinances per Government Code section 53090 and 53091. With respect to visual impacts, DEIR **Mitigation Measures 3.1-12a through 3.12-1d** establish enclosure and screening requirements to integrate proposed facilities with surrounding and minimize visual impacts. Additionally, **Measure 3.12-1c** includes coordination with affected jurisdiction regarding design of proposed well facilities. No additional analysis or mitigation is required.

B-36 Comment acknowledged. As stated in **Mitigation Measure 3.9-4a**, well facilities constructed under the Well Master Plan would, by law, conform to appropriate regulations and statutes from federal, state, and local agencies, including the City of Livermore and Pleasanton Fire Departments. Consistent with existing Zone 7 facilities, all storage of hazardous materials will be in accordance with Uniform Fire Code requirements. No additional analysis or mitigation is required.

B-37 Comment acknowledged. The footprint of individual well sites will be dependent on well type (onsite treatment vs. offsite treatment), and, to a lesser degree, specific property configuration and size. Zone 7 will continue to work with the City of Pleasanton during design review phases to implement facilities that are consistent with surrounding land uses. No additional analysis or mitigation is required.

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May 26, 2004

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MAY 28 2004

Mr. Matt Katen, Senior Hydrogeologist
Zone 7 Water Agency
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SUBJECT: Dublin San Ramon Services District Comments to:
"Zone 7 Water Agency Well Master Plan Draft Environmental Impact Report"

Dear Board of Directors:

The Dublin San Ramon Services District (DSRSD) thanks Zone 7 Water Agency (Zone 7) for the opportunity to review and comment on its "Zone 7 Water Agency Well Master Plan Draft Environmental Impact Report" (WMP-DEIR). DSRSD believes the overall "Program" being defined by the WMP-DEIR is of overwhelming importance to the Tri-Valley areas. DSRSD believes the Zone 7 WMP, if properly implemented, could have long term positive effects on the water quality of the water Zone 7 supplies to the residents and businesses of the Tri-Valley area through their Municipal and Industrial wholesale customers. DSRSD believes the information given below will assist the Zone 7 staff, and its Board of Directors, in their difficult planning decisions regarding the immediate need to improve the current water quality of its total water supply to all of its customers.

DSRSD is a municipal water purveyor providing potable and recycled water service to approximately 12,000 residential, commercial, industrial and institutional water retail customers within the City of Dublin, and the Dougherty Valley area of San Ramon. Approximately 50,000 persons reside within the DSRSD water service area. The number of water customers in the DSRSD service area is expected to increase by 75% over the next 10-years. In addition to water service, the DSRSD provides wastewater collection and treatment services for the City of Dublin, the southern portion of San Ramon, and wastewater treatment under contract with the City of Pleasanton. DSRSD also owns and operates a wastewater treatment plant in the City of Pleasanton that has a capacity of 17.0 million gallons per day (mgd). Combined, the DSRSD supplies potable and recycled water and wastewater services to approximately 140,000 persons.

Currently, the DSRSD receives its wholesale treated potable water supply from Zone 7, under a Municipal Water Supply Contract, dated August 23, 1994. The DSRSD retails the Zone 7 treated water supply to our current 12,000 customers (50,000 persons) as described above. As with most retail water companies, we receive feedback from our customers on how we are doing as water purveyor. The number 1 concern or complaint of our customers is water quality; more specifically, the complaints regard the hardness of the water, the hard chloride taste and

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sometimes-musty taste of the water, and the water spots left by the water after evaporation. Given our customers concerns regarding quality of their water supply, the DSRSD responses to the Zone 7 WMP-DEIR are focused on the effects the Zone 7 WMP will have on the degradation of the current and future water quality of the water Zone 7 supplies to its customers.

DSRSD Comments to the Zone 7 WMP

The DSRSD supports Zone 7's forward-looking planning effort to increase future reliability and redundancy of the water system to mitigate drought year or emergency potable water supply shortages to its customers. DSRSD believes the WMP-DEIR sufficiently addresses the need for some level of water supply reliability during a shortage event. Although, it does not appear the potential degradation of the water quality due to the proposed increase in groundwater pumping capacity has been sufficiently addressed in the WMP-DEIR. A municipal water supply must be reliable, but also must be safe and of the highest quality to be drinkable and useable by the customers.

Currently, DSRSD and other West Valley retailers receive the majority of the groundwater currently pumped by Zone 7; while the East Valley customers receive the majority of the higher quality treated surface water from Zone 7 via the South Bay Aqueduct. Zone 7's "Water Quality Policy" refers to meeting the requirements of their existing water supply agreements, which requires Zone 7 to blend its water supplies to serve equal water quality to all of its customers. The Zone 7 "Water Quality Policy" also states their groundwater supply will meet the State and Federal Secondary Drinking Water Standards' Maximum Contaminant Levels (MCLs). The Secondary Drinking Water Standards for groundwater recommends Total Dissolved Solids (TDS) to be below 500 mg/l; and there are no MCL standards for Hardness of the groundwater or for taste and odor. Zone 7's groundwater TDS range is 400-700 mg/l and Hardness range is 280-370 mg/l; while the Zone 7 treated surface water TDS average level is less than 230 mg/l and the average Hardness level is less than 100 mg/l. By comparison, the EBMUD water supplies average TDS levels are less than 50 mg/l and Hardness levels are less than 20 mg/l in areas adjacent to DSRSD service areas.

DSRSD believes the water quality issue is significant as it relates to the WMP. Secondary drinking water standards were set up for rural America wells so rural America could have drinking water supplies that meets minimum drinking water standards. DSRSD challenges Zone 7 to not simply aspire to meet the minimum safe drinking water standards, but to strive to attain treatment standards met by other Bay Area municipal water agencies; or at a minimum strive to meet its contractual obligation of having equal water quality throughout its service area. With that said, below are areas of the WMP-DEIR where DSRSD believes water quality will be significantly affected, and the WMP-DEIR needs to further address the actions required to mitigate the impacts to water quality.

Project Objectives and Project Alternatives:

1) The Project Objective/Goals sections of the WMP-DEIR should include a provision that states, "the increased groundwater production levels will not further degrade the current level of

C-1

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water quality of the groundwater supply, or the treated surface water supply, to Zone 7 current or future customers." **C-1**

2) The Project Objective/Goals sections should also include a provision that states "the increased groundwater production levels will be designed with adequate treatment facilities to obtain equal water quality throughout its service area for all of its current and future customers." **C-2**

3) The Project Alternatives section does not include degradation of the water quality in the project alternative evaluations. The project alternative evaluations should include potential degradation of the groundwater quality as a measurement in determining the feasibility or desirability of each alternative. **C-3**

4) The Project Alternatives section does not include mandatory deployment of permanent water conservation methods within the Zone 7 service area; or during periods of shortages, mandatory cutbacks, or rationing of water use percentages all of which may mitigate the significant impacts of the alternatives, or reduce the size of facilities required. The project alternative evaluations should include discussions of permanent conservation methods, and during periods of shortages discuss mandatory cutbacks or rationing of water use as a means to evaluate and compare the different project alternatives. **C-4**

5) The Project Alternatives section does not include the additional costs required for treatment of the additional groundwater to meet Zone 7's stated Water Quality Policy Hardness levels of 75-150 mg/l. It would be appropriate to include the treatment cost effects in each of the alternative scenarios. **C-5**

Groundwater Hydrogeology and Water Quality

1) The WMP states the increased pumping capacity could lower ground water levels to historic lows, which has the potential to cause subsidence and adversely affect water quality. The stated mitigation measure is to monitor the effects. Monitoring is not an adequate mitigation action to reduce the significance of subsidence and degraded water quality. The WMP-DEIR should state what measures or actions will be taken to correct the subsidence or reduced water quality. This is a common theme throughout the WMP-DEIR. **C-6**

2) The WMP-DEIR states the increased groundwater production will have the potential to adversely affect the groundwater quality supplied to its customers, such as increased TDS and Hardness levels, but notes the affects as less than significant with mitigations. The stated mitigation of discussing the water quality levels with the retailers is not an adequate mitigation measure. The WMP-DEIR should state exactly what treatment facilities will be installed, and to what MCL levels the treatment facilities will be designed to meet. Then the action will be measurable as to if it is adequate enough to mitigate the affect to less than a significant impact. Once again, DSRSD does not consider meeting Secondary Drinking Water Standards as adequate mitigation of potential degradation to the groundwater quality. **C-7**

Comment Letter C

To properly mitigate the affects of the increased pumping capacity on TDS and Hardness, would not demineralization facilities need to be designed and installed on each new well with a minimum size necessary to meet the Zone 7 stated water quality policy objectives for Hardness levels of 75-150 mg/l. **C-7**

3) The pumping amounts stated on page 2-13 versus that stated on page 2-26 in Chapter 2 do not agree. Page 2-13 states: "The Proposed project would provide **20 mgd** of additional capacity to meet drought year demands, and would provide an additional peak capacity of **42 mgd** to meet emergency demands." **C-8**

However, the first sentence of section 2.5.3 on page 2-26 states: "Well site development to meet the additional **35 mgd** identified would be phased over the next 20 years as water demands dictate within the service area." The statement on page 2-26 appears to be incorrect and should be updated.

Cumulative Impacts

1) There is no mention of the impacts to current and future water quality due to the increase of groundwater production by Zone 7. Clearly the increased groundwater production rates will lower the quality of water served to Zone 7's customers, mostly to its West Valley customers, due to the increase in delivered TDS and Hardness levels. This Cumulative Impact needs to be addressed and mitigation measures identified. **C-9**

Again, the DSRSD supports Zone 7's forward-looking planning effort to increase future reliability and redundancy of the water system in order to mitigate drought year or emergency potable water supply shortages. Although in contrast to Zone 7's WMP-DEIR findings, the DSRSD believes the increase in groundwater production does have a significant effect on the water quality delivered to its customers. The cumulative effects will be significant which will include an increase in TDS levels of the deep aquifer, more movement of salts over the groundwater basin and through the aquifer, and increased levels of TDS and Hardness to its customers. DSRSD would expect the Final EIR to adequately address specific improvements required to mitigate any impacts to the water quality of the water delivered to Zone 7 customers, and to meet the Zone 7 Water Policy Hardness levels of 75-150 mg/l.

Sincerely,

DAVID K. BEHRENS
Principal Engineer

DK/mb
cc: Dave Requa, DSRSD, Assistant General Manager
Steve Cusenza, City of Pleasanton

C. RESPONSE TO: DAVE BEHRENS, DUBLIN SAN RAMON SERVICES DISTRICT, MAY 26, 2004

C-1 Comment acknowledged. Please refer to **Master Response 2.1, Project Objectives** and **Master Response 2.2, Zone 7's Water Quality Management Programs.** Project implementation will not degrade the water quality of either the groundwater or surface water supplies, or to Zone 7 customers. No alteration of the project objectives is required.

C-2 Comment acknowledged. Please refer to **Master Response 2.1, Project Objectives** and **Master Response 2.2, Zone 7's Water Quality Management Programs**.

C-3 Comment acknowledged. Please refer to **Master Response 2.4, Impacts to Delivered Water Quality.**

C-4 Comment acknowledged. Please refer to **Master Response 2.1, Project Objectives.** Goal 1 of Zone 7's Reliability Policy is to meet 100% of demands during a credible drought scenario. This policy, as established in cooperation with Zone 7's Retail Agencies, does not account for conservation savings during a drought year. This represents a conservative planning approach, and provides an additional safety factor in Zone 7 reliability planning for drought year conditions. It should be noted that Zone 7's municipal demand is considered "hardened" due to the implementation of conservation measures by the general public, and water demands during historical drought years have not been substantially reduced. However, Goal 2, which is for emergency conditions, does assume 25% conservation under emergency conditions.

Zone 7 encourages water conservation programs, and will continue to support Retailer Agencies in the implementation of these programs. However, from a water supply planning standpoint, Zone 7 will continue to plan according to the Reliability Policies set forth by its Board of Directors, in consultation with Retailer Agencies.

C-5 Comment acknowledged. Please refer to **Response B.14.**

C-6 Comment acknowledged. Mitigation Measure 3.3-1b and 3.3.1c establish actions for Zone 7 to implement both to reduce the potential for inelastic subsidence to occur, and to alter pumpage in the event that inelastic subsidence is identified. Those measures include the following:

Measure 3.3-1b: Zone 7 shall maintain groundwater elevations above the historical low, consistent with its historical low operational policy. In the event that groundwater elevations approach historical lows at Zone 7 well locations, Zone 7 shall shift pumpage to other portions of the basin such that compliance with this policy is maintained.

Measure 3.3-1c. In the event that the Subsidence Monitoring Program identifies the potential for inelastic subsidence to occur at levels that could adversely affect overlying land uses, Zone 7 shall: a) shift pumpage to other portions of the Main Basin that are not approaching historical low groundwater elevations, or b) shall reduce pumpage levels such that the potential for subsidence to occur is reduced.

C-7 Comment acknowledged. Please refer to **Master Response 2.4, Impacts to Delivered Water Quality** and **Master Response 2.2, Zone 7 Water Quality Management Programs**.

C-8 Comment acknowledged. Typographical error. Text on page 2-26 has been revised as follows to correctly reflect the proposed capacity.

"Well site development to meet the additional 20 mgd of additional drought year capacity and 42 mgd of additional peak capacity for emergency demands would be phased over the next 20 years as water demands dictate within the service area.

Deleted: 35

C-9 Comment acknowledged. Please refer to **Master Response 2.4, Delivered Water Quality** and **Master Response 2.2, Zone 7 Water Quality Management Programs**.

Comment Letter D

CITY OF LIVERMORE

"Wine Country Since 1849"

ADMINISTRATION BUILDING
1052 S. Livermore Avenue
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MAYOR / COUNCIL
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CITY MANAGER
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CITY ATTORNEY
Ph: 960-4150 • Fax: 960-4180

RISK MANAGEMENT
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CITY CLERK
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COMMUNITY DEVELOPMENT
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Building Division
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Engineering Division
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Housing & Human Services Division
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Planning Division
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ECONOMIC DEVELOPMENT
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FINANCE DEPARTMENT
Ph: 960-4300 • Fax: 960-4309

FIRE DEPARTMENT
4550 East Avenue
Ph: 454-2361 • Fax: 454-2367

LIBRARY
1000 S. Livermore Avenue
Ph: 373-5500 • Fax: 373-5503

HUMAN RESOURCES
Ph: 960-4100 • Fax: 960-4105

POLICE DEPARTMENT
1110 S. Livermore Avenue
Ph: 371-4900 • Fax: 371-4950
TDD 371-4982

PUBLIC SERVICES
3500 Robertson Park Rd.
Ph: 960-8000 • Fax: 960-8005
Airport Division
636 Terminal Circle
Ph: 373-5280 • Fax: 373-5042
Golf Course Division
909 Clubhouse Drive
Ph: 373-5239 • Fax: 373-5203
Maintenance Division
3500 Robertson Park Rd.
Ph: 960-8020 • Fax: 960-8025
Water Resources Division
101 W. Jack London Blvd.
Ph: 960-8100 • Fax: 960-8105

May 26, 2004

RECEIVED
MAY 27 2004
ZONE 7, ACFC&WCD

Matthew W. Katen, Project Manager
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588-5127

Subject: Zone 7 Well Master Plan Review Comments

Dear Matt:

The City has completed their review of the Zone 7 Well Master Plan EIR. Our comments are summarized below.

Executive Summary:

1. Please include the proposed well spacing, well depth, location, screens to be used and transmission lines that will be used as well as the new well proximity to recycled water in the project description. Include any additional assumptions that were used in the well model that are pertinent to this report. **D-1** **D-2**
2. Please define the historic low water level and when it was established. **D-3**
3. Please explain how subsidence is monitored now and how the proposed mitigation monitoring will continue or increase the monitoring effort. **D-4**
4. Explain more clearly how the shallow and deep-water aquifers interact and how the salt-water extraction impacts the water quality of the deep-water aquifers. Please further clarify if and why this was a factor in determining the recommended alternative. Also clarify if treatment at any of the proposed well facilities will include demineralization. **D-5**

Draft EIR:

1. Please address impacts upon new development such as the Oaks Business Park. This project has been approved and will be constructed in the next two years. **D-6**
2. Please update the reference on page 3.2-15 citing the new Regional Water Quality Control Board Permit. The Alameda County Clean Water Program negotiated a permit dated February 2003 to implement the Phase II requirements (see letter attached). **D-7**

Comment Letter D

2. Land uses in Livermore were changed February 4, 2004 as part of the City's General Plan Update. Thank you for updating references to this. **D-8**
3. Update Page S-15 Item 3.4-7 to say: Construction on airport property requires City and FAA review and approval. A "Notice of Proposed Construction" FFA form # 7460-1 must be filed for all construction projects on and in the vicinity of an Airport. Please add note in EIR to coordinate with the City of Livermore to obtain FAA and any local agency approvals including encroachment or transportation permits that may be required. **D-9**
4. Update Page 3.4-26 to say: Facilities located on airport property at a location relative to the runway protection zone or adjacent to any operations; such as, taxiways or runways will require FAA & City approval. Property off of the Airport site may require FAA approval for construction/drilling operations per the Federal Aviation Regulation (FAR) Part 77. Please contact Jennifer Craven, Planning Division, (925) 960-4467, Jacqueline Solomon, Engineering Division, (925) 960-4513, Leander Hauri, Airport, (925) 373-5281 or myself for further clarification. **D-10**
5. Include the fact that many of the creeks are natural and owned and maintained by LARPD, the City of Livermore and private property owners as well as Zone 7. **D-11**
6. Please note that recycled water, provided by the City of Livermore, is currently used for irrigation in the areas north and south of the Las Positas Golf Course and Airport. **D-12**

Thank you for allowing us to review the draft EIR for the Zone 7 Well Master Plan. Please let me know if you need any additional information or have any questions. I can be reached at 925-960-4538.

Sincerely,

Pamela Lung

PAMELA LUNG, P.E.
Assistant Civil Engineer

Attachments

cc: Jim O'Toole, Environmental Science Associates, Senior Project Manager
Paul Spence, City of Livermore, Planning
Jennifer Craven, City of Livermore, Planning
Darren Greenwood, City of Livermore, Water Resources
Randy Werner, City of Livermore, Water Resources
Leander Hauri, City of Livermore, Airport Manager
Cheri Sheets, City of Livermore, Engineering
Jacqueline Andrews Solomon, City of Livermore, Engineering

PGL:pgl Let to Zone 7 -Well MP Review 5-26-04

California Regional Water Quality Control Board
San Francisco Bay Region

Winston H. Hickox
Secretary for
Environmental
Protection

Internet Address: http://www.swrcb.ca.gov
1515 Clay Street, Suite 1400, Oakland, California 94612
Phone (510) 622-2300 • FAX (510) 622-2460

Gray Davis
Governor

Attachment to Comment Letter D (referenced in Comment D-7)

Date MAR 0 5 2003
File No. 1538.09 (MLZ)

Certified Mail No. 70022410000265005288

Mr. Jim Scanlin
Management Committee Chair
Alameda Countywide Clean Water Program
951 Turner Court, Hayward CA 94545-2698

SUBJECT: ORDER R2-2003-0021 ISSUING THE ALAMEDA COUNTYWIDE NPDES MUNICIPAL STORMWATER PERMIT FOR THE ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM

Dear Mr. Scanlin:

On February 19, 2003, the Regional Water Quality Control Board, San Francisco Bay Region, adopted Order R2-2003-0021 issuing the Alameda Countywide NPDES municipal stormwater permit for the Alameda Countywide Clean Water Program. We thank you, the Program, and the Permittee staff for all the work toward improving the enclosed Order and making it something we can all support. We intend to continue the dialogue on how to best make this Order work, and will keep you posted on when we will hold our next meeting on new and redevelopment controls.

If you have any questions, please contact Myriam Zech of my staff at (510) 622-5684 or mlz@rb2.swrcb.ca.gov.

Loretta K. Barsamian
Executive Officer

Enclosure: - Adopted NPDES Permit, Order R2-2003-0021
- Summary of one-time requirements
- Standard provisions

cc (with enclosure): - Permittees Mailing List
- Fred Jarvis, EOA, Inc., 1410 Jackson Street, Oakland, CA 94612

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at http://www.swrcb.ca.gov.

Attachment to Comment Letter D (referenced in Comment D-7)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
ALAMEDA COUNTYWIDE NPDES MUNICIPAL STORMWATER PERMIT

ORDER R2-2003-0021
NPDES PERMIT NO. CAS0029831

FOR THE CITIES OF ALAMEDA, ALBANY, BERKELEY, DUBLIN, EMERYVILLE, FREMONT, HAYWARD, LIVERMORE, NEWARK, OAKLAND, PIEDMONT, PLEASANTON, SAN LEANDRO, UNION CITY, ALAMEDA COUNTY (UNINCORPORATED AREA), THE ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, AND ZONE 7 OF THE ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, WHICH HAVE JOINED TOGETHER TO FORM THE ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM.

D. RESPONSE TO: PAMELA LUNG, CITY OF LIVERMORE, MAY 26, 2004

D-1 Comment acknowledged. Please refer to Section 2.0, Project Description of the DEIR. As discussed in this Section, Zone 7 proposes to implement facilities to increase its well production capacity by up to 42 mgd through installation of 8 to 15 production wells over the next 15 to 20 years. The wells would be located within eleven wellfield areas identified in the Cities of Pleasanton, Livermore, and unincorporated areas of Alameda County. Well depths would be 300 to 800 feet deep, with well screens established within the lower aquifer using standard well screen mesh size and materials. Wells would be sited within individual wellfields to avoid potential effects to existing municipal supply wells. As established by Mitigation Measure 3.1-3a, new wells would not be located closer than 500 feet from existing municipal production wells.

With respect to proximity to recycled water, proposed wells could be located within proximity to future potential recycled water storage projects, such as those being considered at the Chain of Lakes. Compliance with Department of Health Services requirements, as established in **DEIR Mitigation Measure 3.1-7**, would reduce potential impacts to a less than significant level. In addition, proposed wells could be sited near recycled water irrigation systems operated by recycled water operators within the Valley, including Dublin San Ramon Services District and the City of Livermore, as long as conditions meet Department of Health Services requirements for drinking water sources. Please refer to Response B-10 for more discussion regarding this issue.

D-2 Comment acknowledged. Please refer to Section 3.1, Groundwater Hydrogeology and Water Quality, pages 3.1-15 through 3.1-19, which provides a summary of Groundwater Modeling Scenarios and Groundwater Modeling Approach. For additional information regarding development of the groundwater model, modeling assumptions, and results please refer to the Well Master Plan prepared by CH2M-Hill, which was distributed to all Retailer Agencies with the DEIR.

D-3 Please refer to DEIR pages 3.1-7 and 3.1-9, which provide a discussion of the historical low map presented in Figure 3.1-7 of the DEIR. As provided in this discussion, Zone 7 has developed a composite map, based upon available historical data, showing the lowest historical low water levels experienced at wells throughout the Main Basin. This composite map does not depict the historical low within a given hydrologic year. Rather it depicts the lowest groundwater level on record at various locations within the Main Basin. This composite map establishes the basin's historical low with respect to groundwater levels.

D-4 Comment acknowledged. Please refer to DEIR pages 3.3-9 and 3.3-10, which discusses current subsidence monitoring efforts by Zone 7. Consistent with its groundwater management role, and the implementation of pumping quotas and conjunctive use practices to recover groundwater levels from overdraft conditions occurring in the 1960s, Zone 7 has used the approach of maintaining groundwater levels above historic low elevations to minimize the potential for subsidence within the Main Basin. In 1995, a survey report by Altamont Land Surveyors reviewed available survey information from 41 benchmarks within the Main Basin for the following time periods: 1947 to 1974 (27 years); 1947 to 1965 (18 years); 1959 to 1974 (15 years) and 1964 to 1974 (10 years).

This data review indicated that although some subsidence has occurred within the Livermore Amador Valley due to historical overdraft conditions, it was largely elastic. In addition, subsidence has not occurred on the scale experienced at other overdrafted aquifer systems, such as Santa Clara or San Joaquin Counties. Zone 7 currently surveys benchmarks within its service area to monitor the potential for subsidence. This program will be augmented with techniques identified in **DEIR Mitigation Measure 3.3-1a**, which include:

The program would use a combination of the following technologies, or other appropriate technologies, to monitor ground subsidence.

- Establishment of benchmarks to be surveyed for elevation by Zone 7 or qualified engineers on a regular basis during both pumping and non-pumping seasons to assess the amount of subsidence and rebound.
- Establishment of key wells to be monitored for water level in real time during well operations
- Continued elevation survey of benchmarks at individual well locations to calculate land surface altitudes on an annual basis.

If determined necessary, the following measures would be implemented.

- Use of Interferometric Sythetic Aperture Radar (InSAR) or equivalent satellite imagery to measure magnitude and areal extent of land subsidence.
- Installation of extensometers to monitor annual changes in surface elevations. Borehole extensometers accurately measure compaction between land surface and the bottom of the borehole. Such devices can detect the level of subsidence occurring, allowing pumpage to be reduced or shifted to other portions of the basin.

D-5 Comment acknowledged. As stated in the DEIR Project Objectives, the Well Master Plan is proposed in order to meet Zone 7's Reliability Goals. The proposed Well Master Plan does not specifically include "salt-water extraction" as referenced by the commenter. However, the analysis provided in DEIR Section 3.1, Groundwater Hydrogeology and Water Quality, does discuss the potential future implementation of a Demineralization Facility by Zone 7, and the potential use of shallow wells to provide source water for this facility. Please refer to **Master Response 2.2** Zone 7 water quality management programs for more discussion regarding Zone 7's Demineralization Facility project.

D-6 Comment acknowledged. The Oaks Business Park is located within the Isabell Wellfield identified within the Well Master Plan. As noted in Section 2.0, Project Description, individual well sites would be located within identified wellfields based upon a number of parameters, including hydrologic, geologic, and environmental factors. Zone 7 intends to acquire property for implementation of well sites through purchase on a willing seller basis, to the extent feasible, although as a public agency, Zone 7 may also acquire property through its power of eminent domain, if necessary.

In the event that property on the Oaks Business Park were identified as a potential well site for implementation, impacts to this business park would be consistent with those impacts identified in Section 3.0. For long-term operational issues, such as noise, visual resources, and traffic, impacts would be consistent with those identified for surrounding

commercial land uses. Based upon the presence of wells throughout the Livermore Valley in a variety of land use settings, as well as the incorporation of mitigation measures established in DEIR Section 3.0, proposed facilities would be compatible with the land uses proposed at the Oaks Business Park. These impacts would be reduced to a less than significant level through the implementation of the mitigation measures identified in Section 3.0, and summarized in Section 1.0, Summary.

D-7 Comment acknowledged. Text of page 3-15 has been revised as follows:

This discharge is covered as a conditionally exempted discharge under the Alameda Countywide Clean Water Program, Program NPDES permit (Order R2-2003-0021 ~~97-030~~, NPDES Permit No. CAS0029831), which exempts uncontaminated pumped groundwater from the prohibitions outlined in the NPDES permit.

Page 3-15, **Measure 3.2-5a.**

Measure 3.2-5a: Due to their intermittent nature and source (untreated groundwater) well start up and shutdown discharges from individual well sites would be conditionally exempted discharge under the Alameda Countywide Clean Water Program, Program NPDES permit (Order 97-030, NPDES Permit No. CAS0029831). No additional mitigation is required.

D-8 Comment acknowledged. No response necessary.

D-9 Comment acknowledged. Please refer to Response D.10, below.

D-10 Comment acknowledged. Text has been revised as follows:

Page 3.4-26, First Paragraph, Impact 3.4-7

The City of Livermore Planning and Zoning Code Section 3-05-270, Heights of buildings and structures, subsection C states that "the height of structures located within 5,000 feet of any airport runway shall not exceed 40 feet (Ord. 1001, 1979; Ord. 442 § 20.80)." ~~Construction on airport property requires City and Federal Aviation Administration (FAA) approval.~~ Facilities located on airport property at a location relative to the runway protection zone or adjacent to any operations, such as; taxiways, or runways will require FAA & City approval. Property off the Airport site may require FAA approval for construction/drilling operations per Federal Aviation Regulation (FAR) Part 77. As the proposed well facilities would not exceed 15 feet, the project would result in less than significant impacts to airport operations. Implementation of Measure 3.4-1d, which requires Zone 7 to coordinate with local affected agencies regarding encroachment permits, including submittal of design drawings for review and comments, will ensure compliance with City of Livermore and FAA requirements. ~~Therefore, no mitigation measures are required or recommended.~~

D-11 Comment acknowledged. Zone 7 acknowledges that creek channels within the wellfields identified under the Well Master Plan are under varied ownership and may still retain natural features. No alteration of the impact analysis or its conclusions is required. Text has been revised as follows:

Page 3.2-2, First Full Paragraph, 6th Sentence

All of the channels in the planning area are improved as flood control facilities. In addition to the channels, there are many existing natural creeks in the area, and these natural creek channels are under varied ownership, including City of Livermore, City of Pleasanton, Livermore Area Parks and Recreation, and adjoining private property owners.

D-12 Comment acknowledged. Zone 7 recognizes that recycled water irrigation is currently in place on lands north and south of the City of Livermore Airport. Compliance with Measure 3.1-7a, which includes compliance with all applicable California Department of Health Services regulations, which includes pre-screening of potential well contaminant sources as part of well siting review, would reduce any potential effects associated with well location relative to recycled water systems within the Valley. No alteration of the impact analysis or its conclusions is required.

Comment Letter E

COUNTY OF ALAMEDA
PUBLIC WORKS AGENCY
DEVELOPMENT SERVICES DEPARTMENT
951 Turner Court, Room 100
Hayward, CA 94545-2698
(510) 670-6601
FAX (510) 670-5269

RECEIVED
MAY 1 3 2004
ZONE 7, ACFC&WCD

May 11, 2004

Mr. Matt Katen, Senior Hydrogeologist
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588-5124

Subject: Zone 7 Water Agency Well Master Plan Draft Environmental Impact Report

Dear Mr. Katen,

Reference is made to the Zone 7 Water Agency Well Master Plan Draft Environmental Impact Report, dated April, 2004. The Alameda County Public Works Agency has had the opportunity to review the Draft EIR and has the following comments.

1. Locations of wells, structures, pipelines within County Road Right-of-Way should be evaluated and approved by the County. Construction impacts and damage to County roads shall be mitigated. Improvements could range from shoulder widening to reconstruction of pavement. **E-1**

2. Additional review will need to be conducted when detailed plans and alignments for each well are available for review. **E-2**

3. Construction impacts to residents and commuters need to be evaluated and mitigated. **E-3**

This is the extent of comments received to date from the Road, Flood, Real Estate, Traffic, Maintenance & Operations, and Environmental sections of the Alameda County Public Works Agency. If there are any further comments prior to the comment due date, they will be forwarded. Thank you for the opportunity to review the Draft EIR.

Very truly yours,

Steven Hunte
Development Services

E. RESPONSE TO: STEVEN HUNT, ALAMEDA COUNTY PUBLIC WORKS AGENCY, DEVELOPMENT SERVICES, MAY 11, 2004

E-1 Comment acknowledged. Zone 7 would review proposed facilities located on County right of way with Alameda County Public Works with respect to potential impacts. Measure 3.4-1c and 3.4-1d, which requires restoration of disturbed areas to their pre-project condition and acquisition of appropriate encroachment permits would provide the mitigation referenced by the contractor. Improvements beyond pre-project conditions are not required.

E-2 Comment acknowledged. As provided for in Mitigation 3.4-1d, Zone 7 shall provide design to affected agencies for review and comment as part of their design review process. No additional analysis or text revision is necessary.

E-3 Comment acknowledged. Please refer to Section 3.8, Traffic and Circulation which reviews the anticipated level of impact associated with well facility implementation. Due to their short-term nature, and the inclusion of appropriate mitigation, including preparation of a Traffic Control Plan to address short-term traffic disruption, potential impacts would be reduced to a less than significant level. No additional analysis or text revision is necessary.

Comment Letter F

Katen, Matt

From: Carlin, Michael [mcarlin@sfwater.org]
Sent: Friday, May 28, 2004 1:35 PM
To: Katen, Matt
Subject: Zone 7 DEIR for Well Master Plan

San Francisco has the following comment:

"In reviewing the Draft Environmental Impact Report for the Zone 7 Water Agency Well Master Plan (April 2004), the SFPUC has the following comment: Under the environmental setting, impacts and mitigation section , the SFPUC believes the EIR should acknowlegde the SFPUC's groundwater rights in the Bernal Basin and discuss any potential impacts the project may have on these groundwater rights." F-1

F. RESPONSE TO: MICHAEL CARLIN, SAN FRANCISCO PUBLIC UTILITIES COMMISSION, MAY 28, 2004

F-1 Comment acknowledged. Section 3.1, Groundwater Hydrogeology and Water Quality discusses overlying property owner rights within the Main Basin. Zone 7 recognizes that SFPUC, as previous owner of the Bernal Property, maintains overlying property owner groundwater rights within the Main Basin, and continues to own appropriative groundwater rights for the Castlewood water system. Pumpage by existing SFPUC wells is factored into groundwater modeling conducted for the Well Master Plan, and summarized for the analysis presented in Section 3.1. As identified in Impact 3.1, implementation of the Well Master Plan is not anticipated to affect municipal well pumpage within the Main Basin under the majority of hydrologic conditions, including single-year and six-year drought scenarios. Therefore, no impacts are anticipated. No additional analysis of text revision is required.

Comment Letter G

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
Water Supply and Treatment Division
Land and Resources Management Section
1657 Rollins Road, Burlingame, Ca 94010 ♦ Tel: (650) 652-3209 ♦ Fax: (650) 652-3219

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PATRICIA E. MARTEL
GENERAL MANAGER

May 28, 2004

RECEIVED
JUN 0 2 2004

Matt Kenton, Senior Hydrogeologist
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588-5124

VIA FACSIMILE

Re: Draft Environmental Impact Report on the Zone 7 Water Agency Well Master Plan, SCH. No. 2002032163

Dear Mr. Kenton:

The City and County of San Francisco (CCSF) provides these comments on the Draft Environmental Impact Report (Draft EIR) entitled Zone 7 Water Agency Well Master Plan, prepared by the Zone 7 Water Agency.

The proposed project involves the installation of 8-15 new production wells to be constructed over a period of approximately 20 years, to increase well capacity and help ensure the reliability of the water system for Zone 7 customers, and to meet the drought year and emergency reliability goals at 2020 demand levels. The proposed new production wells potentially would be located in eleven wellfield areas that according to the Draft EIR, have been selected for examination. These areas include the following: Bernal, Hopyard, Valley Avenue, Mocho, Stoneridge, Martin, Busch Valley, Gravel Pit, Stanley Avenue, Chain of Lakes, and Isabel.

The San Francisco Public Utilities (SFPUC) is concerned about the effects new wells may have on the reduction of water levels, and potentially, a corresponding increase in energy costs for the Castlewood system. The SFPUC retained its overlying groundwater rights to the Bernal property when the property was sold several years ago to developers and continues to own appropriative groundwater rights for the Castlewood water system. Zone 7's water resource planning efforts should continue to account for these rights as part of the native groundwater yield of the subbasins where these rights are located. G-1

The CCSF has an ongoing interest in the proposed project and plans to provide more input in the future.

Very truly yours,

L. H. Schectel

Lori H. Schectel
Regulatory Specialist

Cc: Cheryl Davis, Joe Naras, Joanne Wilson, Steve Apperson, SFPUC
Josh Milstein, City Attorney's Office

G. RESPONSE TO: LORI H. SCHECTEL, SAN FRANCISCO PUBLIC UTILITIES WATER AND TREATMENT DIVISION, MAY 28, 2004

G-1 Comment Acknowledged. Comment acknowledged. DEIR Section 3.1, Groundwater Hydrogeology and Water Quality discusses overlying property owner rights within the Main Basin. Zone 7 recognizes that SFPUC, as previous owner of the Bernal Property, maintains overlying property owner groundwater rights within the Main Basin, and continues to own appropriative groundwater rights for the Castlewood water system. Pumpage by existing SFPUC wells is factored into groundwater modeling conducted for the Well Master Plan and summarized for analysis presented in Section 3.1. As identified in Impact 3.1, implementation of the Well Master Plan is not anticipated to affect municipal well pumpage within the Main Basin under the majority of hydrologic conditions, including single-year and six-year drought scenarios. Therefore, no impacts are anticipated. No additional analysis of text revision is required.

Comment Letter H

1262 Madison Ave.
Livermore, CA.94550-5020
May 28,04

to: Matt Katen,Senior Hydrogeologist
Zone 7 Water Agency

Comments re: Zone 7 Well Master Plan Draft EIR

For several years environmentalists have been looking forward to a study of impacts on groundwater quality in the Livermore-Amador Valley Basin when additional groundwater is extracted. Unfortunately this DEIR does not adequately address that issue.

Zone 7 staff and other water experts at state water conferences have said for decades that when water is pumped out of the central basin, the hydraulic barrier which holds the poor qualiity groundwater in the fringe basins is reduced. As a result the poor quality water is allowed to flow into the main basin where it will degrade water quality forever afterwards, or as a minimum impact, will create a problem which will be extremely difficult to mitigate. H-1

Valley residents, particularly in Pleasanton and in Dublin, are already concerned about the present poor quality groundwater which becomes their drinking supply.

The RWQCB has been urging Zone 7 to resolve the high salt load in the groundwater since the early 1990s. In 1999, 5 years ago, Zone 7 approved a Salt Management Plan to correct that problem. Unfortunately
no facilities have yet been built for de-mineralization and there is no plan yet for brine disposal. H-2

It seems logical to immediately begin implementing the de-min process and to evaluate its effectiveness to mitigate the present salt over-load in the basin before allowing any new wells or additional pumping from existing wells.

There is a semantic problem with some of the terms in the Draft EIR (p,3.1-23) : how can "monitoring" serve as "mitigation"?; how can "modeling" serve as "mitigation"?; how can the product of "new" wells not be considered "new" water? H-3

In Chapter 3.1 many impacts are considered "less than significant". These depend on implementation of the Salt Management Plan (1999) which has not been funded and is at least two or more years in the future. There should be a rational relationship and NO approval or construction of new wells until the present salt overload has been corrected and the proposed de-min process is proved to be satisfactory, sustainable, economical, and efficient. H-4

Comment Letter H

Another problem not addressed in the DEIR is using stored groundwater, our "savings" account,
to meet both ongoing and new demands for urban water deliveriy and to accommodate growth. Anyone dependent on using "savings" account funds to pay for ongoing monthly bills knows that it's a situation courting financial disaster. The same can be applied to use of groundwater resources. The result could be environmental and economic disaster. Does the public support that risk? H-5

Personally I concur with questions and comments raised by the City of Pleasanton in their letter of April 29,04, especiallly pages 3-5, as located in the Draft EIR.

Environmental groups which are likely to share these concerns are Livermore, Pleasanton, and Dublin League of Women Voters, Preserve Area Ridgelands Committee, Citizens for Balanced Growth, Protect our Water, and The Sierra Club Tri-Valley Regional Group.

Thank you for the opportunity to comment.

Margaret J. Tracy

Margaret J. Tracy
Former Zone 7 Board Member 1978-1994

H. RESPONSE TO: MARGARET TRACY, MAY 28, 2004

H-1 Comment Acknowledged. Please refer to **Master Response 2.5, Impacts Related to Salt Loading.**

H-2 Comment Acknowledged. Please refer to **Master Response 2.2**, **Zone 7 Water Quality Management Programs,** regarding the status of Zone 7's Demineralization Facility.

H-3 Comment Acknowledged. The DEIR establishes several monitoring actions and programs that will allow Zone 7 to provide more effective groundwater management within the Main Basin. Establishment of these monitoring programs will allow Zone 7 to meet the Reliability Policy Goals established with its retailers, and will provide the level of data necessary to make effective groundwater management decisions within the context of Zone 7's historical low operational policy. With respect to defining groundwater stored by Zone 7 as a "new water supply", please refer to **Master Response 2.3, Relationship to 1999 WSPP EIR**.

H-4 Comment Acknowledged. Please refer to **Master Response 2.2**, **Zone 7 Water Quality Management Programs,** regarding the status of Zone 7's Demineralization Facility.

H-5 Comment Acknowledged. Please refer to **Master Response 2.1, Project Objectives**.

CHAPTER 4
TEXT REVISIONS

4.1 INTRODUCTION

The following corrections/clarifications have been made to the EIR text. These corrections include: minor corrections made by the EIR authors to improve writing clarity, grammar and consistency; corrections or clarifications requested by a specific response to comments; or staff-initiated text changes to update information presented in the DEIR. The text revisions are organized by the Chapter and page number that appear in the DEIR. ~~Deleted text~~ presented in this section indicates text that has been deleted from the EIR. Text that has been added to this EIR is presented as underlined. For corrections initiated by a comment on the Draft EIR, references in bolded parenthesis refer to Draft EIR comment letters.

4.2 TEXT REVISIONS

CHAPTER 2.0 PROJECT DESCRIPTION

Page 2-26. Section 5.3.2 (**Comment C.8**)

"Well site development to meet the additional ~~20~~ mgd of additional drought year capacity and 42 mgd of additional peak capacity for emergency demands would be phased over the next 20 years as water demands dictate within the service area.

Deleted: 35

CHAPTER 3.1, GROUNDWATER HYDROGEOLOGY AND WATER QUALITY

Page 3.1-15, First Paragraph of Impact 3.2-5 **(Comment D.7)**

This discharge is covered as a conditionally exempted discharge under the Alameda Countywide Clean Water Program, Program NPDES permit (Order R2-2003-0021 ~~97-030~~, NPDES Permit No. CAS0029831), which exempts uncontaminated pumped groundwater from the prohibitions outlined in the NPDES permit.

Page 3.1-34, Mitigation Measure 3.1-5b (**Comments B.1, B.17, B.20, B.28, C.7, C.9**).

Mitigation Measure 3.1-5b. Zone 7 shall commission a "Groundwater Influence on Delivered Water Quality Study" to examine the effects to the aesthetic parameters (TDS, hardness, and other constituents affecting taste and odor) of water quality delivered to Retailer turnouts as a result of Zone 7's groundwater production from the Main Basin,

including any wells constructed as part of Zone 7's Well Master Plan program. Zone 7 will provide a draft of the work plan for the Groundwater Influence Study to the Zone 7 Retailers for their review/comment no later than 120 days following the startup of the first well constructed under the Well Master Plan program. Zone 7 shall finalize the work plan after an evaluation of Retailer comments, and proceed with the Study

The Groundwater Influence Study shall be completed before any more than two wells are constructed under the Well Master Plan program. The Study shall be made available to the Zone 7 Retailers in draft form at least 60 days prior to its scheduled presentation to the Zone 7 Board. The Study, whether accepted or not by the Zone 7 Board, shall be deemed, for the purposes of environmental review, to be "new information" as defined in CEQA Guidelines 15162; as such, this information must be considered by the Zone 7 Board as part of the process defined in CEQA Guidelines 15162 prior to any action to approve any more than two wells under the Well Master Plan program.

CHAPTER 3.2, SURFACE HYDROLOGY AND WATER QUALITY

Page 3.2-2, First Full Paragraph, 6th Sentence **(Comment D.11)**

All of the channels in the planning area are improved as flood control facilities. In addition to the channels, there are many existing natural creeks in the area, and these natural creek channels are under varied ownership, including City of Livermore, City of Pleasanton, Livermore Area Parks and Recreation, and adjoining private property owners.

CHAPTER 3.4, LAND USE

Page 3.4-26, First Paragraph, Impact 3.4-7 **(Comment D.10)**

The City of Livermore Planning and Zoning Code Section 3-05-270, Heights of buildings and structures, subsection C states that "the height of structures located within 5,000 feet of any airport runway shall not exceed 40 feet (Ord. 1001, 1979; Ord. 442 § 20.80)." ~~Construction on airport property requires City and Federal Aviation Administration (FAA) approval.~~ Facilities located on airport property at a location relative to the runway protection zone or adjacent to any operations, such as; taxiways, or runways will require FAA & City approval. Property off the Airport site may require FAA approval for construction/drilling operations per Federal Aviation Regulation (FAR) Part 77. As the proposed well facilities would not exceed 15 feet, the project would result in less than significant impacts to airport operations. Implementation of Measure 3.4-1d, which requires Zone 7 to coordinate with local affected agencies regarding encroachment permits, including submittal of design drawings for review and comments, will ensure compliance with City of Livermore and FAA requirements. ~~Therefore, no mitigation measures are required or recommended.~~

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SUMMARY

S.1 INTRODUCTION

This Draft Environmental Impact Report (EIR) assesses the potential impacts of the expansion of groundwater production facilities by the Alameda County Zone 7 Water Agency (Zone 7). The purpose of the proposed project is to increase reliability and redundancy of the water system such that treated water is available to Zone 7 customers when SWP water allocation are low during a drought year or in the event of an emergency.

This document has been prepared in accordance with the California Environmental Quality Act (CEQA) of 1970 (as amended), the State EIR guidelines, and California Administrative Code, Title 14, Division, Chapter 3. The Zone 7 Water Agency (Zone 7) is the lead agency for this CEQA process. Inquiries about the project should be directed to:

Matt Katen
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588

S.2 PROJECT BACKGROUND

Zone 7's service area comprises approximately 425 square miles in eastern Alameda County and includes the cities of Pleasanton, Livermore and Dublin as well as the surrounding unincorporated Alameda County lands. Today Zone 7 provides water supply to a population of approximately 175,000; this population is projected to increase to 253,000 by 2030.

Zone 7 conjunctively manages the Main Groundwater Basin (Main Basin) of the Livermore-Amador Valley by implementing an annual and long-term water Operation Plan designed to maintain a sustainable water supply and groundwater quality. During non-drought periods, Zone 7's operational practice is to maintain an equal balance of recharge and pumping, as well as to maintain sufficient managed storage for use during a multi- year drought.

Zone 7 implements conjunctive use on an annual basis through 1) artificial recharge of the Main Basin through releases of imported State Water Project (SWP) supplies to Arroyo Mocho and Arroyo Del Valle from the South Bay Aqueduct (SBA); and 2) subsequent recovery of stored groundwater through extractions from seven existing wells within the City of Pleasanton.

Increasing treated water (M&I) demands, reliability policies, and chosen salt management strategies have dictated the need for expansion of Zone 7's groundwater production facilities. Zone 7 will need additional well capacity to provide the operational flexibility to meet this projected demand within the context of its reliability goals. Existing Zone 7 reliability goals relating to groundwater management include the following: 1) Goal 1 – Water supply reliability (meet 100% of demands); and 2) Goal 2 – Groundwater production capacity (maintain 75% "Maximum-Day Demand" capacity).

In addition to these reliability goals, Zone 7 has adopted salt management strategies as part of its Salt Management Program. Zone 7 developed a Salt Management Plan (SMP) in 1998 to address the issue of salt accumulation. The Salt Management Plan was prepared to identify and evaluate salt loading to the groundwater basin, and potential mechanisms for salt removal.

S.3 PROJECT DESCRIPTION

Zone 7 proposes to increase its well production capacity by about 42 mgd through the installation of 8 to 15 new production wells. Based upon projected demands, it is anticipated that wells would be installed over a period of approximately twenty years, with an average of one or two wells being constructed every one to two years, on an as-needed basis. The well facilities would be located within eleven wellfield areas in Alameda County, in the cities of Pleasanton and Livermore, and unincorporated Alameda County (see **Table 2-3** in **Chapter 2**). Each production well would be 300- to 800-feet deep and consist of vertical turbine or submersible pumps with pumping rates in the range of 1,000 to 5,000 gallons per minute (gpm). The size of the well casings would depend on the pump diameters. Well sites would be implemented in two configurations: with onsite treatment and with offsite treatment. Well facilities would be fully enclosed to provide noise attenuation appropriate to surrounding uses. In addition, associated pipelines would be installed as part of the project.

S.4 PROJECT OBJECTIVES

The main objective of this project is to increase reliability and redundancy of the water system such that treated water is available to Zone 7 customers when SWP water allocation is low during a drought year or in the event of an emergency. The specific project objectives are as follows:

- Provide facilities to recover stored groundwater supplies from the Main Basin at a sufficient rate to meet Zone 7's reliability goals, as established in Resolution 02-2382. These goals are consistent with those used for the Zone 7 Water Supply Planning Program, and include:

  – **Goal 1:** Meet 100% of treated water customers water supply needs in accordance with Zone 7's most current contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan (UWMP), which will be coordinated with Zone 7's M&I Contractors. Zone 7 will endeavor to meet this goal during an average water year, a single dry water year, and multiple dry water years.

  - **Goal 2:** Provide sufficient Valley-wide groundwater production capacity (including Zone 7's and Contractors wells) to meet at least 75% of the estimated maximum daily M&I water demand.

- Maintain water levels within the Main Basin above the historic lows.
- Design and site proposed facilities to minimize potential interference to nearby wells during operations, to the degree feasible.
- Design and site proposed facilities to minimize potential effects to surrounding land uses during well development and operation, to the degree feasible.

S.5 ROLE OF THE EIR

Zone 7 intends to use this EIR to: a) support approval of the proposed project, and; b) provide the foundation for tiering future CEQA review and documentation on future development of additional wells for salt management as needed.

This EIR is intended to be used by the Zone 7 Board of Directors when considering approval of the proposed Project. To support its decision on the Project, the Board must prepare written findings of fact for each significant environmental impact identified in the EIR and must also adopt a mitigation monitoring and reporting program to ensure compliance with mitigation measures during Project implementation. The EIR is also intended to be used by responsible agencies that have review and permit authority over the Project. These agencies may include Regional Water Quality Control Board (RWQCB), Dublin-San Ramon Sanitation District (DSRSD), Department of Health and Safety, and the cities of Pleasanton and Livermore.

Future implementation steps of the Zone 7 Well Master Plan may require permits from the following agencies, depending on the location of well facilities: 1) State Department of Health Services (DHS); 2) U.S. Fish and Wildlife Service; 3) California Department of Fish and Game; and/or 4) Regional Water Quality Control Board.

Other ministerial permits/approvals not dependent on the DEIR include: 1) Boring and jacking permit; 2) Roadway encroachment permits/licenses; 3) Sewer Connection fees and Pre-Treatment Permit; 4) Heritage tree removal permit; and/or 5) Temporary or Permanent Easements.

S.6 SUMMARY OF IMPACTS AND MITIGATIONS

Table S-1, at the end of this chapter, presents a complete list of the impacts and mitigation measures identified for the Zone 7 Water Agency Well Master Plan project. Impacts are related to the construction or operation of the proposed well facilities. The discussion associated with these impacts is presented in **Chapter 3, Environmental Setting, Impacts, and Mitigation Measures**. The level of significance for each impact was determined using significance criteria (thresholds) developed for each category of impacts; these criteria are also presented in the appropriate sections of Chapter 3. Significant impacts are those adverse environmental impacts that meet or exceed the significance thresholds; less-than-significant impacts would not exceed

the thresholds. **Table S-1** indicates the measures to avoid, minimize, or otherwise reduce significant impacts to less-than-significant levels.

As indicated in **Table S-1**, implementation of the proposed project would not result in any significant unavoidable impacts.

S.7 ANALYSIS OF ALTERNATIVES

The California Environmental Quality Act (CEQA) Guidelines require Environmental Impact Reports (EIRs) to describe and evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. **Chapter 6, Analysis of Alternatives**, evaluates the potential alternatives to the proposed project. Potential alternatives examined for the proposed project include:

- No Project Alternative(s)
- Treatment Capacity Expansion and Dry-Year Supply
- Storage Alternatives
- Increased Pumpage – Existing Facilities
- Implementation at Existing Well Sites
- Reduced Project – Minimum Number of Wells to Meet 45 mgd Drought Year, 52 mgd Peak Capacity

The Proposed Project and alternatives present various options for meeting Zone 7's objectives regarding reliability within its service area. With the exception of the Proposed Project and the Reduced Alternative, the alternatives examined did not meet one or more of the stated objectives of the project. The Proposed Project would meet all the project objectives, would result in the implementation of between 8 and 15 well sites, (depending upon the production capacity of wells installed) and would have an estimated cost of $34 million. The Reduced Project Alternative would meet all of the project objectives, with the exception of Goal 2 of Zone 7's Reliability Policy. Implementation of the Reduced Alternative would provide capacity to meet 63% of Valley-wide MDD, would require 3 to 8 fewer wells for implementation. Costs associated with the Reduced Alternative are estimated to be between $6 to $16 million less than the Proposed Project. All impacts identified would be reduced to a less than significant level for either alternative. Therefore, these are considered equivalent alternatives that can be implemented at the discretion of the Zone 7 Board of Directors.

S.8 CUMULATIVE IMPACTS

The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's

incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects.

Chapter 5, Cumulative Impacts, evaluates the significant cumulative impacts resulting from the Zone 7 Well Master Plan in combination with other projects or conditions, and indicates the severity of the impacts and their likelihood of occurrence. If implemented at the same time as other construction projects, construction of facilities could contribute to potential short-term cumulative effects associated with erosion, cultural resource disturbance, disturbance of adjacent land uses, traffic disruption, dust generation, construction noise, and visual resources disturbance. Due to their short-term duration and the incorporation of appropriate mitigation measures, construction of facilities under the Well Master Plan would not result in a considerable contribution to cumulative impacts.

S.9 SECONDARY EFFECTS OF GROWTH

The CEQA *Guidelines* require that an EIR evaluate the growth-inducing impact of a proposed action. **Chapter 4, Growth Inducement Potential and Secondary Effects of Growth**, evaluates the secondary effects of growth association with the implementation of this project.

This project would increase the efficiency of Zone 7's existing conjunctive use operations, and allow Zone 7 to effectively manage surface water and groundwater resources to meet demands within the context of their current reliability. As such, implementation of the Well Master Plan relates to the reliability of water supplies, and does not provide a new water supply that could affect the rate, location, or timing of growth within the Zone 7 service area. Furthermore, this reliability would serve only planned and anticipated growth within Zone 7's service area approved by the local jurisdictions. Acquisition of water supply to meet projected growth under the adopted General Plans within the Zone 7 Service Area was evaluated in the Zone 7 *Water Supply Planning Program* (certified on January 21, 1999, SCH# 98041040).

TABLE S-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Groundwater Hydrogeology and Water Quality		
3.1-1: Increased groundwater recovery to meet drought year and emergency demands and/or drought demands would have the potential to result in groundwater levels below the historical low elevations, thereby conflicting with Zone 7's current operational policy of maintaining groundwater levels above the "historic low" groundwater elevation. Less than significant with mitigation.	**3.1-1a:** Zone 7 shall update its well monitoring program to include daily water elevation monitoring using monitoring wells, water level recorders and SCADA systems to provide real time data for all existing and new production wells during drought or water shortage emergency pumping events. Each well shall be monitored with respect to a specified historical low elevation to ensure that historical lows are not exceeded on a regional basis. Following new well installation this data will be used confirm to basin modeling with respect to drawdown and historical low criteria. **3.1-1b:** Modeling conducted to date indicates the ability to meet the Valley-wide 75% MDD at buildout demand for an approximately 30-day period without exceeding historical lows. However, in order to further refine emergency demand requirements, Zone 7 would implement a Reliability Study to review Zone 7's ability to meet Goal 2 solely from stored groundwater supplies. Key elements to be reviewed include: appropriateness of 75% MDD criteria, the duration of the emergency condition, and identification of other facilities or water supplies that could provide sources of reliability.	Less than Significant
3.1-2: Increased groundwater production from the Main Basin during peak demand periods or drought years could reduce groundwater levels below existing well pump or screen elevations, thereby affecting production efficiency in nearby public and private wells. Less than significant with mitigation.	**3.1-2a:** In the event retailer wells become unusable due to low groundwater levels, Zone 7 would provide retailer's independent quota from groundwater supplies in accordance with past practices and service agreements. **3.1-2b:** Zone 7 shall review new well designs to ensure well screen and pump elevations accommodate groundwater levels fluctuation under the Well Master Plan. This review will be part of Zone 7's current role in issuing permits for new potable well construction.	Less than Significant
3.1-3: Placement of new wells within proposed wellfields would alter localized groundwater gradients, and could result in direct effect to the efficiency of existing municipal and private wells within the Main Basin due to well interference. Less than significant with mitigation.	**3.1-3a:** In order to avoid the potential for well interference drawdown of greater than 20 feet, new well facilities shall not be located closer than 500 feet from existing municipal production wells, where such interference effects apply.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Groundwater Hydrogeology and Water Quality (cont.)		
3.1-4: Implementation of the Well Master Plan would have the potential to affect salt movement within the Main Basin, with subsequent reductions in groundwater quality in the vicinity of existing or future well locations. Less than significant.	No mitigation required.	Less than Significant
3.1-5: Increased groundwater production from the Main Basin would have the potential to affect aesthetic parameters of delivered water quality (TDS, hardness), delivered to Zone 7 Retailers. Less than significant with mitigation.	**3.1-5a:** Zone 7 shall continue to coordinate delivered water quality goals with retailers, as well as pursue implementation of the Salt Management Plan as a mechanism for maintaining delivered water quality to retailers.	Less than Significant
3.1-6: Installation of individual well facilities would increase impermeable surfaces and result in long-term reduction of infiltration rates. Less than significant.	No mitigation required.	Less than Significant
3.1-7: Construction and operation of potable supply wells under the Well Master Plan would have potential to affect the quality of potable water supplies and public health. Less than Significant with Mitigation.	**3.1-7a:** All proposed well and treatment facilities shall be designed and operated to comply with applicable California Department of Health Services (DHS) regulations. Zone 7 shall submit relevant application and information to DHS regarding individual, new wells prior to facility construction and use. Upon review and approval, the DHS will issue a permit amendment identifying the conditions for approval of the permit. The permit will be incorporated into Zone 7s existing General Permit. **3.1-7b:** Zone 7 shall review final well locations within Chain of Lakes and Gravel Pit Wellfields with respect to application of Surface Water Treatment Rule requirements. **3.1-7c:** Zone 7 shall continue to coordinate with other jurisdictions regarding recycled water storage within the Chain of Lakes area, and shall consider the status and location of such facility concepts in siting of potable water supply wells within the Chain of Lakes area.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Surface Hydrology and Water Quality		
3.2-1: Project construction could result in increased erosion and sedimentation and could increase turbidity and decrease water quality in surface waterways. Less than significant with mitigation.	**3.2-1a:** Zone 7 or its contractors shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for the proposed project prior to project construction. Zone 7 shall submit an NOI to SWRCB to comply with the NPDES Construction Activity Storm Water Permit requirements. Preparation of this plan shall be the responsibility of Zone 7, and implementation of the plan shall be the responsibility of the contractor hired to perform the work. The plan shall incorporate Best Construction Management Practices (BMPs). Typical BMPs could be included in the SWPPP include, but are not limited to: • Prior to any excavation, determine whether the depth and extent of excavation would likely encounter contaminated soils and groundwater. • Retain, protect and supplement native vegetation wherever possible. Exposure of soil areas shall be limited to the immediate area required for construction operations. • Grading areas should be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area. • Use barriers to contain runoff around excavation sites. • If unreported contaminated soil is encountered during excavation, appropriate remediation of soils shall be carried out in contained areas or covered areas, or remediated through treatment prior to initiating excavation. • Filter runoff on-site using silt fences, desiltation ponds, baker tanks, and other appropriate control measures. • Install temporary (or permanent) storm water retention or detention structures in which treatment can occur.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Surface Hydrology and Water Quality (cont.)		
3.2-1 (cont.)	• No stockpiling of excavated soil or other materials shall occur in stream channels. No excavated soil or other materials shall be disposed of in stream channels, but should be hauled away for proper disposal. Care should be taken to ensure that pollutant spills do not occur in stream channels. For example, changing of oil or other fluids should not be performed in the vicinity of stream channels. • Use tarps to cover any excavation soils storage during the October-April rainy period. • After completion of slope grading, erosion protection shall be provided and must include slope planting. Revegetation shall be facilitated by mulching, hydroseeding or other methods, and shall be initiated as soon as possible after completion of grading, and prior to November 1. Improvement of slopes shall involve ground coverings. Selection of plant materials shall consider native plantings and shall encourage shrubs and trees as a long-term erosion control feature. The SWPPP shall be kept on-site during construction activity and made available upon request to a representative of the Regional Water Quality Control Board. The District's contractor shall conform to the contract specifications addressing storm water pollution prevention and shall follow all BMPs identified in the project SWPPP at all times during construction. **3.2-1d:** In order to reduce the potential for erosion and sedimentation, stream crossing using open-trench construction techniques shall be limited to the dry season annually, from May 1st to October 15th, subject to agreement and permit issuance from appropriate regulatory agencies. Alternatively, Zone 7 could implement microtunneling techniques under channels to reduce the erosion potential.	

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Surface Hydrology and Water Quality (cont.)		
3.2-2: Well sites and connection pipeline alignments may be placed within areas subject to flooding from a 100-year storm. Potential damage to proposed facilities may occur during 100-year storm events. Less than significant with mitigation.	**3.2-2a:** Zone 7 shall locate wells outside of existing 100-year floodplains, to the degree feasible. If wells are located within 100-year floodplains, Zone 7 shall include in well design standard engineering practices to withstand flood damage, such as elevating the casing and facility above the 100-yr flood base flood level, or other measures deemed appropriate by DHS.	Less than Significant
3.2-3: Within any wellfield, construction of the well sites would result in a minor increase in local storm runoff volumes. Less than significant with mitigation.	**3.2-3:** In compliance with the Alameda County Stormwater Management Plan, July 2001 to July 2008, permanent erosion and storm water quality controls would be incorporated into the design of the well sites. These controls, selected from the appropriate guidance materials (including the Bay Area Stormwater Management Agencies Association's *Start at the Source* (1997)) would be incorporated in the design of the facilities.	Less than Significant
3.2-4: If necessary, dewatering during construction activities could result in the discharge of turbid waters into the storm drain systems or nearby creeks. Such a discharge would result in potentially significant impacts. Less than significant with mitigation.	**3.2-4a:** See **Measure 3.2-1a**.	Less than Significant
3.2-5: Consistent with existing operations, start-up or shut-down of individual wells would result in the discharge of untreated groundwater into nearby creeks or storm drain systems. These short-term discharges could adversely affect receiving water quality through either discharge or erosion of unprotected channels. Less than Significant with Mitigation.	**3.2-5a:** Due to their intermittent nature and source (untreated groundwater) well start up and shutdown discharges from individual well sites would be conditionally exempted discharge under the Alameda Countywide Clean Water Program, Program NPDES permit (Order 97-030, NPDES Permit No. CAS0029831). No additional mitigation is required. **3.2-5b:** Individual well facilities that are designed to discharge to creek channels shall include appropriate erosion-control devices such as rock cover, shotcrete, or splash pads to prevent erosion of the creek bank.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Geology and Soils		
3.3-1: Ground water withdrawal under the drought year scenarios examined would have the potential to result in subsidence, with secondary effects to properties overlying the Main Basin. Less than significant with mitigation.	**3.3-1a:** Zone 7 shall implement a Subsidence Monitoring Program. This program would include a combination of techniques to evaluate the effects of groundwater withdrawal on existing land elevation, in order to offset the potential for subsidence in areas where water extraction would occur. The program would use a combination of the following technologies, or other appropriate technologies, to monitor ground subsidence. • Establishment of benchmarks to be surveyed for elevation by Zone 7 or qualified engineers on a regular basis during both pumping and non-pumping seasons to assess the amount of subsidence and rebound. • Establishment of key wells to be monitored for water level in real time during well operations. • Continued elevation survey of benchmarks at individual well locations to calculate land surface altitudes on an annual basis. If determined necessary, the following measures would be implemented. • Use of Interferometric Sythetic Aperture Radar (InSAR) or equivalent satellite imagery to measure magnitude and aerial extent of land subsidence. • Installation of extensometers to monitor annual changes in surface elevations. Borehole extensometers accurately measure compaction between land surface and the bottom of the borehole. Such devices can detect the level of subsidence occurring, allowing pumpage to be reduced or shifted to other portions of the basin. **3.3-1b:** Zone 7 shall maintain groundwater elevations above the historical low, consistent with its historical low operational policy. In the event that groundwater elevations approach historical lows at Zone 7 well locations, Zone 7 shall shift pumpage to other portions of the basin such that compliance with this policy is maintained.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Geology and Soils (cont.)		
3.3-1b (cont.)	**3.3-1c:** In the event that the Subsidence Monitoring Program identifies the potential for inelastic subsidence to occur at levels that could adversely affect overlying land uses, Zone 7 shall: a) shift pumpage to other portions of the Main Basin that are not approaching historical low groundwater elevations, or b) shall reduce pumpage levels such that the potential for subsidence to occur is reduced.	
3.3-2: Well facilities and connection pipelines could be damaged by primary seismic hazards, including ground shaking and fault rupture during an earthquake. Compliance with the most recent version of the Uniform Building Code, state, county, city, and District seismic requirements would reduce potential impacts to less than significant. Less than significant with mitigation.	**3.3-2a:** All design and construction for buildings will be in accordance with design standards for Seismic Zone 4 in the most recent edition of the California Building Code (based on the 1997 Uniform Building Code). Zone 7 shall design proposed facilities to withstand the highest expected peak acceleration as determined by seismic evaluation under the UBC and the California Building Code for each site.	Less than Significant
3.3-3: The proposed well facilities and associated connection pipelines could incur significant damage as a result of underlying soil properties. Less than significant with mitigation.	**3.3-3a:** Zone 7 shall implement site specific geotechnical investigations for proposed well sites and pipeline routes, as appropriate to support facility design. As part of the geotechnical investigation, soils at foundation or base grade shall be sampled and laboratory tested to determine the expansion potential of each soil. The study shall evaluate for the potential for unstable or corrosive soils. **3.3-3b:** Any fill shall be selected, placed, compacted and inspected in accordance to plans and specifications prepared by a licensed civil engineer. **3.3-3c:** Zone 7 shall incorporate methods to reduce unstable foundations associated with the presence of liquefiable and expansive soils at the proposed building sites. These methods may include, but are not limited to, the following: • Removal of the unstable soil, and placement and compaction of select engineered fill for the building pad and foundation support in accordance with ASTM Test Method D 1557. The required depth of excavation should be specified by a registered civil engineer based on actual soil conditions. • Lime treatment of the native expansive clay soils;	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Geology and Soils (cont.)		
3.3-3 (cont.)	• Mixture of the unstable soil with coarse material; or • Incorporation of a rigid, reinforced concrete slab design **3.3-3d:** As determined necessary, a site-specific soil corrosion survey shall be implemented for each well site and connection pipeline routes. This will define the need for and location of insulating couplings, electrolysis test stations and hot spot areas where there should be either galvanic or impressed current cathodic protection. This will assure a high degree of corrosion suppression to cement lined and coated steel or ductile iron.	
3.3-4: Potentially liquefiable soils may be present throughout the planning area. Damage to the proposed well facilities due to liquefaction during an earthquake could be caused by settlement or uplift. Less than significant with mitigation.	**3.3-4a:** Site-specific surveys shall be performed to determine the potential for liquefiable soils at each well site and connection pipeline route. If the site-specific studies determine a strong potential for severe damage to the well facilities, recommendations of the geotechnical report would be incorporated into the construction specifications. Possible measures include compaction grouting or by other in-situ densification of loose sandy or silty layers. Densification and grouting may affect the groundwater flow pattern at the site and shall be evaluated based on site-specific data.	Less than Significant
Land Use		
3.4-1: Project construction would result in short-term disturbance to adjacent land uses in the immediate vicinity of individual well sites. Less than significant with mitigation.	**3.4-1a:** Construction activities associated with well site construction and pipeline installation, with the exception of 24-hour drilling/pump testing, shall occur Monday through Friday, between 8:00 a.m. and 8:00 p.m. This limitation would reduce disturbance (i.e., dust, noise, traffic) to adjacent land uses. Pipeline installation that disrupts traffic within primary roadways shall be limited to weekdays during non-peak hours (see **Section 3.8, Traffic and Circulation**). **3.4-1b:** Zone 7 shall restore private access roads, driveways, and landscaped areas that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards. Restoration of private property shall require negotiations between Zone 7 and private landowners.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Land Use (cont.)		
3.4-1: (cont.)	**3.4-1c:** Zone 7 shall restore public road right-of-ways and recreational facilities that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards. **3.4-1d:** If well sites are located in public right-of-way, Zone 7 or its contractors shall obtain and comply with encroachment permits for installation of well facilities. In addition, Zone 7 shall provide the local jurisdiction with design drawings for review and comment at appropriate design stages. **3.4-1e:** If well facilities are located adjacent to schools or community parks and centers, construction schedules shall be negotiated with the respective school districts and affected agencies in an effort to minimize disturbance to school and community operations and programs. Where construction activities would affect scheduled programs, Zone 7 shall work with affected jurisdictions to establish alternative locations for activities curtailed by project construction. For those activities that are not able to be temporarily relocated due to special facility requirements, Zone 7 will work with affected jurisdictions to establish alternative scheduling on evenings and weekends.	
3.4-2: Project operation could result in long-term disruption to adjacent land uses, including incompatibility with existing land uses and increased dust, noise, traffic and other disturbance to surrounding land uses. Less than significant with mitigation.	Please refer to the **Sections 3.6 (Air Quality), 3.7 (Noise)** and **3.8 (Traffic and Circulation), 3.9 (Hazardous Materials),** and **3.12 (Visual Resources)**.	Less than Significant
3.4-3: Project construction and operation could conflict with goals, policies and programs of affected jurisdictions. Less than significant with mitigation.	Please refer to **Section 3.1 (Groundwater Hydrogeology and Water Quality),** and **Section 3.12 (Visual Resources)** for mitigation measures that would reduce potential conflicts with current or future land uses, including agency coordination, and landscape and architectural treatment of well facilities.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Land Use (cont.)		
3.4-4: Project construction could result in impacts to agricultural resources, including lands designed as prime agricultural lands or lands under Williamson Act contracts. Less than significant with mitigation.	**3.4-4a:** Zone 7 shall avoid well implementation on parcels that are held under Williamson Act Contract, to the extent feasible. In the event that Zone 7 selects a parcel that is held under Williamson Act contract, Zone 7 shall follow requirements of Article 6 of the Williamson Act, which provides for removal of properties from conservation easement under the Williamson Act. **3.4-4b:** Zone 7 shall avoid development of well facilities on lands designated as prime agricultural soils, to the extent feasible. **3.4-4c:** If farmland parcels are selected for development of well sites, Zone 7 would locate facilities at the edge of farmlands or grazing lands to the degree feasible to minimize impacts to agricultural resources.	Less than Significant
3.4-5: Project construction could result in the loss of regionally significant aggregate resources for the Quarry area. Less than significant with mitigation.	**3.4-5:** Siting of facilities within the following wellsites shall be coordinated with aggregate mining operators to avoid potential conflicts: Gravel Pit Wellfield, Chain of Lakes Wellfield, Busch Valley Wellfield, Stanley Avenue Wellfield, and Isabel Wellfield.	Less than Significant
3.4-6: Project construction and operation could result in disturbance of recreational facility uses. Less than significant with mitigation.	**3.4-6:** If well facilities are located within parks or other recreational facilities, Zone 7 shall notify and coordinate with affected jurisdiction to obtain approval for encroachment. To the extent feasible, Zone 7 shall site well facilities in a way that does not impair existing recreational uses in parks. In addition, Zone 7 or its contractors shall post signage within affected park areas describing the length of duration, time of construction activities, and contact person. Construction areas would be appropriately fenced, and equipment would be stored within the fence zone, to provide safety to park users.	Less than Significant
3.4-7: Construction of well sites within the Chain of Lakes Wellfield would have the potential to affect operations of the Livermore Municipal Airport. However, proposed facilities would be less than 20 feet tall, and in compliance with local and federal height restriction. Less than Significant.	No mitigation required.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Biological Resources		
3.5-1: Construction of the proposed project could result in impacts to potentially jurisdictional wetlands/waters of the U.S. under the jurisdiction of Corps and to the streambed and banks under jurisdiction to CDFG. Less than significant with mitigation.	**3.5-1a:** In selecting suitable sites for well development and pipeline installation, Zone 7 shall avoid areas that contain wetlands and other waters of the U.S. to the extent feasible. If avoidance is not feasible, then Zone 7 shall implement appropriate mitigation measure to reduce potential impacts, either limiting construction to outside the rainy season (see **Measure 3.5-1b**) or using jack-and-bore technique for pipeline crossing of jurisdictional features (**Measure 3.5-1c**). **3.5-1b:** This measure applies to all wellfields except Busch Valley and Stanley Wellfields, and also to the pipeline component. Impacts to wetlands and waters of the U.S. from open-trench construction and excavation in creeks will be minimized by conducting the work during low-flow periods, implementing turbidity controls, hydroseeding disturbed areas, and locating spoils and storage areas away from the creek or channel. Pipeline construction in existing creeks will require permit approval from the Corps for fill in wetlands and other waters of the U.S. The project would most likely proceed under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the CWA. Water quality certification from the SFRWQCB will also be required, pursuant to Section 401 of the Act. In addition, the CDFG has jurisdiction pursuant to Sections 1601-1603 of the Fish and Game Code, and pipeline construction in channel bottoms will require a SAA with CDFG. **3.5-1c:** This measure applies to pipeline construction with all wellfields except Busch Valley and Stanley Wellfields. If pipeline installation during the dry season is not feasible, Zone 7 shall use jack and bore techniques to cross under jurisdictional features. Although jack and bore is intended to avoid altering the bed and bank of a stream, in many circumstances an SAA is recommended to ensure that protective and early response measures will be used in the event of an accidental discharge (*i.e.*, "frac-out") of drilling lubricant, typically hydrated bentonite, into a stream.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Biological Resources (cont.)		
3.5-2: Construction of the wells or pipelines could result in impacts to seasonal wetlands. Less than significant with mitigation.	**3.5-2a:** Zone 7 shall avoid selection of seasonal wetlands as well sites and pipeline corridors to the extent feasible. If this measure cannot be implemented and permanent or temporary impacts will occur, then Zone 7 shall implement the applicable mitigation measures below (**Measure 3.5-2b** and **Measure 3.5-2c**). **3.5-2b:** If permanent impacts to seasonal wetlands would occur, Zone 7 shall acquire appropriate regulatory permits and would provide mitigation acreage at a 3:1 ratio or other appropriate ratio as determined by regulatory agencies. Zone 7 shall retain a qualified biologist who would determine the location where such replacement would occur, and who would prepare and implement a monitoring plan outlining the maintenance requirements to ensure that reestablishment of the seasonal wetland occurs. **3.5-2c:** If temporary impacts to seasonal wetlands occur associated with installation of pipeline, Zone 7 shall restore the affected seasonal wetland to pre-project conditions.	Less than Significant
3.5-3: Construction of wells and pipelines could result in impacts to special status plant and wildlife species associated with aquatic habitats and associated uplands, including California red-legged frog, California tiger salamander, western pond turtle, and vernal pool fairy shrimp. Less than significant with mitigation.	**3.5-3a:** Conduct a reconnaissance survey to determine the potential presence of habitat for special status plant and wildlife species. Based on field surveys, avoid removal or damage to all water-dependent vegetation, jurisdictional wetlands, or potential habitat for special status species by redesigning project components away from sensitive areas. If complete avoidance of these areas is infeasible, then implement **Measure 3.5-3b** (for plants) and/or **Measure 3.5-3c** (for animals). **3.5-3b:** Within the wellfields identified to potentially support special status plants (Busch Valley, Chain of Lakes, and Isabel; see **Table 3.5-2**), conduct field surveys for special status plants during the appropriate blooming period for these species. If no special status plant species are identified during appropriately timed surveys, no further mitigation is required. If any special status plant species are identified within 100 feet of a proposed well site or pipeline location, Zone 7 shall determine if the proposed facility would impact the identified populations, and if necessary, a) investigate the use of an	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Biological Resources (cont.)		
3.5-3 (cont.)	alternative site as an avoidance measure, or b) establish further mitigation in consultation with the USFWS and/or CDFG. Additional agency mitigation could include erecting exclusion fencing during construction, monitoring construction activities by qualified biologists, collecting seed for replanting following construction, or purchasing off-site habitat supporting the species and maintaining it in perpetuity. **3.5-3c:** Conduct focused field surveys to determine the presence or absence of special status wildlife species listed in **Table 3.5-1** that have a potential to occur within the water-dependent habitats. The results of such surveys will be coordinated with the USFWS and CDFG, as necessary. If no special status animal species are present, then no further mitigation is required. If any special status animal species are identified within 100 feet of a proposed well site or pipeline location (or other distance deemed suitable to avoid impacts to the identified species) Zone 7 shall a) investigate the use of an alternative site as an avoidance measure or, b) establish further mitigation in consultation with USFWS and/or CDFG. Additional agency mitigation could include erecting exclusion fencing during construction, limiting construction to periods outside of the breeding season, monitoring construction activities by qualified biologists, relocating the animals to appropriate areas outside of the construction zone (for non-listed species) or purchasing off-site compensation habitat known to support the species and maintaining it in perpetuity.	
3.5-4: Construction of well facilities and pipelines could result in impacts to heritage or other significant trees within the planning area. Less than significant with mitigation.	**3.5-4a:** Avoid tree removal and construction within the driplines of trees. If complete avoidance is infeasible, then implement in-kind mitigation in coordination with affected jurisdiction.	Less than Significant
3.5-5: Construction of facilities could result in impacts to common plant and animal species. Less than significant.	No mitigation required.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Biological Resources (cont.)		
3.5-6: Construction of facilities could result to raptors, migratory birds, or roosting special status bats within the planning area. Less than significant with mitigation.	**3.5-6:** To the degree feasible, construction activities shall be avoided during the bird nesting and bat brooding season (March 1 through August 15), or the sites shall be surveyed by a qualified biologist to verify the absence of protected breeding birds and bats. If construction activities occur during the nesting season, a general survey for bats, raptors, passerines, and their nests shall be conducted by a qualified biologist prior to construction to verify species absence. If the survey indicates the potential presence of roosting bats, nesting raptors or protected passerines, the results would be coordinated with the Region 3 office of the CDFG, and suitable avoidance measures would be developed. Construction workers shall observe CDFG avoidance guidelines, which provide up to a 500-foot buffer zone surrounding active raptor nests and a 250-foot buffer zone surrounding nests of other birds. A 250-foot buffer zone will similarly apply to any identified roosts of special status bat species.	Less than Significant
3.5-7: If burrowing owls were present on or adjacent to work sites at the time of project ground-breaking, construction activities could result in disturbance to or direct mortality of owls. Less than significant with mitigation.	**3.5-7:** The following measures would apply in grasslands habitats to reduce the potential for impacts to a less than significant level and avoid incidental take of burrowing owl at construction sites. Pre-construction surveys for burrowing owls would be conducted 14 to 30 days prior to construction by a qualified biologist in accordance with the most recent CDFG protocol, currently the *Staff Report on Burrowing Owl Mitigation* (CDFG, 1995). Surveys would cover grassland areas within a 500-foot buffer (access permitting) and would require checking for adult and juvenile burrowing owls and their habitat. If owls are detected during surveys, occupied burrows would not be disturbed. If occupied burrowing owl habitat is detected at proposed construction sites, measures to avoid, minimize, or mitigate impacts to burrowing owls would be incorporated into the project. Such measures would include the following: • If owls are determined to be nesting at the identified site, an effort would be made to relocate project facilities to a distance of greater than 250-feet from the identified active burrow(s). If such measures are infeasible, the following measures would be implemented.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Biological Resources (cont.)	• Construction exclusion areas would be established around the occupied burrows in which no disturbance would be allowed to occur. During the nonbreeding season (September 1 through January 31), the exclusion zone would extend 160 feet around the occupied burrows. During the breeding season (February 1 through August 31), exclusion areas would extend 250-feet around occupied burrows. • If the above avoidance requirements cannot be met, passive relocation of on-site owls may be implemented as an alternative, but only during the nonbreeding season. Passive relocation would be accomplished by installing one-way doors on the entrances of burrows located within 160 feet of the project site. The one-way doors would be left in place for 48 hours to ensure that the owls have left the burrow. • For each burrow that may be excavated by project construction, two alternate unoccupied natural or artificial burrows would be provided outside of the 160-foot buffer zone (CDFG, 1995). The alternate burrows would be monitored daily for one week to confirm that owls have moved and acclimated. • Burrows within the construction area would be excavated using hand tools, under the supervision of a qualified biologist, and then refilled to prevent reoccupation. If any burrowing owls are discovered during excavation, the excavation would cease and the owl allowed to escape. Excavation may be completed when the biological monitor confirms that the burrow is empty. • Concurrently with a pre-construction worker education program and as needed during "tailgate" sessions for activities near sensitive biological resources, a qualified biologist would describe the life history and avoidance measures for special-status species in the regional vicinity, including burrowing owls, to contractors, their employees, and agency personnel involved in the project.	

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Air Quality		
3.6-1: Construction of the well sites and associated connection pipelines would result in a temporary increase in criteria air pollutant emissions. Less than significant with mitigation.	**3.6-1:** During construction of proposed wells and connection pipeline installation, construction contractors shall implement a dust control program which complies with BAAQMD requirements and contains the following specific elements: • Water all active construction areas at least twice daily. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking area and staging areas at construction sites. • Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.	Less than Significant
3.6-2: The project would result in negligible operational air emissions from pump operation and vehicle trip generation. Less than significant with mitigation.	**3.6-2:** Zone 7 shall acquire relevant permits from BAAQMD/CARB necessary for the operation of portable generators if portable engines do not include a BAAQMD permit or are not registered under the CARB Portable Equipment Registration Program. Acquisition and compliance with relevant permits would ensure that generator operations would not result in exceedences of criteria pollutants.	Less than Significant
3.6-3: The well facilities would not generate objectionable odors. Less than significant.	No mitigation required.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Noise		
3.7-1: Construction of well sites and pipeline construction would generate temporary, intermittent noise levels above existing ambient conditions in the vicinity of the project, and could result in significant impacts to surrounding properties. Less than significant with mitigation.	**3.7-1a:** Zone 7 shall select well sites that are at least 400 feet from occupied school or hospital buildings or shall perform site-specific analyses, prior to site selection, that demonstrate that construction noise levels would not cause interior noise levels at these institutions to exceed 50 dBA. **3.7-1b:** If the proposed well and treatment sites are adjacent to residences, the wells, pump house, treatment facilities, and discharge points shall be setback at least 100 feet from property lines adjacent to these sensitive receptors, if sufficient space is available. **3.7-1c:** For well sites that are located with 500 feet of residential, institutional, or hotel receptors that could be affected by 24-drilling operations, Zone 7 shall include in construction specifications requirements for installation and maintenance of an engineered sound wall during 24-hour construction activities. Sound wall specifications shall include use of materials with a minimum Sound Transmissivity Classification (STC) of 18, and shall be installed to a height that intercepts the line of sight between the drill rig and sensitive receptors. Minimum height shall be 15 feet. Performance standard for this noise mitigation measure shall be reduction of noise levels within 400 feet of the drill rig to 60 dBA. **3.7-1d:** All residents and other sensitive receptors within 1,000 feet of the drilling locations of the project shall be notified four weeks in advance. The information distributed shall include the following: • A brief description of the drilling and testing operations, the necessity for 24-hour drilling, and the proposed schedule for drilling and testing activities. • An offer of temporary motel accommodations to residents with homes where the noise levels influenced by Zone 7 drilling are demonstrated to exceed 65 dBA DNL, estimated at a radius of 400 feet from the drill rig location. Zone 7 shall offer payment for moderately priced motel accommodations for the duration of the period when nighttime drilling occurs. • A contact person and 24-hour contact telephone number for noise complaints.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Noise (cont.)		
3.7-1 (cont.)	• Zone 7 shall evaluate noise complaints associated with nighttime drilling within 24 hours of receipt of the complaint, but shall repeat noise investigations at a particular location, if requested, for no more than two times.	
3.7-2: Operational activities would generate noise levels above existing ambient levels in the vicinity of the project. Less than significant with mitigation.	**3.7-2a:** The pump house enclosures shall be designed such that operation noise resulting from well production would meet the performance standard of 60 dBA DNL at the nearest residential property line. For commercial and industrial uses, the performance standards would be 70 and 75 dBA, respectively. **3.7-2b:** During well site design, Zone 7 shall conduct 24-hour noise surveys in the vicinity of each well site. Where average noise levels are less than 48 dBA, the noise performance standard shall be reduced such that the noise levels from pumping operations shall not result in a 5 dBA increase in ambient noise levels. Where site conditions allow, louvers and doors shall be oriented away from sensitive receptors. **3.7-2c:** If the discharge point is within 400 feet of a residential area, the discharge structure shall be enclosed or the discharge shall be designed to reduce levels to less than 60 dBA DNL at the nearest residential property line.	Less than Significant
Traffic and Circulation		
3.8-1: Construction of the proposed project would increase short-term traffic delays for vehicles traveling past the construction zone on roadways serving project components. Less than significant with mitigation.	**3.8-1a:** Zone 7 shall arrange for a detailed Traffic Control Plan, to be prepared by a licensed traffic engineer, for project-affected roadways and intersections. The Traffic Control Plan shall comply with requirements of the jurisdictional agency directly affected by the project construction. The Traffic Control Plan would include, but would not be limited to, the following elements: • Zone 7 or its contractors shall restrict construction to non-peak periods as required for specific work sites. Weekend and night work shifts may be considered in non-residential areas only. • Zone 7 or its contractors shall maintain the maximum amount of travel lane capacity during non-construction periods and would provide flagger-control at all construction sites to manage traffic control and flows.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Traffic and Circulation (cont.)		
3.8-1 (cont.)	• Zone 7 or its contractors shall limit the construction work zone in each block to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone. Zone 7 shall reroute pipeline alignments if road closures would occur because there is inadequate space to accommodate both the construction easement and alternate one-way traffic flow. • Zone 7 or its contractors shall require temporary steel-plate trench crossings, as needed, to maintain reasonable traffic, bicycle, and pedestrian access to homes, businesses, and streets. When required by the applicable encroachment permit, Zone 7 shall maintain existing lane configuration during non-working hours by covering the trench or jack pit with steel plates or by the use of temporary backfill. Access for emergency vehicles shall be maintained at all times. • Zone 7 or its contractors shall coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to schools and commercial areas. • Zone 7 or its contractors shall post advanced warning of construction activities to allow motorists to select alternative routes in advance and for moving vehicles from areas to be closed. • Zone 7 or its contractors shall require appropriate warning signage and lighting for construction zones. • For construction near Mohr Avenue, Zone 7 or its contractors shall not use Mohr Avenue as a truck route, in accordance with the policies of the City of Pleasanton. • Zone 7 or its contractors shall provide temporary signage indicating businesses are open • Zone 7 or its contractors shall limit lane closures to one lane, to the extent feasible. **3.8-1b:** Zone 7 shall arrange for a 24-hour emergency telephone resource to address public questions and complaints during project construction.	

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Traffic and Circulation (cont.)		
3.8-2: Installation of the connection pipeline would cause disruptions to transit service on pipeline alignment routes. Less than significant with mitigation.	**3.8-2:** This measure applies to construction activities that would displace bus stops. As part of the Traffic Control Plan for roadway segments and intersections (see **Measure 3.8-1a**), Zone 7 shall incorporate a plan, as needed, for the temporary relocation of bus stops. This plan would be completed in coordination with LAVTA.	Less than Significant
3.8-3: Traffic on area roadways serving all of the project components would increase as a result of project-generated vehicle trips by construction workers and construction vehicles. Less than significant with mitigation.	Please refer to **Measure 3.8-1.a**.	Less than Significant
3.8-4: Traffic on area roadways serving all of the project components would increase as a result of project-generated vehicle trips during well facility operation. Less than significant.	No mitigation required.	Less than Significant
3.8-5: Project construction of all project components would generate a demand for parking spaces for construction worker vehicles. Less than significant with mitigation.	**3.8-5:** This measure applies to construction activities within any wellfield, and for impacts on any type of roadway. Zone 7 should require off-street parking for construction workers' vehicles, or, if that is impractical, workers could be shuttled to the work site from an off-site location.	Less than Significant
3.8-6: Construction of the connection pipeline would affect access to adjacent land uses and streets for general, traffic, emergency, and bicycle/pedestrian access, potentially causing safety problems. Less than significant with mitigation.	**3.8-6a:** As part of the Traffic Control Plan for roadway segments and intersections (see **Measure 3.8-1a**), Zone 7 shall develop comprehensive strategies for maintaining emergency access, such as maintaining steel trench plates at the construction sites to restore access across open trenches. Also, police, fire, and emergency services shall be notified of the timing, location, and duration of construction activities throughout the project. **3.8-6b:** This measure applies to all components. Zone 7 shall not, under any circumstances, restrict access to emergency facilities, including Fire Station No. 3 and Valleycare Medical Center. If Zone 7 selects connection pipeline alignments near Fire Station No. 3 or other fire stations, Zone 7 would coordinate with fire station personnel to maintain required 24-hour access to Station No. 3. To avoid blocking access to the Valleycare Medical Center and similar emergency medical	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Traffic and Circulation (cont.)		
3.8-6 (cont.)	facilities, Zone 7 and its contractors shall schedule work on sections of the connection pipeline such that multiple access points to the medical center are not blocked simultaneously. **3.8-6c:** Zone 7 shall provide, upon request, a copy of the Traffic Control Plan to the sheriff's department, local police departments, county fire department, and local fire departments for their review prior to construction. Zone 7 shall provide 72-hour notice to the local service providers prior to construction of associated connection pipeline. Discussion on the Traffic Control Plan is provided in **Section 3.8 (Traffic and Circulation)**. **3.8-6d:** Zone 7 shall temporarily detour bicycle paths around the construction zone or to other streets to ensure that no new safety hazards results from implementation of the project. **3.8-6e:** Zone 7 shall require a minimum 72-hour advance notice of access restrictions for residents and businesses. Affected residents and businesses would be advised when to move motor vehicles out of the area to be closed. Notification and other requirements stipulated in the encroachment permit shall be incorporated into the Traffic Control Plan.	
3.8-7: Construction of the proposed project would increase wear-and-tear on the designated haul routes used by construction vehicles to access the project work site(s). Less than significant with mitigation.	**3.8-7a:** Zone 7 shall prepare a videotape of road conditions only for the routes that will be used by project-related vehicles. Zone 7 shall prepare a similar videotape of road conditions after project construction is completed. The pre- and post-construction conditions of the haul routes shall be reviewed by staff of the local Public Works Department. An agreement shall be entered into prior to construction that will detail the pre-construction conditions and post-construction requirements of the rehabilitation program.	Less than Significant
3.8-8: Construction of the proposed project could disrupt newly repaved streets. Less than significant with mitigation.	**3.8-8a:** Zone 7 shall coordinate project construction with affected jurisdictions so that those entities can plan for the affected roadways in their Capital Improvement Programs.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Traffic and Circulation (cont.)		
3.8-8 (cont.)	**3.8-8b:** If recently repaved/rehabilitated road segments in unincorporated Alameda County are included in the final pipeline alignment, Zone 7 shall: 1) Use trenchless installation techniques; or 2) Rehabilitate the roadway per permitting jurisdiction where trenching is required	
Hazardous Materials		
3.9-1: Project construction activities could expose workers and/or the public to hazardous materials/wastes as a result of an accidental spill of diesel fuel or other hazardous materials used for equipment or otherwise needed for construction operations. Less than significant with mitigation.	**3.9-1:** The following hazardous materials management, spill prevention, and spill response/cleanup measures shall be included in contractor specifications for each well site: • A construction site plan, including delineation of hazardous material and hazardous waste storage areas, access and egress routes, drainage paths, emergency assemble areas, and temporary hazardous waste storage areas; • Materials Safety Data Sheets for all chemicals used and stored at the well site; • Spill control and countermeasures, including employee spill prevention/response training; • An inventory list of emergency equipment; • off-loading, safety and handling, procedures for each chemical; • Notification and documentation procedures.	Less than Significant
3.9-2: The project could disturb existing contaminated soils or groundwater during construction. Less than significant with mitigation.	**3.9-2:** Unanticipated contaminated soils may exist, and these soils may be discovered during construction or well drilling. These soils would likely be identified in the field visually or by detection of odors. The following procedures shall be included in contractor specifications, for the event that noxious odors, discolored soil or other indications of gross contamination are identified: • Stop work in areas of contact.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Hazardous Materials (cont.)		
3.9-2: (cont.)	• If necessary, call responsible agencies. Typically, the Alameda County Health Care Services Agency, Department of Environmental Health, would be the responsible agency; the San Francisco Bay Regional Water Quality Control Board could be involved if the groundwater or surface water is contaminated, and the California Department of Toxic Substances Control could become involved if soils are contaminated. • Fence off areas of contamination. • Perform appropriate clean-up procedures. • All contaminated soils would be segregated, profiled, and disposed of appropriately off-site. Required disposal method will depend on the types and concentrations of chemicals identified in the soil. Any site investigations or remediation will be performed in accordance with applicable laws.	
3.9-3: Construction and operation of wells on or adjacent to properties with known or unknown contamination would have the potential to affect groundwater quality. Less than significant with mitigation.	**3.9-3a:** Zone 7 shall comply with DSWAP requirements established by DHS under the Safe Drinking Water Act, including completion of a DWSAP report for individual well constructed under the Well Master Plan. **3.9-3b:** Zone 7 shall conduct due diligence review of final well sites to ensure that known hazardous materials contamination sites are appropriately avoided. This shall include a Phase I Environmental Site Assessment conducted to ASTM standards, including review of databases listed in **Table 3.9-1**.	Less than Significant
3.9-4: Chemicals used in the treatment of groundwater for potable use would be stored at the treatment well sites. If accidentally released, these chemicals could cause human health effects to maintenance personnel and surrounding populations and could cause adverse environmental effects if released to the environment. Less than significant with mitigation.	**3.9-4a:** Well facilities constructed under Well Master Plan would, by law, conform to appropriate regulations and statutes from the federal, state and local agencies. Any new or additional chemical storage facilities would be designed and constructed to conform to all appropriate regulations including providing secondary containment and testing of pressurized containers. A Hazardous Materials Business Plan shall be prepared for all new well facilities.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Hazardous Materials (cont.)		
3.9-5: Implementation of the project would require delivery of chemicals to the well facilities, which would result in an increase in potential for accidents during transportation. Because of the stringent hazardous material packaging and transportation requirements of the U.S. DOT and the low accident rate involving hazardous materials, this impact is not considered significant. Less than significant.	No mitigation required.	Less than Significant
Public Service and Utilities		
3.10-1: Well facilities construction and connection pipeline installation could result in temporary, planned or accidental disruption to utility services. Less than significant with mitigation.	**3.10-1:** For proposed facilities located within urban/suburban areas, the following mitigations are identified. a. Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits include measures to minimize utility disruption. Zone 7 and its contractors shall comply with permit conditions, and such conditions shall be included in construction contract specifications. b. Utility locations shall be verified through field survey (potholing) and use of the Underground Service Alert (USA) services. c. Detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of Zone 7's construction plans and schedule. Arrangements should be made with these entities regarding protection, relocation, or temporary disconnection of services. d. Zone 7 shall employ special construction techniques in areas where the connection pipeline would parallel wastewater mains. These special measures, which would be included in the engineering specifications, should include trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the water main. **Measure 3.10-2** below provides more discussion on this issue.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Public Service and Utilities (cont.)		
3.10-1: (cont.)	e. Residents and businesses in the planning area shall be notified of planned utility service disruption two to four days in advance, in conformance with county and state standards.	
3.10-2: Construction the connection pipeline associated with the well facilities may result in utility conflicts or require relocation of existing utilities. Less than significant with mitigation.	**3.10-2:** In order to reduce potential impacts associated with utility conflicts, the following measures shall be implemented in conjunction with **Measure 3.10-1**. • Disconnected cables and lines shall be reconnected promptly. • Zone 7 shall observe DHS standards which require 1) a 10-foot horizontal separation between parallel sewer and water mains; 2) 1-foot vertical separation between perpendicular water and sewer line crossings. (In the event that separation requirements could not be maintained, Zone 7 shall obtain DHS variance through the use of special pipeline type or coating, or other means deemed suitable by DHS).	Less than Significant
3.10-3: Project implementation would not include habitable or commercial structures. Therefore, project implementation would not create additional demands on police or fire protection services. Less than significant.	No mitigation required.	Less than Significant
3.10-4: Operation of individual well sites would require power supply. Less than significant with mitigation.	**3.10-4a:** For project facilities with a potential to exceed the capacity of existing PG&E systems, Zone 7 shall coordinate with PG&E to ensure adequate capacity is available.	Less than Significant
Cultural Resources		
3.11-1: Implementation of proposed facilities may affect known or undiscovered archaeological resources. Less than significant with mitigation.	**3.11-1a:** Zone 7 shall avoid siting of well facilities within areas of known / recorded archaeological sites (as shown in the Cultural Resources Map prepared by WSA, 2002). These sites include: Bernal Wellfield – P-1, P-2160; Valley Wellfield – C-280; Mocho Wellfield – CA-ALA-414; Stoneridge: CA-ALA-414 and CA-ALA-413; Martin Wellfield – CA-ALA-46 and CA-ALA-42; Busch Valley – CA-ALA-44; and Chain of Lakes – C-669.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Cultural Resources		
3.11-1 (cont.)	**3.11-1b:** Zone 7 shall consult with a qualified archaeologist to ensure that individual well sites and pipeline routes are not located on one of the identified recorded cultural resources locations. If proposed facilities are located within 100 feet of known archeological sites, a qualified archaeologist shall conduct preliminary field reconnaissance of selected sites as deemed necessary to determine whether prehistoric cultural materials would be encountered. If archaeological materials are detected, Zone 7 shall avoid selection of the site. **3.11-1c:** Zone 7 or a qualified archaeologist shall develop a program for monitoring construction activities. The program shall include provisions to implement the monitoring requirements and preliminary data recovery and analysis plan in the event that archaeological resources are identified during monitoring. Additionally, the archaeologist shall perform an orientation and provide instructions for preliminary identification of archaeological resources to the project engineers and construction crew supervisors. **3.11-1d:** Due to the sensitive nature of the Livermore Valley Area, construction activities within 200 feet of creeks or stream crossings or within 100 feet of recorded archaeological resources shall be monitored by a qualified archaeologist. **3.11-1e:** If cultural resources are encountered during construction of the project, the contractor shall avoid altering the materials and discontinue earthwork within 100 feet of the find. At this time, the contractor must contact a qualified archaeologist, one certified by the Registry of Professional Archeologists (RPA), to evaluate the situation. Any identified archaeological resources shall be recorded by the archaeologist on form DPR 422 (archaeological sites). Project personnel shall not collect cultural resources. Prehistoric resources include, but are not limited to, chert or obsidian flakes, projectile points, mortars, and pestles; and dark, friable soil containing shell and bone, dietary debris, heat-affected rock, or human burials. In anticipation of discovering cultural deposits, procedures shall be in place so that the contractor can move on to another phase of work (connection pipeline component only), thus allowing sufficient time to evaluate the nature and significance of the find and implement appropriate management procedures.	

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Cultural Resources (cont.)		
3.11-1 (cont.)	**3.11-1f:** Zone 7 shall enter into a written agreement between an archaeological consultant to be retained by Zone 7 and Native American (Ohlone) representatives is human remains are found. This agreement shall specify terms as to treatment and disposition of human remains, and should define "associated burial goods" with reference to Public Resources Code Sections 5097.94, 5097.98, and 5097.99 and Health and Safety Code Section 7050.5. **3.11-1g:** If prehistoric archaeological deposits that include human remains are discovered, the county coroner shall be notified immediately. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. If no preconstruction regarding human remains has been executed, the most likely descendant of the deceased Native American shall be notified and given the chance to make recommendations for the remains. If no recommendations are made within 24 hours, the remains may be appropriately interred. If recommendations are made and not accepted, the Native American Heritage Commission would be available to mediate between the parties concerned.	
3.11-2: The proposed project would not affect known or identified historical resources. However, project implementation may affect unknown historical resources. Less than significant with mitigation.	**3.11-2a:** Zone 7 shall avoid siting of well facilities within areas of known / recorded historical sites, as identified in the Cultural Resources Map prepared by WSA (2002), the Alameda County General Plan, and the City of Pleasanton General Plan. These sites include: Bernal Wellfield – Heritage House; Mocho Wellfield – P-1785, English-Mohr House, and Century House; Martin Wellfield – C-736; and Isabel Wellfield – (P-2124 and CA-ALA-519H). **3.11-2b:** If proposed well facilities are located within 100 feet of known historical resources, or construction activities would require the alteration or removal of an existing building or linear feature, Zone 7 shall contract with a qualified archaeologist to determine the presence of unidentified, buried historic resources in the nearby resources, or to determine the age and historical status of the buildings proposed to be altered or removed. If buildings are identified as standing historical resources, and the qualified archaeologist determine that the resources would not be eligible for the California Register of Historic Resources, the qualified archaeologist would record the find on DPR 523 (historic properties) form. No further action is necessary as registration of the historic resources would complete	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Cultural Resources (cont.)		
3.11-2 (cont.)	the lead agency's obligation under CEQA. If historic resources are considered eligible for listing, then Zone 7 shall avoid the site. **3.11-2c:** Zone 7 or a qualified archaeologist shall develop a program for monitoring construction activities. The program shall include provisions to implement the monitoring requirements and preliminary data recovery and analysis plan in the event that historic resources are identified during monitoring. Additionally, the archaeologist shall perform an orientation and provide instructions for preliminary identification of historic resources to the project engineers and construction crew supervisors. **3.11-2d:** If historic resources are encountered during construction of the project, the contractor shall avoid altering the materials and discontinue earthwork within 100 feet of the find. The contractor must contact a qualified archaeologist, one certified by the Registry of Professional Archeologists (RPA), to evaluate the situation. Any identified historic resources shall be recorded by the archaeologist on form 523 (historic properties) or similar forms. Project personnel shall not collect cultural resources. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits, often in old wells and privies. Procedures for stopping construction, in the event that cultural resources are exposed, shall be part of the project plans and specifications. In anticipation of discovering cultural deposits, procedures shall be in place so that the contractor can move on to another phase of work (connection pipeline component only), thus allowing sufficient time to evaluate the nature and significance of the find and implement appropriate management procedures. **3.11-2e:** If historic deposits that include human remains are discovered, the county coroner shall be notified immediately. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. If no preconstruction regarding human remains has been executed, the most likely descendant of the deceased Native American shall be notified and given the chance to make recommendations for the remains. If no recommendations are made within 24 hours, the remains may be appropriately interred. If recommendations are made and not accepted, the Native American Heritage Commission would be available to mediate between the parties concerned.	

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Visual Resources		
3.12-1: Proposed well facilities could diminish the visual aesthetics of the surrounding environment. Less than significant with mitigation.	**3.12-1a:** Zone 7 shall plant native vegetation at individual well sites as needed to provide screening and integration of the facility with the surrounding environment (without affecting operation and maintenance of the proposed facilities). Landscaping will include revegetation of disturbed areas to minimize textural contrasts with the surrounding vegetation. New plants would include grasses, shrubs, and trees typical of the surrounding area. The contractor will be required to warrant landscape plantings for one year after project completion. **3.12-1b:** Zone 7 shall use design elements to enhance visual integration of above-ground components (i.e., well building, ancillary facilities) with their surroundings. Appropriate building materials shall be used (wood and stucco, metal, cinder block, or wood shingle) for well enclosures to maximize integration with surrounding uses and to minimize visual effect on surrounding land uses. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Decorative slats will be used in fencing. **3.12-1c:** Zone 7 shall coordinate with the affected jurisdiction regarding the design of well facilities. **3.12-1d:** Zone 7 shall ensure that its contractors restore disturbed areas to their pre-project condition so that short-term construction disturbance does not result in long-term visual impacts (Also see **Measures 3.4-1b** and **3.4-1c** in **Section 3.4**).	Less than Significant
3.12-2: Development of the project components would introduce new sources of light and glare onto the project site and increase ambient light in the planning area. Less than significant with mitigation.	**3.12-2:** To the extent possible, Zone 7 shall ensure that all permanent exterior lighting is directed downward and oriented to insure that no light source is directly visible from neighboring residential areas.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Cumulative Impacts		
5-1: Construction of project components would contribute to a cumulative increase in sediment loading in creeks and streams. Less than Significant with Mitigation.	No additional measures beyond those identified in **Section 3.2** are required.	Less than Significant
5-2: The Well Master Plan would not increase the number of people exposed to earthquake hazards. Less than Significant (no mitigation required).	None required.	Less than Significant
5-3: Implementation of the Well Master Plan could result in short-term cumulative land use impacts (i.e., increase in noise and dust to nearby sensitive receptors, traffic congestion, and access conflicts) associated with construction in the project vicinity. Less than Significant with Mitigation.	**5-3a:** Zone 7 shall coordinate construction activities along selected alignments with the affected jurisdiction, including but not limited to: Alameda County Planning and Public Works department, City of Pleasanton, and City of Livermore to identify overlapping pipeline routes, planning areas, and construction schedules. To the extent feasible, construction activities shall be coordinated to consolidate the occurrence of short-term construction-related impacts. Such coordination will minimize multiple disruptions to the same streets. See Measures identified in **Chapter 3** of this EIR.	Less than Significant
5-4: Project construction could result in cumulative loss of habitat for Special-Status Wildlife and Plants. Less Than Significant with Mitigation.	No additional Measures beyond those identified in **Section 3.5** are required.	Less than Significant
5-5: The Well Master Plan, together with other existing and reasonably foreseeable development, would contribute to cumulative construction emissions. Implementation of the proposed Project would generally be consistent with the Bay Area's Clean Air Plan. Less than Significant with Mitigation (implementation of BAAQMD-recommended control measures).	No additional Measures beyond those identified in **Section 3.6** are required.	Less than Significant
5-6: The Well Master Plan, together with cumulative development, would temporarily increase ambient noise levels in the planning area. Less than Significant with Mitigation.	None required beyond those identified in **Section 3.7**.	Less than Significant

TABLE S-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
Cumulative Impacts (cont.)		
5-7: Project construction could coincide with other construction projects in the planning area, contributing to cumulative traffic and roadway disruptions. Less than Significant with Mitigation.	**5-7a:** The traffic control plan will include consideration of any other planned traffic detours related to concurrent construction projects.	Less than Significant
5-8: The Well Master Plan would not significantly contribute to cumulative burdens on regional hazardous waste management facilities. Less than Significant (no mitigation required)	No additional measures beyond those identified in **Section 3.9** are required.	Less than Significant
5-9: Pipeline construction could reduce space available for future utilities. Less than Significant with Mitigation.	No additional measures beyond those identified in **Sections 3.4** and **3.10** are required.	Less than Significant
5-10: The project could contribute to other cumulative impacts on public services and utilities. Less than Significant with Mitigation.	No additional measures beyond those identified in **Section 3.10** are required.	Less than Significant
5-11: The proposed project may contribute to a cumulative increase in degradation or removal of archaeological resources. Less than Significant with Mitigation.	No additional measures beyond those identified in **Section 3.11** are required.	Less than Significant
5-12: Implementation of the proposed Project could, in conjunction with other projects, adversely affect the existing visual character of the planning area. Less than Significant (no mitigation required).	None required beyond those identified in **Section 3.12**.	Less than Significant

CHAPTER 1
INTRODUCTION

1.1 PURPOSE OF THE EIR

The Zone 7 Water Agency (Zone 7 or Agency) has prepared this Draft Environmental Impact Report (DEIR) to provide the public, and Responsible and Trustee Agencies reviewing this project, with information about the potential effects, both beneficial and adverse, on the local and regional environment associated with Zone 7's Well Master Plan. This DEIR was prepared in compliance with the California Environmental Quality Act (CEQA) of 1970 (as amended), the State EIR guidelines, and California Administrative Code, Title 14, Division, Chapter 3.

The DEIR describes the environmental impacts of the project. Mitigation measures are identified for reducing impacts to a less-than-significant level. The impact analyses in this report are based on a variety of sources including agency consultation, General Plans for Alameda County and the Cities of Livermore, Pleasanton, and field surveys completed by Environmental Science Associates staff. The Water Supply Planning Program – Program EIR (January 1999) form the basis for the secondary effects of growth analysis.

1.2 CEQA EIR PROCESS

1.2.1 NOTICE OF PREPARATION

In accordance with Section 15082 of CEQA Guidelines, Zone 7, as Lead Agency, prepared a Notice of Preparation (NOP) of an EIR (see **Appendix A**). The NOP was circulated on March 28, 2002 to local, state, and federal agencies, and to other interested parties. No Initial Study was prepared since Zone 7 decided in advance that a full EIR would be required for this project. As indicated in the NOP, the DEIR includes project specific analysis examining the types of impacts specific to implementation of the Well Master Plan, including impacts from construction and operation of the municipal supply wells, impacts to groundwater hydrology; secondary effects of growth, and cumulative impacts. The NOP provided a description of the proposed action and a preliminary list of potential environmental impacts. Written comments received during scoping are included in **Appendix A**.

1.2.2 PUBLIC AND AGENCY SCOPING

An interagency meeting was held at the Zone 7 Administrative Office on April 17, 2002 to present the project, receive agency input on well location development, and receive comments on the content of the EIR / scope of analysis. A similar meeting for both agencies and interested

public was held at the same location on April 24, 2002. Public notices were placed in local newspapers informing the general public of the scoping meeting. Additional coordination with public agencies was provided through informal consultation conducted throughout the DEIR process. A number of organizations and citizens commented on the NOP (written comments are provided in **Appendix A**). Issues and concerns were raised during the scoping period include:

- Ability to reduce demand, retain 100% reliability, and retain full storage of Main Basin
- Effects of groundwater basin fluctuation
- Subsidence potential from groundwater pumpage
- Existing and future imported water infiltration
- Groundwater treatment process
- Water quality
- Groundwater quality effect from fringe basins during drawdown below historic low
- Hazardous materials contamination
- Proximity of project to earthquake faults
- Hydrogeology
- Alternatives analysis
- Future demand projections
- Indirect growth inducement potential
- Impacts on customers if 100% reliability is maintained
- Effects on private developments

1.2.3 DRAFT EIR

This document constitutes the Draft EIR. It contains a description of the project, description of the environmental setting, identification of project impacts, and mitigation measures for impacts found to be significant as well as an analysis of project alternatives. The DEIR addresses those environmental issues that could result in potentially significant environmental effects from project implementation.

Significance criteria have been developed for each environmental issue analyzed in this DEIR, and are defined at the beginning of each impact analysis section. Impacts are categorized as follows:

1) Significant and unavoidable
2) Potentially significant, but can be mitigated to a less-than-significant level
3) Less than significant (mitigation is not required under CEQA, but may be recommended)
4) No impact
5) Beneficial

CEQA requires that a lead agency shall neither approve nor carry out a project as proposed unless the significant environmental effects have been reduced to an acceptable level, where possible (CEQA §15091 and §15092). An acceptable level is defined as eliminating, avoiding, or substantially lessening the significant effects. If such a reduction is not possible, a lead agency must adopt Findings and a Statement of Overriding Considerations. As defined in CEQA §15093, an agency may proceed with a project which has significant adverse environmental

impacts if it makes one or more written findings for each significant effect, accompanied by a brief explanation of the rationale for each finding.

1.2.4 PUBLIC REVIEW

This document is being circulated to local, state and federal agencies, and to interested organizations and individuals who may wish to review and comment on the report. Publication of this DEIR marks the beginning of a 45-day public review period, during which written comments may be directed to the following address: Matt Katen, Zone 7 Water Agency, 5997 Parkside Drive, Pleasanton, CA, (925) 484-2600 ext. 234.

During the 45-day review period, Zone 7 will hold a formal public hearing on the DEIR. After the Final EIR, containing the responses to comments received on the DEIR, has been published, Zone 7 will hold a public hearing on the Final EIR to consider EIR certification.

1.2.5 FINAL EIR PUBLICATION

Written and oral comments received in response to the DEIR will be addressed in a Response to Comments addendum document which, together with the DEIR, will constitute the Final EIR. The Final EIR will be released for public review. The Zone 7 Board of Directors will then consider EIR certification. Upon EIR certification, Zone 7 may proceed to take action on project approval.

If Zone 7 approves the project even though significant impacts identified by the EIR cannot be mitigated, the agency must state in writing the reasons for its actions. A Statement of Overriding Considerations must be included in the record of the project approval and mentioned in the Notice of Determination (CEQA Guidelines §15093.c).

1.2.6 MITIGATION MONITORING AND REPORTING

Section 15097 of the CEQA Guidelines specify that where a public agency has made the findings to certify an EIR in conjunction with approving a project, “the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it imposed to mitigate or avoid significant environmental effects” to ensure that the mitigation measures and project revisions identified in the EIR are implemented. Throughout the DEIR, mitigation measures have been clearly identified and presented to ensure avoidance or reduction of potentially significant impacts to less than significant levels. The measures have been written in a concise language that will facilitate establishment of a monitoring program, in the event that the project has been deemed viable and the Board of Directors certifies the EIR approves the project. Any measures adopted by Zone 7 as conditions for approval of the project will be included in a Mitigation Monitoring and Reporting Program to ensure compliance.

1.3 DOCUMENTS INCORPORATED BY REFERENCE

One document is referred to and is incorporated in part by reference in this DEIR. As provided for by CEQA §15150, an EIR may incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public. The incorporated portions of other documents are considered in full as part of the text of the EIR. The EIR must indicate where the incorporated document is available for public review, and the EIR should briefly summarize or describe the referenced information and describe the relationship of the referenced document to the EIR analysis.

The following document is incorporated by reference and is available for review to gain an understanding of previously completed analysis of Zone 7's water supply planning efforts, and as background material for the proposed project:

- *Zone 7 Water Agency Water Supply Planning Program – Program EIR*, January 1999 (SCH No. 98042005), prepared by Environmental Science Associates. The document was certified by Zone 7 Board of Directors on January 21, 1999.

The document is available for review during business hours at the Zone 7 Water Agency Administrative Office, located at 5997 Parkside Drive, Pleasanton, California, 94588.

CHAPTER 2
PROJECT DESCRIPTION

2.1 INTRODUCTION

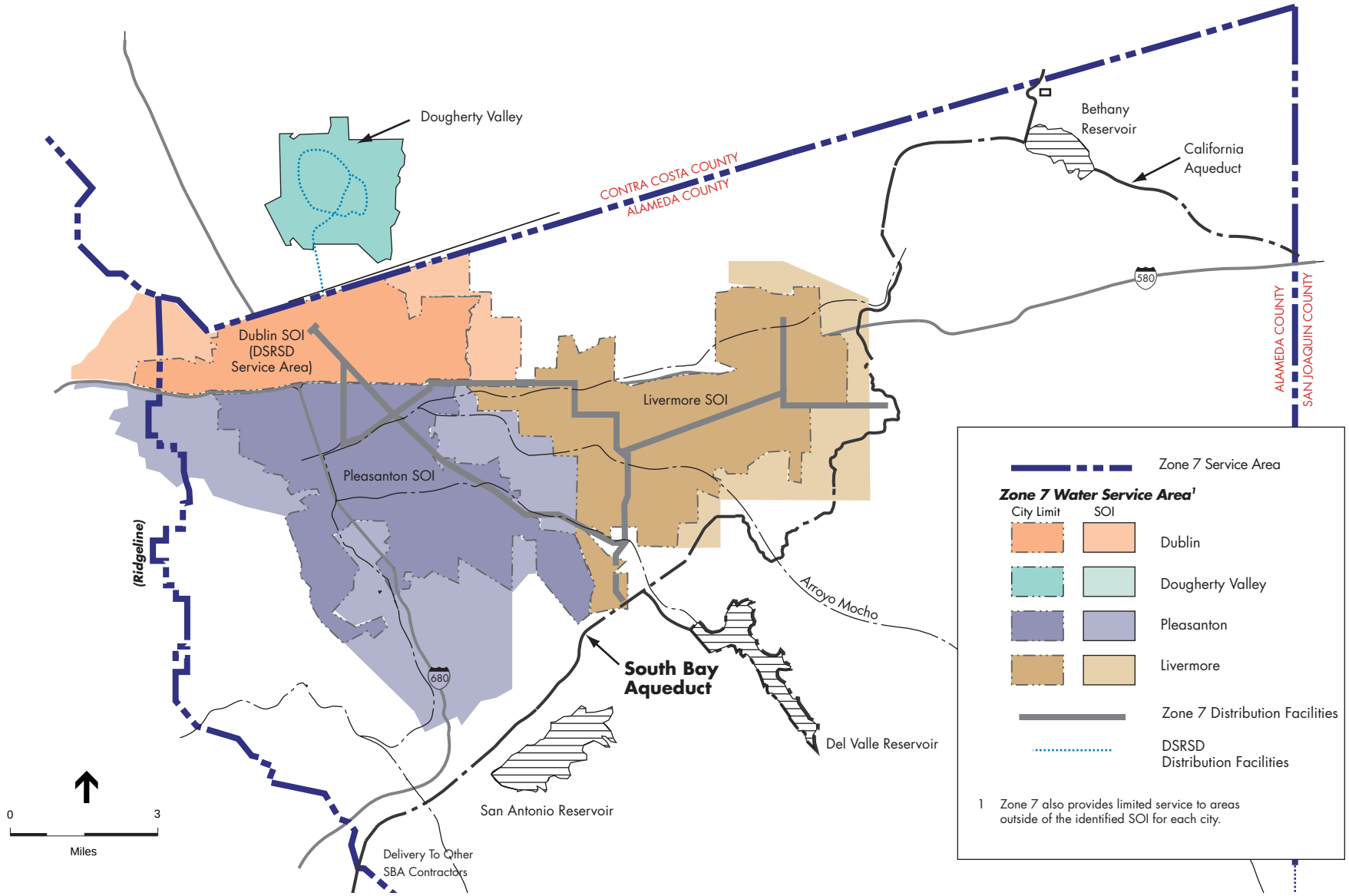
Zone 7 is one of the ten active zones of the Alameda County Flood Control and Water Conservation District (ACFCWCD), a special district established by the State Legislature in 1949. Zone 7 was established by popular vote of the residents of the Livermore-Amador Valley in 1957 under an amendment to the District Act. Zone 7 serves the Livermore-Amador Valley within Alameda County as shown on **Figure 2-1**, and provides the following services:

- Wholesale treated and untreated water supply
- Flood control
- Groundwater management

Zone 7's service area comprises approximately 425 square miles in eastern Alameda County (see **Figure 2-1**) and includes the cities of Pleasanton, Livermore and Dublin as well as the surrounding unincorporated Alameda County lands. Today Zone 7 provides water supply to a population of approximately 175,000; this population is projected to increase to 253,000 by 2030.

Zone 7 wholesales treated water to retail contractors for municipal and industrial (M&I) domestic use, and supplies untreated water for irrigation of vineyards, golf courses, and to others in parts of the Livermore-Amador Valley. Retail contractors include the City of Pleasanton, the City of Livermore, the Dublin San Ramon Services District (DSRSD) and the California Water Services (CWS) Company.

In order to recover groundwater that has been stored under Zone 7's conjunctive use program at the appropriate rate to meet its reliability goals, Zone 7 proposes to increase its well production capacity by about 42 mgd through the installation of 8 to 15 new production wells. Based upon projected demands, it is anticipated that wells would be installed over a period of approximately twenty years, with an average of one or two wells being constructed every one to two years, on an as-needed basis. The well facilities would be located within eleven wellfield areas in Alameda County, in the cities of Pleasanton and Livermore, and unincorporated Alameda County. Each production well would be 300- to 800-feet deep and consist of vertical turbine or submersible pumps with pumping rates in the range of 1,000 to 5,000 gallons per minute (gpm). The size of the well casings would depend on the pump diameters. Individual wells would be designed with two basic configurations: sites with onsite treatment or sites in which recovered groundwater supplies would be treated offsite. Well facilities would be fully enclosed to provide noise attenuation appropriate to surrounding uses**.** In addition, associated pipelines and ancillary facilities would be installed as part of the project.



SOURCE: Water Transfer Associates, 1998

Figure 2-1
City Limits and Spheres of Influence
in the Zone 7 Service Area

2.2 PROJECT BACKGROUND

2.2.1 ZONE 7 GROUNDWATER MANAGEMENT

Zone 7 conjunctively manages the Main Groundwater Basin (Main Basin) of the Livermore-Amador Valley by implementing an annual and long-term water Operation Plan designed to maintain a sustainable water supply and groundwater quality. During non-drought periods, Zone 7's operational practice is to maintain an equal balance of recharge and pumping, as well as to maintain sufficient managed storage for use during a multi- year drought. Zone 7 seasonally uses approximately 15,000 to 20,000 af of storage capacity (including retailer contractor groundwater pumpage). This practice has the objective of preserving up to 240,000 af of groundwater to provide peaking, drought year, and emergency storage. In this groundwater management role, Zone 7 has entered into water supply agreements with its retailers that include provisions limiting annual pumpage by these agencies to a total of 7,245 acre feet per annum (afa), broken down as follows: City of Pleasanton, 3,500 afa; DSRSD, 645 afa; and California Water Services, 3,069 afa; City of Livermore, 31 afa. Additionally, groundwater levels are also maintained in accordance with agreements with gravel mining operations within the Chain of Lakes area. Through Zone 7's long-term conjunctive use management, groundwater levels within the Main Basin have been restored from historical overdraft conditions that occurred in the 1960s, when only approximately 126,000 af of groundwater remained in storage in the Main Basin. This 126,000 af storage level corresponds to groundwater levels identified by Zone 7 as the "historic low" and provides the foundation for Zone 7's current operational practice, which is to maintain groundwater levels above historic lows.

Zone 7 implements conjunctive use on an annual basis through 1) artificial recharge of the Main Basin through releases of imported State Water Project supplies to Arroyo Mocho and Arroyo Del Valle from the South Bay Aqueduct (SBA); and 2) subsequent recovery of stored groundwater through extractions from seven existing wells within the City of Pleasanton. The current Valley-wide municipal well peak pumping capacity is approximately 53 mgd, which includes both Zone 7's instantaneous peak pumping capacity (32 mgd) and Retailer Agency (21 mgd) peak well production capacity. Zone 7's sustainable capacity, or the capacity that could be pumped for a longer than 24-hour period to meet either drought year or emergency demands, is 25 mgd.

The safe yield of the Main Basin is 13,400 af annually. From this safe yield, the Valley retailers are permitted to pump 7,200 af annually. This amount is limited by Zone 7's water supply contracts with each retailer. The balance of the safe yield is pumped for other municipal, agricultural, and gravel mining uses. Zone 7's pumpage for treated water deliveries does not use the natural safe yield of the Main Basin; rather its pumpage is equivalent to the amount of water recharged and stored as part of its conjunctive use operations. Zone 7 implements a flexible, adaptive groundwater management program based on each year's hydrologic conditions (which determines the supply) and demand. Although the amount Zone 7 recharges and recovers may not balance in any given year, over the long term, the amount artificially recharged exceeds the amount pumped from the Main Basin. Between 1974 through 2003, the amount artificially

recharged totaled 137,694 af, of which 76,903 af was recovered by Zone 7. To the extent feasible, Zone 7 maintains a full groundwater basin. Based upon the adopted General Plans within the Zone 7 Service Area, treated water demands are projected to increase to 68,960 afa by 2020. As demands increase over time, Zone 7 will need additional well capacity to recover stored groundwater at rates that will meet this projected demand within the context of its reliability goals. A discussion of these reliability goals is presented in the section below.

2.2.2 ZONE 7 RELIABILITY GOALS

Increasing treated water (M&I) demands, and Zone 7 reliability policies have dictated the need for expansion of Zone 7's groundwater production facilities. Existing Zone 7 reliability goals relating to groundwater management include the following:

Goal 1 – Water Supply Reliability (Meet 100% of Demands)

> Goal 1: Meet 100% of its treated water customers water supply needs in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan, (UWMP), which will be coordinated with Zone 7's M&I water Contractors. Zone 7 will endeavor to meet this goal during an average water year[1], a single dry water year[2], and multiple dry water years[3] (Zone 7, May 2002).

Zone 7's current operational policy is to meet 100% of future demands within its service area under all projected hydrologic conditions, including average year, single drought year, and multiple drought year. Zone 7 examined future demands under the adopted General Plans of the jurisdictions within Zone 7's service area in the Water Supply Planning Program – Program EIR (SCH No. 98041040) (Zone 7, 1999). M&I demands within the Valley wide area for the year 2020 are estimated at 100,300 afa, of which approximately 69,000 af is treated water (M&I) demand and 31,300 af is untreated water demand.

Zone 7's planning criteria is based on the need to maintain reliability during any drought scenario of historic record, when deliveries from the SWP, via the SBA, are substantially reduced. Zone 7's planning criteria for drought year reliability is based upon the historical hydrologic conditions and planning data utilized by the DWR, and includes both the worst single drought year of record (1977) and the two worst multi-year droughts of record (two 6-year droughts, 1929 to 1934 and 1987 to 1992). Zone 7 would continue to recover groundwater from storage to meet future drought year demands. For example, if hydrologic conditions similar to the worst single drought year were to occur at buildout, a Valley-wide capacity of 66 mgd, comprised of 45 mgd from

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1 Average water year—the statistical average quantity of water from all of the water supplies available to Zone 7 on a contractual or legal basis (e.g., surface water runoff to Del Valle reservoir), based on the historical hydrologic records available to Zone 7.

2 Single dry water year—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of a calendar year from the historic record that represents the lowest yield from all normally contracted or legally available supplies.

3 Multiple dry water years—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

Zone 7 plus the retailers 21 mgd, would be necessary to meet the projected demand of the M&I customers at buildout, assuming that DWR would meet 20% of their water allocation deliveries. This is consistent with delivery estimates during drought scenarios established by DWR in the State Water Project Delivery Reliability Report (August 2002). This stored groundwater would be recharged with imported SWP supplies in subsequent normal and wet years to maintain basin groundwater storage, consistent with Zone 7's current conjunctive use practices. Zone 7's current drought year production capacity is 25 mgd; therefore, an additional 20 mgd of well capacity is required to meet this sustainable drought year reliability objective (see **Table 2-1**).

Goal 2 – Groundwater Production Capacity (Maintain 75 % "Maximum-Day Demand" Capacity).

> Goal 2: Provide sufficient valley-wide groundwater production capacity (including Zone 7's and Contractors' wells) to meet at least 75% of the estimated maximum daily M&I water demand (Zone 7, May 2002).

In addition to drought reliability, Zone 7's current reliability goal is to have enough Valley-wide groundwater production capacity to meet 75% of the Valley's M&I maximum day demand from the groundwater basin. This reliability goal allows Zone 7 and its retailers to meet 75% of the maximum daily demand (MDD) with local groundwater supplies in the event of an operational or emergency outage of the SBA. As previously discussed, Zone 7's current sustainable production capacity is 25 mgd, and the retailers' capacity is 21 mgd; therefore, the Valley-wide production is 46 mgd (see **Table 2-1**). The estimated Valley-wide MDD for 2003 is 88 mgd; 75% of this Valley-wide MDD is 66 mgd. Therefore, current Valley-wide production capacity of 46 mgd provides the ability to meet approximately 53% of the Valley-wide MDD.

Peak day production capacity necessary to meet this reliability goal would increase proportionally with municipal demand through buildout, when the Valley-wide MDD is expected to be as high as 118 mgd. Between now and buildout, approximately 42 mgd of additional groundwater production capacity would be necessary to meet the reliability goal of 75% Valley-wide MDD capacity. **Figure 2-2** shows the historic, existing and projected groundwater pumping capacity from 1962 through the year 2020. The figure captures the 75% Valley-wide MDD as well as the total peak well production capacity for both Zone 7 and its retailers. A summary of Valley-wide peak well capacity available to Zone 7 and its retailers, and projected well capacity requirements to meet 75% Maximum Day Demand in 2020 are provided in **Table 2-2**, below.

2.2.3 SALT MANAGEMENT

In addition to these reliability goals, Zone 7 has adopted salt management strategies as part of its Salt Management Program. Zone 7 developed a Salt Management Plan (SMP) in 1998 (EOA, Inc) to address the issue of salt accumulation. The Salt Management Plan was prepared to identify and evaluate salt loading to the groundwater basin, and potential mechanisms for salt removal.

TABLE 2-1
ZONE 7 AND RETAILER WELL CAPACITY RELATIVE TO MEET 100% RELIABILITY OBJECTIVE (Goal 1)

	Zone 7	Retailers	Total
Current Drought Well Capacity	25 mgd	21 mgd	46 mgd
Projected 2020 Demand Sustainable Drought Year (Assumes 20% SBA Delivery)	45 mgd	21 mgd	66 mgd
Capacity Shortfall at 2020 Demands-100% Reliability Objective	20 mgd	0 mgd	20 mgd

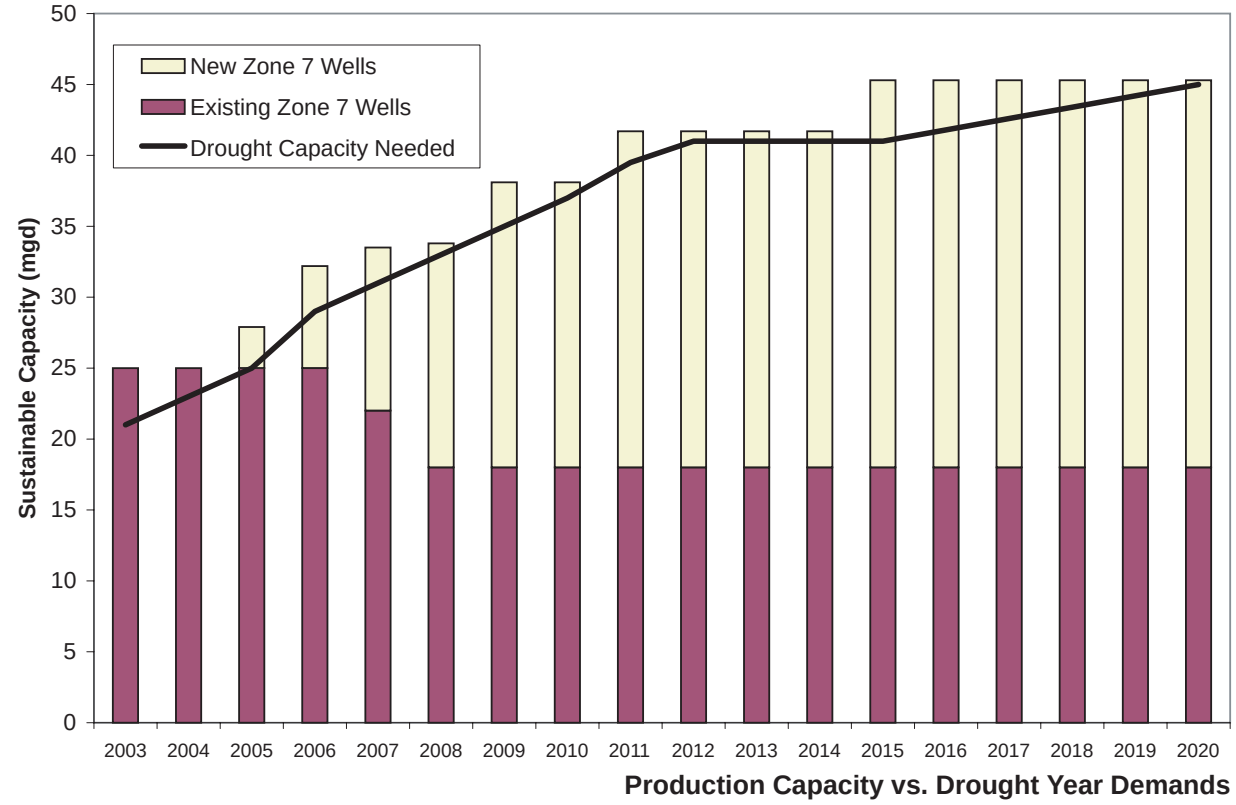
SOURCE: Zone 7 Water Agency, 2004.

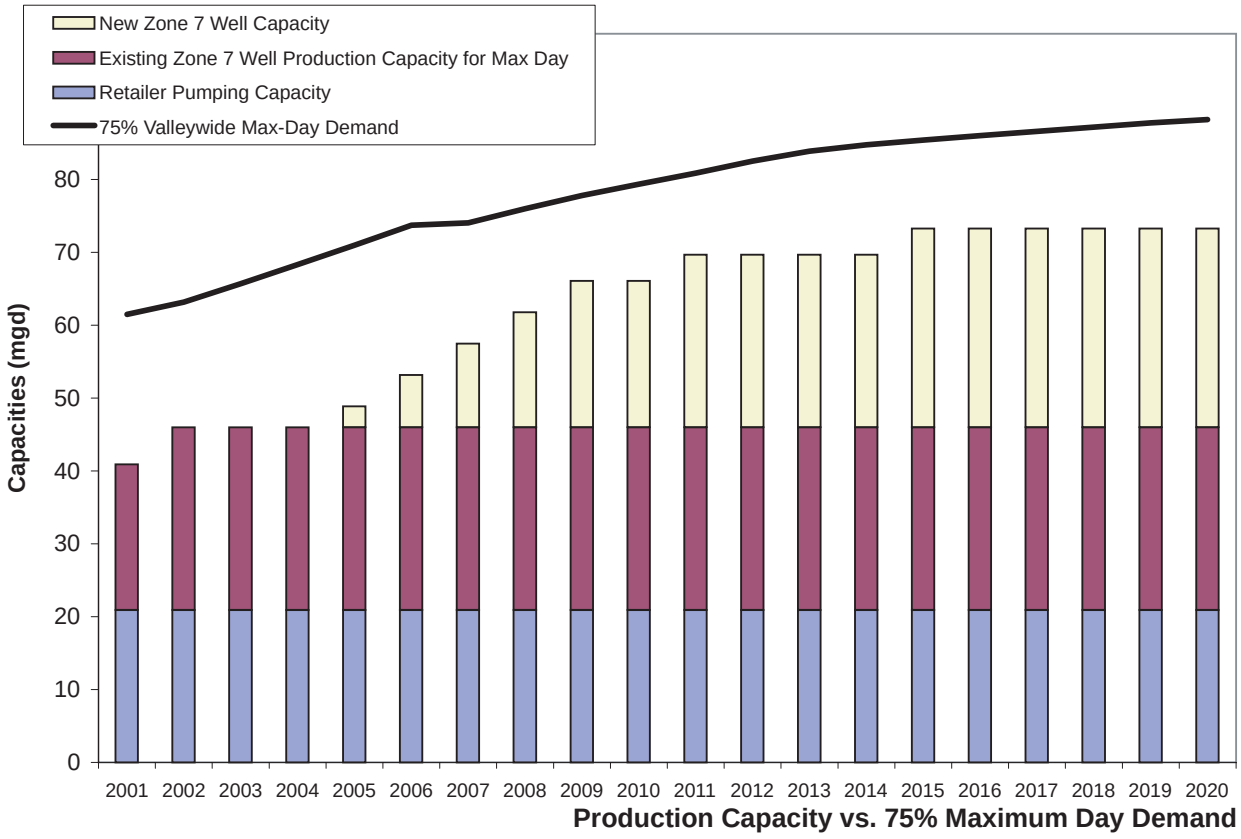
TABLE 2-2
ZONE 7 AND RETAILER WELL CAPACITY TO MEET 75% VALLEY-WIDE MAXIMUM DAY DEMAND OBJECTIVE (Goal 2)

	Zone 7	Retailers	Total	% Valley-wide MDD
Current Capacity vs. Current Demands				
Current Peak Well Capacity[1]	32 mgd	21 mgd	53 mgd	61%
Current Emergency Capacity[2]	25 mgd	21 mgd	46 mgd	53%
75% Maximum Day Demand, 2003	45 mgd	21 mgd	66 mgd	75%
Current Capacity Shortfall-75% Maximum Day Demand (Goal 2)	20 mgd	0 mgd	20 mgd	23%
Projected Capacity Need vs. Projected 2020 Demands				
75% Maximum Day Demand	67 mgd	21 mgd	88 mgd	75%
Existing Capacity Shortfall vs. 75% Maximum Day Demand (Goal 2)	42 mgd	0 mgd	42 mgd	36%

1 Peak Well Capacity is sustainable for 1 day or less.
2 Emergency capacity is sustainable for more than 3 days

SOURCE: Zone 7 Water Agency, 2004.





SOURCE: Zone 7 Water Agency, 2003

Figure 2-2

Groundwater Production Capability vs. Drought Demand and 75% Valleywide Maximum Day Demand

Based upon the results of the SMP analysis, Zone 7 adopted the following policy goals for salt management:

- Offset the current (1998) 2,200 tons per year salt loading plus approximately 200 tons per year projected annual increase;
- Maintain or improve groundwater mineral quality;
- Maintain or improve delivered water quality;
- Provide comparable delivered water quality to all retailers (equalize the east-west water quality;
- Minimize total operational and maintenance costs through an adaptive management process.

To meet these goals, Zone 7 developed a salt management strategy with two immediate elements and one near-term element:

- Immediately increase recharge of imported low TDS surface water, and
- Immediately increase usage of groundwater storage to remove salt from the groundwater basin by increasing turnover.
- Near term: Implement well demineralization to increase salt removal, equalize east-west water quality

As one of the chosen salt management strategies, Zone 7 has increased conjunctive use practices to meet its total treated water demands with 20% groundwater, with an ultimate target of 25% under normal operational conditions. This would assist Zone 7 in meeting its long-term salt management goal of protecting groundwater quality by neutralizing salt buildup within the Main Basin. Accordingly, as demands within its service area increase, Zone 7's average annual groundwater production would increase from its current level of approximately 6,700 afa to approximately 15,000 afa by the year 2020, with corresponding increase in artificial recharge. No additional well facilities are required to meet average demands at 2020. These demands can be met with existing Zone 7 well capacity of 32 mgd.

Another salt management strategy, groundwater or "wellhead" de-mineralization, may involve the construction of additional well facilities. Currently, project alternatives for wellhead demineralization are under development by Zone 7. In the event these facilities are developed for implementation, Zone 7 would conduct separate environmental analysis for this salt management strategy. Potential impacts associated with construction of demineralization well facilities would be similar to those identified for well facilities. For the purposes of the Well Master Plan, groundwater pumpage associated with wellhead demineralization was considered in the analysis of long-term groundwater operations, in order to address potential cumulative effects to groundwater associated with operation of future demineralization facilities, if they are implemented.

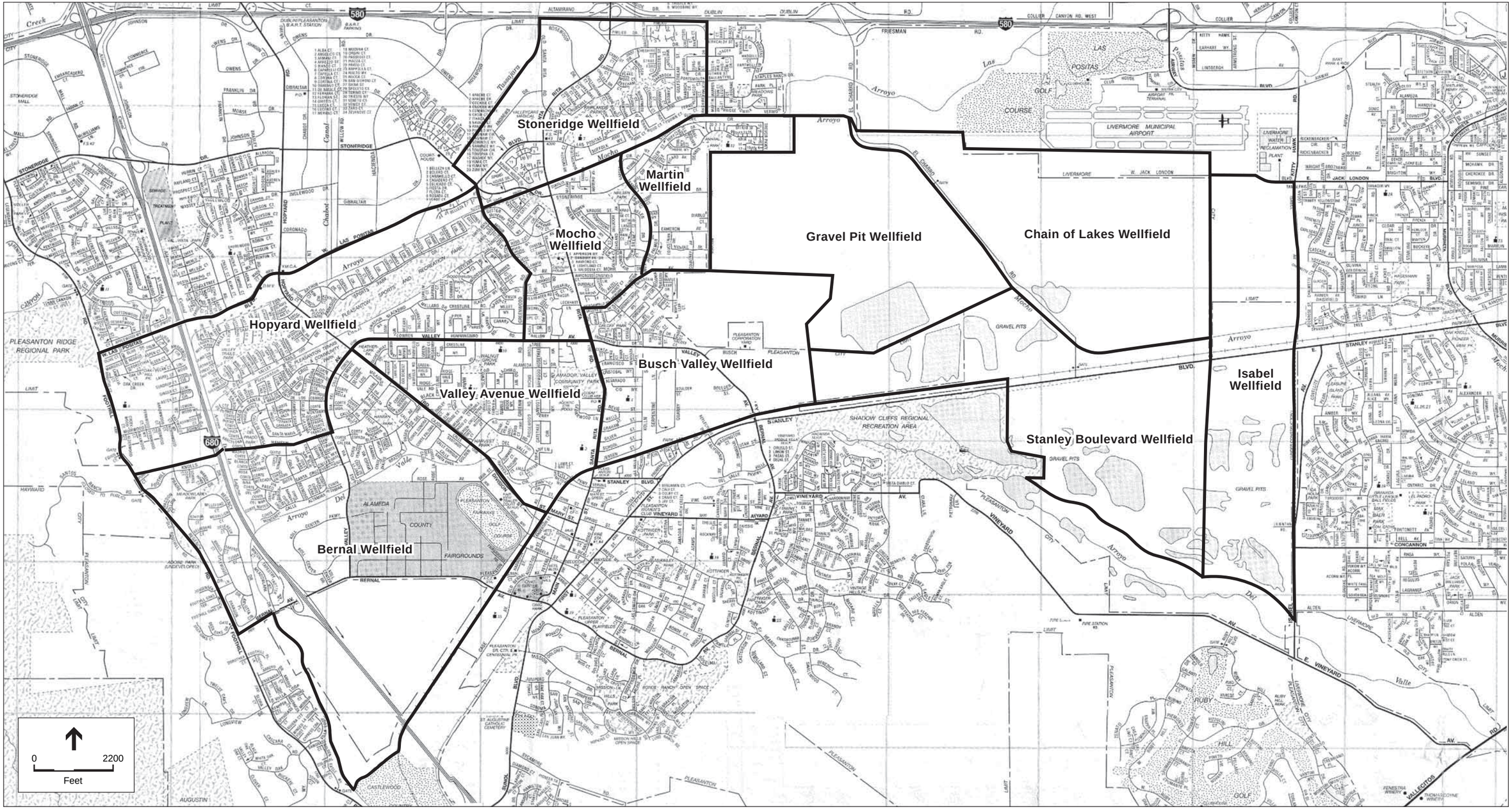
2.3 PURPOSE, NEED AND PROJECT OBJECTIVES

The main objective of this project is to increase reliability and redundancy of the water system such that treated water is available to Zone 7 customers when SWP water allocation is low during a drought year or in the event of an emergency. The specific project objectives are as follows:

- Provide facilities to recover stored groundwater supplies from the Main Basin at a sufficient rate to meet Zone 7's reliability goals, as established in Resolution 02-2382. These goals are consistent with those used for the Zone 7 Water Supply Planning Program, and include:
  - **Goal 1:** Meet 100% of treated water customers water supply needs in accordance with Zone 7's most current contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan (UWMP), which will be coordinated with Zone 7's M&I Contractors. Zone 7 will endeavor to meet this goal during an average water year, a single dry water year, and multiple dry water years.
  - **Goal 2:** Provide sufficient Valley-wide groundwater production capacity (including Zone 7's and Contractors wells) to meet at least 75% of the estimated maximum daily M&I water demand.
- Maintain water levels within the Main Basin above the historic lows.
- Design and site proposed facilities to minimize potential interference to nearby wells during operations, to the degree feasible.
- Design and site proposed facilities to minimize potential effects to surrounding land uses during well construction, development and operation, to the degree feasible.

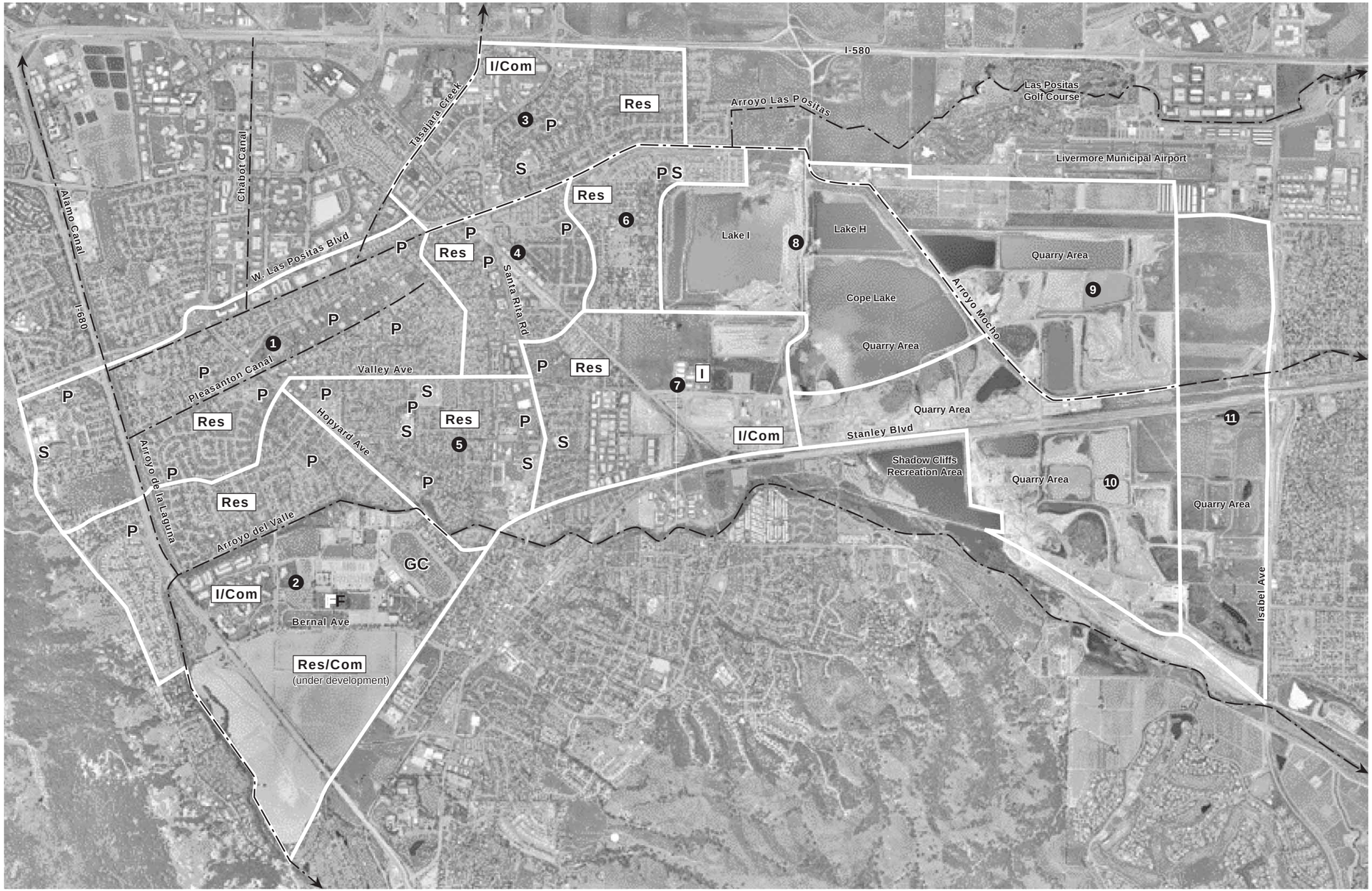
2.4 PROJECT LOCATION

In order to provide maximum flexibility with regard to hydraulic, geologic, and environmental parameters, the precise locations of individual facilities have not been determined. Rather, areas of potential well locations (wellfields) have been identified to aid CEQA analysis. **Figure 2-3** and **Figure 2-4** show the locations of the wellfields within the cities of Pleasanton, Livermore, and unincorporated Alameda County. Eleven wellfield areas have been selected for examination, including: Bernal, Hopyard, Valley Avenue, Mocho, Stoneridge, Martin, Busch Valley, Gravel Pit, Stanley Avenue, Chain of Lakes, and Isabel. The wellfields include all areas of viable groundwater production, and key into existing boundaries such as existing roadways and city boundaries. **Table 2-3** shows the location and jurisdictions of the wellfields. The wellfields have been chosen based upon hydrogeologic evaluation, aquifer transmissivity, and groundwater quality factors, and encompass a variety of land uses including residential, commercial, and industrial uses, quarry areas, and limited agricultural lands. The typical site layout requirement for individual well facilities is described in **Section 2.5** below.



SOURCE: Environmental Science Associates, California State Automobile Association

Figure 2-3
Wellfield Locations
(Street-Based)



F Fairgrounds
GC Golf Course
P Park
S School
Com Commercial
I Industrial
Res Residential

Creeks

1 Hopyard Wellfield
2 Bernal Wellfield
3 Stoneridge Wellfield
4 Mocho Wellfield
5 Valley Avenue Wellfield
6 Martin Wellfield
7 Busch Valley Wellfield
8 Gravel Pit Wellfield
9 Chain of Lakes Wellfield
10 Stanley Boulevard Wellfield
11 Isabel Wellfield

N

SOURCE: Environmental Science Associates

Zone 7 Well Master Plan / 201583 ■

Figure 2-4
Wellfield Locations and Existing Land Uses (Aerial Base)

TABLE 2-3
WELLFIELD SITE LOCATIONS AND CHARACTERIZATION

Wellfield	N, S, E, W Boundary	Jurisdiction
Hopyard Wellfield	Las Positas Blvd Valley Avenue / Hansen Dr. Mohr/Greenwood I-680	City of Pleasanton
Bernal Wellfield	Valley Ave / Hansen Drive North of Castlewood Country Club / UPRR Hopyard Road Arroyo de la Laguna	City of Pleasanton
Stoneridge Wellfield	I-580 Arroyo Mocho Pimlico Tassajara Canal / Stoneridge	City of Pleasanton
Valley Avenue Wellfield	Valley Avenue UPRR Santa Rita Hopyard/Division	City of Pleasanton
Mocho Wellfield	Arroyo Mocho Valley Ave / Morganfield Rd. Kamp Drive Mohr / Greenwood	City of Pleasanton
Martin Wellfield	Arroyo Mocho Mohr Avenue Lake I Kamp Drive	City of Pleasanton
Busch Valley Wellfield	Morganfield / Mohr UPRR along Stanley El Charro Extension Santa Rita	City of Pleasanton, Unincorporated Alameda County
Gravel Pit Wellfield	Arroyo Mocho Pleasanton City Limit Arroyo Mocho El Charro Road Extension	Unincorporated Alameda County
Stanley Wellfield	Pleasanton City Limit / Arroyo Mocho UPRR along Stanley Boulevard / arbitrary line through Gravel pits Pleasanton City Limit Extension Shadow Cliffs Regional Recreation Area	City of Pleasanton, Unincorporated Alameda County

TABLE 2-3 (Continued)
WELLFIELD SITE LOCATIONS AND CHARACTERIZATION

Wellfield	N, S, E, W Boundary	Jurisdiction
Chain of Lakes Wellfield	Airport Boundary Arroyo Mocho Livermore City Limit Arroyo Mocho	Unincorporated Alameda County, City of Livermore
Isabel Wellfield	Jack London North of Arroyo Del Valle Caltrans easement / east of Isabel Avenue Arbitrary line through gravel pits	Unincorporated Alameda County City of Livermore

Ultimately, individual well sites would be selected based on the following criteria:

- Hydrogeologic conditions / groundwater characteristics
- Water quality, projected discharge rates from test wells;
- Proximity to existing Zone 7 distribution facilities;
- Proximity to existing utilities;
- Avoidance of contaminated sites and potential contaminating facilities;
- Avoidance of sensitive biological / cultural resources;
- Minimization of well interference;
- Site conditions/property ownership;
- Land acquisition costs.

As water demands increase over time within the Zone 7 service area, Zone 7 would construct 8-15 individual wells at properties within the identified well fields. Individual well sites may be located removed from, or in clusters near, other individual well sites. Based upon projected demands, it is anticipated that wells would be installed over a period of approximately twenty years, with an average of one or two wells being constructed every one to two years, on an as-needed basis. Following completion of individual wells, Zone 7 would assess well performance and demand rates relative to its reliability objectives prior to implementing the next well(s) construction phase.

2.5 PROJECT DESCRIPTION

In order to recover groundwater that has been stored under Zone 7's conjunctive use program at the appropriate rate to meet its reliability goals, Zone 7 proposes to increase its well production capacity by about 42 mgd through the installation of 8 to 15 new production wells. The Proposed project would provide 20 mgd of additional capacity to meet drought year demands, and would provide an additional peak capacity of 42 mgd to meet emergency demands. Based upon projected demands, it is anticipated that wells would be installed over a period of approximately twenty years, with an average of one or two wells being constructed every one to two years, on an

as-needed basis. Zone 7 proposes to construct additional well capacity within the Main Basin in order to meet its reliability goals at demand levels associated with 2020 buildout within its service area.

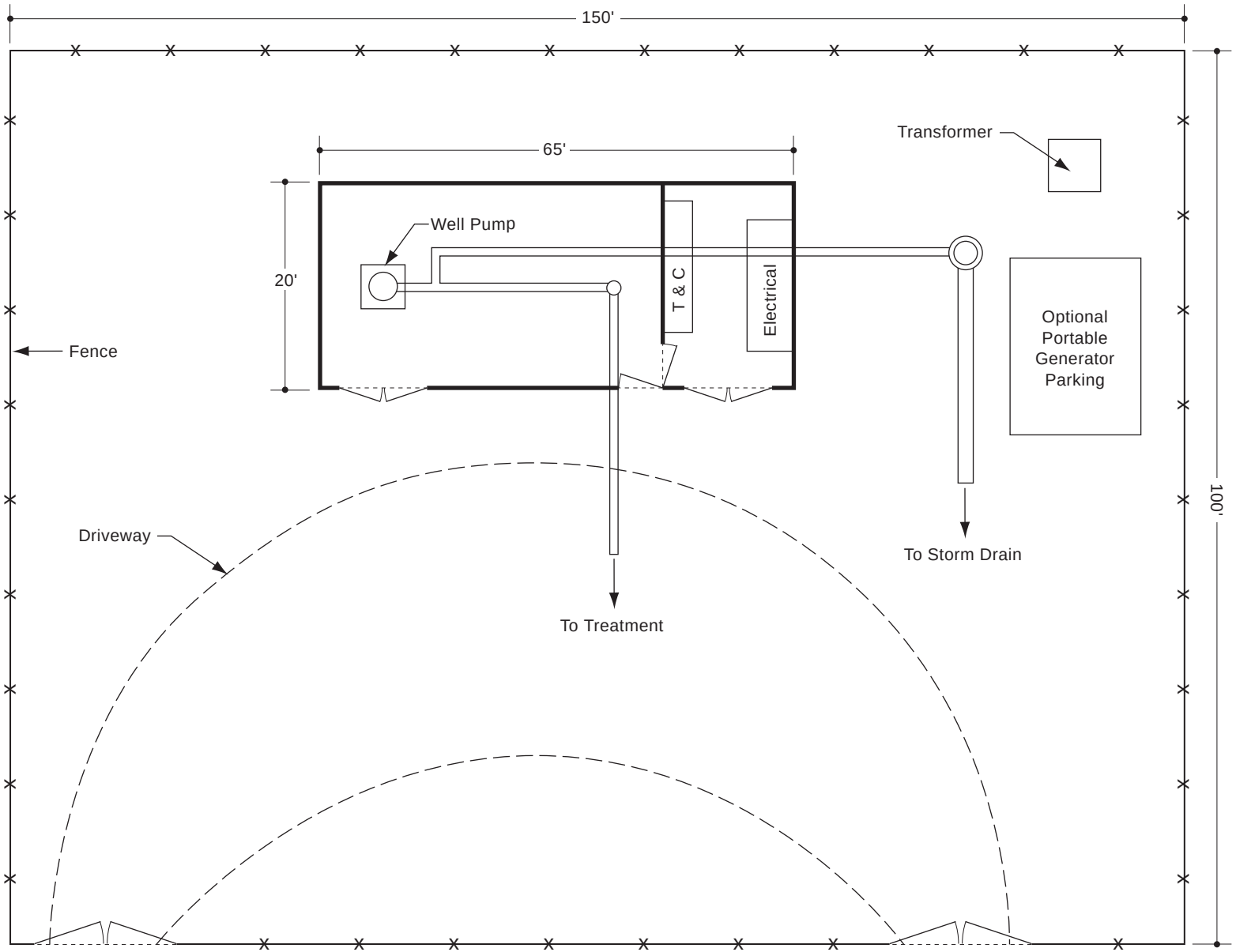
2.5.1 WELL SITE IMPLEMENTATION

Well sites would be designed, constructed, and operated consistent with existing Zone 7 well sites, and would include wells with "offsite" treatment and wells with "onsite" treatment. Wells with offsite treatment would be slightly smaller in layout, would be connected to either another well with onsite treatment or a standalone treatment facility. A design scheme relative to surrounding land uses would then be applied to each configuration for noise control and other land use related issues, such as aesthetics. Wells would be typically installed to depths of more than 500 feet (up to 800 feet) below ground surface to reach the deep aquifer. Each well would consist of an electric vertical turbine or submersible pump with a pumping rate in the range of 1,000 to 5,000 gpm and thus require pump diameters ranging from 10-inches to 18-inches. The size of the well casings would depend on the pump diameters. The electric motors that drive the pumps would have between 200 to 700 hp and be powered from a 480 volt or 4,160 volt electric service.

Proposed facilities would be designed to be consistent with surrounding land uses and sized to meet available aquifer capacity within specific well fields. Zone 7 intends to acquire property for implementation of well sites through purchase on a willing seller basis, to the extent feasible. However, as a public agency, Zone 7 may also acquire property through its power of eminent domain, if necessary. A description of well site configurations is provided below.

WELLS WITH OFFSITE TREATMENT

Wells with offsite treatment would be connected to a well with onsite treatment or standalone treatment facility, and would be operated as a "feeder" well to provide source water for treatment. Wells with offsite treatment would consist of an up to 100-foot by 150-foot site, or approximately 0.35 acres, and would include a well house and discharge structure, asphalt paved entry and parking areas, and typically secured with fencing and lighting. The well house would consist of an up to 65-foot by 20-foot well house, and potentially a 15- foot by 15-foot ancillary building containing the discharge structure. The well house, consisting of a single-story building (less than 15 feet tall) would be constructed of materials that would be non-glare and noise attenuating. The well house would contain the well, pump, motor and electrical control panels. The discharge structure, tied to the local storm drain system, may be open or enclosed within a 15- by 15-foot building constructed of similar non-glare and noise attenuating material. Each well site would be equipped with an up to 700 hp pump motor. Final site specifications may vary based upon site configuration and available area, but would be within the parameters discussed above. **Figure 2-5** shows the layout of a typical well site with offsite treatment. Existing facilities consistent with this well site layout include Mocho 2 and Hopyard 9 wells, as shown in **Figure 2-6**.



SOURCE: Luhdorff & Scalmanini Consulting Engineers, ESA 2002

Figure 2-5
Conceptual Layout of Typical Well Facility
with Off-Site Treatment

Mocho 2

Hopyard 9

SOURCE: Environmental Science Associates

Zone 7 Well Master Plan / 201583 ■

Figure 2-6
Existing Wells with
Off-Site Treatment

In addition to the above well site footprint, a compact well design would be implemented if appropriate due to land use or property constraints. This well design would consist of a smaller site plan limited to only an enclosed, single story well house of approximately 50 by 50 feet, and could be integrated with surrounding open space uses, such as parks or recreational trails. Existing facilities consistent with this well site layout include Mocho 2 and SFWD A and SFWD B wells, Pleasanton 7. Examples are shown in **Figure 2-6**.

WELLS WITH ONSITE TREATMENT

Wells with onsite treatment would include treatment facilities for the onsite well as well as for other "feeder" wells within an individual well field. This would provide for consolidation of treatment facilities, and would reduce the overall facility sizing of associated well sites. Wells with onsite treatment would include slightly larger facilities within the same 100-foot by 150-foot site, and would include both an onsite well and onsite chemical disinfection systems to treat water generated at this and other well sites. The chloramine disinfection system would combine salt ammonium hydroxide and sodium hypochlorite to generate a one percent chloramine solution commonly used in wellhead treatment. Both chemicals are added separately at specific volumes via chemical injectors directly into the distribution pipelines prior to water delivery to customers. All treatment facilities would include secondary containment of hazardous chemicals, eyewash and shower stations, safety equipment, and standby power for treatment systems.

Commercial aqueous ammonia would be combined with sodium hypochlorite to generate chloramine solution. Aqueous ammonia would be delivered to the facilities on an approximate monthly basis at 19% concentration. Facilities associated with aqueous ammonia include: storage tank, ammonia gas detection features, pressure relief valve with a scrubber tank to prevent discharge of ammonia gasses, metering pumps, instrumentation, and controls. The storage tank capacity would range from 100 to 400 gallons, depending on the sizing of the wells, and would be placed within secondary containment. Two alternative chlorine systems may be implemented: bulk deliveries of 12.5% solution sodium hypochlorite or on-site generation of chlorine using catalytic electrolysis of a brine solution for a 0.8% solution of hypochlorite. The storage of bulk delivered 12.5% solution sodium hypochlorite would be limited due to its loss of disinfection strength over time. For well facilities that would be operated infrequently, deliveries would be sized and scheduled to coincide with each well's planned use. Sodium hypochlorite is available in bulk truck deliveries up to 4,500 gallons or semi-bulk. Storage systems are typically sized for a 30 day supply or less. Bulk hypochlorite storage tank capacity would range from 550 to 3,200 gallons, depending on the sizing of the wells.

Sodium hypochlorite may also be generated onsite using catalytic electrolysis of a highly pure saltwater or brine solution. Salt is mixed with water in a saturation tank to a desired solution, and is fed through the generators to produce sodium hypochlorite as needed. The sodium hypochlorite is stored in a small product tank. The process waste product, hydrogen gas, is disposed of by venting outdoors. Facilities required as part of this system includes a salt saturation tank, water softening equipment, salt solution tank, chlorine generator, sodium hypochlorite storage tank, metering pumps, instrumentation and controls. Secondary

containment, equipped with leak detection, would be provided for the hypochlorite solution storage tank and piping.

The entire site dimensions would be up to 100 feet by 150 feet, with proposed facilities housed in an up to 95 foot by 25 foot single-story structure less than 15 feet tall. The structure would be constructed of split-faced cinder block, masonry block or other suitable materials that would be non-glare and noise attenuating. The well house would contain the well, pump motor and electrical control panels. Separate but attached self contained storage for ammonia, salt saturation, and sodium hypochlorite would be provided. Facility dimensions may be altered based upon final site configuration and available area, but would be within the parameters identified. **Figure 2-7** shows a typical layout for a well with onsite treatment. Existing well facilities utilizing this type of well layout include Mocho 3, Mocho 4, and Stoneridge, as shown in **Figure 2-8**.

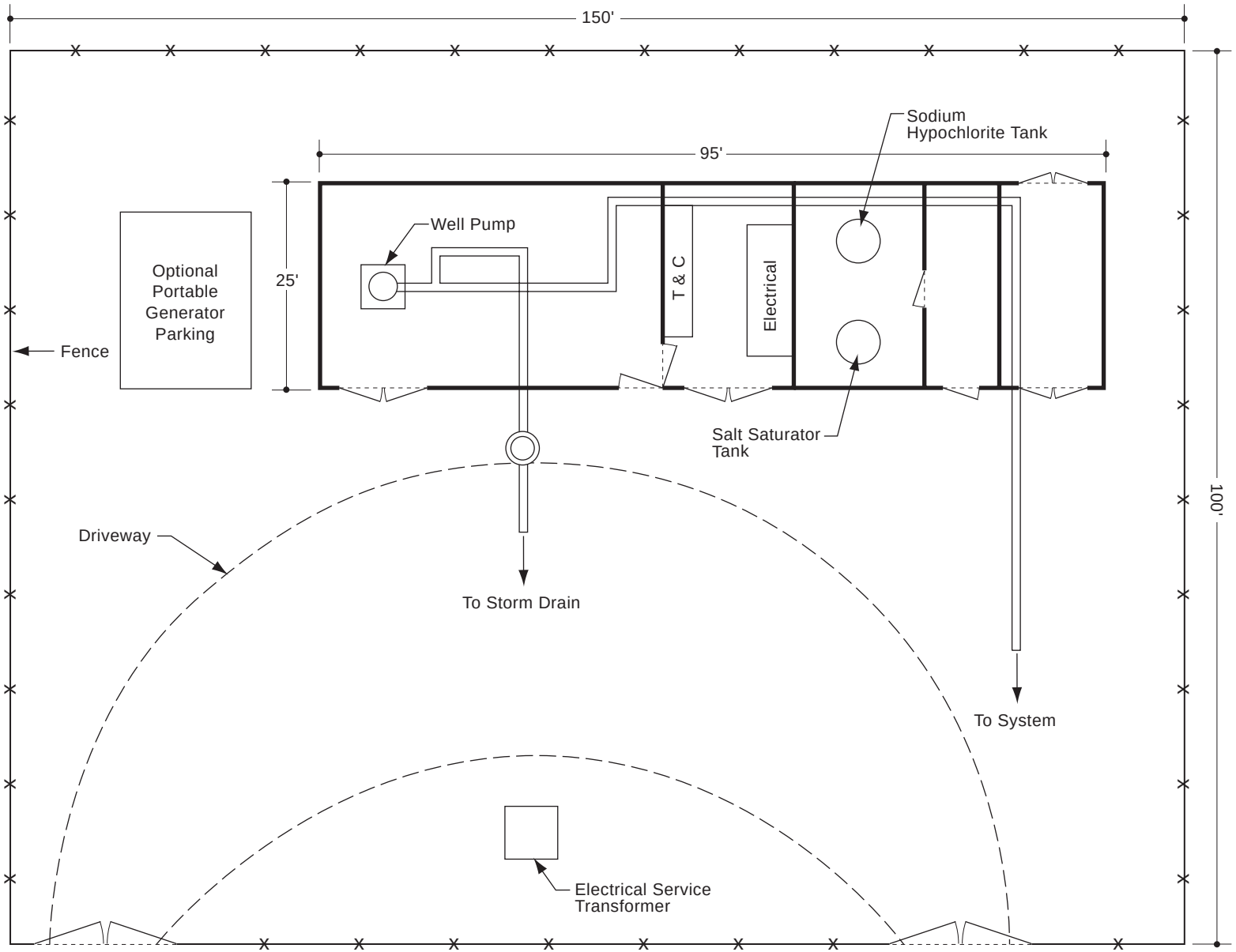
WELL DESIGN PACKAGES

Wells with offsite and onsite treatment would be located within any individual wellfield. However, due to the urbanized nature of areas overlying the Main Basin, proposed well facilities would likely be constructed within an urban setting. Consistent with existing wells overlying the Main Basin, individual well sites could be located adjacent to a variety of land uses, including, residential, recreational, open space, commercial/institutional, and industrial land uses. In order to address potential issues related to these varying land uses, and to provide Zone 7 flexibility in site design, two well design packages have been developed as part of the Master Plan to be applied on a site specific basis at individual well facilities. These design packages have been identified as Residential Well Design and Industrial Well Design[4], and are described below.

Residential Well Design. Wells located within residential areas will include the following design elements, and will be designed to attain applicable noise ordinance standards.

- Decorative block building
- Chain link site perimeter fencing with slat fill or concrete masonry block wall
- Vertical turbine well pumps if site is large enough to mitigate noise with building and distance or submersible pump
- Backup power connections
- Optional space for generator parking for smaller horsepower motors (for wells that would be routinely operated)
- Full access for trucks, or be as small as the size of the building and air gap structure footprint
- Salt based chlorine generator (for wells with onsite treatment that would be routinely operated) or bulk delivery of chemicals

[4] Residential, park, and open space areas consist of primarily residential uses (single or multiple family units, apartments, condominiums, shopping centers, neighborhood parks, open space areas for recreational or nonrecreational use. Industrial and other areas consist primarily of factories, manufacturing uses, warehouses, and quarry operations.



SOURCE: Luhdorff & Scalmanini Consulting Engineers, ESA 2002

Zone 7 Well Master Plan / 201583 ■

Figure 2-7

Conceptual Layout of Typical Well Facility with On-Site Treatment

Mocho 4

Hopyard 6

SOURCE: Environmental Science Associates

Figure 2-8
Wells with On-Site Treatment

Industrial Well Design. Wells located within industrial, commercial, or open space areas would have less potential to affect surrounding sensitive land uses, such as residential units.

- Metal or non-decorative block building
- Chain link site perimeter fencing
- Vertical turbine well pumps
- Optional space for generator parking for smaller horsepower motors (for wells that would be routinely operated)
- Site may include full access for trucks, or be as small as the size of the building and air gap structure footprint
- Bulk storage of aqueous ammonia and sodium hypochlorite for wells with onsite treatment

Application of these well design packages will allow Zone 7 to apply design elements at specific well locations based upon their surrounding land uses. These design elements will be implemented to address potential land use compatibility issues, such as operational noise and aesthetics. Facility design would be submitted to local jurisdictions for review and comment prior to contractor bid.

Test Well Installation. Prior to construction of individual production wells at selected locations, Zone 7 would install test wells to evaluate local water quality and aquifer conditions. These wells would provide necessary data on the production capacity, groundwater quality, hydrogeology, and other parameters that would determine the viability of well development at individual sites. The wells would be drilled up to depths of 800 feet[5], and the surface portion of the wells would be located in locked metal enclosures that flush with the ground. The process of test well installation would be similar to that of the actual wells, with the exception that construction activities would occur during the daytime hours only. Construction activities would consist of drilling of the hole, installing the well casing, and performing aquifer pumping tests. The pump used for the tests would be powered by a diesel engine mounted on a trailer, with a driveshaft that connects to a downhole pump. The engine would be equipped with a muffler. Depending on the resultant noise levels and the type of land uses nearby, noise barriers may be used to further attenuate noise. Well testing would last approximately one week, and would occur during daytime hours only. If groundwater conditions appear favorable, the production well would be drilled within the same parcel of land as the test well. Regardless of whether the site would be used as a groundwater production site, all test wells would be converted into monitoring wells that would be incorporated into Zone 7's Basinwide Well Monitoring Program.

Ancillary Facilities. Ancillary facilities applicable to both wells with onsite treatment and wells with offsite treatment site configurations would include a 16- to 35-foot-wide asphalt access road for delivery and maintenance vehicles, two entrances into the site, associated pipelines (including manholes and catch basins), an electrical transformer contained in a metal box located on a concrete

[5] Test wells are drilled to maximum depths to determine the geologic formation below ground. Actual wells may be drilled to shallower depths, depending on the hydrogeology of the groundwater basin at individual sites.

pad and surrounded by bollards, and six- to eight-foot fencing that may contain barb wires or decorative slats. Zone 7 may also install work bench and bathroom facilities for certain well sites.

The dimensions of the well sites would have adequate space to accommodate maintenance vehicle and chemical truck parking, a small crane for maintenance, and optional parking for a portable generator. All facilities would be equipped with backup power connections. The project also proposes acquisition of diesel driven portable generators mounted onto trailers that would provide backup power during emergency outages. The generators could be parked off-site but would be transported to any of the proposed well sites during an electrical outage. The units vary in size, with typical minimum dimensions of 4 ft by 6 ft, width and length. The trailers would be slightly larger, with a hitch for transportation. The generators would be equipped with noise enclosures and mufflers to provide noise reduction. Rented portable generators would supplement these generators during emergencies.

Connection Pipelines. Up to 12,000 feet of new pipeline to connect individual wells to either a treatment facility for disinfection or the Zone 7 transmission system would be required. In most cases, this pipeline distance would be shorter as well sites would be located in proximity to Zone 7 facilities to the degree feasible. For the purpose of this analysis, up to 6,000 feet of 15- to 24-inch water pipeline is assumed for connection to appropriate facilities (i.e., treatment sites or distribution pipelines). Up to 6,000 feet of 15- to 18-inch pipeline would connect each well site to the existing storm drain system for discharge of startup / shutdown water and periodic backflushing. In addition, each well site would be connected to local sanitary sewers to facilitate minor wastewater discharges. Consistent with current Zone 7 operations, all discharges would be in compliance with permit requirements of the National Pollutant Discharge Elimination System (NPDES), or where applicable, discharge requirements of the local sanitary district.

2.5.2 WELL CONSTRUCTION

Well development would consist initially of site confirmation through installation and testing of test wells. Upon verification of favorable hydrogeologic conditions, the test well would be converted into a monitoring well, and the parcel graded in preparation of production well installation. Construction would including drilling, installation of casing, well development, construction of the production facility and pipeline. The production well would be tested prior to start of operation. A discussion of each of these well development steps is provided below.

Test Well Installation. The test well would generally be installed using a direct mud rotary drill rig. The well would typically be cased with 6- to 8-inch diameter steel casing installed to a depth of up to 800 feet. The drilling process would be similar to that for the production well described above. Well testing would last approximately 8 to 10 hours, and would occur during the daytime hours. Following installation and testing, the test well would be converted into a monitoring well and secured in a flush-mounted lockbox. Construction would occur during the daytime hours only, in accordance with each jurisdiction's allowable construction hours.

Well Site Grading. Following test well installation and confirmation of site suitability, construction activities would require initial clearing and grading of up to an approximately 100 by 150 foot well site. The well site would accommodate the proposed structures (well house and discharge structure), pipeline connections and access driveway, as well as staging areas during construction activities. Excavation dimensions for installation of production well facilities would vary depending on the site location, but would require depths of 3 to 5 feet for installation of slab on grade structures.

Production Well Installation. 24-hour construction is required for activities associated with drilling of the production well borehole and subsequent well construction, well development, and pump testing. Zone 7 would implement a form of rotary drilling method such as reverse circulation rotary drilling to construct the wells. A truck-mounted drill rig consisting of a derrick, power unit, pump, and double hole assembly consisting of the drill bit (used to cut soil), drill pipe and discharge pipe (where cuttings are entrained and suctioned through), would be used. This drilling technique is preferable for construction of production wells in unconsolidated formations, and has been used in previous Zone 7 well development projects. To cool the drill head and transport the cuttings to the surface during drilling operations, a fluid from a nearby tank is piped into the borehole. The cut material (cuttings) from the drilling process is entrained through holes of the drill bit, and suctioned into the drill pipe by rising air bubbles and then discharged through the discharge piping into a mud tank. The cuttings then settle out and the fluid is reused for the drilling process. The borehole size would be up to a diameter of 36 inches. Mud tanks or basins would be used on site to control drilling mud and fluids during development.

Following drilling, a well casing and well screens would be installed. The casing serves as a housing for the pumping equipment and as a vertical conduit for water flowing upward from the aquifer to the pump intake. The well screens allow water to enter the casing. A sorted gravel envelope is placed around the screen in the screen/borehole annulus to prevent sediment from entering with the water during pumping operations. The casing size would be selected based on the capacity of the well. Well screens would be placed opposite favorable aquifer zones, but blank casing would be placed to prevent cross-communication of water between aquifer units. The well casing annulus would be grouted to near the top of the uppermost well screen. In addition, a conductor casing will be installed to a depth of 50-feet below ground surface to provide a sanitary seal, in accordance with Department of Health Services (DHS) requirements.

Following installation of the production well, testing would occur. The pumping test would consist of a step test lasting eight hours, followed by a 24-hour constant rate test. The initial pumped water during testing activities would be piped into a Baker tank for desiltation prior to discharge. All discharges would be in accordance with Best Management Practices for erosion control.

Well drilling, construction, and well testing activities would require approximately four to six weeks to complete. 24-hour construction would be limited to two to three weeks. Actual installation time could be reduced depending upon geologic conditions. Where appropriate due to proximity to residences, well drilling and testing activities would include installation of engineered soundwalls to reduce construction noise.

Installation of proposed wells would include the following:

- Mobilization of drill rig;
- Drilling of borehole, geophysical logging, installation of well, and initial well development;
- Demobilization of drill rig, mobilization of pump rig for completion of well development;
- Pumping development;
- Demobilization of pump rig;
- Installation of ancillary facilities and completion of well house structure
- Installation of pump/motor

In addition to the drill rig and pump rig, construction equipment used for this type of operation will typically consist of a rotary drill rig, an air compressor, a 10 kW electrical generator, a welding machine or rig, a caterpillar for site grading, a backhoe, a geophysical logging truck and miscellaneous support vehicles including forklifts and pick up trucks. Equipment and vehicle staging would be accommodated at the site of construction for well development, therefore increasing the total area of disturbance. Staging would avoid sensitive areas such as riparian or other habitat. All disturbed areas caused by construction activities would be restored to pre-construction condition.

Pipelines. Pipeline installation for production wells would require open trench construction or jack and bore construction. For open trench construction, estimated trench width and depth are up to 5 feet in width and 5 to 10 feet deep, depending upon final route conditions and utility conflicts. The ideal temporary construction easement for pipeline installation would be 25 feet wide (i.e., 12 feet for access by trucks and loaders, a 5-foot-wide trench, and additional width for maneuvering).

At sensitive crossings (i.e., busy intersection, railroad tracks, creek), microtunneling would be used to avoid adverse impacts to circulation and biological resources. A jacking pit and a receiving pit would be excavated at the two ends of the crossings to facilitate the use of a horizontal boring machine (or auger) and a hydraulic jack to, respectively, drill a hole and push a casing through the hole. As the boring proceeds, a steel casing pipe is jacked into the hole; the pipeline is then installed in the casing. The casing is jacked using a large hydraulic jack in a pit located at one end of the crossing. The jacking pit is excavated (and shored) with typical dimensions of 12 to 15 feet wide, 30 to 35 feet long, and depth dependent on the crossing but not less than 8 to 10 feet deep. The receiving pit is typically smaller, approximately 10 feet wide to 10 feet long.

Pipeline construction would proceed in the following order:

- Clearing and grading the right-of-way;
- Trenching and hauling of excess spoils;
- Relocation of utilities if required;
- Delivery of the pipe;

- Installation of the pipe;
- Backfilling the trench;
- Hydrostatic testing and disinfection; and
- Restoration of the right-of-way.

Pipeline construction would proceed at approximately 100 feet per day. Pipeline installation would occur generally within public right-of-way and existing roadways. Depending on the location of the well sites, pipeline installation may require temporary closure of one-lane of traffic during pipeline installation. Fencing or flagging, and appropriate signage would be installed to minimize potential safety hazards for vehicular and pedestrian traffic.

Excavation. The actual amount of spoils excavated would be dependent on the site and alignment selected. For purposes of this analysis, it is assumed that 50 percent of excavated soil would be hauled off-site and would be replaced by imported fill. The amount of native soil re-used on site (reducing the amount of imported fill needed) would depend on its suitability, but could range from 20 to 70 percent of the material excavated. Therefore, this analysis use a reasonable but conservative assumption to avoid understating traffic, air quality and noise impacts associated with construction truck trips. Soil removed from trenches would be loaded directly into dump trucks and hauled away for disposal per applicable City and County requirements. Imported backfill would be delivered to stockpiles near the open trench. Once filled and compacted, the area would be resurfaced to match the surrounding material. A temporary patch would be used until final repaving of the affected area occurs, about two to six weeks after pipeline installation is complete within a given street segment.

Under the worse-case scenario, up to two wells would be constructed per year and up to 24,000 (two at 12,000 feet) linear feet of pipeline. Construction activities may overlap at the two sites. Assuming an excavation depth of five feet and development of two well facilities with onsite treatment, an approximately 24,000 cubic feet (cf) of soil would be excavated (25 ft x 95 ft length and width x 5 ft depth), which is equivalent to 900 cubic yards (cy). For the pipeline component, based on a length, width, and depth of 24,000, six, and five feet, respectively, total excavation would be 720,000 cf (27,000 cy). The total volume of excavation would be approximately 28,000 cy. Assuming that 50 percent of the excavated materials would be hauled off-site for disposal, 14,000 cy of material would require hauling. Assuming that construction of the two wells would occur simultaneously, excavation would be concentrated over a two month period (40 days), About 350 cy of soil would be off-hauled per day. Using an average haul load of 10 cy per truck, the proposed project would generate approximately 35 truck haul round trips (70 one-way trips). It is estimated that up to 90 one-way worker-trips would occur per day as a result of construction activities (assuming 3 crews of 12 plus inspectors). Therefore, an estimated total of 160 one-way vehicle trips would result from construction at two well sites and along the pipeline alignment. This is a conservative estimate and is not likely to occur as construction of the wells sites would unlikely be simultaneous. These vehicle trips would likely be spread throughout the day, and depending on the locations of the well facilities and pipeline alignment, would likely be dispersed geographically.

Staging would occur at each well site (and adjacent parcels if site is constrained), and within the 25-feet construction pipeline easement. Staging includes areas for storing equipment and stockpiling material.

Equipment. Equipment used for well facilities construction are listed below. However, it is unlikely that they would be used simultaneously but rather used at specific phases of construction.

- Pavement Saw
- Jackhammer
- Grader
- Excavator
- Compactor
- Bulldozer/backhoe/loader
- Flatbed trucks
- Drill rig Cyclone filter
- Pump rig
- Welding rig
- Forklift
- Manlift
- Concrete pumper
- Water pump and treatment skid
- Vacuum truck
- Sand shaker
- Crane
- Boom truck
- Water truck
- Generators
- Concrete trucks
- Baker tanks
- Paving Equipment

Three crews are assumed to be working simultaneously under the worse case scenario (development of two sites per year); two at each well development site and one along the pipeline route. There would be up to 12 people per crew, including inspectors. The actual crew size would be at the discretion of the selected contractor.

2.5.3 CONSTRUCTION SCHEDULE

Well site development to meet the additional 35 mgd identified would be phased over the next 20 years as water demands dictate within the service area. Initially, an average of one to two well facilities would be constructed every one to two years until the 75% MDD goal is achieved, then less frequently based on demands. Construction of the well facility would take approximately 12 months per site. One to three weeks of this duration would require continuous 24-hour construction activities, including drilling and well testing. 24-hour construction activities are not expected to be continuous for three weeks, and may be shortened depending on the geologic material. Construction, with the exception of the 24-hour drilling/well testing, would occur during weekdays from 8:00 a.m. to 8:00 p.m. Monday through Friday (holidays excepted). However, depending on actual distances from nearby sensitive land uses, Zone 7 may shorten hours of construction to accommodate these nearby land uses. Construction hours within public right-of-ways would be dictated by the encroachment permits of the local jurisdiction.

2.5.4 EXISTING AND PROPOSED OPERATION OF MUNICIPAL SUPPLY WELLS

The proposed well facilities would be operated similar to Zone 7's existing well facilities, which consist of turbine pumps with or without treatment facilities. Zone 7 currently operates seven wells within its service area. The city of Pleasanton CWS, and DSRSD operate their own well facilities. In addition, SFPUC operates wells in Pleasanton for supply of the Castlewood Golf Course community. **Table 2-4** shows the characteristics of Zone 7's existing well facilities, including pump capacity and sizing, facility type and location.

TABLE 2-4
ZONE 7 EXISTING WELL CAPACITIES

Well Facility	HP Rating	Well Capacity (mgd)	Type of well facility	Location (Pleasanton)
Mocho 1	300	3.4	Turbine Pump w/ Treatment	Santa Rita, 550 ft. s/o Stoneridge Dr.
Mocho 2	250	3.3	Turbine Pump w/o Treatment	Santa Rita, 1,050 ft. s/o Stoneridge Dr.
Mocho 3	600	6.0	Turbine Pump w/ Treatment (self gen.)	Santa Rita & Stoneridge
Mocho 4	600	5.3	Turbine Pump w/ Treatment (self gen.)	Santa Rita & Stoneridge
Hopyard 6	500	5.4	Turbine Pump w/ Treatment	5997 Parkside Road
Hopyard 9	200	1.8	Turbine Pump w/o Treatment	Parkside (within the Pleasanton Sports Park)
Stoneridge	700	6.8	Turbine Pump w/ Treatment	Stoneridge Dr. at Newton / Stone Point Way

Typically, wells are operated during high peak demands (June through September) or during SBA outage events. Due to additional pumping in the past two years from drought conditions, the SBA outage (for SBA improvements and upgrades), and limited Zone 7 treatment plant and SBA summer capacity, the Main Basin is currently below the "full" basin designation of 240,000 af. However, Zone 7 has followed a practice of operating the Main Basin above 220,000 af. The proposed facilities would be operated to a) meet peak day demands; b) meet drought year demands; and c) meet 75% MDD during operational or emergency outages to the SBA or Zone 7 treatment plants. Each well would be connected operationally such that treatment of groundwater occurs prior to distribution. All well facilities would be operated such that groundwater levels are maintained above historic lows.

Existing wells are controlled and operated either remotely from Zone 7's facilities in Livermore or manually at each well site. The proposed wells would be designed to allow for remote operation. Wells are operated such that when they are started or shut off, the pump discharges for a period of a few minutes to over 30 minutes to the storm sewer or directly to an adjacent creek. This discharge is covered as a conditionally exempted discharge under the Alameda Countywide Clean Water Program, Program NPDES permit (Order 97-030, NPDES Permit No. CAS0029831) (RWCB, 2003), which exempts uncontaminated pumped groundwater from the prohibitions outlined in the NPDES permit.

Regular maintenance by Zone 7 Operations and Maintenance (O&M) occurs approximately once a day during operational periods and once a month during idle periods. Maintenance activities include checks on the pump equipment and chemical feed systems. Chemical deliveries of aqueous ammonia and either bulk sodium hypochlorite or brine solution would occur approximately between once a week to once a month for each constituent depending on the use.

2.6 ALTERNATIVES

An EIR must describe a range of reasonable alternatives to the proposed project or project location that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts to the proposed project. The alternatives analysis must include the "No Project" as a point of comparison. The No Project alternative includes existing conditions and reasonably foreseeable future conditions that would exist if the project were not approved (CEQA §15126(d)). Alternatives examined are discussed below.

2.6.1 NO PROJECT ALTERNATIVE

Under the No Project Alternative, Zone 7 would not implement construction of new facilities under the Well Master Plan, and would continue the withdrawal of groundwater to meet reliability and emergency demands using Zone 7's existing facilities. Zone 7's current drought well capacity of 25 mgd and the Valley-wide 75% maximum day capacity of 46 mgd would remain unchanged, as would its operating practices of using approximately 15,000 to 20,000 acre feet of stored groundwater annually to meet peak demands drought year demands.

2.6.2 DRY-YEAR SUPPLY ACQUISITION

As an alternative to recovery of groundwater to drought year and emergency demands, Zone 7 could acquire additional dry year supplies or storage. This would essentially alter Zone 7's 75:25 planning criteria, and would require capacity expansions at Zone 7's existing and future treatment plants to provide the additional peak day capacity no longer provided through recovery of stored groundwater supplies. Capacity improvements would most likely be required for the entire treatment train, but would only be used during peak demand months.

2.6.3 STORAGE ALTERNATIVES

Alternatives to use of the Main Basin for storage and recovery of groundwater include development of other storage facilities, either within the Livermore Valley, or within other portions of the SWP. Potential conveyance and in-valley storage alternatives were examined in the In-Valley Conveyance Alternatives Analysis (CDM, 2001), which examined the provision of an additional 11,000 acre-feet annually through either improved conveyance capacity or in-valley storage.

2.6.4 INCREASED PUMPAGE – EXISTING FACILITIES

Under the Increased Pumpage – Existing Facility alternative, Zone 7 would pump its peak capacity of 32 mgd to meet peak demands and to meet drought year demands, thereby using this total peak capacity as "drought" capacity. Operation in this manner would extend the duration of peak capacity pumping from a number of days during summer months to the entire summer period during a drought year.

2.6.5 IMPLEMENTATION AT EXISTING WELL SITES

Under this alternative, Zone 7 would concentrate new well facilities within existing wellfields, and, if feasible at existing well sites, in order to reduce potential construction related and long-term impacts associated with construction of new well facilities. Under this alternative, Zone 7 would maximize use of the Mocho and Hopyard Wellfields, and would locate new wells necessary to meet reliability goals at existing well sites.

2.6.6 REDUCED ALTERNATIVE – MINIMUM NUMBER OF WELLS TO MEET DROUGHT DEMANDS (45 mgd) AND PEAK CAPACITY (52 mgd)

Implementation of this alternative would focus on meeting Goal 1 of Zone 7's Reliability Policy, and would implement the minimum number of wells to provide a drought well capacity of 45 mgd. The number of wells necessary to meet this capacity would be reduced by three to eight wells, depending upon the actual production capacity of installed wells. Zone 7 wells would provide a peak capacity of 52 mgd, resulting in a Valley-wide peak capacity of 73 mgd. This would provide approximately 62% of the Valley-wide MDD.

2.7 INTENDED USES OF THE EIR AND ADDITIONAL APPROVALS

Zone 7 intends to use this EIR to: a) support approval of the proposed project, and; b) provide the foundation for tiering future CEQA review and documentation on future development of additional wells for salt management as needed.

This EIR is intended to be used by the Zone 7 Board of Directors when considering approval of the proposed Project. To support its decision on the Project, the Board must prepare written

findings of fact for each significant environmental impact identified in the EIR and must also adopt a mitigation monitoring and reporting program to ensure compliance with mitigation measures during Project implementation. The EIR is also intended to be used by responsible agencies that have review and permit authority over the Project. These agencies may include Regional Water Quality Control Board (RWQCB), Dublin-San Ramon Sanitation District (DSRSD), Department of Health and Safety, and the cities of Pleasanton and Livermore.

Future implementation steps of the Zone 7 Well Master Plan may require permits from the following agencies, depending on the location of well facilities.

- State Department of Health Services (DHS) for approval of plans and specifications.
- U.S. Fish and Wildlife Service for Section 7 consultation pursuant to the federal Endangered Species Act regarding "take" of federally listed threatened or endangered species (if applicable).
- California Department of Fish and Game for Memoranda of Understanding regarding threatened and endangered species listed under the state Endangered Species Act (if applicable).
- California Department of Fish and Game for a Stream Alteration Agreement pursuant to Sections 1601 of the state Fish and Game Code (if applicable).
- Regional Water Quality Control Board for Section 401 water quality certification, in support of the Section 404 permit (if applicable).
- Regional Water Quality Control Board for a General Construction Activity Stormwater NPDES permit requiring preparation of a Stormwater Pollution Prevention Plan (SWPPP) if project development exceed 5 acres at any one construction period.

Other ministerial permits/approvals not dependent on the DEIR include:

- Boring and jacking permit from California Occupational Safety and Health Administration (Cal-OSHA) (if applicable).
- Roadway encroachment permits/licenses from Alameda County Public Works and / or from the Cities of Pleasanton and Livermore for installation of pipelines on public, road right-of-ways.
- Encroachment permits from Alameda County, California Department of Transportation (Caltrans) (State Route and highway easements), Southern Pacific Railroad (SPRR), and Union Pacific Railroad (UPRR) (if applicable).
- Sewer Connection fees and Pre-Treatment Permit from the local sanitary District for industrial waste discharge.
- Heritage tree removal permit from the City of Pleasanton Public Works Department; and / or vegetation removal permit from the Livermore City Superintendent; and / or approval of a Tree Replacement Plan from Alameda County (if applicable).

- Temporary or Permanent Easements: from affected jurisdictions for site access, utility siting, etc.

REFERENCES – Project Description

DWR (Department of Water Resources), *State Water Project Delivery Reliability Report*, August 2002.

RWQCB, San Francisco Region (Regional Water Quality Control Board), *NPDES Permits for Alameda County Clean Water Program*, Order RS-2003-0021; NPDES Permit No. CAS0029831, February 2003.

Zone 7 Water Agency, *Main Basin Groundwater Hydrologic Inventory, 1974-2003*, March 2004.

Zone 7 Water Agency, *Salt Management Plan – Draft*, prepared by EOA, Inc, June 2002.

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

GENERAL APPROACH TO EVALUATION OF THE WELL MASTER PLAN

IMPACT SIGNIFICANCE

In this section, the environmental impacts of the proposed project are identified and classified as Significant or Less than Significant. Section 15382 of the CEQA Guidelines defines a significant impact as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project . . . ." For each category of physical conditions evaluated in this EIR, criteria for significance have been developed, using the CEQA Guidelines, City and County standards and policies, or the "significance thresholds" of federal, state, regional, or local agencies. Impacts classified as Significant meet the criteria for significance developed for each category of physical conditions. Impacts that are not significant (because they do not meet the significance criteria) are labeled Less than Significant. The impacts were determined by comparing the environmental effects of constructing and operating well facilities with existing environmental conditions. Each impact is numbered; mitigation measures identified for that impact are assigned the same number.

MITIGATION MEASURES

CEQA Guidelines Section 15126.4(a)(1) states that an EIR "shall describe feasible measures which could minimize significant adverse impacts…." Section 15126.4(a)(3) also states that, "mitigation measures are not required for effects which are not found to be significant." In this EIR, mitigation measures are identified (where feasible) for all of the significant impacts. All mitigation measures are proposed as part of the project.

Mitigation measures identified in the analysis sections establish avoidance of impact where feasible. Otherwise, they provide performance standards that would reduce potential impacts to either less than significant levels or an acceptable level of risk (i.e., earthquake-related ground shaking potential).

3.1 GROUNDWATER HYDROGEOLOGY AND WATER QUALITY

3.1.1 ENVIRONMENTAL SETTING

INTRODUCTION AND REGIONAL SETTING

The Livermore-Amador Valley (Valley) groundwater basin is located within the Valley floor and extends south into the hills south of Pleasanton and Livermore. It is divided into 12 subbasins based largely upon faults, which form local impediments to groundwater flow. These subbasins are divided into two categories depending on their capacity to store groundwater and their significance to the local groundwater supply. The Main Basin consists of Castle, Bernal, Amador, and a portion of the Mocho II subbasins. Altamont, Bishop, Camp, Cayetano, Dublin, May, Spring, Mocho I, and Vasco make up the Fringe Subbasin (**Figure 3.1-1**).

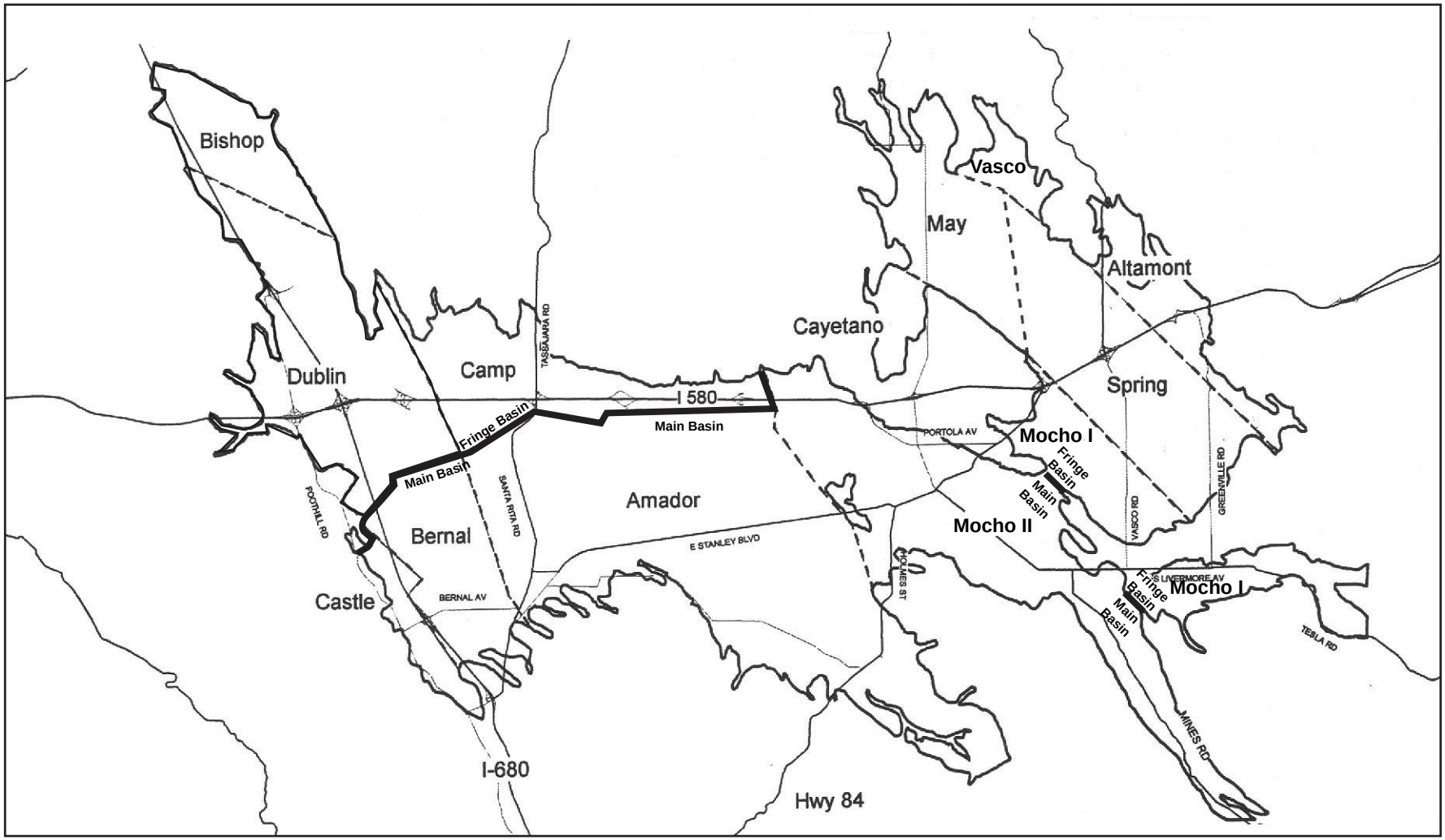
Hydrogeology

The Main Basin underlies the majority of the Valley and includes the Amador, Bernal, Mocho, and Castle Subbasins. The surface of the basin (the valley floor) slopes to the west, and ranges in elevation from 500 feet in the upper reach of Arroyo Valle (along the southeast) to about 300 feet along Arroyo de la Laguna to the southwest where surface water exits the basin. The climate is arid, receiving an average of about 12 to 20 inches of rainfall per year.

The Main Basin is bounded on the north primarily by the Parks Fault, and by a lack of hydraulic continuity with the Livermore and Tassajara formations; on the west by the Calaveras Fault; and on the south primarily by thinning of the recent alluvium and contact with the Livermore Formation. The Main Basin is comprised of the Castle, Bernal, Amador, and Mocho II sub-basins overlain by recent alluvium. The Mocho subbasin has been divided into two distinct areas, Mocho I and Mocho II, distinguished by a change in aquifer characteristics from sodium bicarbonate (Mocho I) to magnesium bicarbonate water type (Mocho II), and by the presence of the less permeable Livermore Formation. The eastern boundary of the Main Basin is the divide between Mocho I and II sub-basins. The Well Master Plan study area is centered on the Bernal, and Amador Subbasins, based upon their hydrogeologic properties.

The Fringe Subbasins include the Dublin, Bishop, Camp, Cayetano, May, Mocho I, Altamont, Spring and Vasco subbasins (**Figure 3.1-1**). These subbasins are characterized by comparatively thin sand lenses that hold less water than the Main Basin, and by relatively limited groundwater storage, low well yield, and poorer water quality than the Main Basin.

The principal water bearing units in the Main Basin are Quaternary valley fill deposits, and portions of the Plio-Pleistocene Livermore Formation, which underlies the valley fill. An east-west cross section of the Main Basin depicting interbedded units and key wells within the Valley is show in **Figure 3.1-2**. The Quaternary alluvium consists of unconsolidated gravel, sand, silt, and clay. The Plio-Pleistocene Livermore Formation consists of beds of clayey gravels and sands, silt, and clay that are unconsolidated to semi-consolidated and estimated to be 4,000 feet thick in the southern and western portion of the basin. Groundwater in the Livermore Valley

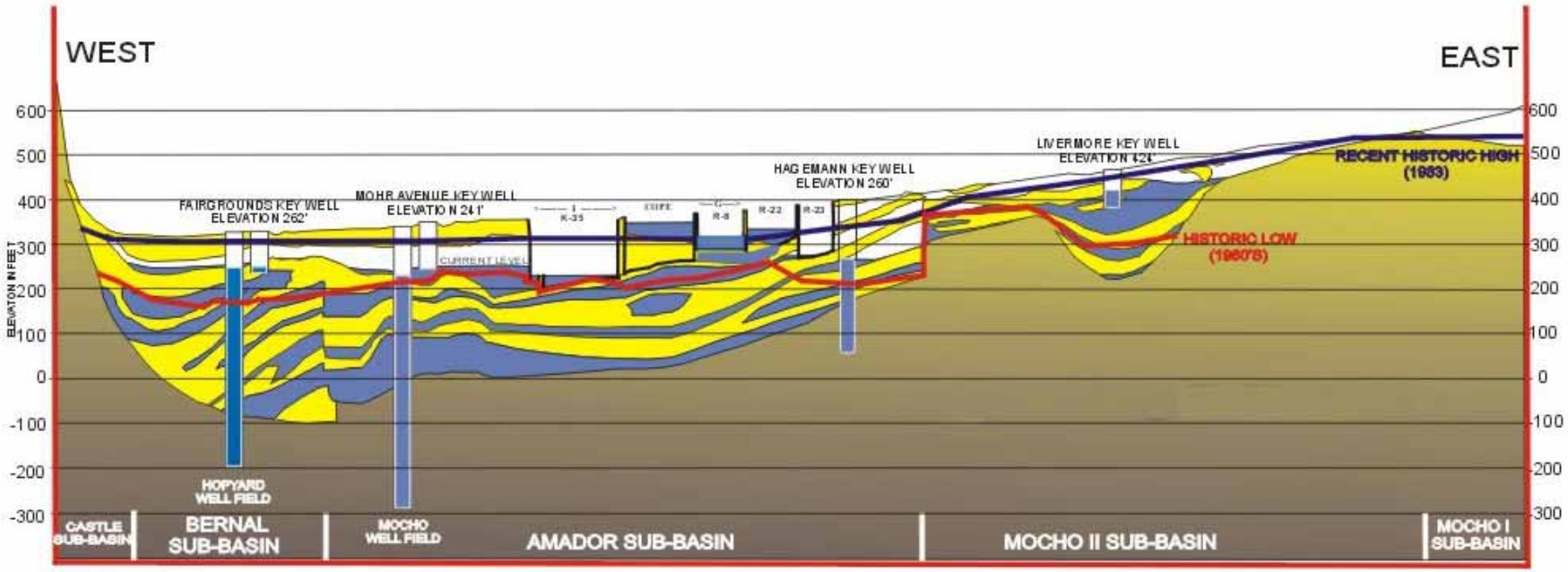


Subbasin Boundary (within younger alluvium)

Boundary Between Main Basin and Fringe Basin

SOURCE: ESA, 1996; Base Map from EOA, Inc., Zone 7 MapInfo Database

Figure 3.1-1
Livermore-Amador Groundwater Basin



SOURCE: CH2MHill, 2003

Figure 3.1-2

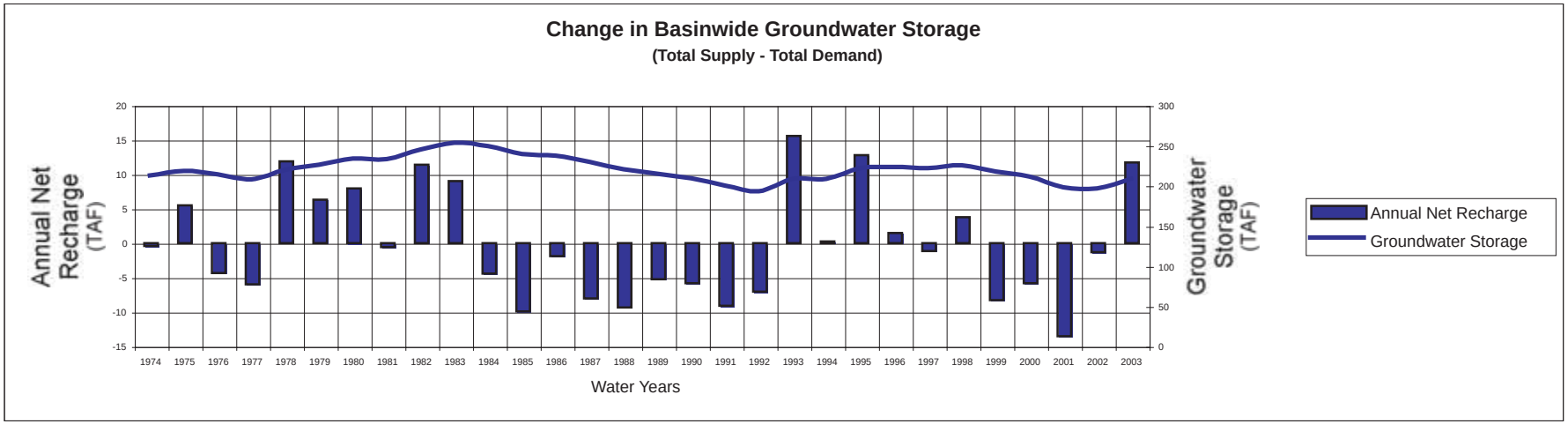
Livermore - Amador Groundwater Basin
West - East Cross-Section

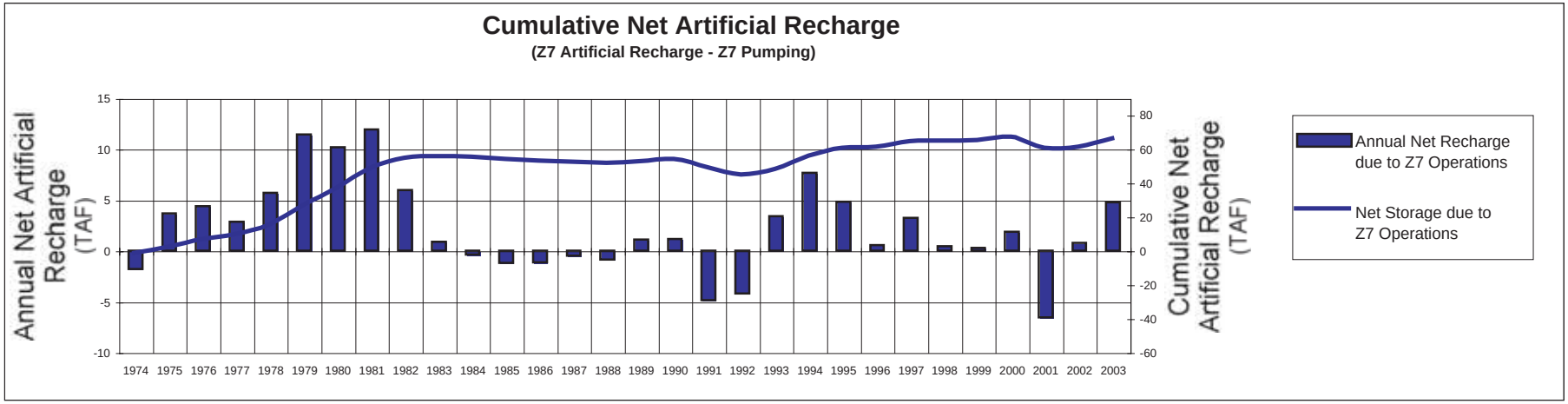
exists in a multi-layered aquifer system with the upper aquifer being unconfined and the subsequent deeper aquifers being semi-confined or leaky. Groundwater generally follows a westerly flow pattern, like the surface streams, along the structural central axis of the valley. These sources of groundwater commingle in the Bernal and Amador sub-basin, and generally flow towards municipal or gravel mining company groundwater pumping wells. The southeastern region of the Livermore Valley is the most important groundwater recharge area and consists of mainly sand and gravel that was deposited by the ancestral and present Arroyo del Valle and Arroyo Mocho.

Groundwater Management

Zone 7 currently manages groundwater levels within the Main Basin of the Livermore-Amador Valley through annual conjunctive use practices. Zone 7 implements conjunctive use on an annual basis through artificial recharge of the groundwater basin through releases of imported State Water Project (SWP) supplies to Arroyo Mocho and Arroyo Del Valle from the South Bay Aqueduct (SBA) and Lake Del Valle, with subsequent extractions from seven existing wells within the city of Pleasanton. On annual basis, Zone 7 compiles a hydrologic inventory of annual supply and demand components for the Main Basin and computes the end of year storage. This hydrologic inventory represents the water balance between groundwater supply and groundwater demand. The Main Basin Groundwater Hydrologic Inventory, 1974-2003 (Zone 7, 2004) included in **Appendix 3.1** provides a 30 year summary of Zone 7's conjunctive use operations. Average annual recharge to the basin is approximately 19,000 af: 13,996 af from natural recharge, including stream recharge, rainfall recharge, recharge from applied irrigation water, and subsurface basin inflow; and 5,024 af of artificial recharge managed by Zone 7 via discharge of imported water to local streams for infiltration. Groundwater demands include municipal pumpage, agricultural pumpage, mining uses, and subsurface basin outflow, with an average annual pumpage of 2,838 acre-feet by Zone 7. Over this 30 year period, Zone 7 has artificially recharged 137,694 acre-feet, with a total pumpage of 76,903 acre feet. **Figure 3.1-3** summarizes the annual net groundwater recharge for water years 1974-2003, and the resulting groundwater storage. During times of drought, relatively large quantities of groundwater can be extracted from the basin, as long as the aquifer is replenished at corresponding amount during wet periods. As discussed in the **Chapter 2 (Project Description)** Zone 7 implements a flexible, adaptive groundwater management program based on each year's hydrologic conditions (which determines the supply) and demand. Although the amount Zone 7 recharges and recovers may not balance in any given year, over the long term, the amount artificially recharged exceeds the amount pumped from the Main Basin.

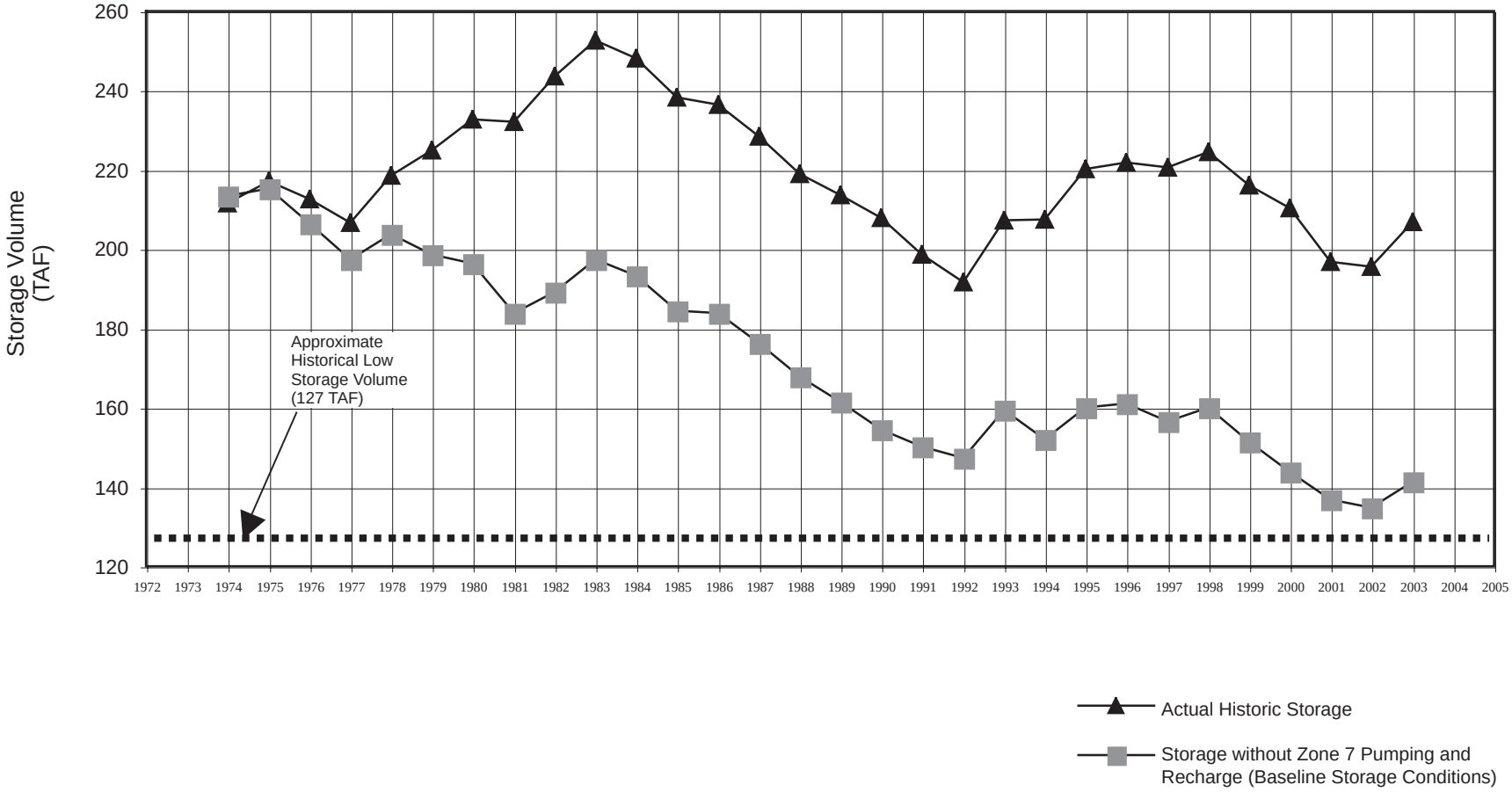
Figure 3.1-4 shows historical basin storage with and without Zone 7's recharge and pumping operations. As demonstrated by this figure, Zone 7 conjunctive use operations, coupled with retailer pumping limitations, have historically maintained a groundwater surplus within the Main Basin. Since 1980, the minimum storage surplus has been 44,300 af (1992), with a maximum of 66,500 af in 2000. These groundwater management efforts have historically provided a benefit to groundwater pumpers within the Main Basin by artificially maintaining groundwater elevations above their naturally occurring levels.





SOURCE: Main Basin Hydrologic Inventory, 1974 -2003
Zone 7, 2004

Figure 3.1-3
Historical Groundwater Artificial Recharge and Storage
Water Years 1974-2003



SOURCE: Main Basin Hydrologic Inventory, 1974 -2003
Zone 7, 2004

Figure 3.1-4
Actual Historical Storage Versus Baseline Storage Conditions (No Zone 7 Operations)

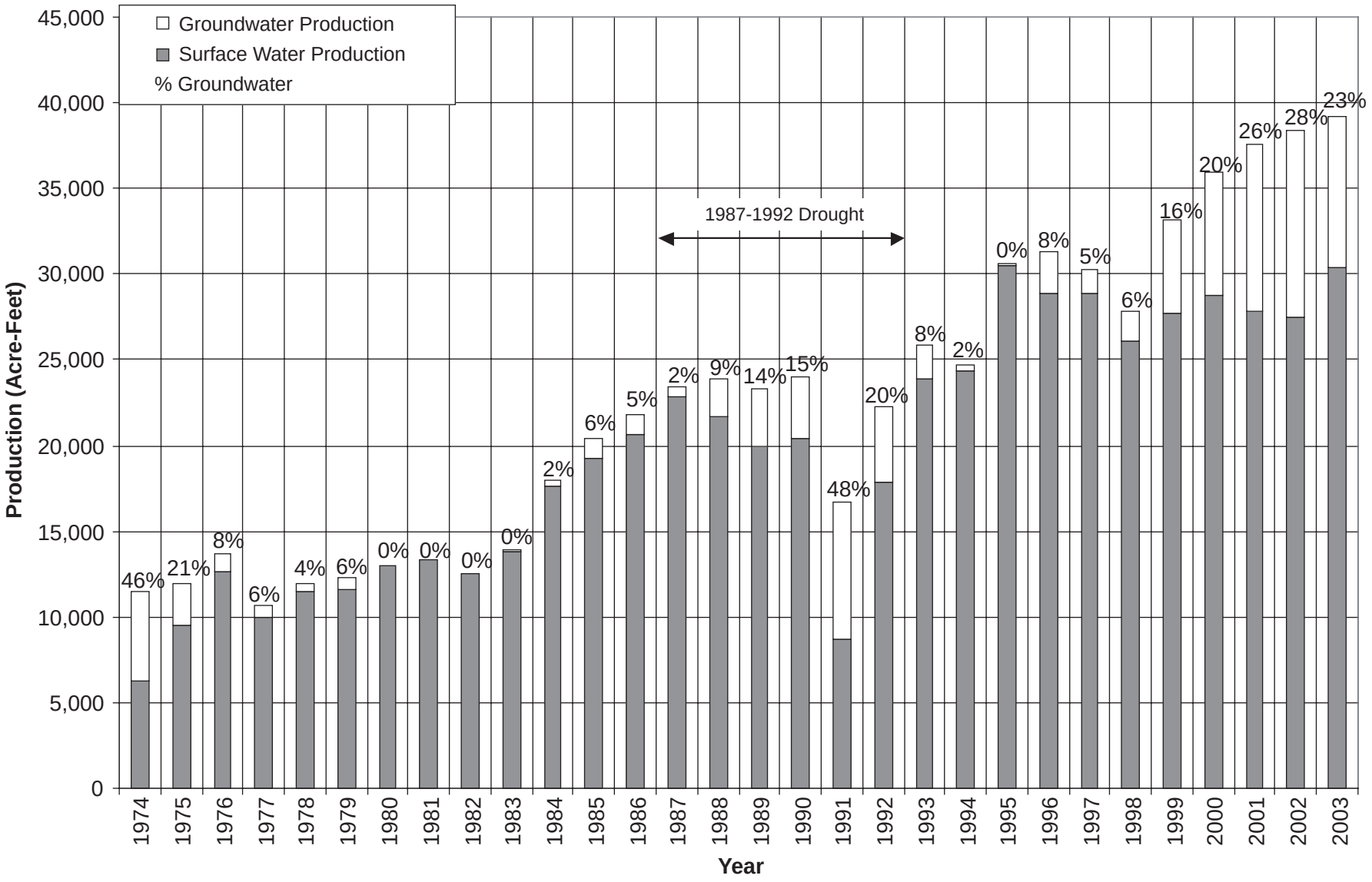
The amount of groundwater delivered in any given year is based upon hydrologic year type and subsequent deliveries from the State Water Project. As a function of this, the percentage of groundwater produced and delivered as treated water supply varies in a given year. **Figure 3.1-5** summarizes groundwater deliveries from 1974 through 2003 as a percentage of municipal treated water deliveries. Historical groundwater deliveries have fluctuated between 48% and 0% of total treated water deliveries over the last 30 years, have averaged 16% of treated water deliveries since 1990, and have comprised 20-28% of treated water deliveries since 1999.

In its groundwater management role, Zone 7 has entered into water supply agreements with its retailers that include provisions limiting annual pumpage by these agencies to a total of 7,245 acre feet per annum (afa), broken down as follows: City of Pleasanton, 3,500 afa; Dublin San Ramon Services District (DSRSD), 645 afa; California Water Services (CWS), 3,069 afa; and City of Livermore, 31 afa. Additionally, groundwater levels are also maintained in accordance with agreements with gravel mining operations within the Chain of Lakes area.

The location of existing municipal production wells in the Main Basin, and the wellfield boundaries established within the Main Basin for this analysis are shown in **Figure 3.1-6**. This figure also shows transmissivity values within the Main Basin, and demonstrates that production wells have been historically sited in portions of the Main Basin with the highest transmissivity to maximize well yields. Zone 7's current peak well capacity of 32 mgd; this capacity is limited to short-term use to meet daily and seasonal peak demands.

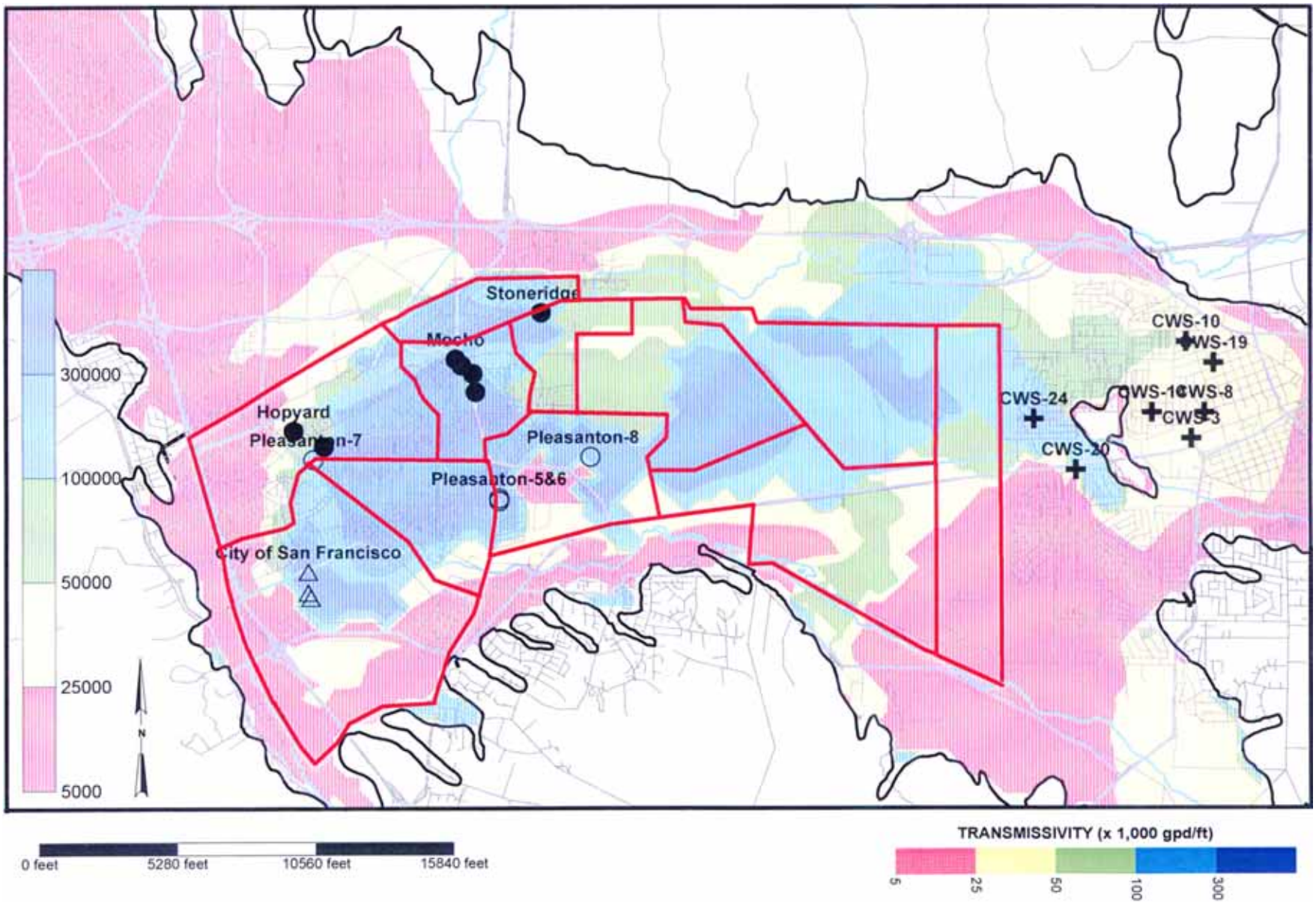
The majority of extracted water is used as municipal water supply. Groundwater represents about 25 percent of the Valley water supply. In the western portion of the basin, municipal wells are operated by Zone 7, City of Pleasanton, City of San Francisco Water Department (SFWD), and Alameda County Fairgrounds. SFWD has historically operated a well field near the confluence of Arroyo de la Laguna and Alameda Creek for groundwater production. More than 20 wells along Valley Avenue have been destroyed. Only four wells are currently in operation. Zone 7 uses three well fields in the basin including the Hopyard, Mocho and Stoneridge. These wells contribute to the potable water supplied by Zone 7 to DSRSD, Pleasanton, and portions of Livermore. The CWS operates water supply wells in the eastern portion of the basin to supply the City of Livermore. There are also a large number of private wells in the Main Basin. Some of these were originally potable supply wells, but many of them are now used for irrigation supply, monitoring or other purposes. **Table 3.1-1** shows the location and ownership of municipal wells within the Main Basin. **Table 3.1-2** summarizes the number of wells within each wellfield by well type.

Through Zone 7's conjunctive use management, groundwater levels within the Main Basin have been restored from historical overdraft conditions that occurred in the 1960s, when only approximately 126,000 af of groundwater were left in storage in the Main Groundwater Basin. This 126,000 af storage level corresponds to groundwater levels identified by Zone 7 as the "historic low" and provides the foundation for Zone 7's current operational policy, which is to maintain groundwater levels above historic lows. Based upon available historical data, Zone 7 has developed a composite map showing the lowest historical low water levels throughout the



SOURCE: Main Basin Hydrologic Inventory, 1997-2003, Zone 7, 2004

Figure 3.1-5
Zone 7 Historic Municipal Production from Surface Water and Groundwater Sources



SOURCE: CH2MHill, 2003

Figure 3.1-6
Existing Municipal Wells
and Basin Transmissivity

TABLE 3.1-1
ZONE 7 AND RETAILER WELL OWNERSHIP AND PHYSICAL CHARACTERISTICS

Well Name	Subbasin	Ownership	Pump Setting Elevation (ft msl)	Top of Screen (ft msl)
Mocho 1	Amador	Zone 7	135	195
Mocho 2	Amador	Zone 7	135	95
Mocho 3	Amador	Zone 7	55	30
Mocho 4	Amador	Zone 7	-120	-170
Hopyard 6	Bernal	Zone 7	-10	177
Hopyard 9	Bernal	Zone 7	115	92
Stoneridge	Amador	Zone 7	-125	95
Pleasanton-5	Amador	Pleasanton	185	196
Pleasanton-6	Amador	Pleasanton	Unknown	180
Pleasanton-7	Bernal	Pleasanton	Unknown	198
Pleasanton-8	Amador	Pleasanton	115	155
CWS-10	Amador	CWS	274	311
CWS-24	Amador	CWS	-8	22

SOURCE: CH2MHill, 2003, Zone 7, 2004

TABLE 3.1-2
EXISTING WELLS PER WELLFIELD

Wellfield	Municipal	Domestic/ Irrigation/ Industrial/Supply	Total Per Wellfield
Hopyard Wellfield	4	2	6
Bernal Wellfield	6	5	11
Stoneridge Wellfield	1	2	3
Mocho Wellfield	4	4	8
Valley Avenue Wellfield	0	0	0
Martin Wellfield	0	19	19
Busch Valley Wellfield	3	3	6
Gravel Pit Wellfield	0	2	2
Stanley Boulevard Wellfield	0	6	6
Chain of Lakes Wellfield	0	10	10
Isabel Wellfield	0	3	3
Total Wells	18	56	74

SOURCE: Zone 7 Water Agency, 2004

Main Basin. The historical low map, shown in **Figure 3.1-7** shows water levels within the Main Basin reached a historical low of approximately 180 feet mean sea level (msl) within the Pleasanton Area. As shown in this figure, the historical low can be thought of as a continual surface plain of varying depths throughout the basin.

Groundwater Quality

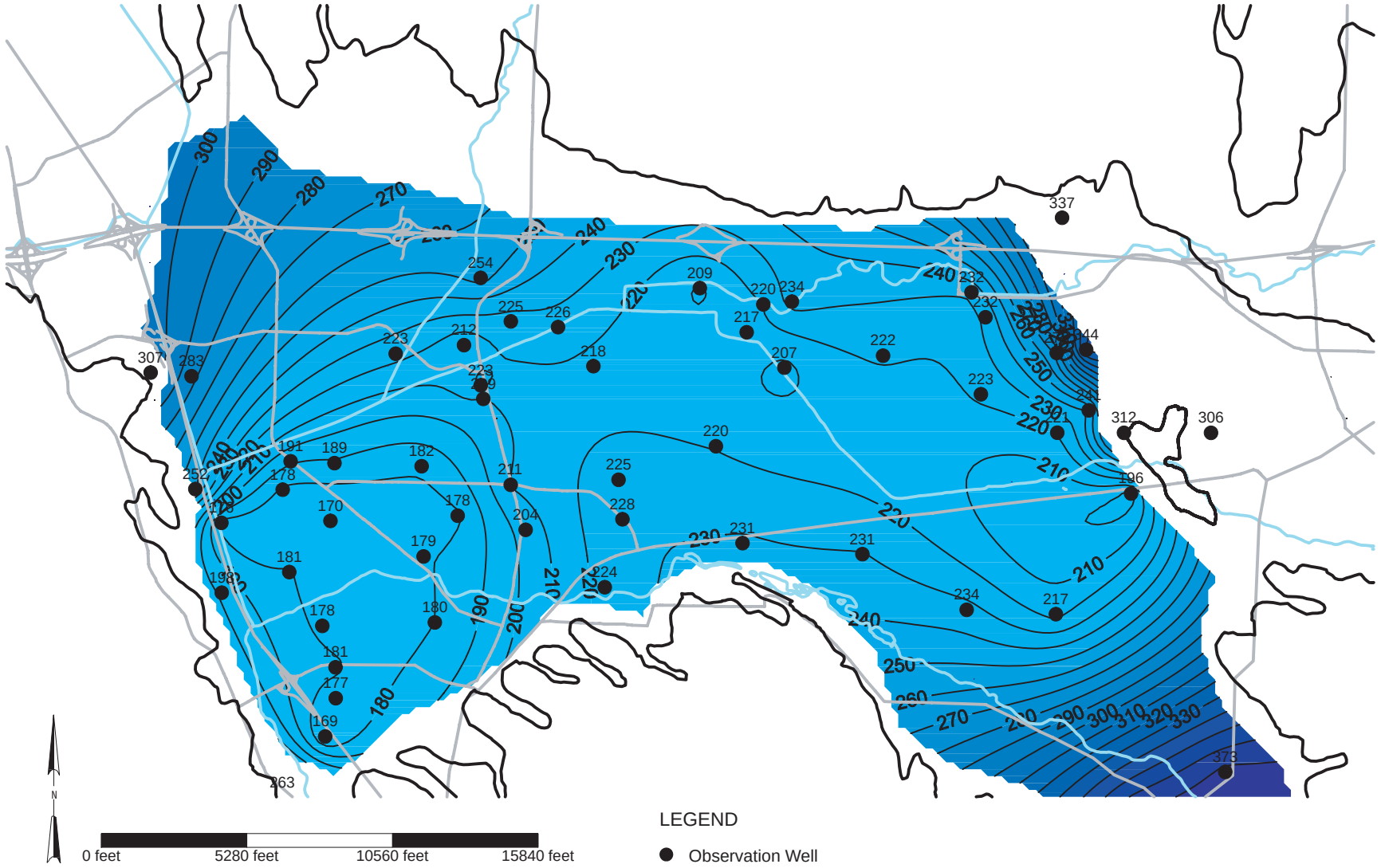
In general, the quality of water in the central portion of the Main Basin varies from fair to excellent. A number of wells are located within this area due to this potable quality water. The total dissolved solids (TDS, a measure of salts) content in the central portion of the Main Basin averages about 400 to 700 mg/L. Shallow groundwater (less than 100 feet deep) may have higher TDS. The Main Basin supports large capacity municipal production wells and is also used to store and distribute high quality imported water through Zone 7's recharge program. The groundwater in the Fringe Subbasins tends to be saltier than the Main Basin.

Zone 7 has developed a salt management plan to identify and evaluate all significant salt loading to, and removal from, the groundwater basin (see discussion below). However, it is a common misconception that the Livermore Valley groundwater basin is a “closed” basin. In the late 1800’s, the pre-development groundwater levels in the basin created a gradient causing groundwater to flow from east to west and naturally exit the basin as flow in the Arroyo de la Laguna. In the early and mid-1900s groundwater began to be extracted in appreciable amounts causing groundwater levels to drop throughout the basin. At that time, groundwater levels dropped blow the point where groundwater would naturally rise into Arroyo de la Laguna and exit the basin through stream flow. Surface application of extracted groundwater through irrigation and septic systems reintroduced the groundwater to the system, with minimal outflow to the Laguna.

It should be noted that the groundwater basin cannot be considered “totally enclosed”, since water is recharged into and exported from the basin through various means. These include the dewatering and export of mining water from the gravel pits (11,000 AF/average year), export of irrigation return flows via streams to the Arroyo de la Laguna, municipal pumpage, and export of resultant treated wastewater to the Bay through the LAVWMA pipeline (Zone 7, 2002). It is estimated that on average, approximately 8% of the total groundwater storage volume exits the basin each year via these processes. Approximately 20,000 afy of extracted groundwater recharges the groundwater basin through percolation of irrigation and percolation of return flows within stream channels. During drought years this percentage increases due to increased reliance on groundwater pumping. During wet years, more imported water is available and used to artificially recharge the basin.

Gravel Quarry Operations and Chain of Lakes

Gravel quarrying has taken place for many years in the central portion of the Valley, southeast of Livermore and east of Pleasanton. Existing quarry operations have to pump out groundwater to dewater the aquifer (lower the water table of the shallow aquifer) in order to keep the quarry pits from partially filling with water. In 1996, the quarry operations pump out approximately



SOURCE: CH2MHill, 2003

Figure 3.1-7
Historical Low Groundwater Elevations,
Main Basin Deep Aquifer

10,600 af, plus evaporative losses of 2,800 af. This amount dropped to approximately 150 af of pumpage, with 3,700 af of evaporative losses by the year 2002, as quarry operations for deep gravel mining were completed and groundwater levels within the Main Basin were low.

Once the quarry operations have been completed, the land will be turned over to Zone 7 for water storage and groundwater recharge. The area will be called the Chain of Lakes (see **Figure 2-4** in the **Project Description**). The quarrying operations will be completed in phases. Some of the quarry pits have been made available for water storage starting in the year 2003. These quarry pits, which consist of Lake H, Lake I and Cope Lake, were conveyed to Zone 7 in late 2003. At this time, these quarries are available for use only as recharge facilities. The entire complex of quarry pits is expected to be available by the year 2030. Zone 7 expects to have 37,000 AF of available capacity in the Chain of Lakes by the year 2005 – 2010. Ultimately, the Chain of Lakes will contain approximately 1,410 acres of quarry pits with the capacity to store approximately 84,000 af of water.

Water Quality Management Program

In October, 2002, Zone 7 completed a draft Water Quality Management Program (WQMP). The purpose of the WQMP was to establish guidelines and policies for potable and non-potable water quality. The WQMP also established goals to effectively manage various water quality issues, guiding operations and assisting in the capital improvement program (CIP) implementation. The goals and policies established were based on discussions with both retailers and end-users (Zone 7, 2002a).

The WQMP was the result of a process that involved public participation, conducting public meetings and workshops, forming a Water Quality Committee, updating and modifying the hydraulic model, identifying water quality parameters of concern and preliminary water quality targets, comparing targets with existing water quality characteristics, reviewing the CIP for planned improvements that could to help meet the water quality targets, develop addition CIP projects that could help meet the water quality targets, identify financing strategies, and develop an implantation plan which addresses the water quality policy and goals, targets to implement the goals, and a financing strategy.

3.1.2 REGULATORY SETTING

WATER QUALITY

The DHS enforces the Safe Drinking Water Act (Act) of the California Health and Safety Code, which encompasses the majority of the federal and state laws and regulations to ensure safe drinking water. The Act requires that a public water system cannot be operated without a DHS domestic water supply permit.

GROUNDWATER RIGHTS

In California, water rights involve the right to use water, not the right to own water. While the Water Code implies the existence of groundwater rights, their doctrinal bases and characteristics are essentially the product of the decisions of the courts. There are three types of groundwater rights:

> Overlying Rights. All property owners above a common aquifer possess a mutual right to the reasonable and beneficial use of a groundwater resource on land overlying the aquifer from which the water is taken. Overlying rights are correlative (related to each other) and overlying users of a common water source must share the resource on a pro rata basis in times of shortage. A property overlying use takes precedence over all non-overlying uses.
>
> Appropriative Rights. Non-overlying uses and public uses, such as municipal uses, are called appropriative uses. Among groundwater appropriators, the "first in time, first in right" priority system applies. Appropriative users are entitled to use the surplus water available after the overlying user's rights are satisfied.
>
> Prescriptive Rights. Prescriptive rights are gained by trespass or unauthorized taking that can yield a title because it was allowed to continue longer than the five year statute of limitations. Claim of a prescriptive water right to non-surplus water by an appropriator must be supported by many specific conditions, including a showing that the pumpage occurred in an open manner, was continuous and uninterrupted for five years, and was under a claim of right.

From a water law standpoint, Zone 7's right as a public agency to store and recapture water in the groundwater basin can be summarized by the following general rules:

- The importer has the right to recapture water that has been added to the groundwater supply as a result of the replenishment operation, and this right is superior to the right of groundwater users with respect to the imported supply;
- The importer has the right to prevent other groundwater producers from extracting the imported supply, although this could require litigation, and in some cases, adjudication of all rights to the groundwater basin may be necessary to determine rights to the total supply;
- The importer has no right to preclude others from appropriating surplus groundwater that would be spilled or lost from the groundwater basin when the basin is in surplus;
- The underground storage and recover of the imported water cannot substantially interfere with the basin's native or natural groundwater supply.

3.1.3 IMPACTS AND MITIGATION MEASURES

IMPACT SIGNIFICANCE CRITERIA

The following criteria are used in this analysis to assess the significance of potential project effects on the groundwater quantity and quality of both the Main and Fringe basins.

Groundwater quantity/flow:

- Cause fluctuations in the groundwater table which would create adverse surface effects.
- Cause the basin or any of its subbasins to become overdrafted; or
- Significantly alter the movement of groundwater within the basin;

Groundwater quality:

- Individually or cumulatively degrade the quality of groundwater resources or cause Main Basin water quality to fail to meet groundwater quality objectives currently defined in the Basin Plan.
- Cause the groundwater in the Main Basin to fail to meet drinking water quality standards.

MODELING SCENARIOS

Zone 7's groundwater management would continue to utilize conjunctive use practices, consistent with current operations. However, as demands increase over time, increased capacity to recover stored water would be necessary to meet Zone 7's current reliability goals, as defined in **Section 2.2.2** of the **Project Description**. The Well Master Plan examined the following four operational scenarios to identify potential effects on the groundwater basin: 1) Average Year – Peak Day Demands; 2) Single Year Drought Demands; 3) Six-Year Drought Demand; and 4) Surface Water Outage. The amount of groundwater recovered from storage would increase in ascending order for the first three scenarios, due to the limitation of SWP deliveries from normal year, to single year, to six-year drought demands. Operations of the wells under each scenario would differ, but would be operated in a manner that would maximize well production, while retaining reliability and flexibility. Typically, wells would be operated during the peak demand season or during emergencies. The number of wells operating in conjunction and the duration of pumping would vary to maintain flexibility and sufficient groundwater storage above the "historical low" water level of the Main Basin. Operational scenarios are described below.

Average Year – Peak Day Demands

Average year groundwater production fluctuates annually depending upon several factors, including hydrologic conditions, deliveries from the State Water Project, and local facility management, including conveyance facility and treatment plant outages. The percentage of historical groundwater delivery is shown in **Figure 3.1-5**. From 1998 to 2002, Zone 7 pumped an average of 6,680 af annually, with a maximum pumpage of 10,920 af in 2002. The volume of groundwater pumped in average years would continue to incrementally increase over time as

demands within the Zone 7 service area increase. Generally, pumping would be spread throughout the year but would be concentrated in the summer and fall seasons, with anticipated peak demands of 41 mgd until the Altamont WTP comes online, and 36 mgd at buildout. During an average hydrologic year, Zone 7 would continue to supplement deliveries from the SBA with groundwater to meet peak day seasonal demands and to recover 20-25% of total annual demand from stored groundwater supplies.

Drought Year Demands

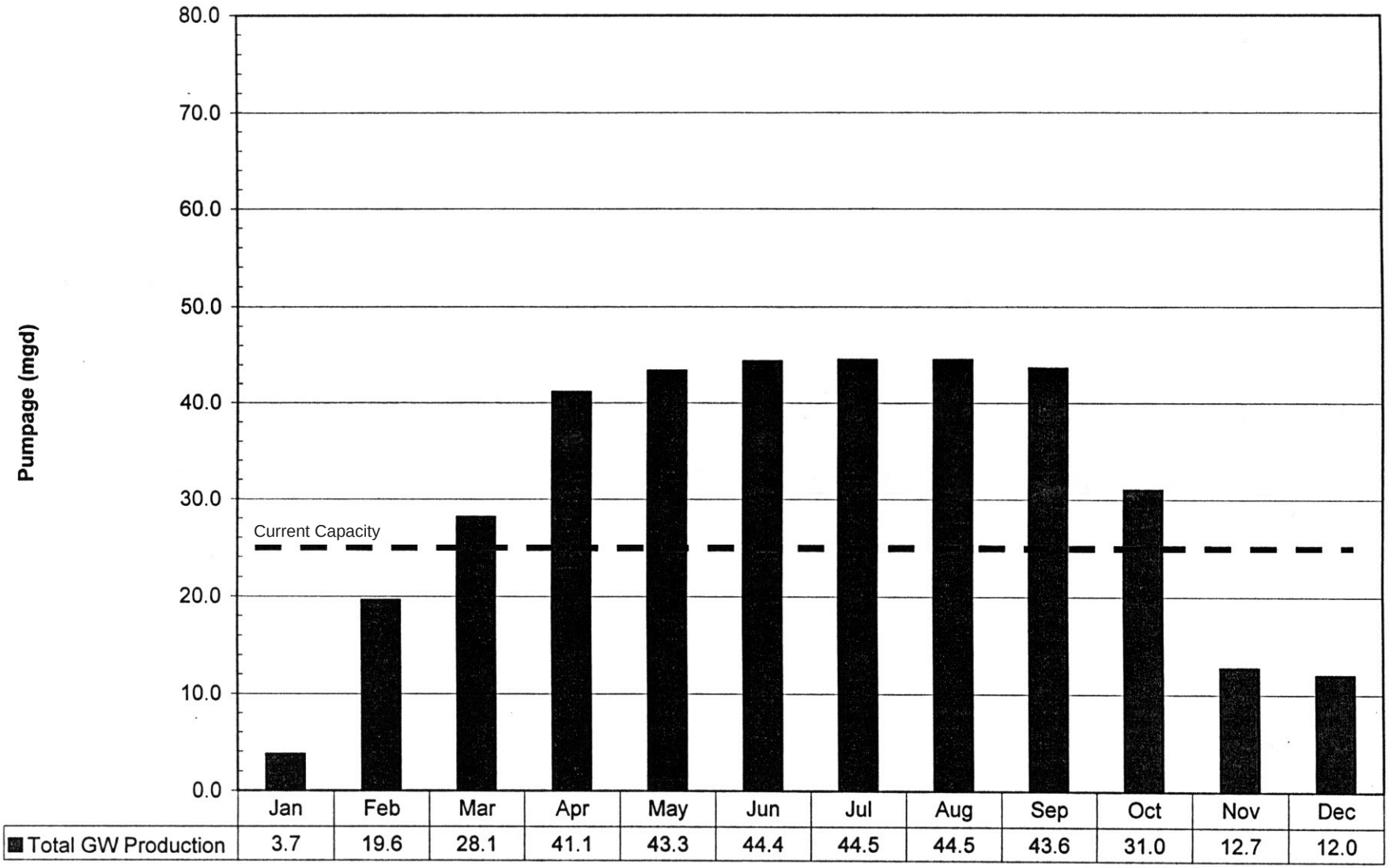
Single Year Drought Scenario

During dry hydrologic year, deliveries from the SWP via the SBA would be reduced. Zone 7 would rely more on stored groundwater supplies to meet demands during dry years. DWR and Zone 7 projections of the single-year drought conditions are similar to that of 1977. Based upon the *State Water Project Reliability Report*, DWR estimates that deliveries would be as low as 20% of Zone 7's entitlements (DWR, 2002). Therefore, groundwater would be utilized to supplement reduced surface water deliveries under this worst case single drought year scenario.

Pumping requirements patterns based on SWP surface water deliveries of 20% are shown in **Figure 3.1-8,** and result in a demand of 45 mgd of pumping capacity. Therefore, an additional 20 mgd of pumping capacity would be required to meet peak rate needs during periods of drought. Projected groundwater production for the single year drought scenario, assuming 20% water allocation deliveries, is shown in **Figure 3.1-9**, and is estimated at approximately 34,453 af. Groundwater supplies would then be restored through recharge in subsequent "normal" and "wet" years.

Six-Year Drought Scenario

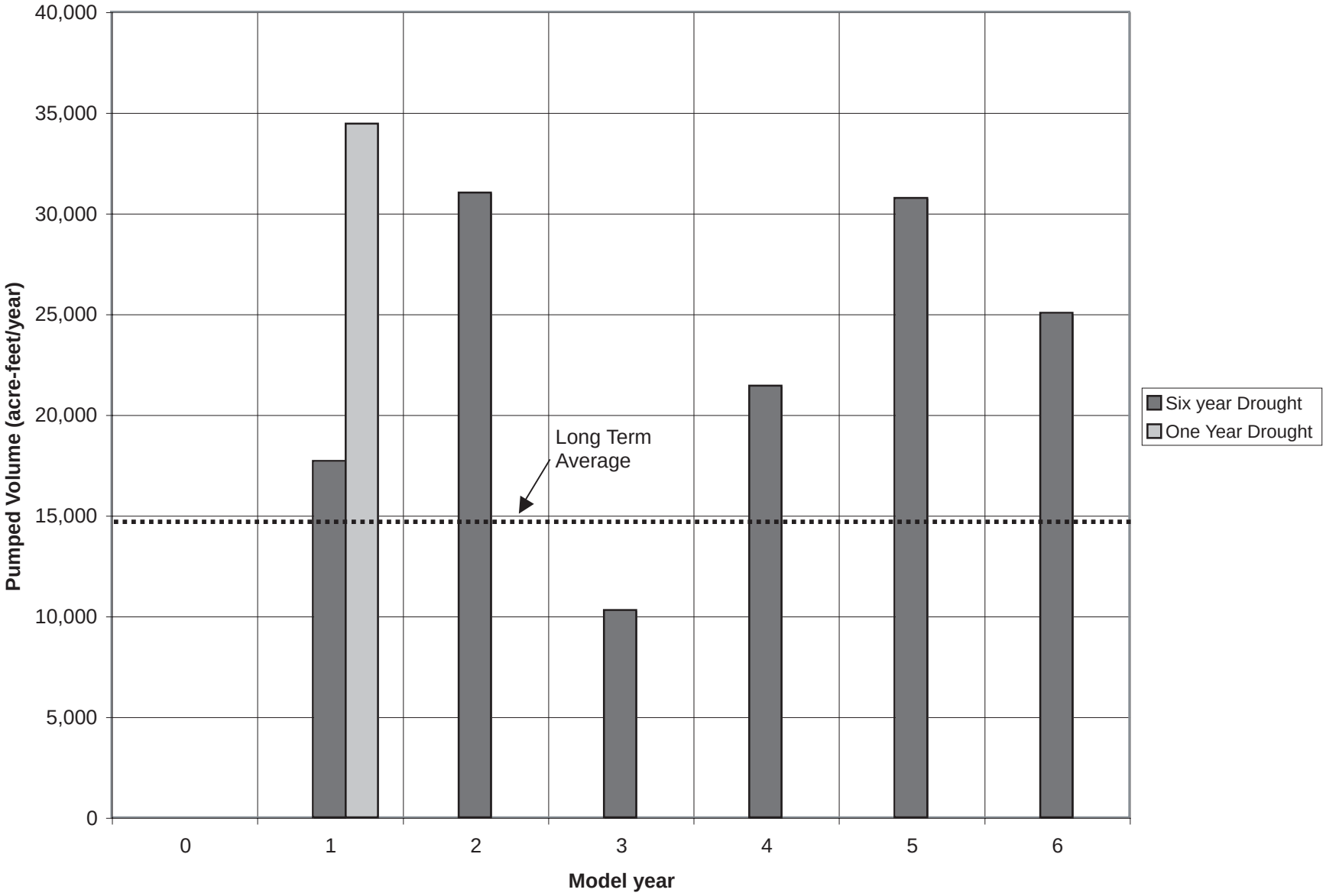
DWR planning criteria utilizes the 1922–1998 period to determine drought year demands and deliveries. Consequently, Zone 7 has determined the "worst-case" multi-year drought scenario to be the six-year drought represented by 1987 to 1992 hydrologic conditions. As with the single year drought scenario, Zone 7 would rely on groundwater supplies to supplement reduced SWP deliveries during these conditions. Projected groundwater production for the six-year drought scenario is shown in **Figure 3.1-9**. As shown in this figure, groundwater production on the order of 30,000 acre-feet (31,012 acre-feet and 30,741 acre-feet, respectively) occurs during two years in the six-year drought cycle. Groundwater supplies would then be restored through increased recharge in subsequent normal and wet years. It should be noted that based upon historical hydrology, the single year and multi-year drought scenarios have similar single year production requirements of between 31,000 and 34,500 acre feet, and both have similar peak rate needs, i.e., approximately 45 mgd. Therefore, an additional 20 mgd of pumping capacity would be required to meet this peak rate need.



SOURCE: CH2MHill, 2003

Figure 3.1-8

Zone 7 Groundwater Pumpage During Peak of Drought
20% SWP Deliveries & 2020 Demand



SOURCE: CH2MHill, 2003

Figure 3.1-9

Anticipated Groundwater Production,
Single Year and 6-Year Drought Scenarios

Surface Water Outage

In the event of an operational or emergency outage of the SBA, Zone 7 water treatment plants or other DWR facilities, Zone 7 would only be able to deliver water from in-valley storage within the Main Basin. Under this scenario, the ability of Zone 7 and its Retailers to meet Goal 2 of its Reliability Policy, provision of 75% of the Valley-wide maximum day demand (MDD) was examined. Modeling of this scenario examined Zone 7's use of well capacity to meet 75% of the maximum peak day demand under 2020 demands. **Figure 2-2** in **Chapter 2, Project Description**, shows the Valley-wide 75% Maximum Day Demand relative to existing and projected groundwater production capacity. Assuming that the Retailer's peak pumping rate remains at 21 mgd, and that Zone 7 can pump 25 mgd from its existing wells, an additional 42 mgd of pumping capacity would be required to meet this Valley-wide 75% Maximum Day Demand criteria at buildout. However, about half of this new capacity would not be needed during average and drought years to meet peak rates, and would be essentially idled until an emergency occurs that requires it to be pumped.

Long-Term Projects

As indicated in **Chapter 2.0, Project Description**, project alternatives for wellhead demineralization are under development by Zone 7 for salt management. For the purposes of the Well Master Plan, groundwater pumpage associated with wellhead demineralization was considered in the analysis of long-term groundwater operations in order to address potential cumulative effects to groundwater associated with operation of future demineralization facilities, if they are implemented.

Groundwater Modeling Approach

CH2MHill conducted groundwater modeling, and prepared a technical memorandum on January 31, 2003 that analyzes existing and proposed water level conditions in the Main Basin under various pumping scenarios (CH2MHill, 2003). The effort also included the evaluation of potential near-well and regional impacts that would result from various pumping patterns. The purpose of the groundwater modeling was to assess future water level conditions of the groundwater basin and to identify viable project alternatives. The modeling is supported by the use of "MODFLOW" and "MT3D," based on existing Zone 7 pumpage data for average yearly groundwater pumpage at buildout (2020), one year drought, and six-year drought. As previously described, annual groundwater pumpage during average year conditions is estimated at 14,800 af. Based upon the 2002 SWP Reliability Report provided by DWR, groundwater pumpage necessary to meet demands during the single-year drought scenario is estimated at 34,453 af. Groundwater pumpage for the six year drought of historical record varies with each drought year, with groundwater production in the two worst drought years projected at over 30,000 af. This scenario was used to compare modeled water level conditions within the groundwater basin to historic low groundwater levels identified in **Figure 3.1-7**. In addition, the effects of shallow desalting wells (to mitigate salt buildup in the basin) were assessed in selected model simulations.

IMPACTS AND MITIGATION MEASURES

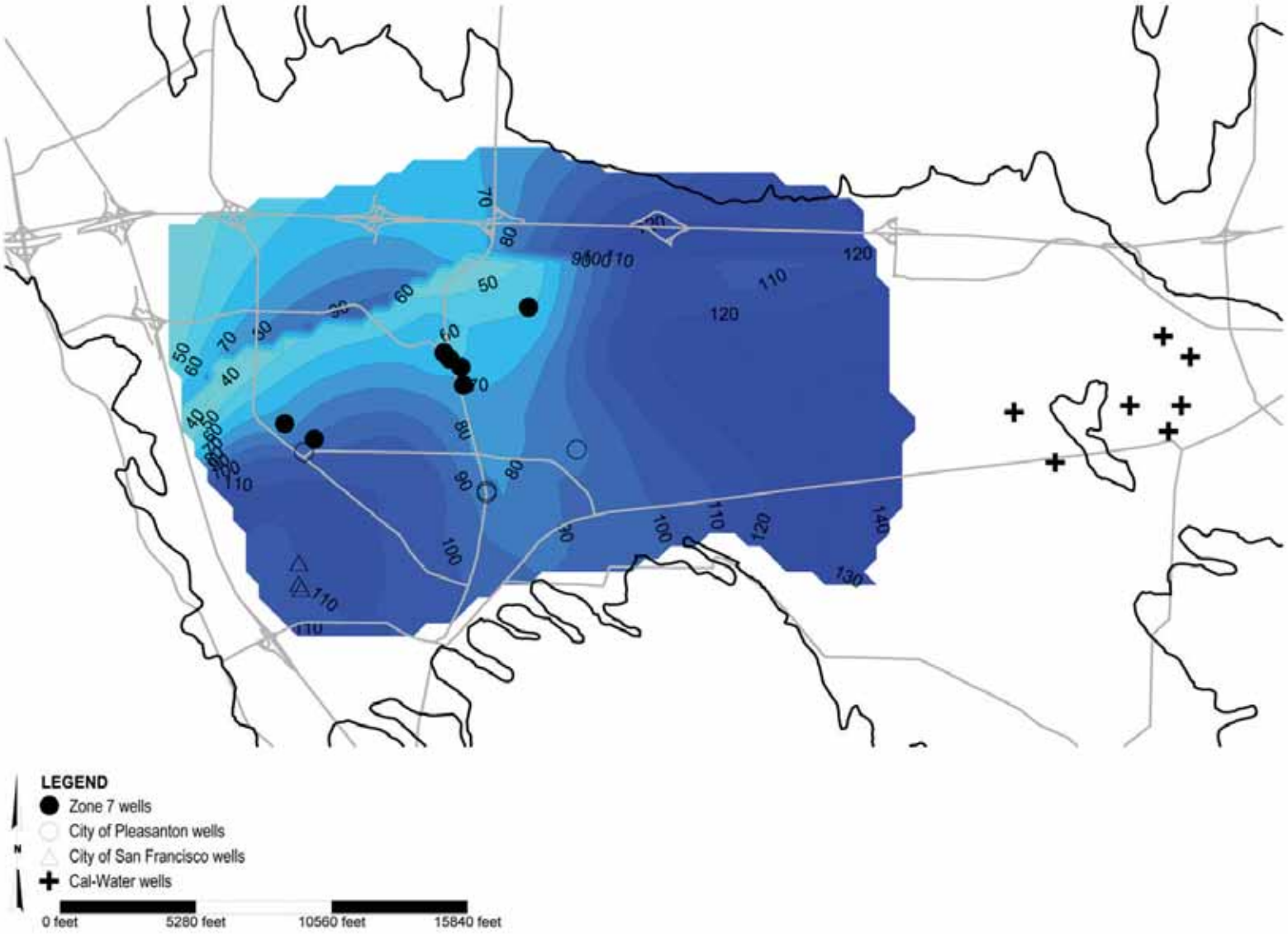
Impact 3.1-1: Increased groundwater recovery to meet drought year and emergency demands would have the potential to result in groundwater levels below the historical low elevations, thereby conflicting with Zone 7's current operational policy of maintaining groundwater levels above the "historic low" groundwater elevation. Less than Significant with Mitigation.

Implementation of the Well Master Plan to meet Zone 7 reliability goals would increase Zone 7's well capacity by approximately 20 mgd for drought demands, and 42 mgd for emergency demands. This is consistent with Zone 7's current practices, which uses the Main Basin to meet these demands, in addition to daily peak demands. However, as demands within the Zone 7 service area increase over time, increased recharge and recovery of stored groundwater supplies would occur.

Average year conditions were examined for consistency with historical low groundwater levels. Average year groundwater recovery is anticipated to increase incrementally over time, and would vary on an annual basis depending upon hydrologic conditions. As previously noted, average year deliveries fluctuate depending upon several factors, including hydrologic conditions, deliveries from the State Water Project, and local facility management, including conveyance facility and treatment plant outages. Zone 7's average year peak day demands at buildout will be 36 mgd. Modeled groundwater elevations for average year are shown in **Figure 3.1-10**. Groundwater levels associated with average year operations would remain 50-100 feet above the historical low. As such, groundwater levels associated with average year operations would remain well above historical lows.

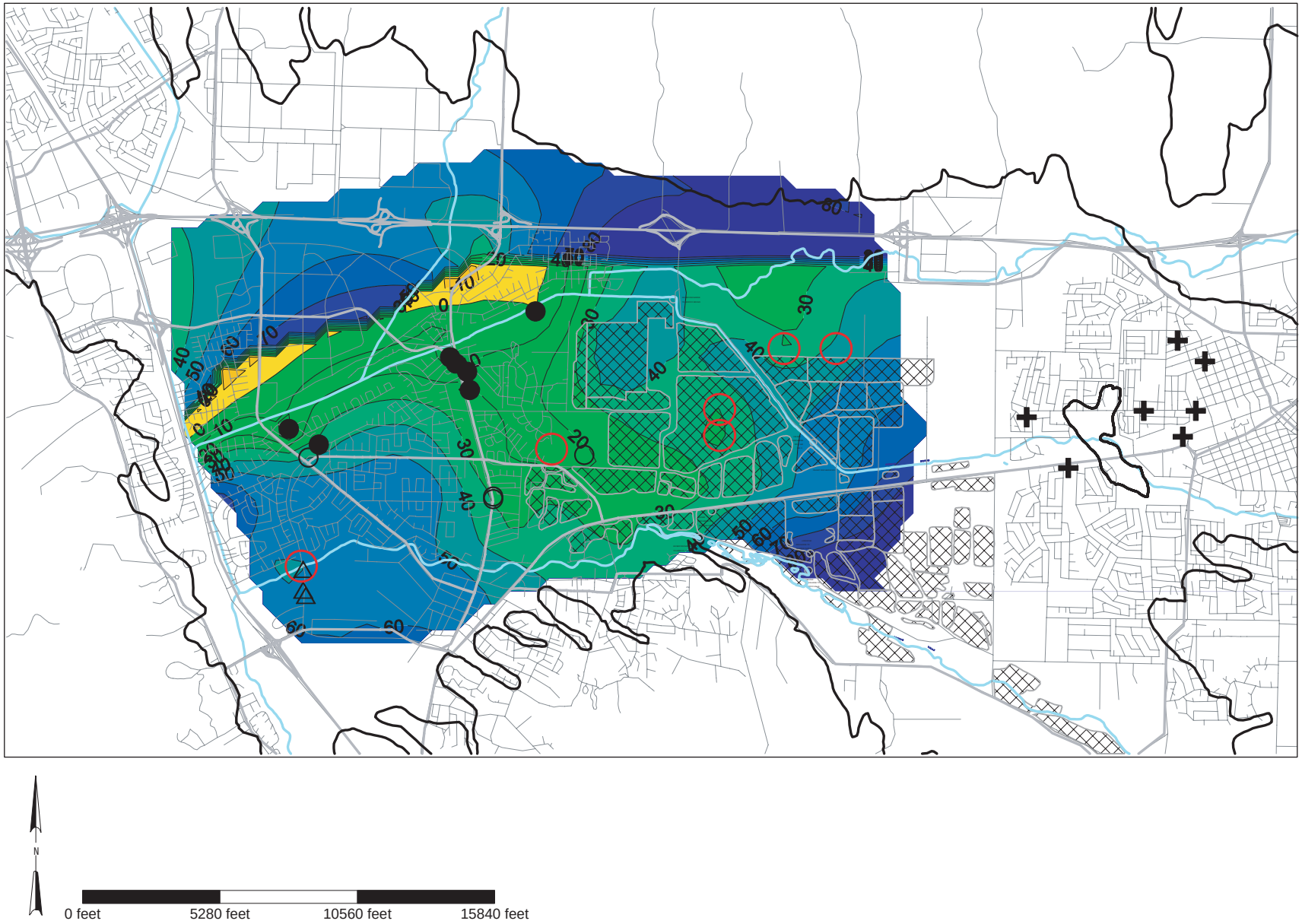
In order to assess potential effects associated with meeting Goal 1 of Zone 7's Reliability Policy, drought conditions for the single year and six-year drought scenarios were modeled to identify resulting groundwater elevations associated with groundwater production to meet projected demands. Pumpage of the groundwater basin during the six-year drought scenario represents the reasonable worst case demand and associated drawdown on the groundwater basin.

Resulting groundwater elevations over the course of the six-year drought scenario were compared to Zone 7's composite map of historical low elevations to review proposed regional groundwater operations relative to Zone 7's historical low operating policy. Drawdown under this scenario would vary across the Main Basin. Maximum drawdown was identified as 78 feet within the Chain of Lakes wellfield. Simulated water elevations for the six year drought were then compared to the historical low elevation map. Results of this comparison are shown in **Figure 3.1-11**. As shown by this figure, use of 45 mgd of well capacity to meet Goal 1 of Zone 7's reliability policy during the historical six-year drought period would cause water levels to approach, but not exceed, historical low elevations on a regional basis. This modeled scenario is representative of the likely extent and distribution of drawdown effects within the Main Basin. However, it should be noted that the actual physical distribution of drawdown effects would be dependant upon final well locations and the number of wells distributed within each wellfield.



SOURCE: CH2MHill, 2003

Figure 3.1-10
Water Level Difference Map for the Deep Aquifer Average Future Conditions Minus Historical Low



SOURCE: CH2MHill, 2003

Figure 3.1-11
Six-Year Drought Drawdown (45 mgd)
vs. Historical Low Groundwater Elevations-
Main Basin Deep Aquifer

Historical lows may be approached within certain wellfields, while water elevations in other wellfields would remain substantially above historical low elevations. Therefore, project implementation would be consistent with Zone 7's operational policy regarding exceedance of historical low groundwater elevations on a regional basis.

In addition to drought year demands, analysis of potential drawdown associated with meeting Goal 2 of Zone 7's Reliability Policy, provision of 75% of the Valley-wide MDD, was examined. Projected drawdown associated with production of 70 mgd was modeled and compared with historical low water elevations. Results of this analysis indicate that placement of well sites within the eastern portion of the Main Basin would allow for groundwater production at this level for approximately 30 days, at which point historical low elevations would be approached. However, the ability to meet this emergency production goal, and the duration of this level of emergency production available in relation to the historical low, would be dependant upon the location of individual wells, their finished production rates, and their interaction. Production at this level would require careful placement of between 8 and 15 wells within the eastern portions of the Main Basin in order to more effectively recover stored groundwater in those areas. Additionally, some idling of existing well capacity would be required in order to maintain groundwater levels above historical lows.

Zone 7's historical low operational policy was established in order to ensure that a reserve of groundwater was maintained for emergencies. In addition it minimizes the potential for secondary impacts relating to regional subsidence, to the degree feasible. It should be noted that localized exceedance of the historical low in the immediate vicinity of a given well may occur, depending upon local geologic conditions and well efficiency. Therefore, it is recommended that local monitoring wells in the vicinity of existing and proposed well locations be used to monitor local groundwater conditions to ensure that localized exceedance of the historical low groundwater elevation for specific wells do not occur. Please refer to **Section 3.3** (**Geology and Soils**) for further discussion regarding the potential for subsidence to occur.

Further modeling would likely be successful in optimizing operations to meet Goal 2 of Zone 7's Reliability Policy and reduce drawdown to less than historical low elevations. However, this implies a level of predictive accuracy relative to actual future response of the system that is unreasonable given the assumptions made during modeling. As new wells are installed, Zone 7 would continue to test well performance and confirm actual groundwater responses compared to those predicted by modeling efforts in order to optimize groundwater recovery operations relative to the historical low policy.

Within this context, and considering that the duration of the emergency condition under Goal 2 is undefined, it may not be prudent to rely solely on the Main Basin to meet 75% of the Valley-wide MDD at buildout demands. It is therefore recommended that Zone 7 review Goal 2 with respect to two key elements: a) definition of a duration for the emergency condition, and b) identification of the statistical need to meet the maximum day demand during emergency conditions.

Mitigation Measures

Measure 3.1-1a: Zone 7 shall update its well monitoring program to include daily water elevation monitoring using monitoring wells, water level recorders and SCADA systems to provide real time data for all existing and new production wells during drought or water shortage emergency pumping events. Each well shall be monitored with respect to a specified historical low elevation to ensure that historical lows are not exceeded on a regional basis. Following new well installation this data will be used confirm basin modeling with respect to drawdown and historical low criteria.

Measure 3.1-1b: Modeling conducted to date indicates the ability to meet the Valley-wide 75% MDD at buildout demand for an approximately 30-day period without exceeding historical lows. However, in order to further refine emergency demand requirements, Zone 7 would implement a Reliability Study to review Zone 7's ability to meet Goal 2 solely from stored groundwater supplies. Key elements to be reviewed include: appropriateness of 75% MDD criteria, the duration of the emergency condition, and identification of other facilities or water supplies that could provide sources of reliability.

Impact Significance After Mitigation: Less than significant.

Impact 3.1-2: Increased groundwater production from the Main Basin during peak demand periods or drought years could reduce groundwater levels below existing well pump or screen elevations, thereby affecting production efficiency in nearby public and private wells. Less than Significant with Mitigation.

In addition to effects associated with regional groundwater elevations, existing wells within the Deep Aquifer could be affected by well interference due to the placement of new wells proposed under the Well Master Plan. Well interference is defined by adverse water level decline at an existing well caused by production from new wells. This interference may reduce the water available to the existing well and affect well yield. To assess the minimum spacing between wells, CH2M Hill simulated "typical" wells at each wellfield operating at estimated peak pumping rates under the single drought year scenario. This modeling allows assessment of potential effects to existing wells arising from each new well. Additionally, potential direct effects associated with well placement are identified (see **Impact 3.1-3**, below).

Two types of impacts to existing deep aquifer production wells were assessed; water elevations relative to pump settings within municipal wells, and water elevations relative to well screen elevations. With respect to pump settings, enough water must remain above a pumps suction point to maintain an adequate net positive suction head (NPSH) to prevent cavitation and/or breaking of suction during operation. This water elevation varies from well to well, but is estimated at 10 feet above the pump setting for local municipal wells. Modeled water levels for the single year drought scenario were compared to pump settings for municipal wells within the Main Basin. Modeling results indicate that potential impacts to pump suction would not occur at any of the wells examined. The lowest water elevation to an existing pump elevation was identified for Zone 7's Hopyard-9 Well, with elevations remaining more than 70 feet above the pump elevation. Therefore, potential impacts to pump suction are less than significant.

Municipal water supply production wells are typically designed and constructed so that water levels inside the well remain above the uppermost well screen during operation. This practice reduces potential problems such as cascading water and air entrainment which can adversely affect pump operation and life, lead to problems in the distribution system and customer complaints. Based on resulting groundwater elevations during the single year drought scenario, Zone 7's Hopyard-6 and Mocho-1, and the City of Pleasanton's Pleasanton-5 wells might experience cascading water during pumpage under this scenario. Consistent with Zone 7's current pumpage agreements with retailers, including the City of Pleasanton, Zone 7 shall notify Pleasanton as part of its Groundwater Monitoring Program if water elevations in a drought year are anticipated to approach well screen elevations. In the event retailer wells become unusable due to low groundwater levels, Zone 7 would provide retailer's independent quota from groundwater supplies in accordance with past practices and service agreements.

In addition to municipal wells, review of Zone 7 databases indicates 56 supply and irrigation wells are located within the identified wellfields **(See Appendix 3.1 for well list)**. These wells were reviewed with respect to use, well depth, screen perforation, and well pump depth. Of the 56 wells identified, 10 are used for irrigation, 7 are identified as idle, and 1 provides industrial water supply. An additional 11 wells have backup City of Pleasanton water connections. This leaves 27 wells that are potable supply wells without back up City connections. In order to review potential well effects to potable water supply use, the upper screen elevations for these 27 wells were compared to modeled groundwater elevations associated with the single-year drought scenario. Additionally, screen elevations were compared to the documented historical low groundwater elevation for each wellfield. Upper screen elevations were unavailable for 6 wells, providing a dataset of 21 wells. Comparison of well screen depths to modeled groundwater elevations indicate that private wells would not be affected by average year operations. However, comparison of modeled groundwater elevations for the single-year drought scenario with known well screen elevations for the 21 wells without backup connections indicate that groundwater levels would be below the upper screen elevation at 4 wells, or 19% of the wells. A summary of these potable supply wells with screen elevations that could be affected during the modeled single-year drought scenario is provided in **Table 3.1-3**. Effects to these wells may be similar to those discussed for municipal pumpers above. This modeled scenario is representative of the likely extent and distribution of drawdown effects within the Main Basin. However, it should be noted that the actual physical distribution of drawdown effects would be dependant upon final well locations and the number of wells distributed within each wellfield.

As such, **Table 3.1-3** also identifies the historical low elevations that this set of potable supply wells has previously experienced. As previously noted in Section 2.0, Project Description, Zone 7's operational policy, and a key element in development of the Well Master Plan, is to maintain groundwater levels above historical low. The ability of individual wells to operate at historical lows is dependent upon the design of individual well pumps, which is the responsibility of individual well owners.

TABLE 3.1-3
COMPARISON OF WELL SCREEN ELEVATIONS AND MODELED GROUNDWATER LEVELS – SINGLE YEAR DROUGHT SCENARIO

			Well Screen Data			1-Year Drought Scenario		Historical Low	
Wellfield	**Owner**	**Well Use**	**Top of Screen Elevation Feet MSL**	**Bottom of Screen Elevation Feet MSL**	**Total Screen**	**Feet Below Upper Screen**	**% Screen Affected**	**Feet Below Upper Screen**	**% Screen Affected**
Bernal Wellfield									
3S/1E 20B 2	Alameda County Fair	Supply	122	-160	282	0	0	58	21%
Busch Valley Wellfield									
3S/1E 9R 6	G. Dana	Domestic	193	118	75	0	0	0	0
3S/1E 9R 8	G. McConkie	Domestic	133	113	20	0	0	0	0
Chain of Lakes Wellfield									
3S/1E 10A 1	Jamieson	Supply	264	122	142	0	0	54	38%
3S/1E 11E 1	Jamieson	Supply	215	-135	350	0	0	5	1%
3S/1E 11H 1	Hagemann	Supply	149	77	72	0	0	0	0
3S/1E 14A 2	R&J Domestic	Supply	246	176	70	18	26%	36	51%
3S/1E 14A 3	Pleasanton Gravel	Supply	100	0	100	0	0	0	0
Gravel Pit Wellfield									
3S/1E 11P 4	Jamieson	Supply	--	220	--	--	--	--	--
3S/1E 11P 6	Jamieson	Domestic	132	-8	140	0	0	0	0
Hopyard Wellfield									
3S/1E 17B 4	A.B. Casterson	Domestic	--	67	--	--	--	--	--
3S/1E 18M 2	Unknown	Supply	--	94	--	--	--	--	--
Isabel Wellfield									
3/1E 24A 1	Jamieson	Domestic	238	-270	508	0	0	28	6%
Martin Wellfield									
3S/1E 9G 3	Wieken	Domestic	185	157	28	0	0	25	89%
3S/1E 9H 3	Schwaegerle	Domestic	146	121	25	0	0	0	0
3S/1E 9H 4	D. Gonsalves	Domestic	250	186	64	0	0	40	63%
3S/1E 9H 6	Peterson	Domestic	251	203	48	0	0	41	85%

TABLE 3.1-3 (Continued)
COMPARISON OF WELL SCREEN ELEVATIONS AND MODELED GROUNDWATER LEVELS – SINGLE YEAR DROUGHT SCENARIO

			Well Screen Data			1-Year Drought Scenario		Historical Low	
Wellfield	**Owner**	**Well Use**	**Top of Screen Elevation Feet MSL**	**Bottom of Screen Elevation Feet MSL**	**Total Screen**	**Feet Below Upper Screen**	**% Screen Affected**	**Feet Below Upper Screen**	**% Screen Affected**
Martin Wellfield (cont.)									
3S/1E 9H 7	E. Lauer	Domestic	285	135	150	32	21%	75	50%
3S/1E 9J 1	Lehman	Domestic	206	158	48	0	0	0	0
3S/1E 9J 3	Leuthauser	Domestic	148	128	20	0	0	0	0
3S/1E 9J 4	Selway	Domestic	145	125	20	0	0	0	0
3S/1E 9Q 3	J. Jennaro	Domestic	241	141	100	0	0	31	31%
Mocho Wellfield									
3S/1E 9P 4	Carpenters Hall	Supply	--	150	--	--	--	--	--
Stanley Wellfield									
3S/1E 13G 1	Jamieson	Supply	307	66	241	57	24%	97	40%
3S/1E 14K 2	Lone Star Industrial	Supply	260	-100	360	10	3%	50	14%
Stoneridge Wellfield									
3S/1E 5J 6	R. Guasco	Supply	--	--	--	--	--	--	--
3S/1E 5R 1	E. Theodore	Supply	--	170	--	--	--	--	--

Notes: "—" Indicates information is not available.

SOURCE: Zone 7 Water Agency, 2004

In general, Zone 7 recharge operations have maintained, and will continue to maintain, groundwater levels within the same operating zones that have been experienced over the past 30 years, i.e., above historical low groundwater elevations, thereby maintaining the historical benefit to pumpers within the Main Basin. It should be noted that historical low groundwater elevations have been approached in portions of the Main Basin following drought periods in 1977 and 1991, and most recently in 2002, following reduced recharge during SBA outages (see **Figure 3.1-3)**. As such, groundwater conditions at or near the historical low groundwater elevations within individual wellfields during drought conditions, and subsequent effects to individual pumpers, have been experienced periodically within the Main Basin, and will continue to be experienced irrespective of the Well Master Plan. Zone 7 is not responsible for ensuring the adequacy of individual wells to operate at the historical low groundwater elevations that have been experienced within the Main Basin. Maintenance of groundwater elevations above historical lows, including during drought period, would not adversely affect overlying property owner ability to exercise the reasonable and beneficial use of groundwater on land overlying the Main Basin. Therefore, impacts are considered less than significant.

Mitigation Measures

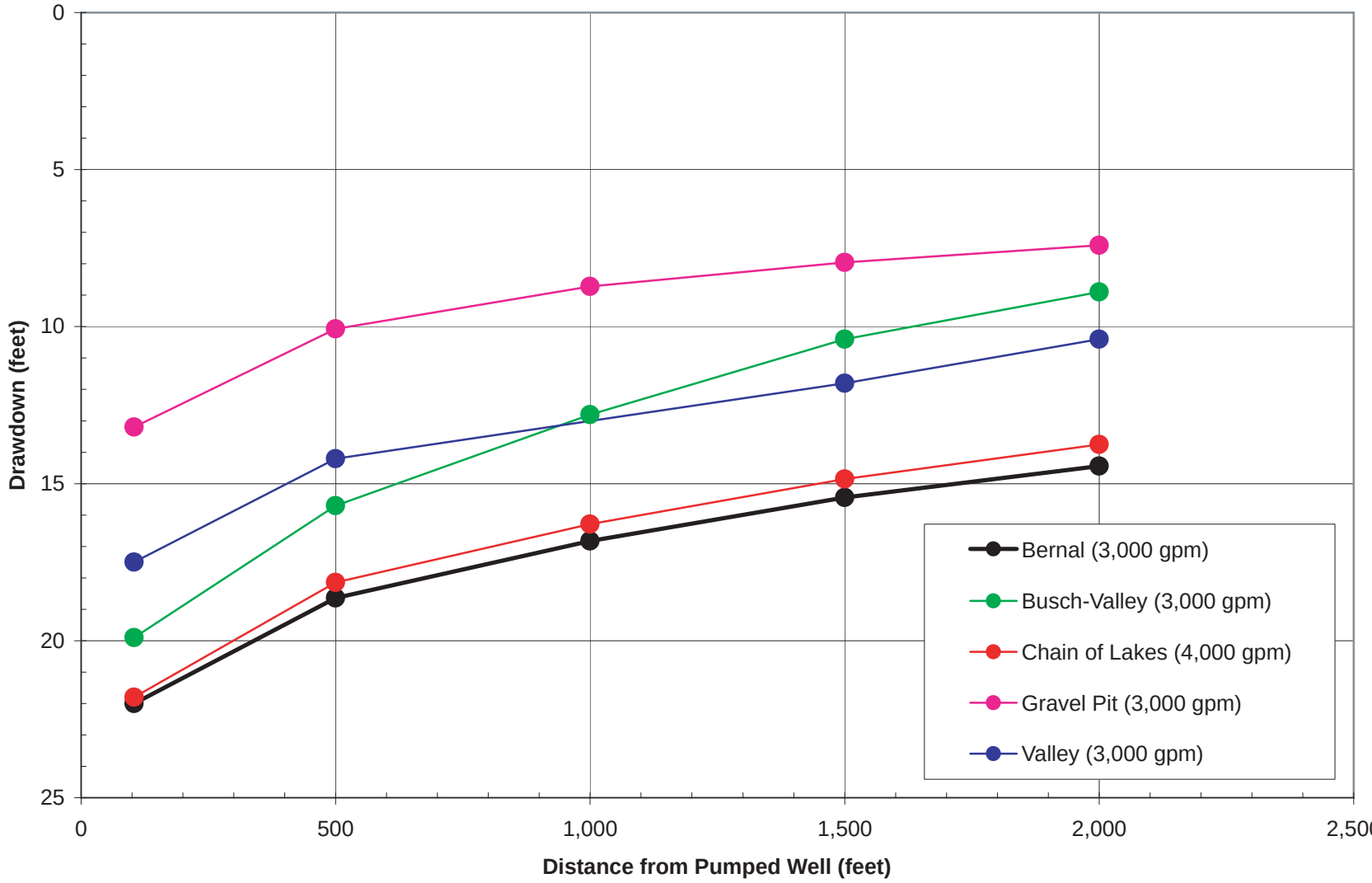
Measure 3.1-2a: In the event retailer wells become unusable due to low groundwater levels, Zone 7 would provide retailer's independent quota from groundwater supplies in accordance with past practices and service agreements.

Measure 3.1-2b: Zone 7 shall review new well designs to ensure well screen and pump elevations accommodate groundwater levels fluctuation under the Well Master Plan. This review will be part of Zone 7's current role in issuing permits for new potable well construction.

Impact Significance After Mitigation: Less than significant.

Impact 3.1-3: Placement of new wells within proposed wellfields would alter localized groundwater gradients, and could result in direct effect to the efficiency of existing municipal and private wells within the Main Basin due to well interference. Less than Significant with Mitigation.

Operation of proposed production wells would cause a drop in local groundwater levels within the vicinity of the well. In order to assess the potential for new wells to have a direct interference effect on existing wells within the Main Basin Deep Aquifer, potential water level impacts from new wells on surrounding areas were modeled using a "typical" well capacity at each wellfield operating at a projected peak pumping rate of 3,000 gpm, with a 4,000 gpm rate used at the Chain of Lakes Wellfield due to increased transmissivity of that wellfield. Distance drawdown graphs are shown in **Figure 3.1-12**. Results of this analysis indicate that new wells would typically result in a drawdown of less than 20 feet within a 500 foot radius of the well site. If the degree of well interference appears to present a problem, it is recommended that the new well be sited no closer than 500 feet to existing production facilities. Potential impacts relating



SOURCE: CH2MHill, 2003

Figure 3.1-12
Projected Well Interference
by Wellfield

to well interference drawdown of this order of magnitude would not typically be considered significant. Additionally, this drawdown effect is accounted for in the modeling analysis on a regional basis for the six year drought scenario discussed under **Impact 3.1-1**. Therefore, potential impacts associated with well interference are considered less than significant.

Mitigation Measures

Mitigation 3.1-3a: In order to avoid the potential for well interference drawdown of greater than 20 feet, new well facilities shall not be located closer than 500 feet from existing municipal production wells, where such interference effects apply.

Impact Significance After Mitigation: Less than significant.

Impact 3.1-4: Implementation of the Well Master Plan would have the potential to affect salt movement within the Main Basin, with subsequent reductions in groundwater quality in the vicinity of existing or future well locations. Less than Significant.

To assess the potential effects of new wellfields on salt movement and the quality of pumped groundwater, salt transport modeling over a 50-year period was conducted using three scenarios; 1) existing well operation only; 2) existing wells plus new Deep Aquifer wells; 3) existing well, new Deep Aquifer wells, and shallow aquifer demineralization wells to be implemented under the Salt Management Plan. The results indicate that installation and use of new Deep Aquifer production wells has relatively minor effects on TDS distribution (<50 ppm TDS difference). **Figures 3.1-13** and **3.1-14** show modeled TDS levels within a 50-year timeframe with and without implementation of wells identified under the Well Master Plan. As shown by these trends, TDS levels are largely unaffected by new well field installation, and implementation of the Well Master Plan is considered salt neutral. Therefore, potential salt loading and transport impacts associated with the Well Master Plan are considered less than significant. Of the scenarios evaluated, installation of shallow desalting wells has the greatest effect on the changes in TDS, particularly in reducing overall TDS in the basin and lowering TDS of pumped groundwater at individual production wells. **Figure 3.1-15** shows modeled TDS levels for the 50-year timeframe with implementation of facilities identified under the Well Master Plan and installation of desalting wells identified as a salt management strategy under Zone 7's Salt Management Plan. As shown by this figure, TDS levels are reduced. Zone 7 will continue to implement projects and policies under the Salt Management Plan to manage long-term salt loading to the Main Basin.

Mitigation Measures

No mitigation measures required.

Impact Significance: Less than significant.

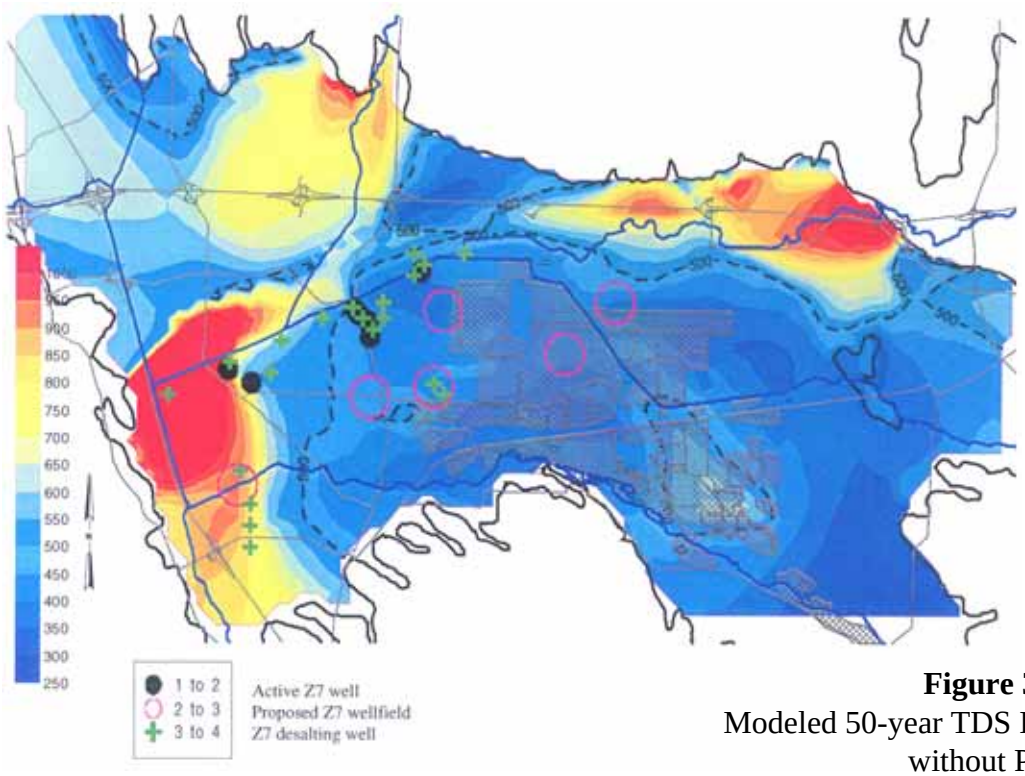


Figure 3.1-13
Modeled 50-year TDS Levels without Project

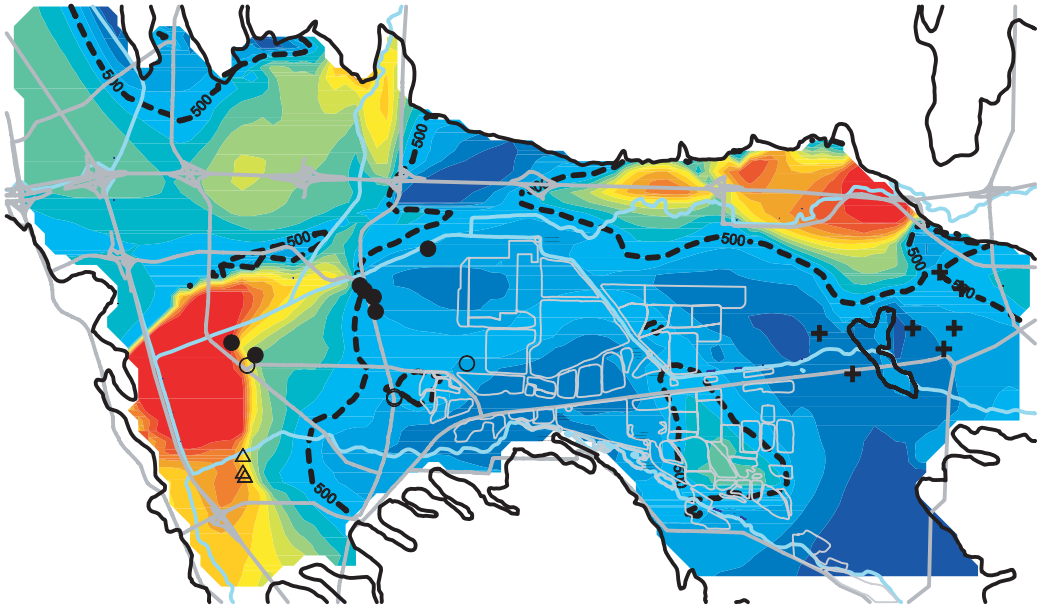
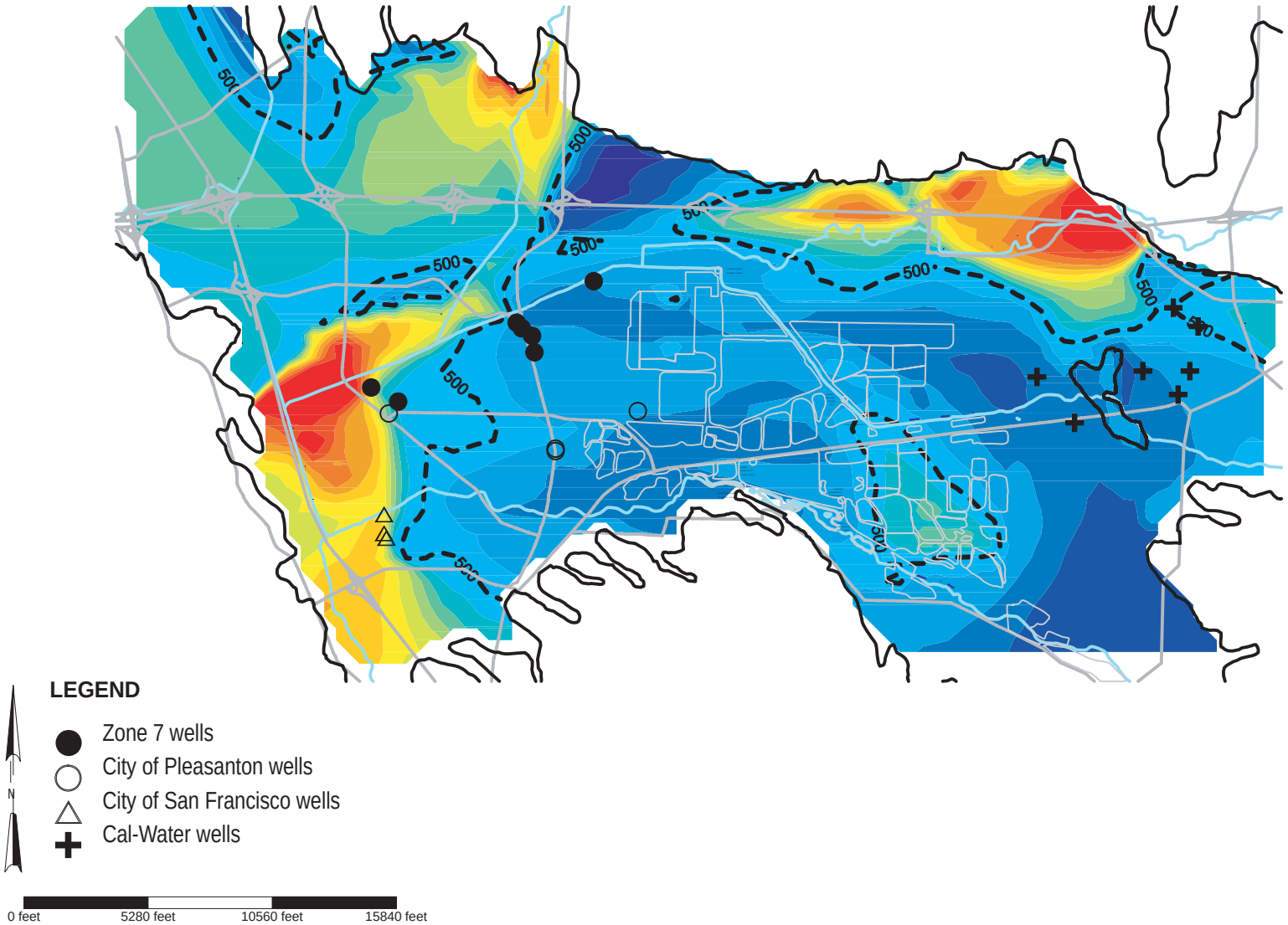


Figure 3.1-14
Modeled 50-year TDS Levels-Well Master Plan Wellfields

SOURCE: CH2MHill, 2003



SOURCE: CH2MHill, 2003

Figure 3.1-15
Modeled 50-year TDS Levels-
Well Master Plan Plus Desalting Wells

Impact 3.1-5: Increased groundwater production from the Main Basin would have the potential to affect aesthetic parameters of delivered water quality (TDS, hardness), delivered to Zone 7 Retailers. Less than Significant with Mitigation.

As noted in **Impact 3.1-4** above, project implementation is not anticipated to substantially affect salt transport or distribution within the Main Basin, and therefore, would not adversely affect delivered water quality. As such, the Well Master Plan is considered salt neutral, delivered water quality to retailers would not be adversely affected by project implementation. With respect to delivered water quality issues relative to water supply sources, i.e., provision of surface water supplies from the SBA versus provision of groundwater supplies from the Main Basin, Zone 7 maintains a water supply planning objective of 75% surface water and 25% groundwater supplies. This objective is to reduce groundwater salinity through increased conjunctive use, provide facilities to recover stored groundwater supplies from the Main Basin at a rate that will allow Zone 7 to meet 20-25% of annual treated water demands, and is the basis for current water supplies and Zone 7's long-term planning. Implementation of the Well Master Plan would be consistent with this objective, and would also allow Zone 7 to meet the reliability goals identified in **Chapter 2, Project Description**. On an annual basis, project implementation would be consistent with Zone 7 water supply planning objective of meeting service area demands with 25% groundwater, and would allow Zone 7 to maintain this supply source mix. Therefore, although project implementation would increase Zone 7 groundwater production capability, this increase is necessitated by increase service demands over time within the Zone 7 service area. Zone 7's water supply planning objectives and conjunctive use operations would maintain current supply ratios such that delivered water quality would not be affected by project implementation. Therefore, no impacts to overall delivered water quality would occur due to project implementation.

In April 2003, the Zone 7's Board of Directors adopted the Zone 7 Water Quality Policy regarding delivered water quality. This policy establishes as goals for Zone 7 that delivered water quality: 1) meets or exceeds the public health requirements for drinking water, which includes continual compliance with all State and federal primary Maximum Contaminant Levels (MCLs) and reach applicable Public Health Goals (PHGs) or Maximum Contaminant Level Goals (MCLGs) as close as is feasible; 2) is aesthetically acceptable by meeting all State and federal secondary MCLs, mitigating earthy-musty taste and odor events from surface water supplies, minimizing chlorinous odor, and reducing hardness to "moderately hard" among retailers. "Moderately hard" is defined by the industry standard as 75 to 150 mg/L hardness. The policy would also establish a target for delivered water TDS levels at <500 mg/L, which is currently not being met by groundwater supplies.

The most feasible mechanism for achieving both the hardness and TDS goals is continued conjunctive use of the groundwater basin to neutralize salt build up, and the implementation of facilities identified under the Salt Management Plan, primarily a demineralization facility to provide a low TDS and hardness source for blending produced groundwater supplies. Zone 7 is currently in the pre-design process for implementation of such a facility, and the facility is currently identified and funded under Zone 7's Capital Improvements Program. Additional analysis of the demineralization facilities are needed to determine specific capacity requirements,

identify the best location of the treatment facilities and demineralization wells, determine conveyance alignments, and establish brine discharge agreements. Zone 7 is currently pursuing these planning activities.

Mitigation Measures

Measure 3.1-5a: Zone 7 shall continue to coordinate delivered water quality goals with retailers, as well as pursue implementation of the Salt Management Plan as a mechanism for maintaining delivered water quality to retailers.

Impact Significance After Mitigation: Less than significant.

Impact 3.1-6: Installation of individual well facilities would increase impermeable surfaces and result in long-term reduction of infiltration rates. Less than Significant.

Based on a worse case scenario in which all 15 wells would be developed within areas that are currently undeveloped, and therefore have permeable surfaces capable of groundwater infiltration, and using a conservative estimate that each well facility would require paving of 15,000 square feet (approximately 0.3 acres per site), the total amount of impermeable surface created by the project would be approximately five acres. Over the course of 20 years, an additional five acres of impermeable surface would not result in a significant reduction in the infiltration of water to the groundwater basin. Groundwater in the Main Basin is primarily recharged via the streambed of Arroyo Mocho and Arroyo Del Valle, as well as intended diversion into Lake H from the Arroyo Mocho. The proposed project would not affect recharge along these channels. Therefore, development of well facilities is not anticipated to alter groundwater levels in the Main Basin. No mitigation measures are required or proposed.

Mitigation Measures

No mitigation measures are required.

Impact Significance: Less than significant.

Impact 3.1-7: Construction and operation of potable supply wells under the Well Master Plan would have potential to affect the quality of potable water supplies and public health. Less than Significant with Mitigation.

The DHS enforces the Safe Drinking Water Act (of the California Health and Safety Code), which encompasses the majority of the federal and state laws and regulations to ensure safe drinking water. The Act requires that a public water system can not be operated without a DHS domestic water supply permit. Zone 7 obtained DHS Domestic Water Supply Permit (No. 02-04-96P-0110010) on May 15, 1996. The general permit has since been updated to incorporate new wells that were constructed and intended for operation. The permit was last amended in 2001, to

include the construction and use of Hopyard 9 Well. Prior to construction and operation of each individual well facility, Zone 7 is required by law to submit relevant application material to amend the existing general permit. Conditions of approval for permit amendment includes, but are not limited to: 1) certifying all water treatment and distribution operators by DHS; 2) serving only approved sources of water supply; 3) treating water using chloramination; 4) monitoring for asbestos and organic / radiological chemicals. As Zone 7 currently operates well facilities within its service area, has certified operators working at these facilities, and would serve only approved sources of water, the development and use of proposed well facilities would be considered less than significant with implementation of **Measure 3.1-7a**, which requires Zone 7 to apply for a permit amendment prior to individual well facility construction and use.

With respect to the individual well fields, both the Gravel Pits and Chain of Lakes wellfields have high transmissivity values, and wells sited within these wellfields could be considered under the influence of surface water either stored or collected within gravel mining pits due to these high transmissivity values. If determined to be under the influence surface storage, these wells would be subject to the DHS Surface Water Treatment Rule, which requires that potable supplies that are stored in open areas be appropriately treated prior to use as a potable supply. DHS defines groundwater under the influence of surface water as "any water under the surface of the ground with significant occurrence of insects or other macroorganisms, algae, or large diameter pathogens, such as Giardia or Cryptosporidium, or significant and reliability rapid shifts in water characteristics such as turbidity, temperature, conductivity, pH which closely correlate to climatological or surface water conditions." Due to their installation depth, the potential for wells located within these wellfields to be considered under the influence of surface water is low. Zone 7 shall review final well locations with DHS with respect to compliance with SWTR requirements.

The potential for storage of recycled water within the Chain of Lakes area using one of the gravel mining pits has been previously reviewed by several agencies within the Livermore Valley, including Dublin San Ramon Services District (DSRSD) and Zone 7. In general, Cope Lake has been identified has having the greatest potential for recycled water use, due to its clay lining, which limits connectivity with groundwater. However, no project has ever been formally proposed for recycled water storage within the Chain of Lakes area. As previously noted in **Table 3.1-2**, approximately 12 private wells are currently located within the Gravel Pit and Chain of Lakes Wellfields. Establishment of potable water supply wells could present a constraint to the future implementation of recycled water storage within the Chain of Lakes area, as any future storage facility would be required to demonstrate that it would not adversely affect potable municipal and private water supply wells within the vicinity. Demonstration of this would be required irrespective of the construction of additional wells within the Chain of Lakes area, and any future action regarding recycled water storage within the Chain of Lakes would be subject to independent CEQA review.

Mitigation Measures

Measure 3.1-7a: All proposed well and treatment facilities shall be designed and operated to comply with applicable California Department of Health Services (DHS) regulations. Zone 7 shall submit relevant application and information to DHS regarding individual, new wells prior to facility construction and use. Upon review and approval, the DHS will issue a permit amendment identifying the conditions for approval of the permit. The permit will be incorporated into the Zone 7's existing General Permit.

Measure 3.1-7b: Zone 7 shall review final well locations within Chain of Lakes and Gravel Pit wellfields with respect to application of Surface Water Treatment Rule requirements.

Measure 3.1-7c: Zone 7 shall continue to coordinate with other jurisdictions regarding recycled water storage within the Chain of Lakes area, and shall consider the status and location of such facility concepts in siting of potable water supply wells within the Chain of Lakes area.

Impact Significance After Mitigation: Less than significant.

REFERENCES – Groundwater Hydrogeology and Water Quality

CH2MHill, *Well Master Plan – Administrative Draft*, prepared for Zone 7 Water Agency, October 2003.

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3.2 SURFACE HYDROLOGY AND WATER QUALITY

3.2.1 SETTING

INTRODUCTION

Surface waters potentially affected by the proposed project include creeks within the Alameda Creek Watershed. Major surface water drainage features that occur within the planning area include arroyos and creeks naturally incised and improved as flood control channels. The surface waters in the planning area are described below, first in a regional overview and subsequently by specific well field. The majority of information in this section is based on several surface hydrology and water quality sections of documents completed in the project vicinity, including the Draft EIR for Dublin San Ramon Services District Clean Water Revival Project (DSRSD, 1997), Livermore-Amador Valley Water Management Agency Export Pipeline Facilities Project EIR (1997), the Alameda County East County Area Plan (2002), the City of Pleasanton General Plan (1996), and the City of Livermore General Plan (2004).

REGIONAL SETTING

The Alameda Creek Watershed encompasses approximately 630 square miles and includes areas of both Alameda and Santa Clara Counties. The watershed is defined by Altamont Pass (near Livermore) on the east, Mount Diablo, Dublin on the north, Mount Hamilton on the south, and its outlet to San Francisco Bay in Union City on the west. The upper basin of the watershed covers portions of three counties: approximately 55 percent lies within Alameda County, 10 percent lies within Contra Costa County, and 35 percent lies within Santa Clara County. Five incorporated cities are completely or partially located in the watershed: Livermore, Pleasanton, Dublin, and the southeastern portions of San Ramon and Danville (Alameda County Water District, 1990). The 630-square-mile upper basin is divided into the Livermore and Sunol drainage units.

The Livermore drainage unit occupies the northern and eastern portion of the watershed and includes the Orinda, Dublin, Altamont, and Livermore uplands; the Livermore Valley; and the Livermore Highland. The major streams in the drainage unit are Arroyo del Valle, Arroyo Las Positas, Arroyo Mocho, Arroyo Seco, Arroyo Del Valle, Collier Creek, Alamo Canal, and San Ramon and Tassajara Creeks. Arroyo del Valle and Arroyo Mocho have the largest drainage areas. These streams converge on the floor of the Livermore-Amador Valley, forming Arroyo de la Laguna, and join Alameda Creek from the Sunol drainage unit at the exit from the upper watershed. The total drainage area of the Livermore unit is about 388 square miles (Alameda County Water District, 1990).

The 245-square-mile Sunol drainage unit is located in the southwestern portion of the watershed and includes the Sinbad and Sunol uplands; the Sunol, Vallecitos, and La Costa Valleys; and the Sunol Highland. Arroyo Hondo and Calaveras Creek are the main streams in this unit and are tributary to Alameda Creek, which flows northward through Sunol Valley at the north end of the drainage unit. Other streams in this drainage unit include Smith, Isabel, Indian, San Antonio,

Arroyo de Valle, Collier Creek, and Vallecitos Creeks (Alameda County Water District, 1990). No natural lakes and few natural ponds exist in the watershed. Small stock ponds are found in the foothill regions.

The major channels which drain to Alameda Creek are Arroyo Mocho, Arroyo Las Positas, Tassajara Creek, Alamo Canal, Dublin Creek, Laurel Creek, Gold Creek, Martin Canyon, Arroyo Seco, and South San Ramon Creek. Arroyo Las Positas, Chabot Canal, and Tassajara Creek drain south and west to Arroyo Mocho, which drains to Alamo Canal. South San Ramon Creek and Alamo Canal drain south through the City of San Ramon to Alamo Canal. Alamo Canal flows southeast and drains to Arroyo de la Laguna, a major tributary of Alameda Creek, in Sunol. Alameda Creek drains through Niles Canyon to the San Francisco Bay at Union City. All of the channels in the planning area are improved as flood control facilities. In addition to the channels, there are many existing natural creeks in the area. Arroyo Mocho between the confluence of Arroyo Las Positas and El Charro Road and is being widened as part of Zone 7's *Arroyo Mocho Widening / Arroyo Las Positas Realignment Project* and is anticipated to be completed by the end of 2003.

Precipitation in the Livermore-Amador Valley occurs primarily during the cool, wet winters, with an annual average precipitation ranging from about 22 inches near Pleasanton to about 12 inches near the east edge of the Valley (Goodridge, 1992). The heaviest rainfall occurs from December through February, with little or no rainfall during summer months. The 100-year storm is estimated to produce about 4.32 inches in a 24-hour period (Goodridge, 1992), based on a Valley wide average annual precipitation of 17 inches.

Flood control within the upper basin of the planning area is primarily under the jurisdiction of Zone 7, the City of Livermore, and the City of Pleasanton. Zone 7 maintains improved flood control channels and installs new drainage channels as needed. In the past, flooding has occurred within the Livermore-Amador Valley at the several locations, including: Arroyo de la Laguna, between the Arroyo Mocho and Bernal Avenue; Arroyo Mocho between Alamo Canal and Santa Rita Road; confluence of Arroyo Las Positas and Arroyo Mocho (Zone 7, 2001). Additional areas have been impacted by flooding or channel damage, and include the reach of Arroyo de la Laguna from above its confluence with Arroyo Mocho to the San Francisco Water Department's Bernal Property. These impacts have been limited primarily to channel damage and repair; residential structures have not been affected.

Within the Livermore-Amador Valley there is no direct diversion of untreated surface water for municipal potable supply us. However, diversion of released surface waters for irrigation does occur at Springtown Golf Course. Surface water recharge into the groundwater aquifer provides a major source of municipal and private potable supply. Similarly, downstream and west of the East Bay Hills in the Fremont area, Alameda County Water District (ACWD) diverts surface water flow from Alameda Creek into the basin for groundwater recharge to replenish groundwater used for municipal supply. This supply is augmented by releases of State Water Project (SWP) flows to Alameda Creek from the South Bay Aqueduct (SBA).

LOCAL SETTING

Hydrologic Features

Figure 2-4 in **Section 2 (Project Description)** identifies drainages within the planning area, and includes the Arroyo de la Laguna, Arroyo Mocho, Pleasanton Canal, Tassajara Creek, and Arroyo del Valle. A discussion of these drainages is presented below. In addition, descriptions of each wellfield with respect to water resources and flood plains are provided below.

Arroyo de la Laguna

Arroyo de la Laguna originates at the confluence of Alamo Canal and Arroyo Mocho, and flows in southerly to its confluence with Alameda Creek in Sunol. The channel is trapezoidal between Alamo Canal and the Bernal Avenue Bridge, and originally had a bottom width of 80 feet, an average depth of 25 feet, and side slopes of about 2:1. The channel from Bernal Avenue south to Alameda Creek is characterized by a natural stream channel with varying channel widths, depths, and slopes.

Arroyo Mocho

The Arroyo Mocho flows in a east to west and northwest direction at the eastern edge of the planning area (through the future Chain of Lakes), then turns in a southwesterly direction west of El Charro Road, and continues approximately three miles to its confluence with Alamo Canal near I-680. The channel is trapezoidal in shape with levees along most of its length within the Planning Area. The reach between Alamo Canal and Santa Rita Road has been actively incised to an average bottom width of 20 feet and side slopes of 3:1 to 4:1. The reach of this channel between Stoneridge Drive and the western edge of Staples Ranch has been widened to 60 feet at the channel bottom and 160 feet bank to bank. Arroyo Mocho between the confluence of Arroyo Las Positas and El Charro Road and is being widened as part of Zone 7's *Arroyo Mocho Widening / Arroyo Las Positas Realignment Project*.

Pleasanton Canal

This channel is an earth-lined trapezoidal flood control channel that parallels the Arroyo Mocho. The channel consists of both open canal and culverted sections. It flows in a southwest direction and empties into the Alamo Canal. The channel bed is approximately 40 feet wide.

Tassajara Creek

Tassajara Creek is channelized and flows in a southwest direction through the Tassajara Valley from the northern hills, draining to Arroyo Mocho. South of I-580 Tassajara Creek is a gaining stream, with flow from the shallow groundwater aquifer discharging into the stream. The channel is incised 15 to 20 feet, with an active channel width of about 15 feet.

Chabot Canal

Chabot Canal is a grass lined, trapezoidal channel conveying runoff from four square miles north of I-580 south to Arroyo Mocho.

Arroyo del Valle

Arroyo del Valle is a natural, unchannelized stream that originals at the Del Valle Reservoir and flows west through unincorporated Alameda County, Shadow Cliffs Regional Recreation Area, and continues to meander through the City of Pleasanton to the confluence with Arroyo de la Laguna and Alamo Canal. A distinctive riparian corridor is located along this stream channel on either side of the channel within the wellfield.

Wellfields

Bernal Wellfield

Major streams within the Bernal wellfield include the Arroyo de la Laguna and Arroyo del Valle.

Hopyard Wellfield

Major streams within the Hopyard wellfield include the Arroyo Mocho, Pleasanton Canal, and Chabot Canal.

Valley Avenue Wellfield

Major streams within the Valley Avenue wellfield include the Arroyo del Valle.

Mocho Wellfield

Major streams within the Mocho wellfield include the Arroyo Mocho, which bounds the wellfield in the north.

Stoneridge Wellfield

Major streams within the Stoneridge wellfield include Tassajara Creek (western boundary) and Arroyo Mocho (southern boundary).

Martin Wellfield

Major streams within the Martin wellfield include the Arroyo Mocho (northern boundary).

Busch Valley Wellfield

There are no drainages located within this Wellfield.

Gravel Pits Wellfield

Major streams within the Gravel Pits wellfield include the Arroyo Mocho (north and east boundary).

Chain of Lakes Wellfield

Major streams within the Chain of Lakes wellfield include the Arroyo Mocho (western boundary).

Stanley Boulevard Wellfield

There are no drainages located within this Wellfield.

Isabel Wellfield

Major streams within the Chain of Lakes wellfield include the Arroyo Mocho.

3.2.2 REGULATORY FRAMEWORK

CONSISTENCY WITH COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

Alameda County, and the cities of Pleasanton and Livermore identify goals and policies in their General Plans that protect surface water resources within individual jurisdictions. The policies relevant to the project intended to protect creeks and water quality are presented in **Appendix 3.2**. The proposed project would be consistency with these goals and policies of the affected jurisdictions.

WATER QUALITY REGULATION

Regulatory authorities exist on both the state and federal levels for the control of water quality in California. The U.S. Environmental Protection Agency (EPA) is the federal agency, governed by the Clean Water Act, responsible for water quality management. An EPA regional office (EPA Region IX) is located in San Francisco and delegates authority for waste discharge permitting to the State Water Resources Control Board (SWRCB).

The SWRCB, located in Sacramento, is the agency with jurisdiction over water quality issues in the State of California. The SWRCB is governed by the Porter-Cologne Water Quality Act (Division 7 of the California Water Code), which establishes the legal framework for water quality control activities by the SWRCB. Much of the implementation of the SWRCB's responsibilities is delegated to nine Regional Boards.

The San Francisco RWQCB, with an office located in Oakland, is responsible for the protection of the beneficial uses of the San Francisco Bay and surrounding waters. The San Francisco RWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and adopted the San Francisco Bay Basin Water Quality Control Plan (Basin Plan) to implement plans, policies, and provisions for water quality management. The most recent revision of the Basin Plan was adopted by the San Francisco RWQCB in June 1995 and was approved by the SWRCB in November 1995 (RWQCB, 1995).

ALAMEDA COUNTY CLEAN WATER PROGRAM

Section 402 of the Clean Water Act requires the U.S. Environmental Protection Agency (USEPA) to administer the federal National Pollutant Discharge Elimination System (NPDES) permit regulations for certain discharges into navigable waters of the United States. The NPDES permit

program manages the water quality of receiving waters by controlling and reducing the pollutants entering the surface water bodies from point and nonpoint discharges. In November 1990, the USEPA promulgated regulations (40 CFR Part 122) that required municipalities and urban counties with separate storm drainage facilities which serve populations over 100,000 to obtain NPDES permits. The federal regulations also gave discretionary authority to the state administrating agency (SWRCB) to require smaller municipalities to obtain NPDES permits.

In California, the NPDES Program is administered by individual RWQCBs. In the 1991 revisions to the San Francisco Bay Regional Water Quality Control Board Plan (Basin Plan), the Board required that all municipalities, the counties, and the flood control and water conservation districts in Alameda and Contra Costa Counties cooperatively develop area-wide programs and submit coordinated Part 1 and Part 2 stormwater NPDES permit applications.

The Alameda Countywide Clean Water Program has been established in order to comply with the Regional Board's Basin Plan revisions adopted in 1991 and requirements of the federal Clean Water Act and other federal regulatory programs discussed above. The Program is a consortium of local agencies in Alameda County including: Alameda County (unincorporated area), Zone 7, and the cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, Union City and San Leandro. The Alameda County Flood Control District is responsible for administering the overall program. The Program participants worked jointly to prepare the *Storm Water Management Plan (SWMP) for the Alameda County Urban Runoff Clean Water Program, July 2001-June 2008* (July 2001). The goal of the Alameda Countywide Clean Water Program, as outlined in the SWMP, is to help local residents, businesses and municipalities meet the stormwater quality goals of the Clean Water Act.

For non-storm water discharges, both exempted and conditionally exempted discharges need not be prohibited unless they are not identified as sources of pollutants to receiving waters or in the latter case, if appropriate control measures to minimize the adverse impacts of such sources are developed and implemented under the Plan. With respect to Zone 7, uncontaminated pumped groundwater is considered a conditionally exempted discharge. Zone 7 currently operates groundwater wells during the peak summer season and emergencies; during operation of these wells, water is discharged to the storm drain systems during well start-up and shut-down. Because the discharge is uncontaminated groundwater, Zone 7 is exempted from the prohibitions of the Program Permit.

CONSTRUCTION ACTIVITY PERMITTING

The RWQCB administers the NPDES stormwater permitting program in the Bay Area. Construction activities of five acres or more are subject to the permitting requirements of the NPDES General Permit for Discharges of Stormwater Runoff Associated With Construction Activity (General Construction Permit) (RWQCB, 2003). The project applicant must submit a Notice of Intent (NOI) to the RWQCB to be covered by the General Permit prior to the beginning of construction. The General Construction Permit requires the preparation and implementation of a SWPPP. The SWPPP must be prepared before construction begins. The plan would include

specifications for BMPs that would be implemented during project construction to control potential discharge of pollutants from the construction area. Additionally, the plan would describe measures to prevent pollutants in runoff after construction is complete and reference a plan for inspection and maintenance of the project facilities. Implementation of the plan starts with the commencement of construction and continues though the completion of the project. Upon completion, the applicant must submit a Notice of Termination to the San Francisco RWQCB.

3.2.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Impacts to surface water hydrology or water quality resulting from the proposed project would be significant if the project:

Water Quality

- Causes violations of effluent water quality limits.
- Causes or contributes to violations of ambient water quality objectives.
- Causes significant increases in mass loadings.

Flooding

- Exacerbates flooding problems.

Surface Water Drainages

- Alters substantially the direction, rate, or amount of surface water flow; alters the course of a stream; or substantially degrades water quality/violates water quality standards for construction activities.

IMPACTS AND MITIGATION MEASURES

Impact 3.2.1: Project construction could result in increased erosion and sedimentation and could increase turbidity and decrease water quality in surface waterways. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Well construction and connection pipeline installation would involve excavation, soil stock piling, and grading for approximately 12 months per site. For installation of the wells, a drill rig would be used for drilling of the bore hole and installation of the well casing; this method would occur for up to three weeks, and could likely produce the largest amount of disturbance at the site.

Well development activities would include generation of groundwater and drilling muds onsite, and would include use of a non-hazardous bentonite-based drilling fluid. These fluids would be stored onsite and circulated through the wells. Baker tanks or settling basins would be used prior

to discharge of water to storm drains or creeks in accordance with BMPs for sediment control requirements. Residual cuttings would be removed from the site via trucks and disposed of appropriately. Additionally, development of the well site would require earth-moving activities. Potential impacts would be associated with development of up to two well facilities and up to 24,000 feet of new connection pipeline (12,000 feet associated with each well facility). As indicated in the project description, approximately 28,000 cy of soil would be excavated, half of which would be stockpiled and disposed of to appropriate landfills over the course of the year-long construction schedule, for both the well facility and connection pipeline component. Soil stockpiles are vulnerable to erosion and sedimentation if not adequately planted or covered.

Construction could occur in or adjacent to several streams depending on selected well and connection pipeline alignment locations. The streams within the planning area include: Arroyo de la Laguna, Arroyo Mocho, Arroyo del Valle, Pleasanton Canal, Tassajara Canal, and Chabot Canal. Project construction activities in the vicinity of these channels could result in soil erosion and subsequent increase in turbidity and decreased water quality. The locations of these channels relative to the wellfields are discussed in the local setting, above and shown in **Figure 2-4** in **Chapter 2**.

The acreage of disturbed land for each well facility and associated connection pipeline alignment would exceed one acre, the minimum acreage that would initiate the preparation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the NPDES Construction Activity Storm Water Permit requirements. Zone 7 would prepare a combined SWPPP and submit a Notice of Intent to the San Francisco RWQCB for the project as a whole. The SWPPP would be updated and implemented as each well is developed. The SWPPP requires implementation of Best Management Practices (BMPs) for erosion and sediment control. These include the use of fencing, water detention structures, baker tanks, and other control measures that would limit construction-related storm runoff. Preparation of the SWPPP and compliance with the measures identified in the SWPPP would ensure Zone 7 is in compliance with state regulatory policies and that Zone 7 minimizes the potential for water quality impacts from construction activities (**Measure 3.2-1a**).

As described briefly above, Alameda County SWMP provides performance standards for new development and construction site controls. These standards are applicable to all phases of construction, including clearing, grading, and excavation that results in a cumulative disturbance of 10,000 or greater square feet of land that would discharge stormwater to the municipally-owned storm drain system (SWMP, 2001). The project would disrupt more than 10,000 square feet of land. Zone 7 is a member agency of the Alameda County Clean Water Program, and therefore would comply with the goals and policies of the SWMP. BMPs would be implemented based Stormwater Quality Task Force's *California Storm Water Best Management Practices Handbook* (2003), or the Association of Bay Area Government's *Manual of Standards for Erosion and Sediment Control Measures* (1995). Both the *Best Management Practices Handbook* and the *Manual of Standards for Erosion and Sediment Control Measures* outline a variety of best management practices that would minimize stormwater runoff during construction activities, and includes hazardous waste management, vehicle and equipment maintenance,

employee/subcontractor training, planting and reseeding, installation of geotextiles and mats, installation of silt fence and other barriers, construction road stabilization, and storm drain protection. Other BMPs that would be necessary to control sediment include the use of baker tanks or other desiltation containment to filter sediments prior to discharge at the drilling site. These BMPs may also be incorporated into the SWPPP (see above). The implementation of **Measure 3.2-1b**, including but not limited to temporary sand bagging, use of hay rolls or silt fences, construction of berms, installation of geofabric, and use of baker tank or desilting ponds, in addition to **Measure 3.2-1a** would ensure potential impacts associated with degradation of water quality from construction activities would be reduced to less-than-significant impacts. In addition, mitigation measures recommended in **Section 3.9 (Hazards and Hazardous Materials)**, would reduce the potential impacts associated with accidental release of hazardous materials to affect water quality.

Pipeline routing may require crossing of hydrologic features. Disruption of the bed and banks of creeks may directly affect water quality by temporarily increasing turbidity. Implementation of **Measure 3.2-1c**, limiting open trench construction through channels during the dry season (May 1 through October 15) or using microtunneling techniques, and conditions set forth by appropriate regulatory agencies would reduce potentially significant impacts to less-than-significant levels.

Mitigation Measures

Measure 3.2-1a: Zone 7 or its contractors shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for the proposed project prior to project construction. Zone 7 shall submit an NOI to the RWQCB to comply with the NPDES Construction Activity Storm Water Permit requirements.

Preparation of this plan shall be the responsibility of Zone 7, and implementation of the plan shall be the responsibility of the contractor hired to perform the work. The plan shall incorporate Best Construction Management Practices (BMPs). Typical BMPs could be included in the SWPPP include, but are not limited to:

- Prior to any excavation, determine whether the depth and extent of excavation would likely encounter contaminated soils and groundwater.
- Retain, protect and supplement native vegetation wherever possible. Exposure of soil areas shall be limited to the immediate area required for construction operations.
- Grading areas should be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area.
- Use barriers to contain runoff around excavation sites.
- If unreported contaminated soil is encountered during excavation, appropriate remediation of soils shall be carried out in contained areas or covered areas, or remediated through treatment prior to initiating excavation.
- Filter runoff on-site using silt fences, desiltation ponds, baker tanks, and other appropriate control measures.

- Install temporary (or permanent) storm water retention or detention structures in which treatment can occur.

- No stockpiling of excavated soil or other materials shall occur in stream channels. No excavated soil or other materials shall be disposed of in stream channels, but should be hauled away for proper disposal. Care should be taken to ensure that pollutant spills do not occur in stream channels. For example, changing of oil or other fluids should not be performed in the vicinity of stream channels.

- Use tarps to cover any excavation soils storage during the October-April rainy period.

- After completion of slope grading, erosion protection shall be provided and must include slope planting. Revegetation shall be facilitated by mulching, hydroseeding or other methods, and shall be initiated as soon as possible after completion of grading, and prior to November 1st. Improvement of slopes shall involve ground coverings. Selection of plant materials shall consider native plantings and shall encourage shrubs and trees as a long-term erosion control feature.

The SWPPP shall be kept on-site during construction activity and made available upon request to a representative of the Regional Water Quality Control Board. Zone 7's contractor shall conform to the contract specifications addressing storm water pollution prevention and shall follow all BMPs identified in the project SWPPP at all times during construction.

Measure 3.2-1b: In order to reduce the potential for erosion and sedimentation, stream crossing using open-trench construction techniques shall be limited to the dry season annually, from May 1st to October 15th, subject to agreement and permit issuance from appropriate regulatory agencies. Alternatively, Zone 7 could implement microtunneling techniques under channels to reduce the erosion potential.

Impact Significance After Mitigation: Less than significant.

Impact 3.2-2: Well sites and connection pipeline alignments may be placed within areas subject to flooding from a 100-year storm. Potential damage to proposed facilities may occur during 100-year storm events. Less than Significant with Mitigation.

Well Construction

The proposed well sites may be located within an designated as 100-year flood plain, 500-year flood plain, or in an area not designated as a flooding hazard, and therefore subject to damage during a large storm event. Floodplains within each wellfield are described below. Flooding has been identified as an existing problem along the east side of Arroyo de la Laguna and adjacent to portions of the Arroyo Mocho between Alamo Canal and Santa Rita Road (Zone 7, 2002).

The California Department of Health Services (DHS) requires that wells be sited such that it would not be subject to flooding during a 100-year storm event. Specifically, DHS recommends siting of wells “above the high water mark” to prevent flood water from entering the well and

affecting groundwater resources. Zone 7 would locate well facilities outside of existing 100-year floodplains to the degree feasible. However, if siting well facilities within 100-year flood plains are not feasible, Zone 7 would incorporate appropriate design measures to ensure that proposed well facilities are protected from flooding (i.e., elevate the well casing and facility above the 100-year base flood level or implement special engineering design to provided added protection of the well (see **Measure 3.2-2a**). Implementation of this measure would eliminate the potential for contamination of groundwater resources during flood events and therefore reduce potential impacts to less than significant levels.

As groundwater wells are non-habitable structures, the potential for injury to people and death would be considered less than significant. Temporary interruption of well function in the event of a flood is not expected to jeopardize the overall project function, since groundwater facilities could be halted, if necessary.

Pipeline Installation

Pipeline routing may occur within roadways or along flood control channel corridors within individual well fields. Either of these potential alignments may be within areas designated as 100-year flood plain of the project channels. To the extent feasible, the connection pipelines would be located within public road right of ways. Connection pipelines along channel banks could be exposed from erosion during high flows; release of groundwater would not be detrimental to existing surface water quality if released into creek channels during a short-term emergency. **Measure 3.2-2a**, as identified above, would ensure that connection pipelines within a 100-year flood plain are designed, engineered, and constructed to withstand damage from flooding and erosion, thereby limiting the potential for pipe damage and failure.

A description of the flood plains within each well field is provided below.

Bernal Wellfield

Major streams within the Bernal wellfield include the Arroyo de la Laguna and Arroyo del Valle. 100-year flood plain is contained within both channels; the northwestern portion of the wellfield is also designated as 100-year flood plain (FEMA, 1984). The base flood level for the 100-year flood plain is elevation 318 feet. East of I-680, the site grades from west to east from a 500-year flood plain zone to areas not designated as a flood hazard zone. The area west of I-680 is primarily designated as Zone C (an area of minimal flooding) with portions along the freeway considered Zone B (an area between a 500- and 100-year flood).

Hopyard Wellfield

Major streams within the Hopyard wellfield include the Arroyo Mocho, Pleasanton Canal, and Chabot Canal. These channels are contained within the 100-year flood plain (FEMA, 1984). The western third of the wellfield is designated 100-year flood plain, and its base flood level is at elevation 318 feet. The remainder of the wellfield grades from a 500-year flood plain to an area not designated as a flood hazard. The area west of I-680 is primarily designated as Zone C, areas

of minimal flooding, with a small area south portions along the freeway considered Zone B, areas between 500- and 100-year flood, and Zone A, area of 100-year flood.

Valley Avenue Wellfield

Major streams within the Valley Avenue wellfield include the Arroyo del Valle. The 100-year flood plain is contained within the Arroyo del Valle (FEMA, 1984). The remainder of the wellfield is not located within an area designated as a flood hazard.

Mocho Wellfield

Major streams within the Mocho wellfield include the Arroyo Mocho, which bounds the wellfield in the north. The 100-year flood plain is contained within the channel (FEMA, 1984). The northern portion of the wellfield is adjacent to the Arroyo Mocho is contained within an area designated as 500-year flood plain.

Stoneridge Wellfield

Major streams within the Stoneridge wellfield include Tassajara Creek (western boundary) and Arroyo Mocho (southern boundary). The 100-year flood plain is contained within both creeks; the eastern portion of the wellfield is designated 100-year flood plain (FEMA, 1984). The base flood elevation is 348 feet. The area between Santa Rita Road and Gulfstream Road is contained within the 500-year floodplain.

Martin Wellfield

Major streams within the Martin wellfield include the Arroyo Mocho (northern boundary). The wellfield is designated as 100-year flood plain (FEMA, 1990). The majority of the wellfield is not designated as a flood hazard zone, with the exception of the area immediately south of the Arroyo Mocho, which grades from 100-year flood plain to 500-year flood plain. The baseline flood elevation ranges from 347 to 352 feet.

Busch Valley Wellfield

There are no drainages located within this Wellfield. Therefore, the wellfield is not designated as a flood hazard.

Gravel Pits Wellfield

Major streams within the Gravel Pits wellfield include the Arroyo Mocho (north and east boundary). The 100-year flood plain is contained within the Arroyo Mocho (FEMA, 1990). The wellfield is designated as either 100- or 500- year flood plain. The baseline flood elevation ranges from 352 to 362 feet.

Chain of Lakes Wellfield

Major streams within the Chain of Lakes wellfield include the Arroyo Mocho (western boundary). The Arroyo Mocho bounds the wellfield to the west. The 100-year flood plain is contained within the creek (FEMA, 1990). The entire wellfield is designated as 100-year or

500-year flood plain, due to the locations of the gravel pits. The baseline flood elevation ranges from 363 to 360 feet.

Stanley Boulevard Wellfield

There are no drainages located within this Wellfield. The area north of Stanley Boulevard is designated a 500-year flood plain (FEMA, 1990). The area south of Stanley Boulevard is not designated as a flood hazard zone.

Isabel Wellfield

Major streams within the Chain of Lakes wellfield include the Arroyo Mocho. The 100-year flood plain is contained within the Arroyo Mocho (FEMA, 1990). The majority of the wellfield site is not designated as a flood hazard with the exception of a small area south of the Arroyo Mocho that is designated as a 500-year flood plain.

Mitigation Measures

Measure 3.2-2a: Zone 7 shall locate wells outside of existing 100-year floodplains, to the degree feasible. If wells are located within 100-year floodplains, Zone 7 shall include in well design standard engineering practices to withstand flood damage, such as elevating the casing and facility above the 100-yr flood base flood level, or other measures deemed appropriate by DHS.

Impact Significance After Mitigation: Less than significant.

Impact 3.2-3: Within any wellfield, construction of the well sites would result in a minor increase in local storm runoff volumes. Less than Significant with Mitigation.

Well Construction

Each 100- by 150-foot well site would result in the construction of 15,000 square feet (0.35 acres) of paved, impervious surface. Assuming two facilities are constructed per year, over the five years, the incremental increase of 0.7 acres of impervious surface would be considered less than significant. The stormwater runoff generated at individual sites would be conveyed by typography to unpaved surfaces that surround the site or to local drainage systems.

Assuming the worse-case construction scenario of 15 wells over a 20 year time frame, approximately 5 acres of impermeable surface would be constructed. This estimate assumes that all proposed wells would be located on existing permeable surfaces rather than developed (paved) areas. Runoff associated with the entire 5 acres over the course of 20 years would not result in a significant increase in local storm runoff volumes, especially since well sites would be dispersed. No drainage improvements are proposed for the well sites.

Pipeline Installation

Connection pipelines would either be constructed in existing or planned roads or along flood channels. No additional impervious surface would be created as alignments, including any overland alignments, would be restored to their pre-project condition. Therefore, pipeline installation would not increase impervious surfaces or contribute to storm water runoff.

Mitigation Measures

Measure 3.2-3: In compliance with the Alameda County Stormwater Management Plan, July 2001 to July 2008, permanent erosion and stormwater quality controls would be incorporated into the design of the well sites. These controls, selected from the appropriate guidance materials (including the Bay Area Stormwater Management Agencies Association's *Start at the Source* (1997)) would be incorporated in the design of the facilities.

Impact Significance After Mitigation: Less than significant.

Impact 3.2-4: If necessary, dewatering during construction activities could result in the discharge of turbid waters into the storm drain systems or nearby creeks. Such a discharge would result in potentially significant impacts. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Well, testing operations and dewatering activities would result in water discharge. Discharge of turbid waters into the storm drain and creek systems would constitute a potentially significant impact. Baker tanks would be used as desiltation devices to settle out sediments prior to discharge. All discharges would comply with SWPPP requirements to reduce the potential for water quality degradation of receiving waters. Implementation of **Measures 3.2-1a**, preparation and implementation of a SWPPP, would reduce potential impacts associated with degradation of water quality from dewatering activities to less-than-significant levels.

Mitigation Measures

See **Measure 3.2-1a**.

Impact Significance After Mitigation: Less than significant.

Impact 3.2-5: Consistent with existing operations, start-up or shut-down of individual wells would result in the discharge of untreated groundwater into nearby creeks or storm drain systems. These short-term discharges could adversely affect receiving water quality through either discharge or erosion of unprotected channels. Less than Significant with Mitigation.

Well Operation

Currently Zone 7 discharges untreated groundwater into the local storm drain system or nearby flood control channels during operation of existing groundwater wells. This discharge is covered as a conditionally exempted discharge under the Alameda Countywide Clean Water Program, Program NPDES permit (Order 97-030, NPDES Permit No. CAS0029831), which exempts uncontaminated pumped groundwater from the prohibitions outlined in the NPDES permit. Where discharge of water occurs directly into nearby creeks, appropriate rock protection has been installed to prevent erosion of the creek banks.

Proposed wells would be operated in a similar manner to existing facilities, and would require the discharge of start-up and shut-down water to the storm drain system or nearby creeks. As with the existing facilities, discharge of groundwater would be considered uncontaminated and would be exempted under the Countywide NPDES Permit. Discharge of groundwater into creeks without erosion control would result in sedimentation to the creek and subsequent degradation of water quality. Design of individual well sites that include discharge to creek channels would include erosion-control measures such as a splash pad, rock cover, or similar measure, to ensure that the erosion leading to sedimentation of the drainage would not occur (**Measure 3.2-4**).

Mitigation Measures

Measure 3.2-5a: Due to their intermittent nature and source (untreated groundwater) well start up and shutdown discharges from individual well sites would be conditionally exempted discharge under the Alameda Countywide Clean Water Program, Program NPDES permit (Order 97-030, NPDES Permit No. CAS0029831). No additional mitigation is required.

Measure 3.2-5b: Individual well facilities that are designed to discharge to creek channels shall include appropriate erosion-control devices such as rock cover, shotcrete, or splash pads to prevent erosion of the creek bank.

Impact Significance after Mitigation: Less than significant.

REFERENCES – Surface Hydrology and Water Quality

Alameda County, *Alameda Countywide Clean Water Program Stormwater Management Plan, July 2001-June 2008*, 2001.

Alameda County, *East County Area Plan*, amended November 2002.

ACWD, *Ordinance Code, Chapter 10 Watercourse Protection*, June 1990.

City of Livermore, *General Plan*, 2004.

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FEMA (Federal Emergency Management Agency), *Flood Insurance Rate Map (FIRM), Community Panels, City of Pleasanton, Panels 060012 0003C, 060012 000605C, 060012 00610C*, revised September 1984.

FEMA, *Flood Insurance Rate Map (FIRM), Community Panels, Unincorporated Alamdea County, Panel 060001 0205B*, revised February 1986.

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RWQCB, *San Francisco Bay Basin Water Quality Control Plan (Basin Plan)*, June 1995.

Storm Water Quality Task Force, *California Storm Water Best Management Practice Handbooks*, January 2003.

Zone 7 Water Agency, *Flood Control Master Plan - Technical Memorandum No. 5*, prepared by West Yost & Associates, November 2001.

3.3 GEOLOGY AND SOILS

3.3.1 SETTING

The majority of information in this section is based on several geology, soils, and seismicity sections of documents completed in the project vicinity, including the Draft EIR for Dublin San Ramon Services District - Clean Water Revival Project (1996), Livermore-Amador Valley Water Management Agency (LAVWMA) Export Pipeline Facilities Project EIR (1997), the Alameda County East County Area Plan (2002), the City of Pleasanton General Plan (1996), and the City of Livermore General Plan (2004). Other documents covering projects located in the vicinity of the proposed project were also reviewed. Information regarding the interaction between the geology and groundwater hydrology is presented in **Section 3.1 (Groundwater Hydrogeology and Water Quality)**. This section focuses on the geological and seismic impacts associated with facility siting, and potential for subsidence from overdraft of the groundwater basin. Erosion impacts associated with construction and operation of the wellfield site is discussed in **Section 3.2 (Hydrology and Water Quality)**.

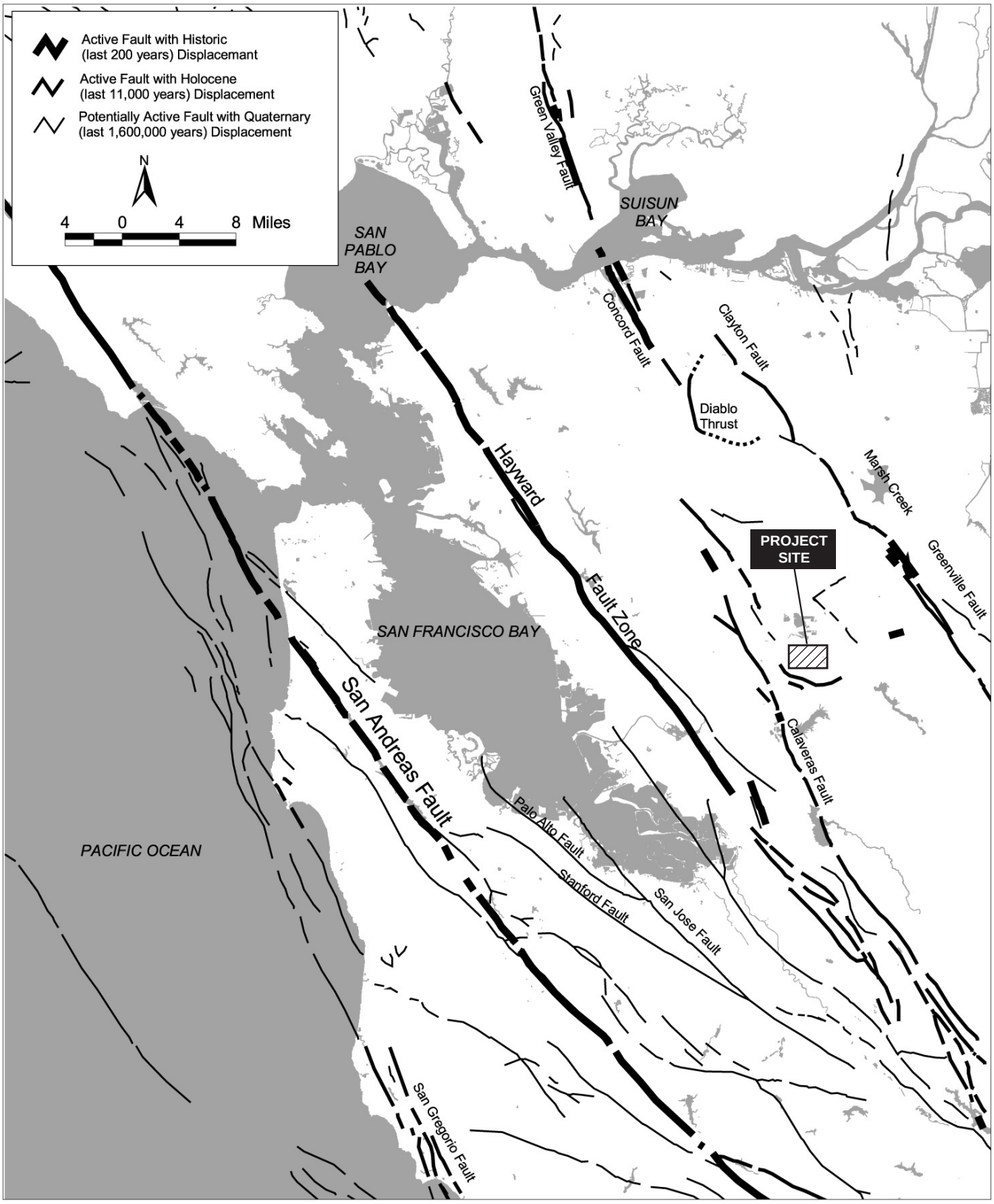
REGIONAL SETTING

Geology

The project sites are located in the Livermore-Amador Valley, which is bounded by the Coast Ranges geomorphic province of California. The valley boundaries are often defined by active faults. The Livermore-Amador Valley is a northwest-trending valley bounded by belts of folded and faulted mesozoic and tertiary rocks, underlain by several hundred feet of sediments ranging in age from plio-pleistocene to recent. Major faults, including the Calaveras and Greenville, and minor faults, including the Las Positas, Pleasanton, Livermore, and Verona faults, have controlled the development of valleys in the region as shown in **Figure 3.3-1**. Upland areas consist of folded and faulted Mesozoic (245 to 65 million years ago) and Cenozoic (65 million years ago to recent) sedimentary and igneous rocks.

The planning area is underlain by alluvium, the youngest geologic formation in the vicinity. Valleys are filled with alluvium deposited during quaternary time. Streams have deposited sand, silt, and clay. Geologic units found at the site include fine-grained alluvium (Qhaf), medium-grained alluvium (Qham), Coarse-grained alluvium (Ohac), and late pleistocene alluvium (Qpa). These units are scattered throughout the valley.

> Fine-grained alluvium (Qhaf) is unconsolidated, plastic, moderately to poorly sorted silts and clays rich in organic material (Helley and Lajoie, 1979). Qhaf is seasonally saturated and irregularly bedded. Qhaf deposits are generally less than 10 feet thick. Deposits originated from standing floodwaters that periodically inundated low interfluvial basin areas. Potential geologic hazards associated with fine-grained alluvium include shrink-swell potential, periodic flooding, high water table, liquefaction where local shallow sand beds exist and are saturated, strong ground-motion amplification during earthquakes, and the possibility of ground failure.



SOURCE: California Department of Conservation, Geological Survey (After Jennings, 1994)

Figure 3.3-1
Principal Active Faults in the Project Vicinity

Coarse-grained alluvium (Ohac) contains sand and silt with coarse sand and gravel becoming abundant toward fan heads and in narrow canyons, and are unconsolidated, moderately sorted, and well bedded (Helley and Lajoie, 1979). Ohac deposits range from less than 10 feet to as much as 50 feet. Deposits are derived from bedrock uplands and older unconsolidated sediments deposited by flowing water on active stream levees and flood plains primarily during floods.

Medium-grained alluvium (Qham) contains fine sand, silt and clayey silt with occasional thin beds of coarse sand and are unconsolidated, moderately sorted, and moderately permeable (Helley and Lajoie, 1979). Qham deposits range between 0 to 12 feet. Deposits originated similarly to younger (and more coarse) alluvial fan deposits, but further from the source.

Late Pleistocene alluvium (Qpa) contains irregular interbedded clay, silt, sand, and gravel and is weakly consolidated, slightly weathered, poorly sorted (Helley and Lajoie, 1979). Qpa deposits may reach 150 feet thick. Deposits originated from flowing water in stream channels, on stream terraces, and on alluvial fans.

SOILS

The Livermore-Amador Valley is a northwest-trending valley bounded by belts of folded and faulted Mesozoic (245 to 65 million years ago) and Tertiary (65 to 1.8 million years ago) rocks. In the Valley these rocks are covered by several hundred feet of younger sediments. The Livermore Valley is the site of high-quality sand and gravel deposits that are considered to be mineral resources of statewide significance. These deposits are located within the following wellfields: Gravel Pits, Busch Valley, Chain of Lakes, Stanley, and Isabel.

The valley floor is dissected by creeks, and slopes gently towards the west. Slope instability is not an issue in the low-lying Livermore-Amador Valley, although localized bank erosion and channel stability may be a concern.

Native soils in the Amador Valley are generally in the Clear Lake-Sunnyvale association. The Clear Lake-Sunnyvale association is characterized by nearly level topography and moderately sloping terraces (USDA, 1966). Elevations range from 100 to 900 feet, and the average annual rainfall is 14 or 15 inches. The Clear Lake, Sunnyvale, Pescadero, and Danville are the principle soils of this association. Of these soils, Clear Lake and Sunnyvale soils occur within the planning area. The Clear Lake soils are moderately well drained and consist of dark-gray clay at the surface and silty clay below four feet in depth. The soil is fertile and used for irrigated pasture, dry-farmed grain, and grain hay. The Sunnyvale soils, formed in fine-grained alluvium from sedimentary rock, are poorly drained, deep to very deep, calcareous soils on nearly level valley floors north of Pleasanton.

Native soils in the Livermore Valley are generally in the Yolo-Pleasanton association. The Yolo-Pleasanton Association is characterized by nearly level topography and range in elevations from 220 to 800 feet (USDA, 1966). The average rainfall is about 14 inches. The association consists of Yolo soils, Pleasanton soils, Sycamore soils, and Livermore soils. The Yolo and Pleasanton series consist of very deep, well-drained, grayish brown soils. Yolo and Sycamore soils in the

Livermore Valley are considered to be prime agricultural soils (California Department of Conservation, 1995). **Table 3.3-1** shows the various soil types present in the planning area.

TABLE 3.3-1
SOIL PROPERTIES WITHIN THE PLANNING AREA

Series	Soil Type(s)	Slope	Shrink-Swell	Corrosivity[a]
Clear Lake	Clear Lake clay	0 to 3%	High	high
Sunnyvale	Sunnyvale clay loam over clay	nearly level	High	NA[b]
Sunnyvale	Sunnyvale clay loam	nearly level	High	Na[b]
Sycamore	Sycamore silt loam	nearly level	low ('66); moderate ('73)	High
Sycamore	Sycamore silt loam over clay	Nearly level	High	Na[b]
Yolo	Yolo gravelly loam	0 to 3%	Low	Na[b]
Yolo	Yolo loam	0 to 3 %	Low	Na[b]
Yolo	Yolo loam over gravel	0 to 3%	low	Na[b]
Livermore	Livermore very gravelly coarse sandy loam	Nearly level	Low	Na[b]

[a] Corrosivity data is taken from the 1977 USDA document because the 1961 document does not include corrosivity data.
[b] NA – Not available; neither the 1966 or 1977 USDA document contain this information.

SOURCE: USDA Soil Conservation Service, *Soil Survey Alameda Area, California*, 1961, and *Soil Survey of Contra Costa County*, 1977.

Soils of the Sycamore Series consist of poorly drained soils that formed in alluvium from sedimentary rock. These soils are on flood plains. Slopes are 0 to 2 percent. The average annual rainfall is 14 to 18 inches and soils are rarely dry below a depth of 20 inches (USDA, 1977).

Soils of the Yolo Series are well-drained, moderately deep to very deep, loamy soils on nearly level valley floors west of Livermore and on the gently sloping to strongly sloping fans in small valleys east of Hayward (USDA, 1966).

SEISMICITY

The project area, and the San Francisco Bay Area as a whole, is located in one of the most seismically active regions in the United States. Major earthquakes have affected the city in the past and may be expected to occur again in the near future. On the basis of research conducted

since the 1989 Loma Prieta earthquake, U.S. Geological Survey (USGS) and other scientists conclude that there is a 60% probability of at least one magnitude 6.7 or greater quake, capable of causing widespread damage, striking the San Francisco Bay region before 2030 (USGS, 2003).

Each year, low and moderate earthquakes occurring within or near this region are felt by residents of the eastern Bay Area. Five major fault zones are located relatively near the planning area: the San Andreas, Hayward, Calaveras, Concord and Greenville fault zones (Jennings, 1994). They are all active faults capable of producing damaging earthquakes that could have impacts on the planning area. An active fault is classified by the California Geological Survey (CGS – previously the California Department of Mines and Geology, CDMG) as one that has exhibited fault displacement in the past 11,000 years. The two nearest fault zones are the Northern Calaveras and the Greenville faults, which bound the planning area to the west and east, respectively (see **Figure 3.3-1**).

Several minor faults are located adjacent to the project site include: Pleasanton, Livermore, Las Positas, and Verona faults. The Pleasanton and Verona faults, located outside of the project area to the north and south, respectively, are also considered an active fault. The Los Positas fault, a Late Quaternary fault, has been displaced within the last 700,000 years, and is considered a potentially active fault. The Livermore fault is another potentially active fault that has exhibited movement in the last 2,000,000 years. However, a potentially active fault is not proven by direct evidence to have moved within the past 11,000 years. Fault locations relative to the planning area are shown in **Table 3.3-2**.

TABLE 3.3-2
DISTANCE TO THE PROPOSED PROJECT OF FAULTS IN THE PLANNING AREA

Source	Nearest Distance from Wellfield
Calaveras fault	2.5 miles from Bernal Wellfield
Greenville fault	> 6 miles from Isabel Wellfield
Hayward fault	> 5.5 miles from Bernal Wellfield
San Andreas fault	> 25 miles from Bernal Wellfield
Pleasanton fault	> 1 mile from Stoneridge Wellfield
Verona fault	> 1 mile from Bernal Wellfield
Camp Parks Fault	< 1 mile from the northern wellfields

SOURCES: ESA, 2003.

A specific discussion of the major active faults immediately adjacent to the planning area is provided below.

Calaveras Fault

The Calaveras fault is a major right-lateral strike-slip fault that has been active during the Holocene. The fault separates rocks of different ages, with older rocks west of the fault and younger sedimentary rocks to the east. The location of the main, active fault trace is defined by youthful geomorphic features (linear scarps and troughs, right-laterally deflected drainage, sag ponds) and local groundwater barriers. The Calaveras fault is designated as an Alquist-Priolo Earthquake Hazard Zone (see discussion on this zone designation below).

Greenville Fault

The Marsh Creek-Greenville fault is along the base of the hills that form the eastern margin of the Livermore Valley. The fault is recognized as a major structural feature and has demonstrated Holocene activity. A magnitude 5.6 earthquake on the Greenville fault in 1980 produced a small amount of surface rupture on the fault near Vasco Road.

Pleasanton Fault

The Pleasanton fault, about two miles east of the Calaveras fault, is also considered to be an active fault and is designated under the Alquist-Priolo Act. The active portion of the fault is about six miles in length. The relatively short fault length indicates that the fault is capable of a moderate magnitude 5.5 earthquake.

Faulting

All structures and infrastructure constructed across an active fault potentially could be severely damaged or destroyed by fault rupture or creep. Current structural engineering design, materials and construction methods offer some possibilities for reducing hazards of structures in zones of potential fault rupture; however, risks remain high and no structure of even the best design could withstand a substantial displacement of the earth on a fault without experiencing severe damage and possible collapse.

Known faults are located outside the planning area. As discussed above, active faults in the vicinity of the planning area, including the Pleasanton fault, Calaveras Fault Zone, and Greenville Fault Zone, are included within an Alquist-Priolo Special Studies Zone. The Alquist-Priolo Earthquake Zoning Act (formerly known as the Alquist-Priolo Special Studies Zone Act of 1972) was enacted to mitigate the hazards of surface fault rupture along earthquake faults considered to be "sufficiently active and well-defined as to constitute a potential hazard to structures from surface faulting or fault creep." The purpose of the act is to avoid placing habitable structures across traces of active faults. Under the act, faults are considered as "active" if they display evidence of displacement or creep within approximately the last 11,000 years (Holocene), and faults are identified as "potentially active" if there is evidence of displacement during Quaternary time but evidence is lacking of displacement in the Holocene.

Ground Shaking

Earthquakes in the Bay Area potentially could produce strong ground shaking in the planning area. Ground shaking is partly related to the size of an earthquake, the distance to the project location, and the response of the geologic materials at the site. As a rule, the greater the earthquake magnitude and the closer the fault rupture to the site, the greater the intensity of ground shaking. Violent ground shaking is generally expected at and near a fault rupture. However, geologic materials respond differently to earthquake waves. Deep unconsolidated materials amplify earthquake waves. Even when an earthquake epicenter is distant from a site, it can induce strong ground shaking and wave amplification with severe hazards to people and property. The depth of the sediments to bedrock also appears to play an important role in determining the strength of ground shaking. Observations of earthquake ground shaking indicate that some of the most severe effects occur where relatively thin sediments overlie bedrock. Earthquake waves are amplified in such areas. The distribution of earthquake wave amplification as related to geologic materials has been mapped by the Association of Bay Area Governments (ABAG) (2004) with input from the U.S. Geological Survey.

When various earthquake scenarios are considered, the intensity (that is, observed effects using the Modified Mercalli Scale on a range from I to XII) reflects to great degree the effects of fault rupture and the strong ground shaking created by nearness to the rupture zone and/or presence of materials that amplify the earthquake waves. Maximum potential ground shaking at the site would result from an earthquake on Northern Calaveras fault. The intensities created by a rupture of the Northern Calaveras fault during an earthquake with a 6.7 magnitude are mapped by ABAG (2002). The shaking intensity are considered X (Very Violent) in the Pleasanton area, IX (Violent), and VIII (Very Strong) in the Livermore area. The Modified Mercalli Intensity Damage levels for the project site ranges from X (Extreme Damage) to VIII (Moderate Damage). According to ABAG, the overall probability of an earthquake of magnitude greater than or equal to 6.7 for this system before the year 2030 is approximately 18%

Ground shaking would also result from an earthquake on the Greenville Fault. The intensities created by a rupture of the Greenville fault during an earthquake with a 6.8 magnitude are mapped by ABAG (2002). The shaking intensity is considered VIII (Very Strong) within most of the planning area to VII (Strong), in the center of the planning area. The Modified Mercalli Intensity Damage levels for the project site ranges from VIII (Moderate Damage) and VII (Nonstructural Damage). According to CGS, the overall probability of an earthquake of magnitude approximately 6.7 somewhere on this fault before the year 2030 is approximately 6%. Earthquakes on other faults generally would produce lower intensities in the planning area.

Liquefaction and Lateral Spreading

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment (such as silt and sand) to a fluid-like state because of earthquake ground shaking. The ground shaking induces a rapid rise in excess pore pressure and the soil loses its bearing strength, and it may spread laterally, undergo settlement and form fissures and sand boils (upwellings of sand at the surface). Liquefaction has resulted in substantial loss of life and injury, and damage to property, roads, and

infrastructure. Potential for liquefaction exists in the planning area where alluvial deposits and high water tables underlie the ground surface. Liquefaction potential is mapped by ABAG (2002). The liquefaction potential within most of the planning area is considered moderate, while a portion of the project, encompassing parts of Hopyard, Bernal, and Valley wellfields, is considered very high. The northern section of the planning area and the areas by the gravel pits are considered high.

The potential exists for lateral spreading in the planning area during a major earthquake. In lateral spreading, the upper layers of unconsolidated sediments glide over underlying layers of liquefied sand or silt toward a free surface, such as a stream bank or cut slope. This process is generally initiated by strong seismic shaking of long duration and its effects are most pronounced when the water table is high. Lateral spreading can cause cracking and differential displacement of the ground surface on slopes as low as 0.3 degrees for distances of several hundred feet from the point of origin (County of Alameda, 1995).

In the planning area, a moderate to high potential for lurch cracking exists. Lurch cracking is a type of ground failure induced by strong seismic shaking where cracks form at the contact between unconsolidated and consolidated deposits along the margins of a valley (County of Alameda, 1995).

Landsliding

The strong ground motions that occur during earthquakes are capable of inducing landslides and related forms of slope adjustments. Earthquakes generally induce land sliding only where unstable soil conditions already exist; the ground shaking provides a mechanism for ground movement. Thus, earthquake-induced landslide hazard areas are the same as those for which general landslide hazard is present. There are no areas of the project site that contain potential landslide hazards. The canals and flood control channels, however, exhibit some slumping or sliding of their banks.

SUBSIDENCE

Land subsidence occurs worldwide, including in California. The principal causes of subsidence occurrence in California are deep-seated compaction of unconsolidated sediments caused by extraction of subsurface fluids, oils, water and gas. Aquifer-system compaction, related to groundwater pumping and extensive water-level declines, is responsible for most of the subsidence in the state, and has been observed in the Santa Clara, San Joaquin, Sacramento, and Antelope Valleys. Land subsidence can result in temporary or permanent lowering of the landform. Overdrafting of groundwater aquifers commonly leads to permanent land subsidence.

As water levels decrease, more load is placed on the solid structure of the aquifer, causing compaction. Aquifer-system deformation can be fully reversible (*elastic*) or largely permanent (*inelastic*). *Elastic* deformation occurs when sediments compress as pore pressure decreases, and expand equally as pore pressure increases. The consequent subsidence and rebound of the land surface commonly occur seasonally, coincident with groundwater discharge and recharge. The

magnitudes of elastic subsidence and rebound are equivalent and typically small, ranging from about 2×10^{-6} to 8×10^{-6} of subsidence (or rebound) per foot of aquifer system thickness per foot of head change.

Inelastic compaction results only when the sediments are compressed beyond their previous maximum stress (*preconsolidation stress*). The preconsolidation stress, or the effective stress threshold at which inelastic compaction begins, generally is exceeded when groundwater levels decline past historic low levels. In these stress ranges, the materials compress inelastically, and the compaction and subsequent land subsidence are largely permanent and irreversible, despite any subsequent water recovery. Because clays are often highly compressible, and subject to rearrangement of the grains, depressurization of clay aquitard strata results in more compaction and subsidence than depressurization of less compressible, coarser-grained deposits.

As noted above, the effective stress threshold at which inelastic compaction begins is generally exceeded when groundwater levels decline past historic low levels. Consistent with its groundwater management role, and the implementation of pumping quotas and conjunctive use practices to recover groundwater levels from overdraft conditions occurring in the 1960s, Zone 7 has used the approach of maintaining groundwater levels above historic low elevations to minimize the potential for subsidence within the Main Basin. In 1995, a survey report by Altamont Surveyors reviewed available survey information from 41 benchmarks within the Main Basin for the following time periods: 1947 to 1974 (27 years); 1947 to 1965 (18 years); 1959 to 1974 (15 years) and 1964 to 1974 (10 years). Beginning with the earlier dataset, the data review identified a minor downward ground movement from the early data sets through 1965, with the majority of this movement occurring prior to 1958. This trend was on the order of magnitudes of an average of –0.2 ft or less, with a maximum change over this period of –0.4 ft. A positive elevation trend was identified during 1965 to 1974, on the order of magnitudes of an average of 0.2 ft or less, with basin elevations returning to elevations consistent with the earlier initial readings (Altamont Land Surveyors, 1994). This data would indicate that although some subsidence has occurred within the Livermore Amador Valley due to historical overdraft conditions, it was largely elastic. In addition, subsidence has not on the scale experienced at other overdrafted aquifer systems, such as Santa Clara or San Joaquin Counties.

The temporal relationship between variations in water levels and aquifer system compaction is complex. Because clay and other fine-grained sediments typically have a low hydraulic conductivity (permeability), changes in hydraulic head are transmitted slowly through these materials when they form aquitards; how slowly depends upon their thickness. While heads in thin aquitards (1 to 3 feet) equilibriate relatively quickly to a water level decline in adjacent aquifer materials, pore pressures in the middle of thick aquitards may take years, decades, or longer to equibilibriate. The delayed drainage of groundwater from the middle of thick aquitards causes *residual compaction* that may continue long after water levels have stabilized in the aquifers. The unequal distribution of hydraulic head in a thick aquitard leads to a complex vertical distribution of preconsolidation stress within the aquitard, which is also in disequilibrium with the preconsolidation stresses in the adjacent aquifers.

Although some subsidence is expressed as soon as water levels begin to decline, full expression of subsidence within thicker aquitards can take a fairly long time, sometimes on the order of tens to hundreds of years or longer. This lag time in pore pressure equilibration is a function of the thickness of the aquitards and their degree of isolation from pumped aquifer zones. Because this equilibrium takes a long time to reach, as water levels simply approach historic lows the possibility of inelastic subsidence increases significantly. Historic low water elevations can therefore be used as a guide to the limit of elastic responses, but not as an absolute reference (CH2MHill, 2003).

3.3.2 REGULATORY FRAMEWORK

COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

The policies and regulations associated with development of structures within the affected jurisdictions are presented in **Appendix 3.3** of this DEIR. State policies that guide development of structures within seismic areas are presented below.

UNIFORM BUILDING CODE AND CALIFORNIA BUILDING CODE

The Uniform Building Code (UBC) and the California Building Code dictate seismic design parameters for structures in California. The UBC provides a standard for building laws. Published by the International Conference of Building Officials, the UBC is a widely adopted model building code in the United States. The 1997 UBC is considered the latest edition and is adopted and used by most cities and counties.

The California Building Code incorporates by reference the UBC with necessary California amendments. The California Building Code is another name for the California Code of Regulations (CCR) Title 24 Part 2, which is a portion of the California Building Standards Code (CBSC, 1995). Applicable portions of California Building Code are incorporated into the 1997 UBC. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988). About one-third of the text within the California Building Code has been tailored for California earthquake conditions (ICBO, 1997).

ESTABLISHING SEISMIC DESIGN PARAMETERS

The CGS categorizes the faults in California for use with the UBC when determining seismic design parameters and classifies them as either A or B faults. The Calaveras Fault zone and the Greenville fault are B-faults.[1]

[1] A-faults are faults with slips rates greater than 5 mm / yr and are well constrained because of paleo seismic date. B-faults are all other faults that lack paleo seismic data necessary to constrain the recurrence interval of large events.

Seismic parameters for structures are considered at the design phase. Generally, unless required to adhere to stricter standards, the design for the structure must conform to the UBC as adopted by the city, county or agency. The seismic analysis is typically completed during the geotechnical analysis stage of the design process.

For seismic design parameters, the UBC requires that a fault factor be determined. This is dependent on proximity to the closest A-type faults. After determining the seismic zone, fault factor, soil types, and near-source factors, the data is incorporated into the structural design calculations. In the case of the well facilities, the A-type Hayward faults would likely be used to determine the fault factor.

3.3.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

CEQA defines a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. Geology-related impacts that would normally be considered significant include exposing people or structures to major geologic hazards; causing substantial flooding, erosion, or siltation; causing substantial changes in topography; adversely affecting unique geologic or topographic features; or preventing the recovery of significant mineral resources. The potential loss of mineral resources is discussed in **Section 3.4 (Land Use)**.

IMPACTS AND MITIGATION MEASURES

Due to the similarity of the seismic and geologic conditions in the planning area, the impact discussions below are not broken down by wellfields. As specific locations have not yet been determined, site-specific geologic conditions are not known. However, the potential for impacts would be similar. A geotechnical investigation would be required to identify the potential for soil instability at each location. Mitigation measures have been developed based on the probability that all types of geologic impacts would occur.

Impact 3.3-1: Ground water withdrawal under the drought year scenarios examined would have the potential to result in subsidence, with secondary effects to properties overlying the Main Basin. Less than Significant with Mitigation.

As described above in the Setting Section, subsidence occurs when the pore pressure of water in the aquifer and aquitard systems is lowered during groundwater extraction, and the soil structure compresses and settles. This compaction can be large and permanent if preconsolidation loads are exceeded. The amount of subsidence is a function of the decrease in the piezometric level (which determines the increase in overburden pressures), and the compressibility of the soil layers. For clay soils, the rate of subsidence is a function of time. Subsidence may be regional or localized, depending on the geology of the site.

Project implementation would increase Zone 7's well capacity by approximately 35 mgd, allowing increased conjunctive use of the Main Basin to meet peak and drought year demands. As demands within the Zone 7 service area increase over time, increased use of the groundwater basin would occur. As previously discussed in **Section 3.1 (Groundwater Hydrogeology and Water Quality)** drought conditions for the 1-year and 6-year drought scenarios were modeled to identify resulting groundwater elevations associated with groundwater production to meet projected demands.

Resulting groundwater elevations associated with this production of groundwater were compared to Zone 7's composite map of historical low elevations to review proposed regional groundwater operations relative to Zone 7's historical low operating policy. Based upon the 2002 SWP Reliability Report provided by DWR, groundwater pumpage necessary to meet demands during the single-year drought scenario are estimated at 34,453 af. Groundwater pumpage for the six year drought of historical record varies with each drought year, with the two worst drought years resulting in production of over 30,000 af. This six year drought scenario presents the most severe pumping stress on the basin when considered cumulatively; drawdowns during this event will typically be greater relative to the single year drought simulation. Simulated water elevations for the six year drought were then compared to the historical low elevation map. Results of this comparison are shown in **Figure 3.1-7** of **Section 3.1 (Groundwater Hydrogeology and Water Quality)**. Production of supplies to meet Goal 1 of Zone 7's reliability policy during the historical six-year drought period would approach, but not exceed, historical low elevations on a regional basis. Therefore, project implementation would be consistent with Zone 7's operational policy regarding exceedance of historical low groundwater elevations on a regional basis. This policy was established in order to maintain an emergency supply within the Main Basin, and also ensures that secondary impact relating to regional subsidence would be avoided, to the degree feasible.

Within the Livermore Valley, the Camp Parks fault, located north of the Mocho and Stoneridge wellfields, forms an impediment to groundwater flow. This fault leads to a cascading of groundwater levels across the fault that could result in differential subsidence. Differential subsidence at the surface is of particular concern because a large amount of stress could be exerted on structures or facilities due to its occurrence.

A primary objective of the Well Master Plan is to meet Zone 7's Reliability Policy while minimizing potential secondary effects relating to subsidence. While some level of subsidence occurs whenever groundwater is produced from a confined aquifer, Zone 7's primary objective in developing the Master Plan is to maintain groundwater elevations at levels that avoid substantial amounts of inelastic subsidence that could adversely impact property and facilities. Based upon that objective, the proposed project, which includes distribution of well throughout the Main Basin, rather than consolidation of facilities near existing wellfields, will help achieve that goal. Please refer to **Section 6.0 (Alternatives)**, for a discussion of additional project alternatives that were examined, but not considered feasible, due to their potential to locally exceed historical lows during drought conditions. Through construction of well capacity in a dispersed manner, Zone 7 can distribute pumpage regionally while mitigating potential land subsidence. This dispersion of production well capacity represents an improvement from current well production capacity distribution, which is focused in a restricted area of the basin.

Historical low water levels (as measured in major aquifers) have been used as a guide of allowable pressure minima in the system; this is largely due to the fact that these are the only zone where abundant data are available. However, this approach assumes that the entire aquifer/aquitard system has fully equilibrated to these lower pressures – this is rarely the case. Due to their low permeability and relatively high compressibility, aquitards drain very slowly toward equilibrium with adjacent aquifers. Although some subsidence is expressed as soon as water levels begin to decline, full expression of subsidence within thicker aquitards can take a fairly long time, sometimes on the order of tens to hundreds of years or longer. This lag time in pore pressure equilibration is a function of the thickness of the aquitards and their degree of isolation from pumped aquifer zones. Because this equilibrium takes a long time to reach, as water levels simply approach historic lows the possibility of inelastic subsidence increases significantly. Historic low water elevations can therefore be used as a guide to the limit of elastic responses, but not as an absolute reference.

It should be noted that some level of subsidence occurs whenever groundwater is produced, and that land subsidence has not been documented to date within the Zone 7 service area. However, to ensure that groundwater recovery to meet drought year demands associated with 2020 buildout is protective of both the aquifer and overlying land uses, Zone 7 would supplement its historical low operational policy with implementation of a Subsidence Monitoring Program. This program, identified in **Measure 3.3-1a** includes continued use of land surveying of benchmarks, supplemented with additional technologies to provide regional and local assessment of subsidence to ensure that secondary effects of subsidence are avoided or minimized. These technologies may include Interferometric Sythetic Aperture Radar (InSAR) satellite imagery to measure the magnitude and areal extent of land subsidence and / or the installation of extensometers to monitor the changes in land elevations resulting from groundwater withdrawal, as needed. This monitoring program would provide Zone 7 with the appropriate level of data to monitor the potential for subsidence. In the event that localized subsidence is identified as occurring, this data would provide Zone 7 with the option of shifting pumpage to other portions of the basin that are not approaching historical low groundwater elevations, or reducing pumpage, as appropriate. This monitoring program would provide Zone 7 with the level of data necessary to meet the reliability goals established by its retailer contracts in a manner that is protective of both the aquifer and overlying land uses.

Mitigation Measures

Measure 3.3-1a: Zone 7 shall implement a Subsidence Monitoring Program. This program would include a combination of techniques to evaluate the effects of groundwater withdrawal on existing land elevation, in order to offset the potential for subsidence in areas where water extraction would occur. The program would use a combination of the following technologies, or other appropriate technologies, to monitor ground subsidence.

- Establishment of benchmarks to be surveyed for elevation by Zone 7 or qualified engineers on a regular basis during both pumping and non-pumping seasons to assess the amount of subsidence and rebound.

- Establishment of key wells to be monitored for water level in real time during well operations

- Continued elevation survey of benchmarks at individual well locations to calculate land surface altitudes on an annual basis.

If determined necessary, the following measures would be implemented.

- Use of Interferometric Sythetic Aperture Radar (InSAR) or equivalent satellite imagery to measure magnitude and areal extent of land subsidence.

- Installation of extensometers to monitor annual changes in surface elevations. Borehole extensometers accurately measure compaction between land surface and the bottom of the borehole. Such devices can detect the level of subsidence occurring, allowing pumpage to be reduced or shifted to other portions of the basin.

Measure 3.3-1b: Zone 7 shall maintain groundwater elevations above the historical low, consistent with its historical low operational policy. In the event that groundwater elevations approach historical lows at Zone 7 well locations, Zone 7 shall shift pumpage to other portions of the basin such that compliance with this policy is maintained.

Measure 3.3-1c. In the event that the Subsidence Monitoring Program identifies the potential for inelastic subsidence to occur at levels that could adversely affect overlying land uses, Zone 7 shall: a) shift pumpage to other portions of the Main Basin that are not approaching historical low groundwater elevations, or b) shall reduce pumpage levels such that the potential for subsidence to occur is reduced.

Impact Significance After Mitigation: Less than significant.

Impact 3.3-2: Well facilities and connection pipelines could be damaged by primary seismic hazards, including groundshaking and fault rupture during an earthquake. Compliance with the most recent version of the Uniform Building Code, State, county, city, and District seismic requirements, would reduce potential impacts to less than significant. Less than Significant with Mitigation.

The planning area is located within a zone subject to seismic hazards, including groundshaking. Several fault zones are located in the vicinity of the wellfield site, but they are not located within the planning area. As indicated in the Seismicity discussion above, the overall probability of an earthquake on the North Calaveras segment of the Calaveras Fault system and the Greenville fault of magnitude greater than or equal to 6.7 before the year 2030 is 18% and 6%, respectively. Groundshaking intensity resulting from earthquakes on these faults would vary from Very Violent to Strong, and would result in Moderate to Extreme Damage. The project proposes the construction and operation of groundwater wells and associated connection pipelines. These are considered non-habitable structures, and as such, would not expose people to injury or death. Although the potential for structural damage may occur during groundshaking, its effects would be minimized by complying with standard engineering practices, including designing well facilities based on the most recent version of the California Building Code (**Measure 3.3-2a**). In addition, Zone 7 would comply with seismic requirements of the state, county and local jurisdictions. Implementation of seismic requirements of the California Building Code, state,

county, and local jurisdictions would ensure that potentially significant impacts would be reduced to less-than-significant levels.

As no known fault zones are located within the Well Master Plan study area, the potential for fault rupture to affect well facilities and connection pipelines would be considered less than significant.

Mitigation Measures

Measure 3.3-2a: All design and construction for buildings will be in accordance with design standards for Seismic Zone 4 in the most recent edition of the California Building Code (based on the 1997 Uniform Building Code). Zone 7 shall design proposed facilities to withstand the highest expected peak acceleration as determined by seismic evaluation under the UBC and the California Building Code for each site.

Impact Significance After Mitigation: Less than significant.

Impact 3.3-3: The proposed well facilities and associated connection pipelines could incur significant damage as a result of underlying soil properties. Less than Significant with Mitigation.

The project proposes the development of approximately 8 to 15 well facilities within a 20-year timeframe. Well facilities would require grading and excavation of a site up to 100- by 150 feet for well site construction. Settlement, caused by consolidation of saturated, fine-grained, subsurface soils, could potentially occur at well sites, but is not expected to occur along the selected connection pipeline corridor (due to the relative lightness of the pipeline). Well facilities could be damaged by differential settlement due to consolidation. The magnitude of the potential settlements cannot be estimated without subsurface exploration and laboratory testing; therefore, a geotechnical investigation would be conducted once each well site location is selected (**Measure 3.3-3a**). Recommendations to reduce effects associated with unconsolidated soil identified in the geotechnical study would be incorporated into the design and specifications of the well facility. These may include replacement of native, unconsolidated material with engineering fill to ensure consistency in the foundation material. Implementation of this measure and **Measure 3.3-3b** (proper selection, placement, compaction of the fill and inspection in accordance to plans and specifications) would reduce potential impacts associated with unstable soils to less than significant.

Plastic, potentially expansive soils with a high shrink-swell potential may occur within the planning area. Expansive soils could cause damage to connection pipelines. A subsurface exploration and laboratory testing would be conducted for each site-specific location, and recommendations identified in the geotechnical study would be incorporated in the specifications. Recommendations may include replacement of the native soil with engineering fill or mixing native soil with lime (**Measure 3.3-2c**). Implementation of this measure would reduce potential impacts to a less-than-significant level.

Since connection pipelines would contain only treated or untreated groundwater, the only impacts from a rupture of the connection pipelines would result if (1) the flowrate from the rupture was high enough to erode soils or (2) the rupture was not repaired and discharge near the surface was permitted to occur for an extended period of time. All transmission pumps will include an automatic shut-off valve that would be activated by a decrease in pipe pressure; therefore, neither of these scenarios would occur since flow would cease within minutes of a pipe rupture.

The soil in the planning area may be corrosive. Corrosive soils can degrade metals and other construction materials and cause leaks in pipelines. As part of the subsurface exploration and laboratory testing, corrosive soils would be identified for the site-specific locations. Zone 7 has and is currently installing corrosion testing stations on existing, buried pipelines as part of Zone 7's facilities maintenance program, and will review proposed facilities for corrosion testing stations, cathodic potection, or other method recommended in the site-specific geotechnical report, as part of well and connection pipeline construction (**Measure 3.3-3d**). Implementation of this measure would reduce potential impacts associated with damage of proposed facilities from corrosive soils to less than significant.

Measures 3.3-3a through **3.3-3d** are common construction practices that would decrease the risk of pipeline rupture due to shrink-swell and/or corrosion to less than significant levels.

Mitigation Measures

Measure 3.3-3a: Zone 7 shall implement site specific geotechnical investigations for proposed well sites and pipeline routes, as appropriate to support facility design. As part of the geotechnical investigation, soils at foundation or base grade shall be sampled and laboratory tested to determine the expansion potential of each soil. The study shall evaluate for the potential for unstable or corrosive soils.

Measure 3.3-3b: Any fill shall be selected, placed, compacted and inspected in accordance to plans and specifications prepared by a licensed civil engineer.

Measure 3.3.3c: Zone 7 shall incorporate methods to reduce unstable foundations associated with the presence of liquefiable and expansive soils at the proposed building sites. These methods may include, but are not limited to, the following:

- Removal of the unstable soil, and placement and compaction of select engineered fill for the building pad and foundation support in accordance with ASTM Test Method D 1557. The required depth of excavation should be specified by a registered civil engineer based on actual soil conditions.
- Lime treatment of the native expansive clay soils;
- Mixture of the unstable soil with coarse material; or
- Incorporation of a rigid, reinforced concrete slab design

Measure 3.3-3d: As determined necessary, a site-specific soil corrosion survey shall be implemented for each well site and connection pipeline routes. This will define the need for and location of insulating couplings, electrolysis test stations and hot spot areas where there should be either galvanic or impressed current cathodic protection. This will assure a high degree of corrosion suppression to cement lined and coated steel or ductile iron.

Impact Significance After Mitigation: Less than significant.

Impact 3.3-4: Potentially liquefiable soils may be present throughout the planning area. Damage to the proposed well facilities due to liquefaction during an earthquake could be caused by settlement or uplift. Less than Significant with Mitigation.

Proposed facilities in areas underlain by clean, granular soil where shallow groundwater is present would be vulnerable to liquefaction. Relatively thick Quaternary alluvial deposits in the Livermore Valley in the vicinity of the proposed facilities would be susceptible to ground failure by liquefaction. Most of the wellfields is considered to have a moderate potential for liquefaction, with a small area considered high to very high. However, liquefaction would occur only if the following conditions are met: 1) presence of unconsolidated, coarse grain material; and 2) saturation of soil. A site-specific geotechnical survey would be conducted for the selected well site and connection pipeline alignment to determine the potential for liquefiable soils.

Liquefaction can cause pipes to bend, crack and/or rupture and may disrupt the alignment of pipes. Pipeline installed in low-lying areas could be subject to liquefaction during a large earthquake. Implementation of **Measure 3.3-4a** (conduct geotechnical survey and incorporation of design recommendations) would reduce potential impacts associated with liquefaction to a less than significant level.

Mitigation Measures

Measure 3.3-4a: Site-specific surveys shall be performed to determine the potential for liquefiable soils at each well site and connection pipeline route. If the site-specific studies determine a strong potential for severe damage to the well facilities, recommendations of the geotechnical report would be incorporated into the construction specifications. Possible measures include compaction grouting or by other in-situ densification of loose sandy or silty layers. Densification and grouting may affect the groundwater flow pattern at the site and shall be evaluated based on site-specific data.

Impact Significance After Mitigation: Less than significant.

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3.4 LAND USE

This section addresses land use issues related to the siting, construction and operation of the proposed Project, and evaluates project conformance with local and regional plans and policies. Land use issues include compatibility of the proposed improvements with land use designations and adjacent land uses, conversion of agricultural land and quarry areas, and conflicts with existing and future recreational facilities. This evaluation is based on review of local land use plans, policies and maps for Alameda County, and the cities of Pleasanton and Livermore.

3.4.1 SETTING

REGIONAL SETTING

The Livermore-Amador Valley is located within eastern Alameda County and includes the Cities of Pleasanton, Livermore, and Dublin. The planning area consists of eleven wellfields, located within the cities of Pleasanton and Livermore, and unincorporated Alameda County. These wellfield are generally bounded by Foothill Road to the west, I-580 and Arroyo Mocho to the north, Isabel Avenue to the east, and Stanley Boulevard / Union Pacific Rail Road (UPPR) corridor to the south. The Chain of Lakes Area, considered a significant aggregate resource area, is located between the cities of Pleasanton and Livermore in unincorporated Alameda County. Other regional land uses within the Livermore-Amador Valley include the Alameda County Fairgrounds, Livermore Municipal Airport, Las Positas Golf Course, and the Shadow Cliffs Regional Recreation Area. In general, the wellfields are located within urbanized areas of Pleasanton, and existing land uses include residential, commercial, industrial, recreational park, and public / institutional uses. For the purposes of this EIR, sensitive uses are considered residential or institutional (schools or hospitals) where people are residing or working. These uses would be subject in particular to construction and operation impacts associated with project development. **Figure 2-4** in **Chapter 2**, **Project Description**, provides an aerial view of the dominant uses in the planning area: urban uses in the west and open space (primarily quarry areas) to the east. Schools and parks in each wellfield are also designated in **Figure 2-4**. Land uses associated with each wellfield are described and summarized in **Table 3.4-1**.

Parks and recreational facilities are managed by different entities in the Livermore-Amador Valley. The East Bay Regional Park District (EBRPD) manages regional facilities in and around the Valley, including Shadow Cliffs Regional Recreation area. The City of Pleasanton Parks and Community Services Department manages neighborhood parks and trails within its jurisdiction and the Livermore Area Recreation and Parks District (LARPD) manages recreational facilities in and around the City of Livermore.

TABLE 3.4-1
SURROUNDING LAND USES

Wellfield	Jurisdiction	N, S, E, W Boundary	Land Uses[a] (including Sensitive Land Uses)
Bernal Wellfield	Pleasanton	Valley Ave / Hansen Drive North of Castlewood Country Club / UPRR Hopyard Road Foothill Road	Residential; Industrial, Commercial and Offices; Community Facilities (Alameda County Fairgrounds, Pleasanton Fairways Golf Course, fire station); Open Space (Hansen Park, Meadowlark Park) Bernal Property within the Bernal Property Specific Plan, includes a mix of Residential, Commercial/office, Park, golf course
Hopyard Wellfield	Pleasanton	Las Positas Blvd Valley Avenue / Hansen Dr. Mohr/Greenwood Foothill Road	Residential; Community Facility; Open Space (Pleasanton Sports and Recreation Park, Pleasanton Tennis and Community Park, Valley Trails Park, Oak Hill Park, Woodthrush Park, Sutter Gate Park, Del Prado Park)
Valley Avenue	Pleasanton	Valley Avenue UPRR Santa Rita Hopyard/Division	Residential; Open Space (Heather Lark Park, Walnut Grove Park, Amador Valley Community Park, Harvest Park); Community Facility (community centers at Amador Valley Community Park, [three schools]); Industrial, Commercial and Offices
Mocho	Pleasanton	Arroyo Mocho Valley Ave / Morganfield Rd. Kamp Drive Mohr / Greenwood	Residential, Industrial, Commercial, and Offices; Open Space (Bicentennial Park, Sutter Gate Park, Neilsen Park),
Stoneridge Wellfield	Pleasanton	I-580 Arroyo Mocho Pimlico Tassajara Canal / Stoneridge	Residential; Industrial, Commercial, and Offices; Open Space (Fairlands Park); Community Facility (Valleycare Medical Center, one school, and Fire Station No. 3

TABLE 3.4-1 (Continued)
SURROUNDING LAND USES

Wellfield	Jurisdiction	N, S, E, W Boundary	Land Uses[a] (including Sensitive Land Uses)
Martin Wellfield	Pleasanton	Arroyo Mocho Mohr Avenue Lake I Kamp Drive	Residential, Open Space (Amaral Park), Community Facility [one school]
Busch Valley Wellfield	Pleasanton, Unincorporated Alameda County	Morganfield / Mohr UPRR along Stanley El Charro Extension Santa Rita	Residential, Industrial, Commercial, and Offices; Open Space (Orloff Park), Community Facility ([one school], Pleasanton Corporation Yard) Alameda County: Sand and Gravel Harvesting
Gravel Pit Well Field	Unincorporated Alameda County	Arroyo Mocho Pleasanton City Limit Arroyo Mocho El Charro Road Extension	Sand and Gravel Harvesting. Quarry area within the Alameda County Specific Plan for Livermore-Amador Valley Quarry Reclamation, which includes a mix of agricultural, recreation, industrial, commercial, and residential.
Stanley Well Field	City of Pleasanton, Unincorporated Alameda County	Pleasanton City Limit / Arroyo Mocho UPRR along Stanley Boulevard / arbitrary line through Gravel pits Pleasanton City Limit Extension Shadow Cliffs Regional Recreation Area	Sand and Gravel Harvesting, Water Management Quarry area within the Alameda County Specific Plan for Livermore-Amador Valley Quarry Reclamation, which includes a mix of agricultural, recreation, industrial, commercial, and residential
Chain of Lakes Wellfield	Unincorporated Alameda County, Livermore	Airport Boundary Arroyo Mocho Livermore City Limit Arroyo Mocho	Sand and Gravel Harvesting Quarry area within the Alameda County Specific Plan for Livermore-Amador Valley Quarry Reclamation, which includes a mix of agricultural, recreation, industrial, commercial, and residential.

TABLE 3.4-1 (Continued)
SURROUNDING LAND USES

Wellfield	Jurisdiction	N, S, E, W Boundary	Land Uses[a] (including Sensitive Land Uses)
Isabel Wellfield	Unincorporated Alameda County, Livermore	Jack London North of Arroyo Del Valle Isabel Avenue Arbitrary line through gravel pits	Sand and Gravel Harvesting, Water Management. Quarry area within the Alameda County Specific Plan for Livermore-Amador Valley Quarry Reclamation, which includes a mix of agricultural, recreation, industrial, commercial, and residential.

[1] Land Use designations based on Pleasanton General Plan Map (August 6, 1996)

SOURCE: Pleasanton General Plan, 1996
Livermore General Plan, 2004

WELLFIELD

Bernal Wellfield

The Bernal Wellfield is located in the City of Pleasanton and consists of residential, commercial/ industrial, open space, and community uses. The Alameda County Fairgrounds and the Pleasanton Fairways Golf Course are two predominant community facilities within the wellfield. Hansen Park is a neighborhood park located north of the Fairgrounds, and Meadowlark Park is located west of the I-680. The Bernal Specific Plan Area is bounded by Bernal Avenue to the north, Foothill Road to the west, and Union Pacific Railroad to the east. The property is currently under construction and will consist primarily of residential and commercial uses, intermixed with open space uses. Alamo Canal and Arroyo Del Valle traverses east to west through the wellfield; Alamo Canal and Arroyo de la Laguna traverses north to south through the wellfield.

Hopyard Wellfield

The Hopyard Wellfield is located in the City of Pleasanton and consists of residential, open space, and community uses. The Pleasanton Sports and Recreation Park is a predominant public use facility in the City, and is surrounded by residential uses and neighborhood parks, including Pleasanton Tennis & Community Park, Valley Trails Park, Woodthrush Park, Sutter Gate Park, Oak Hill Park, Del Prado Park, and Foothill High School. Arroyo Mocho traverses the northern portion of this wellfield.

Valley Avenue Wellfield

The Valley Avenue site is located in the City of Pleasanton and consists of residential, open space, community, and industrial/commercial uses. Neighborhood parks and community centers include Heather Lark Park, Harvest Park, Walnut Grove Park, and Amador Valley Community Park and Center. Three schools located within the wellfield include Amador Valley High (off of Santa Rita Road), Harvest Park Intermediate (Valley Road), and Walnut Grove Elementary (Harvest Road). Arroyo Del Valle crosses the southern portion of the wellfield.

Mocho Wellfield

The Mocho Wellfield is located in the City of Pleasanton and consists of residential, industrial / commercial, and open space uses. Three neighborhood parks located within this site include Bicentennial Park, Sutter Gate Park, and Neilsen Park. Arroyo Mocho makes up the northern boundary of the site.

Stoneridge Wellfield

The Stoneridge Wellfield is located in the City of Pleasanton and consists of residential, industrial / commercial, open space, and community uses. Valleycare Medical Center (off of W. Las Positas Boulevard), Fairlands Elementary (off of W. Las Positas Boulevard), Fire Station No. 3 (off of Santa Rita Road), and Fairlands Park are located within the wellfield. Arroyo Mocho Flood Control Channel bounds the site to the south.

Martin Wellfield

The Martin Wellfield is located in the City of Pleasanton and consists of residential, open space, and community uses. Mohr Elementary (Dennis Dr.) and Amaral Park (Dennis Drive) are located within the wellfield. The Arroyo Mocho Flood Control Channel makes up the northern boundary.

Busch Valley Wellfield

The Busch Valley Wellfield is situated within two jurisdictions: the City of Pleasanton and unincorporated Alameda County. It consists of residential, industrial / commercial, open space, and community uses, as well as mining uses. Orloff Park, Alisal Elementary (off of Santa Rita Road), and Pleasanton Corporation Yard are located within the City. The eastern portion of the site consists of existing industrial uses and mining operations. As part of the Alameda County *Specific Plan for Livermore-Amador Valley Quarry Area Reclamation* (Alameda County 1981) which envisions reclamation and development through the year 2030 (*Reclamation Specific Plan*), quarry areas would be redeveloped for agricultural, residential, recreational, commercial, water management, and industrial uses.

Gravel Pits Wellfield

The Gravel Pits Wellfield is located in unincorporated Alameda County, between the cities of Pleasanton and Livermore. Currently, the site is within a quarry area for sand and gravel mining. As part of its reclamation identified in the *Reclamation Specific Plan*, the gravel pits area would be converted to a "Chain of Lakes" for groundwater management and redeveloped for agricultural and recreational uses. The Chain of Lakes include Lake H, Lake I, and Cope Lake. Zone 7 is currently in ownership of Lake I and Cope Lake, and is in the process of transferring ownership of Lake H, as established by the *Reclamation Specific Plan* and subsequent agreements. The Arroyo Mocho makes up the eastern border of the wellfield. As previously discussed in **Section 3.1**, Cope Lake has been identified as a potential flood control facility and/or storage facility for recycled water; however, no formal project is currently proposed for either of these uses.

Stanley Boulevard Wellfield

The Stanley Boulevard Wellfield is situated within two jurisdictions: the City of Pleasanton and unincorporated Alameda County. The area constitutes current and future mining operations north and south of Stanley Boulevard. Following completion of mining operations, the area would be reclaimed both for water management and mixed uses (as identified above) as part of the *Reclamation Specific Plan*. Arroyo Mocho and the southern limits of Cope Lake make up the northern border of the wellfield.

Chain of Lakes Wellfield

Similar to the Gravel Pit and Stanley Boulevard Wellfields, the Chain of Lakes Wellfield is currently used for mining of sand and gravel. The site is located within unincorporated Alameda County, with a small portion on the northern end within the City of Livermore. As with the wellfields within the quarry areas, the quarry area would be reclaimed for both water management and mixed uses when mining operations are complete. Arroyo Mocho makes up the western border of the wellfield.

Isabel Wellfield

The Isabel Wellfield is located primarily in unincorporated Alameda County, within existing gravel mining areas. Arroyo Mocho traverses east to west through the wellfield. Most of the wellfield would be reclaimed for water management uses by Zone 7. As with the wellfields within the quarry areas, the quarry area would be reclaimed for both water management and mixed uses when mining operations are complete. Arroyo Mocho makes up the western border of the wellfield.

3.4.2 REGULATORY FRAMEWORK

COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

The policies that relate to land uses within the planning area are described in **Appendix 3.4** of this DEIR. Potential conflicts of the proposed project with the regulations, goals, and policies of the affected jurisdictions are discussed in **Impact 3.4-3**, below.

3.4.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

For the purpose of this EIR, and consistent with Appendix G of the CEQA Guidelines, a project would have a significant impact if it would physically divide an established community; conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land; result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or conflict with established recreational, educational, religious or scientific uses of an area. A project may also have the potential to result in significant effects if it would be incompatible with existing land uses in the project vicinity based on environmental impacts (e.g., noise). As existing conditions are expected to change within the next twenty years, during the course of well development, this analysis assumes the existence of foreseeable projects (i.e., reclamation of the quarry areas).

IMPACTS AND MITIGATION MEASURES

Impact 3.4-1: Project construction would result in short-term disturbance to adjacent land uses in the immediate vicinity of individual well sites. Less than Significant with Mitigation.

Well Site Implementation

A number of land uses are more prone to land use disruptions, such as residential / hotels and institutional uses (schools, medical facilities, fire stations). These are shown in **Figure 2-4** in **Chapter 2**. Construction of proposed facilities would generate noise, dust, traffic congestion, safety hazards, as well as increased street and access disturbance that could affect adjacent land uses. Disruptions include limited access, increased noise and dust, and increased safety hazards. Construction activities are expected to occur up to 12 months per site, and would typically be limited to daytime hours Monday through Friday, with exception of up to three weeks when 24-hour drilling is required. Pipeline installation associated with each facility would proceed at a rate of approximately 100 feet per day. At this rate, an individual residence or business could expect to be affected for approximately one to two weeks. The intensity and severity of construction activity, the distance from the nearest sensitive receptors, and the type of impact would determine the significance criteria. Generally, equipment operation within each work day would be intermittent and would vary depending on the phase of work.

With proper mitigation, temporary construction impacts, including 24-hour construction, and disturbance to adjacent land uses would be reduced to less than significant levels. Proposed mitigation includes but are not limited to watering construction site daily (to reduce dust), installing noise barriers to minimize noise levels, maintenance of public access with steel trench plates to maintain access, and advance notice of construction activities. Construction impacts are discussed in detail in **Sections 3.6**, **Air Quality**; **Section 3.7**, **Noise**; and **3.8**, **Transportation / Circulation**.

Although all the wellfields would be subject to land use impacts from construction activities, some sites would be have greater potential for significant effects due to the type of existing land uses. Each wellfield is discussed below with respect to potential impacts on existing land uses. Potential impacts to recreational facilities are discussed in **Impact 3.4-6**.

Bernal Wellfield

As described above, noise and dust related to construction activities would have the greatest disturbance on residences and other uses where people, particularly the elderly, children, or the sick, might be adversely affected by construction impacts during the day and/or evening. Residences and hotels are located through this wellfield, and impacts associated with increased dust, noise (particularly during 24-hour construction) would be considered significant. The Bernal Property is currently under development, and would be developed to include a mix of residential, commercial, and open space uses. Sensitive uses, including a fire station, would be located within the property.

Project implementation may result in potential increases in dust, noise, traffic congestion, and access blockage from construction-related activities in the immediate vicinity of the proposed well sties. Mitigation measures that require limitations on construction duration, dust control, installation of noise barrier, hotel accommodations, implementation of a Traffic Control Plan, restoration of disturbed areas, maintenance of public and private access, and acquisition of appropriate encroachment permits would reduce potential impacts to less than significant levels (see **Measures 3.4-1a** through **3.4-1d** below and measures identified in **Sections 3.6** through **3.8**).

Hopyard Wellfield

As with the Bernal Wellfield, the Hopyard Wellfield consists of residential and other sensitive uses which could be affected by construction activities if they are located in the immediate vicinity of the proposed well sites. **Measures 3.4-1a** through **3.4-1d** and those in **Sections 3.6** through **3.8** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this wellfield to less than significant levels. Foothill High School is located on the west end of the wellfield, and construction activities in the vicinity of the school may affect school operations. Zone 7 would consult with the City of Pleasanton Unified School District to coordinate activities if that occurs (see **Measure 3.4-1e**).

Valley Avenue Wellfield

As with other wellfields where residential, commercial, and open space uses are present, disturbance resulting from construction activities in the immediate vicinity of these uses would be considered a significant impact. **Measures 3.4-1a** through **3.4-1d** and those identified in **Sections 3.6** through **3.8** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this wellfield to less than significant levels. Three schools are located within this wellfield. School operations may be affected by construction activities. Implementation of **Measure 3.4-1e** would reduce potential impacts to less than significant levels.

Mocho Wellfield

As with other wellfields where residential, commercial, and open space uses are present, impacts resulting from construction activities would be considered significant. **Measures 3.4-1a** through **3.4-1d**, as well as those identified in **Sections 3.6** through **3.8** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this wellfield.

Stoneridge Wellfield

As with other wellfields where residential, commercial, and open space uses are present, disturbance resulting from construction activities in the immediate vicinity of these uses would be considered a significant impact. **Measures 3.4-1a** through **3.4-1d**, as well as those identified in **Sections 3.6** through **3.8** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this wellfield. Fairlands Elementary School is located within the wellfield. Implementation of **Measure 3.4-e** would reduce potential impacts associated with school operations to less than significant levels. Pleasanton Fire Station No. 3 and Valleycare Medical Center are also located within this wellfield. Blockage of access to the

fire station and medical center would be considered a significant impact. **Sections 3.7** (Traffic / Circulation) and **3.9** (**Public Services and Utility**) analyzes the potential impacts associated with blockage of access and impacts to public services, and presents mitigation measures to reduce impacts if the proposed project affects these public facilities. Potential land use impacts would be reduced to less than significant levels with implementation of **Measures 3.4-1a** through **3.4-1d** as well as those identified in **Sections 3.6** through **3.8**, and **Section 3.10**.

Martin Wellfield

As with other wellfields where residential uses are present, disturbance resulting from construction activities in the immediate vicinity of these uses would be considered a significant impact. **Measure 3.4-1a** through **3.4-1d**, as well as those identified in **Sections 3.6** through **3.8** would be implemented to reduce significant construction-related impacts on adjacent land uses within this wellfield to less than significant levels. Potential impacts to the operation of Mohr Elementary School would be reduced to less than significant levels with implementation of **Measure 3.4-1e**.

Busch Valley Wellfield

As with other wellfields where residential uses are present, impacts resulting from construction activities would be considered significant. **Measure 3.4-1a** through **3.4-1d**, as well as those identified in **Sections 3.6** through **3.8** would be implemented to reduce significant, construction-related impacts on adjacent land uses within this wellfield to less than significant levels. Potential impacts to the operation of Alisal Elementary School would be reduced to less than significant levels with implementation of **Measure 2.4-1e**. The majority of this site is defined by industrial (mining) uses, and construction activities would not generate significant impacts due to the lack of sensitive receptors.

Gravel Pits Wellfield

The Gravel Pit Wellfield consists primarily of industrial (mining) uses, and limited ranchettes along El Charro Road. The existing quarry area would be converted to groundwater management uses and managed by Zone 7 as identified in the *Reclamation Specific Plan*. Well development and pipeline installation in the proximity of residential uses would be reduced to less than significant levels with implementation of **Measures 3.4-1a** through **3.4-1d** and those identified in **Sections 3.6** through **3.8**.

Stanley Boulevard Wellfield

As with the Gravel Pit Wellfield, the existing land use of the Stanley Avenue Wellfield consists of industrial (mining) uses. However, in accordance with the *Reclamation Specific Plan*, reclamation consists of converting quarry operations to mixed uses, particularly along the Stanley Boulevard corridor. These uses include residential, commercial, industrial, agricultural, and recreational uses, and may include houses, hotels, fire stations, medical centers, community centers, parks, and businesses. Because there is a potential for sensitive receptors to ultimately exist within the next 20 years, within the timeframe of well development, construction-related

impacts would be considered significant. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce potential construction-related impacts to less than significant levels.

Chain of Lakes Wellfield

The Chain of Lakes Wellfield consists of existing industrial (mining) uses, which would be converted to a variety of water management and mixed uses under the *Reclamation Specific Plan*. These uses include residential, commercial, industrial, agricultural, and recreational uses, and may include houses, hotels, fire stations, medical centers, community centers, parks, and businesses. As with the Stanley Boulevard Wellfield, there is a potential for sensitive receptors to ultimately exist within the next 20 years. Therefore, construction-related impacts within the next 20 years would be considered significant. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce potential construction-related impacts to less than significant levels.

Isabel Wellfield

The Isabel Wellfield consists primarily of existing industrial (mining) uses. The northern portion of the site is currently undeveloped. The area is soon to be developed into Oaks Business Park. Under the *Reclamation Specific Plan*, the quarry areas would be converted to water management areas for groundwater management by Zone 7. Sensitive receptors that would be affected by construction activities are therefore limited to those within the Livermore city limits. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce potential construction-related impacts to less than significant levels.

Mitigation Measures

The following mitigation measures would reduce potentially significant, construction-related impacts to less than significant levels. Additional measures are provided in **Section 3.6, Air Quality, Section 3.7, Noise, Section 3.8, Transportation and Circulation, Section 3.9, Hazardous Materials, Section 3.10**, **Public Services and Utilities**, and **Section 3.12**, **Visual Quality** These sections specify measures to reduce dust, noise, access blockage, and public service impacts that would disrupt adjacent land uses.

> **Measure 3.4-1a:** Construction activities associated with well site construction and pipeline installation, with the exception of 24-hour drilling/pump testing, shall occur Monday through Friday, between 8:00 a.m. and 8:00 p.m. This limitation would reduce disturbance (i.e., dust, noise, traffic) to adjacent land uses. Pipeline installation that disrupts traffic within primary roadways shall be limited to weekdays during non-peak hours (see **Section 3.8, Traffic and Circulation**).
>
> **Measure 3.4-1b:** Zone 7 shall restore private access roads, driveways, and landscaped areas that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards. Restoration of private property shall require negotiations between Zone 7 and private landowners.

Measure 3.4-1c: Zone 7 shall restore public road right-of-ways and recreational facilities that would be affected by construction activities to their pre-project condition such that adverse effects to the physical conditions of the work sites would not result in continued disturbance or new safety hazards.

Measure 3.4-1d: If well sites are located in public right-of-way, Zone 7 or its contractors shall obtain and comply with encroachment permits for installation of well facilities. In addition, Zone 7 shall provide the local jurisdiction with design drawings for review and comment at appropriate design stages.

Measure 3.4-1e: If well facilities are located adjacent to schools or community parks and centers, construction schedules shall be negotiated with the respective school districts and affected agencies in an effort to minimize disturbance to school and community operations and programs. Where construction activities would affect scheduled programs, Zone 7 shall work with affected jurisdictions to establish alternative locations for activities curtailed by project construction. For those activities that are not able to be temporarily relocated due to special facility requirements, Zone 7 will work with affected jurisdictions to establish alternative scheduling on evenings and weekends.

Impact Significance After Mitigation: Less than significant.

Impact 3.4-2: Project operation could result in long-term disruption to adjacent land uses, including incompatibility with existing land uses and increased dust, noise, traffic and other disturbance to surrounding land uses. Less than Significant with Mitigation.

There are two types of long-term impacts: 1) site-specific incompatibility with existing land uses; and 2) impacts associated with operation of individual well facilities (from increased noise, traffic, and hazards). Compatibility issues are described further in **Impact 3.4-3**, as it relates to consistency with general and specific plans.

Once well facilities are developed, they would create minimal noise, air, traffic, hazardous material, and visual-related impacts. **Section 3.6, Air Quality, Section 3.7, Noise, Section 3.8, Traffic and Circulation**, **Section 3.9, Hazardous Materials,** and **Section 3.12, Visual Quality** present detailed analyses of the operation of well facilities on adjacent land uses. Operational impacts would be localized around each well facility, and would occur primarily during peak water demand seasons and emergency scenarios when the pump facility is operating. Change in ambient noise levels, increase in air emissions mainly associated with use of the emergency generator, safety hazards associated with hazardous materials storage, and increase in traffic from maintenance activities are associated with operation of each pump facility. Visual quality of the immediate surrounding may also be altered.

Existing Zone 7 well facilities are located throughout the Valley, and are located within various types of land uses. Proposed well facilities would be similar in design and would therefore result in similar land use impacts. Noise levels would be reduced through the use of noise-attenuating building materials and performance standards to ensure that noise levels do not exceed standards established by affected jurisdictions. Air emissions would be both localized and would be considered less than significant due to the small volume emitted. Traffic impacts would be limited to periodic Zone 7 staff maintenance, and is not expected to reduce roadway level-of-service or increase safety hazards. Hazardous materials used for treatment of groundwater would be properly stored within secondary containments such that it would not pose hazards to surrounding neighbors. Visual impacts would be minimized by special design and architectural treatment to integrate well facilities with the surrounding environment. Impact discussions and mitigation measures are provided in individual sections as described above. All potential impacts would be reduced to less than significant levels with implementation of mitigation measures identified in **Sections 3.6** through **3.9** and **3.12**.

Mitigation Measures

Please refer to the **Section 3.6 (Air Quality)**, **Section 3.7 (Noise)**, **Section 3.8 (Transportation and Circulation), Section 3.9(Hazardous Materials)**, and **Section 3.12 (Visual Resources)**.

Impact Significance After Mitigation: Less than significant.

Impact 3.4-3: Project construction and operation could conflict with goals, policies and programs of affected jurisdictions. Less than Significant with Mitigation.

Pursuant to California Government Code Section 53091, Zone 7 as a regional agency and utility district, is not subject to the building and zoning ordinances of local jurisdictions for projects involving facilities for the production, generation, storage or transmission of water. It is, however, the practice of Zone 7 to work with host jurisdictions and neighboring communities during project planning and to conform to local land use plans and policies to the extent possible. Therefore, the Well Master Plan Project's consistency with local land use plans and policies is discussed in this DEIR. **Appendix 3.1** through **3.12** includes applicable plans and policies of local jurisdictions corresponding to individual analysis sections.

The proposed project consists of the construction and operation of well facilities to increase reliability of the water system such that treated water is available to Zone 7 customers during drought and/or emergency conditions. The proposed project is located within Zone 7's service area, which are within the jurisdictions of the Cities of Pleasanton and Livermore, and Alameda County. The plans and policies of these agencies emphasize the expansion of public facilities / infrastructure to meet existing and future water supply needs, as well as maintaining adequate storage of water. Although well facilities are considered industrial in nature, the plans and policies identified under the General Plans of these agencies do not specifically preclude water infrastructure development within residential, commercial, public or open space areas.

Consistency with plans and policies are described below. In addition, the compatibility of proposed well facilities to existing land uses is discussed under its own heading.

East County Area Plan

East County Area Plan (ECAP) Policy 234 (Alameda County, 2002) specifically states that Alameda County work with Zone 7 and other agencies "to develop a comprehensive water plan to assure effective management and long-term allocation of water resources, to develop a contingency plan for potential short-term water shortages…" The intent of the Master Plan is to provide a comprehensive facilities plan that meets the needs of water supply and demand. ECAP Policy 239 states the County's role in "discourag[ing] water service retailers from constructing new water distribution infrastructure which exceeds future water needs." If water demand decreases over time, the number of proposed wells would decrease in parallel such that Zone 7 is actively managing its water supplies and associated infrastructure needs.

City of Pleasanton

Similarly, the goals and policies in the Pleasanton General Plan include "provid[ing] sufficient public facilities and services to ultimately serve the City" (Goal 1), and "develop[ing] a contingency plan for potential water shortages including groundwater management and water conservation." Zone 7 provides water supply to the City.

City of Livermore

The City of Livermore General Plan's Goals include, Goal INF-1, "provid[ing] sufficient water supplies and facilities to serve the City in the most efficient and financially sound manner, while maintaining the highest standards required to enhance the quality of life for existing and future residents." In addition, General Plan outlines the following Objective INF-1.1, "Plan, manage and develop the public water treatment, storage, and distribution systems in logical, timely and appropriate manner." provides limited guidance on public services, but indicates that "it is the goal of the City that the expansion, maintenance, and operation of central sewer and water systems serving all urban development within the Planning Area shall be under the jurisdiction of the City of Livermore." Zone 7 provides water supply to the City.

Specific Plans

The *Bernal Property Specific Plan, the Stoneridge Drive Specific Plan,* and the *Alameda County Reclamation Specific Plan* govern the development of these specific areas. These plans present generalized land uses (including residential, commercial, public, agricultural, and recreational areas) that would be developed within each Specific Plan area. These plans do not specifically preclude the development of public utilities. In fact, the Reclamation Plan defines water management areas (location of future Chain of Lakes, a series of pits that would be developed for water storage) for groundwater management purposes. Therefore, the proposed project would not directly conflict with the plans, policies and goals of these specific plans.

Compatibility with Existing and Future Land Uses

A number of well facilities, including those owned by Zone 7, Pleasanton, California Water Service, and SFWD are located throughout the Livermore-Amador Valley. Existing wells are situated in residential, commercial, industrial, and recreational areas. Proposed well facilities would conform generally in design and function to those facilities that are currently owned by Zone 7 and other agencies within the valley. As such, proposed facilities would be compatible with surrounding houses, businesses, industrial facilities, or park uses. Potential compatibility issues relating to visual quality are discussed in **Impact 3.4-2**, above, and also in **Section 3.12**, Visual Resources. Design of pump facilities to integrate with surrounding uses would reduce potential impacts to less than significant levels.

The potential for storage of recycled water within the Chain of Lakes area using one of the gravel mining pits has been previously reviewed by several agencies within the Livermore Valley, including Dublin San Ramon Services District (DSRSD) and Zone 7. In general, Cope Lake has been identified has having the greatest potential for recycled water use, due to its clay lining, which limits connectivity with groundwater. However, no project has ever been formally proposed for recycled water storage within the Chain of Lakes area. As previously discussed in **Section 3.1, Groundwater Hydrogeology and Water Quality**, establishment of potable water supply wells could present a constraint to the future implementation of recycled water storage within the Chain of Lakes area, as any future storage facility would be required to demonstrate that it would not adversely affect potable municipal and private water supply wells within the vicinity. Demonstration of this would be required irrespective of the construction of additional wells within the Chain of Lakes area, and any future action regarding recycled water storage within the Chain of Lakes would be subject to independent CEQA review.

Mitigation Measures

Please refer to **Section 3.1, Groundwater Hydrogeology and Water Quality**, and **Section 3.12, Visual Resources** for mitigation measures that would reduce potential conflicts with current or future land uses, including agency coordination, and landscape and architectural treatment of well facilities.

Impact Significance After Mitigation: Less than significant.

Impact 3.4-4: Project construction could result in impacts to agricultural resources, including lands designed as prime agricultural lands or lands under Williamson Act contracts. Less than Significant with Mitigation.

The California Department of Conservation, Office of Land Conservation, maps important farmland throughout California. The Department of Conservation published the *Alameda County Important Farmlands Map* in 1990. Important farmlands are divided into the following five categories based on their suitability for agriculture:

- *Prime Farmland* is land with the best combination of physical and chemical features for the production of agricultural crops;

- *Farmland of Statewide Importance* is land with a good combination of physical and chemical features for the production of agricultural crops;

- *Unique Farmland* is land of lesser quality soils used for the production of the State's leading agricultural cash crops;

- *Farmland of Local Importance* is either currently producing crops, or has the capability of production, and does not meet the criteria of the categories above. The County Board of Supervisors has determined that there is no Farmland of Local Importance in Alameda County.

- *Grazing Land* is land on which the existing vegetation is suited o the grazing of livestock;

Other lands identified but not considered Important Farmland include:

- *Urban and Built-up Land* is land occupied by structures or infrastructure to accommodate a building density of at least one unit to one and one-half acres, or approximately six structures to ten acres;

- *Other Land* is land which does not meet the criteria of any other category.

Williamson Act (Land Conservation Act of 1965) contracts are intended to preserve land for agriculture. Under a Williamson Act contract, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years. In return, the land is taxed at a rate based on the agricultural production of the land, rather than its real estate market value, protecting landowners against tax increases caused by inflation. The tax advantage of a landowner holding a Williamson Act contract is substantial. Williamson Act contracts are valid for ten-year periods, and are automatically renewed each year unless the property owner files for non-renewal. After non-renewal has been filed, a landowner may petition to the city/county in which jurisdiction the land is located for early cancellation of the contract. Under the terms of the Act, use of the lands under contract must be limited to agricultural and "compatible uses." Cancellation of Williamson Act contracts is allowed; however, the landowner is assessed penalty charges and the cancellation takes up to ten years to complete.

In addition to the standard provisions for contract non-renewal and cancellation previously discussed, the Williamson Act has specific provisions for acquisition of contracted land for public improvements. Article 6 of the Williamson Act (Government Code Sections 51290-51295, as amended by Senate Bill 1534 in 1994) provides that a public entity may acquire land within an agricultural preserve for a public improvement through eminent domain or in lieu of eminent domain, and that this action terminates the contract. Specific provisions define procedures that the agency must follow in notifying the Director of the Department of Conservation, conditions under which a public improvement may not be located within a agricultural preserve, and public improvements which are exempt from these conditions. To the degree feasible, Zone 7 would avoid well implementation on parcels that are held under Williamson Act Contract. In the event that Zone 7 selects a parcel that is held under Williamson Act contract, Zone 7 will follow

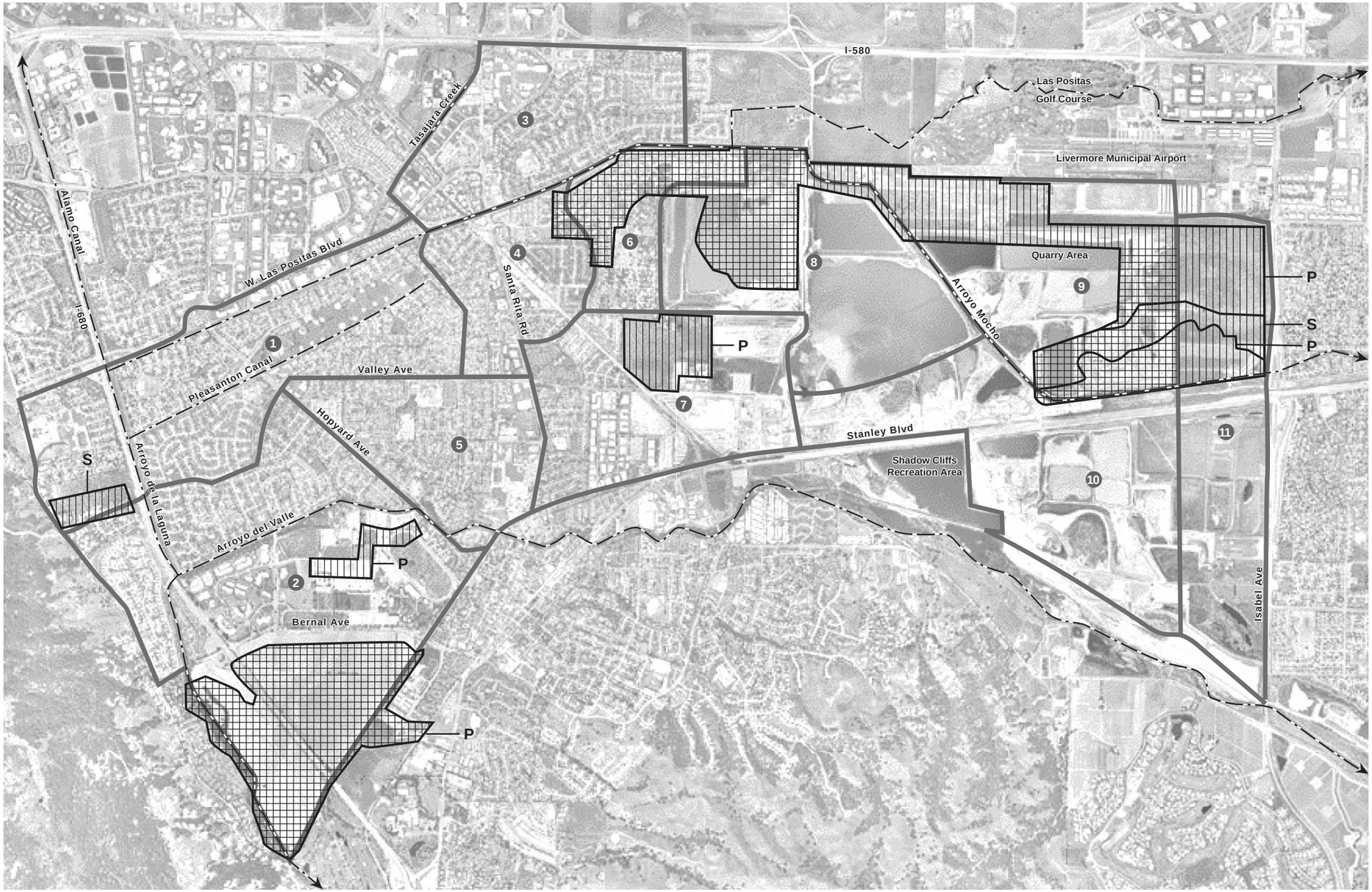
requirements of Article 6 of the Williamson Act during property acquisition which provides for removal of property from conservation easement (**Measure 3.4-4a)**.

Agricultural lands are scattered throughout the planning area. Land and Important Farmland classifications for each wellfields are described below. **Figure 3.4-1** shows areas within the wellfields that are considered Prime Farmland or Farmland of Statewide Importance. They are overlain on an aerial based figure to highlight areas that have been developed for urban or mining uses since preparation of the Important Farmland Map. The majority of the wellfields located in Pleasanton (western portion of the planning area) are designated urban and "built-up" lands and therefore are not considered Important Farmlands. The remaining wellfields are designated as Other Lands (mostly sand and gravel quarry) or designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Grazing Land. A number of developments have been constructed in the Livermore Valley during the last decade, and the map does not reflect new urban and built-up areas.

Removal of prime agricultural land that has not yet been developed from agricultural production would be considered a significant and unavoidable impact. A discussion of the potential for these impacts to occur within each wellfield is provided below. It should be noted that individual well facilities would be located on sites of up to 0.3 acres; therefore, with proper siting along property boundaries, well facilities would not interfere with crop production or grazing operations, and a minimal loss of actual land available for agricultural practices would occur. However, due to its designation, loss of prime agricultural land would be considered a significant impact. Considering the absolute worst case scenario, in which all 15 well sites were located on prime agricultural lands, a total loss of approximately 3.5 acres would occur. Implementation of **Measures 3.4-4b** and **3.4-4c**, which includes avoidance of lands designated as prime agricultural lands and provisions to minimize removal of agricultural lands from production if facilities must be sited on prime farmland, would reduce potential impacts to less than significant levels.

Bernal Wellfield

Several land types are located within Bernal Wellfield, including Urban and Build-up Land, Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Grazing land. Prime Farmland is located north of the Pleasanton Fairways Golf Course, within Alameda County Fairgrounds, and within the Bernal Specific Plan property (see **Figure 3.4-1**). Farmland of Statewide Importance is located in the northern boundary of the wellfield. Unique Farmland are located within Alameda County Fairgrounds. Farmlands are being reduced or replaced by residential developments currently being built on the Bernal Specific Plan Property. The development, when completed, would include urban uses, community parks, and a potential golf course. Siting of well facilities within the generally urban area would not result in impacts to agricultural resources. If well facilities are located on remaining important farmlands, implementation of **Measures 3.4-b** and **3.4-4c** would reduce potential impacts associated with agricultural operations to less than significant levels.



SOURCE: Environmental Science Associates

Figure 3.4-1
Important Farmland
in the Planning Area

Hopyard Wellfield

The area is developed with urban uses and considered Urban and Built-up Land in the *Alameda County Important Farmland Map,* with the exception of a piece of land considered Farmland of Statewide Importance between I-680 and Foothill Boulevard (see **Figure 3.4-1**). Implementation of **Measure 3.4-4c** would reduce potential impacts associated with agricultural operations to less than significant levels.

Valley Avenue Wellfield

The area is developed with urban uses and considered Urban and Built-up Land in the *Alameda County Important Farmland Map*. As no Important Farmlands are located within the wellfield, no impacts to agricultural resources would occur.

Mocho Wellfield

The area is developed with urban uses and considered Urban and Built-up Land in the *Alameda County Important Farmland Map*. Areas considered Prime Farmland, located in the northeastern border of the wellfield, have been developed with urban uses (see **Figure 3.4-1**). Due to the current condition, these areas are no longer consistent with the prime agricultural soil definition. As no Important Farmlands are located within the wellfield, no impacts to agricultural resources would occur.

Stoneridge Wellfield

The area is developed with urban uses and considered Urban and Built-up Land in the *Alameda County Important Farmland Map*. As no Important Farmlands are located within the wellfield, no impacts to agricultural resources would occur.

Martin Wellfield

The majority of the land is developed and considered Urban and Built-up Land in the *Alameda County Important Farmland Map*. The northern portion of the wellfield which is designated Prime Farmland, has been developed for urban uses (see **Figure 3.4-1**). Due to the current condition, these areas are no longer consistent with the prime agricultural soil definition. As no Important Farmlands are located within the wellfield, no impacts to agricultural resources would occur.

Busch Valley Wellfield

The majority of the land is developed and considered Urban and Built-up Land in the *Alameda County Important Farmland Map*. However, Prime Farmland and Other Lands (quarry) also exist within this wellfield (see **Figure 3.4-1**). Farmland is currently being reduced or replaced by residential development. Development of well facilities within important farmland designation would result in significant impacts to agricultural resources. However, implementation of **Measure 3.4-4b** and **3.4-4c** would reduce potential impacts to less than significant levels.

Gravel Pits Wellfield

The majority of the wellfield is considered Other Lands (quarry) in the *Alameda County Important Farmland Map*. A section of the wellfield is designated as Prime Farmland (see **Figure 3.4-1**). Since map publication, these areas have been mined for gravel, and currently comprise Lake H, Lake I, and Cope Lake. These lakes are part of a larger Chain of Lakes designed for water management activities in the *Reclamation Specific* Plan. Lake H and Lake I, along with Cope Lake, is currently in the process of being transferred to Zone 7 as mitigation for the loss of aquifer storage associated with quarry operations, per agreements established as part of the *Specific Plan*. Due to their current condition as depleted gravel mining pits, and the dedication of these pits to water management, these areas are no longer consistent with the prime agricultural soil definition. As such, implementation of well facilities within the Gravel Pit wellfield would not result in potential impacts relating to the loss of agricultural lands.

Stanley Boulevard Wellfield

The Stanley Boulevard Wellfield consists of land considered Urban and Built-up Land, and Other Land (quarry) in the *Alameda County Important Farmland Map*. As no Important Farmlands are located within the wellfield, no impacts to agricultural resources would occur.

Chain of Lakes Wellfield

The Chain of Lakes Wellfield consist of land designated as Other Lands (quarry), Prime Farmland, and Farmland of Statewide Importance in the *Alameda County Important Farmland Map*. Farmland on the east side of the wellfield have since been developed for mining uses. The development of well facilities within prime farmland not yet developed would result in significant impacts to agricultural resources. However, implementation of **Measures 3.4-5b and 3.4-4c** would reduce potential impacts to less than significant levels.

Isabel Wellfield

Portions of the site are located in land considered Prime Farmland, Farmland of Statewide Importance, Grazing Land, and Other Land (quarry) in the Alameda County Important Farmland Map. Portions of the area are located within the future reclaimed areas identified in the Reclamation Specific Plan, which provides a plan for reclaiming the quarry areas and presents staging plans for 1995, 2010, and 2030, and identifies land uses associated with this reclamation. These uses include water management, agriculture, recreation, and various classes of development (residential, commercial, and industrial). The development of well facilities within important farmland not yet developed and not intended to be developed as part of the Reclamation Plan would result in significant impacts to agricultural resources. However, implementation of **Measures 3.4-5b** and **3.4-5c** would reduce potential impacts to less than significant levels.

Mitigation Measures

Measure 3.4-4a: Zone 7 shall avoid well implementation on parcels that are held under Williamson Act Contract, to the extent feasible. In the event that Zone 7 selects a parcel that is held under Williamson Act contract, Zone 7 shall follow requirements of Article 6 of the Williamson Act, which provides for removal of property from conservation easement under the Williamson Act.

Measure 3.4-4b: Zone 7 shall avoid development of well facilities on lands designated as prime agricultural soils, to the extent feasible.

Measure 3.4-4c: If farmland parcels are selected for development of well sites, Zone 7 would locate facilities at the edge of farmlands or grazing lands to the degree feasible to minimize impacts to agricultural resources.

Impact Significance After Mitigation: Less than significant.

Impact 3.4-5: Project construction could result in the loss of regionally significant aggregate resources for the Quarry area. Less than Significant with Mitigation.

The Chain of Lakes area, located between Pleasanton and Livermore, is considered as an "Area of Regional Significance," by the California Geological Survey (previously the California Division of Mines and Geology), and contains a deposit of minerals in which extraction would be "judged to be of prime importance in meeting future needs for Minerals in a particular region of the State within which the Minerals are located and which, if prematurely developed for alternate Incompatible Land Uses, could result in the premature loss of Minerals that are of more than local significance" (Ordinance No. 0-99-60, Section 6.80.070). This quarry is currently being used for the production of sand and gravel, but production has ceased in those areas that have been depleted. Specific parts of the quarry area have also been dedicated to Zone 7 as part of the master plan to create a "Chain of Lakes," recognized both in the ECAP and the *Reclamation Specific Plan.* At this stage, mining is expected to occur in various zones throughout the next 25 years, with full reclamation projected to occur in the year 2030, pursuant to the *Reclamation Specific Plan*. Reclamation includes conversion of the quarry lands to the following uses: residential, commercial, industrial, agricultural, water management, and recreation.

Five wellfields are encompassed within the quarry area, including the Gravel Pit Wellfield, Chain of Lakes Wellfield, Busch Valley Wellfield, Stanley Avenue Wellfield, and Isabel Wellfield. Individual well sites are comprised of approximately 0.3 acres of land, and may be located within the quarry area through agreement with individual property owners. Due to their limited size, implementation within individual wellfields is not anticipated to affect aggregate resources. Implementation of **Measure 3.4-5**, potential impacts to regionally significant aggregate resources are considered less than significant.

Mitigation Measures

Measure 3.4-5: Siting of facilities within the following wellsites shall be coordinated with aggregate mining operators to avoid potential conflicts: Gravel Pit Wellfield, Chain of Lakes Wellfield, Busch Valley Wellfield, Stanley Avenue Wellfield, and Isabel Wellfield.

Impact Significance After Mitigation: Less than significant.

Impact 3.4-6: Project construction and operation could result in disturbance of recreational facility uses. Less than Significant with Mitigation.

Regional and local recreational facilities are located throughout the Livermore-Amador Valley, within the 11 wellfields (see **Figure 2.4** in **Chapter 2**). Trails (multi-use, pedestrian, and bicycle) and park facilities within the planning area are managed by East Bay Regional Park District (EBRPD), Livermore Area Recreation and Parks District (LARPD), and the City of Pleasanton. Impacts are primarily associated with temporary closures of recreational facilities (parks or trails) during construction activities. Impacts to recreational facilities include impacts to users as well as partial closures to neighborhood and community parks. Two types of impacts may occur if individual well sites are sited in recreational facilities: 1) construction impacts that would disturb recreational use and its users; and 2) operational impacts associated with the siting of the well facility in a recreational area and preclusion of future recreational facility development.

Direct construction impacts are associated with the partial closure of a recreational facility for up to 12 months (the duration of work per well site) if well facilities are located on or adjacent to park uses. The construction zone would thus accommodate either the proposed well site or staging / storage of equipment, and may limit park access, affect recreational activities or increase the potential for safety hazards. Zone 7 would obtain approval from the City of Pleasanton Parks and Recreation Department for development of site facilities within park boundaries (see **Measure 3.4-6**). The City would also notify the Department if construction were to affect park facilities. Well sites, with dimensions of up to 100- by 150-feet, would likely be located in open parcels at the edge of parks, or adjacent to trails. Where playground or playing field facilities are located adjacent to the work zone, the area would be appropriately fenced to minimize safety hazards and signage would be installed to warn users of work activities, and/or to provide detours if an existing pedestrian / bicycle trails are affected. Scheduled recreational activities would be maintained to the extent feasible, and Zone 7 would coordinate with local park agencies to ensure that minimal disturbance to existing activities occur (see **Measure 3.4-1c**).

Construction activities would also affect the visual character of the park area. **Section 3.12, Visual Quality** discusses the potential for construction and operation of the well site to affect surrounding visual resources. Restoration of the work site and design of the well facilities to integrate with surrounding environment would be implemented. Implementation of

Measure 3.4-1c and measures identified in **Section 3.12, Visual Quality**, would reduce any potential temporary, direct, significant impacts to parks and their users to less than significant levels.

Indirect impacts are associated with increases in noise, dust, and safety hazards in the vicinity of the construction zone (see **Impact 3.4-1**). Measures identified in **Impact 3.4-1** above, **Sections 3.6, Air Quality, 3.7, Noise**, and **3.8, Traffic and Circulation** would reduce effects of increased noise (e.g., use of muffler on construction equipment), dust (e.g., watering work site for dust control), and pedestrian / bicycle circulation on trails (e.g., provision of warning signage of potential work).

Two Zone 7 wells (Hopyard 9 and Mocho 3) are located within existing or future parks and trails. Hopyard 9 is located at the southern edge of the Pleasanton Sports and Recreation Park, adjacent to Pleasanton Canal. It is situated adjacent to a paved walking trail away from the playing fields, and appropriately fenced and gated to ensure public safety and reduce vandalism. Mocho 3 is located at the corner of Santa Rita Road and Stoneridge Drive. As the majority of the appurtenances (surface pipelines), are enclosed within the building, no fencing is required. A trail runs along the west side of the facility, and a future neighborhood park is proposed adjacent to Mocho 3. Zone 7 coordinated construction of these facilities with the City of Pleasanton such that existing recreational facilities and future recreational opportunities would be unaffected. These existing well facilities coexist with recreational uses, and no long-term impacts on recreation have occurred from operation of either of these sites. In addition, well implementation has not precluded the future development of neighborhood parks. Zone 7 would continue to coordinate siting of the well facilities within the next 20 years with affected land use agencies, and reduce potential, significant operational impacts (see **Measure 3.4-6** and those in **Sections 3.4** through **3.11**). Therefore, the proposed project would not preclude the future development of recreational facilities.

Bernal Wellfield

The Alameda County fairgrounds, the Pleasanton Fairways Golf Course, and Meadowlark Park are located within the Bernal Wellfield. The Bernal Property, which is currently being developed as part of the Bernal Property Specific Plan, would include a potential golf course and community parks. Existing or proposed trails and routes are located along Arroyo de la Laguna, and Bernal Avenue. Trails with regional connections are located along Arroyo Del Valle (EBRPD's proposed Shadow Cliffs to Iron Horse Trail), and the UPRR Corridor (EBRPD's proposed Niles Canyon to Shadow Cliffs Trail). Well facilities may be located within existing or future park areas or along existing and/or potential trails. Zone 7 would coordinate with the City of Pleasanton if facilities are located in public lands or adjacent to park / open space facilities such that initial siting could avoid direct impacts to existing recreational facilities and future recreational opportunities. Implementation of the measures identified in Impact 3.4-1, in this Impact discussion, and in Sections 3.6 (**Air Quality**), 3.7 (**Noise**), and 3.8 (**Traffic and Circulation**) would reduce potential impacts to less than significant levels.

Hopyard Wellfield

The Pleasanton Sports and Recreation Park is a prominent feature within the Hopyard Wellfield, and consists of playgrounds, open space, and softball and soccer fields. Several smaller scale neighborhood parks are located in the wellfield, including: Pleasanton Tennis & Community park, Valley Trails Park, Woodthrush Park, Oak Hill Park, Sutter Gate Park, and Del Prado Park. An existing or proposed trail and route is located along Pleasanton Canal. Trails with regional connection are located along the Arroyo de la Laguna (EBRPD's proposed Shadow Cliffs to Iron Horse Trail) and Arroyo Mocho. As with the Bernal Wellfield, direct and indirect impacts would result if well sites are located at or adjacent to existing or proposed recreational facilities. In addition, if scheduled activities at the City of Pleasanton Sports and Recreation Park are directly affected by construction activities, Zone 7 would coordinate with the City of Pleasanton to find alternative locations for recreational events. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Valley Avenue Wellfield

The Valley Avenue Wellfield is located within urban areas of Pleasanton. Several neighborhood parks are situated within the wellfield, including: Heather Lark park, Harvest park, Walnut Grove Park, and Amador Valley Community Park and Center. A proposed trail with regional connection is located along the Arroyo del Valle (EBRPD's proposed Shadow Cliffs to Iron Horse Trail). Scheduled recreational activities may be affected at the Amador Valley Community Park and Center. If scheduled activities at this center are directly affected by construction activities, Zone 7 would coordinate with the City of Pleasanton to find alternative locations for recreational events. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Mocho Wellfield

The Mocho Wellfield is located within urban areas of Pleasanton. Several neighborhood parks are situated within the wellfield, including: Bicentennial Park, Sutter Gate Park, and Neilsen Park. Existing or proposed trails and routes are located along Santa Rita Road. Existing or proposed trails with regional connection are located along the Arroyo de la Laguna and Arroyo Mocho. Potential impacts at recreational areas would be similar to those identified above. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Stoneridge Wellfield

The Stoneridge Wellfield is located within urban areas of Pleasanton. Fairlands Park is situated within the wellfield. Proposed trails and routes are located along Santa Rita Road and Tassajara Creek. A proposed trail with regional connection is located along the SPRR right-of-way (EBRPD's proposed Shadow Cliffs to Alameda County Trail). Potential impacts at recreational

areas would be similar to those identified above. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Martin Wellfield

The Martin Wellfield is located within urban areas of Pleasanton. Amaral Park is located within the wellfield. A proposed trail with regional connection is located along the Arroyo Mocho. Potential impacts at recreational areas would be similar to those identified above. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Busch Valley Wellfield

The Busch Valley Wellfield is located on both urban and open space (agricultural / mining) areas. Orloff Park is located within the wellfield. As indicated in **Impact 3.4-4**, the quarry would be reclaimed in phases as part of the Reclamation Plan. Various uses, including recreational facilities are proposed within the quarry area. Potential impacts at existing or proposed recreational facilities are similar to those identified above. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Gravel Pits Wellfield, Chain of Lakes Wellfield, Stanley Boulevard Wellfield

The Gravel Pits Wellfield, Chain of Lakes Wellfield, and Stanley Boulevard Wellfield consist primarily of quarry areas. The Arroyo Mocho, a proposed trail with regional connection, traverses the wellfield. There are no existing recreational facilities located within the wellfield; however, they may be developed over the next 30 years, as the quarry areas are converted to mixed uses in accordance with the *Reclamation Specific Plan*. Potential impacts at existing or proposed recreational facilities are similar to these identified above. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Isabel Wellfield

The Isabel Wellfield is located in both unincorporated Alameda County and the City of Livermore. The Arroyo Mocho, a proposed trail with regional connection, traverses the wellfield. Potential impacts on future recreation facility would be similar to those identified for the wellfields containing quarry areas. Assuming sensitive uses are present, implementation of **Measures 3.4-1a** through **3.4-1e** and those in **Sections 3.6** through **3.8** would reduce construction-related impacts to less than significant levels.

Mitigation Measures

Measure 3.4-6: If well facilities are located within parks or other recreational facilities, Zone 7 shall notify and coordinate with affected jurisdiction to obtain approval for encroachment. To the extent feasible, Zone 7 shall site well facilities in a way that does not impair existing recreational uses in parks. In addition, Zone 7 or its contractors shall post signage within affected park areas describing the length of duration, time of construction activities, and contact person. Construction areas would be appropriately fenced, and equipment would be stored within the fence zone, to provide safety to park users.

Impact Significance After Mitigation: Less than significant.

Impact 3.4-7: Construction of well sites within the Chain of Lakes Wellfield would have the potential to affect operations of the Livermore Municipal Airport. However, proposed facilities would be less than 20 feet tall, and in compliance with local and federal height restriction. Less than Significant.

Portions of the Gravel Pit Wellfield and Chain of Lakes Wellfield are located within the City of Livermore General Plan's Airport Protection Area. This area restricts new residential land use designations or the intensification of existing residential land uses within an approximate 5,000-foot buffer around the airport. The City of Livermore Planning and Zoning Code Section 3-05-270, Heights of buildings and structures, subsection C states that "the height of structures located within 5,000 feet of any airport runway shall not exceed 40 feet (Ord. 1001, 1979; Ord. 442 § 20.80)." Construction on airport property requires City and Federal Aviation Administration (FAA) approval. Depending on the height of drilling equipment construction offsite may also require FAA approval. As the proposed well facilities would not exceed 15 feet, the project would result in less than significant impacts to airport operations. Therefore, no mitigation measures are required or recommended.

Mitigation Measures

No mitigation measures required.

Impact Significance: Less than significant.

REFERENCES – Land Use

Alameda County, *East County Area Plan*, amended November 2002.

Alameda County, *Alameda County Specific Plan for Livermore-Amador Valley Quarry Area Reclamation*, 1981

California Department of Conservation, *Alameda County Important Farmland Map*, 1990.

City of Livermore, *General Plan*, January 2004.

City of Pleasanton, *The Pleasanton General Plan*, Adopted August 6, 1996.

City of Pleasanton, *Final Bernal Property Specific Plan*, August 21, 2000.

City of Pleasanton, *Stoneridge Specific Plan*, adopted October 1989.

3.5 BIOLOGICAL RESOURCES

3.5.1 DATA SOURCES AND METHODS OF ANALYSIS

Sources consulted for special status species[1] information during the preparation of this document include the California Department of Fish and Game's (CDFG) California Natural Diversity Data Base (CNDDB) (CDFG, 2002a) and Special Animals and Plants lists (CDFG, 2002b; CDFG 2002c); the California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2002); U.S. Fish and Wildlife Service (USFWS) lists of proposed, candidate, and listed threatened and endangered species and species of special concern that may occur in the planning area (USFWS, 2002); and other planning documents relevant to the planning area (ESA 2002a, ESA 2002b). Data was analyzed for sensitive plant communities or wildlife habitats, suitable habitat for special-status plants and wildlife within the planning area, and for water-related features (e.g., wetlands, and creeks).

Database searches and USFWS lists were generated based on documented occurrences of special status species by U.S. Geologic Survey (USGS) 7.5-minute topographic quadrangles. As part of the initial biological inventory, database research was conducted for the Dublin and Livermore quadrangles as well as the adjacent ten quadrangles to provide a thorough assessment of all species possibly present within the project vicinity. Additional quadrangles searched were: Byron Hot Springs, Tassajara, Diablo, Altamont, Mendenhall Springs, La Costa Valley, Las Trampas Ridge, Niles, Hayward, and Newark. The result of this research is a comprehensive special status species list in **Appendix 3.5**. Species with potential to occur in the Planning Area are shown in **Table 3.5-1**. For each special status species, the analyst assessed habitat requirements and compared these to the habitats present in the wellfields. Factors such as habitat quality and species distribution were also considered in evaluating the likelihood of special status species occurring within individual wellfields. Protocol-level surveys were not conducted as part of this assessment since specific sites for well locations within individual wellfields are unknown at this time. However, such surveys for the California red-legged frog were completed at 18 stream locations in the project study area in 2001 and 8 locations in 2002. Thus, the distribution of this species in the project study area is well studied. The survey results for each waterway will be presented for each wellfield, as available. There is no upland survey protocol for this species. In the absence of project-level reconnaissance surveys, assessment of special status species occurrence is evaluated conservatively (i.e., species are presumed to be potentially present if required habitat is present).

[1] Species are accorded "special status" because of their recognized rarity or vulnerability to various causes of habitat loss or population decline. Some of these receive specific protection defined in federal or state endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this document, following a convention that has developed in practice but has no official sanction.

TABLE 3.5-1
FOCUSED LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Habitat Requirements**	**Potential to Occur in Project Area**	**Period of Identification**	**Well Field**
		SPECIES LISTED OR PROPOSED FOR LISTING			
Invertebrates					
Longhorn fairy shrimp *Branchinecta longiantenna*	FE/--	Vernal pools or other areas capable of ponding water seasonally	**Low to moderate.**	Year-round (eggs in dry season, adult shrimp in wet season)	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit. Busch Valley
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/--	Grassland vernal pools or other areas where water ponds seasonally	**Low to moderate.**	Year-round (eggs in dry season, adult shrimp in wet season)	Isabel, Stanley Avenue, Chain of Lanes, Gravel Pit, Busch Valley
Vernal pool tadpole shrimp *Lepidurus packardi*	FE/--	Grassland vernal pools or other areas where water ponds seasonally	**Low to moderate.**	Year-round (eggs in dry season, adult shrimp in wet season)	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Amphibians					
California tiger salamander *Ambystoma californiense*	FC/CSC	Freshwater ponds or vernal pools with little or no emergent vegetation. Utilizes mammal burrows in grassland habitat for aestivation during the dry season.	**Moderate.**	Winter rains and March-April	Isabel, Stanley Avenue, Chain of Lakes Gravel Pit, Busch Valley, Valley Avenue, Bernal
California red-legged frog *Rana aurora draytonii*	FT/CSC	Breed in stock ponds, pools, and slow-moving streams with emergent vegetation for escape cover and egg attachment. Where water is seasonal often utilizes mammal burrows in upland habitat for aestivation	**Moderate.**	May-August	All
Plants					
Palmate-bracted bird's–beak Cordylanthus palmatus	FE/CE/List 1B	Alkaline areas in chenopod scrub or valley and foothill grassland	**Low to moderate.**	May-October	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Contra Costa goldfields *Lasthenia conjugens*	FE/--/List 1B	Moist grasslands, vernal pools, cismontane woodlands, alkaline playas	**Low-moderate.**	March-June	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley

1 List compiled from CNNDB (2002), CNPS (2002), and USFWS (2002) official lists of species recorded as occurring or with the potential to occur in the project area USGS quadrangles and the surrounding 10 quadrangles

TABLE 3.5-1 (Continued)
FOCUSED LIST OF SPECIAL STATUS SPECIES CONSIDERED IN ZONE 7 WELLFIELD PROJECT AREA

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Habitat Requirements**	**Potential to Occur in Project Area**	**Period of Identification**	**Well Field**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN					
Invertebrates					
Ricksecker's water scavenger beetle *Hydrochara ricksecker*i	FSC/--	Aquatic, pond habitat	**Low to moderate.**	Unknown	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	FSC/--	Found in vernal pools and alkali flats	**Low to moderate.**	Unknown	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit
California linderiella *Linderiella occidentalis*	FSC/--	Seasonal pools in intact grasslands where alluvial soils are underlaid by hardpan or in sandstone depressions	**Low to moderate.**	Year-round (eggs in dry season, adult shrimp in wet season)	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit
Reptiles					
Western pond turtle *Clemmys marmorata*	FSC/CSC	Freshwater ponds and slow streams, marshes, rivers, and irrigation ditches with upland sandy soils for laying eggs. Require basking sites such as partially submerged logs or open mud banks.	**Present.** Observed at Arroyo del Valle in Bernal Wellfield (ESA, 2002).	Year-round	Isabel, Stanley Avenue, Chain of Lakes Gravel Pit, Stoneridge, Bernal, Valley Avenue, Hopyard, Mocho
Birds					
Cooper's hawk *Accipiter cooperi*	--/CSC	Nests in riparian growths of deciduous trees and live oak woodlands	**Low to moderate.**	Year-round	Bernal, Valley Avenue
Tricolored blackbird *Agelaius tricolor*	FSC/CSC	Riparian thickets and emergent vegetation near open water	**Moderate.** CNDDB (2002) records several occurrences within gravel mining areas.	Year-round	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit
Grasshopper sparrow *Ammodramus savannarum*	FSC/	Pastures, grasslands, old fields	**Low to moderate.** Breeds in area.	April-September	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Western burrowing owl *Athene cunicularia hypugaea*	FSC/CSC	Nests in mammal burrows in open, sloping grasslands	**Moderate.**	Year-round	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Northern harrier *Circus cyaneus*	--/CSC	Mostly nests in emergent vegetation, wet meadows or near rivers and lakes, but may nest in grasslands away from water.	**Moderate.**	Year-round	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley

TABLE 3.5-1 (Continued)
FOCUSED LIST OF SPECIAL STATUS SPECIES CONSIDERED IN ZONE 7 WELLFIELD PROJECT AREA

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Habitat Requirements**	**Potential to Occur in Project Area**	**Period of Identification**	**Well Field**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)					
Birds (cont.)					
White-tailed kite *Elanus leucurus*	--/3511	Nests near wet meadows and open grasslands dense oak, willow or other large tree stands.	**High**.	Year-round	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
California horned lark *Eremophila alpestris actia*	--/CSC	Short grass prairie, fallow grain fields, open areas with short vegetation	**Moderate.**	Year-round	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Loggerhead shrike *Lanius ludovicianus*	FSC/CSC	Nests in shrublands and forages in open grasslands	**Moderate.**	Year-round	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley, Martin
Mammals					
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC	Open arid to semi-arid habitats, including woodlands, coastal scrub, chaparral, and grasslands. Roosts in trees, cliffs, dwellings	**Moderate.**	February-August	ALL
Small-footed myotis *Myotis ciliolabrum*	FSC/--	A variety of habitats, excluding coastal redwoods. Nursery colonies in caves, crevices, clay banks. Roosts in caves, dwellings, crevices.	**Moderate.**	February-August	ALL
Long-eared myotis *Myotis evotis*	FSC/--	Brush, woodland, and forest habitats, prefers coniferous habitat types. Nursery colonies in buildings, crevices, spaces under tree bark, and snags.	**Moderate.**	February-August	ALL
Fringed myotis *Myotis thysanodes*	FSC/--	A wide variety of habitats. Optimal habitats are valley-foothill hardwood and hardwood-conifer types. Uses caves, buildings, or crevices for roosting and nursery colonies.	**Moderate.**	February-August	ALL
Yuma myotis *Myotis yumanensis*	FSC/--	Optimal habitat is open forests or woodlands with sources of water and flying insects. Nursery colonies in caves, buildings, or crevices.	**Moderate.**	February-August	ALL

TABLE 3.5-1 (Continued)
FOCUSED LIST OF SPECIAL STATUS SPECIES CONSIDERED IN ZONE 7 WELLFIELD PROJECT AREA

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Habitat Requirements**	**Potential to Occur in Project Area**	**Period of Identification**	**Well Field**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)					
Plants					
Alkali milk-vetch *Astragalus tener* var. *tener*	--/--/List 1B	Alkali flats, valley grasslands	**Low to moderate.**	March-June	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Heartscale *Atriplex cordulata*	FSC/--/List 1B	Chenopod scrub, alkaline meadows, sandy soils in valley and foothill grassland	**Low to moderate.**	May-October	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Brittlescale *Atriplex depressa*	FSC/--/List 1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools, often in alkaline situations	.**Low to moderate**	May-October	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
San Joaquin spearscale *Atriplex joaquiniana*	FSC/--List 1B	Alkaline soils in chenopod scrub, meadows, playas, valley and foothill grassland	**Low to moderate.**	April-September	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	FSC/CSC/List 1B	Alkaline areas in valley and foothill grassland	**Moderate.**	June-November	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Hispid bird's beak *Cordylanthus mollis* ssp. *hispidus*	FSC/--/List 1B	Alkaline microhabitat in meadows, playas, valley and foothill grassland	**Moderate.**	June-September	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Livermore tarplant *Deinandra bacigalupii*	--/--/List 1B	Alkaline meadows	**Moderate.**	June-October	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Recurved larkspur *Delphinium recurvatum*	--/--/List 1B	On alkaline soils in chenopod scrub, valley and foothill grassland, cismontane woodland	**Moderate.**	March-May	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Little mousetail *Myosurus minimus* ssp. *apus*	FSC/--/List 3	Vernal pools in alkaline soils	**Low to moderate.**	March-June	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley
Saline clover *Trifolium depauperatum* var. *hydrophilum*	--/--/List 1B	Marshes and swamps, mesic alkaline areas in valley and foothill grassland	**Low to moderate.**	April-June	Isabel, Stanley Avenue, Chain of Lakes, Gravel Pit, Busch Valley

TABLE 3.5-1 (Continued)
FOCUSED LIST OF SPECIAL STATUS SPECIES CONSIDERED IN ZONE 7 WELLFIELD PROJECT AREA

SENSITIVE PLANT COMMUNITIES

Name	Global Rank	State Rank
Alkali meadow	G3	S2.1
Northern claypan vernal pool	G1	S1.1

STATUS CODES:

Federal Categories (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FPE = Proposed for Listing as Endangered
FPT = Proposed for Listing as Threatened
FC = Candidate for Federal Listing
FSC = Federal Species of Concern
FSLC = Federal Species of Local Concern
BPA = Federal Bald Eagle Protection Act

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in CA

State Categories (California Department of Fish and Game)

CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California
3511 = Fully Protected Species
* = Special Animals
CSC = California Species of Special Concern

The Nature Conservancy (TNC) – Global Heritage Program rarity ranks (for sensitive plant communities)

G1, S1: Fewer than 6 viable occurrences worldwide (G)/statewide (S) and/or 2000 acres
G2, S2: 6-20 viable occurrences worldwide/statewide and/or 2000-10,000 acres
G3, S3: 21-100 viable occurrences worldwide/statewide and/or 10,000-50,000 acres
G4, S4: Greater than 100 viable occurrences worldwide/statewide and/or greater than 50,000 acres

Threat Ranks

0.1: Very threatened
0.2: Threatened
0.3: No current threats known

POTENTIAL TO OCCUR:

Low Potential: Project area and/or immediate area either do not provide suitable habitat or provide only limited or degraded habitat for a particular species. The known range for a particular species also may be outside of the project area.

Moderate Potential: The project area and/or immediate area provide suitable habitat for a particular species. There are no recorded occurrences of the species in the project vicinity.

High Potential: The project area and/or immediate area provide suitable habitat conditions for a particular species, and the species is recorded in the project vicinity.

Present: The species has been observed within the project area.

3.5.2 SETTING

REGIONAL SETTING

The proposed project is located on the floor of the Livermore-Amador Valley in Alameda County, within the California Floristic Province. The valley has a Mediterranean climate, with average annual temperatures ranging from approximately 36° to 115° F and a mean annual temperature of 73° F and average annual precipitation of 14.5 inches. Annual grasslands, riparian woodland, scrub, and forest along intermittent and perennial streams, and seasonal wetlands characterize undisturbed vegetation of the alluvial valley floor. Creeks and flood control channels traverse the valley floor within the planning area, including Arroyo Mocho, Arroyo de la Laguna, Arroyo del Valle, Tassajara Creek, Pleasanton Canal, and Lines B-2-1 and B-2-2. Vegetation of the surrounding hills is a mosaic of oak woodland, annual grasslands, upland scrubs, wetland communities, and riparian scrubs and forests. At higher elevations, foothill oak woodland, annual grasslands, and riparian vegetation dominate. Historically, the major land uses of the valley floor were cattle grazing and agriculture, which served to alter dramatically the natural landscape. More recently, increasing development has fragmented the landscape, restricting once widespread plant and wildlife habitat. Current principal land uses within the Livermore-Amador valley include agriculture; residential, commercial and industrial development; and, a sand and gravel mining area. Residential, commercial, and industrial land uses are rapidly replacing agricultural land uses. Open space remains in the planning area and includes agricultural lands, the Alameda County Fairgrounds, and numerous suburban parks.

EXISTING ENVIRONMENT

The following section describes plant communities and associated wildlife habitats, special status species, and waters of the U. S. occurring throughout the planning area. A discussion of resources specific to each wellfield follows. For the purposes of this discussion, vegetation resources include both common and sensitive plant communities and special-status plant species. Due to the developed condition of much of the planning area, natural vegetation is limited. Urban landscaping is included as a vegetation type, but is regarded as having marginal wildlife habitat value.

Existing Conditions by Wellfield

This section examines the existing conditions for individual wellfields as defined by their respective boundaries. Information on the wellfields is based on existing documents and knowledge about individual wellfields through work on specific projects within a wellfield. Specific project-level field surveys were not conducted for each wellfield.

Hopyard Wellfield

Land uses in the Hopyard Wellfield consist of residential and recreational facilities, including neighborhood parks and the Pleasanton Sports and Recreation Park that provide open space. Arroyo Mocho parallels the northern border of this wellfield. Habitat types in this wellfield

include urban landscaping in the neighborhoods and parks, freshwater emergent wetland, annual grassland, and ruderal habitats along reaches of Arroyo Mocho and Pleasanton Canal, and aquatic habitat within Arroyo Mocho, Pleasanton Canal and Arroyo de la Laguna. Potential jurisdictional waters and/or wetlands occur in Arroyo Mocho, Pleasanton Canal, and Arroyo de la Laguna.

Special status species associated with aquatic habitat and wetlands that may occur in the Hopyard Wellfield include California red-legged frog and western pond turtle. The potential for special status species to occur in each of the eleven wellfields as determined through surveys and available data sources is presented in **Table 3.5-2**. Protocol-level surveys for red-legged frog were conducted in June 2001 and June 2002 in Arroyo Mocho (two stream reaches) and Arroyo de la Laguna (three reaches). Both streams were described as large linear channels that provide low to moderate quality aquatic and upland habitat capable of supporting red-legged frog. However, due to negative protocol-level survey findings, and the absence of CRLF sightings within one-mile of the survey reaches, species presence was considered unlikely at these sites (ESA, 2001; 2002). Thus, the potential for species occurrence is considered low in aquatic habitats. Due to existing urban development, this species is considered absent from upland sites outside of riparian corridors. Based on the presence of suitable habitat (and recent anecdotal reports) for western pond turtle, this species has the potential to occur in the above streams, but would not occur in developed upland sites outside of the riparian corridor. Based on the absence of California tiger salamander breeding habitat and upland aestivation sites, this species is not expected to occur in the Hopyard Wellfield.

Nesting birds, including Cooper's hawk, may use trees found throughout the area. Bats may forage over the channels, playing fields, and roost in trees, under bridges, or in buildings located within this wellfield.

Mocho Wellfield

The Mocho Wellfield consists of residential, industrial, commercial, and open space land uses (restricted to small urban parks). Arroyo Mocho forms the northern boundary of this wellfield. Habitat types here include urban landscaping in the neighborhoods and parks, ruderal habitat in vacant parcels and along reaches of Arroyo Mocho, freshwater emergent wetland, annual grassland, and aquatic habitat within Arroyo Mocho. Potential jurisdictional waters and wetlands occur within the Arroyo Mocho.

Like the Hopyard Wellfield, special status species associated with aquatic habitat and wetlands in the Mocho Wellfield are California red-legged frog and western pond turtle. The likelihood of species occurrence is considered low, with potential occurrences restricted to the immediate vicinity of Arroyo Mocho. California tiger salamander is not expected to occur in the Mocho Wellfield based on the absence of CTS breeding habitat and upland aestivation sites.

Nesting birds in this area are generally restricted to smaller ornamental trees in developed areas and non-native grasslands adjacent to Arroyo Mocho. Bats may forage over Arroyo Mocho, vacant lots, parks, and roost in trees, under bridges, or in buildings located within this wellfield.

TABLE 3.5-2
POTENTIAL SPECIAL STATUS SPECIES WITHIN THE PLANNING AREA

Wellfield	Habitat Type	CRLF[1]	CTS[2a]	Pond Turtle[3]	Inverts[4]	Burrowing Owl[5]	Spec. St. Plants[6]	Breeding Birds/Bats[7]
Hopyard	Aquatic	Low	None	Low	None	None	None	Yes
	Upland	None	None	None				
Mocho	Aquatic	Low	None	Low	None	None	None	Yes
	Upland	None	None	None				
Bernal	Aquatic	Low	None	Low	None	None	None	Yes
	Upland	None	None	None				
Valley	Aquatic	Low	None	Low	None	None	None	Yes
	Upland	None	None	None				
Stoneridge	Aquatic	Low	None	Low	None	None	None	Yes
	Upland	None	None	None				
Busch	Aquatic	Low	Low	None	None	None	Low	Yes
	Upland	None	None	None				
Martin	Aquatic	Low	None	Low	None	None	None	Yes
	Upland	None	None	None				
Gravel Pits	Aquatic	Low	None	None	Unknown, but likely low	Moderate	None	Yes
	Upland	None	None	None				
Chain of Lakes	Aquatic	None	None	None	Unknown, but likely low	Moderate	Moderate	Yes
	Upland	Low	None	None				
Stanley	Aquatic	Low	Low	None	Unknown, but likely low	Moderate	Unknown, but likely low	Yes
	Upland	None	None	None				
Isabel	Aquatic	None	None	None	Unknown, but likely low	Moderate	Moderate	Yes
	Upland	Low	None	None				

1 CRLF = California red-legged frog.
2 (a) CTS = California tiger salamander.
(b) CTS dispersal in upland areas would be limited by Stanley Boulevard and the railroad tracks.
3 Western Pond Turtle.
4 Special status invertebrates include the Vernal Pool fairy shrimp and other invertebrates of special concern associated with vernal pool habitats (see **Table 3.5-1**).
5 Burrowing owl.
6 (a) SS Plants = Special Status Plants; see **Table 3.5-1** for a list of plant species.
(b) The potential for special status plants are present only in alkali meadow or northern claypan vernal pool habitats located within the wellfield.
7 This category includes breeding birds and raptors and special status bats.

Bernal Wellfield

The Bernal Wellfield consists of residential, commercial, open space, and community land uses. The Alameda County Fairgrounds and the Pleasanton Fairways Golf Course are large community facilities within the wellfield that provide open space. Hansen Park is a neighborhood park located north of the fairgrounds. Arroyo de la Laguna and Arroyo del Valle traverse through the wellfield. Flood control channel Lines B-2-1 and B-2-2 are found on the eastern edge of the wellfield south of Bernal Avenue. What was, until recently, open space south of the fairgrounds is currently under residential and commercial development and is therefore highly disturbed. Habitat types occurring in the Bernal Wellfield include ruderal, urban landscaping, riparian forest along the two arroyos, freshwater emergent wetlands and aquatic habitat within the creeks. Sensitive species that may occur in aquatic habitat in this wellfield include California red-legged frog and western pond turtle, which could occur in the immediate vicinity of Arroyo del Valle. Protocol-level surveys for red-legged frog in this stream in 2001 and 2002 describe a dense riparian forest of cottonwood and arroyo willow with dense understory growth of California blackberry, periwinkle fennel, poison hemlock, and non-native grasses. Survey results for red-legged frog were negative at the two surveyed sites, with no frogs reported within one-mile of the study areas (ESA, 2001; 2002). Thus, the possibility of encountering this species is considered low, particularly in upland portions of the wellfield. Due to the absence of suitable breeding sites in the local vicinity, California tiger salamander are not expected to occur in this wellfield. Bats and nesting birds of all kinds are likely along the relatively intact riparian corridors. Other sensitive resources include the waters of Arroyo de la Laguna and Arroyo del Valle. These waters would be considered under jurisdiction of the Corps as "other waters of the U.S." and as waters of the State subject to authority of CDFG.

Valley Avenue Wellfield

The Valley Avenue Wellfield consists of residential, open space in the form of neighborhood parks, and industrial/commercial uses. Arroyo del Valle crosses the southern portion of this wellfield. Habitat types include urban landscaping, riparian forest, aquatic, and ruderal. Similar to the Hopyard Wellfield, special status species with the potential to occur in this wellfield include California red-legged frog and western pond turtle (both with low potential near aquatic habitats and no potential outside the riparian corridor of Arroyo Mocho), bats, and resident and migratory nesting bird species. As with the Hopyard Wellfield, California tiger salamander is not expected to occur in the Mocho Wellfield based on the absence of CTS breeding habitat and upland aestivation sites.

Arroyo del Valle would be considered jurisdictional by the Corps as "other waters of the U.S." and as waters of the State by CDFG.

Stoneridge Wellfield

The Stoneridge Wellfield is located in the City of Pleasanton and consists of residential, industrial/commercial, open space, and community uses. The Arroyo Mocho flood control channel bounds the wellfield to the south and the Tassajara Creek borders it to the west. Habitat types occurring in this wellfield include urban landscaping and ruderal, as well as annual

grassland, freshwater emergent wetland and aquatic habitat within the flood control channels. Like the Hopyard Wellfield, special status species with the potential to occur in this wellfield include California red-legged frog and western pond turtle (both low potential). These species could be associated with freshwater emergent wetland and aquatic habitat in Tassajara Creek and Arroyo Mocho. Protocol level surveys for red-legged frog were conducted in this reach of Tassajara Creek in 2001 and were negative (ESA, 2001). This species has not been identified within one mile of Tassajara Creek in the Stoneridge Wellfield. On this basis, red-legged frog and pond turtle are considered to have a low potential to occur in these two channels, and are considered absent from developed areas outside the stream corridors. California tiger salamander is not expected to occur in the Mocho Wellfield based on the absence of CTS breeding habitat and upland aestivation sites. In addition, the potential exists for nesting raptors and other bird species, and bats.

Potential jurisdictional waters and wetlands occur within Arroyo Mocho and Tassajara Creek.

Busch Valley Wellfield

The Busch Valley Wellfield consists of residential, industrial /commercial, open space, agricultural, and gravel mining uses. There are no streams or flood control channels within this wellfield. Habitat types include urban landscaping, ruderal, agricultural, and annual grassland in gravel mining areas. There is also the potential for seasonal wetlands within areas of the mining areas not recently disturbed. If present, seasonal wetlands in this wellfield could support most of the special status plant species listed in **Table 3.5-1**, though the likelihood of such occurrences is considered low.

This wellfield is in proximity to Arroyo del Valle and the Shadow Cliffs Regional Recreation Area (which parallel the southern border) and thus a low potential exists for upland dispersal of California red-legged frog and California tiger salamander onto wellfield lands. However, as Stanley Boulevard and the railroad tracks provide an essentially impassable barrier to amphibian dispersal, the potential for these species would be unlikely. Western pond turtle is not expected to occur in this wellfield due to the lack of habitat for this species.

Barren areas could provide nesting substrate for California horned lark and trees and shrubs could provide nesting habitat for a variety of birds including loggerhead shrike. Bats may forage over the agricultural areas and roost in trees or buildings located within this wellfield.

Martin Wellfield

The Martin Wellfield consists of residential development, orchards, and open space. Arroyo Mocho makes up the northern boundary. Habitat types occurring in this wellfield include urban landscaping, ruderal, agricultural, aquatic, and freshwater emergent wetland. Sensitive species associated with freshwater emergent wetland and aquatic habitat with the potential to occur in Arroyo Mocho in this wellfield include California red-legged frog and western pond turtle. As described for the Stoneridge Wellfield, if present the distribution of these species would be strictly limited to the riparian corridor of Arroyo Mocho. California tiger salamander is not

expected to occur in the Mocho Wellfield based on the absence of CTS breeding habitat and upland aestivation sites. In addition, the potential exists for nesting raptors and other bird species and bats.

Potential jurisdictional waters and wetlands occur within Arroyo Mocho.

Gravel Pits Wellfield

The Gravel Pits Wellfield is located in unincorporated Alameda County, between the cities of Pleasanton and Livermore. Currently, this wellfield encompasses areas once mined extensively for sand and gravel and is currently covered primarily by open water, with disturbed, ruderal areas and annual grassland surrounding three steep-sided, deep lakes. Arroyo Mocho bounds the eastern section of the wellfield. Though there is no breeding habitat for California red-legged frog in this wellfield, proximity of the area to a known occurrence of the species at Arroyo las Positas (CDFG, 2002a) (and Arroyo Mocho, a potential dispersal corridor) presents a low probability of their dispersal into upland habitat surrounding the lakes. Because the entire wellfield is subject to frequent earthmoving disturbances and management, this wellfield does not provide habitat for the vernal pool fairy shrimp and other invertebrates of special concern, or special status plant species (see **Table 3.5-1**). Western pond turtle and California tiger salamander are not expected to occur in this wellfield due to the lack of habitat for these species.

Areas within or adjacent to the wellfield that support trees or shrubs may consequently provide nesting and foraging habitat for a variety of special status and protected birds and bats. Western burrowing owl may occur in grasslands, berms, levees, or fields inhabited by ground squirrels. Portions of Arroyo Mocho provide aquatic habitat as well as freshwater emergent wetland habitat within this wellfield but other reaches are often dry early in the year, thus providing no breeding habitat for special status amphibians.

Potential jurisdictional waters and wetlands occur within Arroyo Mocho.

Chain of Lakes Wellfield

Similar to the Gravel Pit Wellfield, the majority of the Chain of Lakes Wellfield is primarily used for sand and gravel mining. However, the northern portion supports other uses. The site is located primarily within unincorporated Alameda County. Lakes formed by the filling of exhausted quarries with water are interspersed with areas still being actively mined for gravel. Additional land uses in this wellfield include agriculture and horse ranching in the northern portion. Arroyo Mocho forms the western border of the wellfield. Areas of annual grassland and fallow agricultural fields in this wellfield have the potential to support two sensitive plant communities, alkali meadow and northern claypan vernal pool. These communities, in turn, have the potential to support most of the plant species, as well as all of the invertebrates, listed in **Table 3.5-1**. In addition, these grassland and agricultural areas may provide foraging habitat for raptors such as white-tailed kite and special status bats. Eucalyptus trees within the wellfield may provide nesting habitat for raptors and trees, while buildings or bridges may provide roosting habitat for bats. Western burrowing owl may occur in grasslands, berms, levees, or fields inhabited by ground squirrels.

The potential for California red-legged frog to use upland habitat is similar to that for the Gravel Pit Wellfield, due to proximity to Arroyo las Positas. Aquatic habitat and freshwater emergent wetland may be found in the more northern portion of Arroyo Mocho. Western pond turtle is not expected to occur in this wellfield due to the lack of habitat for this species.

Potential jurisdictional waters and wetlands occur within Arroyo Mocho. Both the Corps and CDFG may consider vernal pools or other seasonal wetlands occurring in this wellfield as jurisdictional.

Stanley Boulevard Wellfield

The Stanley Boulevard Wellfield lies within an existing gravel mining area and includes areas of active mining interspersed with water storage areas. The Arroyo Mocho flood control channel forms part of the northern border of this wellfield. Based on available habitat, special status species potential in the Stanley Boulevard Wellfield is similar to that described for the Chain of Lakes Wellfield. A large portion of this wellfield is actively mined. Therefore, while the potential for seasonal wetland habitats may exist, potential for the occurrence of alkali meadow and its associated plant species here is extremely low. Similarly, the potential for vernal pools and associated special status species, such as vernal pool fairy shrimp, is considered low. Arroyo del Valle runs along the southern border of this wellfield, with no barriers to potential upland dispersal for California red-legged frog or California tiger salamander. However, because this area is actively managed for gravel mining, the likelihood of species occurrence in upland portions of this area is considered low. Western pond turtle is not expected to occur in this wellfield due to the lack of habitat for this species.

The Arroyo del Valle riparian corridor provides nesting, roosting, and foraging habitat for special status birds and bats, which may forage over the wellfield lands. Burrowing owl may occur in grasslands, berms, levees, or fields in this wellfield.

Potential jurisdictional waters occur in Arroyo del Valle, and both the Corps and CDFG may consider any vernal pools or other seasonal wetlands as jurisdictional.

Isabel Wellfield

The Isabel Wellfield is located primarily in unincorporated Alameda County. The northern half of the wellfield is agricultural, while the southern half is within an existing gravel mining area. Residential uses and one neighborhood park are located east of Isabel Avenue and outside of the wellfield. Habitat types occurring in this wellfield are ruderal, annual grassland and agricultural. It is also possible that alkali meadow and northern claypan vernal pool habitat occur here, as well as other seasonal wetlands. In an area north of Lilenthal Road, which appears to have been mined several years ago, a mix of upland and riparian tree species exist. Arroyo Mocho runs through the wellfield with aquatic habitat and freshwater emergent wetlands not likely to be present since this reach of Arroyo Mocho goes dry in the spring. Special status species with the potential to occur in this wellfield are as described for the Chain of Lakes Wellfield. Additionally, burrowing owl may occur in grasslands, berms, levees, or fields in this wellfield. Potential jurisdictional

waters and wetlands may occur in Arroyo Mocho, abandoned gravel areas, and any vernal pools or other seasonal wetlands.

REGULATORY FRAMEWORK

County and Local Regulations, Goals, and Policies

The policies and regulations associated with biological resources within the affected jurisdictions are presented in **Appendix 3.5** of this DEIR. State policies relating to the protection of biological resources are presented below.

California Environmental Quality Act

In general, projects approved through the California Environmental Quality Act (CEQA) process should show that new land uses are in compliance with the wetlands provisions of the federal Clean Water Act (CWA) and with state and federal endangered species acts (CESA and FESA, respectively.

CEQA directs each lead agency to consult with the CDFG on any project the agency initiates that is not statutory or categorically exempt from CEQA. CEQA Guidelines (Section 15065a) declares that reducing the number or restricting the range of rare, threatened, or endangered plants or animals may have a significant effect. The Native Plant Protection Act also affords limited protection to special status plant species. A formal consultation process must be initiated with the CDFG for projects that may or will have an adverse effect on state-listed species.

CEQA (Section 15206) specifies that a project shall be deemed to be of statewide, regional, or area-wide significance if it would substantially affect sensitive wildlife habitats including but not limited to riparian lands, wetlands, bays, estuaries, marshes, and habitats for rare and endangered species as defined by Section 15380.

California Department of Fish and Game

Under Section 1601 of the California Fish and Game Code, an agency or public utility proposing to substantially divert the natural flow of a stream, substantially alter its bed or banks, or use any material from the streambed, must first enter into a Streambed Alteration Agreement (SAA) with CDFG. An SAA would be required for any construction activity that would occur in one of the flood control channels or creeks found in the wellfields. Construction cannot be initiated on the site until an SAA is executed. The CDFG would only enter into an SAA once all other project permits and certifications have been obtained. The SAA is applied for by submitting a CDFG Streambed Alteration Notification form and a nonrefundable application fee (for projects costing more than $25,000) to the CDFG. The SAA can typically be obtained within a few months, provided proposed mitigation (as developed during the environmental review process) is acceptable to the CDFG. The CDFG, while being able to impose reasonable conditions on the agreement, may not decline to enter into an agreement.

San Francisco Regional Water Quality Control Board

Water Quality Regulation

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) regulates water quality within California and established the authority of the State Water Resources Control Board and the nine Regional Water Quality Control Boards (RWQCB). The SFRWQCB has established regulatory standards and objectives for water quality for local surface water bodies. Under Porter-Cologne, the SFRWQCB may choose to regulate discharges of dredge or fill material by issuing or waiving Waste Discharge Requirements (WDRs). Public notice and an opportunity to comment are part of the SFRWQCB's process for issuing a WDR. All discharges associated with the proposed project would be in compliance with SFRWQCB requirements.

401 Water Quality Certification

The SFRWQCB can require a project proponent to obtain a Section 401 (Clean Water Act) water quality certification for Section 404 permits granted by the Corps. For wetland impacts that total less than one acre, the SFRWQCB typically issues a waiver, provided the applicant is also applying to the CDFG for an SAA, as described above. The SFRWQCB has 60 days to issue this waiver. For wetland impacts of one to two acres, a waiver could also be issued, but only after thorough review of any agency or public comments during the 40-day comment period on the Corps' issue notice (assuming that the Corps has required an individual permit). For more than two acres of wetland removal, the SFRWQCB requires a mitigation plan, a public hearing, and approval of the water quality certification by the State Water Resources Control Board.

FEDERAL

Endangered Species Act (Section 7 and 10)

The FESA (16 United States Code 1531 et seq.) requires formal consultation if a project involving a federal agency will result in the "taking" of a species currently listed as threatened or endangered. Section 9 of the act prohibits the "taking" of listed species. If a federal agency must issue a permit for the project (e.g., the Corps under the Clean Water act), then the project would be evaluated according to Section 7 of the FESA, which requires the two federal agencies to consult and resolve adverse effects to endangered species. If a listed species could be affected, a Biological Assessment would need to be prepared and submitted to the USFWS. After review of the Biological Assessment, the USFWS would issue a Biological Opinion, which could allow incidental take of protected species. If there is no other federal agency involvement, Zone 7 could be responsible for consulting directly with the USFWS regarding issues of "take" under Section 10 of the act, which could require preparation of a Habitat Conservation Plan.

Under USFWS and CDFG policy, "species of special concern" are not subject to the same consultation requirements as listed endangered, rare, or threatened species. However, the agencies encourage informal consultation for species of special concern that may become officially listed before completion of the CEQA process.

U. S. Army Corps of Engineers

The Corps is the major agency involved in wetland regulation under Section 404 of the Clean Water Act (CWA). Section 404 regulates discharge of fill material into "waters of the United States," which include wetlands. It is possible that the project could be permitted under the Corps' Nationwide Permit program, which provides a streamlined process for select project categories. Authorization under a Nationwide Permit depends on whether the project would be consistent with specific conditions of the permit, such as the total acreage of wetlands or other waters of the U.S. (such as streams) affected by the project, and special status species that may be adversely affected.

3.5.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Based on policy and guidance provided by CEQA (Public Resources Code Section 21001 and CEQA Guidelines), an impact of the proposed project would be considered significant if it causes one or more of the following effects:

- Adverse substantial effect to any species identified as a threatened, endangered, candidate, sensitive, or special-status species in local or regional plans, policies, regulations or by lists of species of concern from the CDFG, the USFWS or as defined by Section 15380 of the CEQA Guidelines;

- Adverse substantial effect to habitat (including habitats for rare and endangered species as defined by Fish and Game Code 903) or other sensitive natural community identified in local or regional plans, policies, regulations or by lists compiled by CDFG or USFWS;

- Adverse substantial effect to federally protected wetlands (including but not limited to marshes and riparian areas) as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of CDFG as defined by Fish and Game Codes 1601–1603;

- Substantial interference with movement of any native resident or migratory fish or wildlife species or with established migration or dispersal corridors;

- Removal or damage to any protected tree;

- Damage to a resource that is subject to Corps permit requirements under Section 404 of the federal Clean Water Act and that may provide valuable wildlife habitat, such as habitat for special status plant or animal species; or,

- Conflicts with any applicable habitat conservation plan. (There are no habitat conservation planning areas within the wellfield planning area)

For the purpose of this EIR, policies contained in the Cities of Pleasanton and Livermore and the East County Area Plan regarding protected trees are used herein as significance criteria.

IMPACTS AND EIR-IDENTIFIED MITIGATION MEASURES

Several potential impacts and mitigation measures are noted below. When Zone 7 begins the search for individual well sites, potential sites will be reviewed by qualified personnel for consistency with the EIR and for the resources noted within this section. This subsection provides an "if/then" type of scenario. If none of the special status species or sensitive natural communities are present, then no mitigation is required. If sensitive natural communities or special status species are present, then Zone 7 will examine the use of alternate sites. If a site must be used where special status species or sensitive natural communities are present, then Zone 7 will employ the mitigation measures noted below.

Impact 3.5-1: Construction of the proposed project could result in impacts to potentially jurisdictional wetlands / waters of the U.S. under the jurisdiction of Corps and to the streambed and banks under jurisdiction to CDFG. Less than Significant with Mitigation.

Well Construction

As discussed above, all of the wellfields, except Busch Valley Wellfield, contain channels that support wetlands and other waters of the U.S. under the regulatory jurisdiction of the Corps and the CDFG. Zone 7 would avoid development of wells within jurisdictional wetlands/waters of the U.S. It is unlikely that these jurisdictional features would be affected because well facilities would be located either within the developed, urban areas of the City of Pleasanton, or on previously disturbed, mining areas in unincorporated Alameda County. Implementation of **Measure 3.5-1a**, which would avoid selection of well sites on or within jurisdictional features, would ensure that no impacts to wetland/waters of the U.S. would result from this project.

Pipeline Installation

All of the wellfields, except Busch Valley contain channels that support wetlands and other waters of the U.S. under the regulatory jurisdiction of the Corps and the CDFG. The proposed pipelines may require crossing of these jurisdictional features. Such crossings may utilize either open trench construction or jack-and-bore technique. Open trench construction across jurisdictional features during the dry months would affect both areas classified as wetland and other waters of the U.S., but such direct impacts would be considered temporary; permanent loss of wetlands or diminished habitat value is not anticipated. Zone 7 shall avoid construction through jurisdictional features to the extent feasible (see **Measure 3.5-1a**). However, if avoidance is infeasible, implementation of **Measure 3.5-1b** would reduce direct impacts to less than significant levels by restricting the season by which construction occurs, and by compliance with conditions of the regulatory permits that would be required for direct effects on jurisdictional features. If construction during the dry months is not feasible, Zone 7 may choose to use jack-and-bore techniques for channel crossings. This construction method would completely avoid wetlands / waters of the U.S. and no impacts to these resources would occur (see **Measure 3.5-1c**).

Mitigation Measures

Measure 3.5-1a: In selecting suitable sites for well development and pipeline installation, Zone 7 shall avoid areas that contain wetlands and other waters of the U.S. to the extent feasible. If avoidance is not feasible, then Zone 7 shall implement appropriate mitigation measure to reduce potential impacts, either limiting construction to outside the rainy season (see **Measure 3.5-1b**) or using jack-and-bore technique for pipeline crossing of jurisdictional features (**Measure 3.5-1c**).

Measure 3.5-1b: This measure applies to all wellfields except Busch Valley Wellfield, and also to the pipeline component. Impacts to wetlands and waters of the U.S. from open-trench construction and excavation in creeks will be minimized by conducting the work during low-flow periods, implementing turbidity controls, hydroseeding disturbed areas, and locating spoils and storage areas away from the creek or channel. Pipeline construction in existing creeks will require permit approval from the Corps for fill in wetlands and other waters of the U.S. The project would most likely proceed under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the CWA. Water quality certification from the RWQCB will also be required, pursuant to Section 401 of the Act. In addition, the CDFG has jurisdiction pursuant to Sections 1601-1603 of the Fish and Game Code, and pipeline construction in channel bottoms will require a SAA with CDFG.

Measure 3.5-1c: This measure applies to pipeline construction with all wellfields except Busch Valley and Stanley Wellfields. If pipeline installation during the dry season is not feasible, Zone 7 shall use jack and bore techniques to cross under jurisdictional features. Although jack and bore is intended to avoid altering the bed and bank of a stream, in many circumstances an SAA is recommended to ensure that protective and early response measures will be used in the event of an accidental discharge (*i.e.*, "frac-out") of drilling lubricant, typically hydrated bentonite, into a stream.

Impact Significance After Mitigation: Less than significant.

Impact 3.5-2: Construction of the wells or pipelines could result in impacts to seasonal wetlands. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Seasonal wetlands, if they occur, would be located primarily within wellfields in unincorporated Alameda County, including Busch Valley, Gravel Pits, Chain of Lakes, Stanley Boulevard, and Isabel. Disturbance to seasonal wetlands would occur if well facilities are built on such habitat, or if pipelines are installed through seasonal wetlands. Direct impacts to seasonal wetlands would be permanent for well sites, but would likely be temporary for pipeline installation, as seasonal wetlands would be restored to pre-project conditions. Zone 7 would avoid well development on sites where seasonal wetlands are present (see M**easure 3.5-2a**). In the event that seasonal wetlands cannot be avoided and permanent damages would occur, then Zone 7 shall acquire appropriate regulatory permits and would provide mitigation acreage at a 3:1 ratio or other appropriate ratio as determined by regulatory agencies (see **Measure 3.5-2b**). Implementation of these measures would reduce potential impacts to less than significant levels.

For temporary impacts to seasonal wetlands, Zone 7 shall restore the wetlands to pre-project conditions (see **Measure 3.5-2c**).

Mitigation Measures

Measure 3.5-2a: Zone 7 shall avoid selection of seasonal wetlands as well sites and pipeline corridors to the extent feasible. If this measure cannot be implemented and permanent or temporary impacts will occur, then Zone 7 shall implement the applicable mitigation measures below (**Measure 3.5-2b** and **Measure 3.5-2c**).

Measure 3.5-2b: If permanent impacts to seasonal wetlands would occur, Zone 7 shall acquire appropriate regulatory permits and would provide mitigation acreage at a 3:1 ratio or other appropriate ratio as determined by regulatory agencies. Zone 7 shall retain a qualified biologist who would determine the location where such replacement would occur, and who would prepare and implement a monitoring plan outlining the maintenance requirements to ensure that reestablishment of the seasonal wetland occurs.

Measure 3.5-2c: If temporary impacts to seasonal wetlands occur associated with installation of pipeline, Zone 7 shall restore the affected seasonal wetland to pre-project conditions.

Impact Significance after Mitigation: Less than significant.

Impact 3.5-3: Construction of wells and pipelines could result in impacts to special status plant and wildlife species associated with aquatic habitats and associated uplands, including California red-legged frog, California tiger salamander, western pond turtle, and vernal pool fairy shrimp. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Special status species that occur in the regional project vicinity are shown on **Table 3.5-1**. In the Livermore-Amador Valley, special status plant and wildlife species associated with riparian, freshwater emergent wetland, seasonal wetlands, and aquatic habitats occur primarily in unincorporated Alameda County, away from urbanized areas.

As described in the setting section, there are no reported occurrences of California red-legged frog, California tiger salamander, western pond turtle or listed fairy shrimp species in the identified wellfields. However, habitat for these species may be present in the creeks, channels, and seasonal wetlands (if present) in the Planning area. If project components were to occur within occupied aquatic habitat, impacts to California red-legged frog or western pond turtle may result from removal of vegetation, direct mortality, entrapment in pipe sections or trenches, and harassment due to noise or vibration. The likelihood for species "take" is dependent upon the proximity of work areas to California red-legged frog and pond turtle breeding sites, quality of the aquatic habitat at these sites, and species presence or absence. Mitigation for potential impacts to these species would reduce the potential for "take" of these species. In most cases, the application of general mitigation measures such as avoiding suitable habitat, conducting pre-

construction surveys and seasonal avoidance would avoid significant impacts to these species. For project elements that affect aquatic habitats that may support the California red-legged frog, protocol-level surveys may be required and would provide the basis for formal or informal consultation with the U.S. Fish and Wildlife Service. Instream aquatic habitat quality, which varies between the wellfields, are summarized below. **Measures 3.5-3a** through **3.5-3c** provide procedures (surveys, avoidance, agency consultation) to minimize potential impacts to wildlife species in the event that they are identified at proposed well sites or pipeline installation corridors.

The potential for occurrence of California tiger salamander and vernal pool fairy shrimp is extremely limited in the overall project area, with low quality potential habitat limited to the Gravel Pit, Chain of Lakes, Stanley Boulevard, and Isabel wellfields.

Special-status plant species may occur in the Busch Valley, Chain of Lakes, and Isabel Wellfields. **Measures 3.5-3a** through **3.5-3b** provide procedures (surveys, avoidance, agency consultation) to take to minimize potential impacts to wildlife species in the event that they are identified at proposed well development / pipeline installation sites.

Hopyard Wellfield

Special status species associated with aquatic habitat and wetlands that may occur in the Hopyard Wellfield include California red-legged frog and western pond turtle. However, as discussed, the likelihood of species occurrence in the Hopyard Wellfield is considered low in aquatic habitats. Due to presence of existing development, this species is considered absent from upland sites outside of riparian corridors. For project elements located in aquatic habitats, the likelihood of significant impacts to California red-legged frog and western pond turtle are considered low.

Mocho Wellfield

Special status species associated with aquatic habitat and wetlands include California red-legged frog and western pond turtle. The likelihood of species presence in channels in the Mocho Wellfield is considered low, with potential occurrences restricted to the immediate vicinity of Arroyo Mocho in the Mocho Wellfield. For project elements located in aquatic habitats, the likelihood of significant impacts to California red-legged frog and western pond turtle are considered low.

Bernal Wellfield

Similar to the Hopyard Wellfield, sensitive species that may occur in aquatic habitat in the Bernal wellfield include California red-legged frog and western pond turtle. Recent surveys have not identified these species in Arroyo de la Laguna or Arroyo del Valle, however, these watercourses are considered suitable habitat for both species. Based on the results of repeated negative surveys, if project elements are located in aquatic habitats in the Bernal Wellfield, the likelihood of significant impacts to California red-legged frog and western pond turtle are considered low. Thus, if project elements were proposed within these features it is unlikely that either species

would be present in the immediate work area. More likely, however, the wellfields and pipelines would be designed to avoid impacts to aquatic habitats.

Valley Avenue Wellfield

Sensitive species with the potential to occur in this wellfield include California red-legged frog, western pond turtle. Potential impacts are as described for the Bernal Wellfield.

Stoneridge Wellfield

Sensitive species with the potential to occur in this wellfield include California red-legged frog and western pond turtle. These species would all be associated with freshwater emergent wetland and aquatic habitat and restricted to stream corridors by development. Based on the low likelihood of species occurrence, the potential for significant impacts to California red-legged frog and western pond turtle are considered low.

Busch Valley Wellfield

No streams or flood control channels traverse this wellfield based on the predominantly developed land uses, the potential for California red-legged frog and western pond turtle occurrence is considered low.

Martin Wellfield

Special status species associated with aquatic habitat and wetlands include California red-legged frog and western pond turtle. The likelihood of species presence in channels is considered low, with potential occurrences restricted to the immediate vicinity of Arroyo Mocho. For project elements located in or near aquatic habitats, the likelihood of significant impacts to California red-legged frog and western pond turtle are considered low.

Gravel Pits Wellfield

Although there is no suitable breeding habitat for California red-legged frog in this wellfield, proximity of the area to a known occurrence of the species at Arroyo las Positas (CDFG, 2002a) raises the possibility of their dispersal into upland habitat surrounding the lakes. Portions of Arroyo Mocho provide aquatic habitat as well as freshwater emergent wetland habitat within this wellfield but flows are managed and dry early in the year, thus providing no breeding habitat for special status amphibians. The likelihood of species dispersal into the managed gravel pits is considered low, thus no impacts would be anticipated.

Annual grasslands are limited in extent within this wellfield and have a low potential to support seasonal wetlands and thus, a low potential for occurrence of the vernal pool fairy shrimp. If habitat for this species were identified during reconnaissance surveys it would be avoided by project design, thus no impacts are anticipated to vernal pool fairy shrimp.

Chain of Lakes Wellfield

The potential for California red-legged frog to use upland habitat is similar to that for the Gravel Pit Wellfield due to proximity to Arroyo las Positas. Aquatic habitat and freshwater emergent wetland may be found in the northern portion of Arroyo Mocho. The potential for California red-legged frog occurrence in the active quarry areas is considered low, thus no impacts are anticipated to this species.

Annual grasslands in the northern portion of this wellfield have a low potential to support seasonal wetlands and thus, a low potential for occurrence of the vernal pool fairy shrimp. If habitat for this species were identified during reconnaissance surveys it would be avoided by project design, thus no impacts are anticipated to vernal pool fairy shrimp.

Stanley Boulevard Wellfield

Arroyo del Valle runs along the southern border of this wellfield, with no barriers to potential upland dispersal for California red-legged frog or California tiger salamander. However, like the Gravel Pit and Chain of Lakes wellfields, nearly the entire Stanley Boulevard Wellfield is actively managed for gravel mining, and is thus considered to provide poor quality upland habitat for these species. Consequently, no impacts are anticipated to these species due to proposed activities in this wellfield.

Isabel Wellfield

Special status aquatic species with the potential to occur in this wellfield are as described for the Gravel Pit and Chain of Lakes Wellfields. Annual grasslands are limited in extent within this wellfield and have a low potential to support seasonal wetlands and thus, a low potential for occurrence of the vernal pool fairy shrimp. If habitat for this species were identified during reconnaissance surveys it would be avoided by project design, thus no impacts are anticipated to vernal pool fairy shrimp.

Mitigation Measures

Measure 3.5-3a: Conduct a reconnaissance survey to determine the potential presence of habitat for special status plant and wildlife species. Based on field surveys, avoid removal or damage to all water-dependent vegetation, jurisdictional wetlands, or potential habitat for special status species by redesigning project components away from sensitive areas. If complete avoidance of these areas is infeasible, then implement **Measure 3.5-3b** (for plants) and/or **Measure 3.5-3c** (for animals).

Measure 3.5-3b: Within the wellfields identified to potentially support special status plants (Busch Valley, Chain of Lakes, and Isabel; see **Table 3.5-2**), conduct field surveys for special status plants during the appropriate blooming period for these species. If no special status plant species are identified during appropriately timed surveys, no further mitigation is required.

If any special status plant species are identified within 100 feet of a proposed well site or pipeline location, Zone 7 shall determine if the proposed facility would impact the

identified populations, and if necessary, a) investigate the use of an alternative site as an avoidance measure, or b) establish further mitigation in consultation with the USFWS and/or CDFG. Additional agency mitigation could include erecting exclusion fencing during construction, monitoring construction activities by qualified biologists, collecting seed for replanting following construction, or purchasing off-site habitat supporting the species and maintaining it in perpetuity.

Measure 3.5-3c: Conduct focused field surveys to determine the presence or absence of special status wildlife species listed in **Table 3.5-1** that have a potential to occur within the water-dependent habitats. The results of such surveys will be coordinated with the USFWS and CDFG, as necessary. If no special status animal species are present, then no further mitigation is required.

If any special status animal species are identified within 100 feet of a proposed well site or pipeline corridor (or other distance deemed suitable to avoid impacts to the identified species) Zone 7 shall, a) investigate the use of an alternative site as an avoidance measure, or b) establish further mitigation in consultation with USFWS and/or CDFG. Additional agency mitigation could include erecting exclusion fencing during construction, limiting construction to periods outside of the breeding season, monitoring construction activities by qualified biologists, relocating the animals to appropriate areas outside of the construction zone (for non-listed species) or purchasing off-site compensation habitat known to support the species and maintaining it in perpetuity.

Impact Significance After Mitigation: Less than significant.

Impact 3.5-4: Construction of well facilities and pipelines could result in impacts to heritage or other significant trees within the planning area. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Trees considered significant by planning area municipalities may be damaged or removed by construction of well sites or pipeline corridors. Protected trees, which include heritage trees, street trees, and ancestral trees, may occur within the wellfields, and their removal would constitute a potentially significant impact. Mitigation for protected tree removal may vary depending on jurisdiction. Implementation of **Measures 3.5-a** through **3.5-5d** would reduce impacts associated with removal of trees to less than significant levels.

Mitigation Measures

Measure 3.5-4a: Avoid tree removal and construction within the driplines of trees. If complete avoidance is infeasible, then implement appropriate in kind replacement in coordination with the affected jurisdiction.

Impact Significance after Mitigation: Less than significant.

Impact 3.5-5: Construction of facilities could result in impacts to common plant and animal species. Less than Significant.

Well Construction and Pipeline Installation

Direct impacts to common wildlife species include both mortality of resident species, habitat loss and degradation, and possibly, barriers to local wildlife movement. Mortality would include road kills, destruction of burrows of such species as ground squirrels and gophers, and destruction of nests of species such as western meadowlarks during the construction phase of the proposed project. Habitat degradation associated with temporary, construction-related disturbances may include displacement of animals due to construction noise and decreased water quality from oil and grease constituents. Upland project areas provide an incidental, non-essential migratory route for common wildlife species that are found throughout the project region. The long-term survival of large wildlife species that may migrate through the site, such as mule deer and gray fox, would not be inhibited by proposed activities, even in conjunction with surrounding development activities.

Mitigation Measures

No mitigation measures required.

Impact Significance: Less than significant.

Impact 3.5-6: Construction of facilities could result in adverse disturbance to raptors, migratory birds, or roosting special status bats within the planning area. Less than Significant with Mitigation.

Construction activities could adversely affect non-listed special-status nesting raptor and other nesting birds, or roosting bat species. Potential nesting habitat for several non-listed special-status raptor species may occur along riparian corridors, near open grasslands, and other sites in the project vicinity. Human disturbances from construction activities could cause nest abandonment and death of young or loss of reproductive potential at active nests located near the project site. Such effects could also occur to special status bat species.

Other special status bird species potentially breeding on the project site include grassland and shrub-nesting species (e.g., California horned lark and loggerhead shrike). Impacts to these species during project construction include the potential for destruction of individual birds, if present, and the loss of suitable nesting and foraging habitat. This would be a significant impact. However, implementation of **Measure 3.5-7**, below, would reduce potential impacts to less than significant levels.

Mitigation Measures

Measure 3.5-6: To the degree feasible, construction activities shall be avoided during the bird nesting and bat brooding season (March 1 through August 15), or the sites shall be surveyed by a qualified biologist to verify the absence of protected breeding birds and bats. If construction activities occur during the nesting season, a general survey for bats, raptors, passerines, and their nests shall be conducted by a qualified biologist prior to construction to verify species absence. If the survey indicates the potential presence of roosting bats, nesting raptors or protected passerines, the results would be coordinated with the Region 3 office of the CDFG, and suitable avoidance measures would be developed. Construction workers shall observe CDFG avoidance guidelines, which provide up to a 500-foot buffer zone surrounding active raptor nests and a 250-foot buffer zone surrounding nests of other birds. A 250-foot buffer zone will similarly apply to any identified roosts of special status bat species.

Impact Significance after Mitigation: Less than significant.

Impact 3.5-7: If burrowing owls were present on or adjacent to work sites at the time of project ground-breaking, construction activities could result in disturbance to or direct mortality of owls. Less than Significant with Mitigation.

Based on the availability of grasslands habitat and levees, potential burrowing owl nesting habitat was identified in the Gravel Pit Wellfield, Chain of Lakes Wellfield, Stanley Wellfield, and Isabel Wellfield, and along pipeline routes in the vicinity of these wellfields. Burrowing owls could potentially nest throughout these wellfields based on the availability of suitable breeding habitat. Potential breeding sites are available in ground squirrel burrows that could provide potential nesting opportunities for burrowing owl. If owls were present on or adjacent to well sites or pipeline corridors at the time of construction, construction activities have the potential to cause the direct mortality of, or injury to burrowing owls or their nests. Construction-related activities could also indirectly affect owls nesting adjacent to the site, if present. Implementation of **Measure 3.5-8**, below, would reduce potential impacts to less than significant levels.

Mitigation Measures

Measure 3.5-7: The following measures would apply in grasslands habitats within the Gravel Pits, Chain of Lakes, Stanley and Isabel Wellfields to reduce the potential for impacts to a less than significant level and avoid incidental take of burrowing owl at construction sites. Pre-construction surveys for burrowing owls shall be conducted 14 to 30 days prior to construction by a qualified biologist in accordance with the most recent CDFG protocol, currently the *Staff Report on Burrowing Owl Mitigation* (CDFG, 1995). Surveys would cover grassland areas within a 500-foot buffer (access permitting) and would require checking for adult and juvenile burrowing owls and their habitat. If owls are detected during surveys, occupied burrows would not be disturbed.

If occupied burrowing owl habitat is detected at proposed construction sites, measures to avoid, minimize, or mitigate impacts to burrowing owls would be incorporated into the project. Such measures would include the following:

- If owls are determined to be nesting at the identified site, an effort would be made to relocate project facilities to a distance of greater than 250-feet from the identified active burrow(s). If such measures are infeasible, the following measures would be implemented.

- Construction exclusion areas would be established around the occupied burrows in which no disturbance would be allowed to occur. During the nonbreeding season (September 1 through January 31), the exclusion zone would extend 160 feet around the occupied burrows. During the breeding season (February 1 through August 31), exclusion areas would extend 250-feet around occupied burrows.

- If the above avoidance requirements cannot be met, passive relocation of on-site owls may be implemented as an alternative, but only during the nonbreeding season. Passive relocation would be accomplished by installing one-way doors on the entrances of burrows located within 160 feet of the project site. The one-way doors would be left in place for 48 hours to ensure that the owls have left the burrow.

- For each burrow that may be excavated by project construction, two alternate unoccupied natural or artificial burrow would be provided outside of the 160-foot buffer zone (CDFG, 1995). The alternate burrows would be monitored daily for one week to confirm that owls have moved and acclimated.

- Burrows within the construction area would be excavated using hand tools, under the supervision of a qualified biologist, and then refilled to prevent reoccupation. If any burrowing owls are discovered during excavation, the excavation would cease and the owl allowed to escape. Excavation may be completed when the biological monitor confirms that the burrow is empty.

- Concurrently with a pre-construction worker education program and as needed during "tailgate" sessions for activities near sensitive biological resources, a qualified biologist would describe the life history and avoidance measures for special-status species in the regional vicinity, including burrowing owls, to contractors, their employees, and agency personnel involved in the project.

Implementation of these mitigation measures would minimize and avoid potential impacts to burrowing owl and thereby reduce this impact to a less than significant level.

Impact Significance after Mitigation: Less than significant.

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3.6 AIR QUALITY

3.6.1 SETTING

REGIONAL SETTING

Federal and state air quality standards have been established for six ambient air pollutants, primarily to protect human health and welfare. The six "criteria air pollutants" for which federal and state ambient standards have been established are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), suspended particulate matter (PM-10) and lead (Pb). Criteria pollutants are regulated separately from air toxics at both federal and state levels. Documented health effects from air pollution include acute respiratory infections, chronic bronchitis, pulmonary emphysema, and bronchial asthma.

CLIMATE AND METEOROLOGY

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, also are important. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The San Francisco Bay Area climate is Mediterranean in character, with mild, rainy winter weather from November through March, and warm, dry weather from June through September. There is a high percentage of sunshine at areas located away from the immediate coast, particularly in summer. The movement of marine air in a large part determines the temperature, humidity, wind, and precipitation throughout the year, depending upon the location and strength of the dominant Pacific high-pressure system and the coastal temperature gradient. Within the Bay Area, average air temperature increases as distance from the coast increases.

During summer and early autumn, persistent high pressure systems off the coast of California maintain conditions conducive to the formation of smog in the Bay Area. During winter months, cooler temperatures result in greater CO emissions from an increase in cold-starting internal combustion engines when catalytic converters are less efficient. Frequent stagnant weather conditions allow for the buildup of these emissions, resulting in higher CO concentrations. In general, northwesterly winds generated by high-pressure cells over the Pacific Ocean are drawn through the Golden Gate and forced into a more westerly orientation. Once through the Golden Gate, this air mass is split and rechanneled by the East Bay hills, producing southwesterly winds at San Pablo and northwesterly winds at San Jose.

The project site is located within the Livermore-Amador Valley subregion, which is characterized by hot summers, moderate winters, a distinct rainy season, and high winds. The western side of the valley is bordered by 1,000- to 1,500-foot hills with two gaps (the Hayward Pass and Niles Canyon) connecting the valley to the central Bay Area. The eastern side of the valley also is

bordered by 1,000- to 1,500-foot hills with one major passage to the San Joaquin Valley called the Altamont Pass and several secondary passages. The Black Hills and Mount Diablo lie to the north of the valley. The south side of the valley is bordered by 3,000 to 3,500-foot mountains.

During the summer months, when there is a strong inversion with a low ceiling, air movement is weak and pollutants become trapped and concentrated. Maximum summer temperatures in the Livermore Valley range from the high 80s to the low 90s with extremes in the 100s. Air pollution potential is high in the Livermore Valley, especially for photochemical pollutants in the summer and fall. High temperatures increase the potential for ozone to build up. The valley not only traps locally generated pollutants but can be the receptor of ozone and ozone precursors from other Bay Area counties. Similarly, on northeasterly wind flow days, most common in the early fall, ozone may be carried west from the San Joaquin Valley to the Livermore Valley (BAAQMD, 1999).

SENSITIVE RECEPTORS

Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because infants and children, the elderly, and people with health afflictions, especially respiratory ailments, are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Sensitive receptors within each Zone 7 wellfield area are described generally below. See **Figures 2-3** and **2-4** in **Chapter 2, Project Description** for the location of wellfields.

Bernal Wellfield

The Bernal Wellfield consists of residential, commercial, industrial, open space, and community uses. There are no schools or hospitals located within the Bernal Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses.

Hopyard Wellfield

The Hopyard Wellfield consists of residential, open space, and community uses. Foothill High School (Foothill Road) is located within the Hopyard Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses and the school.

Valley Avenue Wellfield

The Valley Avenue Wellfield consists of residential, open space, community, and industrial/commercial uses. Three schools are located within the Valley Avenue Wellfield, including Amador Valley High (Santa Rita Road), Harvest Park Intermediate (Valley Road), and Walnut Grove Elementary (Harvest Road). There are no hospitals located within this wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential and school uses.

Mocho Wellfield

The Mocho Wellfield consists of residential, industrial/commercial, and open space uses. There are no schools or hospitals located within the Mocho Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses.

Stoneridge Wellfield

The Stoneridge Wellfield consists of residential, industrial/commercial, open space, and community uses. Valleycare Medical Center and Fairlands Elementary (both of which are located off of W. Las Positas Boulevard) are located within the Stoneridge Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential areas, the medical center and the school site.

Martin Wellfield

The Martin Wellfield consists of residential, open space, and community uses. Mohr Elementary (Dennis Drive) is also located within the Martin Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses and Mohr Elementary School.

Busch Valley Wellfield

The Busch Valley Wellfield consists of residential, industrial/commercial, open space, and community uses, as well as mining uses. Alisal Elementary, off Santa Rita Road, is located within the Busch Valley Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to the existing residential uses and the school. Future sensitive receptors within this area could include schools and/or a hospital identified in the *Alameda County Specific Plan for Livermore-Amador Valley Quarry Area Reclamation* (November 1981) for the quarry area (see **Appendix 3.4** for a discussion of the Specific Plan).

Gravel Pits Wellfield

The gravel pits are currently used for mining operations. As part of the quarry reclamation, the gravel pits area would be converted to a "Chain of Lakes" area for groundwater management. One residence is located along El Charro Road. Therefore, sensitive receptors are limited to the single residence along El Charro Road and any future residences developed as part of the quarry reclamation (see **Appendix 3.4** for a discussion of the Specific Plan).

Stanley Boulevard Wellfield

The Stanley Boulevard Wellfield currently consists of mining uses. However, as part of its reclamation, the area would be converted to a mix of residential, commercial, industrial, agricultural, recreational and water management uses as described for the above wellfields. Therefore, sensitive receptors would be limited to residential uses, schools, or hospitals that would be developed as part of the quarry reclamation area (see **Appendix 3.4** for a discussion of the Specific Plan).

Chain of Lakes Wellfield

The Chain of Lakes Wellfield is currently used for mining of sand and gravel. As with the wellfields within the quarry areas, this would also be reclaimed for both water management and mixed uses (including residential, commercial, industrial, agricultural, and recreational uses) when mining operations are complete. Therefore, sensitive receptors would be limited to residential uses, schools, or hospitals that would be developed as part of the quarry reclamation area (see **Appendix 3.4** for a discussion of the Specific Plan).

Isabel Wellfield

The Isabel Wellfield currently consists primarily of mining operations. As part of its reclamation, the quarry areas would be converted to water management uses. Therefore, sensitive receptors are limited to existing residential uses.

3.6.2 EXISTING AIR QUALITY

BAAQMD's regional air quality monitoring network provides information on ambient concentrations of criteria air pollutants. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors. BAAQMD maintains a monitoring station in the Livermore-Amador Valley Area located on Old First Street in Livermore that provides pollutant emissions for ozone, carbon monoxide, and PM-10. Where information was unavailable for carbon monoxide in the year 2000, it was taken from a nearby station at 793 Rincon Avenue in Livermore. **Table 3.6-1** presents a five-year summary of air pollutant (concentration) monitoring data collected at these monitoring stations. Pollutant concentrations measured at the Livermore stations are generally representative of background air pollutant concentrations in the Livermore-Amador area. In **Table 3.6-2**, air pollutant concentrations are compared with state ambient air quality standards, which are more stringent than the corresponding national standards.

OZONE

Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_X). ROG and NO_X, which are emitted directly to the atmosphere, are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursor presence for approximately three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production.

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways (BAAQMD, 1999). Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. **Table 3.6-1** shows that the number of days during which ozone concentrations violated the state standard in Livermore was significantly less in 1997 and 2000 than the other years shown. Based on the data from 1996

TABLE 3.6-1
AIR POLLUTANT SUMMARY FOR
THE LIVERMORE-AMADOR VALLEY AREA, 1996-2000

Pollutant	Concentrations by Year[a]					
	Std.[b]	**1996**	**1997**	**1998**	**1999**	**2000**
Ozone:						
Highest 1-hour-average concentration, ppm[c]	0.09	**0.138**	**0.114**	**0.146**	**0.146**	**0.137**
Number of violations[d]		22	3	21	14	5
Carbon Monoxide:						
Highest 1-hour-average concentration, ppm	20	4.9	4.6	4.3	5.2	4.5
Number of violations		0	0	0	0	0
Highest 8-hour-average concentration, ppm	9.0	2.54	2.53	2.36	2.91	2.74
Number of violations		0	0	0	0	0
Suspended Particulate (PM-10):						
Highest 24-hour-average concentration, $\mu g/m^3$ [c]	50	**71.1**	**61.6**	**62.3**	**86.6**	**67.5**
Violations/Samples[e]		1/61	2/61	2/61	3/60	2/61
Annual Geometric Mean, $\mu g/m^3$	30	19.9	22.0	19.4	22.6	19

a Pollutant data were collected at the BAAQMD monitoring station on Old First Street in Livermore, except for the CO data for 2000, which was taken at the monitoring station at 793 Rincon Avenue in Livermore.
b State standard, not to be exceeded.
c ppm: parts per million; g/m^3: micrograms per cubic meter.
d For ozone, "number of violations" refers to the number of days in a given year during which excesses of the standard were recorded.
e Indicates the number of violations and the number of samples taken in a given year.

NOTE: **Bold** values are in excess of applicable standard. NA = Not Available.

SOURCES: California Air Resources Board (CARB), www.arb.ca.gov/adam, 2002; CARB, *Ambient Air Quality Standards Chart*, 1999.

through 2000, ozone concentrations in Livermore violate the state ozone standard on an average of 13 days per year. On-road motor vehicles (cars, pick-up trucks, heavy trucks, etc.) emit over 45 percent of the regional inventory of ozone precursors (i.e., ROG and NO_x) (CARB, 1998). Ozone concentrations in the Bay Area are expected to decline somewhat over the next several years, but violations of the state standard are expected to continue to occur on occasion in the sheltered inland valleys, such as the Livermore-Amador Valley Area, into the foreseeable future.

TABLE 3.6-2
STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Time Averaging	State[a]	National[b]
Ozone	1 hour	0.09 ppm[c]	0.12 ppm
Carbon Monoxide	1 hour	20 ppm	35 ppm
	8 hour	9.0 ppm	9 ppm
Nitrogen Dioxide	1 hour	0.25 ppm	NA
	Annual	NA	0.053 ppm
Sulfur Dioxide	1 hour	0.25 ppm	NA
	3 hour	NA	0.5 ppm
	24 hour	0.04 ppm	0.14 ppm
	Annual	NA	0.03 ppm
Suspended Particulate Matter (PM-10)	24 hour	50 $\mu g/m^3$ [c]	150 $\mu g/m^3$
	Annual	30 $\mu g/m^3$	50 $\mu g/m^3$
Sulfates	24 hour	25 $\mu g/m^3$	NA
Lead	30 day	1.5 $\mu g/m^3$	NA
	Calendar Quarter	NA	1.5 $\mu g/m^3$
Hydrogen Sulfide	1 hour	0.03 ppm	NA

[a] California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and suspended particulate matter are values that are not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

[b] National standards, other than ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

[c] ppm = parts per million by volume; (g/m^3 = micrograms per cubic meter.

NA = Not Applicable.

SOURCES: California Air Resources Board, *Ambient Air Quality Standards Chart*, updated 1999.

CARBON MONOXIDE

Ambient carbon monoxide concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Carbon monoxide concentrations also are influenced by wind speed and atmospheric mixing. Under inversion conditions, carbon monoxide concentrations may be distributed more uniformly over an area, out to some distance from vehicular sources.

When inhaled at high concentrations, carbon monoxide combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood (BAAQMD, 1999). This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

The data contained in **Table 3.6-1** show that the background carbon monoxide concentrations do not approach the state standards, even during stagnant wintertime conditions. However, carbon monoxide concentrations in the vicinity of congested intersections and freeway segments would be expected to be higher than the monitoring data in **Table 3.6-1**. Carbon monoxide emissions from on-road motor vehicles represent approximately 70 percent of the regional inventory of carbon monoxide (CARB, 1998). Carbon monoxide concentrations are expected to continue to decline in the Bay Area into the future due to existing controls and programs as well as the continued retirement of older, more polluting vehicles from the mix of vehicles on the road network.

SUSPENDED PARTICULATE MATTER (PM-10)

PM-10 consists of particulates 10 microns (a micron is one one-millionth of a meter) or less in diameter, which can be inhaled and cause adverse health effects. Particulates in the atmosphere result from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, primarily contribute to increases in local PM-10 concentrations, while others, such as vehicular traffic, affect regional PM-10 concentrations.

Extended exposure to PM-10 can increase the risk of chronic respiratory disease (BAAQMD, 1999). **Table 3.6-1** indicates the annual geometric mean of PM-10 is below the state standard, but that violations of the state 24-hour-average standard still occur on occasion. Entrained road dust from on-road motor vehicle movement over paved and unpaved roads represents over 40 percent of the regional inventory of PM-10 (CARB, 1998). PM-10 concentrations in the Bay Area are expected to increase in the future due to the predicted overall increase in the number of vehicle-miles traveled (VMT) and the associated increase in entrained paved road dust.

3.6.3 REGULATORY FRAMEWORK

Consistency with County and Local Regulations, Goals, and Policies

Alameda County, and the cities of Pleasanton and Livermore identify goals and policies in their General Plans that protect air quality and reduces pollutant emissions. Relevant policies are presented in **Appendix 3.6**. The proposed project would be consistency with these goals and policies of the affected jurisdictions.

Regulatory Agencies

The California Air Resources Board (CARB), California's state air quality management agency, regulates mobile emissions sources and oversees the activities of regional/county air districts.

CARB is responsible for establishing emissions standards for on-road motor vehicles sold in California. The Bay Area Air Quality Management District (BAAQMD) is the regional agency empowered to regulate air pollutant emissions from stationary sources in the Bay Area. BAAQMD regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review activities.

Plans, Policies, and Attainment Status

Regulation of air pollution is achieved through both national and state ambient air quality standards and emissions limits for individual sources of air pollutants. The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards (national standards) to protect public health and welfare. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM-10), and lead. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria set forth in the CAA. California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard. **Table 3.6-2** presents both sets of ambient air quality standards.

Under amendments to the federal CAA, EPA has classified Air Basins, or portions thereof, as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. In 1988, the state legislature passed the California Clean Air Act (CCAA), which is patterned after the federal CAA to the extent that it also requires areas to be designated as "attainment" or "nonattainment," but with respect to the state standards rather than the national standards.

The Livermore-Amador Valley Area lies within the urbanized areas of Alameda County, a sub-region within the nine-county San Francisco Bay Area Air Basin (Bay Area). The Bay Area is designated nonattainment for state and national ozone standards, and for the state PM-10 standard. In 1998, urbanized areas within the Bay Area were redesignated as attainment for the national carbon monoxide standard. The Bay Area is attainment or unclassified for all other ambient air quality standards.

Both the federal CAA and the state CCAA require nonattainment areas to prepare plans that include strategies for achieving attainment. These plans contain measures through which both stationary and mobile sources of pollutants can be controlled in order to achieve national and state ambient air quality standards. At the local level, Ozone Attainment Plans are prepared to comply with the national ozone standard and Clean Air Plans are prepared to comply with the California ozone standard. As such, the BAAQMD has published its *Bay Area 2000 Clean Air Plan*, which is the third triennial update of the District's original *Bay Area 1991 Clean Air Plan*. The goal of the plan is to improve air quality by reducing emissions of certain criteria pollutants (ROG and NOx) that lead to the formation of ozone through tighter industry controls, cleaner cars and trucks, cleaner fuels, and increased commute alternatives. The plan encourages cities and counties to adopt measures in support of this goal (BAAQMD, 2000).

The *Bay Area 2001 Ozone Attainment Plan* responds to the EPA's proposed partial disapproval of the Bay Area's *Bay Area 1999 Ozone Attainment Plan* and finding of failure to attain the national one-hour standard for ozone and establishes an ozone attainment plan that will provide for attainment by 2006 through implementation of stationary source, mobile source, and transportation control measures (BAAQMD, et. al., 2001). The co-lead agencies (the BAAQMD, the Metropolitan Transportation Commission [MTC], and the Association of Bay Area Governments [ABAG]) authoring the plan granted final approval of the plan on October 24, 2001. Subsequent CARB approval was granted on November 1, 2001. The Plan is currently under review by the EPA.

Permits

For this project, BAAQMD permits would not be required for construction and operation of the well facility and pipeline. However, construction contractors may be required to secure BAAQMD permits for some types of equipment, unless exempt under BAAQMD Regulation 2, Rule 1-105, which exempts equipment registered under CARB's Portable Equipment Registration Program.

As part of the project, Zone 7 would provide emergency backup power for the pump stations through the purchase of portable diesel-powered generators mounted onto trailers and the use of rented generators. Portable engines must either have a BAAQMD permit or be registered under CARB's Portable Equipment Registration Program. The Statewide Registration Program establishes a uniform system to regulate portable engines and associated equipment. Engines and associated equipment registered under the CARB program may operate throughout the state without having to obtain authorization or permits from the local air district (in this case the BAAQMD). However, in such cases, the BAAQMD holds the responsibility for enforcing the requirements established in the state regulation.

If the portable diesel-powered generators are not registered under the statewide program, they would fall under the BAAQMD definition of an Emergency Standby Engine and would be subject to permitting. As specified in BAAQMD Regulation 9, Rule 8-330, Emergency Standby Engines with an output rating of 50 brake horsepower or more may only be used under the following circumstances:

1. During an actual emergency. (Failure of regular electric power supply and failure of a primary motor [only for such time as needed to repair or replace the primary motor] are considered emergency uses.) Under emergency conditions, there is no limit to the number of hours the engine may be used.

2. Up to 100 hours per calendar year for reliability purposes[1] and up to 200 hours per year for an essential public service, which includes water treatment and delivery operations.

[1] Reliability-related activities include either: a) operation of an emergency standby engine to test its ability to perform for an emergency use; or b) operation of an emergency standby engine during maintenance of a primary motor. Reliability related purposes include testing and operation after a warning about a blackout has been given, but before a blackout has occurred.

Per BAAQMD Rule 9-8-530, Emergency Standby Engines shall be quipped with a non-resettable totalizing meter that measures hours of operation or fuel usage. Records shall be kept for at least two years and available for inspection by BAAQMD staff upon request. Facility operators are required to keep a monthly log of usage that indicates: a) total hours of operation; b) hours of emergency operation; and c) for each emergency, the nature of the emergency condition.

The CARB or BAAQMD permits would adequately control the duration of use of the generators and/or control the level of emissions of the generators. The incremental addition of exhaust fumes from the periodic use of the backup generators would not contribute substantial emissions within the vicinity of the project site or to the region as a whole.

3.6.4 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

As stated in Appendix G of the *CEQA Guidelines*, a project would generally have a significant effect on the environment if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any nonattainment pollutant;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people (Governor's Office of Planning and Research, 2002).

The following air quality analysis addresses the first four of these general criteria; the fifth is not discussed since the project would not include development of the types of land uses generally associated with potential odor impacts.

BAAQMD has published a set of recommendations that provide specific guidance on evaluating projects under CEQA relative to the above general criteria (BAAQMD, 1999). For temporary construction-phase impacts, BAAQMD recommends a qualitative approach that focuses on the dust control measures that would be implemented. If appropriate mitigation measures are implemented to control PM-10 emissions, then the impact from construction would be less than significant. The *BAAQMD CEQA Guidelines* contain a list of feasible control measures for construction-related PM-10 emissions.

The *BAAQMD CEQA Guidelines* also include significance criteria for evaluating operational-phase emissions from indirect sources associated with a project. Indirect sources include motor vehicle traffic associated with a given land use and do not include stationary sources covered under permit with the BAAQMD. The significance criteria for indirect sources are 80 pounds per day for ROG, NOx, and PM-10. Stationary sources that comply, or that would comply, with

BAAQMD Rules and Regulations generally would not be considered to have a significant air quality impact.

Lastly, BAAQMD recommends that cumulative air quality effects be discussed with reference to the consistency of a project to the regional Clean Air Plan. BAAQMD recommendations are used herein to identify significant effects of the project and significant cumulative effects.

IMPACTS AND MITIGATION MEASURES

Impact 3.6-1: Construction of the well sites and associated connection pipelines would result in a temporary increase in criteria air pollutant emissions. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Construction of each well site and associated connection pipeline would last approximately 12 months. Emissions associated with these construction activities are discussed below.

Construction emissions would result from excavation of soil, combustion of fuel to power heavy construction equipment, delivery and haul trucks and construction worker vehicle trips. While some amount of all of the criteria pollutants would be generated by construction emissions sources, the primary pollutants generated by construction would be NO_X (from combustion of diesel fuel) and PM-10 (from grading and excavation and vehicle travel over unpaved surfaces). Heavy-duty construction equipment used during well site construction would include, but not be limited to, a drill rig, a grader, an excavator, a backhoe, flat-bed trucks, and generators.

Assuming development of two treatment well facilities (25 by 95 feet) excavated to a depth of five feet, approximately 900 cubic yards of soils would be excavated at each site. Connection pipeline construction would occur in parallel with well facility construction. Construction within urban roadways would typically occur at a rate of 100 feet per day. The required trench would be approximately five feet wide and up to 10 feet deep. Up to 24,000 feet of connection pipeline could be required to connect two well sites to existing facilities. As discussed in **Chapter 2, Project Description**, approximately 27,000 cubic yards of soils would be excavated that a trench width and depth of six and five feet, respectively. Construction of a single stretch of connection pipeline (at 100 feet per day) would require that about 120 cubic yards of soil be excavated on a peak day. About 75 percent of the soil would be replaced in the trench, and the remaining 25 percent displaced by the connection pipeline would be transported off-site for disposal.

Fugitive dust emissions would vary from day to day depending upon the level and type of activity, silt content of the soil, and the prevailing weather. Larger-diameter dust particles (i.e., greater than 30 microns) generally fall out of the atmosphere within several hundred feet of construction sites, and represent more of a soiling nuisance than a health hazard, but the smaller-diameter particles (e.g., PM-10) generally remain airborne until removed from the atmosphere by moisture, and are associated with adverse health effects. Construction activities for this project would occur in the immediate vicinity of the proposed well facility or connection pipeline segment

under excavation at a given time. Based upon existing land uses within the wellfields, which include residential, and other sensitive land uses as described in Section 3.6.1 above, unmitigated construction dust emissions could result in significant local effects. BAAQMD recommends determination of significance with respect to construction impacts be based not on quantification of emissions and comparison to thresholds, but upon inclusion of feasible control measures as established in **Measure 3.6-1** for PM-10. Implementation of these measures would reduce construction dust impacts to a less-than-significant level.

Construction equipment, on-road heavy-duty trucks, and construction-worker commute vehicles would also generate criteria air pollutant emissions. Heavy-duty trucks would be used to transport excavated soil materials from the construction area to disposal or deposition sites to be determined by the contractor. Potentially, the contractor could use excavated materials at another construction site, or dispose of such materials as a demolition waste. In the event that excavated material is found to be contaminated, potential disposal locations could include Altamont Landfill, which is located near the eastern side of the valley near Altamont Pass. Trucks would travel roughly 20 miles to dispose of materials at this landfill.

Emissions from construction-worker commute trips would be minor compared to emissions from heavy-duty hauling trucks. Criteria pollutant emissions of ROG and NO_X from these emissions sources would incrementally add to regional atmospheric loading of ozone precursors during project construction. The *BAAQMD CEQA Guidelines* recognize that construction equipment emits ozone precursors, but indicate that such emissions are not expected to impede attainment or maintenance of ozone standards in the Bay Area (BAAQMD, 1999).

Mitigation Measures

Measure 3.6-1: During construction of wells with offsite treatment and connection pipeline installation, construction contractors shall implement a dust control program which complies with BAAQMD requirements and contains the following specific elements:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials *or* require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking area and staging areas at construction sites.
- Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.

Impact Significance After Mitigation: Less than significant.

Impact 3.6-2. The project would result in negligible operational air emissions from pump operation and vehicle trip generation. Less than Significant with Mitigation.

Well Operation

Operational air emissions from the project would include criteria air pollutant emissions from additional vehicle trips for operation, deliveries, and maintenance of the well sites, and emissions associated with pump and emergency generator operation. Current well facilities are maintained on a daily to weekly basis by Zone 7 personnel. Deliveries and maintenance are anticipated to generate seven vehicular round trips per week per well site. Given the small number of additional vehicle trips, related vehicular emissions would be negligible.

Pumps at each facility would be electric and therefore would not emit significant amounts of criteria pollutants. Each pump would be up to 700 horsepower. Well operations would vary on an annual basis depending upon hydrologic conditions. However, based upon single year drought scenario, it is anticipated that individual wells would be operated continually for a 6-month period between April and September.

As described in the setting above, portable generators used during an emergency would be considered stationary point sources and would be subject to BAAQMD permitting or permitting under CARB's Portable Equipment Registration Program. The permit review process would ensure that all air emissions associated with the facility comply with applicable BAAQMD and CARB standards. The permits would minimize the potential for air quality impacts.

Mitigation Measures

Measure 3.6-2: Zone 7 shall acquire relevant permits from BAAQMD/CARB necessary for the operation of portable generators if portable engines do not include a BAAQMD permit or are not registered under the CARB Portable Equipment Registration Program. Acquisition and compliance with relevant permits would ensure that generator operations would not result in exceedance of criteria pollutants.

Impact Significance After Mitigation: Less than significant.

Impact 3.6-3: The well facilities would not generate objectionable odors. No Impact.

Well Operation

Water treatment, either through physical processes such as gravitational settling or filtration or through chemical treatment to disinfect the water, has some potential to generate odors. Odors may derive from organic material suspended in the water due to out gassing of dissolved gases used for disinfection, or from sludge that has been removed from the water during treatment. While odor is a significant concern at wastewater treatment plants, it is generally not a concern at facilities related to treatment of water.

Operation of the proposed Project consists of withdrawal of groundwater from the Main Basin. The groundwater, whether disinfected at the site and distributed to customers, or conveyed to other well treatment sites, would not generate odors. Therefore, no impact would occur, and mo mitigation measures are required.

Mitigation Measures

No mitigation measures required.

Impact Significance: No impact.

REFERENCES – Air Quality

Alameda County, *Alameda Specific Plan for Livermore-Amador Valley Quarry Area Reclamation*, November 1981.

BAAQMD (Bay Area Air Quality Management District), *Bay Area 2000 Clean Air Plan*, December 20, 2000.

BAAQMD, Association of Bay Area Governments (ABAG), and Metropolitan Transportation Commission (MTC), *Final Bay Area 2001 Ozone Attainment Plan*, July 18, 2001.

BAAQMD, *BAAQMD CEQA Guidelines*, December 1999.

CARB, *Ambient Air Quality Standards Chart*, www.arb.ca.gov/aqs/aqs.htm, updated 1999.

CARB, *Emission Inventory 1996*, October 1998.

CARB, *National and State Nonattainment Designations*, www.arb.ca.gov/aqs/aqs.htm, August 2002.

Governor's Office of Planning and Research, California Environmental Quality Act, CEQA Guidelines, Appendix G, 2002.

3.7 NOISE

3.7.1 SETTING

NOISE PRINCIPLES AND DESCRIPTORS

Environmental noise usually is measured in A-weighted decibels (dBA).[1] Some representative noise sources and their corresponding noise levels (in dBA) are shown in **Figure 3.7-1**. Environmental noise typically fluctuates over time, and different types of noise descriptors are used to account for this variability. Typical noise descriptors include the energy-equivalent noise level (Leq),[2] the community noise equivalent level (CNEL)[3], and the day-night average noise level (DNL).[4] The CNEL and DNL descriptors are commonly used in establishing noise exposure guidelines for specific land uses. As a general rule, in areas where the noise environment is dominated by traffic, the Leq during the peak-hour is generally equivalent to the DNL at that location.

Noise levels are measured on a logarithmic scale, instead of a linear scale. On a logarithmic scale, the sum of two noise sources of equal loudness is 3 dBA greater than the noise generated by just one of the noise sources (e.g., a noise source of 60 dBA plus another noise source of 60 dBA generate a composite noise level of 63 dBA). To apply this formula to a specific noise source, in areas where existing levels are dominated by traffic, a doubling in the volume of the traffic will increase ambient noise levels by 3 dBA. A 3-dBA increase is the smallest change in noise level detectable to the average person; an increase of 10 dBA is perceived as a doubling of loudness.

The noise level experienced at a receptor depends on the distance between the source and the receptor, presence or absence of noise barriers and other shielding features, and the amount of noise attenuation (lessening) provided by the intervening terrain. For line sources, such as motor or vehicular traffic, noise decreases by about 3.0 to 4.5 dBA for every doubling of the distance from the roadway. For point or stationary noise sources, such as electric motors, a noise reduction of 6.0 to 7.5 dBA is experienced for each doubling of the distance from the source.

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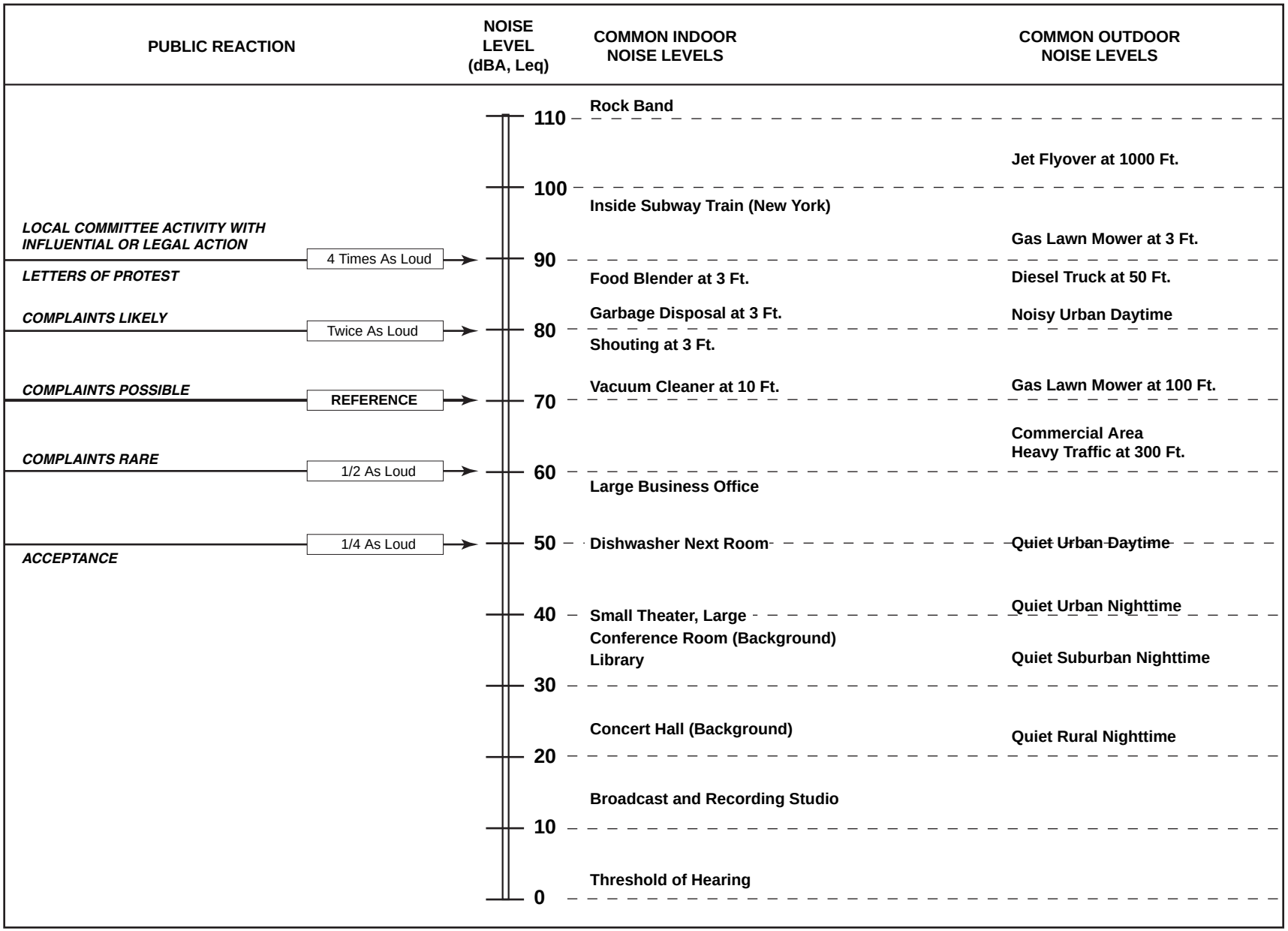
1 A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level") measured in dB. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response of the typical human ear at commonly encountered noise levels.

2 Leq, the energy equivalent noise level (or "average" noise level), is the equivalent steady-state continuous noise level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level that actually occurs during the same period.

3 CNEL, the Community Noise Equivalent Level, is a weighted 24-hour noise level. With the CNEL, noise levels between 10:00 p.m. to 7:00 a.m. are adjusted upward by ten dBA. Noise levels between 7:00 p.m. to 10:00 p.m. are penalized five dBA. Both of these adjustments take into account the greater annoyance of nighttime noise as compared to daytime noise.

4 DNL, the day-night average noise level, is a weighted 24-hour noise level. With the DNL descriptor, noise levels between 10:00 p.m. and 7:00 a.m. are adjusted upward by ten dBA to take into account the greater annoyance of nighttime noise as compared to daytime noise.



SOURCE: Caltrans Transportation Laboratory Noise Manual, 1982; and Modification by Environmental Science Associates

Figure 3.7-1
Effect of Noise on People

EXISTING NOISE LEVELS

Zone 7 serves communities within the Livermore-Amador Valley, including the jurisdictions of Pleasanton, Livermore, and portions of unincorporated Alameda County. Generally, the noise environment for these jurisdictions is dominated by noise from transportation sources such as aircraft, railways, and freeways and highways. Freeway and highway vehicle traffic are the primary and most persistent source of noise in the region. Aircraft operations contribute to the regional noise environment primarily during takeoff and landing operations, but also include noise from aircraft flyovers. Rail activity and corresponding noise are intermittent along railroad lines.

The wellfields are located throughout the Livermore-Amador Valley, and portions of these fields are near noise sources such as the Livermore Municipal Airport, Interstate 680 (I-680), I-580, and Union Pacific Rail Road. I-580 and I-680 are the primary regional noise sources, and the 60-dBA contours are about 2,000 feet from the centerline of the highway (Alameda County, 1993). Other major collector and arterial streets with significant traffic volumes and noise from vehicular traffic are Hopyard Road, West Las Positas Boulevard, El Charro Road, Bernal Avenue, and Stanley Boulevard (see **Section 3.9**).

ESA collected background noise data at six sites near existing water wells in the project area on the morning of July 9, 2002. The spot measurements were recorded when the wells were not operating. **Table 3.7-1** shows the measured background noise levels and the surrounding land uses at these locations, **Table 3.7-2** shows the noise levels recorded in the vicinity of the well sites during well operation. The loudest noise levels were recorded during start-up operations when the initial flow is discharged. The noise levels recorded during start-up reflect noise produced from both the interior pumps and exterior equipment, primarily the discharge manifold. Well startup typically lasts from 3 to 30 minutes as the well casing is flushed. When the initial discharge is complete, the predominate noise source is the pump within the housing. These pumps operate for extended periods of time during peak demand. **Table 3.7-2** provides the noise measurements taken at the specified distances from the pump housing and demonstrate the level of attenuation with distance. For two of the well sites, the recorded level from pump operations is less than the background traffic noise. For the remaining four sites, noise levels are between 4 and 7 dBA higher than ambient background noise levels.

Based upon these measurements, well operations do contribute to ambient noise levels in the vicinity of existing well sites. However, with attenuation provided by the distance between the facility and the property line, noise measurements at all well facilities were below 65 dBA at 50 feet.

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise), the distance from noise source, and the types of activities typically involved. Residential areas, schools and hospitals generally are more sensitive to noise than are commercial and industrial

TABLE 3.7-1
BACKGROUND DAYTIME NOISE LEVELS IN WELLFIELD AREAS

Well Facility	Measured Noise Levels	Audible Noise Sources	Surrounding Land Uses
Hopyard 6	45-50 dBA	Local traffic (no cars passing), airplanes	Residential, parking lot, Zone 7 Administrative offices, Hopyard Road
Hopyard 9	48-51 dBA	Birds, log, leaf blower	Park, residential
Mocho 2	66-70 dBA	Local traffic	Stoneridge Road, public storage, school, Santa Rita Road
Mocho 3	60-72 dBA	Local traffic	Stoneridge Road, church, residences, trail
Mocho 4	56-58 dBA	Local traffic, birds	Stoneridge Road, open space, Santa Rita Road
Stoneridge	49-50 dBA	Local traffic, birds, pump, planes	Residential, preschool, trail

TABLE 3.7-2
MEASURED NOISE LEVELS DURING WELL FACILITY OPERATIONS

Well Facility	Pump Size	Measured Exterior Noise Levels		
		During Start-up Operations	Near Discharge Manifold	Continuous Pump Operations
Hopyard 6	500 hp	73 dBA next to wall with no louvers	53 dBA at 41 ft	50.90 dBA at 50 ft from wall with no louvers
Hopyard 9	200 hp	55-80 dBA at exterior walls with and without louvers	63 dBA at 20 ft	36 dBA at 50 ft outside wall with no louvers
Mocho 2	250 hp	--	--	51.46 dBA at 50 ft from wall with louver
Mocho 3	600 hp	79 dBA next to wall with no louvers	61 dBA at 55.4 ft	64.06 dBA at 50 ft from wall with louvered door
Mocho 4	600 hp	79.7 dBA[1] next to louvered wall	--	40.56 dBA at 50 ft from wall with louvers
Stoneridge	700 hp	74.8 dBA[1] next to louvered wall	66 dBA at 53 ft	59.86 dBA at 50 ft from wall with louvers

[1] Average of recorded 5 second intervals

land uses. The sensitive receptors within each wellfield are described generally below, and are listed in **Section 3.4, Land Use, Table 3.4-1**.

Bernal Wellfield

The Bernal Wellfield consists of residential, commercial, open space, and community uses. There are no schools or hospitals located within the Bernal Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses.

Hopyard Wellfield

The Hopyard Wellfield consists of residential, open space, and community uses, including Foothill High School. No hospitals are in the wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses and the high school.

Valley Avenue Wellfield

The Valley Avenue Wellfield consists of residential, open space, community, and industrial/commercial uses. Schools located within the Valley Avenue Wellfield include Amador Valley High (Santa Rita Road), Harvest Park Intermediate (Valley Road), and Walnut Grove Elementary (Harvest Road). There are no hospitals located within this wellfield.

Mocho Wellfield

The Mocho Wellfield consists of residential, industrial/commercial, and open space uses. There are no schools or hospitals located within the Mocho Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses.

Stoneridge Wellfield

The Stoneridge Wellfield consists of residential, industrial/commercial, open space, and community uses. Valleycare Medical Center and Fairlands Elementary (both of which are located off of W. Las Positas Boulevard) are located within the Stoneridge Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential areas, the medical center and the school.

Martin Wellfield

The Martin Wellfield consists of residential, open space, and community uses. Mohr Elementary (Dennis Drive) is also located within the Martin Wellfield. Therefore, sensitive receptors in this wellfield are generally limited to residential uses and Mohr Elementary School.

Busch Valley Wellfield

The Busch Valley Wellfield consists of residential, industrial/commercial, open space, and community uses, as well as mining uses. There is one school (Alisal Elementary - Santa Rita Road), but no hospitals, located within the Busch Valley Wellfield site. Therefore, sensitive

receptors in this wellfield are generally limited to the existing residential uses and the school. Future sensitive receptors within this area could include schools and/or a hospital identified in the *Reclamation Specific Plan* for the quarry area.

Gravel Pits Wellfield

The gravel pits are currently used for mining operations. As part of the quarry reclamation, the gravel pits area would be converted to a "Chain of Lakes" area for groundwater management and redeveloped for agricultural and recreational uses. One residence is located along El Charro Road. Therefore, sensitive receptors are limited to the single residence along El Charro Road and any future residences developed in conjunction with the agricultural uses identified in the *Reclamation Specific Plan*.

Stanley Boulevard Wellfield/Chain of Lakes Wellfield/Isabel Wellfield

These wellfields currently consists of mining uses. However, as part of its reclamation, the area would be converted to a mix of residential, commercial, industrial, agricultural, and water management uses. Sensitive receptors would be limited to future residential uses, schools, or hospitals that would be developed as part of the quarry reclamation area.

3.6.2 REGULATORY FRAMEWORK

Regulation of the noise environment is conducted by local entities, which adopt plans, policies, and ordinances that establish the acceptable noise levels within their jurisdictions. The policies to the noise environment are described below. Additional goals and policies associated with noise for each individual jurisdiction are presented in **Appendix 3.6** of this DEIR. Zone 7 wellfields are subject to standards and policies established by the City of Pleasanton, the City of Livermore, and Alameda County depending upon the well field location.

ALAMEDA COUNTY

Five of the wellfields include unincorporated lands of Alameda County: Busch Valley Wellfield, Gravel Pit Wellfield, Stanley Wellfield, Chain of Lakes Wellfield, and Isabel Wellfield. Wellfields in the unincorporated areas of Alameda County are covered by the East County Area Plan (Alameda County, 2002). The Noise Element of the East County Area Plan (2002) identifies noise and land use compatibility guidelines for development in the unincorporated portions of Alameda County and contains policies addressing community noise issues. The Noise Element provides noise control land use compatibility guidelines based on that identified in the California Office of Noise Control (1976). For noise sensitive uses (residences, schools, churches, hospitals, etc.), the Noise Element compatibility guidelines indicate that noise levels up to 60 dBA are clearly acceptable.[5] The Noise Element compatibility guidelines indicate that

[5] The East County Area Plan defines "normally acceptable" as: "land use satisfactory, buildings need no special noise insulation" (Alameda County, 1993). "Conditionally acceptable" as: new construction or development [that] should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

noise levels between 50-65 dBA are normally acceptable for residential uses, and 50-70 dBA are normally acceptable for schools, libraries, churches, hospitals, neighborhood parks, golf courses, water recreation, industrial, utilities, and agricultural uses. The County has no noise ordinance outside of the Noise Element. The Noise Element also provides Exterior Noise Level Standards (dBA) based on cumulative number of minutes in any one-hour time period for day and night time for two general land use types: 1) residential, school, hospital, church, public library properties; and 2) commercial properties.

CITY OF PLEASANTON

The General Plan for the City of Pleasanton contain noise compatibility guidelines for land uses within the City (City of Pleasanton, 1996). For residential land uses, schools, libraries, museums, hospitals, personal care, meeting halls, and churches, a noise environment characterized by noise levels less than 60 dBA, DNL is considered normally acceptable. For parks and recreational areas, noise levels less than 65 dBA, DNL is considered normally acceptable, whereas for commercial and industrial uses, 70 dBA, DNL is considered normally acceptable. The City of Pleasanton (1996) recognizes that the goal of 60 DNL as a maximum outdoor noise level in residential areas "cannot necessarily be reached in all residential areas within the realm of economic or aesthetic feasibility, but that this goal should generally be applied where outdoor use is a major consideration (e.g., backyards in single-family housing projects and recreation areas in multi-family housing projects). Front yards can generally tolerate an DNL of up to 65 dB." The Pleasanton General Plan also provides exceptions for pieces of equipment that generate less than 83 dBA at a distance of 25 feet during the daytime.

The City of Pleasanton Noise Regulation (9.04.010 – 9.04.110) provides noise limits for public property. Noise resulting from person, machine, animal, device, or any combination of these on these properties in residential, commercial, and industrial areas shall be limited 60 dBA, 70 dBA, and 75 dBA, respectively at a distance of 25 feet or more from the noise source or sources. (Section 9.04.060). The Noise Regulation provides an exception for these provisions for any noise in residential areas for which does not produce a noise level exceeding 70 dBA at a distance of 25 feet under its most noisy condition of use between the hours of 8:00 a.m. and 8:00 p.m., except Sundays and holidays (10:00 a.m. to 6:00 p.m.).

Exceptions are also provided during the daytime for construction activities (Section 9.04.070 and 9.04.100). Between 8:00 a.m. and 8:00 p.m., except Sundays and holidays (10:00 a.m. to 6:00 p.m.), construction, alteration or repair activities which are authorized by a valid city permit shall be allowed if they meet at least one of the following noise limitations: 1) No individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible; or 2) the noise level at any point outside of the property plane[6] of the project shall not exceed 86 dBA.

[6] "Property plane," defined in the City's of Pleasanton's Noise Regulations, means a vertical plane including the property line which determines the property boundaries in space.

CITY OF LIVERMORE

The City of Livermore has adopted noise level guidelines for land uses within the City (City of Livermore, 2004). Normally acceptable noise levels for residential uses are 60 to 65 DNL or CNEL (dB) or below. Commercial uses, playgrounds and neighborhood parks with noise levels up to 70 DNL or CNEL (dB) are normally acceptable, whereas for industrial uses, up to 75 DNL or CNEL (dB) are normally acceptable. Noise levels less than 70 DNL or CNEL (dB) are conditionally acceptable[7] for residential uses, transient lodging, schools, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, and amphitheatres.

The Noise Element identifies techniques for noise control, which include: 1) sound proofing through construction; 2) attenuation through design; 3) attenuation by distance; and 4) provision of noise buffers.

The Livermore Municipal Code, Chapter 9.36, prohibits certain loud, disturbing, unusual, and unnecessary noise in order to safeguard the public health and safety. Relevant sections of the code include Section 9.36.070, which prohibits the creation of excessive noise on streets adjacent to schools, courts, churches, and hospitals. Section 9.36.080 prohibits the operation of noise-generating construction equipment (pile drivers, pneumatic hammers, derricks and similar equipment that produce loud or unusual noise) between the hours of 8:00 p.m. and 7:00 a.m.

Table 3.7-3 shows the normally acceptable noise levels for different land uses, as specified in the general plans in Alameda County and the cities of Pleasanton and Livermore.

TABLE 3.7-3
NORMALLY ACCEPTABLE NOISE LEVELS BY LAND USE (DNL)

	High and Low Density Residential, Transient Lodging	Schools, Libraries, Churches, Hospitals	Playgrounds, Neighborhood Parks, Golf Courses, Water Recreation	Industrial, Utilities, Agricultural	Office Buildings, Business Commercial, Professional
Alameda County[a]	50-65	50-70	50-70	--	--
City of Pleasanton[b]	45-60	45-60	45-65	45-70	45-70
City of Livermore[c]	45-65	45-70	45-70	45-75	45-70

[a] Alameda County values given in dB, but evaluated as DNL (Alameda County, 1993 referencing the California Office of Noise Control, 1976)
[b] City of Pleasanton General Plan (1996)
[c] City of Livermore General Plan (2004)

[7] The City of Livermore's definition for "Conditionally Acceptable" is the same as that identified for the ECAP, above.

Table 3.7-4 provides the exterior noise standards of the three jurisdictions established by Alameda County (30 minute noise level) and City of Pleasanton (maximum noise level), based on the noise ordinances and municipal codes.

TABLE 3.7-4
EXTERIOR NOISE STANDARDS IN WELLFIELD JURISDICTIONS

	Residential		Commercial		Industrial
	Daytime (Lmax) [a]	**Nighttime (Lmax)** [a]	**Daytime (Lmax)** [a]	**Nighttime (Lmax)** [a]	**(Lmax)** [a]
Alameda County [b]	--	--	--	--	--
City of Pleasanton [c]	60	60	70	70	75
City of Livermore [d]	--	--	--	--	--
	(30-minute)	**(30-minute)**	**(30-minute)**	**(30-minute)**	**(30-minute)**
Alameda County [b]	50	45	65	60	--
City of Pleasanton [c]	--	--	--	--	--
City of Livermore [d]	--	--	--	--	--

[a] Lmax = Maximum noise level not to be exceeded during any one-hour period.
[b] Alameda County Noise Ordinance, Chapter 6.60 (1992). Residential category also schools, hospitals, churches, and public libraries. Measured at any point on the affected property.
[c] City of Pleasanton municipal code (Chapter 9.04). Measure measured 25 feet from source on public property and at the property line for private property.
[d] There are no quantitative noise standards in the City of Livermore Municipal Code (Chapter 9.36).

SOURCE: ESA, 2002

3.7.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Based on the California Environmental Quality Act (CEQA) Guidelines (Governor's Office of Planning and Research, 1996), a project may be deemed to have a significant effect on the environment if it would increase substantially the ambient noise levels for adjoining areas. With temporary noise impacts, identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, as well as the absolute change in dBA levels. A change in noise levels of less than 3 dBA is not discernible to the general population, but an increase in average noise levels of from 3 to 5 dBA is clearly discernible to most people (Caltrans, 1991). An increase in the noise environment of 5 dBA or greater is considered to be the minimum required increase for a change in community reaction (USDOT, 1990). The significance criteria adopted for this project combine elements of the three municipal jurisdictions within the Zone 7 planning area.

For construction-related impacts from this project, a noise impact would be considered significant if it persisted for more than 5 days and resulted in average noise levels that exceeded 60 dBA DNL in residential areas, schools and hospitals; 65 dBA DNL in parks and other recreational areas, and 70 dBA DNL in commercial and industrial areas. These levels are within the "normally acceptable" land use compatibility noise range of the General Plans in the jurisdictions where a project elements are proposed. Short term increases in noise levels during daytime hours would not be considered significant, provided the levels are less than 83 dBA at 25 feet or 86 dBA at the property line, the levels for construction noise that the City of Pleasanton exempts from its noise ordinance. Daytime hours are considered to be 8 a.m. to 7 p.m. on weekdays and Saturday and 10 a.m. to 5 p.m. on Sundays and holidays, a combination of the most restrictive hours from the construction exemptions from the three jurisdictions.

For operational impacts, a noise impact would be considered significant if it would result in any of the following 3 conditions 1) 3 dBA increase over existing 24-hour ambient noise levels, 2) if average noise levels would exceed the exterior noise standards or 3) the "normally acceptable" land use compatibility noise range of the General Plan in the jurisdiction where a project element is proposed.

IMPACTS AND MITIGATION MEASURES

Impact 3.7-1: Construction of well sites and pipeline construction would generate temporary, intermittent noise levels above existing ambient conditions in the vicinity of the project, and could result in significant impacts to surrounding properties. Less than Significant with Mitigation.

Implementation of well facilities would include three types of construction activities that would affect the noise environment; well facility construction, well drilling and development, and pipeline installation. Each of these construction types are discussed below.

Well Drilling and Pump Testing

Individual well facilities would be constructed at a rate of approximately 1 well per year, with wells being drilled individually. Well construction would include 24-hour borehole drilling and subsequent pump testing. Drilling of production wells on a 24-hour basis is required to avoid borehole collapse and maintain well integrity. Construction equipment used for this type of operation typically include either a direct or reverse rotary drill rig, a compressor, a 10 kW generator, a welding machine, a D-9 caterpillar for site grading, a backhoe, a geophysical logging truck and miscellaneous support vehicles. Actual drilling operations would occur 24-hours a day over an approximately 4-6 week period (depending upon geologic conditions), with variations in equipment operating times and types dependent upon the development phase.

The unabated noise from the drill rig is expected to be 92 dBA at distance of 100 feet (Bolt, Beranek, and Newman, 1971). This is equivalent to 99 dBA DNL, which provides a weighting for nighttime operations. This noise would be considerably above existing ambient noise levels

and would attenuate at a 6 dBA per doubling of distance. **Table 3.7-5** shows noise levels and their respective attenuation distances for nighttime construction without appropriate mitigation.

TABLE 3.7-5
SHORT TERM NOISE LEVELS, WELL DRILLING OPERATIONS AND SOUND WALL MITIGATION

Distance	Noise Levels (dBA)			Noise Levels (DNL)		
	Noise Level	15 dBA Sound Wall	20 dBA Sound Wall	Noise Level	15 dBA Sound Wall	20 dBA Sound Wall
100	92.4	77.4	72.4	99	84	79
200	86.4	71.4	66.4	93	78	73
400	80.4	65.4	60.4	87	72	67
800	74.4	59.4	54.4	81	65	60

Noise levels can be reduced though the use of onsite engineered noise walls, which act as a shield to both deflect and attenuate noise levels. Engineered sound walls using buffering materials with a Sound Transmissivity Classification (STC) of 18 or greater have been shown to reduce noise levels by 15 to 40 dBA (Environmental Noise Control, 2002). **Table 3.7-5** also shows noise levels at varying distances with implementation of engineered sound walls onsite, assuming a noise reduction of 15 dBA and 20 dBA respectively. With implementation of these measures it is anticipated that construction activities would comply with City of Pleasanton noise ordinance criteria regarding construction activities, i.e. 86 dBA at the property line during daytime hours. Implementation of appropriate noise barrier mitigation would reduce levels within 100 feet of the drill rig to 77 dBA, which is equivalent to a DNL of 84 dBA. At 400 feet from the drill site, noise levels would be approximately 60 dBA, which is equivalent to a DNL of 67 dBA. Noise levels at this distance from the drilling location would be generally consistent with noise compatibility guidelines identified by the three jurisdictions within the Zone 7 service area (65 dBA Alameda County, 65 dBA DNL for the City of Pleasanton).

Land uses within individual wellfield are variable, and include residential, commercial, industrial, and open space uses. Construction noise would fluctuate depending on construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers between noise source and receptor. However, construction of wells within individual well fields would have the potential to expose adjacent properties within a 400 foot radius of the drilling operation to nighttime noise levels greater than 60 dBA, or a DNL of 65 dBA. This would result in short-term construction impacts to residential properties within this radius area.

At the conclusion of drilling, the well would have to be tested, which requires the use of a generator to operate a pump. The noise levels from an unenclosed 600 hp pump have been measured at 99 dBA at 9.5 feet (ESA, 2002). This rate is equivalent to 78.6 dBA at 100 feet,

which is substantially less than the noise levels associated with drilling, but still above the levels considered normally acceptable for residential areas. Pump testing would be implemented during normal construction hours, and would be included with the noise containment measures implemented for the well drilling activities. With a noise attenuation provided by the noise wall, impacts, and limitations to normal construction hours, pump testing impacts would be less than significant.

The unabated noise levels from drilling and testing of the wells would exceed the normally acceptable noise levels and the significant criteria for all land uses. The use of quieter drilling equipment and noise walls may reduce the noise from drilling noise to acceptable levels for commercial or industrial uses, depending on the configuration of the site and the noise walls, but would result in significant impacts if the site were located near residential areas or other sensitive receptors. The level of impact would depend on the distance between the well site and the surrounding sensitive uses. Zone 7 would inform residents near the future well sites of upcoming 24-hour construction activities and offer motel accommodations for those residents that would be significantly affected, as determined by actual noise measurements. With implementation of the measures below, adverse impacts would be reduced to less than significant levels.

Nighttime noise from 24-hour well drilling would not meet the construction exemption in Pleasanton and Alameda County and would conflict with noise regulations of the City of Livermore. Pursuant to California Government Code Section 53091, projects involving facilities for the production, generation, storage or transmission of water by local agencies such as Zone 7 are not subject to local building and zoning ordinances. This provision recognizes the importance of water and other utility projects and can be applied to the construction activities of the proposed project. In practice, Zone 7 works with host jurisdictions and neighboring communities during project planning in order to conform to local policies to the extent possible.

Well Facility Construction and Pipeline Construction

Table 3.7-6 shows noise levels from typical construction equipment that would be used during the installation of the surficial facilities at the well sites and during pipeline construction.

Noise from construction activity generally attenuates at six to nine dBA per doubling of distance. **Table 3.7-7** shows the estimated range of noise levels from typical construction activities at various distances from a construction site.

Based on an attenuation of 6 dBA per doubling of the distance, **Table 3.7-7** indicates that the noise levels from daytime construction of the surface facilities at the well sites would be less than the significance criteria at a distance of 100 feet and would attenuate to less than measured daytime background levels at a distance of 800 feet.

Pipeline installation is likely to be located along public roads and rights-of-way, which usually have high ambient noise levels from vehicular traffic. The pipeline alignments would typically be 50 to 100 feet from adjacent residences and could temporarily exceed the significance criteria, depending on the relationship of the alignment to the adjacent properties. Pipeline construction

TABLE 3.7-6
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level (dBA, Leq)[a]
Front Loaders	79
Compressors	81
Cranes	83
Trucks	91
Pavers	89
Backhoes	85
Drill rig	98

[a] Average noise level 50 feet from the source

SOURCE: Bolt, Beranek, and Newman, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, December 1971.

TABLE 3.7-7
ATTENUATION OF TYPICAL CONSTRUCTION NOISE LEVELS

Distance from Construction Site	Range of Noise Levels from Typical Construction Activities
100 feet	73 to 85 dBA
200 feet	67 to 79 dBA
300 feet	63 to 75 dBA
400 feet	61 to 73 dBA
500 feet	59 to 71 dBA
600 feet	57 to 69 dBA
800 feet	55 to 67 dBA

SOURCE: ESA, 2002.

estimated to proceed at an rate of 100 feet/day, would be limited to weekdays between 8:00 a.m. to 5:00 p.m. Thus, although the noise levels from pipeline construction equipment could exceed 86 dBA, at any one point along the route these levels would be experienced for only a few days, and the installation of the pipelines would not result in significant noise impacts.

Mitigation Measures

Measure 3.7-1a: Zone 7 shall select well sites that are at least 400 feet from occupied school or hospital buildings or shall perform site-specific analyses, prior to site selection, that demonstrate that construction noise levels would not cause interior noise levels at these institutions to exceed 50 dBA.

Measure 3.7-1b: If the proposed well and treatment sites are adjacent to residences, the wells, pump house, treatment facilities, and discharge points shall be setback at least 100 feet from property lines adjacent to these sensitive receptors, if sufficient space is available.

Measure 3.7-1c: For well sites that are located with 500 feet of residential, institutional, or hotel receptors that could be affected by 24-drilling operations, Zone 7 shall include in construction specifications requirements for installation and maintenance of a engineered sound wall during 24-hour construction activities. Sound wall specifications shall include use of materials with a minimum Sound Transmissivity Classification (STC) of 18, and shall be installed to a height that intercepts the line of sight between the drill rig and sensitive receptors. Minimum height shall be 15 feet. Performance standard for this noise mitigation measure shall be reduction of noise levels within 400 feet of the drill rig to 60 dBA.

Measure 3.7-1d: All residents and other sensitive receptors within 1,000 feet of the drilling locations of the project shall be notified four weeks in advance. The information distributed shall include the following:

- A brief description of the drilling and testing operations, the necessity for 24-hour drilling, and the proposed schedule for drilling and testing activities.
- An offer of temporary motel accommodations to residents with homes where the noise levels influenced by Zone 7 drilling are demonstrated to exceed 65 dBA DNL, estimated at a radius of 400 feet from the drill rig location. Zone 7 shall offer payment for moderately priced motel accommodations for the duration of the period when nighttime drilling occurs.
- A contact person and 24-hour contact telephone number for noise complaints.
- Zone 7 shall evaluate noise complaints associated with nighttime drilling within 24 hours of receipt of the complaint, but shall repeat noise investigations at a particular location, if requested, for no more than two times.

Impact Significance After Mitigation: Less than significant.

Impact 3.7-2: Operational activities would generate noise levels above existing ambient levels in the vicinity of the project. Less than Significant with Mitigation.

The facilities at each Zone 7 well site would consist of a production well, a 700-hp pump, pipelines, electrical control rooms, transformers, and a discharge structure. Additional chemical disinfection facilities would be located at the sites where treatment would be performed. The pumping and water treatment ancillary facilities would be contained within a noise attenuating

building structure. The discharge structure may be within a separate structure, or the discharge facilities may be open, depending on the site characteristics. Transformers would be located outside the main building, and would be contained in a separate enclosure. Transformers are know to generate "pure tones," or continuous hums that could potentially affect the surrounding noise level.

The most significant operational noise source is the 700-hp pumps. These pumps would operate during period of high peak demand for water (typically June through September) or during emergencies, and the wells could operate 24-hours a day. Thus, the wells would be designed to meet at least 60 dBA DNL, which would require a reduction to 53.5 dBA for 24-hour operations. To avoid significant impacts, greater reductions would be needed in residential areas that have 24-hour ambient noise levels less than 48 dBA.

The water pumps would be housed within structures that would be ventilated and accessible for maintenance. The ESA noise measurements show significant differences between the noise levels outside the walls where the ventilation louvers or doors are located and the levels outside the walls with no louvers or doors.

The projected noise levels from the operation of the pumps for the proposed wellfields are based on housing that uses the insulation foam and other noise reduction techniques that have been demonstrated at the Hopyard 6 facility. **Table 3.7-8** shows the attenuation of noise levels at various distances from housing with this acoustical reduction properties.

TABLD 3.7-8
ATTENUATION OF NOISE FROM PROJECTED PUMP OPERATIONS

	Projected Noise Levels (dBA)		
Distance	**Wall with Louvers**	**Wall with No Louvers or Doors**	**Rear of Building**
Wood and stucco with foam insulation[a]			
50 feet	50.9	40.9	45.9
100 feet	44.9	34.9	39.9
200 feet	38.9	28.9	33.9
Split-faced cinder block[b]			
50 feet	64.1	49.1	44.1
100 feet	58.0	43.0	38.0
200 feet	52.0	37.0	32.0

[a] Based on noise reductions at Hopyard 6 housing.
[b] Based on noise reductions at Mocho 3 housing.

SOURCE: ESA, 2002

As shown in **Table 3.7-8**, the impact of the operation of the well pumps would depend on the type of housing and the distance to the nearest sensitive receptor. Use of foam insulation or similar noise redaction technology would be needed to reduce noise levels to 53.5 dBA, which is needed to meet the design criteria of 60 dBA DNL for 24-hour operation. A 100-foot buffer zone or orientation of the louvers and doors away from sensitive receptors would also be needed to meet the Alameda County nighttime criteria of 45 dBA. Split-faced cinder block construction could be used if the wells were located in a commercial or industrial site or if the site allowed an adequate buffer zone between the pump housing and the nearest sensitive receptor.

Noise from the discharge of water to storm drains or discharge channels would occur whenever the well pumps are started up or turned off and would not continue for any longer than 30 minutes. Discharges would typically occur during the day, except in emergencies. Noise levels from water discharge would be 49 to 62 dBA at 100 feet and would be louder than the noise from the enclosed pumps. If the discharge point was not enclosed and within 410 feet of a residential area, the predicted levels could exceed the Alameda County 30-minute daytime criteria of 50 dBA. An enclosure would reduce noise levels by at least 10 dBA and allow the discharge to meet Alameda County 30-minute nighttime criteria from a distance of 130 feet.

With respect to the proposed portable pump, the pump units and generator would be fully enclosed in a sound-attenuated housing. Exhaust flow from the generator would include a silencer that would be roof-mounted on the enclosure. With the exception of monthly testing for maintenance purposes, the generator and pump would operate only under emergency conditions. Based on the limited operation and the acoustical enclosures and exhaust silencers, this temporary impact is considered to be less than significant.

Mitigation Measures

Measure 3.7-2a: The pump house enclosures shall be designed such that operation noise resulting from well production would meet the performance standard of 60 dBA DNL at the nearest residential property line. For commercial and industrial uses, the performance standards would be 70 and 75 dBA, respectively.

Measure 3.7-2b: During well site design, Zone 7 shall conduct 24-hour noise surveys in the vicinity of each well site. Where average noise levels are less than 48 dBA, the noise performance standard shall be reduced such that the noise levels from pumping operations shall not result in a 5 dBA increase in ambient noise levels. Where site conditions allow, louvers and doors shall be oriented away from sensitive receptors.

Measure 3.7-2c: If the discharge point is within 400 feet of a residential area, the discharge structure shall be enclosed or the discharge shall be designed to reduce levels to less than 60 dBA DNL at the nearest residential property line.

Impact Significance After Mitigation: Less than significant.

REFERENCES – Noise

Alameda County, *East County Area Plan*, amended November 2002.

Alameda County, General Ordinance Code, Chapter 6.60 Noise, June 2002.

Bolt, Beranek, and Newman, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, December 1971.

City of Livermore, *General Plan*, 2004.

City of Pleasanton, *The Pleasanton General Plan*, Adopted August 6, 1996.

ESA (Environmental Science Associates), *Noise Samples for Existing Zone 7 Wells.* July 9, 2002.

Governor's Office of Planning and Research, *California Environmental Quality Act Statutes and Guidelines, Appendix G*, 1994.

USDOT (U.S. Department of Transportation), Urban Mass Transportation Administration, *Guidance Manual for Transportation, Noise and Vibration Impact Assessment*, 1990.

3.8 TRAFFIC AND CIRCULATION

3.8.1 SETTING

REGIONAL SETTING

The region is served by an extensive roadway network that includes freeways, state routes, and urban and rural surface streets. **Figure 2-3** shows the roadway network within the Livermore-Amador Valley. Interstate 580 (I-580) is an eight-lane freeway that runs east-west north of the Well Master Plan planning area. I-580 provides connection to a number of other regional-serving facilities, including I-80, I-238, I-680, I-980, and State Route (SR) 84 (in Alameda County); U.S. 101 (in Marin County); and I-5 (in San Joaquin County). I-680 is a six-lane freeway that runs north to south. I-680 provides connection to I-80 and I-780 (in Solano County); I-580, SR 24 and SR 84 (in Alameda County); and U.S. 101 and I-280 (in Santa Clara County). SR 84 is a two-lane arterial in the project vicinity, following along Vallecitos Road.

Urban and rural surface streets include arterial, collector, or local streets. These are designated based primarily on the circulation function of the roadway, but also on the width and number of lanes. Definitions of these roadway types, as generalized from the Circulation Elements of the East County Area Plan (ECAP)) (Alameda County, 2002), City of Pleasanton General Plan (1996), and City of Livermore General Plan (2004), are as follows:

- Freeways.[1] state-designated high speed, high capacity routes serving statewide and interregional circulations needs. It is characterized by limited access and grade separations. In urban areas, freeways are typically six- to ten-lane divided facilities;

- Arterial Streets.[2] roadways that feed through traffic to freeways, provides access to adjacent land uses primarily at intersections, and features traffic control measures. Arterials may be two-to six lanes.

- Collector Streets.[3] relatively low-speed, medium-capacity streets that provide access to adjacent land uses and feeds local traffic to arterials. Collector streets are typically two- to four-lane facilities;

- Local Streets. Low-speed, low-capacity roadways that provide for circulation within neighborhoods (land uses in commercial and residential areas), with direct access to abutting land uses. Local streets are typically two lanes.

1 The City of Livermore distinguishes freeways and highways based on the number of lanes. However, both the ECAP and the City of Pleasanton General Plan does not make this differentiation.

2 The City of Livermore uses the term "major" streets. Major street is defined as a local medium-speed, high capacity routes for intracity, cross-town travel and local access to freeways, highways, and the subregional road system. Major streets are typically four- and six-lane divided facilities. It has a broader definition than arterial, but for the purposes of this EIR, a "Major Street" would be considered equivalent to an "Arterial Street."

3 The City of Pleasanton also includes a category for "Neighborhood Collector Street," which is a roadway that provides access to residential areas and feeds traffic to arterials.

Arterial streets located within, or providing access to, the project area include Bernal Avenue, West Las Positas Boulevard, Stoneridge Drive, Valley Avenue, Hopyard Road, Santa Rita Road, and Stanley Boulevard in Pleasanton, Stanley Boulevard, El Charro Road, and Isabel Avenue in the unincorporated Alameda County area, and Airway Boulevard and Kittyhawk Road in Livermore.

ROADWAY DEMAND AND CAPACITY

Traffic volume is measured by average daily traffic and peak hour traffic volumes. Average traffic is the total number of vehicles on a roadway, in both directions, on any average day. Peak hour traffic figures reflect the total number of vehicles on a roadway during the busiest hour of morning or the afternoon. Both the ECAP and the City of Pleasanton General Plan considers peak morning and afternoon hours between 7:30 to 8:30 a.m., and 4:30 to 5:30 p.m., respectively.

The annual average daily traffic for selected freeway segments are shown in **Table 3.8-1** (Caltrans, 2002). The average daily traffic for selected intersections (based on available data) in the City of Pleasanton and unincorporated Alameda County is shown in **Table 3.8-2**. The latest counts available from the City of Pleasanton are primarily for major arterial and collector streets; this data was obtained in the year 2000. Traffic counts for unincorporated Alameda County vary in survey dates, between 1989 through 1996 for the roadways relevant to this project. More recent data is unavailable.

TABLE 3.8-1
TRAFFIC VOLUMES ON FREEWAYS IN PROJECT AREA

Freeway Segment	AADT[a]
I-580 e/o Airway Boulevard interchange	165,000
I-580 e/o El Charro Road interchange	173,000
I-580 e/o Hopyard Road interchange	183,000
I-580 e/o Junction with I-680 interchange	188,000
I-680 s/o Bernal Avenue interchange	110,000
I-680 s/o Stoneridge Drive interchange	120,000
I-680 s/o South of I-580 interchange	130,000

[a] AADT = Annual Average Daily Traffic (total volume for the year divided by 365 days, two-way).

e/o: east of; s/o: south of

SOURCE: Caltrans, *Traffic Volumes on California State Highways*, 2002.

TABLE 3.8-2
EXISTING TRAFFIC VOLUMES ON MAJOR STREETS IN PROJECT AREA

Street Segment	ADT[a]
City of Pleasanton[b]	
Hopyard Road, s/o West Las Positas Boulevard	36,700
Hopyard Road, s/o Valley Avenue	14,500
Hopyard Road, n/o Del Valle Parkway	12,800
Hopyard Road, s/o Del Valle Parkway	9,800
West Las Positas Boulevard, e/o Hopyard Road	13,600
Santa Rita Road, s/o W. Las Positas Boulevard	39,100
Santa Rita Road, s/o Valley Avenue	25,000
Santa Rita Road, n/o Valley Avenue	41,500
Santa Rita Road, s/o Stoneridge Drive	43,600
Santa Rita Road, n/o Stoneridge Drive	38,231
Santa Rita Road, s/o I-580	42,200
Bernal Avenue, w/o Valley Avenue	14,900
Bernal Avenue, e/o Valley Avenue	25,500
Busch Road, e/o Valley Boulevard	4,350
Foothill Road n/o West Las Positas Boulevard	11,900
Foothill Road s/o West Las Positas Boulevard	10,700
Foothill Road, n/o Bernal Avenue	9,900
Foothill Road, s/o Bernal Avenue	6,000
Unincorporated Alameda County[c]	
Stanley Boulevard, w/of Isabel Avenue	27,992
El Charro Road, s/o I-580	5,903

[a] ADT = Average Daily Traffic (total volume, two-way)
[b] Source: City of Pleasanton, *2000 Pleasanton Traffic Model Update, Average Daily Traffic*, 2001 (from http://www.ci.pleasanton.ca.us/trafcounts.html)
[c] Source: Alameda County Public Works, *Traffic System, Traffic County Report.* These values represent the latest traffic count. The counts for Stanley Boulevard were obtained in 1996; the count for El Charro Road was obtained in 1989.

e/o: east of; n/o: north of; s/o: south of

TRANSIT SERVICES

The Livermore-Amador Valley Transit Authority (LAVTA), also known as "Wheels", the Bay Area Rapid Transit (BART), BART Express, and private shuttle services provide transit services in Livermore, Pleasanton, and / or unincorporated sections of Alameda County within the project area.

Currently, BART provides passenger rail service to Pleasanton (station is located near I-580 / Hopyard Road). BART is proposing conventional rail connections over the Altamont Pass and south into the South Bay (Pleasanton, 1996). The Altamont Commuter Express (ACE) train

currently provides passenger rail service between Stockton and San Jose, and includes stations in Pleasanton (at Bernal Avenue / Pleasanton Avenue), and in Livermore.

BICYCLE TRAIL NETWORK

Bicycle paths are located throughout the Project area, and vary in categories from Class I through Class III. Class I bike paths provide a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross-flow minimized (Alameda County, 1993). Class II bike lanes provide a striped lane for one-way bike travel on a street or highway. Class III bike routes provide for shared use with pedestrian or motor vehicle traffic. Within the planning area, the majority of the bike paths are located within an urban setting, in the city of Pleasanton.

The Pleasanton Community Trails Plan identifies existing and bicycle trails within the city (Pleasanton, 2001), and classifies them in accordance with their regional and local network. Class A trails and routes provide major multi-use pathways through the area, with regional connections. These often make use of existing arroyo maintenance roads and abandoned railroad rights-of-way. Class B routes / trails serve as intermediate connectors to the Class A trails / routes, and may be restricted to pedestrians and / or bicyclists in the urban and developed areas. Class C trails and routes connect the entire community with a relatively safe, contiguous system. These trails are often located on the arroyo maintenance roads or other linear corridors (SPRR), or on major streets including: Hopyard Road, West Las Positas Boulevard, Santa Rita Road, Valley Avenue, Stanley Boulevard, Bernal Avenue, and Mohr Avenue. The Circulation Element of the Livermore General Plan (2004) identifies the bicycle network within Livermore city limits. There are no bicycle routes located within the planning area.

EXISTING ENVIRONMENT

Well facilities may be located within any of the wellfield sites that constitute the planning area (see **Figures 2-3 and 2-4**). Where possible, major roadways have been chosen as boundaries of each wellfield, and include: West Las Positas Boulevard, Valley Avenue, Hopyard Road, Santa Rita Road, Stanley Boulevard, and Isabel Road.

Bernal Wellfield

Bernal Wellfield consists of mixed urban uses. It is made up primarily of local streets, with several arterial and collector streets. Two arterial streets connect to the regional freeway system: Bernal Avenue and Hopyard Road. Bernal Avenue connects to I-680, and traverses east to west through the wellfield. Hopyard Road connects to I-580, runs northwest to southeast and constitutes the northeastern boundary of the wellfield. Valley Boulevard, a collector street within the wellfield that intersects both Sunol Boulevard and Santa Rita Road, directs traffic to these arterial streets and then to I-680 and I-580, respectively. Foothill Road, a collector street, is the western boundary of this wellfield and generally parallels I-680, and it connects Stoneridge Road and Bernal Avenue to the highway. The Bernal Property (south of Bernal Avenue) is currently under development, and will incorporate additional local and collector streets.

Hopyard Wellfield

The Hopyard Wellfield consists of mixed urban uses, and consists primarily of local streets. West Las Positas Boulevard and Valley Avenue are the northern and southern boundaries of this wellfield. Both are collector streets that convey traffic from local streets to Santa Rita Road, and hence to I-580. Foothill Road is the western boundary of this wellfield, and is a collector street that directs traffic to I-680. Santa Rita Road is a major thoroughfare that runs north to south through the City of Pleasanton.

Valley Avenue Wellfield

The Valley Avenue Wellfield consists of mixed urban uses, and consists primarily of local streets. However, it is bounded to the north by Valley Avenue, a collector street, and to the east and south / west by Hopyard Road, an arterial street. Hopyard Road is another major thoroughfare that circulates traffic from north to south through western Pleasanton.

Mocho Wellfield

The Mocho Wellfield consists of mixed urban uses, and consists primarily of local streets. Several neighborhood collector streets circulate traffic from the local streets to Santa Rita Road, an arterial street that passes through the center of the wellfield.

Stoneridge Wellfield

Stoneridge Wellfield abuts I-580, and encompasses Santa Rita Road and its interchange. Santa Rita Road and Stoneridge Drive are arterial streets running through this wellfield. West Las Positas is a collector street that routes traffic onto Santa Rita Road to I-580. The wellfield is predominately local streets that connect residential neighborhoods and other mixed land uses.

Martin Wellfield

Martin Wellfield consists primarily of urban uses and local streets. Stoneridge Drive, an arterial that connects to I-680, terminates within this wellfield.

Busch Valley Wellfield

The Busch Valley Wellfield consists of both urban and non-urban uses. It is bounded to the west by Santa Rita Road, an arterial street connecting local traffic to I-580, and the UPRR to the south, a railway system that links the cities of Pleasanton and Livermore. Bernal Avenue, an arterial street, traverses through the wellfield.

Gravel Pits Wellfield

The Gravel Pits Wellfield consists of areas developed for sand and gravel mining. There are no arterial or collector roads within this wellfield. Private access roads around gravel pits make up the roadway system within the quarry.

Stanley Boulevard Wellfield

The Stanley Wellfield consists of areas developed for sand and gravel mining. Stanley Boulevard, a collector street linking the cities of Pleasanton and Livermore, traverses through the wellfield. Internal access roads around gravel pits make up the roadway system within the quarry.

Chain of Lakes Wellfield

The Chain of Lakes Wellfield consists of areas developed for sand and gravel mining, as well as open space and agricultural uses. El Charro Road, an arterial street that connects traffic on Stanley Boulevard to I-580, bounds the wellfield to the west. There are also internal access roads within the quarry.

Isabel Wellfield

Isabel Avenue forms the eastern boundary of this wellfield, and is a collector street that connects to I-580 via Kittyhawk Road and Airway Boulevard. Stanley Boulevard passes through the southern portion of the wellfield. A network of internal access roads exists within the quarry.

3.8.2 REGULATORY FRAMEWORK

COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

The policies that relate to traffic and circulation are described in **Appendix 3.8** of this DEIR. The proposed project would adhere to the regulation, goals, and policies of the affected jurisdictions, and would not result in long-term degradation in the level of service of local roadways.

3.8.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, a project that would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system is considered to have a significant impact on the environment. The project is also considered to have a potentially significant impact if the following occurs:

- Construction activities significantly impede access to adjacent land uses, including emergency access;
- Construction activities pose a traffic safety hazard to motor vehicles, bicyclists, or pedestrians in areas where there is a history of accident problems (i.e., a high number or accidents and/or an accident rate higher than the statewide average for similar roads);
- Construction activities significantly affect local transit service; or

- Construction substantially affects parking availability, causing traffic safety/operational problems.

- Movement of heavy vehicles would cause substantial damage or wear of public roadways;

IMPACTS AND MITIGATION MEASURES

Well Construction

Although the specific locations of the sites have not yet been established, the well facilities would be located on parcels that would be up to 100 by 150 feet in area. The actual footprints would vary depending on site location. Site construction would occur within the selected parcel and, depending on space limitations, potentially occur within adjacent parcels. Staging of equipment and material would be accommodated within the site to the extent feasible, but would unlikely directly affect adjacent roadways.

Pipeline Construction

As well sites have not been selected, connection pipeline locations also have not been determined. Up to 12,000 feet of new pipeline to connect individual wells to either a treatment facility for disinfection or existing distribution pipelines, and to connect each well site to the existing storm drain system or local waterway for discharge of startup and shutdown water. Connection pipelines would likely be located on roadways (including arterials, collectors, or local streets) or other linear corridors. Open trench construction would be predominately used for pipeline installation, but jack and bore construction may be utilized in areas not acceptable or practical (i.e., across major intersections, limited easement locations, areas of utility congestion, railroad tracks, and streams). The ideal temporary construction easement for pipeline installation would be 25 feet wide (i.e., 12 feet for access by trucks and loaders, a six-foot-wide trench, and additional width for maneuvering). At a minimum, a construction width of about 20 feet (i.e., 10 feet for truck/loader access, a six-foot-wide trench, and 5 feet for maneuvering) would be used.[4] For assessment of potential project impacts, a 25-foot-wide temporary construction easement was assumed. Depending on where the connection pipeline would be located within the roadway width and whether on-street parking is currently provided, either two full traffic lanes, or one travel lane and a parking lane, would be needed to accommodate the construction zone. The pace of completed work is estimated at about 100 feet per day per work crew, and the overall active work zone on any given work day would be about 300 to 600 feet in length.

As stated above, jack and bore construction method would be used at major intersections and other constrained locations. For this method, a jacking pit is constructed at each of the segments where the jacking would occur. The jacking pit is excavated (and shored) with typical dimensions of 12 to 15 feet wide, 30 to 35 feet long, and 8 to 10 feet deep. An additional area of 2,000 square feet would be needed around the pit for temporary storage of pipe sections and for loading material removed from the bore. The receiving pit at the other end of the bore is smaller,

[4] The basis for establishing a minimum width of construction zone is the need to maintain, at a minimum, alternate one-way traffic flow past the construction zone, which requires at least a 10-foot travel width.

encompassing approximately 1,000 square feet. Two typical conditions occur at intersections where jack and bore construction is recommended. One option would be to have a bore configuration where the connection pipeline is constructed directly across one or two legs of the intersection (no diagonal alignment across the intersection, in which the start pit and the receiving pit are located on the northwest and southeast corners of the intersection). The second option would be used at those locations where such a diagonal bore is recommended. Under option two, more width is needed for the jacking pit, and the space requirements must be increased.

Impact 3.8-1: Construction of the proposed Project would increase short-term traffic delays for vehicles traveling past the construction zone on roadways serving project components. Less than significant with Mitigation.

Well Construction

Construction of the well within a confined parcel would not result in short-term traffic delays for vehicles traveling past the well facility construction zone. No mitigation measures are required or recommended.

Pipeline Installation

Pipeline installation within public right-of-ways would directly affect roadways if the 25-foot construction zone were to reduce the travel width during peak traffic periods. Travel width reductions would occur during open trenching, and could occur if jack and bore techniques were employed (although to a lesser degree). Alameda County requires construction work that would affect roadway traffic flow on weekdays to be restricted to off-peak hours. Delays also would be experienced by drivers during off-peak hours, but fewer people would be affected by the delays when traffic volumes are lower. Implementation of **Measure 3.8-1a** and **3.8-1b** would reduce potential traffic impacts associated with construction to less than significant levels.

There are two-lane local or collector streets for which a 25-foot-wide construction zone would result in insufficient remaining width to maintain alternate one-way traffic flow, and the impact would be considered significant if pipeline installations occurs at these specific roads no matter when construction occurred. Restricted travel width would dictate narrower work zones than the proposed 25-foot width, or require road closure. Avoidance of roads where connection pipeline alignments would result in road closure would ensure that this potential impact would not occur (**Measure 3.8-1a**). All other potentially significant traffic impacts would be reduced to less than significant levels with implementation of **Measure 3.8-1a**, which requires the preparation and implementation of Traffic Control Plan (TCP). The TCP includes, but are not limited to the following: restriction of construction activities to non-peak commute periods, provision of advanced notification, and installation of signage.

Mitigation Measures

Measure 3.8-1a: Zone 7 shall arrange for a detailed Traffic Control Plan, to be prepared by a licensed traffic engineer, for project-affected roadways and intersections. The Traffic Control Plan shall comply with requirements of the jurisdictional agency directly affected by the project construction. The Traffic Control Plan would include, but would not be limited to, the following elements:

- Zone 7 or its contractors shall restrict construction to non-peak periods as required for specific work sites. Weekend and night work shifts associated with pipeline installation may be considered in non-residential areas only.

- Zone 7 or its contractors shall maintain the maximum amount of travel lane capacity during non-construction periods and would provide flagger-control at all construction sites to manage traffic control and flows.

- Zone 7 or its contractors shall limit the construction work zone in each block to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone. Zone 7 shall reroute pipeline alignments if road closures would occur because there is inadequate space to accommodate both the construction easement and alternate one-way traffic flow.

- Zone 7 or its contractors shall require temporary steel-plate trench crossings, as needed, to maintain reasonable traffic, bicycle, and pedestrian access to homes, businesses, and streets. When required by the applicable encroachment permit, Zone 7 shall maintain existing lane configuration during non-working hours by covering the trench or jack pit with steel plates or by the use of temporary backfill. Access for emergency vehicles shall be maintained at all times.

- Zone 7 or its contractors shall coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to schools and commercial areas.

- Zone 7 or its contractors shall post advanced warning of construction activities to allow motorists to select alternative routes in advance and for moving vehicles from areas to be closed.

- Zone 7 or its contractors shall require appropriate warning signage and lighting for construction zones.

- For construction near Mohr Avenue, Zone 7 or its contractors shall not use Mohr Avenue as a truck route, in accordance with the policies of the City of Pleasanton.

- Zone 7 or its contractors shall provide temporary signage indicating businesses are open

Measure 3.8-1b: Zone 7 shall arrange for a 24-hour emergency telephone resource to address public questions and complaints during project construction.

Impact Significance After Mitigation: Less than significant.

Impact 3.8-2: Installation of the connection pipeline would cause disruptions to transit service on pipeline alignment routes. Less than Significant with Mitigation.

Well Construction

Well facility development is not anticipated to affect transit services as construction would occur within a specific parcel outside of the road right-of-way. No mitigation measures are required or recommended.

Pipeline Installation

LAVTA, and BART Express operate bus services within the project area. Bus lines generally follow major roadways such as arterial and collector streets. Depending on the location of the connection pipeline alignment, installation activities may disrupt bus operations by blocking bus stops, or delaying bus service due to lane closures. As pipeline construction would occur at a rate of approximately 100 feet per day, bus stops within the 100 feet of blocked roadway for pipeline construction would be directly affected. Disruption of transit services is expected to be greater in the urban areas of the City of Pleasanton rather than the quarry areas within unincorporated Alameda County. Disruption of transit operations would be considered a significant impact if directly impacted by pipeline construction. **Measures 3.8-2** would minimize delays to transit services caused by short-term increased traffic congestion within construction areas. For direct impacts to bus stops, Zone 7 would coordinate with LAVTA and/or BART Express to develop a plan that would relocate bus stops during the course of construction activities, which would reduce potential impact to less than significant levels.

Well Operation

Operation of well facilities and associated connection pipelines would not result in disruptions to transit services. The connection pipelines would be buried underground, and no impacts would occur.

Mitigation Measures

Measure 3.8-2: This measure applies to construction activities that would displace bus stops. As part of the Traffic Control Plan for roadway segments and intersections (see **Measure 3.8-1a**), Zone 7 shall incorporate a plan, as needed, for the temporary relocation of bus stops. This plan would be completed in coordination with LAVTA or BART Express.

Impact Significance After Mitigation: Less than significant.

Impact 3.8-3: Traffic on area roadways serving all of the project components would increase as a result of project-generated vehicle trips by construction workers and construction vehicles. Less than Significant with Mitigation Measure.

Well Construction and Pipeline Installation

Off-site vehicle trips generated by construction of the various project components would primarily consist of truck movements associated with the deliveries of construction materials and equipment to the work sites, hauling of excavated soils or debris from the sites, and the daily arrival and departure of construction workers. The impact of construction-related traffic would be a temporary and intermittent lessening of the capacities of nearby access streets and haul routes because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. In addition, lane blockage due to queued trucks, if it were to occur, would temporarily reduce the roadway capacity of the affected streets.

Weekday construction hours would be limited to non-peak hours, as required under the Traffic Control Plan (see **Measure 3.8-1a**). The total number of daily truck trips is conservatively estimated to be up to about 75 one-way vehicle trips for both well facilities and connection pipeline components (see **Chapter 2, Project Description**). Construction worker-generated traffic for three components would be about 90 one-way trips per day (the typical crew size would be 10 to 12 people plus inspectors). A total of 160 one-way trips would be generated per day this assumes that the majority of the truck trips are generated during the excavation phase, which is estimated to be concentrated over a two-month period. These trips would be temporary, intermittent, dispersed throughout the work day, and dispersed geographically, depending on the site locations of the well facilities and connection pipelines. As construction-generated traffic would be temporary, the proposed project would not result in any long-term degradation in operating conditions or level of service on any project roadways. Therefore, potential impacts associated with traffic congestion resulting from the project would be reduced to less than significant with implementation of **Measure 3.8-1a**.

Mitigation Measures

Please refer to **Measure 3.8-1.a**.

Impact Significance After Mitigation: Less than significant.

Impact 3.8-4: Traffic on area roadways serving all of the project components would increase as a result of project-generated vehicle trips during well facility operation. Less than Significant.

Well Operation

Zone 7 Operation and Maintenance (O&M) staff currently conducts regular inspection of existing well sites. These inspections amount to approximately one inspection per day. In addition,

delivery of bulk chemicals to existing treatment sites occurs approximately twice a week. The addition of approximately seven vehicle trips a week on surface streets would not result in any long-term degradation in operating conditions or LOS on any project roadways. Therefore, impacts are considered less than significant, and no mitigation measures are required or recommended.

Mitigation Measures

No mitigation measures required.

Impact Significance: Less than Significant.

Impact 3.8-5: Project construction of all project components would generate a demand for parking spaces for construction worker vehicles. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

The project would generate a need for parking for construction workers. Assuming each worker drives alone to each day's work location, each crew would require up to 15 parking spaces at any one site. This temporary demand for parking would likely be accommodated by the parcels in which the proposed wells are located, on the parcel, and / or along adjacent public streets within 50 feet of the proposed well sites. Pipeline installation within roads also could temporarily displace available parking spaces in the construction work zone, particularly in the urban areas of the City of Pleasanton. There are some roadways in the project area that would be unable to accommodate any additional parking, and construction workers would have to park outside the immediate area of those streets. The requirement for off-street parking or shuttling of workers would reduce potential impacts less than significant levels (see **Measure 3.8-5**).

Mitigation Measures

Measure 3.8-5: This measure applies to construction activities within any wellfield, and for impacts on any type of roadway. Zone 7 should require off-street parking for construction workers' vehicles, or, if that is impractical, workers could be shuttled to the work site from an off-site location.

Impact Significance After Mitigation: Less than significant, but additional mitigation is recommended.

Impact 3.8-6: Construction of the connection pipeline would affect access to adjacent land uses and street for general and emergency access, potentially causing safety problems. Less than Significant with Mitigation.

Well Construction

Construction of the well within a confined parcel would not affect adjacent land uses. No mitigation measures are required or recommended.

Pipeline Installation

Pipeline construction along roadways would restrict emergency access, bicycle, pedestrian, and vehicular access to adjacent land uses and streets. The blockage of access may result in increased safety hazards. Access for emergency vehicles would be impaired either directly by the blockage of an entrance to the emergency facility or affected land use, or indirectly due to increased roadway congestion or reduction of available lanes. Two emergency facilities are located within Stoneridge Wellfield: Fire Station No. 3 located on Santa Rita Road, and Valleycare Medical Center located on West Las Positas Boulevard. Both sites provide emergency services to local residents, and would require maintenance of access. A fire station may be developed on the Bernal property (Bernal Wellfield), and other emergency facilities may be constructed within the quarry areas that would be reclaimed as part of the Reclamation Specific Plan. The potential for access restrictions for existing and future emergency facilities would require the same type of mitigation. **Measures 3.8-6a** and **3.8-6b** would ensure that access is maintained at emergency facilities and affected land uses, thereby reducing potential impacts associated with access blockage to less than significant levels. Indirect impacts to emergency access may occur due to the increased traffic volume near construction zones or increased congestion due to reduction of travel lanes. **Measures 3.8-1a** and **3.8-1b** would reduce potential impacts associated with short-term increase in traffic with preparation and implementation of a Traffic Control Plan. The TCP would include maintenance of steel-trench plates to restore emergency access when required.

Bicycle trails are located throughout the City of Pleasanton, and along Isabel Avenue in Livermore. There is a potential that connection pipeline alignment would displace existing or proposed on-street bicycle paths within the Project area during construction activities. The displacement of a bicycle path would be short-term, but a potentially significant impact as it would be considered a safety hazard. To reduce impact to a less than significant level, Zone 7 would detour bicycle traffic as necessary to other streets away from construction activities (see **Measure 3.8-6c**). Recreational impacts associated with disruption of trails are provided in **Section 3.4, Land Use**.

Residential, commercial, and public uses (e.g., parks) are located throughout the Valley, primarily within wellfield sites in the Pleasanton area. Public uses such as parks and community centers typically have multiple access points, whereas residences and businesses have only one access point. Pipeline construction within the wellfield sites could temporarily block access for a variety of mixed uses. Since construction would proceed at a rate of 100 feet per day, access to

individual residences or businesses would be affected for a maximum of one to two days. However, advanced notification of access restrictions for residents and businesses would reduce potential impacts to affected residents and businesses (see **Measure 3.8-6d**). With implementation of advanced notification and the measures identified below, construction-related impacts would be reduced to less than significant levels.

Mitigation Measure

Measure 3.8-6a: As part of the Traffic Control Plan for roadway segments and intersections (see **Measure 3.8.1a**), Zone 7 shall develop comprehensive strategies for maintaining emergency access, such as maintaining steel trench plates at the construction sites to restore access across open trenches. Also, police, fire, and emergency services shall be notified of the timing, location, and duration of construction activities throughout the project.

Measure 3.8-6b: This measure applies to all components. Zone 7 shall not, under any circumstances, restrict access to emergency facilities, including Fire Station No. 3 and Valleycare Medical Center. If Zone 7 selects connection pipeline alignments near Fire Station No. 3 or other fire stations, Zone 7 would coordinate with fire station personnel to maintain required 24-hour access to Station No. 3. To avoid blocking access to the Valleycare Medical Center and similar emergency medical facilities, Zone 7 and its contractors shall schedule work on sections of the connection pipeline such that multiple access points to the medical center are not blocked simultaneously.

Measure 3.8.6c: Zone 7 shall provide, upon request, a copy of the Traffic Control Plan to the sheriff's department, local police departments, county fire department, and local fire departments for their review prior to construction. Zone 7 shall provide 72-hour notice to the local service providers prior to construction of associated connection pipeline.

Measure 3.8-6d: Zone 7 shall temporarily detour bicycle paths around the construction zone or to other streets to ensure that no new safety hazards results from implementation of the project.

Measure 3.8-6e: Zone 7 shall require a minimum 72-hour advance notice of access restrictions for residents and businesses. Affected residents and businesses would be advised when to move motor vehicles out of the area to be closed. Notification and other requirements stipulated in the encroachment permit shall be incorporated into the Traffic Control Plan.

Impact Significance After Mitigation: Less than significant.

Impact 3.8-7: Construction of the proposed project would increase wear-and-tear on the designated haul routes used by construction vehicles to access the project work site(s). Less than Significant with Mitigation.

Well Construction and Pipeline Installation

The use of big trucks to transport equipment and material to and from the project work site(s) could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and the existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The project's impacts are expected to be negligible on those roads.

Residential streets are generally not built with a pavement thickness that will withstand substantial truck traffic volumes. Therefore, if residential streets are selected for the connection pipeline alignments, then potential roadwear may occur. Residential streets are located within the project area throughout the City of Pleasanton. Implementation of **Measure 3.8-7a**, would reduce potential impacts to less than significant levels through the implementation of a rehabilitation program based on videotapes of the road conditions.

Mitigation Measures

Measure 3.8-7a: Zone 7 shall prepare a videotape of road conditions only for the routes that will be used by project-related vehicles. Zone 7 shall prepare a similar videotape of road conditions after project construction is completed. The pre- and post-construction conditions of the haul routes shall be reviewed by staff of the local Public Works Department. An agreement shall be entered into prior to construction that will detail the pre-construction conditions and post-construction requirements of the rehabilitation program.

Impact Significance After Mitigation: Less than significant.

Impact 3.8-8: Construction of the proposed project could disrupt newly repaved streets. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Development of 8 to 15 wells would likely occur one or two at a time per year within a 20-year timeframe. Alameda County has a policy that requires a five-year moratorium from the date of rehabilitation of a roadway before trenching is permitted. If the connection pipeline alignment is constructed in a roadway within five years of its rehabilitation, the entire roadway must be rehabilitated with an overlay.

Roadways within unincorporated Alameda County that would be subject to this moratorium include Stanley Boulevard and El Charro Road. Stanley Boulevard is located within the Stanley

Avenue Wellfield. El Charro Road forms the boundary between the Gravel Pits Wellfield and the Chain of Lakes Wellfield. As specific locations of well facilities have not been determine, and Alameda County's Public Works Department does not maintain a Capital Improvement Program (CIP) beyond five-year increments, it is not possible to predict if these roadways would be restricted from trenching activities in the future. If connection pipeline alignments are located within these County roadways subsequent to resurfacing, then the rehabilitated roadways and intersections affected by the proposed connection pipeline alignment would be subject to significant construction impacts. If the Alameda County policy is upheld, the roadway segments would be subject to a complete roadway overlay. Measures **3.8-8a** through **3.8-8c** are intended to reduce potential conflict with Alameda County's policy to less than significant levels. These include coordination with affected jurisdictions of project construction, and compensating Alameda County for disruption of newly-paved roads.

Mitigation Measures

Measure 3.8-8a: Zone 7 shall coordinate project construction with affected jurisdictions so that those entities can time roadways improvements in their Capital Improvement Programs as appropriate.

Measure 3.8-8b: If recently repaved/rehabilitated road segments in unincorporated Alameda County are included in the final pipeline alignment, Zone 7 shall:

1) Use trenchless installation techniques; or
2) Rehabilitate the roadway per permitting jurisdiction where trenching is required

Impact Significance After Mitigation: Less than significant.

REFERENCES – Traffic and Circulation

Alameda County, *East County Area Plan,* amended November 2002.

Alameda County Public Works Agency, *Traffic System Traffic County Report*, provided by Jim Taratino, run date February 2002.

Caltrans (California Department of Transportation), *2001 Traffic Volumes on California State Highways*, http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2001all.htm, 2002.

City of Livermore, *General Plan,* 2004.

City of Pleasanton, *General Plan*, August 1996.

City of Pleasanton, *Community Trails Master Plan*, July 1993.

City of Pleasanton, *Community Trails Master Plan Map*, September 2001.

City of Pleasanton, *2000 Pleasanton Traffic Model Update – Average Daily Traffic,* http://www.ci.pleasanton.ca.us/trafcounts.html, Undated.

3.9 HAZARDOUS MATERIALS

3.9.1 METHODOLOGY

This assessment focuses on the potential to encounter hazardous materials during construction of individual wells and the potential impacts associated with the use of hazardous materials during construction and operation of well facilities. The potential for encountering hazardous materials during construction has been assessed on the basis of a regulatory database search (Environmental Data Resources, Inc., 2002) to identify potential hazardous waste sites within each of the wellfields[1]. Conditions in each wellfield are summarized in this report using information provided by the database search.

3.9.2 SETTING

Hazardous materials are substances with certain physical or chemical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3 groups hazardous materials into the following four categories based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gasses). Hazardous materials have been and are commonly used in commercial, agricultural and industrial applications as well as in residential areas to a limited extent.

A hazardous *waste* is any waste that may (1) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness, or (2) pose a substantial present or potential hazard to human health or the environment, due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, or disposed of, or otherwise managed (California Health and Safety Code, Section 25141). If improperly handled, hazardous materials and wastes can result in public health hazards if released to the soil or groundwater or through airborne releases in vapors, fumes, or dust.

REGULATORY BACKGROUND

Federal, state, and local regulations, with the major objective of protecting public health and the environment, extensively regulate hazardous materials and hazardous wastes. In general, these regulations provide definitions of hazardous substances; establish reporting requirements; set guidelines for handling, storage, transport, remediation and disposal of hazardous wastes; and require health and safety provisions for both workers and the public. Regulatory agencies also maintain lists, or databases, of sites that are permitted to handle hazardous wastes or store

[1] Regulatory agencies maintain databases of sites that are permitted to handle hazardous wastes or store hazardous substances as well as sites where soil or groundwater quality may have been affected by hazardous substances.

hazardous substances in underground storage tanks as well as sites where soil or groundwater quality may have been affected by hazardous substances. Please refer to **Appendix 3.9** for a full discussion of Federal, State, and local regulations regarding hazardous substances. Federal, State and local lists published to track the status of hazardous materials generation and/or release, and reviewed as part of this analysis, are identified below and summarized in **Table 3.9-1**.

Federal Lists

The federally published lists of sites which trace the status of suspected hazardous materials sites or identify sites permitted to generate hazardous wastes, and that were reviewed as part of this analysis, include:

- The National Priority List (NPL), which prioritizes sites with significant risk to human health and the environment;

- The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), which tracks contaminated properties identified under CERCLA and SARA;

- The toxic chemical release inventory which identifies sites which have reported a chemical release to the air, water, or land as required by Title III of the Superfund Amendments and Reauthorization Act of 1986 (TRIS);

- The Emergency Response Notification System (ERNS) which identifies spills of oil or hazardous substances reported pursuant to Section 103 of CERCLA as amended, Section 311 of the Clean Water Act, and sections 300.51 and 300.65 of the National Oil and Hazardous Substances Contingency Plan;

- RCRA Information System which includes facilities permitted to handle hazardous wastes under RCRA including treatment, storage, and disposal facilities (RCRA - TSD); large quantity generators which report generation of greater than 1000 kilogram/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste (RCRA-LgGen); small quantity generators which report generation of less than 1000 kilogram/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste (RCRA-SmGen); and facilities which have been cited by the US EPA for RCRA violations at least once since 1980 (RCRA Viols/Enf); and

- Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (CORRACTS). This list, maintained by the US EPA sites includes RCRA permitted facilities that are undergoing corrective action. A corrective action order is issued pursuant to RCRA Section 3008(h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

TABLE 3.9-1
SUMMARY OF DATABASES REVIEWED FOR WELLFIELDS

Name of List	Responsible Agency	Acronym	Date of List Search
National Priorities List	USEPA	NPL	
Comprehensive Environmental Response, Compensation, and Liability Information System	USEPA	CERCLIS	
Toxic Release Inventory System	USEPA	TRIS	
Emergency Response Notification System. Records and stores information on reported releases of oil and hazardous substances.	USEPA	ERNS	Dec. 2001
RCRA Permitted Small Quantity Generator. Database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act.	USEPA	RCRA SQG	June 2002
RCRA Permitted Large Quantity Generator	USEPA	RCRA LQG	June 2002
RCRA Treatment, Storage, and Disposal Facilities	USEPA	RCRA TSD	June 2002
RCRA Corrective Action Sites	USEPA	CORRACTS	June 2002
Hazardous Materials Incident Report System. Contains hazardous material spill incidents reported to the Dept. of Transportation.	USEPA	HMIRS	Dec. 2001
Facility Index System. Contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA.	USEPA / NTIS	FINDS	Mar. 2001
HAZNET. CA Sites listed on hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually.	DTSC	HAZNET	
California Hazardous Material Incident Report System. Contains information on reported hazardous material incidents, i.e., accidental releases or spills.	California Office of Emergency Services	CHMIRS	Dec. 1994

TABLE 3.9-1 (Continued)
SUMMARY OF DATABASES REVIEWED FOR WELLFIELDS

Name of List	Responsible Agency	Acronym	Date of List Search
Hazardous Waste Substance Site List. Identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration.	Governor's Office of Planning & Research	CORTESE	Feb. 1995
Mines Master Index File.	Dept. of Labor, Mine Safety & Health Admin.	Mines	June 2002
Leaking Underground Storage Tanks. Incident Reports contain an inventory of reported leaking underground storage tank incidents.	SWRCB	LUST	Jan. 2001
Underground Storage Tank Database. Contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA).	SWRCB	UST	Jan. 2002
Historical UST Registered Database	SWRCB	HIST UST	
Notify 65. Records contain facility notifications about any release that could impact drinking water and thereby expose the public to a potential health risk.	SWRCB	NOTIFY 65	
Aboveground Storage Tank Database	SWRCB	AST	May 2002
Facility Inventory Database. Contains active and inactive underground storage tank locations.	SWRCB	CA FID	
DRYCLEANERS. A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaners' agents; linen supply; coin-operated laundries and cleaning; dry-cleaning plants except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.	RWQCB	CLEANERS	Mar. 2002
Waste Management Unit Discharge Systems	RWQCB	WMUDS	Mar. 1996
Spill, Leak, Investigation and Cleanup List	RWQCB	SLIC	

SOURCE: Environmental Data Resources, Inc., July 2002.

State Lists

The published lists of sites which trace remediation progress within the state include:

- The Annual Work Plan, formerly known as the Bond Expenditure Plan (SPL), which is a site-specific expenditure plan for the appropriation of California Hazardous Substance Cleanup Bond Act of 1984 funds. This list is no longer updated;

- CalSites (SCL), which was previously referred to as the Abandoned Sites Program Information System (ASPIS), and identifies potential hazardous waste sites, which are then screened by the DTSC. Sites on this list which are designated for no further action by the DTSC were not identified by the database review;

- The CORTESE List, which is a compilation of information from various sources listing potential and confirmed hazardous waste and hazardous substance sites, maintained by the State Department of Toxic Substances Control; and

- The Deed Restrictions Properties Report (Deed Restrictions) which tracks sites with deed restrictions.

The Regional Water Quality Control Board (RWQCB) is authorized by the State Water Resources Control Board (SWRCB) to enforce provisions of the Porter - Cologne Water Quality Control Act of 1969. This act gives the RWQCB authority to require groundwater investigations when the quality of groundwater or surface waters of the state are threatened and to require remediation of the site, if necessary. Both of these agencies are part of the Cal EPA.

The RWQCB maintains the following lists identifying hazardous waste sites that were reviewed:

- The Leaking Underground Storage Tanks list (LUST or LUST Reg2) and LUST Information System, which track remediation status of known leaking underground tanks;

- The Spill, Leak, Investigations, and Cleanups list (SLIC), North Bay County Toxics List (North Bay), and Toxic Pits Clean Up Facilities (Toxic Pits) which include various hazardous waste sites within the jurisdiction of the San Francisco Bay RWQCB (Region 2); and

- The Waste Management Unit Discharge System (WMUDS) list of sites which tracks waste management units. The list contains sites identified on the Toxic Pits List, which is required by the Toxic Pits Cleanup Act (Katz Bill), and places relatively strict limitations on the discharge of hazardous wastes into surface impoundments, toxic ponds, pits and lagoons (the RWQCB is required to inspect all surface impoundments annually). The WMUDS list also identifies sites targeted by the Solid Waste Assessment Program where there is a possible risk of solid waste disposal sites (landfills) discharging hazardous wastes, threatening either water or air quality.

EXISTING ENVIRONMENT

Known Contamination Sites

Environmental Data Resources, Inc. conducted a search of federal, state, and local hazardous site databases in July 2002. **Table 3.9-1** presents the name and date of each database reviewed. The search identified 131 sites that are permitted to generate hazardous wastes or store hazardous materials in underground or above ground storage tanks, or where soil or groundwater quality may have been degraded by hazardous substances.

Sites permitted to handle hazardous wastes under RCRA and sites with permitted underground storage tanks are known and approved to handle hazardous substances. The presence of these substances does not necessarily indicate that contamination of a site has occurred, just that the substances are present. Because the use of these substances is well regulated, the site contamination is less likely to occur. As a part of permit requirements, these sites hold plans for hazardous materials management and safety.

Potential and confirmed hazardous waste sites are sites where contamination is either suspected or confirmed by the regulatory agencies. The presence of hazardous substances in the soil and/or groundwater at or near a project location increases the potential to encounter hazardous substances during construction and potentially after development. The presence of hazardous substances may also require special construction and/or handling procedures of waste materials produced. The database search identified potential and confirmed hazardous waste sites included on the regulatory databases discussed earlier in this section. Potential and confirmed hazardous waste sites located within each wellfield are listed in **Table 3.9-2**. Sites that have been closed by the lead agency or have a low degree of soil contamination only are characterized as having a low potential impact, and are not listed.

Current Chemical Use at Existing Well Facilities

Zone 7 disinfects groundwater produced at existing facilities prior to distribution. Disinfection occurs at specific wells with onsite treatment, including Mocho 1, Mocho 3, Mocho 4, Hopyard 6, and Stoneridge wells. Water extracted at Mocho 2 and Hopyard 9 are routed to Mocho 1 and Hopyard 6 for disinfection, respectively. A limited amount of hazardous materials is stored onsite, consistent with standard potable water treatment practices. As required by law, Zone 7 maintains a Hazardous Materials Business Plan (HMBP) for each of its facilities. The plan includes a hazardous materials inventory listing chemicals stored and used at Zone 7 facilities.

Zone 7 uses chlormination for disinfection to meet drinking water standards and to limit formation of disinfection byproducts. Some sources claim that chlorimination results in better tasting water than disinfection by chlorine alone. Chloramines are produced when ammonium hydroxide (aqueous ammonia) and sodium hypochlorite (chlorine) are combined. Ammonium hydroxide is delivered in bulk to existing pump facilities with onsite treatment. Sodium hypochlorite is either delivered in bulk or is generated on-site. On-site generation has a longer storage life compared to purchase of standard chloramine. Currently, Mocho-3 and Mocho-4 use an on-site generating chloramine disinfection system.

TABLE 3.9-2
POTENTIAL HAZARDOUS SITES IDENTIFIED IN EACH WELLFIELD

Wellfield		Site Name	Address	ERNS	LUST	UST	AST	CLEANERS
Bernal	1	Hutchison Transfer Service	4227 Pleasanton Ave.		**X**			
	2	Focus Photography	4501 Pleasanton Ave.			**X**		
	3	Bernal Cleaners	6654 Koll Ctr Pkwy					**X**
Hopyard	1	5072 Woodrush Road	5072 Woodrush Road	**X**				
	2	Exxon Service Station No 7-339	2991 Hopyard Road		**X**			
	3	Pacific Bell Communications	5850 W. Las Positas				**X**	
	4	Pleasanton Lucky Cleaners	6051 W Las Positas					**X**
	5	One Hour Martinizing Cleaners	2771 Hopyard Road					**X**
	6	Elite Cleaners	6280 W. Las Positas					**X**
	7	Not Available	3737 Ashwood Drive					
	8	D&D Cleaners	3059 Hopyard Dr. Suite H					**X**
Valley Ave.	1	1801 Santa Rita Road	1801 Santa Rita Road	**X**				
	2	Whalen Construction Co., Inc	4227 Pleasanton Ave.		**X**			
	3	. Shell	1801 Santa Rita Road		**X**			
	4	Valley Plaza Cleaners	180GF Santa Rita Road					**X**
Busch Valley	1	Utility Vault Co. Inc.	3786 Valley Ave		**X**			
	2	Shell	1801 Santa Rita Road		**X**			
	3	1801 Santa Rita Road	1801 Santa Rita Road	**X**				
	4	Oldcastle Precast/Utility	3786 Valley Ave				**X**	
	5	Kaiser Sand & Gravel	3000 Busch Road		**X**	**X**		

TABLE 3.9-2 (Continued)
POTENTIAL HAZARDOUS SITES IDENTIFIED IN EACH WELLFIELD

Wellfield		Site Name	Address	ERNS	LUST	UST	AST	CLEANERS
Busch Valley (cont.)	6	Pleasanton Plant	3000 Busch Road			X		
	7	Pleasanton Truck and Equipment	3110 Busch Road		X			
	8	Pleasanton Garbage Service Inc.	3110 Busch Road			X		
	9	Former B & J Trucking	3742 Valley Ave		X			
	10	Pleasanton Ready Mix Concrete	3400 Boulder Street		X			
	11	Operations Service Center	3333 Busch Road			X		
	12	Valley Plaza Cleaners	180GF Santa Rita Road					X
Mocho	1	2722 Santa Rita Road	2722 Santa Rita Road	X				
	2	Exxon R/S #7-3567	3192 Santa Rita Road		X			
	3	Valero Store #7567	3192 Santa Rita Road			X		
	4	Pleasanton Dry Cleaners	3120 Santa Rita Road					X
	5	VIP Cleaners	3120 Santa Rita Road					X
Martin	1	Combs Property	1808 Courtney Ave		X			
Stoneridge	1	East Bay BMW	3830 Old Santa Rita Road		X			
	2	Valleycare Medical Center	5555 West Las Positas			X		
	3	Rosewood Cleaners	4211-2 Rosewood Dr.					X
	4	Lucky Cleaners	6099 West Las Positas					X
Gravel Pit	1	Jamieson Co.	501 El Charro Road		X			
	2	Pacific Bell	611 Folsom Street			X	X	
Chain of Lakes	1	Jamieson Co.	501 El Charro Road		X			
	2	Pacific Bell	611 Folsom Street			X	X	

TABLE 3.9-2 (Continued)
POTENTIAL HAZARDOUS SITES IDENTIFIED IN EACH WELLFIELD

Wellfield		Site Name	Address	ERNS	LUST	UST	AST	CLEANERS
Chain of Lakes (cont.)	3	Reliable Trucking, Inc.	51 El Charro Road			**X**		
	4	Former Gas Station	Citrus and Main			**X**		
Stanley Ave.	1	Reliable Trucking, Inc.	51 El Charro Road			**X**		
	2	Former Gas Station	Citrus and Main			**X**		
Isabel	1	1901 Isabel Ave	1901 Isabel Ave	**X**				
	2	Associated Concrete Products	1901 Isabel Ave		X			
	3	Excelsior Auto Care	1820 San Jose Ave		X	X		
	4	Florence Distributing Co.	1150 Thomas Ave		X	X		
	5	San Francisco Fire Station #25	2501 25th Street			X		
	6	RMC Pacific Materials	1544 Stanley Blvd.			X		
	7	RMC Lonestar (Eliot Aggregate)	1544 Stanley Blvd.			X		
	8	Central Concrete Supply Co Inc.	1544 Stanley Blvd.			X		

ERNS = Emergency Response Notification System
LUST = Leaking Underground Storage Tank Databases
UST = Underground Storage Tank Registrations Database
AST = Aboveground Storage Tank Database
CLEANERS = Dry Cleaners Database

Notes: See text for an explanation of each database identified.
Sites identified under LUST include sites identified in the state and regional databases as well as sites identified in the CORTESE database because of a leaking tank.

SOURCE: Environmental Data Resources Inc., July 25, 2002.

One hazardous spill has occurred at Zone 7's well facilities. On March 7, 2001, during a super-chlorination treatment of Hopyard Well #6, a 20,000–gallon tank overflowed while chlorinated water was being pumped from the well into the tank. Apparently, the flow from the well into the first tank was substantially greater than what the piping between the tanks could accommodate, thus the first tank filled and overflowed. Approximately 1,500 to 2,000 gallons of well water containing 150 to 200 ppm dissolved chlorine spilled from the top of tank, flowed across the asphalt driveway, and entered one or two storm sewer drains located onsite. Zone 7 cleaned up the site and notified RWQCB and the California Department of Fish and Game immediately. No impacts to water or biological resources occurred.

Emergency Response Procedures

Zone 7 maintains a HMBP for each well. The HMBPs specify the following emergency response procedures to be implemented in the event of a chemical emergency:

- A fire, spill, release or threatened release of hazardous materials or hazardous waste is immediately reported to the facility supervisor during normal working hours or to the Zone 7 Telephone Radio Operator (TRO) during off hours. If emergency assistance is required, the initial observer or supervisor calls 911.

- The supervisor, TRO, and/or on-site personnel will notify appropriate Zone 7 personnel or regulatory agencies and/or initiate site-specific response plans or procedures, as appropriate.

- Concurrent with notification, trained personnel or outside contractors will begin cleanup and/or containment of the spill or release as soon as it is safe to do so.

- Should evacuation be necessary, the facility supervisor or incident commander will direct personnel to evacuate the facility. Upon notification, all employees will immediately secure their area and proceed to the assembly area prescribed by the evacuation plan map.

- In the event of an earthquake, conflagration, flood or other major emergency, the evacuation and response plans will be invoked.

- In the event that an employee experiences a serious chemical exposure, illness, or injury, 911 is called and the victim will be transported to the nearest hospital or treated as determined by the paramedics responding to the call. For lesser exposures, any affected employee will be transported to a local medical facility in accordance with Zone 7 procedures.

3.9.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

In accordance with the California Environmental Quality Act (CEQA) Guidelines, and agency and professional standards, the proposed project would be considered to pose a significant impact if it would create a potential public health hazard or involve the use, production, or disposal of materials that pose a hazard to people, or animal or plant populations, in the area affected.

IMPACTS AND MITIGATION MEASURES

Impact 3.9-1: Project construction activities could expose workers and/or the public to hazardous materials/wastes as a result of an accidental spill of diesel fuel or other hazardous materials used for equipment or otherwise needed for construction operations. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Construction activities at individual well sites would require the use of certain potentially hazardous materials such as fuels, oils, solvents, lead solder, and glues. These materials would generally be used within excavation equipment, generators, and other construction equipment and would be contained within vessels engineered for safe storage. Storage of these materials may occur at the construction site. For the pipeline alignment, tender vehicles would most likely provide fuel and lubricant to construction equipment on a daily basis and would be mobilized from an off-site location (i.e. staging area of the proposed well facility). Spills during on-site fueling of equipment or an upset condition (i.e., puncture of a fuel tank through operator error or slope instability), could result in a release of fuel or oils into the environment, including sensitive waterways along the project alignment. Inclusion of hazardous materials management/spill prevention measures listed in **Measure 3.9-1** in contractor specifications would reduce impacts from hazardous materials release to a less than significant level. Implementation of Best Management Practices (identified in **Section 3.2, Surface Hydrology and Water Quality**) would further reduce the risks associated with hazardous materials release.

Mitigation Measures

Measure 3.9-1: The following hazardous materials management, spill prevention, and spill response/cleanup measures shall be included in contractor specifications for each well site:

- A construction site plan, including delineation of hazardous material and hazardous waste storage areas, access and egress routes, drainage paths, emergency assemble areas, and temporary hazardous waste storage areas;
- Materials Safety Data Sheets for all chemicals used and stored at the well site;

- Spill control and countermeasures, including employee spill prevention/response training;
- An inventory list of emergency equipment;
- Off-loading, safety and handling, procedures for each chemical;
- Notification and documentation procedures.

Impact Significance After Mitigation: Less than significant.

Impact 3.9-2: The project could disturb existing contaminated soils or groundwater during construction. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Site disturbance activities such as excavation for construction could expose hazardous contamination already present from onsite or offsite sources. As part of its due diligence in reviewing individual well sites for property acquisition, Zone 7 would review site history with respect to hazardous materials contamination. However, the project could encounter areas of unknown contaminated soil or groundwater, either at well site or along connecting pipeline routes, where incidents have not been reported. Implementation of **Measure 3.9-2**, inclusion of procedures in contractor specifications to follow in the event that noxious odors, discolored soil or other indications of gross contamination are identified, would reduce impacts from hazardous materials release to a less than significant level.

If encountered, contaminated materials may be classified as a hazardous waste, a designated waste, or a special waste, depending on the type and degree of contamination. Disposal of contaminated soils as standard demolition waste or use as fill for another construction site could pose a hazard to people, or animal or plant populations. Implementation of **Measure 3.9-2**, inclusion of site remediation procedures in contractor specifications, would reduce this impact to less-than-significant.

Mitigation Measures

Measure 3.9-2: Unanticipated contaminated soils may exist, and these soils may be discovered during construction or well drilling. These soils would likely be identified in the field visually or by detection of odors. The following procedures shall be included in contractor specifications, in the event that noxious odors, discolored soil or other indications of gross contamination are identified:

- Stop work in areas of contact.
- If necessary, call responsible agencies. Typically, the Alameda County Health Care Services Agency (ACHCSA), Department of Environmental Health, would be the responsible agency; the San Francisco Bay Regional Water Quality Control Board

could be involved if the groundwater or surface water is contaminated, and the California Department of Toxic Substances Control could become involved if soils are contaminated.

- Fence off areas of contamination.
- Perform appropriate clean-up procedures.
- All contaminated soils would be segregated, profiled, and disposed of appropriately off-site. Required disposal method will depend on the types and concentrations of chemicals identified in the soil. Any site investigations or remediations will be performed in accordance with applicable laws.

Impact Significance After Mitigation: Less than significant.

Impact 3.9-3: Construction and operation of wells on or adjacent to properties with known or unknown contamination would have the potential to affect groundwater quality. Less than Significant with Mitigation.

Well Construction

Construction of all municipal supply wells would be required to comply with Department of Health Services (DHS) permitting requirements under the federal Safe Drinking Water Act. These include completion of a Drinking Water Source Assessment and Protection (DWSAP) report for each proposed well site. The DWSAP Program is a new program (1999) developed by DHS in response to the 1996 reauthorization of the federal Safe Drinking Water Act. This act includes an amendment requiring states to develop a program to assess sources of drinking water and encouraging states to establish protection programs. A DWSAP for a ground water source contains the following elements:

- Location of Drinking Water Source;
- Delineation of Source Area and Protection Zones;
- Drinking Water Physical Barrier Effectiveness Checklist;
- Inventory of Possible Contaminating Activities (PCAs);
- Vulnerability Ranking;
- Assessment Map;
- Completion of Assessment and Summary; and
- Public Notification.

Completion of a DWSAP report for individual well sites would reduce the potential for contamination to affect drinking water supplies. In addition, wells constructed under the Master Plan would be drilled to the Deep Aquifer of the Main Basin, a depth of up to 800 feet. Due to the hydrogeologic properties of the Main Basin, which includes a semi-permeable layer of clay materials separating the Shallow Aquifer from the Deep Aquifer, releases from underground storage tanks do not typically affect water quality of the Deep Aquifer. As such, groundwater production from the Deep Aquifer would not be affected by the presence of shallow

contamination plumes in the vicinity of individual well sites. Standard DHS requirements include the establishment of sanitary seals for potable supply wells, as well as minimum horizontal and vertical separation of up to 10 feet from other conveyance structures, such as sewer lines or drainages, that could act as cross-contamination sources.

In addition to DWSAP requirements, hazardous materials contamination potential at or adjacent to individual well sites would be reviewed as part of standard due diligence requirements for property acquisition. Avoidance of sites identified in **Table 3.9-2** would reduce potential impacts associated with known contamination sites within individual wellfields. Zone 7 is bound by due diligence requirements established for Alameda County. Review of site history, applicable databases listed in **Table 3.9-1** and **3.9-2**, as well as Zone 7's own database of groundwater contaminant locations, would ensure that resulting water quality is not affect by well placement in proximity to contamination sources.

Mitigation Measures

Measure 3.9-3a: Zone 7 shall comply with DSWAP requirements established by DHS under the Safe Drinking Water Act, including completion of a DWSAP report for individual well constructed under the Well Master Plan.

Measure 3.9-3b: Zone 7 shall conduct due diligence review of final well sites to ensure that known hazardous materials contamination sites are appropriately avoided. This shall include a Phase I Environmental Site Assessment conducted to ASTM standards, including review of databases listed in **Table 3.9-1**.

Impact Significance After Mitigation: Less than significant.

Impact 3.9-4: Chemicals used in the treatment of groundwater for potable use would be stored at the treatment well sites. If accidentally released, these chemicals could cause human health effects to maintenance personnel and surrounding populations and could cause adverse environmental effects if released to the environment. Less than Significant with Mitigation.

Well Operation

Zone 7 would use chloramination for disinfection, to meet drinking water standards and limit formation of disinfection byproducts. The chemicals associated with chloramination include sodium hypochlorite and ammonium hydroxide. These chemicals would be stored at well facilities with onsite treatment.

Sodium Hypochlorite

Sodium hypochlorite would be supplied under one of two scenarios: bulk delivery and storage or on-site generation. These scenarios are described below.

Under the bulk delivery and storage scenario, sodium hypochlorite would be transported to the well sites as a 12.5% solution in truck deliveries of up to 4,500 gallons. Storage tanks would be sized for up to a 30 day supply. Secondary containment for storage area and truck unloading area would be provided. Chemical metering pumps would feed hypochlorite to the point of application. Operation would be at peak capacities 50 percent of the time of 1.44 MGD or 8.64 MGD (depending on facility size). Hypochlorite solution demand would be 16.5 gal/day or 98.9 gal/day.

Under the on-site generation scenario, sodium hypochlorite (0.8 percent solution) would be generated onsite using catalytic electrolysis. This process involves mixing salt with water, then feeding this solution through chlorine generators to produce sodium hypochlorite. The process waste product, hydrogen gas, would be disposed of by venting outdoors. Facilities required for this process would include a salt saturation tank, water softening equipment, salt solution tank, chlorine generator, sodium hypochlorite storage tank, metering pumps, and appurtenances. Secondary containment would be provided for the hypochlorite storage tank and piping. Electrolytic cells must be cleaned regularly with an acid solution, which produces a concentrated acid waste by-product. Hypochlorite solution demand would be 280 gal/day or 1,700 gal/day, depending on facility type.

According to the Material Safety Data Sheet for sodium hypochlorite, direct contact with the material can result in the severe irritation of skin and eyes, and inhalation of vapors is to be avoided. This material is not flammable.

Ammonium Hydroxide

Under both scenarios, an ammonium hydroxide solution would be delivered and stored on site at a 19 percent concentration. Feed systems would inject either 2 gal/day or 12.2 gal/day of ammonium hydroxide, depending on facility size. Facilities would include an ammonium hydroxide storage tank, a pressure relief valve with a scrubber tank to prevent discharge of ammonia gasses, and metering pumps. According to the Material Safety Data Sheet for ammonium hydroxide, direct contact with the material can result in the severe irritation of skin and eyes, and inhalation of vapors is to be avoided. This material is not flammable. When combined with sodium hypochlorite, chloramine gas may be produced. Inhalation of these gases results in respiratory tract irritation.

Chemical Storage

Ammonia hydroxide and sodium hypochlorite solutions would be handled and stored in compliance with the most recent applicable laws and regulations that reduce the potential for a release of chemicals. Specific design features, similar to those at existing well facilities, of the chemical storage containment and chemical feed lines that increase the safe handling of hazardous substances at the facility include:

- separate secondary containment for each chemical storage system;

- modernized control and chemical feed systems;
- secondary containment for the chemical feed lines;
- adequate separation of incompatible chemicals; and
- design of all chemical handling facilities to minimize or eliminate the risk of damage from earthquakes or other natural disasters.

These improvements would off-set any increased potential for spills due to the proposed storage of hazardous materials that would be used as part of the proposed project. In addition, Zone 7 has in place emergency response procedures that are included as part of their HMBP (as required by CCR Title 6.95, Section 25500) and Spill Control and Countermeasure Plan (as required by CFR, Title 40, Section 112.7). These plans would be updated to reflect the hazardous substances used at the proposed well facilities part of the proposed project. Implementation of **Measure 3.9-4**, design and construction of facilities to conform to federal, state, and local regulations, as well as preparation of the HMBP, would reduce impacts associated with accidental release of stored hazardous materials to a less than significant level.

Mitigation Measures

Measure 3.9-4a: Well facilities constructed under Well Master Plan would, by law, conform to appropriate regulations and statutes from the federal, state and local agencies. Any new or additional chemical storage facilities would be designed and constructed to conform to all appropriate regulations including providing secondary containment and testing of pressurized containers. A Hazardous Materials Business Plan shall be prepared for all new well facilities.

Impact Significance After Mitigation: Less than significant.

Impact 3.9-5: Implementation of the project would require delivery of chemicals to the well facilities, which would result in an increase in potential for accidents during transportation. Because of the stringent hazardous material packaging and transportation requirements of the U.S. DOT and the low accident rate involving hazardous materials, this impact is not considered significant. Less than Significant.

Well Operation

Under the bulk delivery and storage scenario, two chemical truck deliveries per week is expected at each treatment site. Trucking on highways and local streets is the most common method of transporting hazardous materials and waste in Alameda County. The U.S. Department of Transportation (USDOT), Office of Hazardous Materials Safety regulates transportation of hazardous materials. The Alameda County Hazardous Waste Management Plan also contains policies regarding transportation of hazardous materials and wastes, including emergency response.

An accident involving hazardous materials during vehicle transport could result in the following impacts:

- Direct exposure of motorists and emergency responders, i.e., firefighters, highway patrol officers, paramedics, Caltrans workers, etc., to hazardous materials, resulting in acute and chronic health effects.

- Contamination of the roadway and surrounding environment due to uncontrolled runoff from the incident.

Because of the stringent hazardous material packaging and transportation requirements of the U.S. DOT and the low accident rate involving hazardous materials, this impact is not considered significant.

Mitigation Measures

No mitigation measures required.

Impact Significance: Less than significant.

REFERENCES – Hazardous Materials

CCR, (California Code of Regulations), Title 22, Division 4.5 "Environmental Health Standards for the Management of Hazardous Wastes," Chapter 11, Article 3 (Characteristics of Hazardous Waste), Sections 66261.20-24.

EDR (Environmental Data Resources, Inc.) *EDR Area Study Report: 201583 Zone 7 Well Master Plan EIR, Pleasanton, CA 94568*, July 25, 2002.

3.10 PUBLIC SERVICES AND UTILITIES

3.10.1 SETTING

REGIONAL SETTING

The proposed well facilities and associated connection pipelines would be constructed within the Cities of Pleasanton and Livermore, and in areas of unincorporated Alameda County. The providers of public services and utilities to these areas along the proposed alignment are shown in **Table 3.3-1** and described below with respect to potential pipeline construction impacts.

The proposed project would provide additional potable water capacity to Zone 7's service area, including the Cities of Pleasanton, Dublin, and Livermore. A discussion of secondary effects of growth related to public services and utilities in these cities is presented in Section 4.

EXISTING ENVIRONMENT

The wellfield sites are located through the cities of Pleasanton, Livermore, and unincorporated Alameda County. **Table 3.10-1** shows the wellfields with respect to affected jurisdictions.

TABLE 3.10-1
PROVIDERS OF PUBLIC SERVICES AND UTILITIES IN THE VICINITY OF THE PROPOSED CONNECTION PIPELINE ALIGNMENT

Wellfield Site	Jurisdiction
Bernal Wellfield	Pleasanton
Hopyard Wellfield	Pleasanton
Valley Avenue	Pleasanton
Mocho	Pleasanton
Stoneridge Wellfield	Pleasanton
Martin Wellfield	Pleasanton
Busch Valley Wellfield	Pleasanton, Unincorporated Alameda County
Gravel Pit Well Field	Unincorporated Alameda County
Stanley Well Field	City of Pleasanton, Unincorporated Alameda County
Chain of Lakes Wellfield	Unincorporated Alameda County, Livermore
Isabel Wellfield	Unincorporated Alameda County, Livermore

City of Pleasanton

The majority of the planning area is within the City of Pleasanton jurisdiction. The City is generally developed for urban / suburban uses.

Emergency Service Providers

The Pleasanton Police Department provides police services within Pleasanton city limits. The police station is located at 4833 Bernal Avenue. The Livermore-Pleasanton Fire Department provides fire protection and fire-fighting services within city limits for both Pleasanton and Livermore. American Medical Response has a 911 contract with selected areas of Alameda County, including Pleasanton, Dublin, and Livermore, and individual hospitals (LAVWMA, 1997).

Water Facilities

Zone 7 wholesales water to the City of Pleasanton, who in turn provides water service within Pleasanton city limits. Water mains are generally present on city streets. Groundwater wells are located throughout the Valley. These are maintained both by the City of Pleasanton Public Works Department and Zone 7.

Wastewater Collection

The Dublin San Ramon Services District (DSRSD) provides treatment services to the City of Pleasanton. Sewer trunk lines and laterals are generally present within city streets.

Storm Drains

The City of Pleasanton maintains storm drains within city limits. Storm drains are generally present within city streets.

Other Utilities

SBC and AT&T maintain telephone lines in the planning area. Pacific Gas and Electric (PG&E) maintains gas and electric lines in Pleasanton. Underground cable line, fiberoptic cable lines and petroleum pipelines may also be present throughout the City of Pleasanton.

Schools and Parks

School services within the City of Pleasanton are provided by the Pleasanton Unified School District. The City of Pleasanton maintains parks within city limits. **Section 3.4, Land Use**, identifies schools and parks within the wellfields in the City. A number of parks are located within the western wellfield sites.

Unincorporated Alameda County

Emergency Service Providers

The Alameda County Sheriff's Department provides police services to unincorporated Alameda County. The Alameda County Fire Department provides fire services and emergency medical response to this area.

TABLE 3.10-2
PROVIDERS OF PUBLIC SERVICES AND UTILITIES IN AND AROUND THE PLANNING AREA

Public Service or Utility	Unincorporated Alameda County	City of Pleasanton	City of Livermore
Wastewater	Private septic tanks	DSRSD	City of Livermore
Water	Zone 7 (wholesale)	City of Pleasanton; Zone 7 (wholesale)	California Water Service Co.; City of Livermore; Zone 7 (wholesale)
Solid Waste	Altamont Landfill	Pleasanton Garbage Service; Vasco Road Sanitary Landfill	Livermore and Dublin Disposal Service; Vasco Road Sanitary Landfill
Storm Drainage	ACFCWCD Zone 2	City of Pleasanton, Zone 7	City of Livermore, Zone 7
Gas and Electric	PG&E	PG&E	PG&E
Communications	SBC, AT&T, Viacom, MCI	SBC, AT&T, Viacom, MCI	SBC, AT&T, Viacom, MCI
Other Utilities	TCI	TCI	TCI
Police Protection	Alameda County Sheriff's Department	City of Pleasanton Police Department	City of Livermore Police Department
Fire Protection	Alameda County Fire Department	Livermore -Pleasanton Fire Department	Livermore -Pleasanton Fire Department
Emergency Medical Service	Contract ambulance service; all firefighters have EMT	Ambulance company (AMR)	Ambulance company (AMR)
Schools	NA	Pleasanton Unified School District	Livermore Valley Joint Unified School District
Parks & Recreation	EBRPD	City of Pleasanton	LARPD
Other Services	Alameda County Library	Valley Care Medical Center; Kaiser Permanente Medical Center	NA

AMR = American Medical Response
ACFCWCD = Alameda County Flood Control and Water Conservation District
EBRPD = East Bay Regional Park District
EMT = emergency medical training
LARPD = Livermore Area Recreation and Parks District
NA = not applicable

SOURCE: Environmental Science Associates, 1997.

Water Supply

There are limited developments within this area of unincorporated Alameda County. The predominant use within this area is mining and agricultural operations. Water is provided by Zone 7 through turnouts and pipelines.

Wastewater

There are limited developments within this area of unincorporated Alameda County. Therefore, wastewater is provided either through septic systems or conveyed to one of the two wastewater treatment plants in the area: the DSRSD and the Livermore Water Reclamation Plant.

Storm Drains

Due to the limited, developed urban areas within this area, there are no storm drain facilities within this area. Instead, storm water is managed within the existing flood control channels, in particular, the Arroyo Mocho.

Other Utilities

SBC, AT&T, PG&E, MCI, and Viacom provide most of the other types of utilities in this portion of unincorporated Alameda County.

Schools and Parks

There are no urban areas and therefore no schools in this part of unincorporated Alameda County. Shadow Cliffs Regional Recreation Area, managed by EBRPD, is located south of Stanley Boulevard, outside of the planning area. Trail facilities, managed by EBRPD, are located in the vicinity of the area, including along Stanley Boulevard. A proposed trail is located along El Charro Road (within the Gravel Pit Wellfield).

City of Livermore

Only a small portion of the planning area is located within City of Livermore jurisdiction. The planning area does not include the urban areas of the City.

Emergency Service Providers

The Livermore Police Department provides police services within the city limits and operates one police station, located on 1110 South Livermore Road. The Livermore-Pleasanton Fire Department provides fire protection and fire-fighting services within the city limits of both Livermore and Pleasanton. American Medical Response has a 911 contract with selected areas of Alameda County, including Pleasanton and Livermore as well as with individual hospitals (LAVWMA, 1997).

Water facilities

Zone 7 wholesales water to the California Water Service Company (CWS), who in turn provides water supply to its customers within the majority of the Livermore city limits. Water mains are generally present within city streets.

Wastewater Collection

Livermore Water Reclamation Plant (WRP) provides wastewater collection and treatment services within the city limits. Sewer trunk lines and laterals are generally present within area roadways.

Storm Drains

The City of Livermore maintains storm drains within city limits. Storm drains are generally located within area roadways.

Other Utilities

SBC and PG&E are some of the utility providers in Livermore. They are generally located within area roadways.

Schools and Parks

School services within the City of Livermore are provided by the Livermore Valley Joint Unified School District. A few schools are located to the east of the Isabel Wellfield site, but are not located within the planning area.

The East Bay Regional Park District (EBRPD) and the Livermore Area Recreation and Park District (LARPD) maintain parks and open space within city limits. Park facilities are located east of the Isabel wellfield site, outside of the planning area.

3.10.2 REGULATORY FRAMEWORK

CONSISTENCY WITH COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

Alameda County, and the cities of Pleasanton and Livermore identify goals and policies in their General Plans that addresses public facilities and services. The relevant policies are presented in **Appendix 3.10**. The proposed project would be consistency with these goals and policies of the affected jurisdictions.

3.10.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

A project would normally have a significant adverse impact on public services or utilities under California Environmental Quality Act (CEQA) if it would breach published, national, state, or local standards relating to solid waste, contaminate a public water supply, interfere with emergency services, extend a sewer trunk line with capacity to serve new development, or interfere with emergency response plans or emergency evacuation plans. For the purposes of this DEIR, if the project would breach any of the above-referenced standards, or disrupt utilities service to create a public health hazard or extended service disruption, it would be considered to have a significant impact on the environment.

IMPACTS AND MITIGATION MEASURES

Impact 3.10-1: Well facilities construction and connection pipeline installation could result in temporary, planned or accidental disruption to utility services. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

Water, sewer, storm drain, natural gas, oil, electric, and/or communication lines are located within planning area roadways in developed urban / suburban areas. These areas are primarily located in the City of Pleasanton, and include Bernal Wellfield, Hopyard Wellfield, Valley Wellfield, Mocho Wellfield, Stoneridge Wellfield, Martin Wellfield, and portions of Busch Valley Wellfield. The eastern wellfields are primarily developed for quarry or agricultural uses, and therefore are not expected to have numerous buried lines. Utility services could be disrupted as a result of well facility and pipeline construction, specifically associated with installation of the connection pipeline along the roadways where open trench excavation is required. In most cases, impacts to utilities and services involve temporary disruption would not exceed one day. All utility lines and cables that would be disrupted during pipe installation would be identified as part of the potholing conducted during the preliminary design phase. As a condition of approval for either a utility excavation permit or an encroachment permit, a detailed engineering and construction plan, which thoroughly describes construction techniques and protective measures for minimizing impacts to utilities, would be prepared by Zone 7. This plan requires review by special service districts and utility services in the planning area.

Accidental disruption of smaller utility lines and cables is possible at urban / suburban sites where there are many buried lines. Temporary and accidental impacts to smaller utility lines would be considered adverse, but not significant, because the affected area and duration of the impacts would be limited. However, disruptions to major utility lines would be considered significant, but mitigable.

Mitigation Measures

Measure 3.10-1: For proposed facilities located within urban / surburban areas, the following mitigations are identified.

- Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits include measures to minimize utility disruption. Zone 7 and its contractors shall comply with permit conditions, and such conditions shall be included in construction contract specifications.

- Utility locations shall be verified through field survey (potholing) and use of the Underground Service Alert (USA) services.

- Detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of Zone 7's construction plans and schedule. Arrangements should be made with these entities regarding protection, relocation, or temporary disconnection of services.

- Zone 7 shall employ special construction techniques in areas where the connection pipeline would parallel wastewater mains. These special measures, which would be included in the engineering specifications, should include trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the water main. **Measure 3.10-2**, below, provides more discussion on this issue.

- Residents and businesses in the planning area shall be notified of planned utility service disruption two to four days in advance, in conformance with county and state standards.

Impact Significance After Mitigation: Less than significant.

Impact 3.10-2: Construction the connection pipeline associated with the well facilities may result in utility conflicts or require relocation of existing utilities. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

As discussed in **Impact 3.10-1**, numerous utility lines are located within planning area roadways, primarily in developed urban / suburban areas of Pleasanton (western part of the Planning Area). Proposed connection pipelines would be routed to the extent possible along such major roadways, and would run parallel to, cross under, or cross over these utilities. Areas of high congestion and possible utility conflicts may occur at intersections where there are many crossing pipelines. The proximity of wastewater lines, in particular, may complicate the construction of proposed connection pipeline segments, as Department of Health Services (DHS) regulations require a 10-foot horizontal separation between parallel potable water and wastewater effluent lines, and a one-foot vertical separation for crossing potable water and effluent lines. To minimize utility

conflicts and reduce potential impacts to less-than-significant levels, Zone 7 would implement **Measure 3.10-2**.

Mitigation Measures

Measure 3.10-2: In order to reduce potential impacts associated with utility conflicts, the following measures shall be implemented in conjunction with **Measure 3.10.1**.

- Disconnected cables and lines shall be reconnected promptly.
- Zone 7 shall observe DHS standards which require 1) a 10-foot horizontal separation between parallel sewer and water mains; 2) one-foot vertical separation between perpendicular water and sewer line crossings. (In the event that separation requirements could not be maintained, Zone 7 shall obtain DHS variance through the use of special pipeline type or coating, or other means deemed suitable by DHS).

Impact Significance After Mitigation: Less than significant.

Impact 3.10-3: Project implementation would not include habitable or commercial structures. Therefore, project implementation would not create additional demands on police or fire protection services. Less than Significant.

Well Construction and Pipeline Installation

The proposed project is limited to the construction of well facilities, and would not generate the need for additional police or fire protection services. During construction, project-related hazards include traffic congestion and rough road conditions, open trenches, and operation of heavy construction equipment. Construction activities could also result in interference with high-pressure gas lines and other high-voltage lines. Such activities could require response from fire units, but would be within the context of public service demands within the Livermore Valley. Due to the short-term nature of construction activities at each site, potential impacts public services would be considered less than significant. No measures are required or recommended.

Mitigation Measures

No Mitigation Measures Required.

Impact Significance: Less than significant.

Impact 3.10-4: Operation of individual well sites would require power supply. Less than Significant with Mitigation.

Well Operation

Individual well sites would be sited not only based on hydrologic conditions, proximity to existing Zone 7 facilities, and land acquisition requirements, it would also depend on the availability of power supply. The pumps within the well facilities would be electrically driven, and transformers would be located within the footprints of well facilities to step down the electrical voltage if required. Overhead or underground transmission power lines are located throughout the planning area, primarily within the developed City of Pleasanton. If existing power sources do not have adequate capacity to provide electricity for the well facility, implementation of the project would result in significant impacts. To reduce potential impacts to a less than significant level, Zone 7 would coordinate with PG&E to ensure that adequate capacity is available.

Mitigation Measures

Measure 3.10-4a: For project facilities with a potential to exceed the capacity of existing PG&E systems, Zone 7 shall coordinate with PG&E to ensure adequate capacity is available.

Impact Significance After Mitigation: Less than significant.

REFERENCES – Public Services and Utilities

LAVWMA (Livermore-Amador Valley Water Management Agency), *Livermore-Amador Valley Water Management Agency Export Pipeline Facilities Project EIR*, prepared by Environmental Science Associates, 1997.

3.11 CULTURAL RESOURCES

3.11.1 SETTING

INTRODUCTION

Archival resources at the Northwest Information Center (NWIC) as well as William Self and Associates (WSA) in-house resources were utilized in researching extant information on cultural resources for the Zone 7 Well Master Plan Project. The NWIC maintains 27 records of archaeological studies in the project area. Of those, 20 recorded Native American or historic cultural resources are listed with the Historical Resources Information system. WSA conducted a follow-up review of cultural resources in the project area, and identified 24 known archaeological sites within or abutting the project area. Nine of the 24 sites contain human burials in various quantities. The Livermore Amador Valley Water Management Agency (LAVWMA) Export Pipeline Facilities Project (1997) also provided background information on the existing cultural resources within the project area.

REGIONAL SETTING

The historic Willow Marsh, previously located in the vicinity of today's Hacienda Business Park in the City of Pleasanton, covers the western part of the project site. In prehistoric times, the marsh/lake and its tributaries was an attractive resource to native populations. However, the sedimentation record indicates that prolonged periods of rainfall flooded many of the habitation sites within the Livermore Valley. Several of the sites located within the project area were covered by several feet of alluvium, impeding identification by surficial survey. These sites were not discovered until excavation associated with other infrastructural projects was performed. Specific cultural sites within each wellfield are discussed below. Based on a review of cultural resources in the project area, the NWIC has identified the majority of the project site as high sensitivity for historical and archaeological resources. The area encompassing the quarry area is considered as moderate sensitivity for historical and archaeological resources. Where historical properties were found within the planning area NWIC indicated that they are not listed in state and federal inventories. WSA conducted a follow-up investigation of sites within the project area, and identified the following archaeological and historic resources (see **Table 3.11-1**).

Bernal Wellfield

Two known prehistoric midden sites with burials (P-1 and P-2160) and one historic ranch (P-2246) are located along the western section of the wellfield, in the vicinity of the Arroyo de la Laguna and I-680. These sites are surrounded by open space and residential development. The site integrity of the prehistoric resources is unknown, and the historic ranch was completely destroyed during recent construction activities. Another prehistoric site (P-14) is located adjacent to the wellfield, west of Arroyo de la Laguna. The two prehistoric sites within the wellfield have been or will be covered by development.

TABLE 3.11-1
CULTURAL RESOURCES IN THE PROJECT AREA

Wellfield	Site Number	Site Integrity / Site Type	Description of Cultural Resources Site
Bernal	P-1 (CA-ALA-554)	Unknown / Prehistoric midden, burials	Prehistoric midden site, soon to be covered by development. Lithic artifacts, bone artifacts, decorative items, groundstone, faunal remains, fire cracked rock, charcoal, a hearth feature, and more than 20 burials were recovered in a deposit measuring 135m E/W, and 170m N/S. The thickness of the cultural layer averaged 75 cm thick.
	P-2160 (CA-ALA-574)	Unknown / Prehistoric midden, burials	An extensive prehistoric midden with numerous burials, this site revealed pit features with fire affected rock, bone, shell, flaked stone, and groundstone artifacts. Recent efforts revealed the dimensions of the site to be 500m E/W by 660m N/S. This site is now covered by recent housing developments.
	P-2246	Totally destroyed / Historic ranch	Former location of the Kennedy Ranch, a site measuring 230' E/W by 430' N/S. This ranch was totally destroyed during recent construction activities.
	P-14 (CA-ALA-483) (outside)	Unknown / Prehistoric site, burials	Prehistoric cultural deposit buried beneath 9' of alluvial and colluvial sediments in the southern portion, and less than 1' of sediments in the northern portion of the site. Groundstone, lithics, tools, faunal remains, charcoal, ornaments and burials were recovered. The deposit measures 330m by 170m, and is 0-3.11m deep.
Hopyard	P-1775	Unknown / Historic linear feature: canal	This feature is the Pleasanton canal, which follows the general route of a natural culvert, and provides drainage for the western Pleasanton area. Constructed in the 1960's; some areas are underground and surrounded by building developments.
	P-1776	Unknown / Historic linear feature: railroad grade	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150' wide at the top, 60' wide at the bottom, and 20' deep. Its present form dates to the 1960's.
Valley	C-280	Unknown / Prehistoric midden, burials	A trench was put through the site during construction of a Safeway; most of the site is now under the parking lot. Mortar fragments, midden soil, lithics and burials were recovered.

TABLE 3.11-1 (Continued)
CULTURAL RESOURCES IN THE PROJECT AREA

Wellfield	Site Number	Site Integrity / Site Type	Description of Cultural Resources Site
Mocho	P-1785	Totally destroyed / Historic linear: railroad grade	Previous location of the Southern Pacific--San Ramon Valley Branch railroad grade. Nothing remains of this line except portions of the old grade; ties, rails, and other equipment have been removed.
	CA-ALA-414	"partially [destroyed]" by a trench passing through the site / Prehistoric midden, burials	Prehistoric midden site, with three burials, one obsidian flake, two chert flakes, two groundstone fragments. Site measures 60m along trench, up to 1.2m deep.
	P-1776	Unknown / Historic linear: canal	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150' wide at the top, 60' wide at the bottom, and 20' deep. Its present form dates to the 1960's.
Stoneridge	P-1776	Unknown / Historic linear: canal	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150' wide at the top, 60' wide at the bottom, and 20' deep. Its present form dates to the 1960's.
	CA-ALA-414	"Partially [destroyed]" by a trench passing through the site / Prehistoric midden, burials	Prehistoric midden site, with three burials, one obsidian flake, two chert flakes, two groundstone fragments. Site measures 60m along trench, up to 1.2m deep.
	CA-ALA-413	(This was a salvage operation, suggesting eventual destruction of the site) / Prehistoric mound site, burials	Prehistoric mound site consisting of many burials, groundstone items, lithic materials, faunal bones, pendants, tools. Site is approximately 500m N/S by 750m E/W.
	CA-ALA-467 (outside)	Unknown / Prehistoric	Prehistoric site consisting of lithics, groundstone, shell, bone. Site measures 375' E/W by 400' N/S, is approximately 1m deep, and is buried under 50-80cm sterile overburden, with no surface indicators.
	"Unrecorded Site": (outside)	Unknown	The location of the site was plotted on the map included with the site records for the project area, but no details were included. It is therefore not known whether the site is historic or prehistoric, specific dimensions, etc.

TABLE 3.11-1 (Continued)
CULTURAL RESOURCES IN THE PROJECT AREA

Wellfield	Site Number	Site Integrity / Site Type	Description of Cultural Resources Site
Martin	CA-ALA-46	"buried and disturbed" / Prehistoric site, 1 burial	Prehistoric site consisting of one burial, faunal remains, lithics, and fire cracked rock. Site is 150cm below surface, and measures 67.2m N/S, 0.6m E/W.
	CA-ALA-42	"largely destroyed several years ago" / Prehistoric midden, burials	Prehistoric site with scattered human remains and groundstone artifacts on surface. Site measures approximately 300' by 175'.
	C-736	Unknown / Historic Barn	Historic barn in a complex of buildings at the end of Martin Rd. Possibility of other structures located there historically.
	CA-ALA-394 (outside)	"great [destruction] through vandalism (potlhunting)" / prehistoric midden, burials	Prehistoric site consisting of lithic and bone artifacts, groundstone items, beads, burials. Site is buried under 1.5-3' of sterile fill, over an area measuring 300m by 400m (?).
	P-1776	Unknown / Historic linear: canal	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150' wide at the top, 60' wide at the bottom, and 20' deep. Its present form dates to the 1960's.
Busch Valley	CA-ALA-44	"totally destroyed, area is now gravel pit" / Prehistoric site	Prehistoric site; 3 mortars, 1 pestle. Artifacts were recovered 15' below ground surface.
	P-1774 (WPW-7 and SPW-7)	Good condition, still in use / Historic linear feature: railroad	This record concerns elements of the Western Pacific Railroad and the Southern Pacific Railroad. WPW-7 is located at the intersection of Stanley and Valley roads, north of Stanley road and east of Valley road. There is an 8' wide octagonal building for warning signals and crossing arms at the abandoned railroad crossing. A wood and concrete railroad bridge (pre-1912) is located about 200' east of the crossing on an abandoned side track to the mainline. This track still receives heavy use; rails date from 1954-1955. The Southern Pacific Railroad joins the Western Pacific mainline at this point (Radum Junction). The tracks range from 1927-1946, and are still in use.

TABLE 3.11-1 (Continued)
CULTURAL RESOURCES IN THE PROJECT AREA

Wellfield	Site Number	Site Integrity / Site Type	Description of Cultural Resources Site
Gravel Pits	P-1776	Unknown / linear feature: canal	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150' wide at the top, 60' wide at the bottom, and 20' deep. Its present form dates to the 1960's.
Chain of Lakes	C-669	Unknown / Prehistoric site	Prehistoric site located on the south side of the Johnson property. An area 15m in diameter (85-150cm below the surface) revealed fire cracked rock, hearth features, faunal bones, shell and carbon.
	P-1776	Unknown / linear feature: canal	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150' wide at the top, 60' wide at the bottom, and 20' deep. Its present form dates to the 1960's.
	P-2124 (CA-ALA-518H)	"very poor condition… artifacts broken and redeposited through discing, others possibly removed" / Historic farm / ranch	Historic and modern agricultural remains associated with a shallow arroyo and bordered by cleared, leveled, former farmland. West end of site is a complex of dairy remains, containing a concrete cattle scale foundation, a water well, a burned barn, and a concrete loading dock. The central part of the site contains two historic fences paralleling the arroyo, and extending to the east end of the site, where there is a sparse, disturbed scatter of historic refuse (mostly wood with square cut nails). No structures remain standing.
Stanley Boulevard	None	None	None
Isabel	P-2124 (CA-ALA-518H)	"very poor condition… artifacts broken and redeposited through discing, others possibly removed" / Historic farm / ranch	Historic and modern agricultural remains associated with a shallow arroyo and bordered by cleared, leveled, former farmland. West end of site is a complex of dairy remains, containing a concrete cattle scale foundation, a water well, a burned barn, and a concrete loading dock. The central part of the site contains two historic fences paralleling the arroyo, and extending to the east end of the site, where there is a sparse, disturbed scatter of historic refuse (mostly wood with square cut nails). No structures remain standing.

TABLE 3.11-1 (Continued)
CULTURAL RESOURCES IN THE PROJECT AREA

Wellfield	Site Number	Site Integrity / Site Type	Description of Cultural Resources Site
Isabel (cont.)	CA-ALA-519H	"condition: good" / Historic railroad	Site consists of an abandoned railroad bed and associated structures and equipment, including a cylindrical concrete building/structure, a signal tower, and an electrical control box. The site measures 2493' by 98'.
	CA-ALA-517H	Entire house and parts of outbuildings have burned to the ground / Historic house	Site consists of a historic house and its associated outbuildings, represented by rock and cement foundations. Bottles, glass, square cut nails, wire nails, ceramics, water heater, metal sink, stove parts, refrigerator, and cooking utensils were recovered. The site measures 135' by 135'.
	P-1776	Unknown / Historic linear feature: canal	This feature is the Arroyo Mocho canal, a recently channelized flood control canal. It is V-shaped and earth-lined, measuring 150' wide at the top, 60' wide at the bottom, and 20' deep. Its present form dates to the 1960's.

SOURCE: William Self Associates, 2002.

Hopyard Wellfield

There are no known archaeological resources within the wellfield. Two known historic linear features are identified within the Hopyard Wellfield: Pleasanton Canal (P-1775) and the Arroyo Mocho Canal (P-1776). These channelized flood control channels are surrounded by urban uses and managed by Zone 7 for conveyance of stormwater. Both channels are earthlined, trapezoidal, and entirely open canal within the wellfield. Both channels convey stormwater within the Livermore Valley. The site integrity of both features are unknown.

Valley Wellfield

One known prehistoric midden site (C-280) consisting of mortar fragments, midden soil, lithics, and burials were recovered in part during trenching activities for a Safeway store. This site, located in the western most aspect of the wellfield, is primarily under the parking lot of Safeway. There are no known historic resources identified within the Valley Wellfield.

Mocho Wellfield

One known prehistoric midden site with burials is identified within the wellfield during trenching of a wastewater trunk line by the Livermore Amador Valley Water Management Agency (LAVWMA) in 1978. CA-ALA-414, covered by silt, was found approximately a quarter-mile east of Santa Rita Road along the banks of the Arroyo Mocho. At least three burials were exposed and removed, midden deposit up to 80 centimeters thick was recorded, and cultural features were reported. However, no final archaeological report was completed, and no formal determination of significance under CEQA criteria was made (Banks, 1978a).

Banks (1978b) recovered prehistoric burials and artifacts from the trunk line easement at CA-ALA-414, in the vicinity of Stoneridge Drive and Stone Point Way and south of the Arroyo Mocho Canal.

Two historic resources are located within the wellfield: the Southern Pacific – San Ramon Valley Branch railroad grade historic feature (P-1785) and the Arroyo Mocho Canal (P-1776). The railroad feature passes through the wellfield but is completely destroyed with the exception of portions of the old grade. Feature P-1776 is described above for the Hopyard Wellfield, and its site integrity is unknown.

Stoneridge Wellfield

There are two known prehistoric sites with burials located within the wellfield (CA-ALA-413 and CA-ALA-414), and two sites within half a mile west of the wellfield (CA-ALA-467 and "unrecorded site"). The Arroyo Mocho (P-1776) is a linear historical feature that passes through the wellfield. CA-ALA-414 and P-1776 are described above.

In 1978, trenching for the LAVWMA wastewater trunk line encountered a buried archaeological site, designated CA-ALA-413, just west of the Las Positas Boulevard and Owens Drive intersection. This site was first identified when excavation disturbed numbers of human burials,

leaving others visible in the sidewalls of the trench, which was approximately 10 feet deep. Work stopped in this area, and Holman and Associates ultimately identified 65 human burials in a cultural matrix, extending from just below the surface to near the bottom of the trench.

Martin Wellfield

At the time of the LAVWMA trunk line construction in 1978, (CA-ALA-394) was found on the north side of the Arroyo Mocho east of Santa Rita Road, reportedly buried under as much as 10 feet of recent silt deposits (LAVWMA, 1997). CA-ALA-394, has yielded important archaeological data.

Two later-period sites, CA-ALA-42 and CA-ALA-46, were found on the surface some years earlier (LAVWMA, 1997). CA-ALA-42, a village located on the south side of the Arroyo Mocho along the recent extension of Stoneridge Drive, represents one of these later-period villages. This site has yielded numerous Late Period burials and quantities of artifacts. CA-ALA-46 is another site containing prehistoric burials, located south of Arroyo Mocho. Additionally, a mapped but unrecorded prehistoric shell-bearing midden deposit, designated C-669, is located on the south side of Arroyo Las Positas, approximately 1,900 to 2,300 feet east of El Charro Road.

Site C-736 is a historic barn in a complex of buildings. The site integrity is unknown.

Busch Valley Wellfield

There is one known prehistoric site (CA-ALA-44) within the wellfield that has been destroyed and converted into a gravel pit for mining. Three mortars and one pestle were recovered. One historic resource associated with the Western Pacific Railroad and the Southern Pacific Railroad (P-1774) is also located at the intersection of Stanley and Valley roads. It consists of a building for warning signals and crossing arms at the abandoned railroad crossing, as well as a concrete railroad bridge. The tracks, built between the 1927 through 1946 are still in use.

Gravel Pits Wellfield

The Arroyo Mocho traverse through the wellfield and is considered a historical resource. The site integrity is unknown.

Chain of Lakes Wellfield

There is one known prehistoric site, consisting of fire cracked rock, hearth features, faunal bones, and shell and carbon, located within the wellfield. The site integrity is unknown.

Stanley Boulevard Wellfield

There are no cultural resources located within this wellfield.

Isabel Wellfield

There are no prehistoric resources and four historic resources located within this wellfield. P-2124 is a historic farm consisting of agricultural and dairy remains; there are no standing structures and is considered in poor condition. CA-ALA-519H is a historic railroad that consists of the railroad bed and associated structures and equipment. This site is considered in good condition. CA-ALA-517H consists of a historic house and its associated outbuildings, which have been burned to the ground. The Arroyo Mocho, a historic linear feature, traverses the wellfield; its site integrity is unknown.

3.11.2 REGULATORY FRAMEWORK

Consistency with County and Local Regulations, Goals, and Policies

Alameda County, and the cities of Pleasanton and Livermore identify goals and policies in their General Plans that protect cultural resources within individual jurisdictions. The policies relevant to the project are presented in **Appendix 3.11**. The proposed project would be consistent with these goals and policies of the affected jurisdictions.

3.11.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

CEQA Guidelines Section 15064.5, Public Resources Code, Division 13, Environmental Quality, Sections 21083.2, and 21084.1 discuss policies, goals, and mitigation associated with cultural resources. These provisions provide definitions of historical and archaeological resources, and criteria by these resources are deemed significant.

In accordance with Appendix G of the CEQA Guidelines, a significant effect will normally occur if a project will "cause a substantial adverse change in the significance of a historic resource or archaeological resource." CEQA Guidelines Section 15064.5 defines historic and archaeological resources. Historic resources are identified as "a resource listed in, or determined to be eligible for listing in the California Register of Historical Resources[1]." In addition, "a resource included in a local register of historical resources or identified as significant in an historical resource survey pursuant to Section 5024.1(g) of the Public Resources Code shall be presumed to be historically or culturally significant. Therefore, the demolition, destruction, relocation, or alteration of a historic resource is considered significant.

[1] Eligibility for the Register of Historic Resources is based on four criteria; the resource 1) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; 2) is associated with the lives of persons important in our past; 3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or 4) has yielded, or may be likely to yield, information important in prehistory or history.

Public Resources Code 21083.2 defines unique archaeological resource as "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it:" could provide answers to important scientific research questions; has a special and particular quality such as being the oldest of its type; or directly associated with a scientifically recognized important prehistoric or historic event or person. For purposes of this DEIR, a significant effect would occur if the integrity of a cultural resource is adversely changed via demolition, destruction, relocation, alteration.

IMPACTS AND MITIGATION MEASURES

Impact 3.11.1: Implementation of proposed facilities may affect known or undiscovered archaeological resources. Less than Significant with Mitigation.

The NWIC has identified the planning area, with the exception of a portion of the quarry area, as having a high sensitivity for cultural resources. Known prehistoric resources, many consisting of burial sites, are scattered throughout the Livermore Valley (see **Table 3.11-1**); the integrity of these resources varies from unknown to partially destroyed. Given the sensitivity of the project area, there is a high potential for Native American sites to be encountered during construction of the well facility and installation of associated connection pipeline. Impacts to known or unknown cultural resources would be considered significant and would require the implementation of mitigation measures to ensure that known resources are avoided and proper procedures are implemented if unknown resources are encountered.

Well Construction and Pipeline Installation

Approximately half the wellfields encompass urban uses (including residential, commercial, and industrial uses), and the remaining half of the wellfields encompass open space areas used for mining and agriculture. In disturbed areas where urban development or sand and gravel mining have occurred due to previous excavation for foundations or gravel pits, the potential for the occurrence of undisturbed archaeological resources onsite is lower than in undisturbed areas defined by agriculture and drainages. The footprint of the largest treatment well facility layout (consisting of the structure and paved areas) would be up to 100- by 150 feet with an up to 95- by 25-foot area excavated down to a maximum depth of five feet for well facility development. The remaining area would be graded and paved. Trenching would also be required for the installation of the connection pipeline. Typical trench width and depth are six and up to ten feet, respectively. There is a potential that construction activities would encounter known or unknown archaeological resources.

To reduce potential adverse impacts to known archaeological resources, Zone 7 would avoid selection of well facilities at prehistoric sites (**Measure 3.11-1a**), as identified in **Table 3.11-1** and shown on the Cultural Resources Map prepared by WSA (2002). This map has been provided to Zone 7, but it cannot be published in this document due to the sensitivity of site locations. Where site selection is within 100 feet of known prehistoric sites, Zone 7 would consult with a qualified archaeologist to conduct a preliminary field reconnaissance for

archaeological resources (**Measure 3.11-1b**). To reduce the potential for unknown resources to be affected, Zone 7 would develop a program for construction monitoring, and monitor construction activities in the vicinity of drainages and within 100 feet of known archaeological resources (**Measures 3.11-1c** and **3.11-1d**). In addition, procedures for stopping construction work upon the encountering of archaeological resources would be implemented (**Measure 3.11-1e** through **Measure 3.11-1g**).

Bernal Wellfield

The wellfield consists primarily of urban uses, and also open space along two creek corridors: the Arroyo de la Laguna and Arroyo del Valle. Two known prehistoric midden sites with burials (P-1 and P-2160) are located along the western section of the wellfield, in the vicinity of the Arroyo de la Laguna and I-680. Zone 7 would avoid selection of well facilities at these recorded sites, thereby eliminating the potential for disturbing known archaeological resources. Excavation and trenching activities may result in the disturbance to unknown archaeological resources, particularly along the creek corridors. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts to less than significant levels.

Hopyard Wellfield

The wellfield consists primarily of urban uses. No known archaeological resources have been identified within this wellfield. Due to the general sensitivity of the area and presence of two creek corridors traversing the wellfield (Arroyo Mocho and Pleasanton Canal), excavation and trenching activities may result in the disturbance of unknown archaeological resources. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential disturbance to cultural resources during construction activities to less than significant levels.

Valley Wellfield

The wellfield consists primarily of urban uses. One known prehistoric midden site (C-280) was recovered in part during trenching activities for a Safeway store, with the remaining part under the Safeway parking lot. Zone 7 would avoid selection of well facilities at this recorded site, thereby eliminating the potential for disturbing known archaeological resources. Excavation and trenching activities may result in the disturbance of unknown archaeological resources, particularly along the creek corridors. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts to less than significant levels.

Mocho Wellfield

The Wellfield consists primarily of urban uses. One recorded prehistoric midden site (CA-ALA-414), located approximately a quarter-mile east of Santa Rita Road along the banks of the Arroyo Mocho, is identified within the wellfield. Zone 7 would avoid selection of well facilities at this recorded site, thereby eliminating the potential for disturbing known archaeological resources. Excavation and trenching activities may result in the disturbance of unknown archaeological resources, particularly along Arroyo Mocho corridor. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts to less than significant levels.

Stoneridge Wellfield

The Wellfield consists primarily of urban uses. Two known prehistoric sites CA-ALA-413 and CA-ALA-414 are located within the wellfield. The Arroyo Mocho traverses the wellfield. Zone 7 would avoid selection of well facilities at these recorded sites, thereby eliminating the potential for disturbing known archaeological resources. Excavation and trenching activities may result in the disturbance of unknown archaeological resources, particularly along the Arroyo Mocho and Tassajara Creek corridors. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts to less than significant levels.

Martin Wellfield

The Wellfield consists primarily of urban uses. Three prehistoric sites, CA-ALA-394, CA-ALA-46 and CA-ALA-42 are located within the wellfield. Zone 7 would avoid selection of well facilities at these recorded sites, thereby eliminating the potential for disturbing known archaeological resources. Excavation and trenching activities may result in the disturbance to unknown archaeological resources, particularly along the Arroyo Mocho corridor (P-1776). Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts to less than significant levels.

Busch Valley Wellfield

The Busch Valley Wellfield consists of both urban and quarry lands. CA-ALA-44 is a known prehistoric site that has been destroyed and converted into a gravel pit for mining. Because the area has been identified as moderately sensitive for known cultural resources, excavation and trenching activities may result in the disturbance of unknown archaeological resources. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts during construction activities to less than significant levels

Gravel Pits Wellfield

The Gravel Pits Wellfield consists primarily of quarry lands. There are no known archaeological sites within this wellfield. Because the area has been identified as moderately sensitive excavation and trenching activities may result in the disturbance of unknown archaeological resources, particularly along the Arroyo Mocho corridor. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts during construction activities to less than significant levels.

Chain of Lakes Wellfield

The Chain of Lakes Wellfield consists primarily of quarry lands. One known prehistoric site, C-669, with unknown site integrity is located within the wellfield. Zone 7 would avoid selection of well facilities at this recorded site, thereby eliminating the potential for disturbing known archaeological resources. Because the area has been identified as moderately sensitive, excavation and trenching activities may result in the disturbance to unknown archaeological resources, particularly along the Arroyo Mocho corridor. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts to less than significant levels.

Stanley Boulevard Wellfield

The Stanley Boulevard Wellfield consists primarily of quarry lands. There are no archaeological resources located within the Wellfield. Because the area has been identified as moderately sensitive, excavation and trenching activities may result in the disturbance of unknown archaeological resources, particularly along the Arroyo Mocho corridor. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts during construction activities to less than significant levels.

Isabel Wellfield

The Isabel Boulevard Wellfield consists primarily of quarry lands, with some urban uses within the City of Livermore. There are no archaeological resources located within the Wellfield. Because the area has been identified as moderately sensitive, excavation and trenching activities may result in the disturbance of unknown archaeological resources, particularly along the Arroyo Mocho corridor. Implementation of **Measures 3.11-1a** through **3.11-1g** would reduce potential impacts during construction activities to less than significant levels.

Mitigation Measures

Measure 3.11-1a: Zone 7 shall avoid siting of well facilities within areas of known / recorded archaeological sites (as shown in the Cultural Resources Map prepared by WSA, 2002). These sites include: Bernal Wellfield – P-1, P-2160; Valley Wellfield – C-280; Mocho Wellfield – CA-ALA-414; Stoneridge: CA-ALA-414 and CA-ALA-413; Martin Wellfield – CA-ALA-394, CA-ALA-46 and CA-ALA-42; Busch Valley – CA-ALA-44; and Chain of Lakes – C-669.

Measure 3.11-1b: Zone 7 shall consult with a qualified archaeologist to ensure that individual well sites and pipeline routes are not located on one of the identified recorded cultural resources locations. If proposed facilities are located within 100 feet of known archeological sites, a qualified archaeologist shall conduct preliminary field reconnaissance of selected sites as deemed necessary to determine whether prehistoric cultural materials would be encountered. If archaeological materials are detected, Zone 7 shall avoid selection of the site.

Measure 3.11-1c: Zone 7 or a qualified archaeologist shall develop a program for monitoring construction activities. The program shall include provisions to implement the monitoring requirements and preliminary data recovery and analysis plan in the event that archaeological resources are identified during monitoring. Additionally, the archaeologist shall perform an orientation and provide instructions for preliminary identification of archaeological resources to the project engineers and construction crew supervisors.

Measure 3.11-1d: Due to the sensitive nature of the Livermore Valley Area, construction activities within 200 feet of creeks or stream crossings, or within 100 feet of recorded archaeological resources shall be monitored by a qualified archaeologist.

Measure 3.11-1e: If cultural resources are encountered during construction of the project, the contractor shall avoid altering the materials and discontinue earthwork within 100 feet of the find. At this time, the contractor must contact a qualified archaeologist, one certified by the Registry of Professional Archeologists (RPA), to evaluate the situation. Any identified archaeological resources shall be recorded by the archaeologist on form DPR 422 (archaeological sites). Project personnel shall not collect cultural resources. Prehistoric resources include, but are not limited to, chert or obsidian flakes, projectile points, mortars, and pestles; and dark, friable soil containing shell and bone, dietary debris, heat-affected rock, or human burials. In anticipation of discovering cultural deposits, procedures shall be in place so that the contractor can move on to another phase of work (connection pipeline component only), thus allowing sufficient time to evaluate the nature and significance of the find and implement appropriate management procedures.

Measure 3.11-1f: Zone 7 shall enter into a written agreement between an archaeological consultant to be retained by Zone 7 and Native American (Ohlone) representatives in the event that human remains are found. This agreement shall specify terms as to treatment and disposition of human remains, and should define "associated burial goods" with reference to Public Resources Code Sections 5097.94, 5097.98, and 5097.99 and Health and Safety Code Section 7050.5.

Measure 3.11-1g: If prehistoric archaeological deposits that include human remains are discovered, the county coroner shall be notified immediately. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. If no preconstruction regarding human remains has been executed, the most likely descendant of the deceased Native American shall be notified and given the chance to make recommendations for the remains. If no recommendations are made within 24 hours, the remains may be appropriately interred. If recommendations are made and not accepted, the Native American Heritage Commission would be available to mediate between the parties concerned.

Impact Significance After Mitigation: Less than significant.

Impact 3.11.2: The proposed project would not affect known or identified historical resources. However, project implementation may affect unknown historical resources. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

As part of the archival search by NWIC and WSA, historic resources within the project area were identified and are shown in **Table 3.11-1** (and on the Cultural Resources Map prepared by WSA (2002), not included in this EIR). Although these historic sites are not identified on federal or state inventories for historic resources, they are not precluded from eligibility. The following conditions determine the eligibility of historical resources:

- Resource is greater than 45 years old, is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;

- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual; or

- Possesses high artistic values, has yielded, or may be likely to yield, information important in prehistory or history.

The Alameda County and the City of Pleasanton general plans identify historical buildings within their city / county limits. Most of the historical resources identified in these general plans are located outside of the project planning area (City of Pleasanton, 1996; Alameda County, 1993). The potential demolition, destruction, relocation, or alteration of known or unrecorded historic resources would be considered a potentially significant impact. For known historic sites, avoidance would ensure that no significant impact would result (**Measure 3.11-2a**). Field assessments would be conducted if the proposed well sites are located within 100 feet of known historical resources, or if the proposed project would alter or remove any existing structures that may be considered for listing in the California Register of Historic Resources. **Measure 3.11-2b** would ensure that any potential structure that would be altered or removed would be assessed by a qualified archaeologist to ensure that it is not considered a historical resource.

Although the connection pipeline alignments would likely follow roads that have been in use for most of this century, road alignments commonly are adjusted for private and public development projects. As proposed connection pipeline routes would primarily be located within existing roadways, a comprehensive parcel-by-parcel inventory of historic standing structures is not required. Pleasanton Canal and Arroyo Mocho have been identified as linear historic resources. Crossing of these drainages may constitute a significant impact if it destroys or alters the historic integrity of the channels, such as through the demolition of a culverted section of the Pleasanton Canal. A qualified archaeologist would conduct a field reconnaissance if well facilities are located within 100 feet of these known historical resources to determine the presence of unidentified, buried historic resources (see **Measure 3.11-2b**). During construction, excavation and trenching activities may result in the disturbance to unknown non-standing historic resources. Implementation of **Measures 3.11-2c** through **3.11-2e** would reduce potential impacts to less than significant levels.

The locations of recorded historic resources for each wellfield are summarized below.

Bernal Wellfield

A historic ranch (P-2246) is located along the western section of the wellfield, in the vicinity of the Arroyo de la Laguna and I-680. The historic ranch was completely destroyed during recent construction activities. The Heritage House, located on the Alameda County Fairgrounds) was designated in 1991 as a National Register of Historical Places. Well development would not require the alteration, damage, or removal of the Heritage House **(see Measure 3.11-2a)**. Therefore, project implementation would not affect known historic resources. Potential impacts associated with alteration or removal of unrecorded historic resources (including non-standing resources) would be reduced to a less than significant level with implementation of **Measures 3.11-2b** through **3.11-2e**.

Hopyard Wellfield

Two known historic linear features are identified within the Hopyard Wellfield: Pleasanton Canal (P-1775) and the Arroyo Mocho Canal (P-1776). The site integrity of both features are unknown. These channels are manmade stormwater facilities that are continually maintained by Zone 7 for flood control purposes. As they are greater than 45 years old, they are considered historic. Specific features of the canals (i.e., culverts) may be eligible as a California Register of Historic Resource. However, it is unlikely that Zone 7 would affect the integrity of the linear features. Zone 7 would avoid siting of well facilities within areas of known / recorded historical sites (as shown on **Table 3.11-1** and in the Cultural Resources Map prepared by WSA) unless appropriate recording procedures are conducted (**Measure 3.11-2b**). In addition to impacts to known historic resources, potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** through **3.11-2e**.

Valley Wellfield

There are no known historic resources identified within the Valley Wellfield. Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** through **3.11-2e**.

Mocho Wellfield

Several historic resources are located within the wellfield: the Southern Pacific – San Ramon Valley Branch railroad grade historic feature (P-1785), the Arroyo Mocho Canal (P-1776), English-Mohr House, and Century House. The railroad feature passes through the wellfield but is completely destroyed with the exception of portions of the old grade. Feature P-1776 is described above for the Hopyard Wellfield, and its site integrity is unknown. The English-Mohr House, located at the end of Mohr Avenue, was designated as a point of historical interest in 1976 (Alameda County, 1993). Points of Historical Interest are locations of local significance that do not qualify for State Historical Landmarks registration. The Century House (2401 Santa Rita Road) is considered one of the man-made buildings that symbolize the City's early development (City of Pleasanton, 1996). Specifically, the Century House conveys the architectural heritage of the Amador Valley; this building is not identified as a historical resource in the Alameda County General Plan. Well site development would not alter, damage, or remove existing historical buildings (see **Measure 3.11-2a**). Zone 7 would avoid siting well facilities or connection pipelines at or through linear features unless appropriate recording procedures are conducted (**Measure 3.11-2b**). As discussed for Hopyard Wellfield above, project implementation would unlikely affect the integrity of the Arroyo Mocho as it is currently functioning as a storm water conveyance. Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** and **3.11-2e**.

Stoneridge Wellfield

The Arroyo Mocho (P-1776) is a linear historical feature that passes through the wellfield. As discussed for Hopyard Wellfield above, project implementation would unlikely affect the integrity of the Arroyo Mocho as it is currently functioning as a storm water conveyance. Zone 7 would avoid siting well facilities or connection pipelines at or through linear features unless appropriate recording procedures are conducted (**Measure 3.11-2b**). Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** and **3.11-2e**.

Martin Wellfield

A historic barn (C-736) is located within the wellfield, as well as the Arroyo Mocho Canal (P-1776). The site integrity of both features are unknown. Zone 7 would avoid siting well facilities or connection pipelines at or through the historic barn (see **Measure 3.11-2a**). As discussed for Hopyard Wellfield above, project implementation would unlikely affect the integrity of the Arroyo Mocho as it is currently functioning as a storm water conveyance. Zone 7 would avoid siting well facilities or connection pipelines at or through linear features unless appropriate recording procedures are conducted (**Measure 3.11-2b**). Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** and **3.11-2e**.

Busch Valley Wellfield

One historic resource associated with the Western Pacific Railroad and the Southern Pacific Railroad (P-1774) is located at the intersection of Stanley and Valley roads. It consists of a building for warning signals and crossing arms at the abandoned railroad crossing, as well as a concrete railroad bridge. Well development would not affect the integrity of the historic resource, as the railroad tracks are currently in use. Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** and **3.11-2e**.

Gravel Pits Wellfield

The Arroyo Mocho (P-1776) is a linear historical feature that passes through the wellfield. As discussed above, project implementation would unlikely affect the integrity of the Arroyo Mocho as it is currently functioning as a storm water conveyance. Zone 7 would avoid siting well facilities or connection pipelines at or through linear features unless appropriate recording procedures are conducted (**Measure 3.11-2b**). Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** and **3.11-2e**.

Chain of Lakes Wellfield

There are no known historic resources at this wellfield. Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** and **3.11-2e**.

Stanley Boulevard Wellfield

There are known historic resources located within the Wellfield. Potential impacts are associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2b** and **3.11-2e**.

Isabel Wellfield

There are four historic resources located within this wellfield. P-2124 is a historic farm consisting of agricultural and dairy remains, but no standing structures. This site is considered in poor condition. CA-ALA-519H is a historic railroad that consists of the railroad bed and associated structures and equipment. This site is considered in good condition. CA-ALA-517H consists of a historic house and its associated outbuildings, which have been burned to the ground. The Arroyo Mocho, a historic linear feature, traverses the wellfield; its site integrity is unknown. Zone 7 would avoid well siting at existing historic sites (P-2124 and CA-ALA-5174) (see **Measure 3.11-2a**). In addition, Zone 7 would avoid siting well facilities or connection pipelines through linear features unless appropriate procedures to record these resources are implemented (see **Measure 3.11-2b**). Potential impacts are also associated with alteration or removal of unrecorded historic resources (non-standing resources); these impacts would be reduced to a less than significant level with implementation of **Measures 3.11-2c** and **3.11-2e**.

Mitigation Measures

Measure 3.11.2a: Zone 7 shall avoid siting of well facilities within areas of known / recorded historical sites, as identified in the Cultural Resources Map prepared by WSA (2002), the Alameda County General Plan, and the City of Pleasanton General Plan. These sites include: Bernal Wellfield – Heritage House; Mocho Wellfield –English-Mohr House, and Century House; Martin Wellfield – C-736; and Isabel Wellfield – (P-2124 and CA-ALA-517H).

Measure 3.11.2b: If proposed well facilities are located within 100 feet of known linear historical resources, or construction activities would require the alteration or removal of an existing building or linear feature, Zone 7 shall contract with a qualified archaeologist to determine the presence of unidentified, buried historic resources in the nearby resources, or to determine the age and historical status of the buildings proposed to be altered or removed. If buildings are identified as standing historical resources, and the qualified archaeologist determine that the resources would not be eligible for the California Register of Historic Resources, the qualified archaeologist would record the find on DPR 523 (historic properties) form. No further action is necessary as registration of the historic

resources would complete the lead agency's obligation under CEQA. If historic resources are considered eligible for listing, then Zone 7 shall avoid the site.

Measure 3.11.2c: Zone 7 or a qualified archaeologist shall develop a program for monitoring construction activities. The program shall include provisions to implement the monitoring requirements and preliminary data recovery and analysis plan in the event that historic resources are identified during monitoring. Additionally, the archaeologist shall perform an orientation and provide instructions for preliminary identification of historic resources to the project engineers and construction crew supervisors.

Measure 3.11.2d: If historic resources are encountered during construction of the project, the contractor shall avoid altering the materials and discontinue earthwork within 100 feet of the find. The contractor must contact a qualified archaeologist, one certified by the Registry of Professional Archeologists (RPA), to evaluate the situation. Any identified historic resources shall be recorded by the archaeologist on form 523 (historic properties) or similar forms. Project personnel shall not collect cultural resources. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits, often in old wells and privies. Procedures for stopping construction, in the event that cultural resources are exposed, shall be part of the project plans and specifications. In anticipation of discovering cultural deposits, procedures shall be in place so that the contractor can move on to another phase of work (connection pipeline component only), thus allowing sufficient time to evaluate the nature and significance of the find and implement appropriate management procedures.

Measure 3.11.2e: If historic deposits that include human remains are discovered, the county coroner shall be notified immediately. If the remains are found to be Native American, the Native American Heritage Commission shall be notified within 24 hours. If no preconstruction regarding human remains has been executed, the most likely descendant of the deceased Native American shall be notified and given the chance to make recommendations for the remains. If no recommendations are made within 24 hours, the remains may be appropriately interred. If recommendations are made and not accepted, the Native American Heritage Commission would be available to mediate between the parties concerned.

Impact Significance After Mitigation: Less than significant.

REFERENCES – Cultural Resources

Alameda County, *East County Area Plan*, amended November 2002.

City of Livermore, *General Plan*, 2004.

City of Pleasanton, *General Plan*, August 1996.

LAVWMA (Livermore-Amador Valley Water Management Agency), *Livermore-Amador Valley Water Management Agency Export Pipeline Facilities Project EIR*, prepared by Environmental Science Associates, 1997.

Mills, Heather, Northwest Information Center, Records Review for the Zone 7 Water Agency Master Plan Project, 10 May 2002.

William Self & Associates (WSA), Zone 7 Water Wells Master Plan Record Search Results (letter, map, and table), July 2002.

3.12 VISUAL RESOURCES

3.12.1 SETTING

REGIONAL SETTING

The Livermore-Amador Valley contains visual resources representative of California's northern coast range and inland valley landscapes. These visual elements include expansive grass-covered grazing lands; steep, rolling hills and narrow ravines; broad valleys and prominent ridges; meandering tree-lined creeks and drainages; oak woodlands; and various agricultural lands, including pasturelands, vineyards, dry farmlands, orchards, and row croplands. Peaks and ridgelines of the Diablo Range and Las Trampas/Pleasanton/Sunol range are visually prominent landform features. The visual quality of the area is based largely on its suburban, pastoral character and its topographic diversity.

Both interstate highways passing through the Livermore Valley Area—Interstate 580 (I-580), oriented east-west and I-680, oriented north-south—provide panoramic views. I-680 is an officially designated State Scenic Highway, which requires special measures by local governments to protect views along the travel corridor. I-580 is an Alameda County-designated scenic highway.

EXISTING ENVIRONMENT

The wellfields are located between I-680 and I-580 within the Livermore Valley (see **Figures 2-4** and **2-5** in **Chapter 2, Project Description**). Each wellfield contains a variety of land uses, including existing and future residential, commercial, industrial, agricultural, and open space. A few examples of land use types are given below in **Table 3.12-1**.

TABLE 3.12-1
DESCRIPTIONS OF LAND USE CATEGORIES

Land Use	Examples of Uses
Residential	Single and/or multi-family houses
Commercial	Shops, business parks, malls, and gas stations
Industrial	Railroad tracks, warehouses, car maintenance shops, and quarry areas
Public	Alameda County Fairgrounds, golf courses, and parks
Agricultural	Open rangelands, farms, and vineyards

SOURCE: Environmental Science Associates

Visual characteristics and short-range views within each wellfield is determined by the topography of the land and the uses within that wellfield. Predominant land uses in each wellfield are defined in **Table 3.12-2**. **Figure 2-4** in **Chapter 2, Project Description** shows the contrast between the two major types of land use within the planning area: urban areas in the City of Pleasanton, and open space/industrial in unincorporated Alameda County.

TABLE 3.12-2
WELLFIELD CHARACTERISTICS

Wellfield	Visual Characteristics
Hopyard	Predominantly residential, with commercial, large park, and open space
Bernal	Residential, commercial, public (fairgrounds and golf course), and open space
Valley Avenue	Predominantly residential, with commercial, parks, and open space
Mocho	Predominantly residential
Stoneridge	Predominantly residential with limited open space
Martin	Predominantly residential with open space
Bosch Valley	Residential, industrial
Gravel Pit	Predominantly industrial with open space
Chain of Lakes	Predominantly industrial with open space
Stanley Avenue	Predominantly industrial with open space
Isabel	Predominantly industrial with open space

SOURCE: Environmental Science Associates

Short range (10 to 20 feet away) and medium range (more than 20 feet away) views of well facilities would depend on the land use of the individual well sites. The planning area is within the topographically flat Livermore Valley. Due to the flat terrain, views are limited in distance. In more urban areas, well facilities would be visible from the same streets which they are located (short range views). Well facilities would not be easily detectable in medium- and long- range views in urban areas due to intervening structures and vegetation. In open space areas, well facilities may be highly visible in both short and medium range views due to the lack of surrounding structures.

Zone 7 currently operates seven well facilities, which are located throughout the Valley. These wells are located within a variety of land uses, mostly within residential and public areas. Design of existing well facilities has varied depending on surrounding land uses. A variety of building materials have been used, including wood and stucco, split-faced cinder block and masonry block, corrugated metal, or wood shingle. **Figures 3.12-1** and **3.12-2** show some of Zone 7's existing well facilities. Examples of the well type, with onsite treatment or with offsite treatment, are given for each photograph.

Building Type: Split faced cinder block and masonry block. **Well Type:** Well with On-Site Treatment.

Building Type: Wood shingle. **Well Type:** Well with Off-Site Treatment.

SOURCE: Environmental Science Associates

Figure 3.12-1
Existing Zone 7 Well Facility Types

Building Type: Wood and stucco. **Well Type:** Well with On-Site Treatment.

Building Type: Corrugated metal. **Well Type:** Well with Off-Site Treatment.

SOURCE: Environmental Science Associates

Zone 7 Well Master Plan EIR / 201583 ■

Figure 3.12-2
Existing Zone 7 Well Facility Types

3.12.2 REGULATORY FRAMEWORK

CONSISTENCY WITH COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

Alameda County, and the cities of Pleasanton and Livermore identify goals and policies in their General Plans that protect visual resources within individual jurisdictions. The relevant policies related to visual resources are presented in **Appendix 3.12**. The proposed project would be consistent with these goals and policies of the affected jurisdictions.

3.12.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

This section addresses potential project impacts to visual aesthetics. The impact significance criteria are based on guidance provided by CEQA regarding what constitutes a significant environmental effect (Guidelines Sections 15064, 15126, and Appendix G). For this DEIR, the following impact significance criteria are used:

> The project would have a significant impact if it would have a substantial, demonstrable negative aesthetic effect on the surrounding environment. A negative aesthetic effect could occur if the project caused substantial alterations to or degradation of the visual environment and/or if the project conflicted with an adopted policy regarding aesthetics and visual resources.

IMPACTS AND MITIGATION MEASURES

Impact 3.12.1: Proposed well facilities could diminish the visual aesthetics of the surrounding environment. Less than Significant with Mitigation.

Well Construction and Pipeline Installation

The construction of the proposed facilities may require the removal of native trees (see also **Impact 3.5-4** in **Section 3.5**). Each affected jurisdiction has guidelines on the protection of heritage trees. Removal of these trees would further reduce the visual character of the site and increase the prominence of the proposed facilities. Removal of heritage trees as a result of well facility development would be considered a significant adverse impact. Measures identified in **Section 3.5** and **Measure 3.12-1a**, below, requiring replacement of removed trees and implementation of landscaping to enhance the visual integration of the development with its surroundings, would reduce potential impacts to less than significant.

Construction of the well facilities and installation of associated connection pipelines would result in short-term visual impacts during construction. Construction activities would require the use of heavy equipment and storage of materials at the construction zone. The visual quality of the surrounding area, in any of the land use type, would likely be localized due to the flat terrain and

intervening structures. Proposed well facilities are estimated to take up to 12 months of construction.

The connection pipelines would be installed at a rate of approximately 100 feet per day and the construction zone would continuously move along the route. Therefore, potential visual impact would be confined to approximately that length of road per day, which would be considered temporary both because of the short length of affected area and because the pipeline train would be continuously moving. As discussed above, in urban areas, intervening structures would visually block middle to long-range views due to the flat terrain. Construction impacts would generally be limited to short-term views from adjacent residences, commercial businesses, and/or industrial uses along the actual corridor. Although middle- and long- range views of the construction zone may be available in open space areas (i.e., Chain of Lakes), as there are no long-term, sensitive, public views and construction activities would be temporary in nature, potential impacts would be considered less than significant.

Well Operation

Two types of well facilities are proposed: wells with offsite treatment and wells with onsite treatment. Well facilities would consist of a well structure, associated exterior facilities (connection pipelines, electrical and metering boxes), and surrounding paving for maintenance vehicle access. Well parcels would be surrounded by a six- to eight foot fence, with a gate on the street-side for vehicle access. Wells with onsite treatment would include an up to 95- by 25- by 15- foot structure containing facilities for treatment of pumped groundwater. The parcel size would be up to 100 by 150 feet. For wells with offsite treatment, parcel and building sizes would be much smaller (e.g., Mocho 2 in **Figure 2.12-1**). As described in **Chapter 2, Project Description**, two different design packages are available for residential and industrial uses. The material type would be determined by the visual sensitivity of the surrounding land uses and would generally consist of decorative block buildings within residential, park, and open space uses and non-decorative block buildings within industrial uses (including quarry areas). The suite of options would be based on existing well types and would include wood and stucco, split-faced cinder block and masonry block, corrugated metal, or wood shingle (see **Figures 3.12-1** and **3.12-2**).

Under the worse case scenario, individual well sites would be up to 100 by 150 feet in dimensions, containing a structure of approximately 95- by 25- by 15 feet. Other appurtenant structures include connection pipelines, electrical and metering boxes and surrounding fence. The proposed wells would be constructed of similar materials as the existing wells, as they have shown integration with surrounding visual environment and do not substantially alter the appearance or character of the surrounding area. As indicated above, examples of existing Zone 7 well facilities are located throughout the Valley (see **Figures 3.12-1** and **3.12-2**). The proposed well facilities would be designed to integrate with the surrounding environment, through measures such as appropriate building materials, low-glare earth-tone paint, decorative slats in fences (see **Measure 3.12-1b**). Compliance with this measure would reduce visual impacts at individual well sites to less than significant levels. In addition, Zone 7 would coordinate with the affected jurisdiction regarding the design of the facilities (see **Measure 3.12-1c**).

For certain residential zoning districts in the City of Pleasanton, restrictions on fence and building height exist. Zone 7 would work with the City of Pleasanton to comply with height restrictions for facilities to the extent possible (see **Measure 3.12-1c**).

Pipeline Operation

Long-term operation of the proposed connection pipelines would not alter the aesthetic quality of the surrounding area because it would be buried below ground. **Measure 3.12-1d** would require that disturbed areas are returned to their pre-project conditions, such that short-term construction impacts do not result in long-term visual impacts. Implementation of these measures, and measures identified in **Section 3.5, Biological Resources**, would reduce visual impacts from construction to less than significant levels.

Mitigation Measures

Measure 3.12-1a: Zone 7 shall plant native vegetation at individual well sites as needed to provide screening and integration of the facility with the surrounding environment (without affecting operation and maintenance of the proposed facilities). Landscaping will include revegetation of disturbed areas to minimize textural contrasts with the surrounding vegetation. New plants would include grasses, shrubs, and trees typical of the surrounding area. The contractor will be required to warrant landscape plantings for one year after project completion.

Measure 3.12-1b: Zone 7 shall use design elements to enhance visual integration of above-ground components (i.e., well building, ancillary facilities) with their surroundings. Appropriate building materials shall be used (wood and stucco, metal, cinder block, or wood shingle) for well enclosures to maximize integration with surrounding uses and to minimize visual effect on surrounding land uses. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Decorative slats will be used in fencing.

Measure 3.12-1c: Zone 7 shall coordinate with the affected jurisdiction regarding the design of well facilities.

Measure 3.12.1d: Zone 7 shall ensure that its contractors restore disturbed areas to their pre-project condition so that short-term construction disturbance does not result in long-term visual impacts (Also see **Measures 3.4-1b** and **3.4-1c** in **Section 3.4**).

Impact Significance After Mitigation: Less than significant.

Impact 3.12.2: Development of the project components would introduce new sources of light and glare onto the project site and increase ambient light in the planning area. Less than Significant with Mitigation.

Well Construction

Nighttime construction for well development would create a temporary source of light within the affected area, including nearby residential areas. Well construction, associated with drilling and

pump testing, would occur on a 24-hour basis. Well drilling would be temporary and would last for two to three weeks. In addition, while exterior lighting could be visible from these residences, it would not be expected to substantially increase ambient light in the planning area. In some cases, depending on proximity of residences, a sound wall would be constructed, which would block light sources, as described in **Section 3.7, Noise**. This would be a less than significant impact.

As the connection pipelines would be located entirely below grade, no exterior lighting is proposed, and no reflective building materials would be visible. Therefore, the proposed connection pipelines would not introduce new sources of light or glare.

Well Operation

New or additional glare could occur at individual well sites if reflective exterior materials and finishes in construction are used. Light impacts could also result from the nighttime illumination of individual well sites, or from lights on automobiles or vehicles associated with the project. As discussed above, facilities would be painted low-glare earth-tone colors that blend with the surrounding terrain, thereby reducing potential for light and glare impacts from the building materials (see **Measure 3.12-1c**).

As stated in **Chapter 2, Project Description**, exterior security lighting would be installed at new well facilities. Outdoor site lighting would be provided in accordance with Illumination Engineering Society Standards and local codes. Outdoor lighting shall be low pressure sodium type and controlled with local switches. Lighting for emergency system repairs will be provided in accordance with Zone 7 standards. Therefore, no long-term light and glare impacts would result.

Mitigation Measures

Measure 3.12-2: To the extent possible, Zone 7 shall ensure that all permanent exterior lighting is directed downward and oriented to insure that no light source is directly visible from neighboring residential areas.

Impact Significance After Mitigation: Less than significant.

REFERENCES – Visual Resources

Alameda County, *East County Area Plan*, amended November 2002.

City of Livermore, *General Plan Map*, October 1992.

City of Livermore, *City of Livermore General Plan*, January 2004.

City of Livermore, *City of Livermore Scenic Route Element*, Revised, July 1997.

City of Pleasanton, *General Plan*, August 1996.

CHAPTER 4

GROWTH INDUCEMENT POTENTIAL AND SECONDARY EFFECTS OF GROWTH

4.1 INTRODUCTION

4.1.1 CEQA DEFINITION OF GROWTH INDUCEMENT

The CEQA *Guidelines* require that an EIR evaluate the growth-inducing impact of a proposed action. A growth-inducing impact is defined as follows:

> The ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a water treatment plant might, for example, allow for more construction in service areas). . . . It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.[1]

The environmental effects of a proposed project's induced growth are secondary, or indirect, impacts. Secondary effects of growth can result in significant increased demand on community and public service infrastructures, increased traffic, noise, degradation of air and water quality, and the conversion of agricultural and open space land to urbanized uses.

4.1.2 OVERVIEW

GROWTH-INDUCEMENT POTENTIAL

Based on the CEQA definition above, assessing the growth-inducement potential of the Well Master Plan Project involves answering the question: Will implementation of the project directly or indirectly support economic expansion, population growth, or residential construction? Water supply is one of the chief, though not the only, public services needed to support urban development. A water service capacity deficiency could constrain future development, particularly if coupled with strong community policy. Adequate water supply, treatment, and conveyance would play a role in supporting additional growth in the Valley, but it would not be the single impetus to such growth. Factors such as the General Plans and policies of the cities and counties and/or the availability of wastewater disposal capacity, public schools, and transportation services also influence business and residential or population growth in the planning area. Economic factors, in particular, greatly affect development rates and locations.

[1] CEQA *Guidelines* Section 15126.2(d).

Growth inducement may constitute an adverse impact if the growth is not consistent with the land use plans and growth management plans and policies for the area affected. Local land use plans provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service and solid waste service. A project that would induce "disorderly" growth that is in conflict with local land use plans could indirectly cause additional adverse environmental impacts and impacts to other public services. Thus, it is important to assess the degree to which the growth accommodated by a project would or would not be consistent with applicable land use plans. The project is designed to reflect growth management plans within the Zone 7 service area within the context of providing reliability to its water system.

This project would increase the efficiency of Zone 7's existing conjunctive use operations, and allow Zone 7 to effectively manage surface water and groundwater resources to meet demands within the context of its current reliability and water quality goals. As such, implementation of the Well Master Plan relates to the reliability of water supplies, and does not provide a new water supply that could affect the rate, location, or timing of growth within the Zone 7 service area. Furthermore, this reliability would serve only planned and anticipated growth within Zone 7's service area approved by the local jurisdictions. Acquisition of water supply to meet projected growth under the adopted General Plans within the Zone 7 Service Area was evaluated in the Zone 7 *Water Supply Planning Program* (certified on January 21, 1999, SCH# 98041040).

Zone 7's reliability goals relating to groundwater management include: 1) meeting 100% of future demands under all hydrologic conditions, including drought scenarios; and 2) meeting 75% of the Valley's M&I maximum day demand (MDD) from the groundwater basin. Peak day production capacity necessary to meet this reliability goal would increase proportionally with "total" municipal demand through 2020, when it is expected to be as high as 118 million gallons per day (mgd). Between now and 2020, approximately 42 mgd of additional groundwater production capacity would be necessary to meet the current reliability goal of 75% MDD capacity under projected 2020 demands. **Chapter 2, Project Description,** provides additional discussion, figures, and tables that reflect the projected supply and demand through the year 2020. The proposed project would be constructed in phases over the course of 20 years to ensure that groundwater reliability facilities are constructed on an as-needed basis to match with actual growth trends within the Zone 7 Service Area.

CONCLUSION

Growth potential and secondary impacts of growth have been evaluated in detail in the *Zone 7 Water Supply Planning Program* (WSPP) *EIR.* The WSPP, consisting of a Near-Term Project and Long-Term Project, addresses the acquisition, storage, treatment, and conveyance of water supplies to meet 2020 demands in the Zone 7 service area. This included discussion of the Well Master Plan to assist Zone 7 in meeting its reliability goals. As the proposed project would provide water treatment and conveyance capacity to meet reliability goals as well as future water demands, its implementation would not remove an obstacle to growth. The WSPP identified

potential growth impacts associated with buildout of the service area, and the mitigation programs that local jurisdictions have adopted to minimize the effects of growth. These jurisdictions also adopted Statements of Overriding Considerations to address significant, unavoidable impacts. Similarly, Zone 7 has adopted a Statement of Overriding Considerations for secondary effects of growth associated with buildout under the approved General Plans within Zone 7's service area. Because the Well Master Plan Project is essentially a component of the WSPP, the growth analysis in the 1999 WSPP EIR would be applicable to this project. Implementation of the Well Master Plan would not result in additional impacts beyond those identified in Chapter 7 of the 1999 WSPP EIR.

4.2 ZONE 7 WATER SUPPLY PLANNING PROGRAM

Chapter 7 of the WSPP EIR evaluated the growth inducement potential and secondary effects of growth associated with the acquisition of water supply and development of additional treatment, storage and conveyance facilities to meet water demands associated with 2020 buildout under the adopted General Plans within its service area. It acknowledges that implementation of the Near-Term Project and Long-Term Program would increase Zone 7's water treatment, supply and distribution capacity in order to serve additional urban growth that is planned and anticipated to occur within Zone 7's service area. Water demand projections used by Zone 7 in development of the Near-Term Project and Long-Term Program are consistent with the more detailed water demands developed by the Zone 7 Retailers, and therefore would indirectly support growth that is consistent with the local General Plans and regional growth management projections.

The WSPP identified potentially significant impacts of growth based on the analyses provided by the various municipalities located in Zone 7's service area, and identified both significant and mitigable, and significant and unavoidable impacts in the issue areas of land use, air quality, traffic and transportation, visual and aesthetic resources, geology, biological resources, public services and utilities, hydrology and water quality, cultural resources, recreation, noise, and energy resources. In addition, the WSPP analyzed the cumulative secondary effects of growth for the broader region beyond Zone 7's immediate service area, and include topical discussions on land use, surface water hydrology, water quality, wastewater capacity, air quality, biological resources, and traffic and circulation. WSPP EIR **Table 7-11** (see also **Table 4-1**, below) identifies all potentially significant impacts identified in the EIRs within the Zone 7 Service Area and the regional area. It also identifies mitigation measures to partially reduce the unavoidable impacts.

As specified in the 1999 WSPP, the city and county jurisdictions that have adopted the land use plans and approved the development projects within the Zone 7 water service and broader Tri-Valley Area have adopted statements of overriding considerations to address adopting plans with significant and unavoidable impacts. **Table 4-1**, taken from the 1999 WSPP, provides a list of social, economic, and other considerations found to outweigh the potential secondary effects of proposed growth and development.

TABLE 4-1
KEY OVERRIDING CONSIDERATIONS FOR SIGNIFICANT, UNAVOIDABLE IMPACTS OF PLANNED GROWTH AND DEVELOPMENT

- Accommodation of ABAG-projected growth[a]
- Provision for balanced jobs/housing balance[a,b,d]
- Furtherance of regional housing share objectives and provisions of affordable housing[a,b]
- Provision and maintenance of affordable housing: rental housing and attached housing near commercial and employment uses[e]
- Provision of housing near growing regional employment centers[b,d]
- Location of development where it can be efficiently served with public services and utilities[e]
- Job creation[b,e]
- Increased sales revenue[b]
- Enhancement of wine-producing image and creation of investment incentives and perpetuation of agricultural uses[e]
- Minimization of vehicle-miles traveled by providing housing near employment[c]
- Minimization of energy consumption and air pollution from automobile commuting[c]
- Minimization of traffic congestion[c]
- Establishment of an urban growth boundary[a,e]
- Establishment of policies to preserve agricultural lands[a,e]
- Establishment of policies to preserve open space lands[d,e]
- Comprehensive resource management[a,b]
- Comprehensive open space/recreation planning, implementation, and management[a,b,d]

[a] Alameda County Board of Supervisors, 1994.
[b] City of Dublin City Council, 1993.
[c] City of Pleasanton, 1996b.
[d] City of Livermore, October 1993b.
[e] City of Livermore, 1997d.

SOURCE: Compiled by ESA from sources listed at the end of this chapter.

In addition to the overriding considerations, each jurisdictions have identified policies and programs intended to limit or reduce the potential impacts of growth. Implementation of these measures is beyond the jurisdiction of Zone 7, which does not have the authority to regulate land use and growth within its service areas. The three cities and Alameda and Contra Costa Counties have primary land use jurisdiction and responsibility to regulate growth through the land use planning and development approval process. Zone 7 has jurisdiction and service responsibility for water supply and service. It can mitigate identified significant and unavoidable impacts to water supply and service by providing the necessary facilities and services such that planned growth is not constrained by inadequate service. However, as Zone 7 is a water wholesaler, it does not provide service connections to individual development or residences. Rather, Zone 7 wholesales treated water to its retailers (Livermore, Pleasanton, DSRSD, and CWS), who are

responsible for its distribution through their local distribution systems to approved land uses. However, recognizing that implementation of the WSPP would remove a potential obstacle to growth, the Zone 7 Board of Directors adopted findings and a statement of overriding considerations for secondary effects of growth associated with buildout under the approved General Plans within the Zone 7 Service Area (Resolution 99-0256, adopted July 21, 1999). For a detailed discussion and analysis of growth-inducement potential and secondary effects of growth, please refer to the 1999 WSPP. This document is available for review at the Zone 7 Administrative Offices, located at 5997 Parkside Drive, in Pleasanton, California.

4.3 UPDATED PROJECTIONS

This section updates the treated water and growth projections in Chapter 7 of the 1999 WSPP EIR, and does not include updates to the household projections. The inclusion of the updated projections is not intended to reevaluate the entire growth inducement and secondary effects of growth potential. Growth inducement potential and the secondary effects of growth resulting from the WSPP was adequately analyzed in the EIR, and was approved as part of EIR certification; as identified above, Statements of Overriding Considerations were also adopted to address significant, unavoidable growth impacts. This section is intended to evaluate whether the updated 2002 projections are within those identified in the 1999 WSPP EIR. The growth analysis in the 1999 WSPP EIR evaluated the potential of growth given the projections that were identified at that time, and would represent a conservative analysis if the revised projections have decreased. Decreased projections correlate with decreased development, and subsequently, a decrease treated water supply to the retailers. If the potential effects of secondary growth associated with the provision of water are quantitatively less than previously identified, the original analysis would constitute the worse case scenario.

The Zone 7 Board of Directors approved a modified Near-Term Project that provides Zone 7 with an average year water supply of 81,300 acre-feet per annum (afa) under the 1999 WSPP EIR. This amount consists of existing supplies of 60,500 afa and an additional 20,800 afa average year contract amount obtained through transfer of water supplies and SWP water allocation from various water and irrigation districts. The WSPP EIR also identified a need of 100,300 afa to meet buildout demands (2020) under the General Plans for the jurisdictions within Zone 7's service area. Of this amount, 68,960 afa of water would be required by the year 2020 to meet projected treated water demand, an increase of 25,690 afa from the projected year 2002 delivery request of 43,270 afa[2] (see WSPP EIR Table 7-1). Based on updates to Zone 7 Retailer projections, the Valleywide treated water demand for 2020 is 65,567 afa, which is approximately 3,400 afa below that identified in the 1999 WSPP EIR. **Table 4-2** shows the treated water demand within the Zone 7 Service Area, which is based on baseline growth for DSRSD and the City of Pleasanton, and a low "vision" growth rate for the City of Livermore (maximum

[2] These values includes Dougherty Valley and groundwater pumping quotas of 645, 3069, and 3500 af for DSRSD, CWS, and Pleasanton, respectively.

TABLE 4-2
ZONE 7 PROJECTED TREATED WATER DEMAND VERSUS TOTAL EXISTING SUPPLY[1]

	DEMAND, acre-feet								
	Delivery Requested					Projected			
	2002	2003	2004	2005	2006	2010	2015	2020	2025
Treated Demand									
Municipal & Industrial									
City of Dublin[2]	8,241	8,642	8,987	9,356	9,727	11,102	12,364	12,942	13,153
Dougherty Valley[3]	1,074	1,378	1,685	1,986	2,290	3,506	4,560	4,560	4,560
City of Livermore[3]	14,813	15,387	16,033	16,679	17,326	18,820	20,249	21,674	21,674
City of Pleasanton[3]	15,492	16,111	16,757	17,427	18,134	18,165	18,797	18,797	18,797
Other Treated Water Demand[4]	315	320	321	324	350	350	350	350	350
Treated Water Demand Subtotal[5]	**39,935**	**41,838**	**43,783**	**45,772**	**47,827**	**51,943**	**56,320**	**58,323**	**58,534**
Subtotal from 1999 WSPP[6]	**43,270**	**NA**	**NA**	**49,190**	**NA**	**57,530**	**64,440**	**68,960**	**NA**
Percent Decrease from 1999 WSPP	**8%**	**NA**	**NA**	**7%**	**NA**	**10%**	**13%**	**15%**	**NA**
Valleywide Demand[7]	47,180	49,083	51,028	53,017	55,072	59,188	63,565	65,567	65,778

1 Information provided by Zone 7 Water Agency, 2002.
2 Future treated water demands for the City of Dublin were obtained from DSRSD's Table E (Bruce Webb, 2001)
3 Treated water demands from 2002 to 2006 were obtained from the retailers five-year delivery requests, submitted Fall 2001. Treated water projections for 2006 through 2025 were obtained from projections based on the five-year delivery requests.
4 Other Treated Water Demand include DHA, East Bay Regional Park District, Livermore Area Recreation Parks District, Lawrence Livermore National Laboratory, VAMC, and Wente.
5 Zone 7 Treated Water Demand does not include the retailers' groundwater pumping quotas.
6 Data obtained from Table 7-1 of the Zone 7 Water Supply Planning Program EIR.
7 Vallywide Demand includes Zone 7 Treated Water demand plus groundwater pumping quotas of 645, 3069, and 3,500 acre-feet fro DSRSD, CWS, and Pleasanton, respectively.

population of 95,800 by 2019).[3] The updated retailer projections have been reduced since 1999, and as indicated above, the potential effects of secondary growth associated with the provision of water would be similar to that identified in the 1999 WSPP EIR. The analysis in the 1999 WSPP EIR represents the worse-case scenario associated with secondary effects of growth. No new indirect growth impacts beyond those previously identified in the 1999 WSPP are expected to occur. As a result, the potential for growth inducement associated with this proposed project has been addressed, and implementation of the Well Master Plan Project would not result in additional, significant impacts.

In addition to changes to the Zone 7 Retailer treated water demand, population projections have been updated for both ABAG and retailers since the publication of the 1999 WSPP. Zone 7 reviewed these projections against previous projections and each other. **Table 4-3** shows the updated ABAG population projections from 1995 to 2025, which are consistently 0 to 5 percent less than the 1998 ABAG projections. **Table 4-4** shows the updated Retailer population projections from 2002 through 2025, and provides a comparison to the ABAG 2002 projections. ABAG projections are consistently 2 to 10% higher than the Retailer projections. ABAG is commonly used as a benchmark against which to compare growth accommodated by infrastructure projects. In general, ABAG projections are intended to represent the higher end of the potential range of growth for an areas and "can also be defined as the upper bound of a forecast range." It is intended that growth "is not likely to exceed the levels identified" in the report. The General Plan and city planning information used by the Zone 7 water retailers is more current than the information used in Projections 2002 and is considered the more accurate of the two.

Since current retailer projections are below current ABAG projections, which are below those previously identified in the 1999 WSPP, potential for growth inducement as a result of this project has been adequately addressed in the 1999 WSPP. No new impacts beyond those previously identified in the 1999 WSPP are expected to occur.

[3] The low "vision" growth for the City captures the changes in land use resulting from voter approval of Measure D, the Save Agriculture and Open Space Lands Initiative (November 2000; effective date, December 22, 2000). As a result of this Initiative, the Urban Growth Boundary (UGB) was redrawn to remove North Livermore from urban development. However, the exclusion of the North Livermore Specific Plan water demand does not affect the projections under the Treated Water Demand, as it was identified as an Untreated Water Demand in Table 7-1 of the 1999 WSPP EIR.

TABLE 4-3
ABAG 2002 POPULATION PROJECTIONS

Subregional Area	1990	2000	2005	2010	2015	2020	2025
Dublin[1,2]	23,308	30,007	39,400	47,500	52,400	57,900	63,200
Pleasanton[1]	52,035	65,058	72,600	79,200	81,700	84,200	87,400
Livermore[3]	57,711	73,841	81,700	90,600	95,500	101,400	106,800
GRAND TOTAL	**133,054**	**168,906**	**193,700**	**217,300**	**229,600**	**243,500**	**257,400**
ABAG 1998 from WSPP[4]	**133,054**	**177,100**	**203,000**	**221,300**	**240,700**	**250,500**	**NA**
Percent decrease from ABAG 1998	**0%**	**5%**	**5%**	**2%**	**5%**	**3%**	**NA**

1 City sphere of influence.
2 ABAG does not provide separate projections for Dougherty Valley, therefore Dougherty Valley was not included in this analysis.
3 Other Subregional Area.
4 The 1999 WSPP refer to the ABAG 1998 Population Projections for the three cities and sphere of influence / other subregional area.

SOURCE: ABAG, 2002

TABLE 4-4
ZONE 7 RETAILER POPULATION PROJECTIONS[1]

Subregional Area	2002	2003	2005	2010	2015	2020	2025
Dublin (including Dougherty Valley) [2]	38,643	41,367	46,533	63,149	74,982	77,324	78,261
Dublin (not including Dougherty Valley)	33,973	35,376	38,183	47,309	52,482	54,824	55,761
Pleasanton	68,457	69,752	71,706	76,456	79,600	79,600	79,600
Livermore	76,349	77,495	79,783	85,503	91,223	95,800	95,800
GRAND TOTAL	**178,779**	**182,623**	**189,672**	**209,268**	**223,305**	**230,224**	**231,161**
ABAG 2002 Total	**NA**	**NA**	**193,700**	**217,300**	**229,600**	**243,500**	**257,400**
Percent less than ABAG 2002	**NA**	**NA**	**2%**	**4%**	**3%**	**5%**	**10%**

1 Growth Scenario: DSRSD and City of Pleasanton at Baseline Growth and Maximum City of Livermore Population = 95,800 by 2019 (Low "Vision" Growth Rate), and takes into account Measure D, which does not account for implementation of the North Livermore Specific Plan. Future projected population data for the City of Dublin were obtained from DSRSD; Pleasanton's projected population for 2002-2005 from the October 2001 City of Pleasanton Growth Management Report. Pleasanton's projected population from 2010 beyond was obtained from the Urban Water Management Plan; Livermore's projections assumes a 1.5% annual population growth rate for 2001 to 2004. Per the Livermore Vision Project Final Report (January 2002), 95,800 residents at buildout was the low "vision" alternative; buildout for this alternative is expected to occur by 2019, at a maximum growth rate of 3.5% per year.
2 Future population data for the Dougherty Valley was generated by taking the number of residential homes to be built and using a factor of 2.3 people per dwelling unit. As per the Dougherty Valley Specific Plan, it is projected there will be a total buildout population of 29,000 with a total of 11,000 residential units. Of these units, DSRSD will serve 9,784 and EBMUD will serve the remainder.

SOURCE: Zone 7 Water Agency, 2002

REFERENCES – Growth Inducement Potential and Secondary Impacts of Growth

Association of Bay Area Governments, Projections 2002, 2001.

Zone 7 Water Agency, *Water Supply Planning Program – Program EIR*, 1999.

Zone 7 Water Agency, *Alternative 3 Treated Water Demands*, 2002.

CHAPTER 5
CUMULATIVE IMPACTS

5.1 CEQA ANALYSIS REQUIREMENTS

A cumulative impact is created as a result of the combination of the project evaluated in an EIR together with other projects causing related impacts. The purpose of this analysis is to disclose significant cumulative impacts resulting from the Zone 7 Well Master Plan in combination with other projects or conditions, and to indicate the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. The discussion of cumulative impacts should include:

(1) Either: (a) a list of "past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency," or (b) a summary of projections contained in an adopted General Plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact.

(2) A summary of expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and

(3) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The analysis of cumulative effects in this chapter focuses only on the effects of concurrent construction of the proposed project with other spatially and temporally proximate projects. Although this Chapter presents site-specific projects occurring within the planning area, the analysis primarily addresses general cumulative impacts that could result from concurrent construction. This approach is needed due to the absence of precise well locations and the extended 20-year construction schedule. For impacts related to secondary effects of growth potentially related to the project, refer to **Chapter 4**.

5.2 POTENTIAL PLANS AND PROJECTS WITH RELATED OR CUMULATIVE EFFECTS

Table 5-1 lists the projects that were considered in the evaluation of cumulative impacts. These projects were identified by the planning, community development, and public works/engineering departments of Alameda County, the City of Pleasanton, and the City of Livermore, as well as by the Metropolitan Transportation Commission. Projects include primarily residential. commercial, and industrial development projects, and road improvements. However, other projects that may occur include street improvement work, flood-control channel upgrades, pipeline installations, and other maintenance and repair work. The type of project, its planning jurisdiction, location, project characteristics, status, and location relative to the wellfields are provided. The two conditions, geographic proximity and overlapping of construction schedule, must be met for cumulative impacts to occur. These conditions are described below.

5.2.1 GEOGRAPHIC SCOPE

The potential for project-generated impacts to be exacerbated by other projects would be if they are located within the same geographic scope. Construction impacts associated with increased noise, dust, erosion, and access limitations tend to be localized and could be exacerbated if other development or improvement projects are occurring within the same or adjacent locations as well development or pipeline installation. Cumulative traffic impacts associated with congestion and delay would be more extensive geographically as project-related construction trucks may share the same haul routes to access the freeway system, and therefore would affect the roadway network outside of the construction zone.

Projects that could be implemented concurrently with the Zone 7 Well Master Plan and thus result in cumulative construction impacts are those projects located on or near well development site or proposed pipeline alignments. **Table 5-1** identifies known projects within one mile of the affected jurisdictions, and includes primarily development and larger road improvement projects. Projects outside of the planning area are included to acknowledge the possibility of cumulative traffic impacts from the sharing of similar haul routes. Although the table identifies primarily residential, commercial, industrial, and large transportation projects, other projects including utility installation, local road improvements, and other maintenance and repair work may occur proximate to individual well sites. Within the planning area, the majority of the development project occur within the City of Pleasanton, and are located within or near the Bernal Wellfield. Few projects within the City of Livermore would be located in proximity to the Isabel wellfield.

5.2.2 PROJECT TIMING

In addition to the geographic scope, cumulative impacts are determined by timing of the other projects relative to the proposed project. Schedule is particularly important for construction-related impacts: for a group of projects to generate cumulative construction impacts, they must be temporally as well as spatially proximate. The projects listed in **Table 5-1** may or may not occur simultaneously with the proposed well development and pipeline installation; they may be

TABLE 5-1
DEVELOPMENT PROJECTS IN THE VICINITY OF THE PLANNING AREA

Project Name / Type	Planning Jurisdiction	Location/ Project Characteristics	Status[a]	Proximity to Wellfield
Arroyo Mocho Diversion Project	Zone 7	Arroyo Mocho Channel, installation of inflatable diversion structure	Construction to Occur in 2004	Within Gravel Pits Wellfield
Walnut Hills, KB Home / Residential	Pleasanton	Within Bernal Property / 21.9 acres, 121 Small-lot Single Family Homes	40 Units Under Construction, 81 Units w/o Permits	Within Bernal Wellfield
Valley Avenue Apartments, Greenbriar Homes / Residential	Pleasanton	Within Bernal Property / 4.9 acres, 100 Apartments	100 Units Under Construction	Within Bernal Wellfield
Nolan Farm, Summerhill Homes / Residential	Pleasanton	1015 Rose Avenue / 13.4 acres, 38 Mixed-lot Single Family Homes	12 Units Under Construction	Within Bernal Wellfield
Lauer / Residential	Pleasanton	2221 Martin Drive / 5.1 acres, 6 Large-lot Single Family Homes.	1 Unit Under Construction; 4 Units w/o Permits	Within Martin Wellfield
Ponderosa Homes / Busch Property / Residential	Pleasanton	South of Mohr Avenue and east of Maple / 92 acres, 300 units	Under Construction	Within Busch Valley Wellfield
Moreira / Residential	Pleasanton	558 Sycamore Road / 2.23 acres, 4 Large-lot Single Family Homes	Application submitted	< 1.0 mile east of Bernal Wellfield
Thompson / Residential	Pleasanton	6240 Sunol Boulevard / 0.98 acres, 3 Medium-lot Single Family Homes	Development Plan Approval	< 1.0 mile east of Bernal Wellfield
Bridle Creek, Greenbrian Homes / Residential	Pleasanton	East of Sunol Boulevard / 56.2 acres, 111 Medium-lot Single Family Homes	44 Units Under Construction	< 1.0 mile east of Bernal Wellfield
Castlewood Heights, Pulte Homes / Residential	Pleasanton	East I-680, Sunol Boulevard junction / 17.72 acres, 29 Large-lot Single Family Homes	29 Units Under Construction	< 1.0 mile east of Bernal Wellfield
Carriage Gardens, Black Mountain / Residential	Pleasanton	East of Sunol Boulevard / 35.9 acres, 49 Large-Lot Single Family Homes	Construction to occur.	< 1.0 mile east of Bernal Wellfield
Bozogzad / Residential	Pleasanton	488 Sycamore Road / 2.5 acres, 4 Large-lot Single Family Homes	Construction to occur.	< 1.0 mile east of Bernal Wellfield

TABLE 5-1 (Continued)
DEVELOPMENT PROJECTS IN THE VICINITY OF THE PLANNING AREA

Project Name / Type	Planning Jurisdiction	Location/ Project Characteristics	Status[a]	Proximity to Wellfield
Walsh / Residential	Pleasanton	447 Kottinger / 1.48 acres, 2 Large-lot Single Family	Growth Management Program Approval	< 0.5 to 1.0 mile south and west of Valley Avenue Wellfield, Busch Valley Wellfield, and Bernal Wellfield
Bras	Pleasanton	300 Del Sol Avenue / 1.73 2 Medium-lot Single Family Homes	Final Map Approval	< 0.5 to 1.0 mile south and west of Valley Avenue Wellfield, Busch Valley Wellfield, and Bernal Wellfield
Heritage Oaks Estates / Connolly	Pleasanton	North of Angela Street / 2.4 acres, 9 Medium-lot Single Family Homes	Construction to occur.	< 0.5 to 1.0 mile south and west of Valley Avenue Wellfield, Busch Valley Wellfield, and Bernal Wellfield
Hacienda Mobile home Park	Pleasanton	3231 Vineyard Avenue / 18.3 acres, 152 Mobile Homes	Application submitted	< 0.5 miles south of Stanley Boulevard
Hacienda Business Park / Commercial, Office, Light Industrial	Pleasanton	Bounded by I-680, Hopyard Road, West Las Positas Boulevard, and Santa Rita Road / Total 9,566,843 sq. ft.	225,246 sq. ft. Under Construction; 1,609,229 sq. ft. not yet under construction	Within Portions of Stoneridge Wellfield
Rheem Dr., Santa Rita Rd., Mohr Avenue / Light Industrial	Pleasanton	Rheem Dr., Santa Rita Rd., Mohr Avenue / Total 439,744 sq. ft	Project completed	Within Mocho Wellfield
Valley Business Park / Light Industrial, Office	Pleasanton	North of Stanley Road, east of Santa Rita Road / Total 884,941 sq. ft.	Project completed	Within Busch Valley Wellfield
Bernal Corporate Center / Commercial, Light Industrial, Office	Pleasanton	North of Bernal Avenue, east of I-680 / Total 1,272,591 sq. ft.	22,660 sq. ft Under Construction	Within Bernal Wellfield
Stanley Business Park / Service Commercial, Light Industrial	Pleasanton	Stanley Road near Bernal Avenue / Total 968,023 sq. ft.	26,088 sq. ft. Under Construction; 399,209 sq. ft. not yet Under Construction	< 0.5 miles South of Busch Valley Wellfield

TABLE 5-1 (Continued)
DEVELOPMENT PROJECTS IN THE VICINITY OF THE PLANNING AREA

Project Name / Type	Planning Jurisdiction	Location/ Project Characteristics	Status[a]	Proximity to Wellfield
Signature Center/ R&D, Warehouse, Light Industrial, Hotel	Pleasanton	West of Hopyard Road, north of Stoneridge Drive / Total 1,162,124 sq. ft.	90,000 sq. ft. not yet Under Construction	< 1.0 miles north of Hopyard Wellfield and west of Stoneridge Wellfield
Rosewood Garden Expansion / Residential	Livermore	999 E. Stanley Boulevard / Addition to existing care facility: 2 stories, 50 units	CUP approved by Planning Commission 11/21/00	Within Stanley Avenue Wellfield
Livermore Airway Business Park / Industrial	Livermore	SE Corner of Kittyhawk Road and Armstrong Street	Approved by Planning Commission 8/7/01	< 1.0 mile north of Isabel Wellfield
Isabel Avenue / SR 84 / I-580 Interchange Improvements	Livermore	Build a bridge to provide 6 lanes over I-580	Funding Committed (MTC)	< 0.5 mile north of Isabel Wellfield
Oaks Business Park	Livermore	Development of 177 acre site for light industrial, R&D, and commercial uses.	Approved by Planning Commission. Construction to begin in 1-2 years.	Within Isabel Wellfield
I-580 auxiliary lane	Pleasanton, Livermore	I-580 eastbound auxiliary lane between Santa Rita Road interchange and new Isabel Avenue / SR 84/I-580 Interchange	Funding Committed (MTC)	< 0.5 mile north of Stoneridge Wellfield
Altamont Commuter Express	Pleasanton, Livermore, Unincorporated Alameda County	Altamont Commuter Express rail service operating and station / track improvements	Funding Committed (MTC)	Within Stanley Avenue Wellfield; < 0.5 mile south of planning area
LAVTA	Pleasanton, Livermore	LAVTA satellite maintenance / operations facility	To Be Determined	Within Stanley Boulevard

SOURCE: City of Pleasanton, Pleasanton Residential Projects (as of 1/1/02), 2002; City of Pleasanton, *Major Commercial, Office, and Industrial Complexes in Pleasanton* (website date unknown – the above list updated based on website information in July 2003); City of Livermore, *Residential Projects*, May 2003; City of Livermore, *Industrial Projects*, 2003; City of Livermore, *Current Public Works Projects*, May 2003; Metropolitan Transportation Council, *Draft 2001 Regional Transportation Plan for the San Francisco Bay Area*, August 2001.

at various phases of completion over time as new projects begin over the course of 20 years. Although the list in **Table 5-1** would be dynamic and likely fluctuate due to changes of schedules or other unknown factors, this analysis considers concurrent implementation of these projects with construction of an individual well. Zone 7 would coordinate with the appropriate departments of Alameda County, City of Pleasanton, City of Livermore, and any other affected agencies (i.e., Caltrans, railroad owners) regarding the timing of construction projects that would occur near the final well sites and pipeline alignments. Such coordination will help to minimize multiple disruptions to the same areas. Zone 7 will also submit plans related to affected jurisdictions, and comply with the requirements of their encroachment permits, which will provide further opportunity for coordination of multiple projects.

5.3 POTENTIAL CUMULATIVE EFFECTS

This section evaluates the potential cumulative effects of constructing the proposed project simultaneously with other development or infrastructural projects. Cumulative impacts would result only where other projects with related impacts would exacerbate project generated significant impacts, and concurrent construction activities with other projects would exacerbate those impacts. As discussed in **Chapter 3**, the majority of significant impacts associated with the proposed Project are related to facility construction.

Depending on the selected well sites and pipeline alignments, the projects identified in **Table 5-1** may or may not occur spatially and temporally to the proposed facilities. The cumulative impacts analysis presents a conservative approach by assuming that there are other projects with similar construction-related impacts that may be located in proximity to the proposed facilities, and that those projects would overlap in their construction schedules. The significance level would be determined by the proposed project's contribution to cumulative effects. Significant, cumulative impacts are termed "cumulatively considerable," which is defined in **Section 5.1**, above.

The impacts associated with routine operation of proposed facilities are considered significant primarily as it relates to groundwater resources. As the analysis of long-term groundwater withdrawal and its impact on the groundwater basin is cumulative by nature, potential impacts associated with groundwater resources are evaluated and discussed in **Section 3.1, Groundwater Hydrogeology and Water Quality**.

Impact 5-1: Construction of project components would contribute to a cumulative increase in sediment loading in creeks and streams. Less than Significant with Mitigation.

Geographic Scope

The geographic area for consideration of cumulative impacts is the drainage area for project components, which is the upper Alameda Creek Watershed. The creeks within the planning area are shown in Figure 2.3 (in Chapter 2 Project Description) and described in **Section 3.2**, **Surface Hydrology and Water Quality**. The projects shown on **Table 5-1** are representative of known cumulative projects located within the Alameda Creek Watershed.

Well Facility and Pipeline

As described in **Section 3.2**, the Alameda County Clean Water Program is the entity responsible for implementing requirements of the federal Clean Water Act to control stormwater pollution through the County's Stormwater Management Plan. The program includes requiring best management practices that include construction controls, legal and regulatory approaches, public education and industrial outreach, inspection activities, wet weather monitoring, and special studies. In effect, the Program implements County-wide measures to reduce cumulative pollutant loading to local water bodies, including the drainages that are affected by construction of Zone 7 Well Master Plan components. Zone 7 as well as the jurisdictions identified in Table 5-1 are members of the Alameda Countywide Clean Water Program, and thus is required to implement the best management practices specified in the Program NPDES Permit and the *Storm Water Management Plan for the Alameda County Urban Runoff Clean Water Program, July 2001-June 2008* (July 31, 2001).

Implementation of measures identified in **Section 3.2** (including preparation and implementation of a Storm Water Pollution Prevention Plan), as well as implementation of BMPs identified in the Alameda Countywide Clean Water Program, would ensure that the project's contribution to this cumulative effect is less than cumulatively considerable.

Mitigation Measures

No additional measures beyond those identified in **Section 3.2** are required.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-2: The Well Master Plan would not increase the number of people exposed to earthquake hazards. Less than Significant (no mitigation required).

Geographic Scope

The project's impacts related to seismic hazards are site-specific in nature and have no cumulative context. However, the potential for subsidence, which is discussed in **Section 3.3**, **Geology and Soils**, is a regional impact that could be associated with project implementation. **Section 3.3** discusses subsidence associated with drawdown relating to pumpage of the Main Basin; as such, this provides a cumulative analysis of potential subsidence associated with long-term well operations.

Well Facility and Pipeline

The project would result in few, if any, new employees. Therefore, the project would not increase the number of people exposed to earthquake hazards and the project's contribution to this cumulative effect is less than cumulatively considerable.

Mitigation Measures

None required.

Impact Significance After Mitigation: Less than Significant.

Impact 5-3: Implementation of the Well Master Plan could result in short-term cumulative land use impacts (i.e., increase in noise and dust to nearby sensitive receptors, traffic congestion, and access conflicts) associated with construction in the project vicinity. Less than Significant with Mitigation.

Geographic Scope

The geographic scope for construction-related impacts, including increased noise and air quality would be localized within and adjacent to the construction zone. The geographic scope is broader for traffic-related impacts and would encompass the road network to the nearest freeway due to the sharing of roadways for construction-related vehicular travel. The geographic scope of this impact is the same as for construction-phase noise, air quality, and traffic impacts (described below).

Well Facility

New or expansion of existing residential, commercial, and industrial development, as well as road or utility improvements would likely occur during the Well Master Plan implementation; these projects may include the projects identified in **Table 5-1,** which are currently at various levels of planning or construction. Simultaneous construction of other projects in the vicinity of the individual well sites could exacerbate disruption of nearby sensitive receptors. Because potential, construction-related, significant impacts associated with noise and dust would result from this project alone, it could also contribute to potential cumulative effects if other projects are in close proximity to the selected project sites. Assuming that there are nearby projects occurring simultaneously with the Zone 7 Well Master Plan, potential land use impacts would be considered "cumulatively considerable." However, the project's contribution to this impact could be reduced to a less-than-significant level with the implementation measures identified in **Chapter 3**. These measures include limitations on project construction to specific times where feasible, and provision of advanced notice to adjacent land use owners. Long-term (operation-phase) impacts are considered less-than-significant because land uses at and around individual well sites would generally remain similar to current conditions. Well sites currently exist throughout the Valley, and are considered compatible with a variety of land uses due to the use of appropriate design elements. Implementation of the measures identified above, in addition to the temporary nature of construction (one-year), and the limited size of the construction zone compared to larger development projects, would reduce the project's incremental effects to cumulative impacts. Therefore, the project's contribution to cumulative effects would be reduced to less than cumulatively considerable.

Pipeline

Up to 12,000 linear feet of pipeline would be installed simultaneous with well construction, to connect the well facilities with the existing distribution system. Unlike well facility sites which would be localized on any one parcel, the pipeline would extend through many parcels, likely within public, road right-of-ways. **Chapter 3** identifies potentially significant impacts associated with construction of the pipeline. Potential cumulative impacts would occur if the pipeline alignment is in proximity to development projects or are located within or along the same corridor as other linear infrastructure projects. Assuming that the timing of the projects are overlapping, pipeline installation would exacerbate disruption of residents, businesses, commuters, and others. Coordination of construction activities with local jurisdictions and developers could reduce the severity of cumulative impacts. Although Zone 7 has no authority to require other utilities or developers to coordinate construction, it has stated its intent to work with those agencies and developers to minimize cumulative construction-related impacts where possible (see **Measure 5-3a**). The project's contribution to this impact would be less than cumulatively considerable with the implementation of measures identified in **Chapter 3** of this EIR. These measures include limitations on project construction to specific times where feasible, provision of advanced notice to adjacent land use owners, implementation of dust control, use of noise barriers, and implementation of a Traffic Control Plan.

Long-term (operation-phase) impacts are considered less-than-significant because the pipelines would be underground and unobtrusive; land uses at and around the pipeline alignment would remain similar to current conditions.

Mitigation Measures

> **Measure 5-3a:** Zone 7 shall coordinate construction activities along selected alignments with the affected jurisdiction, including but not limited to: Alameda County Planning and Public Works department, City of Pleasanton, and City of Livermore to identify overlapping pipeline routes, planning areas, and construction schedules. To the extent feasible, construction activities shall be coordinated to consolidate the occurrence of short-term construction-related impacts. Such coordination will minimize multiple disruptions to the same streets.
>
> See Measures identified in **Chapter 3** of this EIR.
>
> **Impact Significance After Mitigation:** Less than Significant with Mitigation.

Impact 5-4: Project construction could result in cumulative loss of habitat for Special-Status Wildlife and Plants. Less Than Significant with Mitigation.

Geographic Scope

The geographic areas for evaluating the potential for cumulative impacts on habitats of special status species is the East County of Alameda County.

Well Facility and Pipeline

Construction of the Well Master Plan would have the potential to affect the following species: California red-legged frog, California tiger salamander, Alameda whipsnake, western pond turtle, burrowing owl, fairy shrimp, and special-status bat species. The likelihood of the project contributing to cumulative impacts to these species is considered less than cumulatively considerable, as proposed wellfields are located within primarily urban and gravel mining areas that are currently disturbed. Given the very limited acreage associated with proposed facilities, the low potential for habitat to occur within the majority of the wellfields, and the limited acreage affected by the project relative to other cumulative development (see **Table 5-1**), implementation of measures identified in **Section 3.5, Biological Resources** would ensure that the project's contribution to this potential cumulative effect is less than cumulatively considerable.

Mitigation Measures

No additional Measures beyond those identified in **Section 3.5** are required.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-5: The Well Master Plan, together with other existing and reasonably foreseeable development, would contribute to cumulative construction emissions. Implementation of the proposed Project would generally be consistent with the Bay Area's Clean Air Plan. Less than Significant with Mitigation (implementation of BAAQMD-recommended control measures).

Geographic Scope

Topographical, meteorological, and atmospheric conditions affect the dispersal of air pollutants. In the Bay Area, these factors define the San Francisco Bay Area Air Basin (described in **Section 3.6, Air Quality**), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The geographic scope for cumulative air quality impacts of the project is the San Francisco Bay Area Air Basin. As discussed in **Section 3.6**, the Clean Air Plan (CAP) is the guidance document used to improve air quality throughout the Air Basin.

Well Facility and Pipeline

Project construction in conjunction with other projects in the vicinity could increase the amount of fugitive dust emissions and other criteria pollutants emitted in the study area at a given time. However, due to the short-term nature of project construction (one year per site), the impact to sensitive receptors at a given location would be less than cumulatively-considerable provided that measures identified in **Section 3.6** are implemented.

Mitigation Measures

No additional Measures beyond those identified in **Section 3.6** are required.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-6: The Well Master Plan, together with cumulative development, would temporarily increase ambient noise levels in the planning area. Less than Significant with Mitigation.

Geographic Scope

The project's operation- and construction-related noise impacts affect only land uses within a few hundred feet (or less) of noise sources at well facility sites. Consequently, the geographic area for cumulative noise impacts is the immediate vicinity of the selected well site and pipeline alignment.

Well Facility

Project related construction activities would result in short-term, significant impacts, particularly during the two to three week 24-hour drilling and well testing operations. The contribution to cumulative impacts would be potentially significant. However, disruption to nearby residents would be mitigated through implementation of noise attenuation measures and alternative overnight stays at a hotel as identified in **Section 3.7**, Noise. Project-related potential impacts would be reduced to less than significant levels with implementation of the above measure and other measures including restrictions on the construction schedule for the pipeline component. These measures would reduce the project's contribution to cumulative construction noise to less than cumulatively significant.

Pipeline

The pipeline corridor may be located on public right-of-ways within 50 feet of residents. Similar to construction of the well facilities, there is a potential that construction activities would generate significant cumulative noise impacts. Implementation of measures identified in **Section 3.7** would reduce the project's incremental contribution to cumulative construction noise to a less-than-significant level.

Mitigation Measures

None required beyond those identified in **Section 3.7**.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-7: Project construction could coincide with other construction projects in the planning area, contributing to cumulative traffic and roadway disruptions. Less than Significant with Mitigation.

Geographic Scope

The geographic scope of potential cumulative traffic impacts includes access routes to area freeways, and arterial and collector roadways to/from the proposed project sites.

Well Facility and Pipeline

The projects listed in **Table 5-1** and other future projects within the City of Pleasanton and unincorporated Alameda County likely would share some of the same construction access routes with the Zone 7 Well Master Plan, particularly for pipeline construction. Consequently, cumulative traffic and roadway disruptions would occur from open trench portions of the pipeline construction, because of the roadway disruption along the pipeline alignment in combination with other cumulative projects. Scheduling trips outside of the peak traffic hours on construction work and the dispersion of truck trips throughout the day (identified in Section 3.8 Traffic and Circulation) would reduce the project's incremental contribution to cumulative effects to a less-than-significant level.

Mitigation Measures

Measure 5-7a: The traffic control plan will include consideration of any other planned traffic detours related to concurrent construction projects.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-8: The Well Master Plan would not significantly contribute to cumulative burdens on regional hazardous waste management facilities. Less than Significant (no mitigation required).

Geographic Scope

The project's impacts related to hazardous materials are site-specific in nature and have no cumulative context.

Well Facility and Pipeline

Project construction could incrementally contribute to cumulative hazardous waste requiring disposal. Potential sources of hazardous waste generated by the project include: contaminated soils from excavation and contaminated groundwater. (It has not been determined whether site development or pipeline construction actually *would* encounter contaminated soils or groundwater.) There are a number of treatment/disposal options available for the types of hazardous waste potentially generated by the project. The project's contribution to this cumulative impact is considered less than cumulatively considerable.

Mitigation Measures

No additional measures beyond those identified in **Section 3.9** are required.

Impact Significance After Mitigation: Less than Significant with Mitigation

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Impact 5-9: Pipeline construction could reduce space available for future utilities. Less than Significant with Mitigation.

Geographic Scope

The geographic area of this impact is limited to the pipeline alignment.

Pipeline

Pipeline construction could limit the number of utilities that could eventually be located in pipeline alignment roadways. The Department of Health Services (DHS) regulations require a 10-foot horizontal separation between buried parallel potable water and wastewater effluent pipelines, and a 1-foot vertical separation for crossing potable water and effluent lines, with the effluent pipeline below the potable water pipeline. Installation of proposed pipelines could potentially limit or preclude the use of some roadway segments for new or expanded wastewater water pipelines. As part of project implementation, Zone 7 would obtain encroachment permits from affected agencies. The process of permit acquisition would ensure that Zone 7 informs local jurisdictions of pipeline installation activities. This would ensure that implementation of the project on project roadways would not preclude the installation of future projects. Implementation of measures identified in **Section 3.4** and **3.10** would reduce potential cumulatively-considerable impacts to less than cumulatively considerable.

Mitigation Measures

No additional measures beyond those identified in **Sections 3.4** and **3.10** are required.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-10: The project could contribute to other cumulative impacts on public services and utilities. Less than Significant with Mitigation.

Geographic Scope

The geographic area is the service areas of the potentially affected public services and utilities.

Well Facility and Pipeline

As noted in the **Section 3.10**, implementation of the project would have no long-term effects on demand for or provision of public services, including police and fire protection services. In general, implementation of the project would have no direct long-term effects on demand for public services and utilities, with the exception of water supply service, which is the subject of this EIR and is discussed in detail throughout the report.

As discussed under **Section 3.10**, pipeline installation could disrupt the provision of other utility services through accidental damage of utility lines or the required relocation of some utility lines. **Measures 3.10-1** and **3.10-2** include requiring the contractor to locate all underground utilities and structures prior to excavation; notifying all known owners of underground utilities in the area of proposed work; excavating around utilities and traffic loop detectors; coordinating planning and design efforts with other service agencies; and contacting the local fire department every time damage to a gas utility results in a leak or suspected leak, in addition to notifying utility owners of any damage caused by Zone 7 employees or contractors. Implementation of these measures would also ensure that the project's contribution to possible cumulative impacts would be less than cumulatively considerable.

Cumulative traffic impacts are discussed above. As noted, the project's cumulative traffic-related impacts, which includes potential delays of police, fire, and other emergency response vehicles, would be less than cumulatively considerable.

Mitigation Measures

No additional measures beyond those identified in **Section 3.10** are required.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-11: The proposed project may contribute to a cumulative increase in degradation or removal of archaeological resources. Less than Significant with Mitigation.

Geographic Scope

The geographic area considered for cumulative historic/archaeological resources is the East County of Alameda County, which is considered a sensitive cultural resources area due to the presence of the Willow Marsh in the present-day Pleasanton urban area.

Well Facility and Pipeline

Given Zone 7's intent to avoid known and recorded archaeological resources during siting of the well facilities and pipeline alignments, and limited acreage associated with development of project facilities, project-specific impacts to archaeological resources, implementation of measures identified in **Section 3.11, Cultural Resources,** would ensure that the project's contribution to this potential cumulative effect is less than cumulatively considerable.

Mitigation Measures

No additional measures beyond those identified in **Section 3.11** are required.

Impact Significance After Mitigation: Less than Significant with Mitigation.

Impact 5-12: Implementation of the proposed Project could, in conjunction with other projects, adversely affect the existing visual character of the planning area. Less than Significant (no mitigation required).

Geographic Scope

The geographic scope of cumulative impacts to visual quality are the viewsheds that could be affected by implementation of the proposed project.

Well Facility and Pipeline

The planning area is located within the Livermore-Amador Valley, a topographically flat terrain bounded in all directions by rolling hills. Although the exact locations of the well facilities and pipeline alignments are not known, the project's incremental contribution to cumulative impacts would be less than significant due to the limited size of the facilities and design features that would be incorporated. With respect to construction, cumulative projects may be visible from long-range views (from distant hills to the south). The limited size of the construction zone associated with an up to 100- by 150-feet facility pad and more than two miles of six-foot wide trench would be miniscule when seen from these hills. Short- and medium- range views, particularly within the urban areas, would be blocked by structures, buildings, and vegetation. Short to medium- range views of construction projects may be more noticeable in the quarry areas, where there are few intervening structures. However, due to the temporary nature and limited size of this project, potential cumulative impacts would contribute incrementally to cumulative impacts.

Cumulative, long-term contribution to visual degradation would not be significant due to the limited size of the well facility and the underground placement of the proposed pipeline alignment. Well facilities, constructed over the course of 20 years, would integrate with the existing neighborhoods or landscape.

Mitigation Measures

None required beyond those identified in **Section 3.12**.

Impact Significance After Mitigation: Less than Significant with Mitigation.

REFERENCES – Cumulative Impacts

City of Pleasanton, Pleasanton Residential Projects (as of 1/1/02), http://www.ci.pleasanton.ca.us/new_dev_projects.html, 2002.

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CHAPTER 6
ANALYSIS OF ALTERNATIVES

6.1 INTRODUCTION

6.1.1 CEQA REQUIREMENTS

The California Environmental Quality Act (CEQA) Guidelines require Environmental Impact Reports (EIRs) to describe and evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. The Guidelines set forth the following criteria for selecting alternatives:

1. The discussion of alternatives shall focus on "…reasonable alternatives to the project or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." (§15126.6[a])

2. "The range of potential alternatives shall include those that could feasibly accomplish most of the basic purposes of the project and could avoid or substantially lessen one or more of the significant effects." (§15126.6[c])

3. "The specific alternative of 'no project' shall also be evaluated along with its impacts." (§15126.6[e][1])

To provide the appropriate context for this alternatives analysis, the project objectives and the significant impacts of the project are summarized below.

6.1.2 PROJECT OBJECTIVES

The main objective for this project is to increase the reliability and redundancy of Zone 7's treated water supply such that treated water is available to Zone 7 customers when annual State Water Project (SWP) allocations are low during a drought year, or in the event of an emergency. The specific project objectives are as follows:

- Provide facilities to recover stored groundwater supplies from the Main Basin at a sufficient rate to meet Zone 7's reliability goals, as established in Resolution 02-2382. These include:
  - Goal 1: Meet 100% of treated water customers water supply needs in accordance with Zone 7's most current contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water

Management Plan (UWMP), which will be coordinated with Zone 7's M&I Contractors. Zone 7 will endeavor to meet this goal during an average water year, a single dry water year, and multiple dry water years.

  - Goal 2: Provide sufficient Valley-wide groundwater production capacity (including Zone 7's and Contractors wells) to meet at least 75% of the estimated maximum daily M&I water demand.

- Maintain water levels within the Main Basin above the historic lows.
- Design and site proposed facilities to minimize potential interference to nearby wells during operations, to the degree feasible.
- Design and site proposed facilities to minimize potential effects to surrounding land uses during well construction, development and operation, to the degree feasible.

6.2 SIGNIFICANT EFFECTS OF THE PROJECT AND LOCATIONAL ALTERNATIVES

Chapter 3 presents the impact analysis associated with implementation of the proposed project. Following is a summary of the significant environmental effects identified. These are the impacts that are considered in the evaluation of the alternatives to identify which alternative(s) can avoid or reduce the environmental effects and still meet the basic project objectives.

6.2.1 WELL CONSTRUCTION

Construction of well sites could result in potentially significant construction impacts, such as erosion and sedimentation, dust and emissions generation, disturbance of biological resources, disturbance of cultural resources, noise generation during 24-hour construction activities, construction traffic, and temporary effects to visual resources during construction. Mitigation measures, identified in **Chapter 3**, would reduce all of potential impacts to less than significant levels.

6.2.2 WELL OPERATION

Long-term impacts associated with well operations include: potential noise effects during operations; storage of hazardous materials onsite; and potential effects to visual resources. These impacts would be reduced to less than significant levels with the implementation of mitigation measures established in **Chapter 3**. Potential impacts associated with groundwater drawdown, including the potential for drawdown below historical low groundwater levels, with subsequent impacts related to subsidence, would also be avoided through implementation of measures identified in **Chapter 3**.

6.2.3 LOCATIONAL ALTERNATIVES

With respect to implementation at individual wellfields, impacts associated with well construction would be identical regardless of well site location. However, the potential for these impacts to affect sensitive land uses, such as residential uses, schools, hospitals, or elderly housing would be greater for wellfields within the western portion of the Valley, which are more urbanized. Well construction within the Bernal, Hopyard, Valley, Mocho, Stoneridge and Martin Wellfields would have a greater potential for these types of impacts. Conversely, the potential for biological or cultural resource impacts are higher within the eastern wellfields, which are less urbanized, and have greater potential for sensitive species habitat.

With respect to long-term operations, there is some variation between impacts within individual wellfields. This relates to historical groundwater usage, existing pumpage capacity distribution, and groundwater elevation trends within the Main Basin. As noted in **Section 3.1**, groundwater levels have been historically lower in the Bernal Wellfield due to historical pumping within this area. Additionally, the Mocho, Hopyard and Stoneridge wellfields are constrained in their capacity to accommodate additional well pumping by the historical low policy. Groundwater pumping simulations indicate that concentrating the pumping in these wellfields leads to rapid drawdown of water levels below the historic low. This is mainly due their proximity to the northern groundwater basin boundary and its inability to transmit significant quantities of water across the boundary. The Well Master Plan has been developed to more efficiently recover stored groundwater within the context of Zone 7's historical low operational criteria. Therefore, implementation of additional capacity within outlying wellfields that are more central to the Main Basin, and away from Zone 7's existing well capacity, would maximize the ability to recover stored groundwater within the context of Zone 7's historical low operating criteria.

Individual wellfields were reviewed for environmental and engineering constraints as part of the Well Master Plan. A ranking system integrating environmental, physical, and cost related issue was developed in order to compare individual wellfields with respect to implementation. Results of the analysis are presented in **Figure 6-1**. **Figure 6-2** shows those wellfields that were ranked highest, and are therefore considered "preferred" in terms of well implementation from a hydrogeologic, physical, environmental, and cost standpoint.

As noted in **Chapter 3**, impacts associated with well construction and implementation can be reduced to a less than significant level through implementation of identified mitigation measures at each individual well site. Therefore, although wellfields have been ranked in terms of preference, Zone 7 may implement individual wells within any of the well fields identified within the planning area. As noted in Section 2.0, Project Description, individual well site would be selected based on the following criteria:

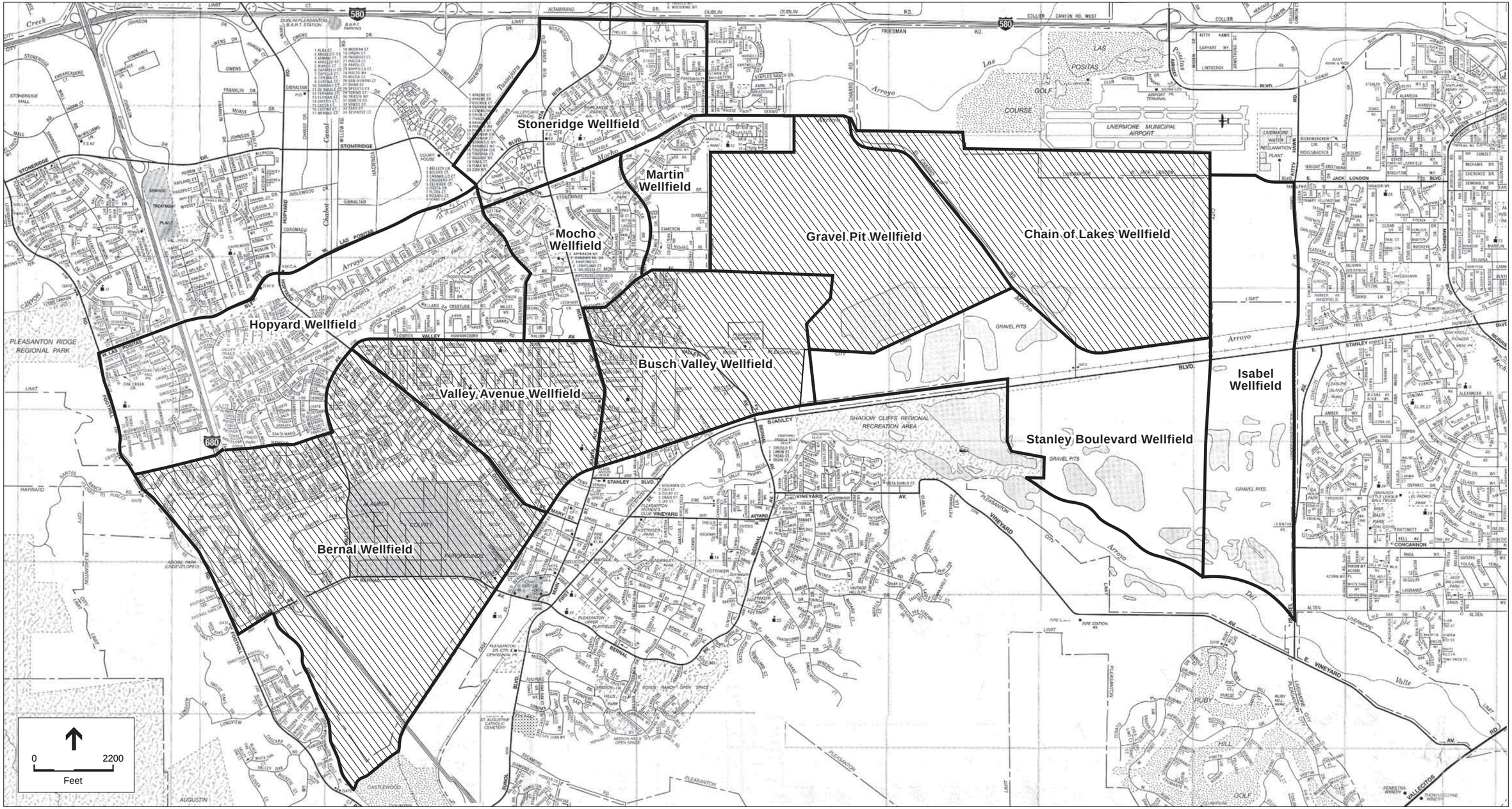
- Hydrogeologic conditions / groundwater characteristics
- Water quality, projected discharge rates from test wells;
- Proximity to existing Zone 7 distribution facilities;
- Proximity to existing utilities;
- Avoidance of contaminated sites and potential contaminating facilities;
- Avoidance of sensitive biological / cultural resources;

Issue	Criteria	weight	WELLFIELD											
			Stoneridge	Gravel Pit	Chain of Lakes	Busch-Valley	Bernal	Valley (north)	Stanley	Martin Avenue	Valley (south)	Hopyard	Mocho	Isabel
Environmental	Current land use	2	2.0	3.0	3.0	3.0	2.5	1.0	3.0	2.0	1.0	1.0	1.0	3.0
Environmental	Proximity to nearby municipal wells	2	3.0	3.0	3.0	2.5	2.5	3.0	3.0	3.0	3.0	2.0	1.0	3.0
Environmental	Proximity to known local contamination	2	2.5	3.0	2.5	1.0	2.5	2.0	3.0	3.0	2.0	2.0	2.0	1.5
Environmental	Proximity to sensitive biologic resources	3	3.0	2.0	2.0	3.0	2.5	3.0	2.0	3.0	2.0	2.5	2.5	2.0
Physical	Avail drawdown above historic low WL	3	0.0	3.0	3.0	2.0	2.5	1.5	3.0	0.0	2.5	0.0	0.0	3.0
Physical	Potential discharge rate	3	3.0	3.0	3.0	1.0	2.0	3.0	1.0	2.0	3.0	3.0	3.0	1.0
Physical	Water quality - TDS	2	3.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Physical	Water quality - Hardness	2	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Cost	Possible GW under the influence impact	2	3.0	2.0	2.0	2.5	3.0	3.0	2.0	2.5	3.0	3.0	3.0	1.0
Cost	Proximity to existing infrastructure	3	3.0	1.0	1.0	3.0	1.0	2.0	1.5	3.0	1.0	3.0	3.0	1.5
	Score >>>>>		**58**	**57**	**56**	**55**	**55**	**55**	**53**	**53**	**52**	**50**	**48**	**48**

Issue	Criteria	Scoring Basis			
		0	1	2	3
		Very Unfavorable	Unfavorable	Adequate	Very favorable
Environmental	Current land use	no space	residential	commercial	open space parcel
Environmental	Proximity to nearby municipal wells	< 100 feet	100 to 500 feet	500 to 1,000 feet	> 1,000 feet
Environmental	Haz mat: number of sites in EDR report 9July02)	in major plume	12 sites present	5 to 6 sites present	1 to 2 sites present
Environmental	Proximity to sensitive biologic resources	in sensitive habitat	near known sensitive habitat	distant from known sensitive habitats	no sensitive habitats
Physical	Avail drawdown above historic low WL (pref alt)	0 feet	< 50 feet	50 to 100 feet	> 100 feet
Physical	Potential discharge rate	< 500 gpm	500 to 750 gpm	1,000 to 2,000 gpm	> 2,000 gpm
Physical	Water quality - TDS	> 1,000 ppm	600 to 1,000 ppm	400 to 600 ppm	< 400 ppm
Physical	Water quality - Hardness	> 500 ppm	300 to 500 ppm	200 to 300 ppm	< 200 ppm
Cost	Possible GW under the influence impact	known impact	within 500 feet of pit	500 to 1,000 feet from pit	> 1,000 feet from pit
Cost	Proximity to existing infrastructure	> 20,000 feet	> 5,000 feet	1,000 to 5,000 feet	< 1,000 feet

SOURCE: CH2MHill

Figure 6-1
Wellfield Ranking



SOURCE: Environmental Science Associates, California State Automobile Association

Figure 6-2
Preferred Wellfields for Implementation

- Minimization of well interference;
- Site conditions/property ownership;
- Land acquisition costs.

6.3 NO PROJECT ALTERNATIVE

DESCRIPTION

Under the No Project Alternative – Existing Conditions, Zone 7 would not implement construction of new facilities under the Well Master Plan, and would continue the withdrawal of groundwater to meet reliability and emergency demands using Zone 7's existing facilities. Zone 7's current drought capacity of 25 mgd from wells and the Valley-wide well capacity of 46 mgd would remain unchanged, as would its operating practices of using approximately 15,000 to 20,000 acre feet of stored groundwater annually to meet annual groundwater demands.

Under current demand conditions, Zone 7's drought well capacity of 25 mgd is adequate to meet Goal 1 of Zone 7's Reliability Policy, until the year 2006, when demands would exceed Zone 7's ability to meet Goal 1 under the single year and 6-year drought scenarios. Additionally, as noted in **Chapter 2, Project Description**, the Valley-wide well capacity currently provides 53% of the current Valley-wide maximum day demand (MDD), and is behind the Goal 2 objective to meet 75% of the Valley-wide MDD in the event of an emergency condition.

Implementation of this alternative would avoid impacts related to construction of new well facilities, including impacts associated with construction noise during 24-hour well development. Long-term operational impacts associated with effects to surrounding land uses, such as aesthetics, noise generation, and land use consistency, would also not occur. However, as noted in **Chapter 3**, these impacts can be reduced to a less than significant level through the implementation of identified mitigation measures.

Although implementation of the No Project alternative under existing conditions would avoid potential impacts associated with the siting, construction, and operation of wells identified under the Master Plan, this alternative would not meet the stated objectives of the proposed project, including Goals 1 and 2 of Zone 7's adopted Reliability Policy. Impacts associated with implementation of the proposed project would be mitigated to less than significant levels by mitigation measures identified in **Chapter 3**. Because this project would not avoid any impacts that could not be mitigated, and would not meet the stated project objectives, it is not considered environmentally superior to the proposed project.

Discussion of the No Project Alternative must examine the existing conditions and reasonably foreseeable future conditions that would exist if the project were not approved (CEQA §15126.6[e][2]). As previously discussed in **Chapter 4,** growth within the Zone 7 service area is provided for under the local adopted General Plans. As such, the potential for water demands to remain static, i.e., the "existing condition," is extremely low. Therefore, the following discussion focuses on reasonably foreseeable conditions within the Zone 7 service area, which would include growth under the approved General Plans.

Under the No Project Alternative, Zone 7 would not implement construction of new facilities under the Well Master Plan, and would continue the withdrawal of groundwater to meet reliability and emergency demands using Zone 7's existing facilities. Zone 7's current drought well capacity of 25 mgd would remain unchanged. However, as growth occurs within its service area, peak demands and drought year demands would continue to increase. Implementation of the No Project Alternative within this context would have several potential consequences with respect to provision of reliable water supplies within the Livermore Valley. These would include inability to meet Zone 7's Reliability Goals, a potential shift in the ratio of surface water and groundwater supplies provided by Zone 7, with subsequent reduction of salt management benefits, and the likely need to acquire additional dry-year supplies. These supplies, which would likely be surface water supplies, or surface water supplies in-lieu of groundwater stored outside of the Zone 7 service area, would be subject to hydrologic conditions in a given dry year, and would not provide the in-service area storage reliability provided by use of the groundwater basin for storage and conjunctive use.

As treated water demands increase over time within the Zone 7 service area, Zone 7's existing well capacity of 25 mgd would not be adequate to recover the stored groundwater necessary to provide water supply to its Retail Agencies in a manner consistent with Goal 1 of Zone 7's Reliability Policy, provision of 100% reliability during average, single drought year, and multiple drought years. Additionally, as treated water demands increase over time, the peak day production capacity necessary to meet Goal 2 of Zone 7's Reliability Policy, provision of 75% Valley-wide MDD, would also increase. As previously noted in Section 2.0, Project Description, the current Valley-wide capacity is capable of providing 53% of Valley-wide MDD. Without construction of new well facilities, Zone 7's existing shortfall with respect to this reliability goal would continue to be exacerbated over time. At buildout, the Valley-wide existing well capacity would be capable of providing only 37% of the Valley-wide MDD. As such, Zone 7 would likely continue to pursue other water supplies or facilities that would provide reliable water supplies for both drought year and emergency conditions.

Zone 7's water supply planning criteria provides for a treated water supply ratio of 75% surface water supplies treated at Zone 7 treatment plants, and 25% groundwater stored and recovered through conjunctive use. This planning criteria, established in the Water Supply Planning Study (West Yost Associates, 1999), Treatment Facilities Master Plan (CDM, 2000) and the Water Supply Planning Program EIR (ESA, 1999), serves as the basis for Zone 7 water supply and facility planning, including acquisition of SWP water allocation, additional SBA capacity, and required treatment plant capacities at existing and future Zone 7 treatment plants. Additionally, this 25% groundwater planning criteria has been identified as a salt management tool to neutralize salt buildup within the Main Basin.

As demands increase within its service area, the inability to provide 25% groundwater due to insufficient well capacity would likely increase the use of surface water supplies to meet projected needs. In order to meet its reliability goals with imported surface water supplies, rather than groundwater stored within its service area, Zone 7 would need to implement the following: a) oversize existing conveyance and treatment facilities to meet future peak day summer demands

not provided through recovered groundwater; b) acquire additional dry year surface water supplies sufficient to provide 100% reliability during single year and 6-year drought scenarios, consistent with Goal 1 of Zone 7's Reliability Policy, and c) identify alternative storage within the Zone 7 service area to provide emergency supplies sufficient to meet 75% of the Valley-wide MDD, consistent with Goal 2 of Zone 7's Reliability Policy. This storage could be provided outside of the service area if conveyance into the service area did not rely solely on the South Bay Aqueduct, thereby providing Zone 7 with emergency reliability in the event of an SBA outage. These represent alternatives to the proposed project that could meet a number of the project objectives, and are discussed below.

6.4 TREATMENT PLANT CAPACITY EXPANSION AND DRY YEAR SUPPLY ACQUISITION

As an alternative to recovery of groundwater to meet peak summer demands, Zone 7 could expand its surface water treatment capacity. This would essentially alter Zone 7's 75:25 planning criteria, and would require capacity expansions at Zone 7's existing and future treatment plants to provide the additional peak day capacity no longer provided through recovery of stored groundwater supplies. Capacity improvements would most likely be required for the entire treatment train, but would only be used during peak demand months. Provision of water supply in this manner could meet reliability goals during typical peak summer months; however, it would not provide reliability during drought years when supplies from the SWP are reduced. Local supplies would not be adequate to provide the difference required for 100% reliability.

The Water Supply Planning Program (WSPP) and WSPP Program EIR identified the need for Zone 7 to acquire additional dry year supplies and/or storage in order to augment SWP supplies during drought years to meet Zone7's 100% treated water reliability goal. Average SWP deliveries to Zone 7 have historically averaged 75% of entitlement, and Zone 7 has used this criteria in identifying a mix of local and imported water supplies necessary to meet demands consistent with Goal 1 of this Reliability Policy.

The WSPP's, Long-Term Program identified the need for 27,800 af of dry year water supply acquisitions and/or storage in order to provide for dry-year reliability at 2020 demands. This amount of dry-year water assumed a safe-yield of 13,400 from the Main Basin and SWP deliveries as low as 11% of Zone'7s entitlement. Since that analysis, DWR has estimated their minimum deliveries at 20% of entitlements (DWR, 2002).

Within this context, the Main Basin provides Zone 7 with the ability to rely on groundwater supplies to meet 25% of its treated demand during an average delivery year for the SWP. During drought years, when SWP may be reduced to as little as 20%, Zone 7 can recover stored groundwater to supplement reduced SWP entitlement deliveries. At buildout, treated water demands within the Zone 7 service area are projected at 65,567 afa. As previously discussed in **Section 3.2**, DWR estimates that SWP deliveries during a single drought could be as low as 20% of SWP entitlements. Combined with Zone 7's current and anticipated dry year water supply contracts, which include Semitropic, Byron Bethany Irrigation District (BBID) and Cawelo, it is

anticipated that approximately 50% of this demand would be provided through supplies conveyed into the Zone 7 service area. The remaining demand, or approximately 30,000 acre-feet, would be provided through recovery of stored groundwater supplies.

As an alternative to using recovery of stored groundwater to meet drought year demands, Zone 7 could acquire additional dry-year water supplies through water transfer, out of basin storage programs, or other dry-year alternatives identified in Chapter 5 of the WSPP Program EIR. Potential dry-year supply options included: American Basin Conjunctive Use, State Water Bank, Glen Colusa Water District, Browns Valley Irrigation District, Placer County Water Agency, Reclamation District 2068, and the State Option Program.

Under this type of alternative, Zone 7 would not implement additional well capacity to increase its ability to recover stored groundwater supplies. At current well capacities, Zone 7's single year production capacity is limited to approximately 17,000 af, at which point existing wellfields begin to approach the historical low. These recovered groundwater supplies supplement Zone 7's existing dry-year water contracts of approximately 35,400 af, providing a total dry year supply of 52,400 af. This is approximately 12,000 af below projected 2020 demands. Therefore, under this type of alternative, Zone 7 would need to acquire this amount of supplemental dry-year supplies in order to meet Goal 1 of its Reliability Policy.

Chapter 5 of the WSPP EIR examined at a program level potential impacts associated with dry-year water supplies available for acquisition, and identified potential mitigation strategies that could be implemented. These impacts and mitigation strategies are summarized in **Table 6-1** of the WSPP EIR (below). In addition to these types of impacts, all of the identified dry-year supplies would be conveyed to the Zone 7 service area via the South Bay Aqueduct, and would be subject to potential emergency outages associated with either that facility or Zone 7's water treatment plants. As such, implementation of this type of alternative would not provide the emergency reliability that is provided by storage within the Zone 7 service area. Additionally, these water supplies would require treatment by Zone 7's surface water treatment plants, and would not provide redundancy with respect to outages at individual treatment plants or the South Bay Aqueduct. Therefore, implementation of this type of alternative would not meet Goal 2 of Zone 7's Reliability Policy. As implementation of this alternative would not meet the stated objectives of the proposed project, would result in potential impacts relating to dry-year water transfers, and would not substantially reduce significant unavoidable impacts that cannot otherwise be mitigated, it is not considered environmentally superior to the proposed project.

6.5 STORAGE ALTERNATIVES

Alternatives to use of the Main Basin for storage and recovery of groundwater include development of other storage facilities, either within the Livermore Valley, or within other portions of the SWP to provide drought year and emergency reliability. Potential conveyance and in-valley storage alternatives were examined in the Water Conveyance Study (CDM, 2001), which examined the provision of an additional 11,000 acre-feet annually through either improved conveyance capacity or in-valley storage. The goal of this analysis was to identify an appropriate

TABLE 6-1
TYPICAL WATER TRANSFER IMPACTS

Typical Impacts of Water Transfers	Potential Mitigation Strategies
• **Delta Fisheries.** Potential impacts to sensitive Delta fisheries including: Winter-Run, Spring-Run Chinook Salmon, Delta Smelt, Steelhead trout, and Delta splittail.	• **Pumping Restriction Compliance.** Compliance with existing and future pumping requirements, including: 1995 SWRCB Water Rights Decision 95-06; 1993 NMSF Biological Opinion – Winter Run Chinook Salmon; 1995 USFWS Biological Opinion – Delta smelt.
• **Delta Flow Impacts – Wheeling.** Potential impacts to flows associated with wheeling North of Delta Transfers through the Delta. Could result in secondary impacts to Delta fisheries.	• **Flow Analysis- Wheeling.** Examination of flow impacts, and potential secondary effects on biological resources. Timing of delivery to be modified to minimize impacts and meet pumping restrictions. Properly coordinated water transfers can also have a beneficial impact on Delta flows.
• **Delta Water Quality.** Potential impacts to water quality, including salinity, bromides and temperature.	• **Water Quality Compliance.** Compliance with additional restrictions identified by the pending EIR/EIS for the CALFED Bay Delta program, the CVPIA Programmatic EIS, and the SWRCB Draft EIR for the 1995 Bay-Delta Water Quality Control Plan. Properly coordinated water transfers can also improve water quality.
• **Transfer Agency Water Resources/Service.** Potential impacts to irrigation supplies or service availability.	• **Water Resource Agency Approval.** Demonstrate availability through review/approval of proposed water transfers by applicable regulatory agency. Depending upon the type of water transfer, could include: - *DWR:* transfers between State Water Contractors or utilizing SWP facilities. - *Bureau of Reclamation:* transfers involving Central Valley Project supplies or facilities. - *State Water Resources Control Board.*
• **Agricultural Resources/Land Conversion.** Potential impacts to land use associated with conversion pressures from agricultural to urban uses.	• **Reduce Crop Conversion Pressure** - Demonstrate available surplus supply in service area. - Include farming interests in decision making process to identify balance between resource impacts and transfer benefits.[1] - Avoid fallowing or shifting crops that require high input and output expenditures.[1] - Improve waters supply reliability for agricultural uses.[1] - Ensure dry year supplies.
• **Groundwater Resources.** Potential for increased dependence upon groundwater resources, resulting in basin overdraft, increased pumping costs, reduced water quality.	• **Establish Groundwater Management Measures** - Use iterative analysis to assess basin safe yield and establish appropriate monitoring methodology.[1] - Establishment of groundwater monitoring wells and program.[1] - Regulate groundwater withdrawals to ensure compliance with safe yield requirements.[1] - Creation of additional groundwater or surface water storage facilities.[1]
• **Impacts to Conveyance Infrastructure.** Reduced facility capacity for conveyance of water supplies.	• **DWR/Bureau Approval.** Review and approval by appropriate agency to confirm available conveyance capacity.
• **Construction Related Impacts of New Infrastructure.** Potential construction disturbance impacts: geology, water resources, biological resources, cultural resources, air quality, traffic, noise, land use, hazardous materials, aesthetics.	• **Implement Standard Construction Measures** - Similar to construction measures identified to reduce construction impacts associated with Zone 7 facilities, as identified in Table 6-6 of Section 6.0.

[1] CALFED Draft Programmatic EIR, 1998.

SOURCE: Zone 7 Water Supply Planning Program – Program EIR, June 1999.

approach to meeting conveyance capacity constraints in the South Bay Aqueduct system. In addition to improvements to the SBA itself, this analysis included examination of several storage options, including purchase of the Future Contractor Share Storage at Del Valle Reservoir, construction of a new reservoir within the Livermore Valley at either Doolan Canyon, Arroyo Mocho, or Upper Del Valle Reservoir, and use of the Chain of Lakes for storage. As noted under **Section 6.4** above, approximately 12,000 acre-feet of dry-year water would be necessary to make up the shortfall in dry year supplies if the Well Master Plan were not implemented. The Water Conveyance Study analysis concluded that construction of new surface storage within the Livermore Valley would be cost prohibitive and would likely result in significant unavoidable impact relating to loss of biological resources, cultural resources, and land use within the dam and inundation areas. Implementation of a new surface reservoir of this magnitude within the Livermore Valley is not considered cost effective or feasible within today's regulatory environment.

The Chain of Lakes represents existing storage facilities within the Livermore Valley that could be used to provide storage of this magnitude. Under the Water Conveyance Study, the Chain of Lakes was examined as a mechanism to meet untreated agricultural demands within the Livermore Valley through construction of the In-Valley Conveyance, a series of distribution pipelines to provide agricultural water to the South Livermore area. In order for the Chain of Lakes to meet drought year treated water demands, a surface water treatment plant would need to constructed at or in the vicinity of the Chain of Lakes. In order to provide a viable alternative for the Well Master Plan, this facility would need to have a minimum capacity of 20 mgd to accommodate drought year demands. This type of alternative would have potential construction and operational impacts associated with the siting, construction and operation of a fourth Zone 7 surface water treatment plant within the Livermore Valley. In terms of capital cost for drought year and emergency supply, costs associated with this alternative would be greater than the Well Master Plan. Using a cost estimator of $3 million per 1 mgd of treatment capacity, implementation of this type of facility would have an estimated capital cost of $60 million, approximately twice the estimated cost of the Well Master Plan. When compared to consistency with current Zone 7 groundwater management, and the overall cost of the Well Master Plan, use of the Chain of Lakes with surface water treatment is not considered environmentally superior to the proposed project.

Storage may be available through participation on the Los Vaqueros Reservoir Expansion Project, or through other surface reservoir or groundwater banking programs available within the State Water Project or Central Valley Project systems. Zone 7 currently participates in storage of dry year water supplies within the Semitropic Groundwater Banking Program. However, implementation of storage outside of the Livermore Valley would be susceptible to conveyance facility damage in the event of an earthquake or Delta levee breach, and would not provide the in-service area emergency storage capability provided by the Main Basin. As previously discussed in relation to dry-year water supplies, conveyance of supplies stored outside of the Zone 7 service area would be via the South Bay Aqueduct, and would be subject to potential emergency outages associated with either that facility or Zone 7's water treatment plants. As such, implementation of this type of alternative would not provide the emergency reliability that is provided by storage

within the Zone 7 service area. Additionally, these water supplies would require treatment by Zone 7's surface water treatment plants, and would not provide redundancy with respect to outages at individual treatment plants or the South Bay Aqueduct. Therefore, implementation of this type of alternative would not meet either Goal 1 or Goal 2 of Zone 7's Reliability Policy. As implementation of this type of alternative would not meet the stated objectives of the proposed project, and would not substantially reduce significant unavoidable impacts that cannot otherwise be mitigated, it is not considered environmentally superior to the proposed project.

6.6 INCREASED PUMPAGE – EXISTING FACILITIES

Zone 7 could alter current well operations to maximize the capacity of its existing facilities to meet demands during drought year or peak demand periods. Zone 7's current installed drought capacity is 25 mgd, with a peak capacity of 32 mgd. As previously discussed in Section 3.1, Groundwater Hydrogeology and Water Quality, this peak capacity is used for a number of days during summer months each year to meet peak demands within the Zone 7 service area, as well as to provide operational flexibility for maintenance of conveyance and treatment facilities. Under the Increased Pumpage – Existing Facility alternative, Zone 7 would pump its peak capacity of 32 mgd to meet peak demands and to meet drought year demands, thereby using this total peak capacity as "drought" capacity. Operation in this manner would extend the duration of peak capacity pumping from a number of days during summer months to the entire summer period during a drought year. However, as discussed in **Section 2.0, Project Description**, this current capacity would only be capable of meeting Zone 7's drought demands through the year 2006.

As previously discussed in **Section 3.1, Groundwater Hydrogeology and Water Quality**, historical pumpage within the Mocho Wellfield has resulted in lower groundwater levels within that portion of the Main Basin. Due to the concentration of Zone 7's existing well capacity within the Mocho and Hopyard Wellfields, pumping of these wellfields at Zone 7's peak capacity (32 mgd) over the period necessary to meet drought year demands would result in water levels below the historical low in the vicinity of these wellfields. It is estimated that historical low groundwater levels would be approached pumping at this rate for the duration necessary to meet drought year demands at buildout. As noted in Section 3.1 and Section 3.3, Zone 7's operational policy is to maintain groundwater levels above historic lows. Implementation of this alternative would not provide the capacity necessary to meet Goal 1 and Goal 2 of Zone 7's Reliability Policy. Additionally, use of Zone 7's existing peak well capacity and well configuration to meet drought demands would not allow for maintenance of groundwater levels above historic low. As such, this alternative would not meet the stated goals of the project, is not considered viable when compared to the proposed project, and was not considered further.

6.7 IMPLEMENTATION AT EXISTING WELL SITES

Under this alternative, Zone 7 would concentrate new well facilities within existing wellfields, and, if feasible at existing well sites, in order to reduce potential construction related and long-term impacts associated with construction of new well facilities. Under this alternative, Zone 7

would maximize use of the Mocho and Hopyard Wellfields, and would locate new wells necessary to meet reliability goals at existing well sites.

Implementation of this alternative would result in consolidation of future well facilities with existing facilities, thereby reducing the need for well construction within other portions of the basin. Implementation of wells at existing well sites would maintain consistency of use at these existing facilities, and would intensify existing uses at each site.

Implementation of this alternative would result in concentration of well capacity, and the drawdown associated with well operations, within the Mocho and Hopyard Wellfields. However, groundwater modeling conducted for this alternative indicates that installation of additional capacity within these wellfields, and operation of wells as proposed under the Well Master Plan, would result in groundwater elevations below the historical lows within the Mocho and Hopyard Wellfields. As implementation of this alternative would not meet the stated objectives of the proposed project, and would not substantially reduce significant unavoidable impacts that cannot otherwise be mitigated, it is not considered environmentally superior to the proposed project.

6.8 REDUCED PROJECT – MINIMUM NUMBER OF WELLS TO MEET 45 MGD DROUGHT YEAR CAPACITY, 52 MGD PEAK CAPACITY

Implementation of this alternative would focus on meeting Goal 1 of Zone 7's Reliability Policy, and would implement the minimum number of wells to develop 20 mgd of additional capacity to provide a drought capacity of 45 mgd. Zone 7 wells would provide a peak capacity of 52 mgd, comprised of Zone 7's existing 25 mgd, and 27 mgd of additional peak capacity. This would provide a Valley-wide peak capacity of 73 mgd when combined with the retailer capacity of 21 mgd. This capacity would allow Zone 7 to meet its reliability goals under drought year and peak summer demands associated with buildout under the approved General Plans within its service area. The peak capacity provided by this alternative would also maintain and improve the relationship between Zone 7's current well capacity and Goal 2 of Zone 7's Reliability Policy, which establishes the goal having well capacity to meet 75% of the Valley-wide MDD. Implementation of this alternative would provide the capacity to meet 63% of the Valley-wide MDD. It is anticipated that provision of this capacity would reduce construction of 3 to 8 potential well sites, depending upon the actual production capacity provided by each individual well implemented under the Well Master Plan.

As previously discussed, Goal 2 relates primarily to emergency outage of conveyance or treatment facilities, with the intent of providing a Valley-wide well capacity capable of meeting 75% of MDD at buildout. Current Valley-wide well capacity provides for 53% of the Valley-wide MDD. Capacity provided by this alternative, which would provide adequate drought year capacity at 2020 buildout demands, would provide a Valley-wide capacity capable of meeting 62% of the Valley-wide MDD.

Implementation of the Reduced Alternative would reduce the number of wells constructed by between 3 to 8 wells, depending upon the actual production capacity of installed wells. This would avoid construction and operational impacts at 3 to 8 potential well sites. Although, potential impacts associated with well construction and operation would be reduced to a less than significant level through the implementation of mitigation measures established in Section 3.0, the reduction in the number of wells would incrementally reduce the level of impact associated with implementation of the Well Master Plan by reducing the total number of well sites. Additionally, as discussed in Section 3.1, groundwater modeling indicates that although Goal 2 of Zone 7's Reliability Criteria could be met from the Main Basin, it may not be prudent to rely solely on the Main Basin to meet 75% of the Valley-wide MDD at buildout demands. Mitigation Measure 3.1-1b, identifies the need for Zone 7 to review this issue further.

With respect to the cost of meeting this criteria, implementation of the proposed project is estimated at $34 million, with construction of individual wells estimated at $2.0 million per well. These costs do not include land acquisition costs. Based upon this estimate, implementation of this alternative would reduce program implementation costs by approximately $6 to $16 million.

Implementation of this alternative would reduce the number of total wells constructed, but would not change the timing or location of the first eight wells that would be constructed under this alternative compared to the proposed project. Zone 7 does not currently have well capacity to meet either Goal 1 or Goal 2 of its Reliability Policy, and the implementation timeframe for the first five wells would continue to be 2005 though 2009 under this alternative. Implementation of this alternative would result in construction of 2 to 3 wells between 2009 and 2020, as opposed to the 5 wells envisioned under the proposed project. During the timeframe 2008 to 2020, construction impacts associated with construction of 3 to 8 wells within the Zone 7 service area would be avoided. As implementation of this alternative would substantially meet the stated objectives of the proposed project, and would reduce the number of wells by 3 to 8 wells, thereby reducing environmental impacts and lowering the cost of program implementation it is considered equivalent to the proposed project.

CONCLUSIONS

The proposed project and alternatives present various options for meeting Zone 7's objectives regarding reliability within its service area. **Table 6-2** compares each alternative against the objectives of the project. **Table 6-3** also summarizes each alternative against other considerations. As shown in **Table 6-3**, with the exception of the proposed project and the Reduced Alternative, the alternatives examined did not meet one or more of the stated objectives of the project. The Proposed Project would meet all the project objectives, would result in the implementation of between 8 and 15 well sites, (depending upon the production capacity of wells installed) and would have an estimated cost of $34 million. The Reduced Project Alternative would meet all of the project objectives, with the exception of Goal 2 of Zone 7's Reliability Policy. Implementation of the Reduced Alternative would provide capacity to meet 63% of Valley-wide MDD, would require 3 to 8 fewer wells for implementation. Costs associated with the Reduced Alternative are estimated to be between $6 to $16 million less than the proposed project.

TABLE 6-2
ABILITY OF ALTERNATIVES TO MEET PROJECT OBJECTIVES

Project Objectives	Proposed Project 45/66 mgd	No Project	Increased Surface Water Capacity	Alternative Storage	Increased Pumpage – Existing Facilities	New Wells At Existing Well Sites	Reduced Project 45/52 mgd
Provide facilities to recover stored groundwater supplies from the Main Basin at a sufficient rate to meet Zone 7's reliability goals, as established in Resolution 02-2382.							
Goal 1. Provide 100% Reliability during average water year, single dry water year and multiple dry water years.	Yes	No	Maybe	Yes	Yes	Yes	Yes
Goal 2: Provide sufficient Valley-wide groundwater production capacity to meet at least 75% of the estimated maximum daily M&I water demand.	Yes	No	No. In-Valley Storage would be required.	Maybe. In-Valley storage site could provide.	No	Yes	No. Provides 63% Valley-wide MDD
Maintain water levels within the Main Basin above the historic lows.	Yes	Yes	Yes	Yes	No	No	Yes
Design and site proposed facilities to minimize potential interference to nearby wells during operations, to the degree feasible.	Yes	Yes. Additional wells not constructed	Yes. Additional wells not constructed	Yes	No	No	Yes. Reduces construction by 3-8 wells
Design and site proposed facilities to minimize potential effects to surrounding land uses during well development and operation, to the degree feasible.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

SOURCE: Environmental Science Associates

TABLE 6-3
EVALUATION OF PROJECT ALTERNATIVES

Alternative	Meets All Project Objectives	Maintains Water Levels Above Historical Low	Avoids Construction Impacts	Generates Other Significant Environmental Impacts
Proposed Project 45 mgd / 66 mgd	Yes	Yes	Impacts Reduced to Less than Significant by Mitigation	No
No Project	No	Yes	Yes. No new well facilities constructed	Yes. Reliability criteria not currently met.
Increased Surface Water Capacity	No	Yes	Number of constructed wells reduced	Yes. Additional storage required.
Alternative Storage	No	Yes	Number of constructed wells reduced	Yes. Effects of dam and inundation area.
Increased Pumpage – Existing Facilities	No	No	Yes. No new well facilities constructed	Yes. Historical low water levels exceeded.
Implement at Existing Well Sites	No	No	No. Impacts occur at existing facilities	Yes. Historical low water levels exceeded.
Reduced Project 45 mgd / 52 mgd	No. Provides 63% Valley-wide MDD	Yes	3 to 8 less wells required. Impacts Reduced to Less than Significant by Mitigation	No Increases ability to meet Valley-wide MDD by 10% during emergency

All impacts identified in **Chapter 3** would be reduced to a less than significant level for either alternative. Therefore, these are considered equivalent alternatives that can be implemented at the discretion of the Zone 7 Board of Directors.

REFERENCES – Analysis of Alternatives

Bookman Edmonston Engineering, Inc., *Report on Supplemental Water and Storage for South Bay Aqueduct Contractors, Phase II Study, 1992.*

Zone 7 Water Agency, *Water Supply Planning Water Demand Projection 1997 to 2020, December 1997.*

Water Transfer Associates, *Water Supply Planning Study Update*. Prepared for Zone 7 Water Agency, May 1998.

USACOE (U.S. Army Corps of Engineers), *Report on Reservoir Regulation, Del Valle Dam and Reservoir,* October 1978.

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APPENDIX A

NOTICE OF PREPARATION

ZONE 7 WATER AGENCY
WELL MASTER PLAN EIR

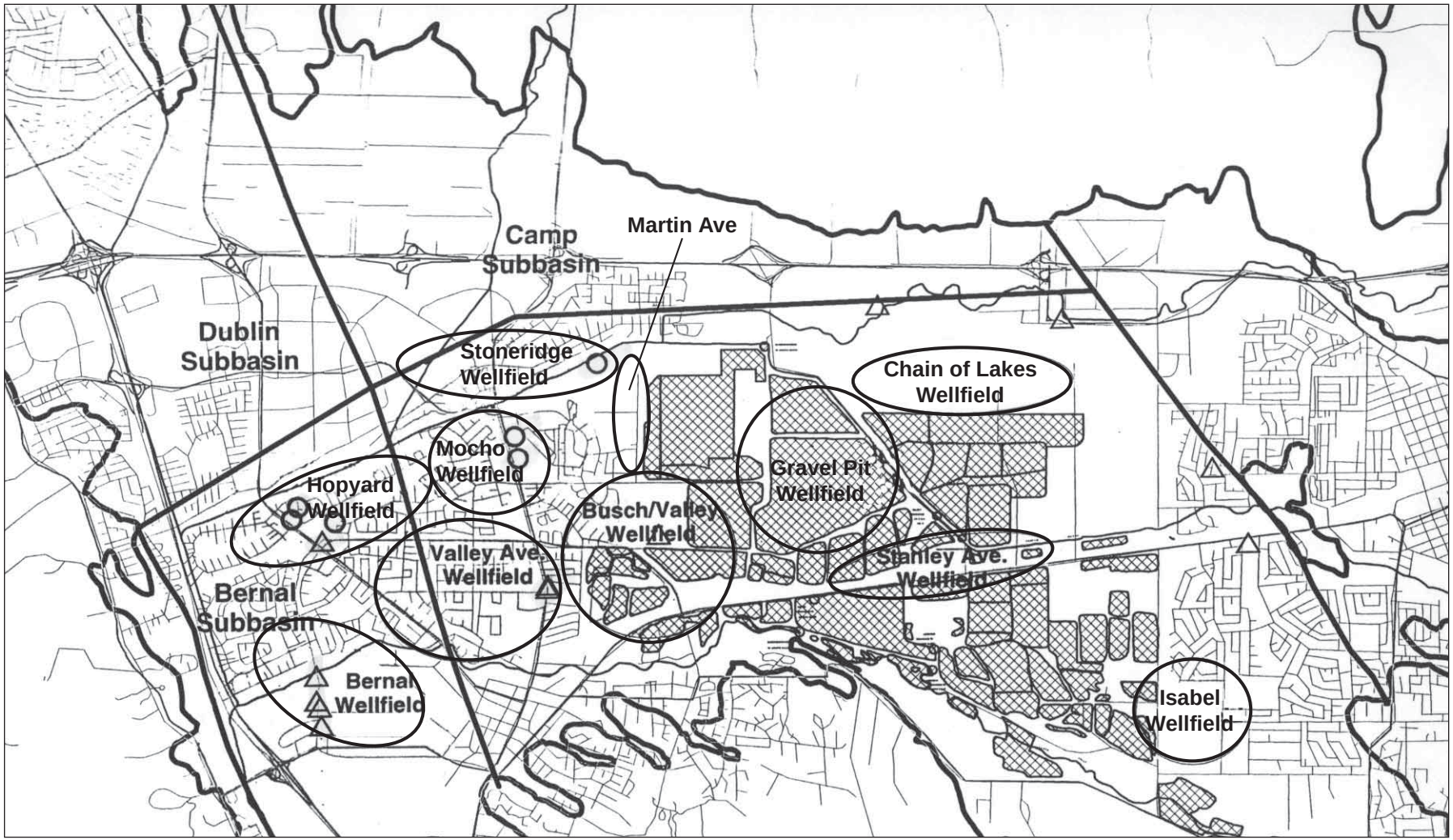
NOTICE OF PREPARATION

1.0 PROJECT LOCATION AND OVERVIEW

Zone 7 is one of the ten active zones of the Alameda County Flood Control and Water Conservation District (ACFCWD), which is a special district established by the State Legislature in 1949. Zone 7 Water Agency was established by popular vote of the residents of the Livermore-Amador Valley in 1957 under an amendment to the District Act. Zone 7 Water Agency presently serves a population of approximately 175,000 over a service area comprising 425 square miles in eastern Alameda County, California. A regional location map showing Zone 7 facilities, well locations, and future well fields is presented in **Figure 1**.

Zone 7 currently manages groundwater within the Livermore Valley through conjunctive use practices, including groundwater pumpage and subsequent recharge of imported State Water Project entitlements. The Main Basin provides approximately 240,000 acre-feet (af) of storage and is managed by Zone 7 to meet three reliability purposes: a) groundwater storage is used to meet peak day summer demands, with subsequent recharge during winter months; b) groundwater storage provides drought year reliability in dry years when State Water Project deliveries are reduced; and c) groundwater storage provides emergency supplies in the event of an outage to the South Bay Aqueduct. As water demands within its service area increase over the next 15 years, an additional 39 mgd of well production capacity would be necessary to meet these three water supply and reliability uses. This would require between 10 and 15 new production wells. Additionally, groundwater levels within the Main Basin would have greater fluctuation from year to year, as Zone 7 continues conjunctive use practices within the context of increasing demands within its service area. Therefore, Zone 7 is developing the Well Master Plan to identify well facilities and groundwater management operations necessary to meet its current reliability goals under projected future demands associated with buildout of the adopted General Plans within its service area.

In compliance with Section 15000 of the *CEQA Guidelines*, Zone 7 would be the lead agency for preparation and circulation of a Draft EIR to examine potential impacts associated with the implementation of the Well Master Plan. This examination would include the identification of mitigation strategies to reduce potential impacts to a less than significant level, to the degree feasible. Zone 7 intends to utilize this EIR to complete the public review process required under CEQA, and to present findings to the Zone 7 Board of Directors for consideration and approval of the Well Master Plan. As such, Zone 7 intends to implement the Well Master Plan, including individual well facilities, using the analysis and mitigation measures identified in this EIR.



SOURCE: CH2M Hill

Figure 1
Wellfield Locations

2.0 PROJECT BACKGROUND

Zone 7 Groundwater Management

Zone 7 wholesales treated water to retail contractors for municipal and industrial (M&I) domestic use, and supplies untreated water for irrigation to vintners, golf courses, and others in parts of the Livermore-Amador Valley. Retail contractors include the City of Pleasanton, the City of Livermore, the Dublin San Ramon Services District (DSRSD) and the California Water Services (CWS) Company.

Zone 7 currently manages groundwater levels within the Main Basin of the Livermore-Amador Valley through annual conjunctive use practices. During non-drought periods, Zone 7's operational practice is to keep the Main Basin essentially full, seasonally using approximately 15,000 to 20,000 af of storage capacity (including retailer contractor groundwater pumpage). This practice has the objective of preserving up to 240,000 af of groundwater in storage to provide peaking, drought year, and emergency storage. In this groundwater management role, Zone 7 has entered into water supply agreements with its retailers that include provisions limiting annual pumpage by these agencies to a total of 7,201 acre feet per annum (afa), broken down as follows: City of Pleasanton, 3,500 afa; Dublin San Ramon Services District, 645 afa; and California Water Services, 3,069 afa.

Additionally, groundwater levels are also maintained in accordance with agreements with gravel mining operations within the Chain of Lakes area. Through Zone 7's conjunctive use management, groundwater levels within the Main Basin have been restored from historical overdraft conditions that occurred in the 1960's, when only approximately 126,000 af of groundwater were left in storage in the Main Groundwater Basin. This 126,000 af storage level corresponds to groundwater levels identified by Zone 7 as the "historic low" and provides the foundation for Zone 7's current operational policy, which is to maintain groundwater levels above historic lows.

Zone 7 implements conjunctive use on an annual basis through extractions from seven existing wells, with subsequent artificial recharge of the groundwater basin through releases of imported State Water Project supplies to Arroyo Mocho and Arroyo Del Valle from the South Bay Aqueduct. Existing Zone 7 well locations are shown in **Figure 1.** The current Valley-wide municipal well capacity is approximately 53 mgd, which includes both Zone 7 capacity (32 mgd) and Retailer Agency (21 mgd) well production capacity. Zone 7's current well capacity of 32 mgd, provides a monthly production capacity of approximately 2,950 acre feet.

Zone 7's treated water deliveries in 2000 totaled 35,800 af, of which 7,150, or 20 percent was groundwater pumpage. Zone 7 has recharged 8,600 af of water released to the local creeks from the South Bay Aqueduct. Total retailer groundwater pumpage was 6,780 af. Based upon the adopted General Plans within the Zone 7 Service Area, treated water demands are projected to increase to 68,960 afa by 2020. As demands increase over time, Zone 7 would need additional well capacity to provide the operational flexibility to meet this projected demand within the

context of its reliability goals. A discussion of these reliability goals is presented in the section below.

Zone 7 Reliability Goals

Increasing treated water (M&I) demands, reliability policies, and chosen salt management strategies have dictated the need for expansion of Zone 7's groundwater production facilities. Existing Zone 7 reliability goals relating to groundwater management include the following:

1) **Meet 100% of Future Demands.** Zone 7's current operational policy is to meet 100% of future demands within its service area under all projected hydrologic conditions. Zone 7 examined future demands under the adopted General Plans of the jurisdictions within Zone 7's service area in the Water Supply Planning Program – Program EIR (SCH No. 98041040). Buildout demands within the Valley wide area for the year 2020 are estimated at 100,300 afa, of which approximately 69,000 af is treated water (M&I) demand and 31,300 af is untreated water demand. The untreated amount over 8,400 af is considered speculative. Zone 7 has no current intent to acquire supplies for this additional untreated demand.

2) **Maintain Drought Year Reliability.** Zone 7's planning criteria are to maintain reliability during any "credible worst-case drought" scenario of historic record, when deliveries from the State Water Project, via the South Bay Aqueduct, are substantially reduced. Zone 7's planning criteria for drought year reliability is based upon the historical hydrologic conditions and planning data utilized by the Department of Water Resources, and includes both the worst single drought year of record (1977) and the worst multi-year drought of record (6-year drought, 1987 to 1992). Zone 7 would continue to use groundwater supplies to meet future drought year demands. For example, if 1977 hydrologic conditions were to occur in 2020 (and given the current sustainable water supply and untreated water demand) Zone 7 would have to pump approximately 70 mgd to meet the projected demand of the M&I customers. These groundwater supplies would be recharged with imported SWP supplies in subsequent normal and wet years to maintain basin groundwater storage, consistent with Zone 7's current conjunctive use practices.

2) **Maintain 75 % "Maximum-Day Demand" Capacity**. In addition to drought reliability, Zone 7's current reliability goal is have enough Valley-wide groundwater production capacity to meet 75% of the Valley's M&I maximum day demand from the groundwater basin. This reliability goal allows Zone 7 and its retailers to meet 75% of the maximum daily demand with local groundwater supplies in the event of an operational or emergency outage of the South Bay Aqueduct. The estimated"75% maximum-day" Zone 7 production capacity necessary to meet 2002 demands is approximately 42 mgd. As previously discussed, Zone 7's current production capacity is 32 mgd, or approximately 10 mgd behind this reliability goal.

   Peak day production capacity necessary to meet this reliability goal would increase proportionally with "total" municipal demand through 2020, when it is expected to be as high

as 92 mgd. Between now and 2020, approximately 38 mgd of additional groundwater production capacity would be necessary to meet the current reliability goal of 75% Maximum Day Demand capacity under projected 2020 demands. A summary of Valley-wide well capacity available to Zone 7 and its retailers, and project well capacity requirements to meet 75% Maximum Day Demand in 2020 is provided in **Table 1**, below.

TABLE 1. ZONE 7 AND RETAILER WELL CAPACITY RELATIVE TO 75% MAXIMUM DAY DEMAND OBJECTIVE

	Zone 7	Retailers	Total
Current Well Capacity(1)	32 mgd	21 mgd	53 mgd
75% Maximum Day Demand, 2002	42 mgd	21 mgd	63 mgd
Current Capacity Shortfall-75% Maximum Day Reliability Objective	10 mgd	0 mgd	10 mgd
Projected 2020 75% Maximum Day Demand	71 mgd	21 mgd	92 mgd
Increase over Existing Well Capacity	39 mgd	0 mgd	39 mgd

In addition to these reliability goals, Zone 7 has adopted salt management strategies as part of its Salt Management Program. As one of the chosen salt management strategies, Zone 7 has increased the volume of groundwater in its treated water deliveries to 20% of the total treated water demand, with an ultimate target of 25% under normal operational conditions. This would assist Zone 7 in meeting its long-term salt management goal of stabilizing salt buildup within the Main Basin. Accordingly, the average annual Zone 7 groundwater production may increase from its current level of approximately 8,300 afa to approximately 15,500 afa by the year 2020.

Another salt management strategy, groundwater or "wellhead" de-mineralization, may involve the construction of additional well facilities. Currently, project alternatives for wellhead demineralization are under development by Zone 7, and have not been developed to a level of detail appropriate for analysis. In the event these facilities are developed for implementation, Zone 7 would conduct separate environmental analysis for this salt management strategy. For the purposes of the Well Master Plan, groundwater pumpage associated with wellhead demineralization would be considered in the analysis of long-term groundwater operations, in order to address potential cumulative effects to groundwater associated with operation of future demineralization facilities, if they are implemented.

3.0 PROJECT DESCRIPTION

3.1 WELL FIELD LOCATIONS

In order to provide appropriate well capacity to meet its current reliability goals, Zone 7 proposes to increase its well production capacity by 39 mgd through the installation of 10 to 15 new production wells within the Main Basin of the Livermore Valley. Proposed facilities would be

located within up to 11 potential wellfields identified within the Well Master Plan. The eleven identified wellfields are located in the Cities of Pleasanton, Livermore, or within unincorporated lands of Alameda County. Wellfields identified include: Mocho, Bernal, Busch-Valley, Hopyard, Valley Avenue, Martin Avenue, Stanley Boulevard, Stoneridge, Gravel pits, Chain of Lakes and Isabel. **Figure 1** shows the wellfield locations. Land uses within these wellfield areas include residential, commercial, industrial, and open space areas. Wellfields have been identified in the Well Master Plan based upon a hydrogeologic evaluation, aquifer transmissivity, and groundwater quality factors.

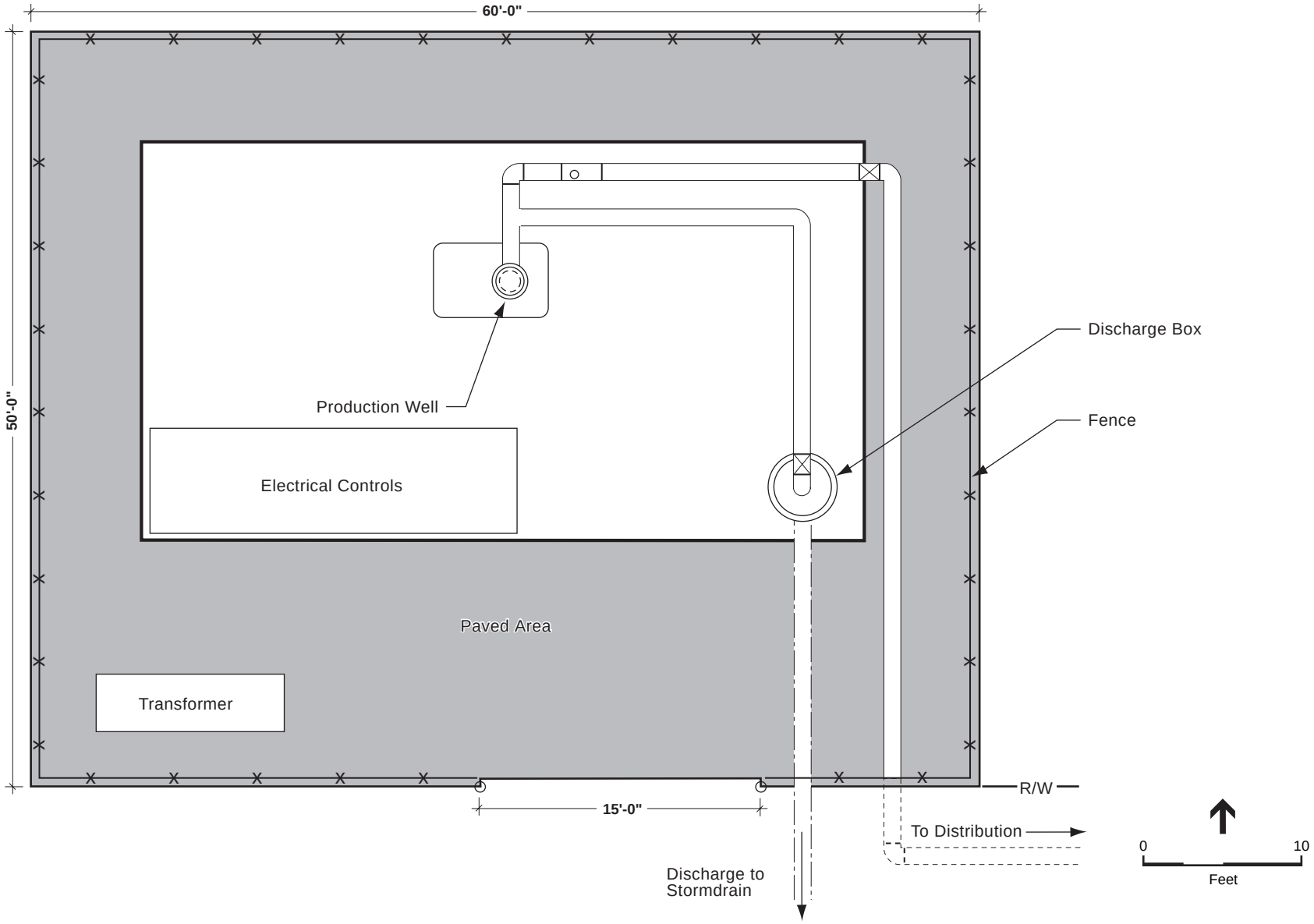
3.2 WELL SITE IMPLEMENTATION

As water demands increase over time within the Zone 7 service area, Zone 7 would implement individual well sites at properties within the identified well fields. Based upon projected demands, it is anticipated that wells would be installed over a period of approximately twenty years, with an average of one or two wells being constructed per year. Individual well sites would be selected based upon the following criteria:

- hydrogeologic conditions,
- proximity to existing Zone 7 distribution facilities,
- proximity to existing utilities,
- site conditions/property ownership,
- land acquisition costs.

Well sites would be consistent with existing Zone 7 well sites, and would include Single Well Site and Treatment Well Site configurations. Proposed facilities would be designed to be consistent with surrounding land uses and sized to meet available aquifer capacity within specific well fields. Zone 7 intends to acquire property for implementation of well sites through purchase on a willing seller basis, to the extent feasible. However, as a pubic agency, Zone 7 may also acquire property through its power of eminent domain, if necessary. A brief description of well site configurations is provided below.

Single Well Site: Single well sites would consist of an up to 100-foot by 100-foot site, or approximately 0.23 acres, and would include a well house and discharge structure, asphalt paved entry and parking areas, and security fencing and lighting. The well house would consist of an up to 40-foot by 20-foot well house, and a 15- foot by 15-foot ancillary building containing the discharge structure. The well house, consisting of a single-story building (less than 15 feet tall) would be constructed of materials that would be non-glare and noise attenuating. The well house would contain the well, pump, motor and electrical control panels. The discharge structure, tied to the local storm drain system, would be enclosed within a 15- by 15-foot building constructed of the same non-glare and noise attenuating material. Each well site would be equipped with an up to 700 horsepower (hp) pump motor. Final site specifications may vary based upon site configuration and available area, but would be within the parameters discussed above. **Figure 2** shows the layout of a typical well site.



SOURCE: Luhdorff & Scalmanini Consulting Engineers, ESA 2002

Figure 2

Conceptual Layout of Typical Well Facility

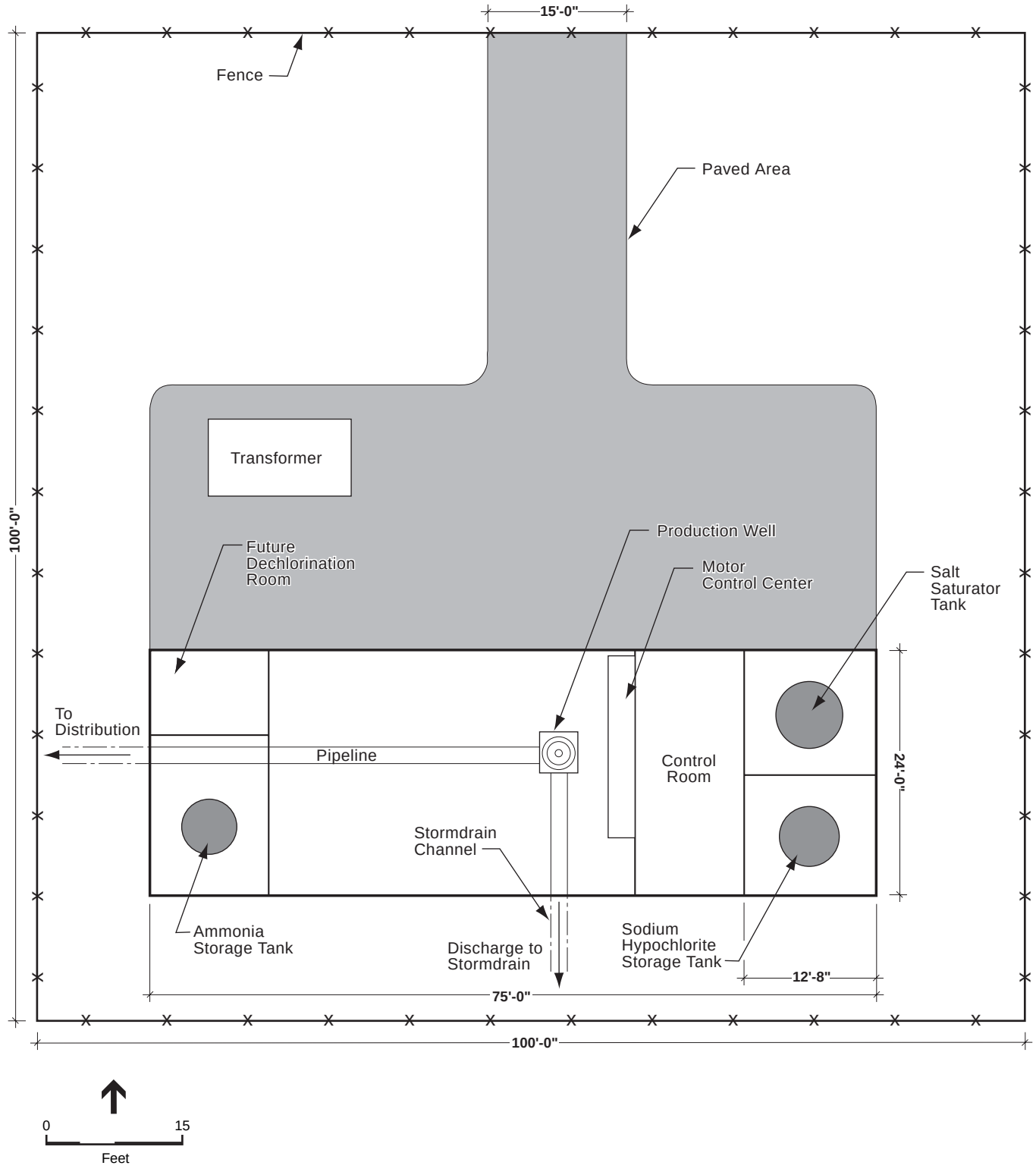
Treatment Well Site. It is anticipated that one treatment well site would be implemented within each well field, and would provide treatment facilities for other single well sites within that well field. This would provide for consolidation of treatment facilities, and would reduce the facility of single well sites. Treatment well sites would include slightly larger facilities within the same 100-foot by 100 foot site, and would include both an onsite well and onsite chemical disinfection systems to treat water generated at other well sites. This would consist of a self-generating chloramine disinfection system that combined salt ammonium hydroxide and sodium hypochlorite (household bleach) to generate a 1 percent chloramine solution commonly used in wellhead treatment. A chemical feed system would then introduce this to produced groundwater supplies prior to distribution. Site dimensions would be up to 100 feet by 100 feet, with proposed facilities housed in a 75 foot by 25 foot single-story structure less than 15 feet tall. The structure would be constructed of split-faced cinder block, masonry block or other suitable materials that would be non-glare and noise attenuating. The well house would contain the well, pump motor and electrical control panels. Separate self contained storage for ammonia, salt saturation, and sodium hypochlorite would be provided. Facility dimensions may be altered based upon final site configuration and available area, but would be within the parameters identified. **Figure 3** shows a typical layout for a treatment well site.

Ancillary facilities applicable to both configurations would include a 20-foot-wide, asphalt access road and up to 12,000 feet of new pipeline to connect individual wells to either a treatment facility for disinfection, or the Zone 7 transmission system. In most cases, this pipeline distance would be shorter as well sites would be located in proximity to Zone 7 facilities to the degree feasible. For the purpose of this analysis, up to 6,000 feet of 15- to 24-inch water pipeline is assumed for connection to appropriate facilities. Up to 6,000 feet of 15- to 18-inch pipeline would connect each well site to the existing storm drain system for discharge of startup water and periodic backflushing. In addition, each well site would be connected to local sanitary sewers to facilitate minor wastewater discharges. Consistent with current Zone 7 operations, all discharges would be in compliance with permit requirements of the NPDES, or where applicable, discharge requirements of the local sanitary district.

3.3 WELL CONSTRUCTION

Construction activities would require initial clearing and grading of at each site to accommodate excavation and staging activities. An excavation of up to 100 feet- by 100 feet would be necessary to accommodate the well house and discharge structure at each location. The excavation depths would be on the order of 3 to 5 feet for installation of slab on grade structures. Grading would also include installation of access road to the well facility at roadway grade.

For installation of the wells, a drill rig would be used for drilling of the bore hole and installation of the well casing. It is anticipated that well development would require 24-hour drilling for up to four weeks in duration; although actual installation time could be reduced depending upon geologic conditions. This 24-hour construction schedule is required in order to avoid borehole



SOURCE: Zone 7 Water Agency, 2002

Figure 3
Conceptual Layout of Typical Well Facility with Treatment

collapse during well installation and to minimize formation damage during well drilling operations. Where appropriate due to proximity to residences, well drilling activities would include installation of engineered soundwalls to reduce construction noise. Well casings would be perforated within the saturated zone, but would be unperforated elsewhere to prevent cross-communication of water between aquifers. The well casing-formation annulus would be grouted to a depth of 50-feet below ground surface to provide a sanitary seal, in accordance with Department of Health Services (DHS) requirements. Installation of proposed wells would include the following:

- Mobilization of drill rig;
- Drilling of borehole, geophysical logging, installation of well, and initial well development;
- Demobilization of drill rig, mobilization of pump rig for completion of well development;
- Pumping development;
- Demobilization of pump rig;
- Installation of pump/motor
- Installation of ancillary facilities and completion of well house structure

Equipment and vehicle staging would be accommodated at the site of construction, therefore increasing the total area of disturbance. Staging would avoid sensitive areas such as riparian or other habitat. All disturbed areas caused by construction activities would be restored to pre-construction condition.

Pipeline installation would require open trench construction. Estimated trench width and depth are up to 5 feet in width and 5 to 10 feet deep, depending upon final route conditions and utility conflicts. Pipeline installation would occur generally within public right-of-way and existing roadways. Depending on the location of the well sites, pipeline installation may require temporary closure of one-lane of traffic during pipeline installation. Fencing or flagging, and appropriate signage would be installed to minimize potential safety hazards for vehicular and pedestrian traffic.

It is estimated that the up to 10 truck deliveries per day and 25 one-way worker-trips would occur per day as a result of construction at each well. Staging would occur at each well site, for storing equipment and stockpiling material. Construction equipment required include flat bed truck, boom truck, generator, sand shaker, drill rig, water truck, baker tanks, and other construction equipment.

Construction Schedule

Construction of the well facility would take approximately 12 months per site. Activities include drilling and installation of well casing, well screen, and gravel packs, which would require 24 hour construction for a period of two to four weeks per site depending upon geologic conditions at the site. As previously noted, continuous 24-hour construction activities are required to minimize borehole collapse and maximize production capacity of the well by reducing formation damage during well drilling operations. In addition, well testing may require 24-hour pumping subsequent to drilling activities.

3.4 OPERATIONAL SCENARIOS TO BE EXAMINED

Zone 7 groundwater management would continue to utilize conjunctive use practices, consistent with current operations. However, as demands increase over time, increased use of the groundwater basin to meet Zone 7's current reliability goals would be necessary. The Well Master Plan examined the following operational scenarios to identify potential effects on the groundwater basin.

Average Year – Peak Day Demands

During an average hydrologic year, Zone 7 would supplement deliveries from the South Bay Aqueduct with groundwater to meet peak day seasonal demands. This is consistent with Zone 7's current practices. However, groundwater production would increase to meet increased peak demands as development within the Zone 7 service area occurs.

Drought Year Demands

During dry hydrologic year, deliveries from the South Bay Aqueduct would be reduced. Zone 7 would rely on groundwater supplies to meet demands during dry years. Based on DWR's and Zone 7's projections of the "credible worse-case single-year drought conditions, similar to that of 1977, DWR estimates that deliveries would be as low as 11% of Zone 7's entitlements. Therefore, groundwater would be utilized to supplement this "worse-case" scenario.

Six-Year Drought Scenario

DWR planning criteria utilizes the 1922–1998 period to determine drought year demands and deliveries. Consequently, Zone 7 has determined the "credible worst-case multi-year drought" scenario to be the six-year drought represented by 1987 to 1992 hydrologic conditions. Zone 7 would rely on groundwater supplies to supplement reduced State Water Project deliveries during these conditions. Groundwater supplies would then be restored through increased recharge in subsequent "wet" years.

75% Maximum Day Demand

In the event of an operational or emergency outage of the South Bay Aqueduct or Zone 7 water treatment plants, Zone 7 would supplement deliveries with groundwater production. This scenario would examine Zone 7's use of the groundwater basin to meet 75% of the maximum peak day demand under buildout demands.

4.0 ENVIRONMENTAL ISSUES TO BE EXAMINED

Zone 7 is preparing a project-level EIR in accordance with CEQA (Guidelines §§15161), which states that a project EIR "focus[es] primarily on the changes in the environment that would result from the project," and examines "all phases of the project including planning, construction, and operation." Implementation of the Well Master Plan could result in potential environmental impacts within the service areas of Zone 7, including region-wide effects on groundwater

resources and site specific effects on surrounding land uses. Based on previous environmental analysis conducted for similar well sites, Zone 7 has identified potential environmental issues. Environmental impact areas that would be examined in the EIR include the following:

- groundwater hydrology and water quality;
- visual character of the site and surrounding areas;
- land use impacts from noise generation, traffic congestion, and air pollutant emissions;
- construction impacts;
- biological resources;
- geology and soils;
- hazards and hazardous materials;
- public services and utilities; and
- cultural resources.

Growth inducement potential and the associated secondary effects of growth have been evaluated in the Water Supply Planning Program- Program EIR, certified on January 21, 1999. The additional wells needed for improved conjunctive use efficiency and reliability were recognized in the WSPP EIR, which included discussion of the Well Master Plan and identified Zone 7's long-term need for 10 to 15 additional wells. The WSPP EIR identified the need for additional project-specific planning and CEQA review for the additional wells. The analysis in the WSPP EIR include the effects associated with acquisition of water supply to meet 2020 demands and the Zone 7 Board of Directors adopted a Statement of Overriding Considerations associated with potential effects relating to development under the adopted General Plans within the Zone 7 service area. Conjunctive use operations do not provide Zone 7 with an additional water supply. Rather, they allow Zone 7 to effectively manage surface water and groundwater resources to meet demands within the context of their current reliability and water quality goals. As such, implementation of the Well Master Plan relates to the reliability of water supplies, and does not provide a new water supply that could affect the rate, location, or timing of growth within the Zone 7 service area.

APPENDIX B

COMMENTS RECEIVED DURING NOP CIRCULATION

State of California—Health and Human Services Agency
Department of Health Services

California Department of Health Services
DIANA M. BONTÁ, R.N., Dr. P.H.
Director

GRAY DAVIS
Governor

April 26, 2002

RECEIVED
MAY 0 2 2002

Matt Katen
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588

Dear Mr. Katen:

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT (EIR) FOR ZONE 7 WATER AGENCY/ZONE 7 WELL MASTER PLAN - SYSTEM NO. 0110010 (SCH# 2002032163)

Thank you for the opportunity to review the above document. The Department of Health Services, Division of Drinking Water and Environmental Management (DHS) is responsible for water supply permits administered under the Safe Drinking Water Program. If Zone 7 Water Agency plans to increase its well production capacity by 39 mgd through the installation of 10 to 15 new production wells within the Main Basin of the Livermore Valley in order to provide appropriate well capacity to meet its current reliability goals, DHS may need to amend the current permit or provide a new water supply permit. Accordingly, DHS would be a responsible agency pursuant to CEQA and may need to consider an environmental document when deciding whether to permit the new facility. Therefore, we request that you send us a copy of the draft Environmental Impact Report when it becomes available. Please contact Cliff Bowen, of the San Francisco District Office at (510) 540-2158 if you have any questions regarding permits, permit applications or permit amendments.

Please call me at (916) 445-4287 if you have any questions regarding our environmental review of this project.

Sincerely,

Chris Stewart
Environmental Review Unit

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Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

April 25, 2002

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APR 26 2002

Matt Katen
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588

Dear Mr. Katen:

The Department of Toxic Substances Control (DTSC) has reviewed the "Notice of Preparation for Zone 7 Water Agency Well Master Plan (SCH# 2002032163)", dated March 28, 2002.

It is our understanding that the Zone 7 Water Agency is proposing to install 10 to 15 new production wells over the next 20 years within the Main Basin of the Livermore Valley. We have the following comments:

1. Please provide a regional map, showing the surrounding cities including Livermore, in relation to the wellfield locations.

2. The Lawrence Livermore National Laboratory (LLNL) is the National Priority List site and the environmental restoration program is currently in progress. Potential impacts of LLNL site on your proposed water project should be discussed, if any.

3. Any potential site hazard and contamination issues should be discussed for the selected new well locations. Also, what are the depths of the new proposed wells?

If you have any questions, please call Ted Park of my staff at (510) 540-3805.

Sincerely,

Barbara J. Cook, P.E., Chief
Northern California-Coastal
Cleanup Operations Branch

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov.

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THE CITY OF

PLEASANTON.

April 29, 2002

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MAY 0 1 2002

Mr. Matt Katen
Project Engineer
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588-5127

SUBJECT: Zone 7 Well Master Plan Notice of Preparation (NOP) for an Environmental Impact Report (EIR).

Dear Mr. Katen:

Thank you for the opportunity to review and comment on Zone 7's NOP for its Well Master Plan, dated March 28, 2002. We have a number of comments, concerns, and issues which, we believe, need to be addressed within the EIR.

We believe the environmental questions and issues presented below need to be resolved before Zone 7 constructs new wells in the Main Basin. The following are the City of Pleasanton's comments separated into major environmental subject categories appropriate to the project:

Land Use Impacts and Issues:

1. While the wellfield areas are identified on the NOP map, the locations are not specifically defined. It is impossible to identify specific land use impacts until more specific locations are identified. If the EIR is going to be a project level EIR, it should identify one, two or more specific parcels, if possible, within the areas where these wells may be located so that specific land use impacts can be addressed. If this is not possible, it appears that the current wellfield area approach can only be considered a program level EIR, with site-specific analysis needed once each individual well field site is identified.

2. The City has major concerns regarding the construction, design, noise and traffic impacts of wells located in or near residential areas. For example, the NOP states that the construction will require 24-hour drilling and other activities. Depending on the distance to sensitive areas, this could be a significant impact that must be mitigated. The EIR should include a noise analysis addressing the impacts and contributors to noise generation and recommend mitigation measures for those well sites adjacent to sensitive areas such as residential neighborhoods. Alternatives to 24-hour drilling should be explored, or mitigation measures devised for nearby residents if the 24-hour drilling is required.

3. Property owners/residents within and adjacent to these wellfield areas or specific parcels (if identified) should be notified early on in the environmental process and given an opportunity to comment. This may include the need to receive a copy of the NOP prior to preparation of the Draft EIR.

4. Conditional use permit and design review approvals by the City are required for each of these facilities before they are built.

5. The well facilities should be attractively designed and include landscaping on the site. All new equipment outside of a building should be effectively screened. The specific wellsite location should also include compliance with the Americans with Disabilities Act for sidewalk blockage by trucks during construction activities as well as mitigation for commercial driveway widths following construction.

6. Any hazardous materials delivered, stored or used within the wellfield areas or at any of the individual wellfield locations within the cities of Livermore and Pleasanton should be identified and reviewed to assure compliance with the hazardous material requirements of the Livermore/Pleasanton Fire Department.

7. The proposed facilities will fall into the threshold of projects requiring stormwater Best Management Practices. Detention or retention of stormwater runoff from these sites most likely will be required.

8. Construction of the proposed wells will most likely require hauling of native materials off-site. Designated haul routes must be obtained from the City of Pleasanton.

9. Stormwater runoff into existing or proposed City owned storm drainage systems will require calculations that assure the existing storm drainage system has adequate capacity for both the proposed facilities and buildout conditions within each stormwater system drainage boundary. The storm drainage runoff calculations, including the capacity of each system to handle the flows from well development during construction, startup, and operation, must be reviewed and verified.

10. Similarly, portions of the City's sanitary sewer system in some of the proposed wellfield areas flow to sewer pumping stations. The capacity of these pumping stations, or our gravity sewer systems to handle the sanitary flows from these wellfield areas, must be reviewed and verified. Water quality standards for flowing into the City's sanitary sewer system must also meet the City's Municipal Code wastewater limits.

11. When the actual well sites are determined within the City, we believe that it will be necessary to access the wells both during construction and ultimate operation from roads other than major arterial or collector streets. Many of the roads within the wellfield areas shown in the NOP in Pleasanton are major thoroughfares for the City and have high traffic volumes and speed limits. We would discourage access off of these streets and recommend designs that minimize or eliminate access on major thoroughfares.

12. Without a clear definition of the exact well sites within the City, it is difficult to address what potentially significant impacts the project will have on several public services. For example, construction and operations activities may have significant traffic impacts that can only be addressed in general terms for the wellfield areas identified in the NOP. Similarly, other site-specific public service issues can only be addressed with specific well sites. Hence, we would suggest some consideration for identifying specific parcels within the wellfield areas that may be considered a well site so that these can be commented on by the City in the draft EIR.

13. It is difficult to determine, once again, within the wellfield areas, what cultural or aesthetic factors may be impacted.

Delivered Water Quality Differences & Impacts

As noted in the City's past written comments to Zone 7 concerning; previous well construction projects, the Salt Management Plan (SMP), and our comments to Zone 7's EIR for its Water Supply Planning Program, further groundwater pumping by Zone 7 creates water quality degradation to those retailers receiving this groundwater on the west side of Zone 7's treated water delivery system.

Just after the 1987-1992 drought, and as part of the SMP, Zone 7 changed its historical policy on the use of the local groundwater basin. The change was from use of the basin to augment peak summer demands to use of the basin for salt management mitigation, an annual conjunctive use supply, and for drought or emergency conditions. This change has been documented in the Zone's recent Salt Management Plan (SMP), water supply planning and connection fee program documents. The current proposal, increasing groundwater use with 10 to 15 new groundwater production wells, pumping a potential 39 million gallons per day additional water into its treated water system, will further exacerbate the difference in water quality between the east and west sides.

In the most recent correspondence in this issue, Zone 7's water supply planning program, the City again expressed in writing the concern regarding the further degradation in delivered water quality as a result of Zone 7 pumping additional groundwater. Those concerns, the Zone responded that mitigation to this water quality degradation was to come about from the use of aquifer storage and recovery wells (ASR).

It is our understanding that the ASR well program is no longer being proposed or pursued by Zone 7. Hence, there is no present day mitigation of the water quality degradation that occurs on the west side from Zone 7 pumping additional water from the basin for salt management, increased conjunctive use, meeting peak summer demands, or meeting the stated reliability goals as part of the Well Master Plan (WMP). As a result, mitigation for the following issues should be included in the WMP EIR:

1. Zone 7 states within the NOP, that due to the Salt Management Program (SMP), it has increased its volume of groundwater in its treated water deliveries to 20% of the total treated water demand, with the ultimate target of 25% under normal operating conditions. The recommended and adopted mitigation for the SMP regarding delivered water quality degradation, was to come from wellhead demineralization. This mitigation is currently not in place; despite the fact that Zone 7 has been pumping additional groundwater to mitigate salts for the SMP for approximately the past three years.

   If the same wells being used for the SMP are being used to meet the reliability goals of the WMP (as we understand they are), mitigation for delivered water quality degradation must be included as part of this EIR. If the additional wells in the WMP are only needed to meet Zone 7's reliability goals, the delivered water quality impacts, as a result of pumping these wells during any period to meet the stated three reliability goals, must be mitigated.

2. Any additional pumping of the Main Basin from facilities built for the WMP will add to the unmitigated water quality differences between the west and east side noted above. We believe the EIR must adequately address and identify implementable, long-term projects to mitigate the current groundwater pumping by Zone 7 (since the ASR wells are not mitigating this issue) as well as additional projects to mitigate the water quality degradation from the proposed WMP project wells.

   We understand that the only mitigation currently being pursued for the past and proposed future pumping by Zone 7 to this issue appears to be wellhead demineralization. Hence, the facility maps within the WMP's NOP should include wellhead demineralization facilities as part of the treatment scheme and space on the wellfield sites.

3. Contrary to statements within the NOP, we believe the project alternatives for wellhead demineralization have been adequately developed as part of Zone 7's SMP and Wellhead Demineralization Projects, to a level of detail appropriate for analysis within the WMP EIR as mitigation for delivered water quality differences.

Groundwater Interference and Quality Changes:

1. In is not clear whether the WMP EIR is going to analyze the short and long-term basin hydraulic impacts during the periods of use of these wells. As part of the EIR, we believe Zone 7 should include more than just region-wide effects of the increased pumping on the basin in a project level EIR. The groundwater hydraulic and water quality impacts to other private and public groundwater wells must be part of the environmental impacts studied in this EIR. As an example, will this additional emergency use of the groundwater basin cause more inflow from the fringe basins and thus aggravate the existing salt balance problem? If so, where and what are the impacts?

   After the environmental effects of pumping these additional wells are assessed, it seems that additional modeling (on both the basin and treated water quality deliveries) must also be performed in order to ascertain the cumulative impacts of Zone 7 pumping for salt management plan mitigation, conjunctive use, and emergency/drought use.

2. The EIR should also address the individual and cumulative pumping interference impacts of pumping the new wells proposed in the WMP on existing public and private wells. Specifically, the EIR should analyze both the short-term, instantaneous mutual pumping influences that would result from pumping one or more of these new wells, together with Zone 7's seven existing wells, on other private and public groundwater pumping wells. To illustrate our concern, the City's existing wells suffer adverse short and long-term influences from Zone 7's current groundwater extraction is from their existing wells in the Stoneridge, Mocho and Hopyard wellfields. These influences reduce the yield and specific capacity of these existing wells. A thorough analysis must be performed as part of the EIR to properly assess these environmental impacts, including engineering and modeling data to verify what the impacts of pumping each and all of the wells will be on the city's three operating and one standby well. This analysis should include both daily, peak summer period, and annual scenarios, in addition to the operational scenarios described within the NOP.

3. The city's three existing and one standby well are located within the wellfield areas identified in the NOP. We are concerned how the City wells' water quality will be impacted through the significant extraction rates that are being proposed as part of the WMP wells. The EIR must address and provide mitigation for any groundwater quality degradation to the City. In the case of City Well No. 8, the city specifically selected the well location based upon water quality criteria. We have the same concerns with respect to extraction from the WPP wells impacting City's Well Nos. 5, 6 and 7.

Thank you for the opportunity to comment on the subject NOP document. We look forward to reviewing the requested information, analysis and mitigation plans within the EIR to address these concerns prior to the Zone 7 Board approval of the Well Master Plan EIR or construction of new wells. If you have any questions on these comments, please don't hesitate to contact me.

Yours very truly,

Stephen S. Cusenza
Utility Planning Manager

M:\Steve\Zone 7 Well MP NOP Comments.doc

.c: Randall A. Lum, Director of Public Works
Michael Roush, City Attorney
Brian Swift, Director of Planning and Community Services
Abbas Masjedi, Utility Engineer
Dale Myers, General Manager, Zone 7
Ed Cummings, Asst. General Manager, Zone 7

CITY OF LIVERMORE

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ermore, CA 94550-4899
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Fax: (925) 373-5135
TDD (925) 373-5052

MAYOR / COUNCIL
373-5149

CITY MANAGER
373-5140 • Fax: 373-5061

CITY ATTORNEY
: 373-5120 • Fax: 373-5125

CITY CLERK
: 373 5130 • Fax: 373 5135

COMMUNITY DEVELOPMENT
Building Division
: 373-5180 • Fax: 373-5183
Engineering Division
: 373-5240 • Fax: 373-5267
Housing Division
h: 373-5200 • Fax: 373-5318
Planning Division
h: 373-5200 • Fax: 373-5318

ECONOMIC DEVELOPMENT
h: 373 5095 • Fax: 454-2379

FINANCE DEPARTMENT
h: 373-5150 • Fax: 373-5165

FIRE DEPARTMENT
4550 East Avenue
h: 454-2361 • Fax: 454-2367

LIBRARY
1000 S. Livermore Avenue
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PERSONNEL
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POLICE DEPARTMENT
1110 S. Livermore Avenue
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PUBLIC SERVICES
3500 Robertson Park Rd.
h: 373-5270 • Fax: 373-5317
Airport Division
636 Terminal Circle
h: 373-5280 • Fax: 373-5042
Golf Course Division
909 Clubhouse Drive
h: 373-5239 • Fax: 373-5208
Maintenance Division
3500 Robertson Park Rd.
h: 373-5220 • Fax: 373-5033
Water Resources Division
101 W. Jack London Blvd.
h: 373-5230 • Fax: 373-5295

May 1, 2002

Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588-5127

Attn: Matt Katen

RE: Notice of Preparation Well Master Plan Environmental Impact Report

Dear Mr. Katen,

City of Livermore staff has reviewed the Notice of Preparation (NOP) for the Zone 7 Well Master Plan Environmental Impact Report (EIR). Based on the limited information provided in the NOP, the City submits the following general comments:

The Draft EIR should consider the potential effects of proposed increases in groundwater drawdown during drought years relating to the ability to effectively recharge the groundwater basin within a reasonable period following a drought. The Draft EIR should also consider the potential effect on agricultural and rural residential groundwater users with the increased use of groundwater for urban uses, particularly during drought years.

The City is looking forward to reviewing the Draft EIR when it is circulated.

Sincerely,

Susan Frost

Susan Frost
Senior Planner

cc: Eric Brown, Planning Manager
Marc Roberts, Community Development Director

DUBLIN
SAN RAMON
SERVICES
DISTRICT

7051 Dublin Boulevard
Dublin, California 94568
FAX: 925 829 1180

925 828 0515

April 25, 2002

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APR 26 2002

Mr. Matt Katen
Zone 7 Water Agency
5997 Parkside Drive
Pleasanton, CA 94588-5127

Subject: **Notice of Preparation of a Draft Program Environmental Impact Report, Zone 7 Well Master Plan EIR**

Dear Mr. Katen:

Thank you for providing Dublin San Ramon Services District (District) the opportunity to review and comment on the Notice of Preparation of a Draft Program Environmental Impact Report for the Zone 7 Well Master Plan EIR. We thank Zone 7 for considering our comments when it comes to regional issues involved with the Tri-Valley. As the water retailer for the City of Dublin and Dougherty Valley, DSRSD continues to expect Zone 7 will blend its different sources of water to provide water of approximately equal quality to each of its Municipal and Industrial water supply contractors. The Zone 7 water agency must manage their water wholesale operation and groundwater management to ensure the water reliability and water quality needs of its customers including DSRSD are met in accordance with its most current contract for Municipal and Industrial water supply.

Again, thank you for the opportunity to comment on the subject document. If you have any questions or need additional information, please contact me at (925) 551-7230, ext. 112.

Sincerely,

GREGORY TAYLOR,
Engineering Technician/GIS Specialist II

GT:jg
Cc: David Behrens, DSRSD
Dave Requa, DSRSD
Bert Michalczyk, DSRSD

The Dublin San Ramon Services District is a Public Entity

3200 BUSCH ROAD
PLEASANTON, CA 94566
PHONE 925/462-1088
FAX 925/462-8794

KIE-CON
A DIVISION OF KIEWIT PACIFIC CO.
Contractor License #433176
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ANTIOCH, CA 94509
PHONE 925/754-9494
FAX 925/754-0624

4/23/2002

Zone 7 Water Agencies
5997 Parkside Drive
Pleasanton, CA 94588-5127

Attention: Matt Katen

Reference: Zone 7 Well fields

Subject: Kiewit Construction Co. Property

Dear Matt,

I am Gregory W. Sousa, with Kie-Con a division of Kiewit Pacific Co.; which is part of the Kiewit Company of Omaha NE and a representative of the property owners Kiewit Construction Co.

I/we are here tonight to stay involved in the process with regards to the Zone 7 Well fields and their impact on the Kiewit Construction Co.'s property at 3300 and 3200 Busch Road.

We have had discussions in mid 2000 with Zone 7 Water Agencies and the Negative Declaration and now see that things have moved forward with and EIR. The location of the wells in the Busch/Valley well field and their relation to the Kiewit Construction Co.'s business operations and property will continue to be our concerns.

If you have any questions, contact me at (925) 462-1088

Very Truly Yours,

Gregory W. Sousa
Asst. Plant Supt.

PONDEROSA
HOMES

April 24, 2002

Mr. John Mahoney
Alameda County Flood Control &
Water Conservation District - Zone 7
5997 Parkside Drive
Pleasanton, CA 94588

RE: Busch Property Well Sites

Dear Mr. Mahoney:

This correspondence is sent on behalf of Ponderosa Homes and the McConkie and Dana families, owners of the Busch Property. As you know from our previous discussions and correspondence on this matter, we are opposed to the potential selection of the Busch Property as a location for ground water wells. We stated our concerns in a letter to Athena Wilson dated July 12, 2000. We continue to share the concerns detailed in that correspondence.

More importantly, we have over the past year spent considerable time and effort in a public workshop process to create an acceptable land use plan for the Busch Property. In January, 2002, we reached a consensus among the neighbors and the city council of the City of Pleasanton on a land use plan which has formed the basis of an application for the rezoning and subdivision of the property. This application has now been submitted to the city and we are now in the more detailed planning stages regarding the property.

Our plan includes not only single family homes but senior apartments, a church and a future school site. The proposed well locations which have been identified will affect not only the proposed single family homes and the church site but our existing neighbors as well. Given all of the uses proposed for the site you can imagine that there is little opportunity to introduce new land uses. Furthermore, we are working closely with our immediate neighbors to confirm the uses adjacent to their homes and the uncertainty of the inclusion of a potential well site makes this very difficult.

We hope to have the planning process and public hearings completed by this August, which is well ahead of what we believe your schedule for finalizing the well sites

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anticipates. Ultimately, we believe that there are better locations in the immediate area for the use you have proposed. These locations are more suitable for the type of use a well and associated facilities represents, both for our proposed use and for our existing neighbors. We respectfully request that you remove the Busch property from your list of potential well locations. Thank you for your cooperation with this matter and please contact me regarding your decision and any questions or comments you may have.

Sincerely yours,

PONDEROSA HOMES II, INC.

Jeffrey C. Schroeder
Vice President, Land Acquisition & Planning

PONDEROSA
HOMES

July 12, 2000

Ms. Athena Watson
Alameda County Flood Control &
Water Conservation District
5997 Parkside Drive
Pleasanton, CA 94588-5127

Re: Mitigated Negative Declaration Comments
Busch-Valley Wellfield Project

Dear Ms. Watson:

Ponderosa Homes represents Gerald McConkie and Eugene Dana who are the owners of the Busch Property which is bounded by Mohr Avenue, Valley Avenue and Busch Road, and which is immediately adjacent to the proposed Project site. The purpose of this letter is to provide you with our comments and objections to the adequacy of the above referenced Mitigated Negative Declaration (MND) and to the Project which proposes to construct three to five new Aquifer Storage and Recovery (ASR) Wells in the Busch-Valley Wellfield Area in Pleasanton, Ca.

Inadequacy of MND to Satisfy CEQA Requirements

The California Environmental Quality Act (CEQA) requires a detailed Project statement which describes and analyzes the significant environmental impacts of a project and discusses ways of mitigating or avoiding those effects. As an informational document, the MND must provide sufficient analysis so the decision-makers and the public can identify, consider and address mitigation measures to adverse environmental impacts occurring as a result of a project. The MND fails to provide information necessary to assist the decision-makers and public in its assessment the Project as described below.

The MND indicates that there would be "No Impact" in Hydrology and Water Quality (Section VIII.b of the Initial Study Checklist), however, the MND does not provide any data to support this conclusion and fails to fully evaluate the impacts to all possible water supply wells in the vicinity of the wellfield. For example, the MND concludes that "the use of the Busch-Valley Wellfield is expected to have an impact on the capacity of the City of Pleasanton's Well No. 8 which is located about 600 feet north of the proposed wellfield (and immediately adjacent to the Busch Property). The MND does not provide the technical data to support this conclusion. Furthermore, the MND does not identify other active or potentially active water supply wells in

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the project vicinity that may be affected by wellfield operations. For instance, the MND does not identify the two domestic wells that are currently in use serving the two residences on the Busch property, or the one additional agricultural well on said property which is not presently being utilized but which could be put into use at any time. Potential project impacts on these water supply wells during both drought and non-drought periods is insufficiently evaluated in the MND. The analysis of this impact should also consider the California Regional Water Quality Control Board's water reuse requirements for the Livermore-Amador Valley contained in Order No. 93-153 and adopted on December 15, 1993 which sets forth provisions for horizontal separations between wells where treated or recycled water is injected and the nearest potable water supply well.

We request that Zone 7 perform a well survey and hydrological modeling to determine the influence on the groundwater levels and water quality in adjacent wells from pumping from the proposed wellfield. If impacts to these wells are identified, mitigation measures, if possible, are required. We further request that this analysis be circulated for public review and comment in an amended or revised MND, and if unavoidable adverse impacts are identified in this analysis that Zone 7 prepare the appropriate CEQA document, an Environmental Impact Report.

Additionally, the MND does not assess the impacts of operating the wellfield in terms of potential conflicts that may result from future land uses north of the proposed wellfield. Section X on the Initial Study Checklist states "No Impact" to Mineral Resources. A majority of the Busch property which is located immediately to the north of the Project site is within the Livermore-Amador Valley Quarry Reclamation Area (LAVQRA) and is also in an area classified as a Mineral Resource Zone (MRZ-2) by the State of California, Department of Conservation, Division of Mines and Geology. Under the California Surface Mining and Reclamation Act (SMARA), the LAVQRA has been designated as an area of regional significance because it contains "a deposit of minerals; the extraction of which is judged to be of prime importance in meeting future needs for minerals." (SMARA, 1975).

If the area within the MRZ-2 and LAVQRA were mined, the feasibility of the wellfield project may be affected; conversely, the presence of the wellfield could result in Zone 7 objecting to the mining of the aggregate resource at some time in the future. The MND needs to address how the proposed project would be affected by the mining of the MRZ-2 and LAVQRA areas, and this should be accomplished by hydrologic modeling. The results of the modeling effort should be presented in a revised MND to be recirculated for public review and comment pursuant to CEQA requirements.

In closing, and although not directly related to comments regarding CEQA adequacy which is the subject of this letter, it is important to point out that over the past several years, Ponderosa Homes has diligently worked with the City of Pleasanton in attempting to obtain approval of a

residential subdivision on the Busch property consistent with the City's General Plan designation. Should a residential project not be authorized, a quarry would be an economically viable alternative use of the Busch property consistent with LAVQRA. If the Project would preclude the ability of a quarry on this property in the future, Zone 7 may be required to compensate the Dana & McConkie families as well as Ponderosa Homes for diminution of property rights.

Very truly yours,

Pamela Hardy
Planning Manager

cc: Eugene Dana
Gerald McConkie
Deborah Acosta, City of Pleasanton
Michael Roush, City of Pleasanton
Brian Swift, City of Pleasanton
Andy Faber, Berliner & Cohen

Mrs. Margaret Jory Tracy
1262 Madison Ave
Livermore, CA 94550

April 24, 2002

Comments on N.O.P. for E.I.R. on Zone 7 Well Master Plan

1. How can ways to reduce demand be implemented to maintain 100% reliability?
   For example, developers should be required to provide measures for water conservation before approval of proposed development.
   Developers could also pay demineralization fees.
2. How can greater fluctuations of the ground water levels be avoided or minimized?
3. How can plans for basin management balance Zone 7's 100% reliability policy with the need to keep the basin as full as possible?
4. What is the difference in water quality between South Bay Aqueduct water released for groundwater recharge and the quality of water pumped up from the ground water basin?
5. What is the ground water quality in the fringe basins?
6. What is the current ground water inflow (quantity and quality) into the main basin?
7. What will the inflow be when the groundwater level is lowered in various pumping scenarios?
8. What treatment is given now and what will be given in the future to water pumped out of the basin and blended for municipal use?
9. How much land subsidence will occur?

APPENDIX 3.1

GROUNDWATER HYDROGEOLOGY AND WATER QUALITY

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (ECAP) (Alameda County, 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

Policy 306: The County shall protect surface and groundwater resources by:

- Preserving areas with prime percolation capabilities and minimizing placement of potential sources of pollution in such areas;
- Minimizing sedimentation and erosion through control of grading, quarrying, cutting trees, removal of vegetation, placement of roads and bridges, use of off-road vehicles, and animal-related disturbance of the soil.

Water

Goal. To provide an adequate, reliable, efficient, safe, and cost-effective water supply to the residents, businesses, institutions, and agricultural uses in East County.

Policy 252. The County shall encourage Zone 7 to pursue new water supply sources and storage facilities only to the extent necessary to serve the rates and levels of growth established by the Initiative and by the general plans of the cities within its service area.

Policy 256. The County shall discourage water service retailers from constructing new water distribution infrastructure which exceeds future water needs based on the level of development consistent with the Initiative.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) includes the following relevant policies that are relevant to the proposed project:

Policy 9. Protect the quality and quantity of surface water and groundwater in the Planning Area.

Program 9.7. Support the policies and programs contained in the Water Quality Control Plan for the San Francisco Bay Basin to the extent they are consistent with the City's policies for water quality.

ZONE 7 HYDROLOGIC INVENTORY

MEMORANDUM

DATE: March 12, 2004

TO: David W. Lunn, Water Resources Manager

FROM: Sal Segura, Assistant Engineer

SUBJECT: Main Basin Groundwater Hydrologic Inventory, 1974-2003

INTRODUCTION

The Water Resources Section compiles a hydrologic inventory of annual supply and demand components for the Livermore-Amador Valley's main groundwater basin and computes the end-of-year storage. The hydrologic inventory represents the water balance between groundwater supply and groundwater demand. The five groundwater supply components used to replenish the groundwater reserves are **Natural stream recharge**[1], **Artificial stream recharge**[1], **rainfall recharge**[4&5], **applied water recharge**[4&5] and **subsurface groundwater inflow**[6&7]. The four groundwater demand components which draw down the groundwater reserves are **municipal pumpage**[2], **agricultural pumpage**[2], **gravel mining water use**[8] and **groundwater basin outflow**[7]. The difference between supply and demand is the **net recharge**. Because calculating groundwater storage is a complex operation, two independent methods are utilized to arrive at a year-end storage amount. The nodal groundwater storage is computed from groundwater levels and hydrogeologic parameters of the main basin. This method, although less labor intensive, serves to confirm the storage calculated by the hydrologic inventory method which accounts for all major supply and demand components to arrive at a groundwater storage amount. The mean of the numbers computed by both methods then becomes the final groundwater storage at the end of 2003 water year. This memorandum presents the 2003 hydrologic inventory components as well as a historic inventory summary covering the past 30 water years.

Table 1 presents the hydrologic inventory for the 2003 water year and compares each component of supply and demand with its corresponding "normal year" value. The "normal year" values shown in Table 1 are based on a historic period which best reflects the current conditions for that component. These values are determined in the "Groundwater Supply and Use Forecast" [2] report for the 2003 water year. Figure 1 presents the pie charts of supply and demand components for 2003 and for a normal year. Table 2 presents a summary of the hydrologic inventory components for the 30 water years spanning 1974-2003. Figure 2 presents a graph of the hydrologic inventory components for 1974-2003.

DESCRIPTION OF SUPPLY COMPONENTS

STREAM RECHARGE [1]

Stream recharge is the water that percolates through stream beds into the main groundwater basin. The stream recharge is calculated from daily stream flow records from three arroyos, Del Valle, Mocho and Las Positas. This daily collection of data is managed to produce reports which summarize the amount of water recharging into the main basin on a monthly and annual basis.

Each one of the arroyos contributes to the groundwater basin account depending on its geographic location, streambed composition and sources of supply. Streamflow into Arroyos Mocho and Del Valle comes from several sources, namely, natural flow from the local watershed and urban runoff, artificial releases by Zone 7 and DWR, and groundwater discharges due to mining operations. When the mining companies discharged groundwater into the arroyos, some of that water re-percolated into the basin but was not counted as recharge. Flow into Arroyo Las Positas is mainly from the local watershed and urban runoff and is therefore considered natural flow.

Recharge via Arroyos Mocho and Del Valle is categorized as Natural and Artificial to separate the recharge amount that Zone 7 is entitled to pump out of the main basin. On Arroyo Del Valle, the stream recharge components are divided into "Natural", "Arroyo Valle prior rights" and "Artificial" to highlight the magnitude of the Zone 7's artificial recharge operations. Arroyo Valle prior rights recharge refers to the amount of water that would have recharged due to natural runoff had Del Valle Reservoir not been built. Through the Hydrologic Inventory, Zone 7 makes sure that Prior Rights recharge is satisfied every year.

During the gravel mining years, Zone 7 staff allowed the main basin storage to drop in an effort to maintain the groundwater levels low enough for the mining companies and instead transferred its water reserves to the water account in the Semitropic Groundwater Basin. Now that Hanson Aggregates has ceased their operation, and Lakes H and I have become available, Zone 7 is using these lakes to recharge the groundwater basin. In April 2003, water from Lake H was allowed to flow into Lake I for recharge into the Amador sub-basin. In 2004, a temporary diversion structure is being constructed to divert water from Arroyo Mocho into Lake H and from there into Lake I for recharge via the western face of that lake.

DISCUSSION OF HISTORIC ARTIFICIAL STREAM RECHARGE OPERATIONS

Artificial stream recharge is the recharge that occurs from water released by Zone 7 via the South Bay Aqueduct to replenish groundwater reserves. Artificial stream recharge operations began in 1962 with the first importation of State Water Project water to the Valley. Between 1978 and 1982, artificial recharge was increased to near maximum amounts in an effort to fill the groundwater basin. Artificial recharge was discontinued in January 1983 due to the high level of storage and agreements with the gravel companies to lower groundwater levels.

Artificial recharge was resumed on Arroyo Mocho in 1988 and continued until January 1991. Artificial recharge was discontinued in January 1991 when it became clear that significant cuts (up to 90%) would be made to our State Water Project annual deliveries. Recharge releases resumed in October and December 1991 when additional water was made available from the State Water Project for local storage. Artificial stream recharge was discontinued in January 1992 due to reduced project water deliveries. Releases were resumed in January 1993 at a low rate, then increased to maximum rate in February and continued throughout the year in order to restore our groundwater storage following the 1987-92 drought period.

Artificial stream recharge in 1994 continued at the maximum rate until the beginning of April when it was determined that State Water Project could only deliver 50% of our entitlement at which time releases were terminated. Artificial stream recharge was resumed during the last week of May and continued through the end of 1994 water year. Artificial recharge continued at available recharge capacity throughout the 1995 water year.

Artificial stream recharge during the period 1996-2001 continued at a reduced rate on Arroyo Mocho and Arroyo Valle. In 1999, Zone 7 opted to cut back on artificial recharge and allow a drop in the main groundwater basin levels. This allowed room for direct injection of treated surface water via an Aquifer Storage and Recover (ASR) well. Water that would have typically been recharged locally was transferred to the Semitropic Storage Water District for future use. This water is stored in a groundwater basin in Kern County and can be pumped into the California Aqueduct at Zone 7's request in exchange for Delta water into the South Bay Aqueduct. In 2002, Zone 7 was able to resume normal artificial operations since mining operation has slowed considerably. Zone 7 is trying to increase recharge to the main basin with the lowest TDS water available.

RAINFALL RECHARGE [4&5]

Rainfall recharge occurs when precipitation runoff infiltrates the soil layer and eventually the groundwater basin. Rainfall recharge is calculated using monthly climatological monitoring data, soil conditions and current year land use conditions for about 200 geographic areas in the 17,000 acre main basin. The rainfall, soil conditions and land use conditions vary substantially within the main basin. Rainfall recharge during 2003 water year was about 5,310 acre-feet, or 111% of normal.

Starting in 2003, rainfall runoff recharging node 36 of the main basin is accounted as such. Previously, this water was accounted as ungaged natural recharge in Reach 2 of Arroyo Valle.

APPLIED WATER RECHARGE [4&5]

Applied water recharge is recharge resulting from the irrigation of urban and agricultural lands overlying the main basin. A small portion of water applied for irrigation is metered. The water that recharges due to un-metered water application must be calculated from land use mapping, monthly climatological data and soil types based upon geographic location. The applied water recharge for metered areas is calculated using metered applied water quantities and a fixed percentage of recharge (10% or 25%) depending upon soil type. Applied water recharge was about 1,190 acre-feet or 60% of normal.

SUBSURFACE INFLOW [6&7]

Subsurface inflow is groundwater that flows into the main basin from an adjacent fringe basin, namely, the Dublin Sub-basin. Most years, the subsurface inflow is calculated using the groundwater gradients across the basin boundaries as determined from semi-annual groundwater level monitoring data. This year, subsurface inflow was estimated at 960 acre-feet or 96% of normal.

DESCRIPTION OF DEMAND COMPONENTS

MUNICIPAL GROUNDWATER PUMPING [2]

Municipal groundwater pumping is a major component of demand on the groundwater basin. Typically, about 56% of the total groundwater pumped is for municipal use. Municipal pumping also includes small amounts of domestic and golf course pumping. Municipal pumping during the 2003 water year was 25% above normal. In 2003, Zone 7 recharged 13,020 acre-feet and pumped 8,230 acre-feet.

AGRICULTURAL GROUNDWATER PUMPING [2]

Groundwater pumping for agricultural use has generally been on a declining trend due to a gradual reduction in agricultural areas over the main basin. In 2003, metered ag pumping from the main basin was about 140 acre-feet or 35% of normal. More than 95% of agricultural irrigation is done with surface water from the State Water Project.

MINING GROUNDWATER USE [8]

Mining use includes the export of water from the basin through stream discharges, processing losses and evaporation losses. The gravel mining exports include water that leaves the valley but exclude any portion that re-percolates within the arroyos. Groundwater stream export has ceased due to closing of Hanson's gravel mining operation. However, evaporation losses continue due to existing lakes created by mining companies. Net evaporation from mining areas was 1,785 acre-feet which is normal. Total mining use was 73% of normal.

SUBSURFACE OUTFLOW [7]

Groundwater basin outflow is groundwater in the Bernal Sub-basin which re-surfaces in Arroyo de la Laguna and subsequently leaves the valley. Groundwater outflow from the main basin generally occurs when the groundwater elevation in the Fairgrounds Key Well is higher than 280 feet. Subsurface outflow is computed from a combination of stream flow data and groundwater level monitoring data. The groundwater elevation in the Fairgrounds Key Well remained below 280 feet therefore groundwater outflow did not occur during 2003.

NET GROUNDWATER RECHARGE

The mass balance equation of "INFLOW - OUTFLOW = CHANGE IN STORAGE" is essential to understand and explain groundwater changes in the main basin. The sum of the independently computed supply components equals the total basin inflow. The sum of the independently computed demand components equals the total basin outflow. The computed change in storage represents the net recharge.

GROUNDWATER STORAGE

Groundwater storage is the computed total main basin groundwater storage in thousands of acre-feet. It is calculated from the mean of storage computed from groundwater elevations and that computed from hydrologic inventory method. The groundwater storage at the end of 2003 water year was calculated at 211,430 acre-feet.

IN-LIEU RECHARGE

In-lieu recharge is the deliberate process of increasing groundwater storage by substituting surplus surface water for Groundwater Pumping Quota water. This was accomplished through agreements with the retailers to reduce their groundwater pumping in exchange for purchasing treated surface water at a reduced rate. Zone 7 began this program in 1993, but discontinued using the program in December 1996 due to its negative impact on the main basin's salt balance.

SUMMARY

Final 2003 supply and demand components have been computed and have been incorporated into the historic 1974-2003 hydrologic inventory. This hydrologic inventory presents all the major groundwater supply and demand components for the main basin. In 2003 the total main groundwater basin supply was about 31,100 acre-feet, which is 10% above normal. The 2003 total groundwater demand was about 19,400 acre-feet which is 69% of normal. The increase in the main basin groundwater supply is due to a combination of increased stream and rainfall recharge, decreased groundwater pumping and decreased mining activity. The net recharge in 2003 resulted in an increase of about 11,700 acre-feet to the main basin.

REFERENCES

The following Monthly and Annual reports contain more detailed data and supporting documentation of the information summarized in this report.

1. Monthly Stream Recharge Report, Sal Segura.
2. Monthly Groundwater Supply & Use Report, Sal Segura.
3. Annual Groundwater Supply & Use Forecast Report, Sal Segura.
4. Monthly Rainfall and Applied Water Recharge Report, Jarnail Chahal.
5. Rainfall and Applied Water Recharge Model Documentation, 17-July-1995, Jarnail Chahal.
6. Subsurface Inflow Documentation, 2-June-1995, Jarnail Chahal.
7. Annual Subsurface Inflow & Outflow Report, Sal Segura.
8. Monthly Mining Area Groundwater Export & Evaporation Report, Todd Wendler.
9. Annual Main Groundwater Basin Storage Report, 2003WY, Sal Segura

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TABLE 1

ZONE 7 WATER AGENCY
WATER RESOURCES

GROUNDWATER SUPPLY & UTILIZATION
MAIN BASIN HYDROLOGIC INVENTORY
ACRE-FEET
2003 WATER YEAR

	WATER YEAR		NORMAL YEAR		PERCENT NORMAL
SUPPLY INDICES					
LOCAL					
Rainfall at Pleasanton (inches)	27.94		21.02		133%
Arroyo Valle Stream flow	19,648		24,053		82%
SACRAMENTO RIVER INDEX	19.18	MAF	19.10	MAF	100%
SUPPLY COMPONENTS					
Stream Recharge					
Natural Stream Recharge					
Arroyo Valle	4,397		2,000		220%
Arroyo Mocho	2,980		2,600		115%
Arroyo Las Positas	1,640		1,300		126%
*Total Natural Stream Recharge**	9,017		5,900		153%
Arroyo Valle Prior Rights*	1,612		1,250		129%
Artificial Stream Recharge					
Arroyo Valle	3,159		1,500		211%
Arroyo Mocho	9,864		4,810		205%
Arroyo Las Positas	0		0		
Total Artificial Stream Recharge	13,023		6,310		206%
Total Stream Recharge	23,652		13,460		176%
Rainfall Recharge*	5,311		3,700		144%
Applied Water Recharge*	1,192		1,660		72%
Subsurface Inflow*	960		1,000		96%
Supply Total	31,115		19,820		157%
DEMAND COMPONENTS					
Municipal Pumping					
City of Pleasanton	3,674		3,500		105%
California Water Service	3,979		3,714		107%
Dublin San Ramon Services District	645		645		100%
Zone 7	7,586		7,600		100%
SFWD	423		390		108%
Fairgrounds	327		410		80%
Domestic	134		120		112%
Golf Courses	217		220		99%
Total	16,985		16,600		102%
Agricultural Pumping	135		200		68%
Mining Use					
Stream Export	0		0		
Evaporation	1,785		1,780		100%
Processing	510		700		73%
Total	2,295		2,480		93%
Subsurface Outflow*	0		540		0%
Demand Total	19,415		19,820		98%
NET RECHARGE	11,699		0		
*** NATURAL SAFE YIELD RECHARGE**	18,092		12,970		139%
ARTIFICIAL RECHARGE					
Stream Recharge	13,023		6,310		206%
END OF YEAR STORAGE	207,174				

ZONE 7 WATER AGENCY
WATER RESOURCES

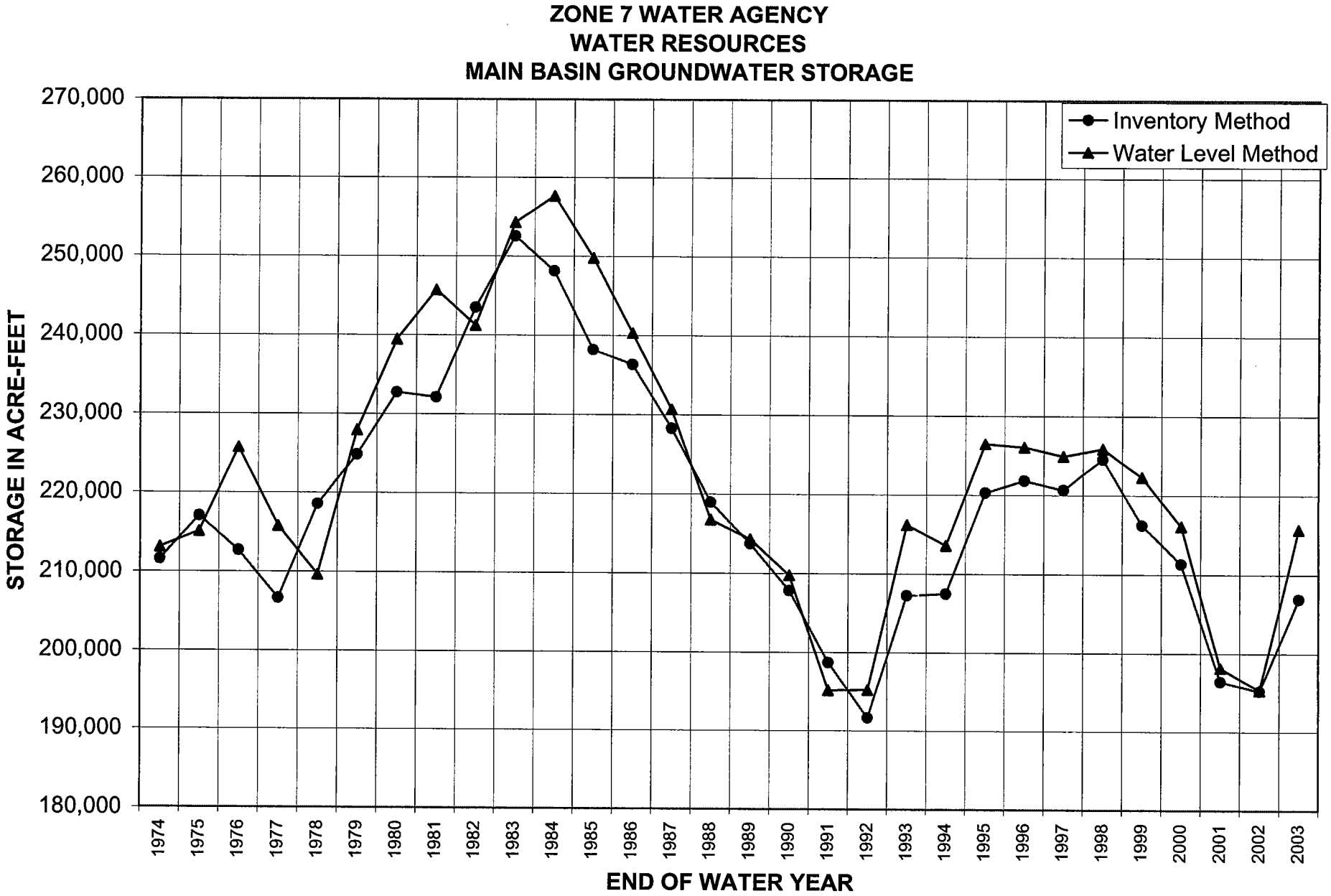
LIVERMORE-AMADOR VALLEY MAIN GROUNDWATER BASIN
HYDROLOGIC INVENTORY AND STORAGE IN ACRE-FEET
1974-1990 WATER YEARS

Water Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
SUPPLY COMPONENTS																	
Stream Recharge																	
Natural																	
Arroyo Valle	2,400	2,950	360	290	2,450	1,290	1,750	840	2,970	4,893	2,580	751	2,831	527	679	458	418
Arroyo Mocho	3,160	3,760	540	140	5,900	1,170	2,500	880	4,810	8,514	4,616	1,716	4,176	843	902	809	428
Arroyo las Positas	500	400	200	200	500	400	600	480	840	980	1,130	1,074	1,161	1,326	1,072	1,322	1,404
Total	6,060	7,110	1,100	630	8,850	2,860	4,850	2,200	8,620	14,387	8,326	3,541	8,168	2,696	2,653	2,589	2,250
Arroyo Valle Prior Rights	1,771	1,540	115	0	1,038	984	1,419	922	1,848	1,870	1,160	1,206	877	869	724	971	288
Artificial																	
Arroyo Valle	1,439	4,320	1,875	1,300	3,002	5,886	4,541	6,328	2,442	0	0	0	0	0	0	139	304
Arroyo Mocho	1,670	1,830	3,220	1,290	2,840	5,780	5,270	5,130	3,290	901	0	0	0	0	1,172	4,181	4,184
Arroyo las Positas	500	600	600	600	600	600	400	460	220	0	0	0	0	0	0	0	0
Total	3,609	6,750	5,695	3,190	6,442	12,266	10,211	11,918	5,952	901	0	0	0	0	1,172	4,320	4,488
Total	11,440	15,400	6,910	3,820	16,330	16,110	16,480	15,040	16,420	17,158	9,486	4,747	9,045	3,565	4,549	7,880	7,026
Injection Well Recharge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rainfall Recharge	3,031	2,523	0	0	4,398	2,002	3,891	967	11,423	16,357	3,110	1,249	9,008	290	398	283	141
Applied Water Recharge	2,697	2,497	3,130	3,022	2,768	3,034	2,673	2,105	1,345	1,359	2,118	1,894	1,915	1,893	2,008	1,621	1,701
Subsurface Basin Inflow	1,000	1,000	1,010	1,790	1,230	990	650	630	630	430	650	750	740	770	920	1,160	1,260
SUPPLY TOTAL	18,168	21,420	11,050	8,632	24,726	22,136	23,694	18,742	29,818	35,304	15,364	8,640	20,708	6,518	7,875	10,944	10,128
DEMAND COMPONENTS																	
Municipal Pumpage																	
City of Pleasanton	2,264	2,497	1,707	3,271	2,640	3,273	2,961	3,089	3,565	3,886	3,486	3,056	3,705	3,310	3,548	3,316	3,856
Cal. Water Service	2,612	2,852	2,781	1,312	1,964	2,383	2,531	2,695	2,286	2,660	3,035	2,788	2,774	3,276	2,761	2,850	3,073
Zone 7	5,405	3,089	1,281	310	745	825	42	0	0	23	348	1,199	1,164	488	2,043	3,213	3,327
Camp Parks	769	808	980	925	796	881	819	808	713	630	647	40	0	0	0	0	0
SFWD	302	242	495	374	397	413	372	402	348	321	378	353	484	491	472	443	362
Fairgrounds	200	200	200	200	200	200	200	267	217	242	281	272	280	280	280	280	280
Domestic	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Golf Courses	156	92	227	230	149	166	0	0	98	101	198	182	146	215	253	191	257
Total	11,808	9,880	7,771	6,722	6,991	8,241	7,025	7,361	7,327	7,963	8,473	7,990	8,653	8,160	9,457	10,393	11,255
Agricultural Pumpage	3,753	2,217	4,596	4,970	3,191	3,711	2,628	2,433	1,355	1,402	1,557	1,974	1,911	1,470	1,476	1,226	1,420
Mining Use																	
Stream Export	1,200	2,220	690	470	800	2,000	3,480	6,530	6,050	12,760	4,340	4,265	8,858	558	2,443	1,808	665
Evaporation/Production	1,849	1,634	2,367	2,476	1,858	1,750	2,106	2,475	1,564	1,191	3,140	3,137	2,545	3,795	3,428	2,677	2,645
Total	3,049	3,854	3,057	2,946	2,658	3,750	5,586	9,005	7,614	13,951	7,480	7,402	11,403	4,353	5,871	4,485	3,310
Subsurface Basin Outflow	0	0	0	0	0	150	530	550	2,160	2,960	2,240	1,200	600	600	400	100	0
DEMAND TOTAL	18,610	15,951	15,424	14,638	12,840	15,852	15,769	19,349	18,456	26,276	19,750	18,566	22,567	14,583	17,204	16,204	15,985
NET RECHARGE	(442)	5,469	(4,374)	(6,006)	11,886	6,284	7,925	(607)	11,362	9,028	(4,386)	(9,926)	(1,859)	(8,065)	(9,329)	(5,260)	(5,857)
AVERAGE CALCULATED STORAGE (TAF)	211	215	218	211	214	226	235	238	242	252	252	243	237	229	217	213	208
INLIEU WATER RECHARGE																	
PLEASANTON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVENTORY STORAGE	211,558	217,027	212,653	206,647	218,533	224,817	232,742	232,135	243,497	252,525	248,139	238,213	236,354	228,289	218,960	213,700	207,843
NODAL STORAGE	211,111	213,424	224,048	214,417	208,569	226,569	238,005	244,153	239,877	252,328	255,686	248,028	238,515	229,175	215,388	212,957	208,567

ZONE 7 WATER AGENCY
WATER RESOURCES

LIVERMORE-AMADOR VALLEY MAIN GROUNDWATER BASIN
HYDROLOGIC INVENTORY AND STORAGE IN ACRE-FEET
1991-2003 WATER YEARS

Water Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1974-2003 AVERAGE	1974-2003 TOTAL
SUPPLY COMPONENTS															
Stream Recharge															
Natural															
Arroyo Valle	1,215	970	3,648	735	2,707	1,426	3,521	4,401	1,796	1,389	2,440	2,259	4,397	1,978	59,341
Arroyo Mocho	1,884	1,711	3,902	1,263	3,144	5,226	2,670	4,560	1,833	1,540	944	1,279	2,980	2,593	77,800
Arroyo las Positas	1,320	1,315	1,591	1,082	1,297	1,091	1,184	1,572	1,462	1,249	1,267	1,271	1,640	1,031	30,930
Total	4,419	3,996	9,141	3,080	7,148	7,743	7,375	10,533	5,091	4,178	4,651	4,809	9,017	5,602	168,071
Arroyo Valle Prior Rights	668	337	845	876	623	398	899	958	548	656	804	1,130	1,612	932	27,956
Artificial															
Arroyo Valle	82	411	1,182	797	683	143	1,290	182	1,180	878	1,503	2,962	3,159	1,534	46,028
Arroyo Mocho	3,178	502	4,439	7,085	4,493	2,824	3,487	1,930	3,993	7,129	1,670	8,755	9,864	3,337	100,107
Arroyo las Positas	0	0	0	0	0	0	0	0	0	0	0	2	0	153	4,582
Total	3,260	913	5,621	7,882	5,176	2,967	4,777	2,112	5,173	8,007	3,173	11,719	13,023	5,024	150,717
Total	8,347	5,246	15,607	11,838	12,947	11,108	13,051	13,603	10,812	12,841	8,628	17,658	23,652	11,558	346,744
Injection Well Recharge	0	0	0	0	0	0	0	537	1,524	1,146	0	0	0	107	3,207
Rainfall Recharge	1,838	1,760	10,761	1,242	13,243	8,176	8,634	12,868	2,773	4,794	823	1,792	5,311	4,436	133,086
Applied Water Recharge	282	1,635	1,443	1,587	1,449	1,974	2,210	1,354	1,690	2,116	2,039	1,557	1,192	1,944	58,308
Subsurface Basin Inflow	1,680	1,570	1,330	1,090	990	920	680	810	750	906	1,000	960	960	975	29,256
SUPPLY TOTAL	12,147	10,211	29,141	15,757	28,629	22,178	24,575	29,172	17,549	21,803	12,490	21,967	31,115	19,020	570,601
DEMAND COMPONENTS															
Municipal Pumpage															
City of Pleasanton	4,164	3,368	3,252	2,578	1,263	1,332	3,208	3,925	2,563	4,558	3,124	3,579	3,674	3,134	94,018
Cal. Water Service	3,966	3,744	2,570	2,626	2,052	1,553	2,947	3,595	3,271	3,567	3,785	3,458	3,979	2,858	85,746
Zone 7	8,119	5,136	2,214	213	367	2,383	1,562	1,682	4,912	6,139	9,751	10,923	8,231	2,838	85,134
Camp Parks	0	3	1	0	0	0	0	0	0	0	0	0	0	294	8,820
SFWD	408	410	414	395	375	390	478	460	380	532	489	448	423	408	12,251
Fairgrounds	346	338	282	325	286	342	344	230	333	369	325	423	327	278	8,349
Domestic	100	113	113	116	116	117	117	113	116	109	111	134	134	107	3,209
Golf Courses	252	251	289	250	147	186	170	262	250	249	120	232	217	185	5,536
Total	17,355	13,363	9,135	6,503	4,606	6,303	8,826	10,267	11,825	15,523	17,705	19,197	16,985	10,102	303,063
Agricultural Pumpage	556	346	213	218	150	212	266	108	203	1,094	857	242	135	1,530	45,890
Mining Use															
Stream Export	639	712	2,220	6,070	9,070	10,577	12,661	12,617	10,082	7,827	5,011	149	0	4,559	136,772
Evaporation/Production	2,729	2,839	1,991	2,716	1,819	2,804	3,205	1,624	3,377	3,061	2,440	3,711	2,295	2,508	75,248
Total	3,368	3,551	4,211	8,786	10,889	13,381	15,866	14,241	13,459	10,888	7,451	3,860	2,295	7,067	212,020
Subsurface Basin Outflow	0	0	0	0	200	766	760	750	362	125	0	0	0	482	14,453
DEMAND TOTAL	21,279	17,260	13,559	15,507	15,845	20,662	25,718	25,366	25,849	27,630	26,013	23,299	19,415	19,181	575,426
NET RECHARGE	(9,132)	(7,049)	15,582	250	12,784	1,516	(1,143)	3,806	(8,300)	(5,827)	(13,523)	(1,332)	11,700	(161)	(4,825)
AVERAGE CALCULATED STORAGE (TAF)	196	193	212	211	223	224	223	225	219	213	197	195	211		
INLIEU WATER RECHARGE															
PLEASANTON	0	0	276	516	2,576	2,453	547	0	0	0	0	0	0	220	6,368
CWS	0	0	325	418	1,377	2,793	592	0	0	0	0	0	0	190	5,505
INVENTORY STORAGE	198,711	191,662	207,244	207,494	220,278	221,794	220,651	224,457	216,157	210,330	196,807	195,475	207,175		
NODAL STORAGE	193,804	193,965	216,174	213,571	226,462	226,050	224,914	225,849	222,254	216,100	198,150	193,744	215,683		



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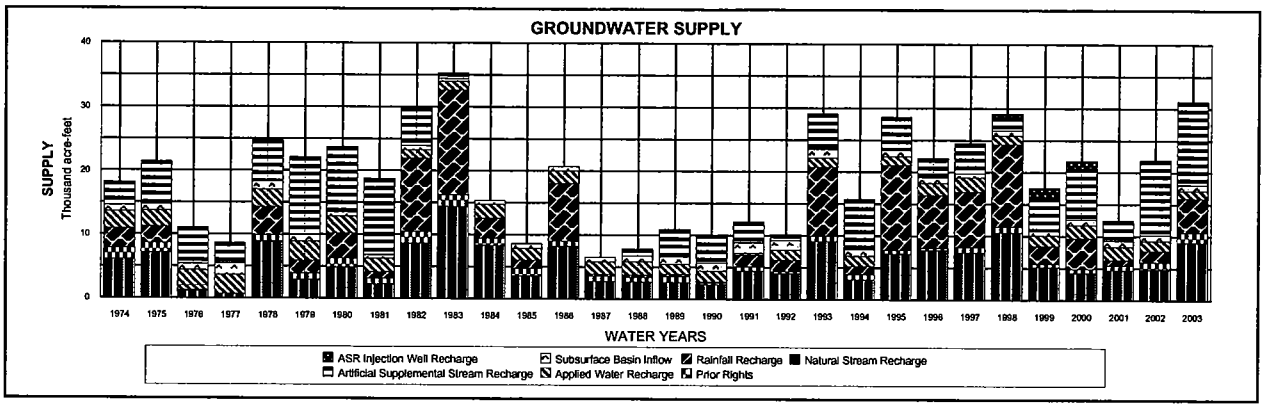
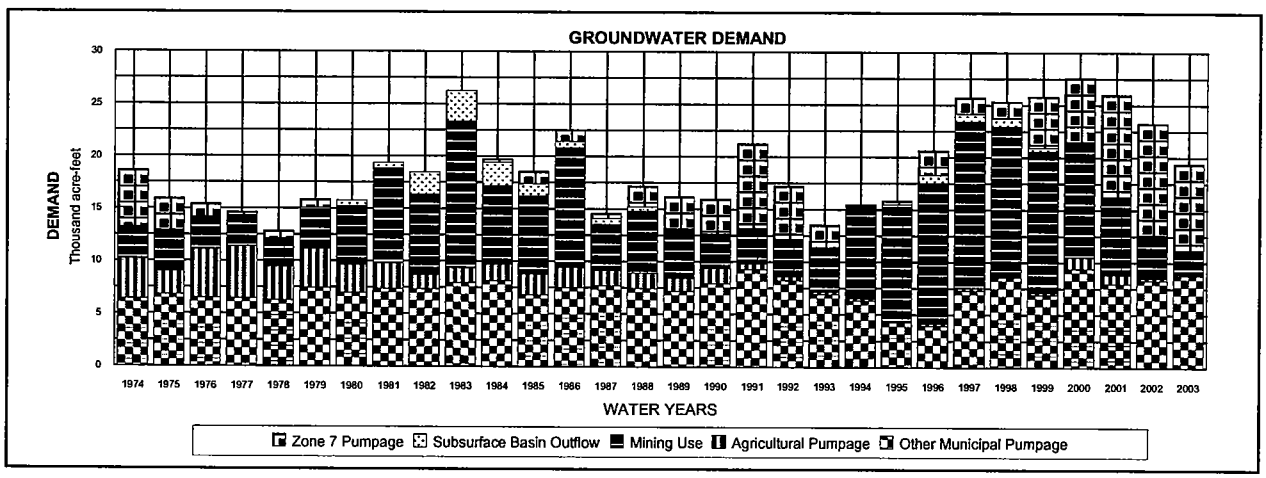
3/31/2004
Figure 1-2

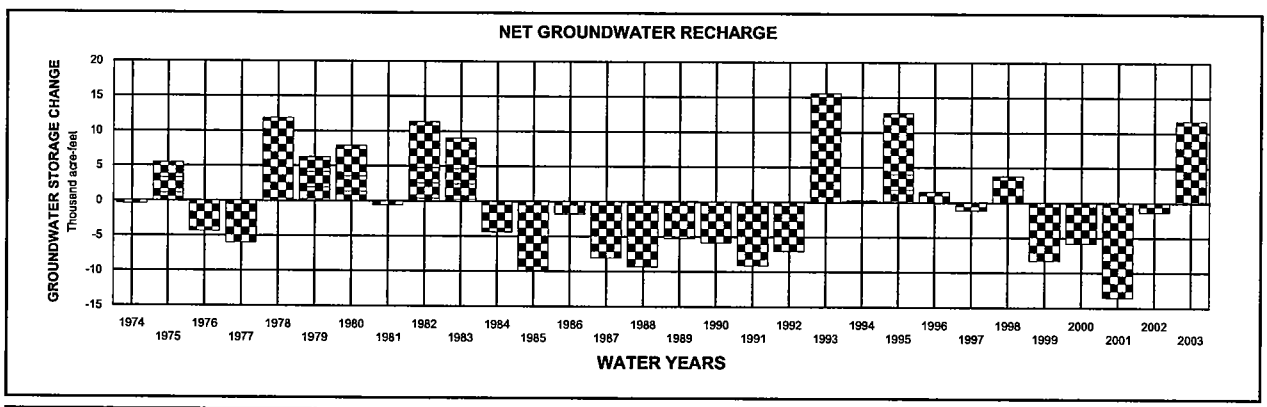
FIGURE 2
31-Mar-04

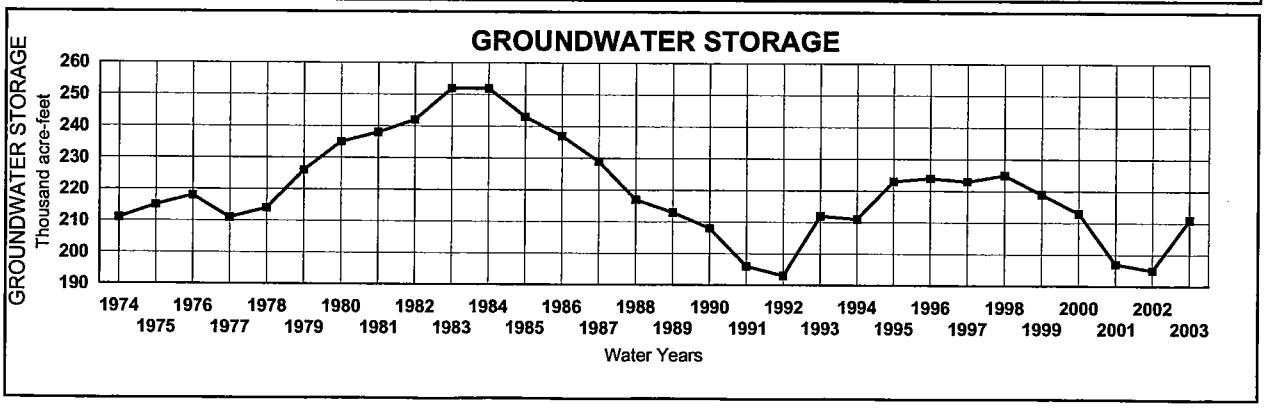
ZONE 7 WATER AGENCY
WATER RESOURCES

LIVERMORE-AMADOR VALLEY MAIN GROUNDWATER BASIN
HYDROLOGIC INVENTORY
(1974-2003 WYs)









ZONE 7 WELL INVENTORY DATABASE

Summary of Private Existing Wells with Respect to Historic Low Water Levels and Upper and Lower Screen Elevations

Bernal Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 18N 1	sup	316.7		RALPH MERRITT		88	-293	708	Yes
3S/1E 20B 2	pub & irr	339.9	PLEASANTON	ALAMEDA COUNTY FAIR		122	-160	0	
3S/1E 20C 3	pub & irr	336.1	PLEASANTON	ALAMEDA COUNTY FAIR		261	229	110	
3S/1E 30H 6	irr	340	PLEASANTON	BART PRICE		280	202	140	
3S/1E 29E 4	irr	310.5		CASTLEWOOD COUNTRY CLUB		281	-85	1013	
					180				

Busch Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 15F 3	sup	360		HANSON AGGREGATES		165	-255	640	
3S/1E 9R 6	dom	353	PLEASANTON	GENE DANA		193	118	235	
3S/1E 9R 8	dom	353	PLEASANTON	GERRY MCCONKIE		133	113	250	
					220				

COL Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth
3S/1E 10A 1	sup	362		JAMIESON		264	122	0
3S/1E 11E 1	sup	364.8		JAMIESON		215	-135	500
3S/1E 11H 1	sup	372.2		HAGEMANN		149	77	303
3S/1E 11Q 1	irr	377				Unk	Unk	0
3S/1E 12F 1	irr	400	LIVERMORE	JAMIESON COMPANY		285	166	240
3S/1E 12M 2	irr	383.8				277	158	0
3S/1E 12P 5	irr	402.9	LIVERMORE	E. HAGEMANN		143	55	348
3S/1E 14A 2	sup	381	PLEASANTON	R & J DOMESTIC		246	176	220
3S/1E 14A 3	sup	380	PLEASANTON	PLEASANTON GRAVEL CO.		100	0	420
3S/1E 14B 1	ind	382		VULCAN MATERIALS		182	-28	435
					210			

Gravel Pit Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 11P 4	sup	372		JAMIESON		Unk	220	0	
3S/1E 11P 6	dom	372		JAMIESON		132	-8	415	
					220				

Hopyard Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	
3S/1E 17B 4	dom	335	PLEASANTON	A.B. CASTERSON		Unk	87	248	No
3S/1E 18M 2	sup	323.9				Unk	94	0	
					180				

Isabel Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 12P 1	irr	402.9	LIVERMORE	HELEN JOHNSON		Unk	0	0	
3S/1E 12P 5	irr	402.9	LIVERMORE	E. HAGEMANN		143	55	348	
3S/1E 24A 1	ind/dom	404.9	LIVERMORE	RHODES JAIMESON		238	-270	702	
					210				

Summary of Private Existing Wells with Respect to Historic Low Water Levels and Upper and Lower Screen Elevations

Martin Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 9G 1	sup	349.7	PLEASANTON	MRS. KAMP		273	201	160	Yes
3S/1E 9G 3	dom	353	PLEASANTON	WIEKEN		185	157	220	No
3S/1E 9G 4	sup	350	PLEASANDTON	MONTGOMERY		160	120	250	Yes
3S/1E 9H 1	sup	354	PLEASANDTON	LARSON		Unk	194	0	Yes
3S/1E 9H 2	sup	354	PLEASANDTON	LARSON		235	195	172	Yes
3S/1E 9H 3	dom	351.2	PLEASANDTON	Schwaegerle		146	121	240	No
3S/1E 9H 4	dom	350	PLEASANDTON	GONSALVES, DAVID		250	186	168	No
3S/1E 9H 6	dom	351	PLEASANDTON	Peterson		251	203	153	No
3S/1E 9H 7	dom	363.5	PLEASANDTON	Eugene Lauer		285	135	241	No
3S/1E 9J 1	dom	355.6	PLEASANDTON	Lehman		206	156	213	No
3S/1E 9J 3	dom	353	PLEASANDTON	Leuthauser		148	128	250	No
3S/1E 9J 4	dom	355	PLEASANDTON	SELWAY		145	125	265	No
3S/1E 9J 5	sup	355	PLEASANDTON	Woodall		158	118	240	Yes
3S/1E 9J 6	sup	353.8	PLEASANDTON	Woodall		Unk	163	0	Yes
3S/1E 9K 4	sup	355	PLEASANDTON	M. Lawer		258	138	217	Yes
3S/1E 9Q 2	sup	352	PLEASANDTON	Warm		232	145	207	Yes
3S/1E 9Q 3	dom	345.32	PLEASANDTON	JERALD JENNARO		241	141	207	No
3S/1E 9Q 5	sup	350	PLEASANDTON	JOHN MOORE		250	230	140	Yes
3S/1E 9R 9	irr	353	PLEASANDTON	DAN MARKS		275	193	160	Yes
					210				

Mocho Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 9P 4	sup	344.9		CARPENTER'S HALL		Unk	150	0	
3S/1E 8H 2	Idled sup	340.87		US ARMY		217	176	205	
3S/1E 8H 3	Idled sup	342		US ARMY		218	171	203	
3S/1E 8H 4	Idled sup	339.36		US ARMY		209	158	200	
					190				

Stanley Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 13G 1	sup	396.8		JAIMESON COMPANY		307	66	0	
3S/1E 13K 1	Idled sup	397	Livermore	VA HOSPITAL		217	-263	750	
3S/1E 13K 2	Idled sup	397	Livermore	VA HOSPITAL		217	-263	600	
3S/1E 13P 1	Idled sup	397.3	LIVERMORE	JAIMESON COMPANY		Unk	-255	0	
3S/1E 13P 2	Idled sup	397.3		JAIMESON COMPANY		Unk	-3	0	
3S/1E 14K 2	sup	380		LONE STAR IND.		260	-100	508	
					210				

Stoneridge Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
3S/1E 5J 6	sup	346	PLEASANTON	RICHARD GUASCO		Unk	Unk	0	
3S/1E 5R 1	sup	345	PLEASANTON	ERMA THEODORE		Unk	170	175	
					210				

Valley Ave Wellfield

Well Number	Use	RP	City	Owner	Estimated Historic Low WL (ft msl)	Upper Perforation (ft msl)	Lower Perforation (ft msl)	Drill depth	City Water Connection
NO ACTIVE WELLS IN THIS WELL FIELD									

APPENDIX 3.2
SURFACE HYDROLOGY AND WATER QUALITY

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

> Policy 306. The County shall protect surface and groundwater resources by:
>
> - Minimizing sedimentation and erosion through control of grading, quarrying, cutting trees, removal of vegetation, placement of roads and bridges, use of off-road vehicles, and animal-related disturbance of the soil.
>
> Policy 316. The County shall require new residential, public, commercial, and industrial development to have protection from a 100-year flood.
>
> Program 108. The County shall implement all federal, state, and locally imposed statutes, regulations, and orders that apply to storm water quality.

The Watercourse Protection Ordinance (Alameda County, 1990) was enacted to restrict discharge of polluted materials to watercourses and encroachment of new development into watercourses within the unincorporated county. Implementation of the ordinance protects surface water and groundwater recharge areas from erosion, sedimentation, and other sources of pollution.

The county implements all federal, state, and locally imposed statutes, regulations, and orders that apply to stormwater quality, including NDPES stormwater permits issued by the RWQCB to the Alameda Countywide Clean Water Program, NPDES General Permit for Storm Water Discharges (General Construction Permit), Water Quality Control Plan, and letters issued by the RWQCB under the Porter-Cologne Water Quality Act.

In addition to the Watercourse Protection Ordinance, the county has a grading erosion and sediment control ordinance requiring that trenching and grading incidental to the construction or installation of approved underground pipelines shall be backfilled and the surface restored to its original condition, including reseeding or otherwise restoring vegetation on all disturbed earth surfaces if slopes exceed 2 percent, as soon as possible after such grading work is completed.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) includes the following that are relevant to the proposed project:

Policy 9. Protect the quality and quantity of surface water and groundwater in the Planning Area.

Program 9.7. Support the policies and programs contained in the Water Quality Control Plan for the San Francisco Bay Basin to the extent they are consistent with the City's policies for water quality.

Policy 17. (Clean Water Program) Implement stormwater runoff requirements, as recommended by the Alameda Countywide Clean Water Program, with as little impact on development and business costs as possible.

Program 17.1. Incorporate conditions of approvals developed by the Alameda Countywide Clean Water Program, as appropriate, for new development and discretionary permits.

Program 17.2. Develop design guidelines and standard details to enable developers to incorporate clean water runoff requirements into their projects.

Program 17.3. Evaluate the effect of development on stormwater runoff in the CEQA process.

Program 17.4. Encourage the use of site planning and design techniques to minimize impacts to water quality, including minimizing land disturbance, minimizing impervious surfaces, clustering development, preserving open space, and maintaining riparian areas with buffer zones to reduce runoff into waterways.

Program 17.5. Include stormwater quality requirements in plans and contract specifications for City projects.

Program 17.6. Require the use of Best Management Practices for construction activities and ongoing business operations to prevent contaminants from entering the storm drain system.

Program 17.7. Review the City's erosion and sedimentation prevention program to ensure that erosion prevention controls and enforcement are being implemented. Create an ordinance, if necessary, to accomplish these requirements.

Program 17.8. Conduct construction site field inspections to ensure the proper implementation and maintenance of erosion prevention and materials/waste management to effectively prohibit non-stormwater discharges.

Program 17.9. Provide educational materials for distribution to developers, business people, and the general public explaining stormwater quality issues and requirements.

Program 17.10. Train City staff on stormwater quality requirements with an emphasis on being proactive and flexible in implementing stormwater controls.

The City of Pleasanton City Council has established Chapter 9.14, Stormwater Management and Discharge Control Ordinance (No. 1572). The purpose of this ordinance is to ensure the future health, safety, and general welfare of Pleasanton citizens by controlling non-storm runoff and reducing pollutants in stormwater discharges and to protect and enhance the water quality of watercourses, water bodies, and wetlands. The ordinance includes provisions to protect both the storm system and natural water courses within city limits. The ordinance prohibits non-stormwater discharges to the storm system and includes standards for:

- Preventing littering;
- Cleaning parking lots and gas station pavement;
- Providing BMPs for new development and redevelopment;
- Providing Notice of Intent, complying with and undertaking all activities described in an individual general stormwater permit; and
- Complying with BMPs.

The ordinance also includes the following:

- Responsible parties for administration and inspecting;
- Discharge prohibitions and exceptions to discharge prohibitions;
- Prohibitions of illicit discharge and illicit connections; and
- Reduction of pollutants in stormwater by individual citizens, occupants or tenants, operators of parking lots and gas stations, construction contractors, industrial dischargers, and persons owning or leasing property through which a watercourse passes.

In addition to the above provisions, the ordinance specifies the penalties for violations.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) contains the following policies that are relevant to the proposed project:

> Goal INF-3. Collect, store, and dispose of stormwater in ways that are safe, sanitary, environmentally acceptable and financially sound while maintaining the highest standards required to enhance the quality of life for existing and future residents.
>
> Policy INF-3.2. P3. The City shall take all necessary measures to regulate runoff from urban uses to protect the quality of surface and ground-waters and other resources from detrimental conditions.
>
> Policy OSC-2.1.P1. Require the implementation of Best Management Practices (BMPs) to minimize erosion, sedimentation, and water quality degradation resulting from the construction of new impervious surfaces.
>
> Policy OSC-2.1.P2. The City shall take all necessary measures to regulate runoff from urban uses to protect the quality of surface and groundwater.

Goal PS-2. Reduce hazards related to flooding or inundation.

Policy PS-2.1.P4. Only which have low flood damage potential and do not threaten other lands during times of flooding shall per permitted in the 100-year flood zone.

Policy PS-2.1.P5. Development shall only be allowed on lands within the 100-year flood zone, if it will not:

(a) Create danger to life and property due to increased flood heights or velocities caused by excavation, fill, roads, and intended use.

(b) Create difficult emergency vehicle access in times of flood.

(c) Create a safety hazard due to the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site.

(d) Create excessive costs in providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities.

(e) Interfere with the existing waterflow capacity of the floodway.

(f) Substantially increase erosion and/or sedimentation.

(g) Contribute to the deterioration of any watercourse of the quality of water in any body of water.

(h) Require storage of material, or any substantial grading or placement of fill.

Policy PS-2.1.P6. Both public and private service facilities and utilities in existing 10-year flood zones shall be floodproofed to a point at or above the base flood elevation.

Policy PS-2.1.P7. The City shall prevent the construction of flood barriers within the 100-year flood zone which will divert flood water or increase flooding in other areas.

APPENDIX 3.3

GEOLOGY AND SOILS

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

> Policy 309. The County shall not approve new development in areas with potential for seismic and geologic hazards unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis. The County shall review new development proposals in terms of the risk caused by seismic and geologic activity.
>
> Policy 310. The County, prior to approving new development, shall evaluate the degree to which the development could result in loss of lives or property, both within the development and beyond its boundaries, in the event of a natural disaster.
>
> Policy 311. The County shall ensure that new major public facilities, including emergency response facilities, and water storage, wastewater treatment and communications facilities, are sited in areas of low geologic risk.
>
> Policy 312. The County shall ensure that major transportation facilities and pipelines are designed, to the extent feasible, to avoid or minimize crossings of active fault traces and to accommodate fault displacement without major damage that could result in long-term disruption of service.
>
> Policy 315. The County shall require that buildings be designated and constructed to withstand groundshaking forces of a minor earthquake without damage, of a moderate earthquake without structural damage, and of a major earthquake without collapse of the structure. The County shall require that critical facilities and structures (e.g., hospitals, emergency operations centers) be designed and constructed to remain standing and functional following an earthquake.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) contains the following policies that are relevant to the proposed project:

> Policy 1. Restrict development in areas prone to seismic safety hazards.
>
> Program 1.3. Prohibit construction of facilities and systems vital to the public health and safety (e.g., water facilities, fire stations, hospitals, communication facilities, etc.) within the Alquist Priolo Earthquake Fault Zones.

Policy 2. Investigate the potential for seismic hazards during the development review process, and implement soil engineering and construction standards which minimize potential danger from earthquakes.

Program 2.2. Design and construct all structures to address potential seismic and geologic hazard conditions according to the State Uniform Building Code standards or more stringent standards. All structures and facilities not addressed by the UBC shall be designed and constructed to mitigate potential seismic and geologic hazards as recommended by site specific soils, geologic, and/or geotechnical engineering studies.

Policy 5. Investigate the potential for geologic hazards as part of the development review process, and maintain this information for the public record.

Program 5.1. Require site-specific soils studies for all new development prior to the issuance of building permits and prior to the approval of final improvement plans in areas with "Moderate," "Moderate to High," or "High" hazards for the following geologic hazards: seismic shaking, lateral spreading, differential settlement, lurch cracking, liquefaction, erosion, and expansive soils.

Program 5.2. Require site-specific geologic and/or geotechnical engineering studies prior to development approval in areas with "Moderate," "Moderate to High," or "High" hazards for the following geologic hazards: surface fault rupture, bank failures, rock falls, and landslides; and for areas with slopes equal or greater than 20 percent.

Program 5.3. Require measures to mitigate potential geologic safety hazards during adverse conditions such as saturated soils and groundshaking, and during grading of the site for roads, installation of infrastructure, and creation of building pads. Mitigation measures identified by the site engineering studies shall be incorporated into the project design.

Program 5.4. Require technical review and analysis of geotechnical studies by a qualified consulting geotechnical engineer reporting to the City. Incorporate the recommendations of the City's consulting engineer into the project design.

Program 5.5. Permit development in areas with a "high" susceptibility to geologic hazards only when geologic and soils investigations demonstrate that hazards can be mitigated by accepted engineering and construction techniques. Mitigation measures identified by the investigations shall be incorporated into the project design and subject to approval by the City's reviewing geologist/engineer.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) contains the following policies that are relevant to the proposed project:

Policy OSC-3.1.P1. Undeveloped lands that are State-designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland shall be preserved, to the greatest extent feasible, for open space or agricultural.

Policy PS-1.2.P2. Areas of high shrink-swell potential soils shall incorporate suitable mitigation measures. If development is allowed in areas of high shrink-swell potential,

special measures must be undertaken in site grading, foundation design and construction to alleviate potential movements.

Policy PS-1.2.P3. The City shall control site preparation procedures and construction phasing to reduce erosion and exposure and exposure of soils to the maximum extent possible.

APPENDIX 3.4

LAND USE

ALAMEDA COUNTY EAST COUNTY AREA PLAN

In the 1970s, Alameda County began a General Plan amendment process, which included development of documents on a geographic, or planning unit, basis. The geographic planning unit associated with the proposed project is covered under the East County Area Plan (amended 2002).

The East County planning area encompasses 418 square miles of unincorporated eastern Alameda County that surrounds the Cities of Dublin, Livermore, Pleasanton, and a portion of Hayward. The East County Area Plan was adopted by the Board of Supervisors in May 1994, and revised most recently in November 2002. Plans and policies relevant to the proposed project are discussed below:

> Policy 13. The County shall not provide nor authorize public facilities or other infrastructure in excess of that needed for permissible development consistent with the Initiative. This policy shall not bar 1) new, expanded, or replacement infrastructure necessary to create adequate service for the East County, 2) maintenance, repair or improvements of public facilities which do not increase capacity, and 3) infrastructure such as pipelines, canals, and power transmission lines which have no excessive growth-inducing effect on the East County area and have permit conditions to ensure that no service can be provided beyond that consistent with development allowed by the Initiative. "Infrastructure" shall include public facilities, community facilities, and all structures and development necessary to the provision of public services and utilities.
>
> Policy 71. The County shall conserve prime soils by (Class I and Class II, as defined by the USDA Soil Conservation Service Land Capability Classification) and Farmland of Statewide Importance and Unique Farmland (as defined by the California Department of Conservation Farmland Mapping and Monitoring Program) outside the Urban Growth Boundary.
>
> Policy 138. The County shall allow development and expansion of major public facilities (e.g., hospitals, research facilities, landfill sites, jails, etc.) in appropriate locations inside and outside the Urban Growth Boundary consistent with the policies and Land Use Diagram of the *East County Area Plan.*
>
> Policy 139. The County shall ensure that new major public facilities are properly sited to avoid land use conflicts and potential health and safety risks.
>
> Policy 252. The County shall encourage Zone 7 to pursue new water supply sources and storage facilities only to the extent necessary to serve the rates and levels of growth established by the Initiative and by the general plans of the cities within its service area.

Policy 255. The County shall encourage Zone 7 to maximize use of Chain of Lakes for water supply development and groundwater management. Zone 7 is encouraged to stage implementation of the system so that each component may be utilized as it becomes available.

Policy 256. The County shall discourage water service retailers from constructing new water distribution infrastructure which exceeds future water needs based on a level of development consistent with the Initiative.

In addition, the ECAP identifies policies associated with quarries and regionally significant aggregate resource areas. These policies are relevant to several o the wellfields that are located in the quarry area. Policies relevant to the proposed project include the following::

- Policy 160. states that "the County shall ensure that where quarry operations are located in areas designated as Water Management, extraction of the aggregate resource shall be allowed in the short-term. Reclamation of the land for water management and other compatible uses shall occur subject to conditions of surface Mining Permits and Reclamation Plans and consistent with the Specific Plan for Livermore-Amador Valley Quarry Area Reclamation or the comparable plan prepared for Sunol Valley / San Francisco Water Department watershed lands pursuant to Policy 161 and Program 71, whichever is applicable.

ALAMEDA COUNTY SPECIFIC PLAN FOR LIVERMORE-AMADOR VALLEY QUARRY AREA RECLAMATION

The *Alameda County Specific Plan for Livermore-Amador Valley Quarry Area Reclamation* (adopted November 1981) was prepared by three mining operators in conjunction with the Alameda County Planning Commission and input by Zone 7.[1] The Specific Plan discusses objectives, policies, and implementation of a reclamation program for the 3,280 acres sand and gravel quarry area, and serves as the framework and basis for future, detailed reclamation plans. It outlines the mining operator's obligation to dedicate the existing lakes, exterior perimeter areas and associated appurtenances to Zone 7 in order to mitigate for the adverse effects of mining on water resources, as well as return depleted lands to productive use. The Plan identifies the need to create a "Chain of Lakes," connected in series, to provide a surface storage and conveyance system to replace a portion of the pre-existing subsurface water storage and conveyance system feeding the groundwater basin. The document provides staging plans for 1995, 2010, and 2030, and identifies land uses associated with reclaimed areas for the year 2030. These uses include water management, agriculture, recreation, and various classes of development (residential, commercial, and industrial). Policy 12 of the Plan specifies that "Water areas may be used by Zone 7 for water conservation, water transmission, groundwater recharge, flood control and water

[1] Environ prepared a Livermore-Amador Valley Quarry Reclamation Plan in 1977, which develops the background and an overall master Reclamation Plan for the quarry area. In July 1979, Alameda County prepared an Environmental Impact Report (EIR) to consider the impacts of the Reclamation Plan. Environ prepared the 1980 Reclamation Plan Alternative Reclamation Plan to include measures that mitigate the impacts identified in the EIR and incorporates the results of meetings between mining operators and Zone 7. The 1981 Alameda County Specific Plan for Livermore-Amador Valley Quarry Area Reclamation was adopted on November 5, 1981.

quality management. Water areas may also be used for recreation, fish farming, and other productive uses to the extent such uses would be compatible with the first-named uses" (Alameda County Planning Department, 1979).

CITY OF PLEASANTON

No land use policies have been identified in the City of Pleasanton General Plan (1996) that relate to the siting or use of public utility infrastructure such as the proposed well facilities. The following policies are related to the provisions of public services.

> Goal 1. To provide sufficient public facilities and services to ultimately serve the City in maximum financially available increments while preserving and enhancing the quality of life for existing and future residents.
>
> Policy 4. Ensure an adequate water system for existing and future development, and maintain an adequate reserve of water in storage facilities.
>
> Program 4.2. Develop a contingency plan for potential water shortages including groundwater management and water conservation.
>
> Program 4.3. Work with Zone 7 to establish and monitor acceptable ranges of underground water levels and recharge when necessary.
>
> Program 4.6. Utilize water reclamation methods to the fullest extent feasible.
>
> Program 4.7. Work with Zone 7 to develop contingency plans for supplemental water sources independent of the State Water Project.

BERNAL PROPERTY SPECIFIC PLAN

The City of Pleasanton prepared the Bernal Property Specific Plan (Adopted by the City Council Resolution No. 00-111, August 21, 2000). The 300-acre Bernal Property is currently owned by SFPUC, but has been identified for acquisition by the City of Pleasanton. Based on extensive citizen participation, the City has prepared a Specific Plan for the Bernal Property to establish the future development potential and orderly development the site. The Bernal Property Specific Plan identifies the objectives and policies associated with its development, in the areas of: land use, open space, transportation / circulation, public facilities, and conservation and environmental mitigation.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) was recently adopted in 2004, and governs land use and development within the Livermore city limits. Goals and policies contained within the General Plan that are relevant to the proposed project include the following:

> Policy OSC-3.1.P1. Undeveloped lands that are State-designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland shall be preserved, to the greatest extent feasible, for open space or agricultural use.

Policy PS-5.1.P1. All construction in Livermore shall be consistent with the required setbacks and height restrictions for the Airport Protection Area, as well as the policies of a master plan adopted for future Airport operations.

APPENDIX 3.5
BIOLOGICAL RESOURCES

COUNTY AND LOCAL REGULATIONS, GOALS, AND POLICIES

The City of Livermore protects all vegetation planted within the public right-of-way on city streets as well as ancestral trees, which are specific trees or stands of trees so designated by the Livermore beautification committee. The City of Livermore requires a permit from the city maintenance superintendent to remove street vegetation and ancestral trees, but does not specify mitigation for removal.

Heritage trees, as defined by the City of Pleasanton, include all trees (except fruit or nut trees in orchards) with a circumference of 55 inches or more measured 4.5 feet above ground level; multi-trunked trees of which the two largest trunks have a total circumference of 55 inches or more measured 4.5 feet above ground level; any trees 35 feet or taller; trees with historical significance; or a tree within a stand that depends on each tree for survival or the area's natural beauty (City of Pleasanton, 1996a). Removal of heritage trees for development projects within the City of Pleasanton requires a tree survey plan of the project area completed by one of the city's consulting arborists, including all trees six inches or more in diameter at breast height (dbh). A permit from the Department of Public Works and Utilities and mitigation developed on a case-by-case basis, usually a replacement ratio of 4:1 using 24-inch box trees may be required.

TREE PRESERVATION

ALAMEDA COUNTY EAST COUNTY AREA PLAN

> Policy 110. Alameda County requires that developments are sited to avoid or, if avoidance is infeasible, to minimize disturbance of large stands of mature, healthy trees and individual trees of notable size and age. Where healthy trees are removed, the County requires a tree replacement program which includes a range of tree sizes, including specimen-sized trees, to achieve immediate visual effect while optimizing the long-term success of the replanting effort.

Chapter 12.08 of the of the Alameda County General Ordinance Code (Ordinance No. 0-2002-77) provides guidelines protecting trees (adopted by the Board of Supervisors on May 7, 2002). An encroachment permit is required for the removal of any tree (regardless of size and health) from the County right-of-way, and that the responsibility rests on the adjacent property owner, "who shall bear all costs of the removal and associated restoration of the right-of-way." All removed trees shall be replaced within 90 days by the owner at the owner's expense, and all replacements shall be in conformance to the standards and procedures provided by the director. A written maintenance agreement may be required as a condition of the permit.

Planting, pruning, trimming, guying, staking, root trimming, or removal of trees within the right-of-way would also require an encroachment permit. This includes "the installation of trees and all associated facilities, such as irrigation systems, tree wells, root barriers and supports, and all subsequent actions which could in any way affect the growth or health of such trees." As with the removal and replanting of trees, the responsibility is that of the adjacent property owner, who bears the costs of all necessary maintenance of the tree and the associated facilities. All maintenance and repair located within the right-of-way shall be performed by licensed landscape contractors, and "all general trimming and pruning shall be incompliance with the International Society of Arboriculture Pruning and Trimming Standards and the Standard Practices for Tree Care Operations (ANSI A300-1995)." The ordinance further states that any person or utility proposing to encroach in the vicinity of an existing tree shall submit a plan showing the extent of the activity, and the director may require that the plan be prepared by a certified arborist..

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) contains the following policy that is relevant to the proposed project.

> Policy. Preserve heritage trees throughout the Planning Area. Follow the provisions of the City's Heritage Tree Ordinance when reviewing future development projects.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) contains the following policy that is relevant to the proposed project.

> Objective OSC-1. Conserve Livermore's native trees and vegetation, which are important biological resources within Planning Area.

SPECIAL STATUS SPECIES PRESERVATION

ALAMEDA COUNTY EAST COUNTY AREA PLAN

> Policy 125. The County encourages preservation of areas known to support special status species.

CITY OF PLEASANTON

> Policy. Potential impacts on wildlife populations and habitats should be included in CEQA review of development projects.

CITY OF LIVERMORE

> Objective OSC-1.3. Conserve Livermore's native trees and vegetation, which are important biological resources within the Planning Area.

PRESERVE AND PROTECT STREAMS, CREEKS, AND WETLAND HABITAT

ALAMEDA COUNTY EAST COUNTY AREA PLAN

Policy 124. The County shall encourage the maintenance of biological diversity in East County including a variety of plant communities and animal habitats in areas designated for open space.

Policy 126. The County encourages no net loss of riparian and seasonal wetlands.

Policy 127. The County encourages the preservation of East County oak woodland plant communities.

Policy 129. The County shall protect existing riparian woodland habitat present along Arroyo Mocho, Arroyo Del Valle, Arroyo Las Positas, Arroyo de la Laguna; and Alamo, Tassajara, and Alameda Creeks.

CITY OF PLEASANTON

Policy. Preserve and enhance streambeds and channels in a natural state, except where needed for flood and erosion control.

Policy. Develop and implement ordinances and policies that provide for the preservation and restoration of riparian corridors, and establish mitigation requirements for modifications to such corridors.

Policy. Provide for the preservation of wildlife corridors, and require mitigation that minimizes barriers across wildlife corridors created by roadways and developments.

Policy. Preserve and enhance streambeds and channels in a natural state, except where needed for flood control and erosion control. Projects adjacent to the arroyos should be designed to protect habitat areas. For projects known to have or that may have wetlands present within their boundaries, preserve and enhance the resource value of the wetlands through project development design measures.

CITY OF LIVERMORE

Policy. Riparian woodlands and freshwater marshes shall be preserved. Developers shall be required to mitigate possible adverse impacts upon these resource areas. To the extent possible, arroyos and creeks shall be preserved in their natural state.

PLANT COMMUNITIES AND WILDLIFE HABITATS WITHIN THE WELLFIELD PLANNING AREA

Plant communities generally correlate with wildlife habitat types. However, high-quality wildlife habitat, as determined by the combination of a variety of healthy, stable vegetation communities allowing for wildlife diversity, is generally not present within the wellfield Planning Area due to the prevalence of urban development and other existing land uses, such as agriculture and gravel mining. Descriptions of common plant communities, sensitive plant communities, and special

status species potentially found in the project area are included in this section of the document. The wellfield-specific discussions identify the common and sensitive plant communities potentially occurring within each wellfield.

COMMON PLANT COMMUNITIES AND ASSOCIATED WILDLIFE HABITAT

ANNUAL GRASSLAND

Annual grasslands are herbaceous plant communities found throughout the project area. Due to the extent of urban development, grasslands range from relatively sparse or small isolated patches, to extensive and densely vegetated. Typical plant species in these areas include annual grasses such as soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus)*, wild oats (*Avena sp.)*, and foxtail barley (*Hordeum murinum*), as well as a wide range of non-native and native, usually annual herbaceous plants. Grasslands in the project area provide habitat for reptiles and amphibians such as western fence lizard (*Sceloporus occidentalis*), northern alligator lizard (*Elgaria coerulea*), and pacific tree frog (*Pseudacris regilla*), and birds including mourning dove (*Zenaida macroura*) and western meadowlark (*Sturnella neglecta*). In rural areas, grasslands can also be important foraging grounds for aerial and ground foraging insect eaters such as *Myotis* bat species and pallid bat (*Antrozous pallidus*). Mammals such as Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*), striped skunk (*Mephitis mephitis*), and black-tailed jackrabbit (*Lepus californicus*) may browse and forage within the grassland and thrive when varied natural habitats are available nearby. Small rodents attract raptors (birds of prey), many of them special status (see the discussion of wildlife resources section below) including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), and western burrowing owl (*Athene cunicularia hypugaea*).

RUDERAL

Ruderal (disturbed and weedy) habitats are a conspicuous component of road shoulders and other developed or disturbed areas. Disturbed habitats are most prevalent in areas subject to frequent and often severe vegetation and soil disturbances because of road maintenance, vehicle parking, and regular mowing and/or disking. Ruderal habitats are most commonly characterized as areas immediately adjacent to paved and dirt roads and areas that have been used as parking areas. Other ruderal habitats may include disked or fallow fields, construction sites, levees, and railroad or other public utility rights of way. This habitat type occurs frequently throughout the project area and is especially prevalent in semi-rural, low-density residential and agricultural land use types. Where vegetated, these sites are dominated by weedy non-native plant species, such as yellow star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echiodes*), curly dock (*Rumex crispus*), and bull thistle (*Cirsium vulgare*).

Ruderal habitats provide limited foraging or nesting habitat for disturbance tolerant and non-native birds and small mammals {*e.g.*, English sparrow (*Passer domesticus*), European starling (*Sternus vulgaris*), house finch (*Carpodacus mexicanus*), Norway rat (*Rattus norwegicus*), and house mouse (*Mus musculus*)}. Within the project area, less disturbed ruderal areas may be occupied by ground squirrels and other rodents. Although these areas are generally depauperate in wildlife, under appropriate conditions they may support sensitive plant and wildlife species such as tarplants (*Centromadia* sp.*)* and western burrowing owl.

URBAN LANDSCAPING

Ornamental trees, shrubs, grasses and urban landscaped areas comprise a large portion of the vegetation within the wellfield planning area. This is due to the focus on predominantly urbanized areas. The majority of ornamental vegetation consists of non-native plant species. When landscaped areas become isolated within urban centers, away from natural habitats such as streams or wetlands, they provide little habitat for native wildlife and only rarely support special-status species. Common wildlife species identified within these communities include European starling, house finch, yellow-billed magpie (*Pica nuttalli*), rock dove (*Columba livia*), northern mockingbird (*Mimus polyglottus*), and white-crowned sparrow (*Zonotrichia leucophrys*). With the exception of common rodents such as house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), Botta's pocket gopher, and fox squirrel (*Sciurus niger*), few mammals, amphibians or reptiles are expected in highly landscaped portions of the project area.

AGRICULTURAL

Agricultural habitats in the project area include croplands, and, orchards, irrigated pastureland, and non-irrigated rangeland/annual grassland. Agricultural areas are often subject to periodic discing, planting, harvesting, and the application of herbicides, pesticides, and fertilizers, which prevent the establishment of native plant species and communities. A number of ruderal plant species, including bristly ox-tongue, curly dock, and bull thistle are associated with cultivated lands, and are adapted to disturbed, bare ground. They mature rapidly and have high seed production. Agricultural lands may provide occasional habitat for transient mammals, reptiles, and amphibians, and have some value to birds. Small mammals, such as rabbits and rodents, forage on leaves and grasses, and in turn, may attract predatory raptors to agricultural areas. Orchard habitat may provide foraging resources to mammals such as mule deer (*Odocoileus hemionus*)and California ground squirrels, and birds such as northern flicker (*Colaptes auratus*), yellow-rumped warbler (*Dendroica coronata*), American robin (*Turdus migratorius*), and western scrub jay (*Aphelocoma californica*). This habitat also provides cover and nesting habitat for mourning dove and California quail (*Callipepla californica*).

RIPARIAN FOREST, WOODLAND, AND SCRUB

While riparian habitat along Arroyo Mocho, Tassajara Creek, Pleasanton Canal and Lines B-2-1 and B-2-2 are absent within the project area, riparian forest, woodland, and scrub habitat still remains along Arroyo del Valle and portions of Arroyo de la Laguna. Various species of willows

(*Salix* sp.) and cottonwood (*Populus* sp.) dominate these riparian communities. Understory species include native species such as California blackberry (*Rubus ursinus*), elderberry (*Sambucus mexicana*), and non-native species such as periwinkle (*Vinca major*) and fennel (*Foeniculum vulgare*). Herbaceous vegetation may include sedges, grasses and aquatic species (discussed below in Freshwater Emergent Wetland).

Although somewhat degraded by the invasion of non-native plant species, particularly in the understory vegetation layer, riparian habitats support some of the most diverse wildlife communities in the project area. The relatively high diversity of plant species, multi-layered vegetation, and perennial water provide a variety of foods and microhabitat conditions for wildlife. Mature willows and other riparian trees provide high-quality nesting habitat for Cooper's hawk (*Accipiter cooperii*), white-tailed kite, and other raptors. Cavity-nesting wildlife, such as the Nuttall's woodpecker (*Picoides nuttallii*), downy woodpecker (*Dendrocopos pubescens*), northern flicker, white-breasted nuthatch (*Sitta carolinensis*), and bat species require mature stands of trees. California blackberry and elderberry produce important fall and winter foods for birds and mammals. Common wildlife species that depend on the nectar, fruits and seeds of riparian plants include Anna's hummingbird (*Calypte anna*), black-headed grosbeak (*Pheuticus melanocephalus*), California towhee (*Pipilo crissalis),* raccoon (*Procyon lotor*), striped skunk, and gray fox (*Urocyon cinereoargenteus*).

Riparian vegetation supports an abundance of insect prey that feed on foliage and stems during the growing season. These insects, in turn, support a high density of migratory and resident birds, including the Pacific-slope flycatcher (*Empidonax difficilis*), Wilson's warbler (*Wilsonia pusilla*), warbling vireo (*Vireo gilvus),* and bushtit (*Psaltriparus minimus*). Abundant insect populations support numerous bat species as well. Woodpeckers excavate nest holes in live and dead trees, and these cavities are subsequently used by other cavity-nesting species, such as American kestrel, western screech owl (*Otus kennicottii*), tree swallow (*Tachycineta bicolor*), ash-throated flycatcher (*Myiarchus cinerascens*), and western bluebird (*Sialia mexicana*).

FRESHWATER EMERGENT WETLAND[1]

Freshwater emergent wetland occurs in the project area where year-round, shallow, standing water is present. Emergent wetlands are typically dominated by perennial emergent species, including cattail (*Typha* sp.), tule (*Scirpus* sp.), and umbrella sedge (*Cyperus eragrostis*), and watercress (*Rorippa nasturtium-aquaticum*). Annual species, such as water smartweed (*Polygonum* sp.), duckweed (*Lemna* sp.), and rabbit's-foot grass (*Polypogon monspeliensis*), are also common in emergent marsh. This habitat type is associated with the edges of canals, and flood control channels within the wellfield planning area. It may also occur along the edges of ponds and lakes within the gravel mining areas when these artificial water features remain undisturbed for a period of time.

[1] CNDDB identifies this sensitive community as coastal and valley freshwater marsh. This document will use the Wildlife Habitat Relationships habitat classification of freshwater emergent wetland.

The narrow band of emergent marsh vegetation along canals, flood control channels, and gravel ponds provides some nesting and foraging opportunities and cover for water bird species and small mammals, including mallard (*Anas platyrhynchos*), green-winged teal (*Anas crecca*), great egret (*Ardea alba*), red-winged blackbird (*Agelaius phoeniceus*), raccoon, and California vole (*Microtus californicus*). Large, extant, emergent wetlands are also important foraging grounds for several bat species.

SEASONAL WETLANDS

Seasonal wetlands provide important foraging habitat for resident and migratory birds and supply an abundant invertebrate food source. In addition, the importance and sensitivity of wetlands have increased due to their value as recharge areas and filters for water supplies, and due to widespread filling and destruction of wetlands for urban and agricultural development. Most plant and animal species that have adapted to ephemeral wetlands are unique to these habitats and have highly specialized life cycles. Seasonal wetlands within the project area may include vernal pools and alkali meadows. These sensitive plant communities and the special status plant and animals which may inhabit these areas are discussed in detail below. The National Wetlands Inventory maps (USFWS, 1976) for the Dublin and Livermore quadrangles do not map wetlands outside of the streams and gravel pits. The exception is for one emergent wetland at the southern end of the Hewlett Canal, near Arroyo Mocho. This area was subsequently developed and the wetland no longer exists.

AQUATIC HABITAT

The quality of aquatic habitats in the project area varies considerably, influenced by the degree of channelization, channel lining, and annual or perennial flow. Generally, streams in the project area provide aquatic habitat for a relatively limited variety of wildlife as channelization of waterways for flood control management has eliminated the majority of aquatic habitat or reduced it to a very low habitat value. Arroyo Mocho, Tassajara Creek, Pleasanton Canal and Lines B-2-1 and B-2-2 provide habitat that ranges from low to moderate in quality. These waterways do support common amphibians, such as pacific chorus frog (*Hyla regilla*), and the non-native bullfrog (*Rana catesbeiana*), as well as introduced fish species, including carp (*Cyprinus carpo*) and mosquito fish (*Gambusia affinis*). A number of lakes and ponds exist within the gravel mining areas and likely provide aquatic habitat of variable quality, depending on disturbance levels.

Where stream channels remain natural, along portions of Arroyo de la Laguna and Arroyo del Valle, they may provide habitat for western toad (*Bufo boreas*), garter snake (*Thamnophis sirtalis*) and gopher snake (*Pituophis melanoleucus*). Aquatic plants provide aquatic food-chain support in the form of insect larvae and water bugs such as stoneflies (Plecoptera), mayflies (Ephemoroptera), water beetles (Coleoptera), and true aquatic bugs (Heteroptera). Special status species associated with this habitat include the California red-legged frog (*Rana aurora draytonii*), western pond turtle (*Clemmys marmorata*), and California tiger salamander (*Ambystoma californiense*).

Central California steelhead (*Oncorhynchus mykiss*) are known historically from the Alameda Creek watershed, which includes this portion of the Livermore Valley. Arroyo Mocho, Arroyo del Valle, and Arroyo de la Laguna are all tributary to Alameda Creek, which historically contained anadromous steelhead trout, resident rainbow trout, and other native fishes. Native rainbow trout are still known from the considerably less disturbed upper reaches of Arroyo Mocho and are sometimes found in the more urbanized reaches of this stream. Currently, the Alameda Creek system has a low potential for supporting a sustainable steelhead trout run due to significant barriers that exist throughout.

SPECIAL STATUS SPECIES IN THE WELLFIELD PLANNING AREA

A comprehensive list of special status plant and animal species, as well as sensitive natural communities, reported to occur within the vicinity of the project area was compiled from the California Department of Fish and Game's California Natural Diversity Data Base (CNDDB) (CDFG, 2002a) and Special Animals and Plants lists (CDFG, 2002b; CDFG 2002c); the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2002); U.S. Fish and Wildlife Service (USFWS) official lists of proposed, candidate, and listed threatened and endangered species and species of special concern that may occur in the project area (USFWS, 2002); and biological literature of the region. This comprehensive list is presented in **Table A.3.5-1** at the end of this section.

One hundred seventy-five special status animal species, plant species, and natural communities at all levels of federal or state concern were evaluated in this analysis, including:

- 30 species listed as threatened or endangered at the federal or state level;
- One species proposed for listing as federally threatened;
- Two federal candidate species;
- 95 federal or state special concern or other special status species;
- Seven plant species of concern listed by the California Native Plant Society;
- Seven natural communities considered sensitive by the state.

Of these, 141 plants and animals and five natural communities were removed from further consideration due to (1) the known range of the species falling outside the project area, (2) lack of suitable habitat in the project area or its immediate vicinity, (3) low occurrence potential in the project area or project vicinity, or (4) determination that, although a species may occur in the project area or its immediate vicinity, these species would avoid either direct or indirect impacts due to proposed construction alternatives.

Thirty-four special status species with a low to moderate to high potential for occurrence and two sensitive natural communities known to occur in the project area and/or immediate vicinity were retained for analysis. These plant and animal species, as well as sensitive communities, their status, general habitat requirements and potential to occur are presented in **Table 3.5-1** in **Section 3.5**. Species accounts for species listed as threatened or endangered by the federal government or the state of California are given below.

SPECIAL STATUS PLANT SPECIES

Special status plants are defined as such because they are:

- listed or proposed for listing as Threatened or Endangered under the federal Endangered Species Act (FESA) (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species);
- Federal Candidates for listing as Threatened or Endangered under the FESA (58 FR 188: 51144-51190, September 30, 1993);
- Federal Species of Concern or California Species of Special Concern;
- Listed by the State of California as Threatened or Endangered under the California Endangered Species Act (CESA) (14 CCR 670.5);
- Plants listed as rare under the California Native Plant Protection Act of 1977 (California Fish and Game Code, Section 1900 et seq.); and
- Plants considered by CNPS to be "Rare, Threatened, or Endangered in California" (generally species from Lists 1B and 2).

Twelve plants species and two sensitive plant communities were retained for analysis in this document (see **Table 3.5-1** in **Section 3.5**). Documented occurrences of these species are typically located in areas of natural vegetation and open space within otherwise highly disturbed areas. Many of these documented occurrences are either historic (*i.e.*, documented before extensive urbanization or other disturbance) and therefore mapped as large, unspecific areas of potential occurrence, or have since been extirpated by development. Several species may occupy habitat adjacent to the proposed activity, but would not be subject to direct affects of construction. The following special status plant species were determined most likely to potentially occur within, or in habitat adjacent to, the project area: the federally and state endangered palmate-bracted bird's beak and the federally endangered Contra Costa goldfields. Other plant species include alkali milk-vetch, heartscale, brittlescale, San Joaquin spearscale, Congdon's tarplant, hispid birds-beak, Livermore tarplant, recurved larkspur, little mousetail, and saline clover. The two listed plant species have a low to moderate potential for occurrence within the project area.

Palmate-bracted bird's beak (*Cordylanthus palmatus*): This member of the figwort family (Scrophulariaceae) is listed as endangered by both the federal government and the state of California. With gray-green, glandular, hairy foliage and whitish-lavender two-lipped flowers, this species inhabits alkaline areas in grassland habitat. Areas of annual grassland, as well as agricultural fields and fallow fields exist in the Isabel, Chain of Lakes, Stanley, Gravel Pit and Martin wellfields. If soils in these areas exhibit alkaline characteristics and seasonal ponding occurs, then suitable habitat may be present for palmate-bracted bird's beak. A number of plant species of special concern may also be present, including alkali milk-vetch (*Astragalus tener* var. *tener*), San Joaquin spearscale (*Atriplex joaquiniana*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), Livermore tarplant (*Deinandra bacigalupii*), and saline clover (*Trifolium*

depauperatum var. *hydrophilum*) (see **Table 3.5-1** in **Section 3.5** for other species that may occur under these conditions).

Contra Costa goldfields (*Lasthenia conjugens*): A small erect annual of vernal pools and grasslands with a bright yellow, daisy-like flower and ranges from 1-4 decimeters in height. This species is currently known from vernal pools and surrounding valley and foothill grassland in Solano County, as well as a few sites in Napa County, at elevations ranging from sea level to 700 feet. The range of Contra Costa goldfields once extended throughout the Sacramento-San Joaquin Valley, Sierra Nevada foothills, and Inner Coast Ranges from Mendocino County to Santa Barbara County. Within the San Francisco Bay Area, it is believed to have been extirpated in Contra Costa, Alameda, and Santa Clara counties. Many historic populations have been extirpated by development. Because of habitat loss to grazing, agriculture, and urban residential and industrial development, the species is listed as endangered by the federal government.

Critical Habitat for Sensitive Plant Species

Critical habitat is defined as the specific areas located within the geographical regions occupied by a threatened or endangered species that include physical and biological features essential to that species' conservation and survival. Critical habitat also includes areas outside the geographical area occupied by the species that are determined to be essential to its conservation. Designated critical habitat for any special status plant species does not encompass the project area.

Sensitive Plant Communities

For this assessment, sensitive plant communities include those communities that are especially diverse, regionally uncommon, considered sensitive natural communities (as defined by Holland (1986) or documented in CNDDB (2002), or covered by state or federal regulations (*e.g.*, Section 404 of the Clean Water Act and Section 1600 of the CDFG Code). Most sensitive plant communities are given special consideration because they are limited in extent due to habitat modification, and provide important ecological functions, such as water quality maintenance and essential habitat for plants and wildlife. Some plant communities support a unique or diverse assemblage of plant species; therefore, they are considered sensitive from a botanical standpoint. The following sensitive plant communities and habitat types occur or may occur within the project area:

Alkali Meadow: Alkali meadows are dominated by low growing perennial grasses and sedges. Characteristic species include salt grass (*Distichlis spicata*) and hispid bird's beak (*Cordylanthus mollis* ssp. *hispidus*). The Livermore-Amador Valley floor likely supported this plant community historically. However, the prolonged period of disturbance that has occurred as the valley was settled and has undergone a variety of changes in land use has served to extirpate much of this community from the area. Nonetheless, it is possible that remnants exist in less disturbed areas or are able to re-establish when disturbance ceases. Alkali meadows may occur in grasslands in the undisturbed portions of Gravel Pit, Chain of Lakes, Stanley Avenue and Isabel wellfields in areas where soil salt concentrations and soil moisture are high.

Northern Claypan Vernal Pool: These vernal pools form in grasslands underlain by old, neutral to alkaline cemented hardpan that prohibit percolation of water through the soil. They are dominated by low growing, amphibious, herbaceous plants, including annual herbs and grasses such as *Downingia* sp., goldfields (*Lasthenia* sp.), and little mousetail (*Myosurus minimus*). Germination and growth begin with winter rains, often continuing even when inundated. Pools may range in size from a few square meters to several hectares. Vernal pools can provide habitat for fairy shrimp (*Branchinecta* sp.), vernal pool tadpole shrimp (*Lepidurus packardi*), and California tiger salamander (*Ambystoma californiense*). Vernal pools occurred throughout the Livermore-Amador Valley historically and may still occur in the undisturbed portions of Gravel Pit, Chain of Lakes, Stanley Avenue and Isabel wellfields.

Riparian Forest: Most riparian habitat types are considered sensitive by the state. This habitat type occurs along Arroyo del Valle and the lower reaches of Arroyo de la Laguna within the project area. Cottonwood and willow dominate the overstory along these streams, while the understory is a mix of native and non-native vegetation. Riparian communities provide habitat for numerous common amphibians, reptiles, mammals, and birds. In addition, large trees within these communities provide potential foraging and nesting habitat for a variety of special status species such as Cooper's hawk, white-tailed kite, and small-footed Myotis (*Myotis ciliolabrum*).

Aquatic Habitat/Freshwater Emergent Wetland: As described above, several streams run through the project area and these retain aquatic habitat values in at least some reaches. However, the entire length of Arroyo Mocho and the upper reaches of Arroyo de la Laguna as they run through the project area have been channelized, thus degrading habitat values. The lower reaches of Arroyo de la Laguna and Arroyo del Valle remain largely unchannelized. Where streams have been channelized, they are characterized by trapezoidal earth channels, instream freshwater emergent wetlands, non-native vegetation dominating the banks, and as lacking a developed riparian canopy. Where streams within the project area have not been channelized they are characterized by cottonwood-willow riparian forest and scrub and higher habitat values are generally provided. California red-legged frog may occur in drainages and adjacent habitats throughout the project area. Although, results of two years of protocol-level surveys for the species at sites in Arroyo de la Laguna and Arroyo del Valle were negative (ESA 2001, 2002a). Large areas of freshwater emergent wetlands provide nesting habitat for tricolored blackbird (*Agelaius tricolor*). Riparian forest provides nesting and foraging habitat for numerous special status birds as well as for bats. Lakes and ponds in this region also are relatively abundant, and provide varying degrees of aquatic habitat depending on size and condition.

SPECIAL STATUS WILDLIFE

In this document, the term special-status wildlife includes species that are:

- Listed or proposed for listing as Threatened or Endangered under the FESA (50 CFR 17.11 [listed animals] and various notices in the Federal Register for proposed species);
- Federal Candidates for listing as Threatened or Endangered under the FESA (58 FR 188: 51144-51190, September 30, 1993);

- Federal Species of Concern or California Species of Special Concern;
- Listed by the state of California as Threatened or Endangered under CESA (14 CCR 670.5), and;
- Fully protected animals in California (California. Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians].
- Nesting activity of all native bird species in California is protected under California Fish and Game Code (Code) Section 3503. Section 3503.5 specifically protects nesting raptors. Section 3513 of the Code and the Federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989) prohibit the killing, possession, or trading of migratory birds. Finally, Section 3800 of the Code prohibits the taking of non-game birds, which are defined as birds occurring naturally in California that are not game birds or fully protected species.

Twenty-two animal species were retained for analysis in this document (see **Table 3.5-1** in **Section 3.5**). Of these, five are listed as threatened or endangered species or are candidate species for listing by the federal government or State of California. The following species were determined to be most likely to occur, or have been observed, in habitats within or adjacent to areas of potential wellfield development: the federally threatened California red-legged frog, the California tiger salamander, a candidate for federal listing, and the following federal and state species of special concern western pond turtle, Cooper's hawk, tricolored blackbird, grasshopper sparrow, western burrowing owl, northern harrier, white-tailed kite, California horned lark, and loggerhead shrike. Mammals of concern to the project are limited to bats, predominantly of the genus *Myotis*, which may establish roosts in trees, under bridges, and in abandoned buildings in rural or urban areas. Finally, three federally endangered invertebrates and three invertebrates of federal special concern were determined to have a low to moderate potential for occurrence within the project area. Their presence depends on suitable aquatic habitat (e.g., alkali meadow or vernal pool), which may occur in the undisturbed portions of Gravel Pit, Chain of Lakes, Stanley Avenue and Isabel wellfields.

The five federal and state threatened and endangered or proposed animal species described below have a low to moderate potential for occurrence in the project area:

Longhorn fairy shrimp *(Branchinecta longiantenna)*: Longhorn fairy shrimp generally inhabit moderately deep, medium to large-sized grass-bottomed and clay-bottomed alkaline pools and moderately deep, small to medium-sized pools that form in rock outcrops. Individuals have been observed in pools less than one square meter in area to pools as large as 0.7 acre. The depth of known, occupied habitats ranges from 8 inches to 20 inches. Longhorn fairy shrimp are similar in shape and habit to vernal pool fairy shrimp, although they are typically smaller (e.g., 0.8 inch). Female longhorn fairy shrimp carry eggs in a cylindrical, ventral brood sac. The male antennae are relatively long, and have low, wart-like mounds on the medial surface of the distal end of their basal segments.

Vernal pool fairy shrimp (*Branchinecta lynchi*): This crustacean is restricted to vernal pools and swales and other seasonal aquatic habitats in California. The vernal pool fairy shrimp inhabits vernal pools with tea-colored water, most commonly in grass or mud bottomed swales, or

basalt flow depression pools in unplowed grasslands. This fairy shrimp has been collected from early December to late May. Thirty-two populations of the vernal pool fairy shrimp are known to exist: (1) extending from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and, (2) along the central Coast Range from northern Solano County to Pinnacles National Monument in San Benito County.

Vernal pool tadpole shrimp *(Lepidurus packardi)*: This crustacean is restricted to vernal pools and swales and other seasonal aquatic habitats in California. The vernal pool tadpole shrimp has dorsal compound eyes, a large shield-like carapace that covers most of the body, and a pair of long cercopods at the end of the last abdominal segment. Their diet consists of organic detritus and other invertebrates, such as fairy shrimp. This invertebrate inhabits vernal pools containing clear to highly turbid water, and ranging in size from 54 square feet to the 89-acre Olcott Lake at Jepson Prairie. The life history of the vernal pool tadpole shrimp is linked to the phenology[2] of the vernal pool habitat. After winter rainwater fills the pools, the populations are reestablished from diapause[3] eggs that lie dormant in the dry pool sediments.

California tiger salamander (*Ambystoma californiense*): This salamander is a large, black salamander with pale yellow spots, occurring in the Central Valley of California and adjacent valleys and foothills. Agricultural and urban development in the Central Valley have eliminated much of the former habitat of this species. These salamanders breed primarily from December through February, spending the majority of its adult life in subterranean refugia, such as ground squirrel burrows, in grasslands. Adult salamanders emerge for only a few weeks per year from their underground retreats adjacent to breeding habitat, generally at the height of the rainy season. At which time, they move to temporary rain pools, streams, and ponds to mate and lay their eggs. During the short breeding season, salamanders can be observed moving to temporary rain pools, ponds, streams, and lakes. Eggs are usually laid singly or may be in small clusters attached to vegetation in shallower water. The tiger salamander feeds on earthworms, snails, insects, fish, and small mammals.

California red-legged frog (*Rana aurora draytonii*): The California red-legged frog is chiefly a pond frog that can be found in quiet permanent waters of ponds, pools, streams, springs, marshes, and lakes. Moist woodlands, forest clearings, and grasslands also provide suitable upland habitat for this species in the non-breeding season. Adult frogs seek waters with dense vegetation, such as cattails, along the shore for cover; however, they may be found in unvegetated waters as well. California red-legged frogs are active year-round along the coast but will aestivate[4] from late summer to early winter inland. Adults consume insects such as beetles, caterpillars and isopods, while tadpoles forage on algae and detritus.

[2] Phenology: Meterology applied to climatic conditions as affecting the conditions and the development of animals and plants.

[3] Diapause: A period of arrested growth and development.

[4] Aestivate: A state of dormancy.

Critical Habitat for Listed Wildlife Species

Arroyo Mocho was considered by the National Marine Fisheries Service (NMFS) as part of designated Critical Habitat for Central California coast steelhead (NMFS, 2000). However, this designation was recently overturned in a court case and is currently suspended.

WATERS OF THE UNITED STATES (INCLUDING WETLANDS)

For the purpose of this document, the term "waters of the U.S." is an encompassing term used by the U.S. Army Corps of Engineers (Corps) for areas that would qualify for federal regulation under Section 404 of the Clean Water Act. Waters of the United States are separated into wetlands and other waters of the United States.

Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 Code of Federal Regulations [CFR] 328.3[b], 40 CFR 230.3). To meet the Corps' criteria as a Section 404 wetland, a site must be subject to hydrological conditions that result in inundated or saturated soils, and that support vegetation that is adapted to such conditions.

Other waters of the U.S. are sites that typically lack one or more of the three indicators identified above (wetland hydrology, vegetation, or soils). Other waters of the U.S. that may occur in the project area include drainages and seasonal wetlands that form in shallow, disturbed depressions in ruderal habitat. For the purpose of this document, drainages include all streams, creeks, rivers, and other surface features with defined beds and banks.

Waters of the U.S. occurring within the project area are discussed below. In addition to these streams and canals, wetlands subject to Corps jurisdiction are also present within the project area and may be affected by project activities. Wetland habitats in the project area include freshwater emergent wetland and may include seasonal wetlands. Freshwater emergent wetlands occur along Arroyo Mocho, Arroyo de la Laguna, Pleasanton Canal and Lines B-2-1 and B-2-2. They may occur, if only ephemerally, due to periodic disturbance, along the shores of the numerous lakes and ponds within gravel mining areas. Seasonal wetlands may occur in non-native grassland habitat and fallow agricultural fields, as well as within gravel mining areas. These habitat types were described previously in the section on plant communities. As noted previously, no wetlands were mapped outside of the flood control channels and gravel pits by the USFWS (USFWS, 1976), except for one emergent wetland at the southern end of the Hewlett Canal, near Arroyo Mocho. This area was subsequently developed and the wetland no longer exists.

ARROYO MOCHO, TASSAJARA CREEK, PLEASANTON CANAL

Within the project area, Arroyo Mocho, Tassajara Creek and Pleasanton Canal have been channelized and are straight, trapezoid earthen channels with perennial flow. There is no riparian canopy cover along Tassajara Creek or Pleasanton Canal and most reaches of Arroyo Mocho. There are some scattered eucalyptus trees along Arroyo Mocho where it forms the boundary

between the Gravel Pit Wellfield and the Chain of Lakes Wellfield. Vegetation on the slopes of the channel is dominated by ruderal species, such as poison hemlock (*Conium maculatum*) and annual grassland. Where in-channel vegetation occurs it is often dominated by tule and cattail and often includes large patches of watercress and algae on the water's surface. The dimensions of open water and emergent vegetation vary depending on location. Arroyo Mocho is the largest channel with a width of 60 feet, in some reaches.

ARROYO DE LA LAGUNA

Arroyo de la Laguna parallels I-680 on the western border of the project area (forming the western boundaries for the Hopyard and Bernal wellfields). It is a wide, warm water, moderately swift stream channel. Arroyo de la Laguna has been channelized throughout approximately half of the project area (down to Bernal Avenue). Vegetation along the modified reaches is similar to that found along Arroyo Mocho, Tassajara Creek and Pleasanton Canal.. Arroyo de la Laguna downstream of Bernal Avenue (adjacent to the Bernal Wellfield) supports a dense riparian canopy of cottonwood and willow, along with some urban landscape-type of trees and shrubs. This portion of Arroyo de la Laguna has not been channelized; however, it has been directly and indirectly by a variety of land uses.

ARROYO DEL VALLE

Within the project area, Arroyo del Valle remains unchannelized. This is a deep, slow moving stream, with steep banks and average water depths up to four feet in observed reaches (ESA 2002a). However, there are sections of Arroyo del Valle, in the Bernal Wellfield that are dry in the summer months (ESA 2002b). Arroyo del Valle supports a dense riparian forest of cottonwood (*Populus fremontii*) and willow (*Salix lasiolepis*) along the entire reach that passes through the Bernal and Valley Avenue wellfields. California blackberry and periwinkle (*Vinca major*) line the lower banks and fennel poison hemlock, and non-native grasses dominate the upper banks.

LINES B-2-1 AND B-2-2

Lines B-2-1 and B-2-2 parallel the Western Pacific Railroad tracks, which forms the eastern boundary of the Bernal Wellfield. Line B-2-2 flows into Line B-2-1, which flows into Arroyo de la Laguna above the Castlewood Country Golf Course. During the summer months, the water is stagnant and water does not flow into Arroy de la Laguna. These channels are smaller than Arroyo Mocho, Tassajara Creek and Pleasanton Canal, being about 20 feet wide. Annual grassland is found on the channel slopes and emergent wetlands are found in the bottom of the channels. However, downstream of I-680, trees are found along the south bank of Line B2-1 and the maintenance road. The tree species consist of pines (*Pinus* sp.), walnuts (*Juglans* sp.), valley oak (*Quercus lobata*), and coast live oak (*Q. agrifolia*).

TABLE A.3.5-1
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
SPECIES LISTED OR PROPOSED FOR LISTING		
Invertebrates		
Longhorn fairy shrimp *Branchinecta longiantenna*	FE/--	Endemic to small, rain-filled grassland pools of the Central Valley
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/--	Grassland vernal pools
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus* Critical habitat designated	FT/--	Occurs primarily in the California Central Valley in association with blue elderberry (*Sambucus mexicana*)
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT/--	Serpentine bunchgrass grassland with healthy populations of larval host, *Plantago erecta*
Vernal pool tadpole shrimp *Lepidurus packardi*	FE/--	Vernal pools
Fish		
Delta smelt *Hypomesus transpacificus* Critical habitat designated	FT/CT	Restricted to the Sacramento-San Joaquin Delta, including Suisun and San Pablo Bays and the Carquinez Strait.
Coho salmon—Central California coast ESU *Oncorhynchus kisutch*	FT/CE	Accessible Bay Area and coastal rivers and streams with cover, cool water and sufficient dissolved oxygen. Require beds of loose, silt-free gravel for spawning.
Steelhead – Central California Coast ESU *Oncorhynchus mykiss irideus* Critical Habitat designated	FT/CSC	Accessible Bay Area and coastal rivers and streams
Steelhead-Central Valley ESU *Oncorhynchus mykiss irideus* Critical Habitat designated	FT/--	Spawn in the Sacramento and San Joaquin Rivers and their tributaries, migrate through San Francisco and Suisun Bays, as well as the Delta region
Chinook salmon—Central Valley spring-run *Oncorhynchus tshawytscha* Critical Habitat designated	FT/CT	Spawning and rearing restricted to Sacramento River basin, migrate through San Francisco Bay and Sacramento-SanJoaquin Delta

[1] List compiled from CNNDB (2002), CNPS (2002), and USFWS (2002) official lists of species recorded as occurring or with the potential to occur in the project area USGS quadrangles and the surrounding 10 quadrangles

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
SPECIES LISTED OR PROPOSED FOR LISTING (cont.)		
Fish (cont.)		
Chinook salmon—fall/late fall-run *Oncorhynchus tshawytscha* Critical Habitat proposed	FC/CSC	Spawning and rearing restricted to Sacramento River basin, migrate through San Francisco Bay and Sacramento-SanJoaquin Delta, require clean, cold water and gravel beds
Chinook salmon—winter run *Oncorhynchus tshawytscha*	FE/CE	Spawning restricted to the Sacramento River. Requires clean, cold water with gravel beds.
Sacramento splittail *Pogonichthys macrolepidotus*	FT/CSC	Slow moving river sections and dead-end sloughs with flooded vegetation for spawning and foraging for young.
Amphibians		
California tiger salamander *Ambystoma californiense*	FC/CSC	Seasonal freshwater ponds with little or no emergent vegetation. Utilizes mammal burrows in upland habitat for aestivation during the dry season.
California red-legged frog *Rana aurora draytonii*	FT/CSC	Breed in stock ponds, pools, and slow-moving streams with emergent vegetation for escape cover and egg attachment. Where water is seasonal often utilizes mammal burrows in upland habitat for aestivation
Reptiles		
Alameda whipsnake *Masticophis lateralis euryxanthus* Critical Habitat designated	FT/CT	Preferred habitat a mosaic of open coastal scrub or chaparral and grassland with rocky outcrops
Giant garter snake *Thamnophis gigas*	FT/CT	Freshwater marsh and slow streams
Birds		
Western snowy plover *Charadrius alexandrinus nivosus*	FT/CSC	Nests and forages on sandy beaches on marine and estuarine shores - requires sandy, gravely, or friable soils for nesting

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
SPECIES LISTED OR PROPOSED FOR LISTING (cont.)		
Birds (cont.)		
Mountain plover *Charadrius montanus*	FPT/CSC	Winters in areas with short-grasses or plowed fields with bare ground and flat topography. Prefer grazed areas and those with burrowing rodents.
American peregrine falcon *Falco peregrinus anatum*	Delisted/CE	Nests near wetlands, lakes, rivers, or other water on cliffs, banks, human structures
Greater sandhill crane *Grus canadensis tabida*	--/CT	Winters in the Central Valley. Prefers grain fields within 4 miles of a shallow body of water.
Bald eagle[2] *Haliaeetus leucocephalus*	FT/CE	Nests and forages on inland lakes, reservoirs, and rivers; winter foraging at lakes and along major rivers
California black rail *Laterallus jamaicensis coturniculus*	FSC/CT	Nests and forages in tidal emergent wetland with pickleweed and cordgrass
California brown pelican *Pelecanus occidentalis californicus*	FE/CE	Nests on coastal islands of small to moderate size that afford protection from predators.
California clapper rail *Rallus longirostris obsoletus*	FE/CE	Nests and forages in emergent wetlands with pickleweed, cordgrass, and bulrush
Bank swallow *Riparia riparia*	--/CT	Nests primarily in riparian and other lowland habitat. Requires vertical banks or cliffs with fine textured or sandy soils near water.
California least tern *Sterna antillarum browni*	FE/CE	Colonial breeder on bare or sparsely vegetated flat substrates including sand beaches, alkali flats, land fills, or paved areas

[2] The bald eagle was proposed for delisting by the U.S. Fish and Wildlife Service on July 6, 1999.

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
SPECIES LISTED OR PROPOSED FOR LISTING (cont.)		
Mammals		
Riparian woodrat *Neotoma fuscipes riparia*	FE/CSC	Generally found in riparian areas supporting a mixture of trees and brush. Require suitable nesting sites such as cavities in trees, snags, or logs; spaces in talus; or lodges built of downed woody material, which are usually a conspicuous feature of areas inhabited by the species.
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE/CE	Saline emergent marsh with dense pickleweed
Riparian brush rabbit *Sylvilagus bachmani riparius*	FE/CE	Found in San Joaquin Valley native riparian areas with large clumps of dense shrubs, low growing vines, some tall shrubs and scrubby trees.
San Joaquin kit fox *Vulpes macrotis mutica*	FE/CT	Annual grasslands or open scrublands with loose textures soils for burrowing and suitable prey base
Plants		
Large-flowered fiddleneck *Amsinckia grandiflora*	FT/CE/List 1B	Cismontane woodland, valley and foothill grassland
Palmate-bracted bird's–beak *Cordylanthus palmatus*	FE/CE/List 1B	Alkaline areas in chenopod scrub or valley and foothill grassland
Santa Cruz tarplant *Holocarpha macradenia* Critical Habitat designated	FT/CE/List 1B	Coastal scrub, coastal sand dunes, openings in oak woodlands with sandy or gravelly soil
Contra Costa goldfields *Lasthenia conjugens*	FE/--/List 1B	Moist grasslands, vernal pools, cismontane woodlands, alkaline playas
Rock sanicle *Sanicula saxatilis*	--/CR/List 1B	Rocky substrates in valley and foothill grassland, chaparral, cismontane woodland
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN		
Invertebrates		
Opler's longhorn moth *Adela oplerella*	FSC/--	Serpentine grasslands, larvae feed on *Platystemon californicus*

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Invertebrates (cont.)		
Monarch butterfly *Danaus plexippus*	--/*	Winter in California. Roost in wind protected eucalyptus,) Monterey pine, and cypress groves, with water and nectar sources nearby.
Bridge's coast range shoulderband *Helminthoglypta nickliniana bridgesi*	FSC/--	Found in tall grasses and weeds on open grassy hillsides
Ricksecker's water scavenger beetle *Hydrochara rickseckeri*	FSC/--	Aquatic
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	FSC/--	Found in vernal pools and alkali flats
California linderiella *Linderiella occidentalis*	FSC/--	Seasonal pools in intact grasslands where alluvial soils are underlaid by hardpan or in sandstone depressions
Molestan blister beetle *Lytta molesta*	FSC/--	Central Valley of California; from Contra Costa to Kern and Tulare Counties.
Fairmont microblind harvestman *Microcina lumi*	FSC/--	Serpentine grassland with rocky outcrops for cover
Fish		
Green sturgeon *Acipenser medirostris*	FSC/--	Spawn in the Sacramento River and its tributaries, the San Francisco Bay system provides rearing habitat for juveniles
River lamprey *Lampetra ayresi*	FSC/--	Larger coastal streams in the San Francisco Bay drainage system
Pacific lamprey *Lampetra tridentata*	FSC/--	Pacific Ocean and estuaries; spawning in coastal streams from Alaska to Baja California
Longfin smelt *Spirinchus thaleichthys*	FSC/--	Sacramento-San Joaquin estuary in the salt or brackish water portions of the estuary, require fresh water, sandy-gravel substrates, rocks, and aquatic vegetation for spawning
Amphibians		
Foothill yellow-legged frog *Rana boylii*	FSC/CSC	Partly shaded streams with riffles and quiet pools absent of predatory fish

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Amphibians (cont.)		
Western spadefoot toad *Spea hammondii*	FSC/CSC	Floodplains and grassland pools
Reptiles		
Silvery legless lizard *Aniella pulchra pulchra*	FSC/CSC	Sparsely vegetated areas with sandy or loose loamy soils having a high moisture content
Western pond turtle *Clemmys marmorata marmorata*	FSC/CSC	Freshwater ponds and slow streams, marshes, rivers, and irrigation ditches with upland sandy soils for laying eggs
Southwestern pond turtle *Clemmys marmorata pallida*	FSC/--	Permanent or nearly permanent bodies of water in a variety of habitat types. Require basking sites such as partially submerged logs or open mud banks.
San Joaquin coachwhip *Masticophis flagellum ruddocki*	FSC/CSC	Open dry habitats with little or no tree cover, such as grassland or open scrub. Requires mammal burrows for oviposition and refuge.
California horned lizard *Phrynosoma coronatum frontale*	FSC/CSC	Patchy open areas with sandy soils
Birds		
Cooper's hawk *Accipiter cooperi*	--/CSC	Nests in riparian growths of deciduous trees and live oak woodlands
Sharp-shinned hawk *Accipiter striatus*	--/CSC	Nests in riparian growths of deciduous trees and live oaks
Tricolored blackbird *Agelaius tricolor*	FSC/CSC	Riparian thickets and emergent vegetation near open water
Grasshopper sparrow *Ammodramus savannarum*	FSC/	Pastures, grasslands, old fields
Bell's sage sparrow *Amphispiza belli belli*	FSC/CSC	Prefer chaparral with fairly dense stands of chamise
Golden eagle *Aquila chrysaetos*	CSC/3511	Open hills with grassland, open scrub, adequate prey base, large trees or cliffs for nesting
Great blue heron *Ardea herodias*	--/*	Nests in trees along lakes and estuaries

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Birds (cont.)		
Short-eared owl *Asio flammeus*	--/CSC	Fresh water and salt marshes and swamps, lowland meadows, irrigated fields
Western burrowing owl *Athene cunicularia hypugaea*	FSC/CSC	Nests in mammal burrows in open, sloping grasslands
Oak titmouse *Baelophus inornatus*	FSLC/--	Deciduous or oak woodlands
Ferruginous hawk *Buteo regalis*	FSC/CSC	Dry open country with a variety of habitats
Costa's hummingbird *Calypte costae*	FSC/--	Dry chaparral, desert washes
Lawrence's goldfinch *Carduelis lawrencei*	FSC/--	Dry grassy slopes and chaparral
Vaux's swift *Chaetura vauxi*	FSC/--	Riparian woodlands and woodlands near lakes
Black tern *Chlidonias niger*	FSC/CSC	Freshwater lakes, marshes, ponds, and flooded agricultural fields
Northern harrier *Circus cyaneus*	--/CSC	Mostly nests in emergent vegetation, wet meadows or near rivers and lakes, but may nest in grasslands away from water.
Black swift *Cypseloides niger*	FSC/CSC	Colonial breeders using cliffs in deep canyons
Hermit warbler *Dendroica occidentalis*	FSC/--	Prefers coniferous habitat
Yellow warbler *Dendroica petechia brewsteri*	--/CSC	Prefers riparian habitat with willows, cottonwoods, sycamores, or alders for nesting and foraging
White-tailed kite *Elanus leucurus*	--/3511	Nests near wet meadows and open grasslands dense oak, willow or other large tree stands.
Little willow flycatcher *Empidonax traillii brewsteri*	FSC/CSC	Willow riparian habitat, dry, brushy upland pastures, orchards

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Birds (cont.)		
California horned lark *Eremophila alpestris actia*	--/CSC	Short grass prairie, fallow grain fields, open areas with short vegetation
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	FSC/CSC	Saline and freshwater marshes
Loggerhead shrike *Lanius ludovicianus*	FSC/CSC	Nests in shrublands and forages in open grasslands
Lewis's woodpecker *Melanerpes lewis*	FSC/--	Open woodlands in interior foothills and valleys
Alameda (South Bay) song sparrow *Melospiza melodia pusillula*	FSC/CSC	Salt marshes of eastern and south San Francsico Bay
Long-billed curlew *Numenius americanus*	FSC/--	Lake beaches, nests in both dry and wet uplands
White-faced ibis *Plegadis chihi*	FSC/--	Marshes, swamps, ponds, and rivers; mostly freshwater habitats.
Rufous hummingbird *Selasphorus rufus*	FSC/--	Forests, woodland edges, thickets
Allen's hummingbird *Selasphorus sasin*	FSC/--	Brush and woodlands
California thrasher *Toxostoma redivivum*	FSC/--	Chaparral covered foothills and brushy parklands where there is open ground under a dense shrub layer
Mammals		
Townsend's western big-eared bat *Corynorhinus townsendi townsendii*	FSC/CSC	Humid coastal regions, will only roost in the open, extremely sensitive to disturbance
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC	Open arid to semi-arid habitats, including woodlands, coastal scrub, chaparral, and grasslands. Roosts in trees, cliffs, dwellings
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	FSC/--	Open grasslands and open chaparral, blue oak-gray pine woodland, with fine, deep, well drained soil

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Mammals (cont.)		
Small-footed myotis *Myotis ciliolabrum*	FSC/--	A variety of habitats, excluding coastal redwoods. Nursery colonies in caves, crevices, clay banks. Roosts in caves, dwellings, crevices.
Long-eared myotis *Myotis evotis*	FSC/--	Brush, woodland, and forest habitats, prefers coniferous habitat types. Nursery colonies in buildings, crevices, spaces under tree bark, and snags.
Fringed myotis *Myotis thysanodes*	FSC/--	A wide variety of habitats. Optimal habitats are valley-foothill hardwood and hardwood-conifer types. Uses caves, buildings, or crevices for roosting and nursery colonies.
Long-legged myotis *Myotis volans*	FSC/--	Most common in woodland and forest habitats above 4000 feet. Use trees and caves for roosting, hollow trees or spaces under tree bark for nursery colonies.
Yuma myotis *Myotis yumanensis*	FSC/--	Optimal habitat is open forests or woodlands with sources of water and flying insects. Nursery colonies in caves, buildings, or crevices.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	FSC/CSC	Hardwood forests and scrub communities
San Joaquin pocket mouse *Perognathus inornatus inornatus*	FSC/--	Grasslands and blue oak savanna with friable soils
Salt marsh wandering shrew *Sorex vagrans halicoetes*	FSC/CSC	Salt-marshes
Plants		
Bent-flowered fiddleneck *Amsinckia lunaris*	FSC/--List 1B	Coastal bluff scrub, cismontane woodland, valley and foothill grasland
Mt. Diablo manzanita *Arctostaphylos auriculata*	--/--/List 1B	On sandstone in chaparral
Contra Costa manzanita *Arctostaphylos manzanita* ssp. *laevigata*	--/--/List 1B	Rocky slopes in chaparral

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Plants (cont.)		
Alkali milk-vetch *Astragalus tener* var. *tener*	FSC/--/List 1B	Alkali flats, valley grasslands
Heartscale *Atriplex cordulata*	FSC/--/List 1B	Chenopod scrub, alkaline meadows, sandy soils in valley and foothill grassland
Brittlescale *Atriplex depressa*	FSC/--/List 1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools, often in alkaline situations
San Joaquin spearscale *Atriplex joaquiniana*	FSC/--List 1B	Alkaline soils in chenopod scrub, meadows, playas, valley and foothill grassland
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	FSLC/--/List 1B	Cismontane woodland, grassland
Big tarplant *Blepharizonia plumosa* var. *plumosa*	FSC/--List 1B	Sometime on serpentine soils in chaparral, cismontane woodland, valley and foothill grassland
Mt. Diablo fairy lantern *Calochortus pulchellus*	--/--/List 1B	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland
Chaparral harebell *Campanula exigua*	FSC/--/List 1B	Rocky areas in chaparral, usually on serpentinite derived soils
Salt marsh owl's clover *Castilleja ambigua* ssp. *ambigua*	FSLC/--List 1B	Salt marshes
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	FSC/CSC/List 1B	Alkaline areas in valley and foothill grassland
South Bay clarkia (=Santa Clara red ribbons) *Clarkia concinna* ssp. *automixa*	FSC/--/List 4	Chaparral, cismontane woodland
Hispid bird's beak *Cordylanthus mollis* ssp. *hispidus*	FSC/--/List 1B	Alkaline microhabitat in meadows, playas, valley and foothill grassland
Livermore tarplant *Deinandra bacigalupii*	FSC/--/List 1B	Alkaline meadows
Recurved larkspur *Delphinium recurvatum*	FSC/--/List 1B	On alkaline soils in chenopod scrub, valley and foothill grassland, cismontane woodland

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Plants (cont.)		
Western leatherwood *Dirca occidentalis*	FSC/--/List 1B	Broadleafed upland forests, closed-cone coniferous forests, chaparral, cismontane woodland, North coast coniferous forests, riparian forests, riparian woodland; mesic sites
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	FSLC/--/List 3	Serpentine soils in coastal prairie, chaparral, and valley and foothill grasslands
Ben Lomond buckwheat *Eriogonum nudum* var. *decurrens*	FSC/--/List 1B	Sandy soils in chaparral, cismontane woodland
Mt. Diablo buckwheat *Eriogonum truncatum*	--/--/List 1A	Sandy soils in chaparral, coastal scrub, and valley and foothill grassland
Round-leaved filaree *Erodium macrophyllum*	--/--/List 2	Clay soils in cismontane woodland and valley and foothill grassland
Diamond-petaled poppy *Eschscholzia rhombipetala*	FSC/--/List 1B	Alkaline areas and clay soils in valley and foothill grassland
Fragrant fritillary *Fritillaria liliacea*	FSC/--/List 1B	Coastal scrub, valley and foothill grassland, coastal prairie; on heavy clay soils, often on ultramafic soils
Diablo helianthella *Helianthella castanea*	FSC/--/List 1B	Openings in chaparral and broadleaved upland forest
Brewer's western flax *Hesperolinon breweri*	FSC/--/List 1B	Often in rocky serpentine soils in chaparral and grasslands, also cismontane woodland
Northern California black walnut *Juglans hindsii*	FSC/--/List 1B	Riparian forest and woodland
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	FSC/--/List 1B	Freshwater and brackish marshes along slough and marsh edges, mostly restricted to Sacramento-San Joaquin Delta
Hall's bush mallow *Malacothamnus hallii*	FSC/--/List 1B	Chaparral, sometimes on serpentine soils
Robust monardella *Monardella villosa* ssp. *globosa*	FSC/--/List 1B	Cismontane woodland, openings in chaparral
Little mousetail *Myosurus minimus* ssp. *apus*	FSC/--/List 3	Vernal pools in alkaline soils
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Plants (cont.)		

APPENDIX A.3.5-1 (Continued)
COMPREHENSIVE LIST OF SPECIAL STATUS SPECIES CONSIDERED[1] IN ZONE 7 WELLFIELD PROJECT AREA

Common name ***Scientific name***	**Listing Status** **USFWS/ CDFG/CNPS**	**Habitat** **Requirements**
Mt. Diablo phacelia *Phacelia phacelioides*	FSC/--/List 1B	Rocky substrates in chaparral, cismontane woodland
Choris's popcorn-flower *Plagiobothrys chorisianus* var. *chorisianus*	FSLC/--/List 1B	Mesic areas in chaparral, coastal prairie, coastal scrub
Hairless popcorn-flower *Plagiobothrys glaber*	FSC/--/List 1A	Coastal salt-marsh, alkaline flats, meadows, and seeps
Rayless ragwort *Senecio aphanactis*	--/--/List 2	Drying alkaline flats in coastal scrub and cismontane woodland
Pacific cordgrass *Spartina foliosa*	FSLC/--/--	Salt marshes
Most beautiful jewelflower *Streptanthus albidus* ssp. *peramoenus*	FSC/--/List 1B	Serpentine grassland, chaparral
Mt. Diablo jewelflower *Streptanthus hispidus*	FSC/--/List 1B	Talus or rocky outcrops in chaparral, valley and foothill grassland
Saline clover *Trifolium depauperatum* var. *hydrophilum*	FSC/--/List 1B	Marshes and swamps, mesic alkaline areas in valley and foothill grassland
Coastal triquetrella *Triquetrella californica*	FSLC/--/List 1B	Coast bluff scrub, coastal scrub
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	FSC/--/List 1A	Alkaline hills, grasslands
Oval-leaved viburnum *Viburnum ellipticum*	--/--/List 2	Chaparral, cismontane woodland, lower montane coniferous forest

TABLE A.3.5-1 (continued)
SPECIAL STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING IN THE ALAMEDA COUNTY PROJECT AREA

SENSITIVE PLANT COMMUNITIES

Name	Global Rank	State Rank
Alkali meadow	G3	S2.1
Alkali seep	G3	S2.1
Cismontane alkali marsh	G1	S1
Northern claypan vernal pool	G1	S1.1
Sycamore alluvial woodland	G1	S1.1
Valley needlegrass grassland	G1	S3.1
Valley sink scrub	G1	S1.1

STATUS CODES:

Federal Categories (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government

FT = Listed as Threatened by the Federal Government

FPE = Proposed for Listing as Endangered

FPT = Proposed for Listing as Threatened

FC = Candidate for Federal Listing

FSC = Federal Species of Concern

FSLC = Federal Species of Local Concern

BPA = Federal Bald Eagle Protection Act

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California

List 1B = Plants rare, threatened, or endangered in California and elsewhere

List 2 = Plants rare, threatened, or endangered in CA

State Categories (California Department of Fish and Game)

CE = Listed as Endangered by the State of California

CT = Listed as Threatened by the State of California

CR = Listed as Rare by the State of California

3511 = Fully Protected Species

* = Special Animals

CSC = California Species of Special Concern

TABLE A.3.5-1 (continued)
SPECIAL STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING IN THE ALAMEDA COUNTY PROJECT AREA

STATUS CODES (cont.) :

The Nature Conservancy (TNC) – Global Heritage Program rarity ranks (for sensitive plant communities)

G1: Fewer than 6 viable occurrences worldwide and/or 2000 acres

G2: 6-20 viable occurences worldwide and/or 2000-10,000 acres

G3: 21-100 viable occurrences worldwide and/or 10,000-50,000 acres

G4: Greater than 100 viable occurrences worldwide and/or greater than 50,000 acres

State Rarity Ranks:

S1: Fewer than 6 viable occurrences statewide and/or 2000 acres

S2: 6-20 viable occurences statewide and/or 2000-10,000 acres

S3: 21-100 viable occurrences statewide and/or 10,000-50,000 acres

S4: Greater than 100 viable occurrences statewide and/or greater than 50,000 acres

Threat Ranks

0.1: Very threatened

0.2: Threatened

0.3: No current threats known

APPENDIX 3.6
AIR QUALITY

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The goal, policies, and programs identified in the ECAP (amended November 2002) include the following:

Goal: To ensure that air pollution levels do not threaten public health and safety, economic development, or future growth.

> Policy 291. The County shall strive to meet federal and state air quality standards for local air pollutants of concern. In the event that standards are exceeded, the County shall require appropriate mitigation measures on new development.
>
> Policy 294. The County shall require new development projects to include traffic and air pollutant reduction measures to help attain air quality standards. For non-residential projects, these measures could include Transportation Demand Management programs such as ridesharing and transit promotion; for residential projects, these measures could include site plan features to reduce traffic trip generation such as mixed use development and transit-oriented development.
>
> Policy 299. The County shall require projects that generate high levels of air pollutants, such as manufacturing facilities, hazardous waste handling operations, and drive-through restaurants and banks, to incorporate air quality mitigations in their design.
>
> Policy 300. The County shall review proposed projects for their potential to generate hazardous air pollutants.
>
> Program 107. The County shall include evaluation of hazardous air pollutant emissions in development review procedures of proposed land uses which may handle, store or transport lead, mercury, vinyl chloride, benzene, asbestos, beryllium, and other hazardous materials.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) provides goals and policies associated with protection of air quality. Relevant goals and policies include:

> Goal 1: To implement a pro-active approach and use available technology to maintain and improve air quality within Pleasanton and the region to protect the public health.
>
> Policy 1. Adhere to Federal, State, regional, and local air quality standards, whichever is most stringent, for local pollutants of concerns

Policy 4. Review proposed projects for their potential to impact air quality conditions.

Program 4.1. Include air quality as a factor in the City's environmental review process. Encourage development plans which minimize negative impacts on air quality.

Program 4.2. Require projects which generate high levels of air pollutants, such as manufacturing facilities and hazardous waste handling operations, to incorporate air quality mitigations in their design.

CITY OF LIVERMORE

Relevant goals and policies from the City of Livermore General Plan 2003 – 2025 (2004) applicable to the proposed project includes:

Objective OSC-1. Minimize air pollution.

Policy OSC-1.P1. The City shall require project developers to develop and implement a construction-period air pollution control plan, consistent with dust and emission-abatement actions outlined in the CEQA handbook of the Bay Area Air Quality Management District.

Policy OSC-1.P4. All industrial uses within Livermore shall meet regional, State, and federal air pollution standards.

APPENDIX 3.7

NOISE

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The goal, policies, and programs identified in the ECAP (amended November 2002) are relevant to the proposed project are as follows:

Goal: To minimize East County residents' and workers' exposure to excessive noise.

Policy 288. The County shall endeavor to maintain acceptable noise levels throughout East County.

Policy 289. The County shall limit or appropriately mitigate new noise-sensitive development in areas exposed to projected noise levels exceeding 60 Db based on the *California Office of Noise Control Land Use Compatibility Guidelines.*

Program 104. The County shall require the use of noise reduction techniques (such as buffers, building design modifications, lot orientation, sound walls, earth berms, landscaping, building setbacks, and real estate disclosure notices) to mitigate noise impacts generated by transportation- related and stationary sources as specified in the *California Office of Noise Control Land Use Compatibility Guidelines*.

CITY OF PLEASANTON

The City of Pleasanton Noise Element identifies the goals, policies and programs to minimize noise within its jurisdiction. Goals and policies that are relevant to the proposed project include:

Goal 1: To reduce noise to acceptable levels throughout the community.

Policy 1. Require new projects to meet acceptable exterior noise level standards.

Program 1.1. Use the "normally acceptable" noise levels for new land uses as established in the "Noise and Land Use Compatibility Guidelines" contained in Table VIII-3 [of the General Plan], including the descriptions in the text.

Program 1.2. Use noise guidelines and contours to determine the need for noise studies and require new developments to construct or pay for noise attenuation features as a condition of approving new projects.

Program 1.3. Require noise studies for future projects to use a consistent format, to analyze alternative mitigations, and to evaluate the effectiveness of the mitigations following their implementation.

Policy 2. Reduce outdoor noise levels in existing residential areas where economically and aesthetically feasible.

Program 2.1. Encourage the use of greater setbacks and landscaped earth berms to reduce noise levels. The use of sound walls should only be used where other mitigation measures are not feasible and should be only used in conjunction with attractive landscaping.

Program 2.2. Project and monitor noise levels using traffic projections and periodic noise monitoring.

Program 2.3. Verify projected noise levels with noise monitors at locations adjacent to residential and other noise sensitive areas where traffic volumes increase by more than 50 percent from baseline noise data.

Policy 3. Ensure that noise does not exceed interior noise levels of 45 DNL for residential uses and those levels specified in noise studies for other uses.

Program 3.1. Require new developments to pay their fair share of mitigation measures necessary to reduce interior noise levels within adjacent or impacted land uses.

Policy 4. Control noise at its source to maintain existing noise levels, and in no case to exceed acceptable noise levels as established in the Noise and Land Use Compatibility Guidelines.

Program 4.1. Enforce the noise emission standards for various noise emitting land uses established in the City's Noise Ordinance.

Program 4.2. Aggressively enforce the noise emissions standards for all vehicles.

Program 4.3. Explore vehicular speed limit reductions on streets in noise-impacted areas.

Policy 5. Protect schools, hospitals, libraries, religious facilities, convalescent homes, and other noise-sensitive uses from noise levels exceeding those allowed in residential areas.

Program 5.1. Locate noise-sensitive uses away from noise sources unless mitigation measures are included in development plans.

Policy 6. Limit truck traffic in residential and commercial areas to designated truck routes.

Program 6.1. Limit construction, delivery, and through truck traffic to designated routes.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) provides community goals regarding noise, techniques for noise control, and implementation programs. Goals and policies that are relevant to the proposed project include:

Objective N-1.1. Establish appropriate noise levels, design standards, and noise reduction techniques for all areas to minimize the adverse effects of noise.

Policy N-1.1,P1. Noise analysis shall be measured in dBA CNEL or dBA L_{dn} as defined in this Element.

Objective N-1.2. Adopt design standards and identify effective noise attenuation programs to prevent noise or reduce noise to acceptable levels.

Policy N-1.2.P3. The City shall require the control of noise at the source for new development deemed to be noise generators through site design, building design, landscaping, hours of operation, and other techniques.

Objective N-1.5. Reduce the level of noise generated by mechanical and other noise-generating equipment by means of public education, regulation, and/or political action.

Policy N-1.5.P1. The city shall require that industrial and commercial uses be designed and operated as to avoid the generation of noise effects on surrounding sensitive land uses (e.g., residential, churches, schools, hospitals) from exceeding the following noise levels for exterior environments:

(a) 55 dBA L_{50} (7:00 a.m. to 10:00 p.m.)
(b) 45dbA L_{50} (10:00 p.m. to 7:00 a.m.)

Policy N-1.5.P2. In order to allow for temporary construction, demolition or maintenance noise and other necessary short-term noise events, the stationary source noise standards in Policy N-1.5, P1, above, may be exceeded within the receiving land use by:

(a) 5 dBA for a cumulative period of no more that fifteen (15) minutes in any hour.
(b) 10 dBA for a cumulative period of no more that five (5) minutes in any hour.
(c) 15 dBA for a cumulative period of no more than one (1) minute in any hour.

Policy N-1.5.P3. In order to allow for temporary construction, demolition or maintenance noise and other necessary short-term noise events, the stationary source noise standards in Policy N-1.5, P1, above, shall not be exceeded within the receiving land use by more than 15 dBA for any period.

Policy N-1.5.P3. The following sources of noise are exempt from the standard in N-1.5.P1: motor vehicles on public streets; trains; emergency equipment, vehicles, devices, and activities; temporary construction, maintenance, or demolition activities conducted between the hours of 7:00 a.m. and 8:00 p.m.

APPENDIX 3.8
TRAFFIC AND CIRCULATION

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

Goal. To reduce East County traffic congestion.

Policy 183. The County shall seek to minimize traffic congestion levels throughout the East County street and highway system.

Policy 184. The County shall seek to minimize the total number of average daily trips throughout East County.

CITY OF PLEASANTON GENERAL PLAN

The City of Pleasanton General Plan (1996) includes the following policies that are relevant to the proposed project:

Goal 1. To develop a safe, convenient, and uncongested circulation system.

Policy 2. Phase development and roadway improvements so that levels of service do not exceed LOS D at major intersections outside the Central Business District.

Program 2.1. Monitor roadway improvements to determine if levels of service are approaching City standards.

Policy 3. Facilitate the free flow of vehicular traffic on major arterials.

Program 3.2. Discourage non-local and commercial traffic from using streets through residential areas.

Policy 4. Design and regulate City streets to minimize traffic-related impacts on adjacent land uses.

Policy 4.2. Restrict truck traffic to deliveries on all City streets except truck routes.

Policy 4.4. Notify all residents and property owners who may be directly affected by potential street closures and traffic rerouting in advance of taking such actions.

Policy 4.5. Mohr Avenue should not be used as a truck route or primary access to industrial development to the east.

Policy 5. Adhere to City design standards for streets in new developments

Program 5.2. Provide more than one access road (including emergency vehicle routes) to new developments, and discourage cut-through traffic by appropriate use of traffic controls (e.g., cul-de-sacs, stop signs, landscaped barriers, etc.)

Policy 7. Require adequate on- and off-street parking.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) provides community goals regarding traffic and circulation. Goals and policies that are relevant to the proposed project include:

APPENDIX 3.9
HAZARDOUS MATERIALS

HAZARDOUS SUBSTANCES REGULATORY FRAMEWORK

Hazardous materials and hazardous wastes are extensively regulated by various federal, state, regional, and local regulations, with the major objective of protecting public health and the environment. The major regulations are presented below.

FEDERAL REGULATIONS

The U.S. Environmental Protection Agency (U.S. EPA) is the lead agency responsible for enforcing federal regulations that affect public health or the environment. The primary federal laws and regulations include: the Resource Conservation and Recovery Act of 1974 (RCRA); the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); and the Superfund Amendments and Reauthorization Act of 1986 (SARA). Federal statutes pertaining to hazardous materials and wastes are contained in the Code of Federal Regulations (40 CFR).

RCRA was enacted in 1974 to provide a general framework for the national hazardous waste management system, including the determination of whether hazardous wastes are being generated, techniques for tracking wastes to eventual disposal, and the design and permitting of hazardous waste management facilities. The Hazardous and Solid Waste Amendments was enacted in 1984 to better address hazardous waste; this amendment began the process of eliminating land disposal as the principal hazardous waste disposal method. Other specific areas covered by the amendment include regulation of carcinogens, listing and delisting of hazardous wastes, permitting for hazardous waste facilities, and leaking underground storage tanks.

CERCLA, also known as Superfund, was enacted in 1980 to ensure that a source of funds was available to clean up abandoned hazardous waste sites, compensate victims, address releases of hazardous materials, and establish liability standards for responsible parties. SARA amended CERCLA in 1986 to increase the Superfund budget, modify contaminated site clean up criteria and schedules, and revise settlement procedures. SARA also provides a regulatory program and fund for underground storage tank cleanups and an Emergency Planning and Community Right-to-Know Program (EPCRA).

Title 40 of the Code of Federal Regulations, Section 112 also contains requirements for above ground storage of petroleum products. In accordance with these regulations, a petroleum tank of greater than 660 gallons or aggregate storage of over 1,320 gallons which could reasonably

discharge to a navigable water is required to have Spill Control and Countermeasure Plan (EPA Region IX, San Francisco, has taken a conservative stance that virtually any large oil spill in California will enter federally regulated waters). The plan would include appropriate spill containment or equipment used to divert spills from sensitive areas, a discussion of facility specific requirements for the storage system, inspections and a record keeping system, security for the system, and personnel training.

The federally published lists of sites which trace the status of suspected hazardous materials sites or identify sites permitted to generate hazardous wastes include:

- The National Priority List (NPL), which prioritizes sites with significant risk to human health and the environment;
- The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), which tracks contaminated properties identified under CERCLA and SARA;
- The toxic chemical release inventory which identifies sites which have reported a chemical release to the air, water, or land as required by Title III of the Superfund Amendments and Reauthorization Act of 1986 (TRIS);
- The Emergency Response Notification System (ERNS) which identifies spills of oil or hazardous substances reported pursuant to Section 103 of CERCLA as amended, Section 311 of the Clean Water Act, and sections 300.51 and 300.65 of the National Oil and Hazardous Substances Contingency Plan;
- RCRA Information System which includes facilities permitted to handle hazardous wastes under RCRA including treatment, storage, and disposal facilities (RCRA - TSD); large quantity generators which report generation of greater than 1000 kilogram/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste (RCRA-LgGen); small quantity generators which report generation of less than 1000 kilogram/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste (RCRA-SmGen); and facilities which have been cited by the US EPA for RCRA violations at least once since 1980 (RCRA Viols/Enf); and
- Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (CORRACTS). This list, maintained by the US EPA sites includes RCRA permitted facilities that are undergoing corrective action. A corrective action order is issued pursuant to RCRA Section 3008(h)when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

STATE AND REGIONAL REGULATIONS

The USEPA has delegated much of its regulatory authority to the individual states. The Department of Toxic Substance Control (DTSC) of the California Environmental Protection Agency (Cal EPA), formerly a division of the Department of Health Services, enforces hazardous materials and waste regulations in California, in conjunction with the USEPA. The DTSC is responsible for regulating the management of hazardous substances including the remediation of

sites contaminated by hazardous substances. California hazardous materials laws incorporated federal standards, but are often more strict than federal laws. The primary state laws include: the California Hazardous Waste Control Law (HWCL), the state equivalent of RCRA; and the Carpenter-Presley-Tanner Hazardous Substance Account Act (HSAA), the state equivalent of CERCLA. State hazardous materials and waste laws are contained in the California Code of Regulations, Titles 22 and 26.

The HWCL, enacted in 1972 and administered by the DTSC, is the basic hazardous waste statute in California and has been amended several times to address current needs, including bringing the state law and regulations into conformance with federal laws. This act implements the RCRA cradle-to-grave waste management system in California, but is more stringent in its regulation of non-RCRA wastes, spent lubricating oil, small quantity generators, transportation and permitting requirements, as well as penalties for violations. The HWCL also exceeds federal requirements by mandating the recycling of certain wastes, requiring certain generators to document a hazardous waste source reduction plan, requiring permitting for federally exempt treatment of hazardous wastes by generators, and stricter regulation of hazardous waste facilities.

The HSAA, enacted in 1981, addresses similar concerns as CERCLA. The primary difference is in how liability is assigned for a site with more than one responsible party. This is important for petroleum clean up sites because federal law is usually used to force responsible party cleanups; state law is used for petroleum cleanup sites which are CERCLA exempt.

Other relevant state statutes include:

- The Toxic Pit Cleanup Act of 1984 and the Toxic Injection Well Act of 1985 which were established to provide a regulatory framework for open pits or injection wells as a means of hazardous waste or disposal;

- The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires preparation of Hazardous Materials Business Plans and disclosure of hazardous materials inventories. A business plan includes information such as an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures (California Health and Safety Code, Division 20, Chapter 6.95, Article 1).

- The Hazardous Waste Management Act of 1986 which coordinates the state's implementation of federal landfill bans and authorizes landfill bans for non-RCRA hazardous wastes;

- The Aboveground Petroleum Storage Act of 1989 which requires the owner or operator of aboveground petroleum storage tanks to file a storage statement with the State Water 3Resources Control Board (SWRCB) if tank storage exceeds 10,000 gallons and holds petroleum or petroleum product which is liquid at ambient temperatures. In addition, the tank or tanks must be registered if they are subject to federal requirements; this potentially expands the requirement for a storage statement to any tank over 660 gallons or aggregate storage of 1,320 gallons;

- The Hazardous Waste Source Reduction and Management Act which required large quantity generators to document hazardous wastes being generated and to prepare a documented waste reduction plan beginning in 1991;

- The Hazardous Waste Treatment Permitting Reform Act of 1992 which required a permit for any hazardous waste treatment by a generator beginning on April 1, 1993. This statute established a new tiered permitting program whereby on-site treatment facilities are permitted or authorized to operate subject to different levels of regulatory requirements depending on the nature and size of the treatment activity. Amendments to this statute adopted in 1993-96 have enacted certain exemptions and modified compliance requirements.; and

- The Hazardous Waste Management Reform Act of 1995 which required the DTSC to revise its regulations to more closely conform to federal hazardous waste identification criteria and essentially eliminate land disposal restrictions for California-only hazardous wastes among other major changes. However, many of these changes have been deferred to a DTSC advisory committee for further study and are not expected to be implemented for several years, and in certain cases, not at all.

The published lists of sites which trace remediation progress within the state include:

- The Annual Work Plan, formerly known as the Bond Expenditure Plan (SPL), which is a site-specific expenditure plan for the appropriation of California Hazardous Substance Cleanup Bond Act of 1984 funds. This list is no longer updated;

- CalSites (SCL), which was previously referred to as the Abandoned Sites Program Information System (ASPIS), and identifies potential hazardous waste sites, which are then screened by the DTSC. Sites on this list which are designated for no further action by the DTSC were not identified by the database review;

- The CORTESE List, which is a compilation of information from various sources listing potential and confirmed hazardous waste and hazardous substance sites, previously maintained by the State Office of Planning and Research (this list is no longer updated); and

- The Deed Restrictions Properties Report (Deed Restrictions) which tracks sites with deed restrictions.

The Regional Water Quality Control Board (RWQCB) is authorized by the State Water Resources Control Board to enforce provisions of the Porter - Cologne Water Quality Control Act of 1969. This act gives the RWQCB authority to require groundwater investigations when the quality of groundwater or surface waters of the state are threatened and to require remediation of the site, if necessary. Both of these agencies are part of the Cal EPA.

The RWQCB maintains the following lists identifying hazardous waste sites that were reviewed:

- The Leaking Underground Storage Tanks list (LUST or LUST Reg2) and LUST Information System, which track remediation status of known leaking underground tanks;

- The Spill, Leak, Investigations, and Cleanups list (SLIC), North Bay County Toxics List (North Bay), and Toxic Pits Clean Up Facilities (Toxic Pits) which include various

hazardous waste sites within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (Region 2); and

- The Waste Management Unit Discharge System (WMUDS) list of sites which tracks waste management units. The list contains sites identified on the Toxic Pits List, which is required by the Toxic Pits Cleanup Act (Katz Bill), and places relatively strict limitations on the discharge of hazardous wastes into surface impoundments, toxic ponds, pits and lagoons (the RWQCB is required to inspect all surface impoundments annually). The WMUDS list also identifies sites targeted by the Solid Waste Assessment Program where there is a possible risk of solid waste disposal sites (landfills) discharging hazardous wastes, threatening either water or air quality.

The Bay Area Air Quality Management District (BAAQMD) may impose specific requirements on remediation activities to protect ambient air quality from dust or other airborne contaminants.

The California Integrated Waste Management Board maintains a list of active, inactive or closed solid waste disposal sites and transfer facilities, as legislated under the Solid Waste Management and Resource Recovery Act of 1972. The list is referred to as the Solid Waste Information System (SWLF).

The SWRCB also requires registration of above ground storage tanks subject to Federal regulations and permitting of all underground storage tanks (USTs) containing hazardous substances. The California laws regulating USTs are primarily found in the Health and Safety Code; combined with regulations adopted by the State Water Board, these laws comprise the requirements of the state UST program. The laws contain requirements for UST permitting, construction, installation, leak detection monitoring, repairs and upgrades, corrective actions and closures. In accordance with state laws, counties are required to implement a UST program and in some cases, the county requirements are more stringent than those of the State. Cities are also given the option to implement a UST program. The Regional Water Quality Control Board may also oversee corrective actions. Permitted above- and underground storage tanks were identified in the Aboveground Storage Tank Database and Underground Storage Tank Registration Database (AST and UST).

HAZARDOUS MATERIALS TRANSPORT

The U.S. Department of Transportation regulates hazardous materials transportation between states. State agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and the California Department of Transportation. Together, these agencies determine container types used and license hazardous waste haulers for hazardous waste transportation on public roads.

LOCAL REGULATIONS-ALAMEDA COUNTY

The Alameda County Health Care Services Agency, Department of Environmental Health (ACDEH) is the county agency responsible for implementing the UST program in Alameda. They are responsible for issuing operating and closure permits for USTs and overseeing such tasks as UST design plans, construction, monitoring, leak reporting and UST closure. They also oversee remediation of contaminated soil and groundwater at leaking underground storage tank sites and hazardous waste sites in coordination with Cal EPA. The Alameda County Health Care Services, Department of Environmental Health is also the administering agency for the Certified Uniform Program Agency (CUPA) regulations for local jurisdictions. The Livermore-Pleasanton Fire Department also responds to hazardous materials incidents.

HAZARDOUS MATERIALS WORKER SAFETY REQUIREMENTS

The Federal Occupational Safety and Health Administration (Fed/OSHA) and the California Safety and Health Administration (Cal/OSHA) are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. The federal regulations pertaining to worker safety are contained in the Code of Federal Regulations, Title 29 (29 CFR) as authorized in the Occupational Safety and Health Act of 1970. They provide standards for safe workplaces and work practices, including standards relating to hazardous materials handling. In California, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations; Cal/OSHA standards are generally more stringent than federal regulations.

State regulations concerning the use of hazardous materials in the workplace are included in Title 8 of the California Code of Regulations, which contain requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information relating to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites.

WASTE DISPOSAL REGULATIONS

All California landfills have been segregated by regulatory authority into the categories of Class I, Class II and Class III facilities. Class I facilities can accept hazardous wastes with chemical levels below the federal land disposal restriction (land ban) treatment standards. Class II and III facilities can accept non-hazardous wastes that meet acceptance criteria determined by the State for organic and inorganic compounds; each landfill has an individual acceptance criteria.

The disposal of soil is regulated by the RWQCB and will be predicated on the concentrations of the chemical constituents that are present. Soil with total petroleum hydrocarbon or organic compound concentrations above the detection limit must be disposed of at an appropriately

landfill facility or treated to reduce the levels of chemicals in the soil; the concentration of the compounds present will determine the appropriate type of disposal facility. In general, soil with total petroleum hydrocarbon levels up to 100 milligrams per kilogram can be disposed of at a Class III disposal facility. If the concentration is between 100 and 1,000 milligrams per kilogram and be disposed of at a Class II disposal facility and if the concentration is greater than 1,000 milligrams per kilogram, Class I disposal would be required.

The disposal alternative is also predicated on the total and soluble concentrations of metals. Soil with total metal concentrations that are above the Total Threshold Limit Concentration (TTLC) and soluble metal concentrations that are above the Soluble Threshold Limit Concentration (STLC) must be disposed of at a Class I disposal facility or treated.[1] The Class II and III landfills in the Bay Area have acceptance criteria for lead that are lower than the STLC.

Soil with no concentrations of organic chemicals above detection limit and total and soluble metal concentrations that are below the TTLC and STLC may be used on-site or transported off-site as unrestricted waste.

[1] The total threshold limit concentration (TTLC) and the soluble threshold limit concentration (STLC) are criteria used for waste classification purposes. If the waste contains a total concentration of a constituent and a concentration greater than the TTLC, it is considered a hazardous waste. If the total concentration is greater than ten times the STLC, then it would be necessary to perform a waste extraction test to determine the soluble concentration. If the soluble concentration is greater than the STLC, the waste would be considered hazardous. The waste extraction test involves a ten times dilution of the sample; because of this, it would be impossible for the soluble concentration to exceed the STLC unless the total concentration exceeded ten times the STLC.

APPENDIX 3.10

PUBLIC SERVICES AND UTILIITES

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

Police, Fire, and Emergency Medical Services

> Goal. To ensure the prompt and efficient provision of police, fire, and emergency medical facility and service needs.
>
> Policy 227. The County shall require that new developments are designed to maximize safety and security and minimize fire hazards risk to life and property.

CITY OF PLEASANTON GENERAL PLAN

Policies identified in the General Plan (1996) associated with public services and utilities relate primarily to new development rather than maintenance and protection. Policies and goals relevant to the proposed project are as follows:

> Goal 1. To provide sufficient public facilities and services to ultimately serve the City in maximum financially available increments while preserving and enhancing the quality of life for existing and future residents
>
> Policy 4. Ensure an adequate water system for existing and future development, and maintain an adequate reserve of water in storage facilities.
>
> Program 4.2. Develop a contingency plan for potential water shortages including groundwater management and water conservation.
>
> Program 4.3. Work with Zone 7 to establish and monitor acceptable ranges of underground water levels and recharge when necessary.
>
> Program 4.4. Maintain water pressure at sufficient levels to serve residential, commercial, industrial, and fire flow requirements as determined by the City Engineer.
>
> Program 4.7. Work with Zone 7 to develop contingency plans for supplemental water sources independent of the State Water Project.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) provides the following goals, policies, and programs:

Objective INF-4.1. Facilitate the development and maintenance of all utilities at the appropriate levels of service to accommodate the City's projected growth.

Objective INF-1.1. Plan, manage and develop the public water treatment, storage and distribution systems in a logical, timely and appropriate manner.

Policy INF-1.1.P1. Potable water shall be available to the City's residents and businesses.

Policy INF-1.1.P4. The City shall work with Zone 7 to consider developing a pump monitoring and cost allocation system to cover the cost of new potable water in the event that additional supplies are needed..

Objective INF-1.2. Require coordination between land use planning and water facilities and service to ensure that adequate water supplies are available for proposed development.

Policy INF-1.2.P1. The potable water distribution and storage system shall be sized to serve development anticipated under the General Plan and shall not provide for additional growth and development beyond that anticipated under the General Plan.

Policy INF-1.2.P2. The approval of new development shall be conditioned on the availability of sufficient water supply, storage and pressure requirements from the City, California Water Service Company and Zone 7 for the project as applicable.

APPENDIX 3.11
CULTURAL RESOURCES

ALAMEDA COUNTY EAST COUNTY AREA PLAN

The East County Area Plan (amended November 2002), part of the Alameda County General Plan, includes the following policies that are relevant to the proposed project:

> Policy 136. The County shall identify and preserve significant archaeological and historical resources, including structures and sites that contribute to the heritage of East County.
>
> Policy 137. The County shall require development to be designed to avoid cultural resources or, if avoidance is determined by the County to be infeasible, to include and implement appropriate mitigation measures that offset the impacts.
>
> Implementation Program 59. The County shall require a background and records check of a project area if the project is located within an extreme or high archaeological sensitivity zone as determined by the County. If there is evidence of an archaeological site within a proposed area, an archaeological survey by qualified professionals shall be required as part of the environmental assessment process. If any archaeological sites are found during construction, all work in the immediate vicinity shall be suspended pending site investigation by a qualified archeology professional. Proposed structures or roads on property that contains archaeological sites should be sited in consultation with a professional archaeologist to avoid damaging the sites. The County shall follow the California Environmental Quality Act (CEQA) Guidelines for cultural resource preservation procedures in reviewing development projects located near identified cultural resources. Appropriate measures for preserving an historic structure include renovation or moving it to another location. Proposals to remove historic structures shall be reviewed by qualified professionals.

CITY OF PLEASANTON

The City of Pleasanton General Plan (1996) identifies the following policies to protect cultural resources:

> Policy 6. Preserve and rehabilitate those cultural and historic resources that are significant to Pleasanton because of their age, appearance, or history.
>
> Program 6.2. Require archaeological studies in areas of known archaeological significance prior to development approval, and ensure that such studies meet the requirements of

CEQA Appendix K[1] in recommending mitigation measures if an archaeological site is encountered . Include provisions for the interpretation of cultural resources.

CITY OF LIVERMORE

The City of Livermore General Plan (2004) identifies the following policies to protect cultural resources:

Policy CC-3.1.P1. The City shall encourage, and when possible require, the preservation of places, sites, areas, buildings, structures, and works of humans which have cultural, archeological, or historical significance or other special distinction to the community.

Policy CC-3.1.P3. Whenever a historical resource is known to exist in or near a proposed project area, the City shall require an evaluation by qualified professionals as part of the environmental assessment process.

Objective CC-3.4. Identify and protect archeological and paleontological resources that enrich our understanding of early Livermore and the surrounding region.

Policy CC-3.4.P1. The City shall require proper archeological or paleontological testing, research, documentation, monitoring, and safe retrieval of archeological and cultural resources as part of a City established archeological monitoring and mitigation program.

Policy CC-3.4.P2. Whenever there is evidence of an archeological or paleontological site within a proposed project area, and archeological survey by qualified professionals shall be required as a part of the environmental assessment process.

Policy CC-3.4.P3. If an archeological site is discovered during construction, all work in the immediate vicinity shall be suspended pending site investigation by qualified professionals. If in the opinion of a qualified professional, the site will yield new information or important verification of previous findings, the site shall not be destroyed.

Policy CC-3.4.P4. Archeological sites should be preserved for research and educational programs. Where possible, such sites shall be made accessible to the public as part of the open space/recreation/educational system.

[1] Appendix K no longer exists; therefore, references to Appendix K are not appropriate. However, CEQA Guidelines Section 15064.5, and the California Public Resources Code , Division 13, Environmental Quality, Sections 21038.2 and 21084.1 afford protection of cultural resources.

APPENDIX 3.12
VISUAL RESOURCES

ALAMEDA COUNTY EAST AREA COUNTY PLAN

The following visual policies relevant to the project are identified in the ECAP (amended November 2002).

> Policy 106. Structures may not be located on ridgelines or hilltops or where they will project above a ridgeline or hilltop as viewed from public roads, trails, parks, and other public viewpoints unless there is no other site on the parcel for the structure or on a contiguous parcel in common ownership or subsequent to the date this ordinance becomes effective. New parcels may not be created that have no building site other than a ridgeline or hilltop, or that would cause a structure to protrude above a ridgeline or hilltop, unless there is no other possible configurations.
>
> Policy 108. To the extent possible, including by clustering if necessary, structures shall be located on that part of a parcel or on contiguous parcels in common ownership on or subsequent to the date this ordinance becomes effective, where the development is least visible to persons on public roads, trails, parks, and other public viewpoints. This policy does not apply to agricultural structures to the extent it is necessary for agricultural purposes that they be located in more visible areas.
>
> Policy 115. In all cases appropriate building materials, landscaping and screening shall be required to minimize the visual impact of development. Development shall blend with and be subordinate to the environment and character of the area where located, so as to be as unobtrusive as possible and not detract from the natural, open space or visual qualities of the area. To the maximum extent practicable, all exterior lighting must be located, designed and shielded so as to confine direct rays to the parcel where the lighting is located.
>
> Policy 116. To the maximum extent possible, development shall be located and designed to conform with rather than change natural landforms. The alteration of natural topography, vegetation, and other characteristics by grading, excavating, filling or other development activity shall be minimized. To the extent feasible, access roads shall be consolidated and located where they are least visible from public view points.

CITY OF PLEASANTON

The following visual policies were identified in the City of Pleasanton General Plan (August 1996).

> Policy LU-6.1.P1. Structures may not be located on ridgelines or hilltops, where they will project into the view from public places of a ridgeline or hilltop, unless there is no less obtrusive site on the parcel or a contiguous parcel in common ownership. To the extent

practicable, including by deep setbacks from parcel boundaries, structures shall be located on that part of a parcel that minimizes visual impact from public roads and parks.

Goal 3, Policy 8. Improve the visual quality of entries to Pleasanton.

CITY OF LIVERMORE

The following visual policies were identified in the City of Livermore General Plan (January 2004).

Policy LU-6.1.P2. Structures may not be located on ridgelines or hilltops, or where they will project into the view from public places of a ridgeline or hilltop, unless there is no less obtrusive site on the parcel or a contiguous parcel in common ownership. To the extent practicable, including by deep setbacks from parcel boundaries, structures shall be located on that part of a parcel that minimizes visual impact from public roads and parks.

Policy LU-6.1.P3. Development shall be subordinate to and blend harmoniously with the natural and open space qualities of the area where located, so as not to impair those qualities and to be as unobtrusive as possible. In all cases, appropriate landscaping, screening, preservation of vegetation, and building materials, covering, and paint shall be required by the City to reduce as much as practicable the visibility of development. To the maximum extent possible, all exterior lighting must be designed, placed, and shielded to confine rays to the parcel where the light is located…

Policy LU-6.1.P1. New or reconfigured parcels, including those resulting from lot line adjustments, must be created or drawn to limit, as much as possible, visibility of development from public roads, parks and other public places. Parcels may not be created that have no building site other than a ridgeline or hilltop or that would cause a building to project into the view of any ridgeline or hilltop or that would cause a building to project into the view of any ridgeline or hilltop from public places, unless there is no other possible configuration.

Policy CC-4.6.P1. Landscaping should be designed and maintained in scenic route corridors to provide added visual interest, to frame scenic views, and to screen unsightly views.

Policy CC-1.3. P1. The importance of views of the nighttime sky unimpaired by inappropriate intensities of light and glare shall be acknowledged as a significant scenic resource in Livermore.

Objective CC-2.3. Maintain high-quality design of public facilities.

Policy CC-2.3.P1. Existing overhead utilities shall be placed underground through a phased program of conversion.

Policy CC-2.3.P2. Utility distribution lines shall be placed underground in new developments and upon redevelopment.