



IRVINE RANCH WATER DISTRICT

15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

POSTED

APR 23 2012

By TOM DALY, CLERK/RECORDER DEPUTY

April 23, 2012

To: Interested Parties

Subject: **NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION FOR THE PROPOSED ORANGE PARK ACRES WELL REPLACEMENT PROJECT**

The Irvine Ranch Water District (IRWD) is proposing the abandonment of one existing well and the construction and operation of a replacement well and disinfection equipment at the former Orange Park Acres (OPA) Mutual Water Company Headquarters. As the Lead Agency under the California Environmental Quality Act (CEQA), the IRWD has prepared an Initial Study/Draft Mitigated Negative Declaration (IS/MND) which evaluates the potential environmental effects of the proposed project.

Project Location: The project area is located in north-central Orange County, within the City of Orange, south of Villa Park. The proposed project would be located within the boundaries of the former OPA Mutual Water Company Headquarters located at 678 North Gravier Street in the City of Orange.

Project Description: The IRWD proposes the destruction of one existing well (OPA Well-3), and construction and operation of a replacement well (IRWD OPA Well-1), disinfection equipment, and associated

Comments on the IS/MND must be received in writing no later than 5:00 p.m., May 24, 2012 and sent to:

Irvine Ranch Water District
Attention: Christian Kessler
15600 Sand Canyon Avenue
Irvine, California 92618-3102

appurtenances. The proposed replacement well would serve the existing IRWD OPA service area within the City of Orange. The replacement well would have a maximum operational capacity of approximately 900 acre feet per year. The chlorine disinfection system for OPA Well-3 would be removed and replaced with a new system, and a surge tank system would be placed on site. Other ancillary facilities include, but are not limited to a wet well, electrical panels, radio mast, Supervisory Control and Data Acquisition (SCADA)/Programmable Logic Controller (PLC), meters, valves, sand separator, and enclosures for various facilities. A chemical building would also be constructed to house the new disinfection system, associated pump and motor, and a restroom.

Public Review Period: The IS/MND is being made available for public review for a period of 30 days beginning April 24, 2012 and concluding May 24, 2012. The electronic version of the IS/MND may be viewed at the following website address:

<http://www.irwd.com/environment/ceqa.html>

Printed copies of the IS/MND are also available for review at the Irvine Ranch Water District Headquarters, located at 15600 Sand Canyon Avenue, Irvine, California 92618-3102.



IRVINE RANCH WATER DISTRICT

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Comments may also be emailed to Christian Kessler at KESSLER@irwd.com or faxed to (949) 453-0028.

All comments received related to issues discussed in the IS/MND will be included in the final package that is forwarded to the Board of Directors for final consideration.

Public Meeting: The Board will consider the adoption of the IS/MND and any comments received on the IS/MND, along with the proposed project at a regularly scheduled Board meeting to be held on June 11, 2012 at 5:00 p.m. at Irvine Ranch Water District Headquarters, located at 15600 Sand Canyon Avenue, Irvine, California 92618. All parties are welcome to attend and provide testimony as to the proposed project and/or the IS/MND.

If you have any questions regarding the IS/MND, please contact Mr. Christian Kessler at (949) 453-5441.

POSTED
APR 23 2012
By TOM DALY, CLERK-RECORDER DEPUTY

DRAFT

**IRVINE RANCH WATER DISTRICT
ORANGE PARK ACRES WELL REPLACEMENT PROJECT
INITIAL STUDY/MITIGATED NEGATIVE DECLARATION**

PREPARED FOR:

Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, CA 92618

PREPARED BY:

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April 2012



ICF International. 2012. Irvine Ranch Water District Orange Park Acres Well Replacement Project Initial Study/Mitigated Negative Declaration. Draft. April. (ICF 00550.09.) Irvine, CA. Prepared for Irvine Ranch Water District, Irvine, CA.

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Acronyms and Abbreviations

AB 32	Assembly Bill 32
AELUP	Airport Environs Land Use Plan
AFY	acre feet per year
AQMP	Air Quality Management Plan
Basin	Orange County Groundwater Basin
BAU	Business As Usual
BEA	Basin Equity Assessment
bgs	below ground surface
BMPs	Best Management Practices
BPP	Basin Production Percentage
Cal/OSHA	California Occupational Safety and Health Administration
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
CMU	concrete masonry unit
Committee	Joint Groundwater Engineering and Management Committee
DAMP	Drainage Area Management Plan
EFZs	Earthquake Fault Zones
EIR	Environmental Impact Report
EOCWD	East Orange County Water District
Farmland	Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
FTA	Federal Transit Administration
GHG	greenhouse gas
gpm	gallons per minute
IRWD	Irvine Ranch Water District
IS/MND	Initial Study/Final Mitigated Negative Declaration
IS	Initial Study
LAFCO	Local Agency Formation Commission
LDR	Low Density Residential
LST	Localized Significance Threshold
MGD	Million gallons per day
MND	Mitigated Negative Declaration
MUTCD	Manual on Uniform Traffic Control Devices
NCCP/HCP	Natural Community Conservation Plan and Habitat Conservation
NPDES	National Pollutant Discharge Elimination System

OCFA	Orange County Fire Authority
OCFCD	Orange County Flood Control District
OCHCA	Orange County Health Care Agency
OCTA	Orange County Transportation Authority
OCWD	Orange County Water District
OPA	Orange Park Acres
OPAMWC	Orange Park Acres Mutual Water Company
OSHA	Occupational Safety and Health Administration
PLC	Programmable Logic Controller
PPV	peak particle velocity
RA	Replenishment Assessment
RCPG	Regional Comprehensive Plan and Guide
SAMP	Subarea Master Plan
SARWQCB	Santa Ana Regional Water Quality Control Board
SCADA	Supervisory Control and Data Acquisition
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SOI	Sphere of Influence
SWPPP	stormwater pollution prevention plan
TMDL	total maximum daily load

Overview

Irvine Ranch Water District (IRWD) has prepared this Draft Initial Study/Mitigated Negative Declaration (IS/MND) to evaluate the potential environmental consequences associated with replacing a groundwater well located at the former Orange Park Acres (OPA) Mutual Water Company Headquarters, 678 N. Gravier Street, in Orange. Prior to consideration of the project by the IRWD Board of Directors, the proposed project is required to undergo an environmental review pursuant to the California Environmental Quality Act (CEQA).

Authority

The preparation of this IS/MND is governed by two principal sets of documents: CEQA (Public Resources Code Section 21000 *et seq.*) and the State CEQA Guidelines (California Code of Regulations Section 15000 *et seq.*).

One of the main objectives of CEQA is to disclose to the public and decision makers the potential environmental impacts of proposed activities. CEQA requires that the lead agency determine whether a project is subject to CEQA review or exempt under statutory exemptions (CEQA Guidelines, Article 18, Sections 15260 *et seq.*) or categorical exemptions (CEQA Guidelines, Article 19, Section 15300 *et seq.*). IRWD determined that the proposed project is not exempt from CEQA and therefore proceeded with the preparation of an initial study (IS) to determine whether an environmental impact report, a negative declaration, or a mitigated negative declaration (MND) is appropriate. IRWD is the lead agency for the proposed project under CEQA.

The preparation of an IS is guided by Section 15063 of the State CEQA Guidelines, and Sections 15070–15075 of Article 6 guide the process for the preparation of an MND. Where appropriate and supportive to an understanding of the issues, reference will be made to the statute, the State CEQA Guidelines, or appropriate case law.

This IS/MND meets CEQA content requirements by including a project description; a description of the environmental setting, potential environmental impacts, and mitigation measures for any significant impacts; discussion of consistency with plans and policies; and names of preparers.

Scope of the Initial Study/Mitigated Negative Declaration

This IS/MND evaluates the proposed project's impacts on the following resource topics:

- Aesthetics
- Agriculture and Forest Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

Impact Terminology

The following terminology is used to describe the level of significance of impacts.

- A finding of *no impact* is appropriate if the analysis concludes that the proposed project would not affect the particular resource in any way.
- An impact is considered *less than significant* if the analysis concludes that it would cause no substantial adverse change to the environment and requires no mitigation.
- An impact is considered *less than significant with mitigation incorporated* if the analysis concludes that it would cause no substantial adverse change to the environment with the inclusion of environmental commitments that have been agreed to by the applicant.
- An impact is considered *potentially significant* if the analysis concludes that it could have a substantial adverse impact on the environment.

Organization of the Initial Study/Mitigated Negative Declaration

The content and format of this report are designed to meet the requirements of CEQA. The report contains the following sections.

- Chapter 1, "Introduction," identifies the purpose and scope of this IS/MND and the terminology used in the report.

- Chapter 2, “Project Description and Environmental Setting,” identifies the location, setting description, background, and planning objectives of the proposed project and describes the proposed project in detail.
- Chapter 3, “Environmental Checklist,” presents the CEQA environmental checklist and responses for each resource topic in the checklist. This section includes a brief setting section for each resource topic and identifies the impacts of implementing the proposed project and identifies any mitigation measures.
- Chapter 4, “References,” identifies all printed and Internet references and individuals cited in this IS/MND.
- Chapter 5, “List of Preparers,” identifies the individuals who prepared this report and their roles in the proposed project.

Chapter 2

Project Description and Environmental Setting

Introduction and Overview

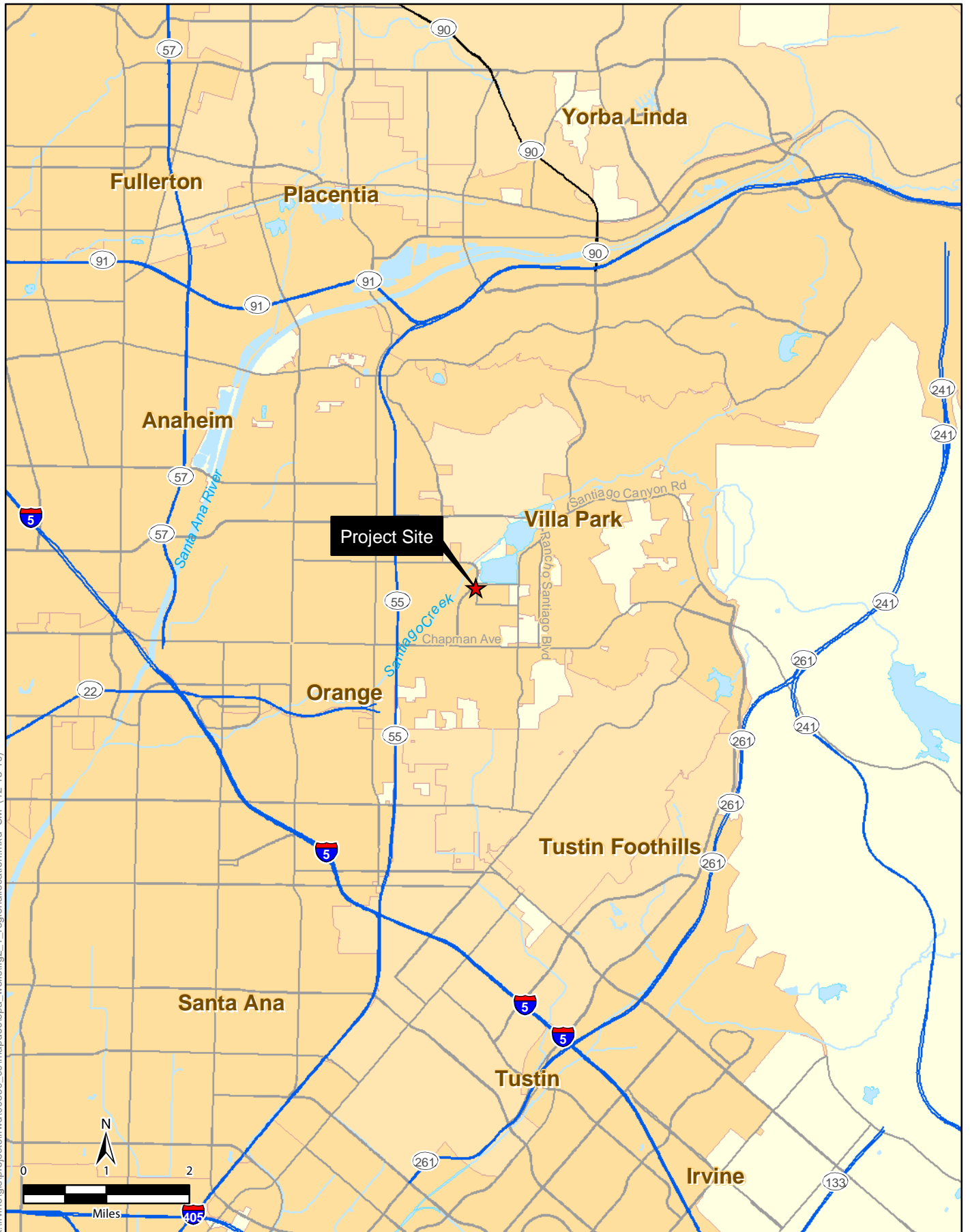
The Irvine Ranch Water District proposes to replace an underperforming groundwater well (OPA Well-3) that is approaching the end of its useful life. The proposed project would include the destruction of OPA Well-3 and the construction, installation, and operation of a new well (referred to as IRWD OPA Well-1 in this document) and ancillary equipment and facilities on the same site located at 678 N. Gravier Street in the City of Orange. The project area is located in north-central Orange County, within the City of Orange, south of Villa Park. Figure 2-1 depicts the regional location of the project area. The proposed project would serve areas of OPA that are serviced by IRWD (referred to as the OPA service area), depicted in Figure 2-2. Details regarding the project objectives, location, environmental setting, and construction and operation of the proposed project are included in this chapter.

Project Background

The OPA service area was formerly operated as the Orange Park Acres Mutual Water Company (OPAMWC) before consolidation with IRWD in June 2008. The OPA service area covers approximately 646 acres primarily within unincorporated Orange County, with some areas within the City of Orange. The service area is generally bounded to the north and east by Santiago Canyon Road and Villa Park Drive, to the east by Cannon Street and Rancho Santiago Boulevard, and to the south by Chapman Avenue.

Historically, water supply for the OPA service area has been provided primarily by an existing groundwater well (OPA Well-3) located at the former OPAMWC headquarters at 678 N. Gravier Street. On an as needed basis, demand for the OPA service area is met by importing water from the East Orange County Water District (EOCWD) via the existing EOCWD turnout No. 5 located at the reservoir site along Calle Grande or from various City of Orange sources including imported water from the Metropolitan Water District of Southern California and local groundwater basins (City of Orange 2009). Historically, groundwater provides for two-thirds of the annual demands, and imported water supplies the remaining one-third of the water supply for the OPA service area. The average annual groundwater production from OPA Well-3 for 2004 to 2008 was approximately 892 acre-feet per year (AFY) or about 0.80 million gallons per day (MGD).

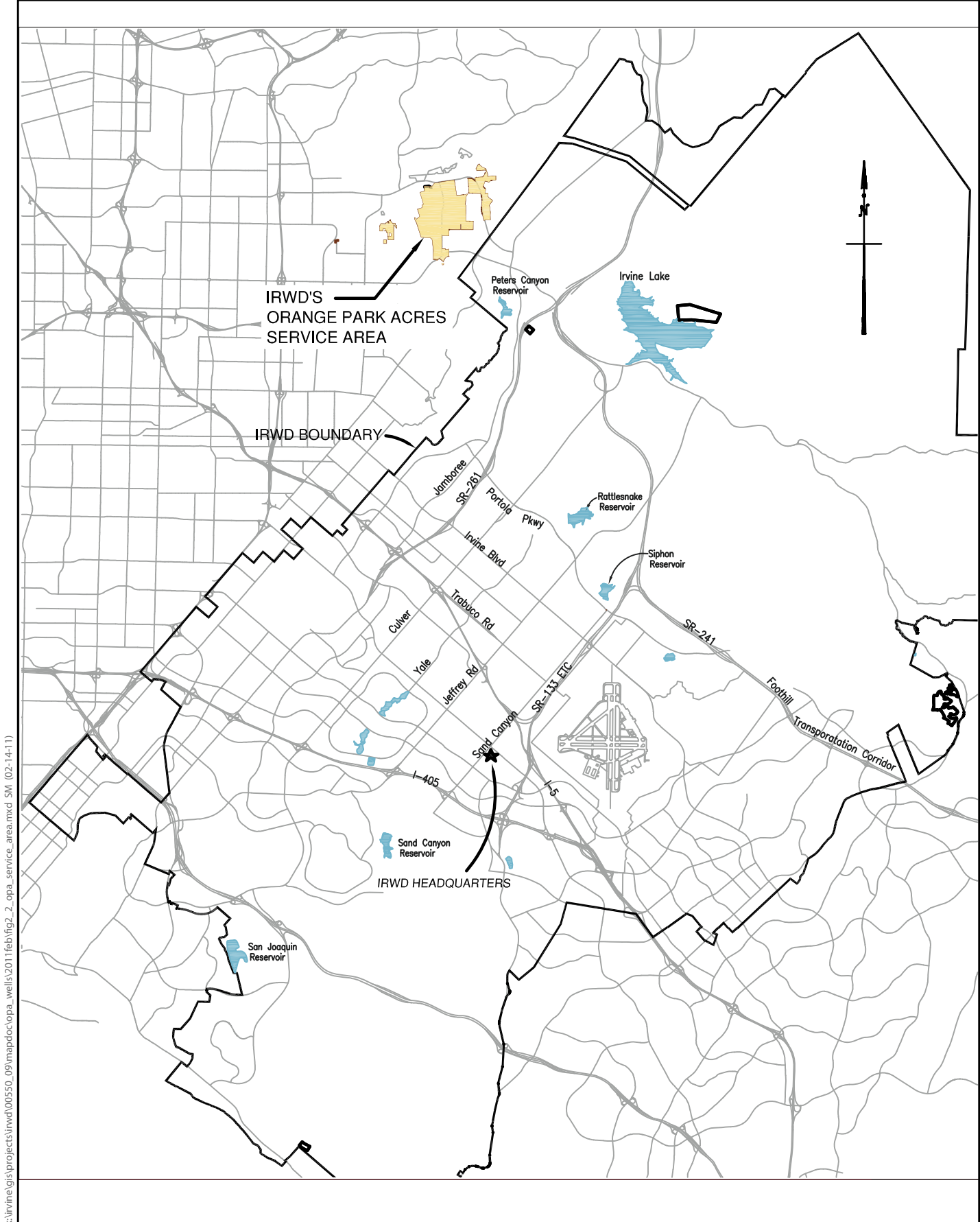
IRWD prepared a Sub Area Master Plan (SAMP) for the OPA service area, which (based on existing and projected water demand) identified the need for upgrades and improvements to the domestic water distribution and transmission system (Stantec 2009), OPA Well-3 (the existing groundwater well), and a future sanitary sewer system. An IS/MND was prepared, distributed for public review, and adopted by the IRWD Board of Directors in August of 2010 for the Orange Park Acres Domestic Water Distribution and Transmission System Improvements Project. This previously approved IS/MND evaluated potential impacts associated with phased improvements and upgrades to the OPA distribution and transmission system, including upgrading the OPA transmission main to a 20-inch line connecting to the existing Zone 5 16-inch line at Jamboree and Chapman; upgrading



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SOURCE: ESRI 2008

**Figure 2-1
Regional Location**



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SOURCE: Stantec (2009)



Figure 2-2
OPA Service Area

distribution lines; removing an emergency bypass line; installing pressure reducing stations, telemetry, and bidirectional meters; modifying the EOCWD turnout; upgrading the Meads pump station; and demolishing the Orange Park Acres reservoir and four booster pump stations. This project is currently under construction.

Recommendations for a new well (referred to in this document as IRWD OPA Well-1) to be drilled at the existing OPA Well-3 site were included as part of the SAMP based on the poor condition of the existing OPA Well-3. The existing OPA Well-3 has significantly degraded over the years since its original construction in 1980 and is in need of replacement. The original capacity of the OPA Well-3 was approximately 1,900 gallons per minute (gpm) in 1980, but the well has degraded over the years and is currently producing approximately 900 gpm.

In June of 2011, IRWD circulated for public review a Draft IS/MND, which analyzed the destruction of existing OPA Well-3, and construction and operation of two new wells (IRWD OPA Well-1 and OPA Well-2). IRWD OPA Well-1 was proposed to replace OPA Well-3 to serve the demands of the existing OPA service area, and IRWD OPA Well-2 was proposed to serve the future demands of the approved Santiago Hills II and East Orange developments. IRWD determined that environmental review of IRWD OPA Well-2 was not necessary at this time. Therefore, IRWD has modified the project to include only the IRWD OPA Well-1 to replace the deteriorating OPA Well-3, and has removed IRWD OPA Well-2 from the proposed project. It should be noted that the proposed IRWD OPA Well-1 and the potentially needed OPA Well-2 have independent utility and are not dependent on one another for ongoing operations of the OPA Service Area.

IRWD has decided not to go forward with the IRWD OPA Well-2 project at this time. Further environmental review will be required for the installation of an additional well (IRWD OPA Well-2) to serve the future developments associated with Santiago Hills II and East Orange as well as a sanitary sewer system to serve the OPA area in the future. The environmental review of these potential projects and potential cumulative impacts, including the determination of the type of environmental document to be prepared, will be conducted in accordance with the California Environmental Quality Act statute and guidelines. IRWD will coordinate with the City of Orange and EOCWD during the environmental review process.

Project Location

The project area is located in the City of Orange, south of the City of Villa Park (Figure 2-1). The project site is at 678 N. Gravier Street (Assessor's Parcel Number 383-294-02), the former location of the OPAMWC Headquarters, which is currently owned and operated by the IRWD. Land uses in the general vicinity of the project site are primarily residential single-family homes. Three schools are located within 0.5 mile of the project site: Prospect Elementary School (within 0.25 mile), Eldorado School, and a private elementary school (Esplanade Elementary School). Additionally, Grijalva Community Park is located approximately 0.5 mile south-southwest of the project site. Santiago Creek is within 0.25 mile of the project site to the west, and the Santiago Creek Recharge Basin (operated by the Orange County Water District) is about 300 feet to the north-northeast. Figure 2-3 depicts the project site and local vicinity of the project area.



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SOURCE: ESRI 2008; Digital Globe Imagery (2008)



Figure 2-3
Local Vicinity

Existing Site Conditions

The project site comprising the former OPAMWC headquarters building pad is approximately 16,000 square feet (0.37 acre). According to the City of Orange General Plan, the land use designation of the site is Low Density Residential (LDR). Per the City of Orange Zoning Ordinance, the project site is zoned Single Family Residential with a 7,000 square foot minimum lot size (R-1-7). The project site contains an aboveground well pump, support infrastructure for the well, a single-family home, the former OPAMWC headquarters building pad (2,000 square feet), an enclosure for a chlorine disinfection system, and other associated appurtenances. Each of these components is discussed in additional detail below. Approximately 9,000 square feet (29%) of the project site contains impervious surfaces (buildings, building pads, concrete, asphalt), while the rest is pervious surfaces (lawn, dirt, trees, gravel). Figure 2-4 depicts details of the project site including the existing well and buildings in relation to the surrounding residential land uses.

OPA Well-3

The existing OPA Well-3 is located in the northwest corner of the project site, as shown on Figure 2-4. It was drilled in 1980 and has a 100-foot sanitary seal. A 20-inch diameter well casing (within a 28-inch diameter borehole) extends to a depth of 800 feet below ground surface (bgs). Casing perforations, which allow the well to draw in groundwater from the surrounding water bearing strata, are set at various depths between 315 and 760 feet bgs. There is no gravel pack at the bottom of the well; however, there is a desanding unit that removes sand from the well.

OPA Well-3 originally had a pumping rate of approximately 1,900 gpm but overtime, OPA Well -3 began underperforming. The production of OPA Well -3 decreased to a point where the pump, which was designed for higher capacity, could no longer operate efficiently. In early 2009, the pump and bowl assembly was replaced with equipment of lower capacity to allow the pump to operate efficiently at a rate of approximately 900 gpm. Historical pumping data indicates the well produced between 700 AFY and 800 AFY.

OPA Well-3 is currently in poor operating condition and is nearing the end of its useful life. Recent inspections revealed that the upper portion of the casing appeared to have an extreme amount of exfoliation of metal, leaking was observed in the casing joint at about 210 feet bgs, and the well casing was covered with a considerable amount of biofilm.

The existing disinfection system sits adjacent to the well and is contained within a closed and locked storage shed. There is outdoor lighting currently located on the chlorine disinfection system near the OPA Well-3. The system holds two 55 gallon drums that are refilled with sodium hypochlorite solution. This solution is stored offsite at the Michelson Water Recycling Plant and transported to the site and refilled by IRWD personnel as needed (approximately once per month). Sodium hypochlorite solution is used to disinfect the groundwater prior to discharge into the distribution system. IRWD performs regularly scheduled maintenance on the well, including checking and refilling the disinfection system needed, checking the operation of the well pump, and performing required water quality testing.



SOURCE: ESRI USA Imagery (2009)

Figure 2-4
Project Site

Former OPAMWC Headquarters Building Pad

The former OPAMWC headquarter building was built in 1980 and was approximately 2,000-square-feet located on the northern end of the project site. This single story building was nearing the end of its useful life and no longer served a purpose for IRWD. The building was demolished in June of 2011 as part of a separate action from the proposed IRWD OPA Well-1 project under a Notice of Exemption filed on March 23, 2011. The former OPAMWC headquarter building pad remains and is surrounded by a fence (both chain link and concrete masonry unit [CMU] wall approximately 6 to 8 feet high and has a padlocked iron gate that provides access to the site).

Single Family Home

An approximately 2,000-square-foot single-family home is located on the south end of the project site as shown on Figure 2-4. The single-story home is owned by IRWD, and has a yard and garage. Based on the architectural features of the home, it was likely built in the 1960s or 1970s and is currently being leased by IRWD for residential use. The single family home is currently connected to the existing water, sewer, and storm drain system. The single family home has a chain link fence surrounding the back yard which is approximately 6 to 8 feet high. The single family home has some outdoor nighttime lighting.

Orange County Groundwater Basin

The project site is located within the Coastal Plain of the Orange County Groundwater Basin (Basin) and within the boundaries of the Orange County Water District (OCWD) service area. The Basin is managed by OCWD under the Orange County Water District Act (see Regulatory Setting below for a description). The Basin covers approximately 350 square miles, bordered by Chino Hills to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean to the southwest (OCWD 2009). The Basin is dominated by a deep structural depression containing a thick accumulation of freshwater-bearing marine sand, silt, and clay deposits (City of Orange 2009). Groundwater conditions in the Basin are influenced by natural hydrologic conditions such as rainfall, groundwater seepage, stream flow, and measured artificial recharge performed by OCWD. Groundwater recharge occurs near OPA Well-3 at the Santiago Creek Recharge Basin and within Santiago Creek south of the Recharge Basin. Additional artificial recharge is performed at OCWD Forebay percolation facilities and water injection facilities at the Talbert Barrier and Alamosos Barrier. The static groundwater level fluctuates regularly depending on the amount of recharge and seasonal rainfall; therefore, the static groundwater level can change over time. The depth to static groundwater in the project location varies, but it was approximately 293 feet bgs on February 18, 2009, at the existing OPA Well-3 site when the pump was replaced.

Groundwater production is managed by OCWD through financial incentives, which is detailed in the Orange County Water District Act (see Regulatory Setting). IRWD is a producer/operator of existing groundwater facilities in the Basin and therefore is subject to OCWD management.

Proposed Project

Project Objectives

The CEQA Guidelines (Section 15124[b]) require that a project description contain a statement of objectives, including the underlying purpose of a proposed project. The objective for the proposed project is to provide a reliable source of groundwater for the OPA service area by replacing existing OPA Well-3, which is at the end of its useful life, with a new well that will operate at the same historic pumping levels of OPA Well-3 ranging from 700 to 900 afy.

Project Description

The proposed project includes the destruction and abandonment of the existing OPA Well-3 and the drilling, construction, and operation of IRWD OPA Well-1 at the former OPAMWC headquarters site. Figure 2-5 depicts the preliminary site layout for the project and is subject to minor changes resulting from the final design phase of the project. The project facilities would be constructed within the project boundary shown in Figure 2-4.

The proposed well would serve the existing OPA service area within the City of Orange (per the terms of the 2006 agreement with the City of Orange [Appendix A]). As part of the Local Agency Formation Commission (LAFCO) approval of the OPAMWC consolidation into IRWD, the August 2006 agreement between the City of Orange and IRWD states that groundwater wells operated by IRWD within the City of Orange's Sphere of Influence (SOI) shall only serve water customers within the City's SOI. Per this agreement, no groundwater pumped from the proposed IRWD OPA Well-1 can be exported out of the City of Orange's SOI. The groundwater well would be operated in accordance with the 2006 agreement and the LAFCO approval. IRWD OPA Well-1 would have a maximum extraction capability of approximately 2,000 gpm which would be restricted to a maximum production of 900 acre-feet per year. Records related to actual pumping rates, durations, pumping levels, static water levels and annual pumping volumes will be maintained by IRWD. These records will be made available for review by others including the City of Orange and EOCWD to confirm that the annual water extraction from Well-1 does not exceed 900 acre-feet per year. IRWD OPA Well-1 would only serve demand within the OPA service area per the August 2006 agreement with the City of Orange.

The chlorine disinfection system for OPA Well-3 would be removed and replaced with a new system, and a surge tank system would be placed on site. The new onsite disinfection system would be similar to the existing disinfection facility, and would utilize chloramination to disinfect the groundwater pumped by the well prior to delivery of the water into the existing distribution system. The disinfection system would consist of two tanks—one tank would contain the 12.5% sodium hypochlorite and the other tank would contain the 29% ammonia. It is estimated that the sodium hypochlorite and ammonia tanks would be approximately 2,500 gallons and 200 gallons in size, respectively. Both tanks would have double containment by being located in a spill containment area. The tanks would be located in an enclosed and locked stucco enclosure with an intrusion alarm. The enclosure would have a pitched roof similar to those on the surrounding residences.

Additionally, a wet well and pump station would be constructed on site to receive and deliver water from IRWD OPA Well-1. The wet well would be an underground concrete vault that will temporarily store disinfected water before being pumped to another location. IRWD OPA Well-1 would pump



SOURCE: ESRI USA Imagery (2009)
 NOTE: Project facilities will be constructed within the project site boundary.
 Preliminary site layout is subject to change based upon final design.

Figure 2-5
Preliminary Site Layout

water to the wet well that would hold approximately 50,000 gallons of water. The associated pump station would then pump the disinfected well water to Santiago Hills Zone 5 Reservoir. The wet well would be constructed below the ground surface and the associated pump and motor would be located on top of or near the wet well in an enclosure. Other ancillary facilities will include, but are not limited to, electrical panels, radio mast, Supervisory Control and Data Acquisition (SCADA)/Programmable Logic Controller (PLC), meters, valves, sand separator, chemical tanks, and enclosures for various facilities. Once the well is constructed, IRWD would also perform regular well inspection and maintenance at the project site. The construction activities associated with each of these project elements is described in greater detail below.

Construction Activities

Construction activities will include the destruction of OPA Well-3 well and construction of IRWD OPA Well-1 and the associated facilities and would occur within the project site boundary as shown in Figure 2-4. These activities would last approximately 14 months. As part of the proposed project, temporary sound walls at a height of 24 feet would be installed within the project site boundary during well drilling, well construction, and testing to reduce construction noise impacts on the surrounding residential neighborhood. The project site would also be surrounded by a 7- to 8-foot high temporary chain link fence for security purposes. The fence would have green mesh screens or other acceptable paneling to reduce visibility during construction.

Destruction of OPA Well-3 would follow the State of California Department of Water Resources, City of Orange, and Orange County Health Care Agency (OCHCA) requirements for properly abandoning wells in accordance with the California Well Standards Bulletins 74-81 and 74-90. Generally, destruction of water wells includes filling with either cement grout, or bentonite grout and cutting and capping the upper several feet of well casing. Destruction of the well would require a well demolition and abandonment permit from the City of Orange and would be observed and monitored by City Water Division staff in the field (discussed further in the Regulatory Setting). Destruction of OPA Well-3 would take place during normal working hours (i.e., 7:00 a.m. to 8:00 p.m.), per the City of Orange's Noise Ordinance (Title 17, Section 8.24.070, of the City of Orange Municipal Code).

As part of the proposed project, IRWD will seek, as necessary, a variance from the noise ordinance to allow drilling, water quality testing, construction, well development and pump testing of the proposed well between 8:00 p.m. and 7:00 a.m.

The drilling phase of construction for IRWD OPA Well-1 would include site preparation, mobilization of equipment to the project site, well drilling, water quality testing, installing the well casing, gravel packing, constructing a cement seal, well development, pump testing, and other incidental construction-related activities. IRWD OPA Well-1 would be constructed to a depth of approximately 900 feet bgs. Construction contractors working in City areas would adhere to traffic control standards identified in the Manual on Uniform Traffic Control Devices (MUTCD) (Federal Highway Administration 2001).

Construction of IRWD OPA Well-1 would require periodic 24-hour drilling that would take place over approximately 6 to 8 weeks. The drill rig would need to run 24 hours a day to prevent the borehole walls from collapsing and compromising the integrity of well construction. In addition, well development and pump testing would also have to occur 24 hours per day. The City's Noise Ordinance exempts construction activities performed between the hours of 7:00 a.m. and 8:00 p.m. from the provisions of the noise ordinance (Title 17, Section 8.24.070, of the City of Orange

Municipal Code). Construction activities conducted outside of those hours are required to comply with the City's noise ordinance (including limits on noise levels generated during nighttime hours). As mentioned above, IRWD will seek as necessary a variance from the noise ordinance to allow drilling, well development, construction and pump testing of the well between 8:00 p.m. and 7:00 a.m.

During construction of IRWD OPA Well-1, water would be provided to OPA service areas from the EOCWD Turnout No. 5 and various City of Orange emergency inter-connections. IRWD will contact the City of Orange and EOCWD prior to the start of the project to confirm availability of obtaining water from existing Orange/IRWD interconnections. Water discharged during well drilling would be conveyed to onsite settling tanks (known as Baker tanks) and discharged to the storm drain in compliance with the National Pollutant Discharge Elimination System (NPDES) Permit issued by the Santa Ana Regional Water Quality Control Board (SARWQCB). IRWD will also need to obtain a flood control encroachment permit from the Orange County Flood Control District (OCFCD) for well construction discharge flows. In addition, all drill cutting, rotary fluid, and other by-products would be retained on site to be transported and disposed of per applicable regulations. Additional regulatory requirements such as permits, approvals, or coordination to construct and operate the well from the California Department of Public Health, the City of Orange, and other regulatory agencies are discussed below in the Regulatory Setting.

A permanent noise attenuating enclosure or enclosures would be constructed around the IRWD OPA Well-1 and pumps. This structure would likely consist of an enclosed stucco structure with a pitched roof similar to the residential roofs in the area to be consistent with the surrounding residential neighborhood. Structures such as these currently contain most of IRWD's existing wells and are equipped with concrete-lined and concrete masonry walls with internal sound blankets inside the structures to attenuate noise generated by the operating well pumps.

A surge tank used to protect from system pressure surges would also be constructed on the project site. The surge tank does not generate noise because it is only used to prevent spikes in pressure. If the surge tank requires an air compressor, the compressor will be located in a building to attenuate the sound. The surge tank would not be enclosed in a structure. The height of the surge tank depends on the needs of the well once it is drilled; however, it would likely be a metal structure less than 15 feet tall. It would be painted neutral colors to match other onsite and surrounding structures. The wet well would be located below ground and would have pumps located above it to move disinfected water from the wet well to the Santiago Hills Zone 5 Reservoir. The wet well pumps would be located within an enclosure. Finally, a tapered pole antenna of approximately 25 feet in height and several inches in diameter would be installed on the project site to convey information to IRWD regarding well operation. All construction activities would occur within the project site boundary shown in Figure 2-4.

A chemical building would be constructed that houses the sodium hypochlorite and ammonia tanks and a restroom. A spill containment area would be constructed outside the building to capture chemicals that may spill or leak during deliveries. A secondary containment area would be constructed within the chemical building that will contain the chemicals in the event of a leak from the tank.

Well Operations

IRWD OPA Well-1 would pump water to the wet well facilities that would then pump the disinfected well water to the Santiago Hills Zone 5 Reservoir where it would be stored and used to meet daily OPA service area demands. Figure 2-6 depicts the location of the Santiago Hills Zone 5 Reservoir. Although IRWD OPA Well-1 could be operated at any time of the day, it would generally be operated during off peak hours to take advantage of lower energy costs to fill the Santiago Hills Zone 5 Reservoir. The well would be equipped for an extraction capability of approximately 2,000 gpm which would be restricted to a maximum production of 900 acre-feet per year. Water from the well would be delivered to the Santiago Zone 5 Reservoir where releases would then be made to meet an average demand of approximately 900 AFY of potable water to the OPA service area, which is based on the OPA SAMP.

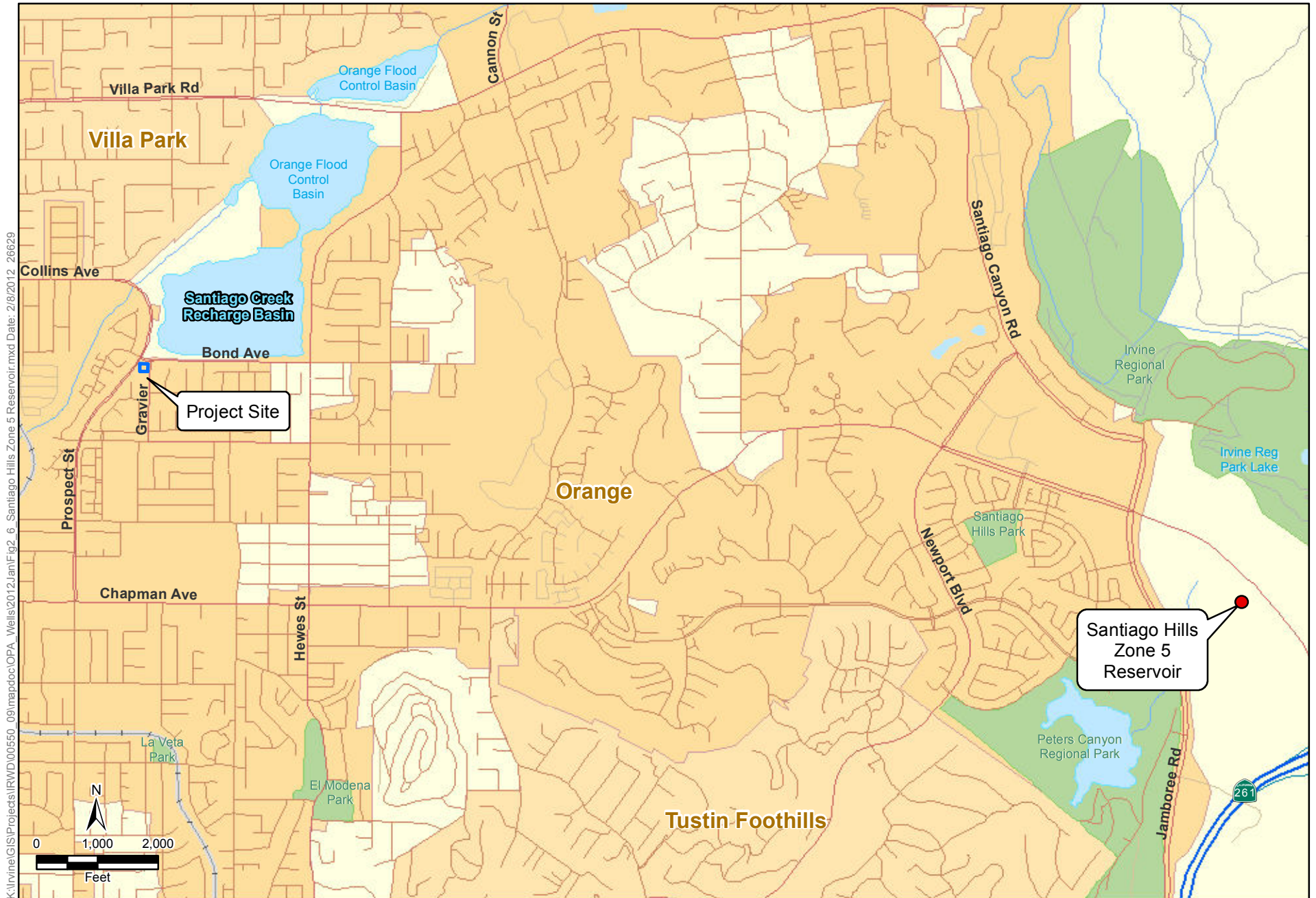
IRWD would conduct regularly scheduled inspection and maintenance on the well and project facilities similar to current activities for OPA Well-3. The maintenance would be scheduled as needed and would include checking the disinfection system and the operation of the pumps, as well as testing water quality. The inspection would include confirming the condition of existing facilities, condition of fencing and CMU wall, and operational integrity of onsite security systems. It is estimated that the disinfection tanks will be refilled once a month.

Joint Groundwater Engineering and Management Committee

At the time of the annexation of the OPAMWC by IRWD, the City of Orange expressed concerns over the pumping and use of groundwater in the annexation area (currently the OPA Service Area). In order to coordinate groundwater production, monitoring, and the mitigation of impacts from new wells, IRWD and the City of Orange have established a Joint Groundwater Engineering and Management Committee (Committee) in accordance with the Annexation Agreement. The primary purpose of the Committee is to facilitate communication between IRWD and the City of Orange, as well as to coordinate its activities and recommendations with OCWD. The Committee is charged with the following tasks to cooperatively monitor and evaluate groundwater production activities in Orange Park Acres and in the East Orange area:

- Monitoring groundwater levels and production;
- Monitoring water quality;
- Reviewing any proposed IRWD and City of Orange well sites;
- Developing mitigation measures for IRWD and City of Orange wells;
- Allocating cost of groundwater mitigation measures; and
- Developing programs to augment groundwater production

The Committee provides a framework for IRWD to work with the City of Orange and OCWD to address specific issues caused by projects that affect regional and local groundwater supplies on a case-by-case basis. Section IX, Hydrology and Water Quality, of Chapter 3 includes additional discussion and analysis of potential impacts that may occur to nearby City of Orange or EOCWD groundwater wells.



K:\Irvine\GIS\Projects\IRWD\00550_09\mapdoc\OPA_Wells\2012\Jan\Fig2_6_Santiago Hills Zone 5 Reservoir.mxd Date: 2/8/2012 2:66:29

SOURCE: ESRI 2008; Digital Globe Imagery (2008)



Figure 2-6
Santiago Hills Zone 5 Reservoir

Regulatory Setting

The proposed project falls within the jurisdictions of several agencies. Each of these entities is described below.

California Department of Public Health

The California Department of Public Health regulates drinking water supplies in the state of California. Drinking water-related statutes are from the Education Code, Food and Agricultural Code, the Government Code, the Health and Safety Code, the Public Resources Code, and the Water Code. Regulations are from Title 17 and Title 22 of the CCR. The California Department of Public Health permits all water purveyors in the state with water supply permits.

Santa Ana Regional Water Quality Control Board

There are nine regional water quality control boards statewide. The Santa Ana Regional Water Quality Control Board manages Region 8 and sets water quality standards, issues waste discharge requirements, determines compliance with those requirements, and takes appropriate enforcement action when necessary within Orange County and other parts of Region 8.

Orange County Water District Act

OCWD manages the Basin under the Orange County Water District Act. Producers, such as IRWD, may install and operate production facilities (such as wells) within the Basin and are required to notify OCWD of their intent to do so. In accordance with the Orange County Water District Act, OCWD manages annual production and recharge and replenishment of the Basin. The production in the Basin is managed through financial incentives, which incentivizes groundwater producers to control groundwater pumping through the implementation of the Basin Production Percentage (BPP) each year. The BPP is the ratio of groundwater production to total water demands. A Replenishment Assessment (RA) is paid for all water pumped out of the Basin by each producer on a biannual basis. Groundwater production above the BPP is charged a Basin Equity Assessment (BEA), which is set so that the cost of groundwater pumping above the BPP is similar to the cost of imported water. Each year, OCWD sets a BPP and assesses a BEA on all water pumped above the limit.

Orange County Flood Control District

The Orange County Flood Control District (OCFCD), also known as the Orange County Flood Section, is tasked with protecting Orange County from the threat of floods. OCFCD designs and constructs channels, storm drains, dams, pump stations and other drainage related facilities. The OCFCD issues permits to discharges that utilize their drainage facilities.

Discretionary Actions and Approvals

Under CEQA, the IRWD has primary discretionary authority over the approval of the proposed project. The anticipated discretionary approvals required for IRWD to implement the proposed project include the following:

- Adoption of the MND;
- Adoption of a mitigation monitoring and reporting program; and
- Design, construction, and operation of the project.

Other public agencies may also have discretionary authority over the project, or aspects of the project, and are considered responsible agencies. Specifically, a well permit will be required from the City of Orange as discussed below. The IS/MND can be used by the responsible agencies to comply with CEQA in connection with permitting or approval authority over the project. OCWD is not a responsible agency because they do not have discretionary approval over the proposed project. Furthermore, OCWD does not have a need to use this CEQA document to issue any approvals or permits.

Proposed Permits and Coordination

California Department of Public Health

IRWD would obtain approvals from the California Department of Public Health (CDPH) for the well plans and specifications. The California Department of Public Health will require an amendment to IRWD's existing Water Supply Permit dated April 24, 1980 to add IRWD OPA Well-1.

OCWD

IRWD would notify OCWD of its intent to drill the well so that OCWD can add the well to its database of existing producer wells and assess IRWD the requisite semi-annual replenishment assessment and annual basin equity assessment, if applicable.

Santa Ana Regional Water Quality Control Board

Dewatering may be required during proposed project construction. A region-specific permit is available from the SARWQCB allowing IRWD and its contractors to discharge groundwater resulting from construction projects (Order No.R8-2009-0003, NPDES No. CAG998001).

Orange County Flood Control District

IRWD will obtain an encroachment permit for well construction discharge flows from OCFCFD if required.

City of Orange

IRWD would obtain a permit from the City of Orange to abandon and destroy OPA Well-3 and to construct IRWD OPA Well-1, in accordance with City of Orange OMC Section 13.40. This section prohibits any person, firm, or private or public corporation or agency to construct or reconstruct any well within the corporate limits of the City unless such construction or reconstruction is carried

out pursuant to and in conformance with a written permit issued by the City. In addition, City encroachment permits for any work within City right-of-way may be obtained. Transportation and/or haul permits associated with construction may also be required. As part of constructing the proposed project, IRWD will seek a variance from the noise ordinance to allow drilling, construction, well development and pump testing of the well between 8:00 p.m. and 7:00 a.m.

Coordination with the City of Orange Fire Department for storage of hazardous materials on site (associated with the disinfection system) is also required during proposed project operations. Also, as part of the proposed IRWD OPA Well-1 improvements, IRWD will work closely with City staff to accommodate as necessary the City's requirements and to resolve as necessary any design, construction, or operations related issues.

East Orange County Water District

IRWD will make records pertaining to the operation of OPA Well-1 available to EOCWD to confirm that the annual water extraction from Well-1 does not exceed 900 acre-feet per year. In the future, IRWD and EOCWD may enter into an agreement for the development of joint groundwater production facilities. IRWD would coordinate with EOCWD in accordance with any such agreement in the environmental review, construction and operation of any such facilities. The environmental review of potential joint project, including the determination of the type of environmental document to be prepared, would be conducted in accordance with the California Environmental Quality Act statute and guidelines.

Chapter 3 Environmental Checklist

- 1. Project Title:** Irvine Ranch Water District Orange Park Acres Well Replacement Project
- 2. Lead Agency Name and Address:** Irvine Ranch Water District (IRWD)
15600 Sand Canyon Avenue
Irvine, CA 92618
- 3. Contact Person and Phone Number:** Christian Kessler
949-453-5441
- 4. Project Location:** 678 North Gravier Street, Orange, CA 92869
- 5. Project Sponsor's Name and Address:** Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, CA 92618
- 6. General Plan Designation:** Low Density Residential
- 7. Zoning:** Single Family Residential
- 8. Description of Project:** The proposed project includes the destruction and abandonment of the existing OPA Well-3, and the construction and operation of a replacement well, IRWD OPA Well-1. See Chapter 2, Project Description.
- 9. Surrounding Land Uses and Setting:** Land uses in the general vicinity of the project site are primarily residential single-family homes. Three schools are located within 0.5 mile of the project site: Prospect Elementary School (within 0.25 mile), Eldorado School, and a private elementary school (Esplanade Elementary School). Additionally, Grijalva Community Park is located approximately 0.5 mile south-southwest of the project site. Santiago Creek is within 0.25 mile of the project site to the west, and the Santiago Creek Recharge Basin (operated by the Orange County Water District) is approximately 300 feet to the north-northeast. See Chapter 2, Project Description.
- 10. Other Public Agencies Whose Approval is Required:**

Environmental Factors Potentially Affected

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

- | | | |
|---|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture and Forest Resources | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality |
| <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Population/Housing | <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Transportation/Traffic | <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Mandatory Findings of Significance |

Determination

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have an impact on the environment that is "potentially significant" or "potentially significant unless mitigated" but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Christian Kessler
Signature

4/19/2012
Date

Christian Kessler
Printed Name

Irvine Ranch Water District
For

Evaluation of Environmental Impacts

1. A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained if it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an Environmental Impact Report (EIR) is required.
4. “Negative Declaration: “Less than Significant with Mitigation Incorporated” applies when the incorporation of mitigation measures has reduced an effect from a “Potentially Significant Impact” to a “Less-than-Significant Impact”. The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less-than-significant level. (Mitigation measures from Section XVII, “Earlier Analyses”, may be cross-referenced.)
5. Earlier analyses may be used if, pursuant to tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration [Section 15063(c)(3)(D)]. In this case, a brief discussion should identify the following:
 - a. Earlier Analysis Used. Identify and state where earlier analyses are available for review.
 - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c. Mitigation Measures. For effects that are “Less than Significant with Mitigation Incorporated,” describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, when appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project’s environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
 - a. the significance criteria or threshold, if any, used to evaluate each question; and
 - b. the mitigation measure identified, if any, to reduce the impact to a less-than-significant level.

I. Aesthetics	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Would the project:

a. *Have a substantial adverse effect on a scenic vista?*

No Impact. According to Figure 5.1-1 of the City of Orange General Plan Program EIR, there are no designated scenic vistas at or near the project site (City of Orange 2009). The project site is flat and is surrounded by 2-story residential homes and mature landscaping. These homes and landscaping effectively block views from the surrounding areas to the project site except those views by adjacent neighbors, pedestrians, and motorists on Gravier Street. The visual characteristic of the project site is predominantly infrastructure (the existing OPA Well-3).

During construction, the project site would be surrounded by a 7- to 8-foot-high temporary chain link fence for security purposes. The fence would have green mesh screens, or other acceptable paneling, to reduce visibility during construction. Furthermore, construction activities during well drilling would take place behind a 24-foot-tall noise wall, which would screen the majority of views of the project site from the surrounding neighborhood during well drilling.

Once construction is complete, the project site would be surrounded by a 6- to 8-foot concrete masonry unit wall that would be a neutral color. This wall would be consistent with other masonry and concrete walls within the surrounding residential neighborhood and would screen views of the well. The final conditions of the site would be very similar to the existing conditions, with similar well head and treatment equipment to be replaced at the site. Some additional equipment would be added to the site, including a surge tank, a replacement chloramination disinfection system, a wet well, and other ancillary facilities such as electrical panels, radio mast, Supervisory Control and Data Acquisition (SCADA)/Programmable Logic Controller (PLC), meters, valves, sand separator, and enclosures for various facilities. A below ground wet well would be constructed on site to receive water from IRWD OPA Well-1. The wet well would be equipped to pump the water to Santiago Zone 5 Reservoir. The top of the antenna (approximately 21 feet tall) could be visible over the top of the

wall at some locations in the surrounding neighborhood. The sole function of the antenna would be to transmit data to IRWD regarding well operations. The antenna would be relatively unobtrusive when compared to other tall features of the neighborhoods such as street lights and telephone poles, because it would only be several inches in diameter. Furthermore, the antenna location on the project site would be selected in a manner that would be unobtrusive to the surrounding residential neighborhood. The surge tank is expected to be less than 15 feet high, but depending on the final site design, it may be visible over the top of the concrete masonry wall. It is currently proposed to be located behind the treatment structure which may be approximately 20 to 30 feet tall. Surge tanks are typically metal structures painted neutral colors. Since there are no scenic vistas at or near the project site, construction and operation of the proposed project would not have an adverse impact on scenic vistas and no impact would occur.

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?

No Impact. There are no officially designated state scenic highways in the vicinity of the proposed project (Caltrans 2009). Furthermore, the County of Orange General Plan Figure IV-11, Scenic Highway Plan (County of Orange 2004), and Figure 5.1-1 of the City of Orange General Plan Program EIR (City of Orange 2009) do not identify any landscape or viewscape corridors in the vicinity of the project site. Therefore, construction and operation of the proposed project would not substantially damage scenic resources along a scenic highway, and no impact would occur.

c. Substantially degrade the existing visual character or quality of the site and its surroundings?

Less-than-Significant Impact. The existing visual character of the project site is comprised of infrastructure elements of varying heights. These elements include the OPA Well-3 and aboveground infrastructure. The immediate area surrounding OPA Well-3 is made up of concrete and gravel, and a lawn and concrete driveway surrounding the adjacent single-family residence. Concrete and masonry walls surround the site on the north, south, and west. These walls are approximately 6- to 7- feet high. A chain link fence separates the well and well infrastructure from the single-family home and the home's backyard. A chain link fence with green mesh screens, which is approximately 7- to 8- feet high, secures the site to the east of OPA Well-3. The existing well and well infrastructure (e.g., piping) are visible through the spaces in the chain link fence along the single-family home property. The visual character and quality of the surrounding neighborhood is that of a typical suburban southern California residential neighborhood with varying heights of buildings, front and back yards, mature landscaping, and infrastructure elements (telephone poles, light poles, etc.). To the north of the project site is the Santiago Creek Recharge Basin, which is operated by the Orange County Water District.

The proposed project would involve construction and operation activities within the boundaries of the existing IRWD property. Construction activities would take place behind a 7- to 8-foot-high temporary chain link fence with green mesh screens, or other acceptable paneling, to reduce visibility, as described above. Furthermore, during well drilling, construction activities would likely take place behind a 24-foot-tall temporary noise wall, which would screen the majority of the views of the project site from the surrounding neighborhood. The drill rig would be visible over the top of the noise wall; however, the rig would only be located on the project site for a duration of 6 to 8 weeks and would be removed from the project site once drilling of the well is complete.

Operation of the proposed project would not represent a substantial change from the existing visual character and quality of the project site and surrounding area. The scale and height of the proposed

well facilities would be similar to the existing OPA Well-3 facilities. Upon completion of construction activities, IRWD OPA Well-1 would be located within an enclosure, the wet well would be located below the ground surface, a disinfection system would be located within an enclosure, and some above ground infrastructure similar to the existing well would be located on the project site. There would also be an antenna (approximately 21 feet tall) and surge tank located on site. The existing masonry walls located on three sides of the project site would remain. Fencing along the front of the project site, where the existing iron gate is currently located, would be located along the street and would be consistent with the theme of the neighborhood. The proposed enclosures, surge tank, and top of the antenna would extend past the top of the existing walls and would likely be seen by adjacent residences and motorists on Gravier. However, the communication antenna would not be significantly obtrusive. It would have a similar aesthetic impact as existing street lamps, telephone poles, or traffic signals in the area. Furthermore, the height of the surge tank may be visible, although it would likely be shielded by the treatment structure from some vantage points.

Detailed architectural plans for the enclosures have not yet been designed. However, IRWD would work with the City to design them to be compatible with the surrounding neighborhood. The enclosures would likely consist of an enclosed stucco structure with a pitched roof similar to the residential roofs in the area to be consistent with the surrounding residential neighborhood. The existing walls and the proposed 6- to 8-foot concrete masonry wall would screen views into the site from the neighborhood.

Therefore, the construction and operation of the proposed project would not substantially degrade the existing visual character or quality of the project site or surrounding area. Impacts would be less than significant.

d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

Less-than-Significant Impact. The project site currently has lighting on the chlorine disinfection system near the OPA Well-3. A design feature of the proposed project requires all nighttime lighting during construction to be shielded and directed downward so that traffic and adjacent property owners would not experience substantial light or glare. Furthermore, during well drilling the 24-foot noise wall would reduce the spill effects of any nighttime construction lighting. Therefore, impacts to nighttime views during project construction would be less than significant. Project operations would not introduce a new substantial source of light or glare to the project area. Currently, the existing OPA Well-3 chemical building has outdoor lighting, and the proposed project would include comparable security lighting as the existing conditions. Nighttime lighting during project operations could include some lighting located along the buildings for security purposes similar to the nighttime lighting currently on the property. Furthermore, nighttime lighting would be shielded so traffic and adjacent property owners would not experience substantial impacts due to light and glare. Impacts would be less than significant.

II. Agriculture and Forest Resources	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts on forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project, and forest carbon measurement methodology provided in the Forest Protocols adopted by the California Air Resources Board. Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. Result in the loss of forest land or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Discussion

Would the project:

- a. Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resource Agency, to non-agricultural use?**

No Impact. According to the California Department of Conservation *Orange County Important Farmland 2008* report, the proposed project site is classified as “urban and built-up land” and “other land,” which does not contain any agricultural uses (DLRP 2009). The proposed project does not have the potential to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. No impact would occur.

- b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?**

No Impact. The proposed project is located on a developed urban site within a developed urban area. No agricultural land uses and no property under Williamson Act contract exist on the project site or within in the vicinity of the proposed project. Therefore, the proposed project would not conflict with existing zoning for agricultural use or a Williamson Act contract. No impact would occur.

- c. Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?**

No Impact. No land zoned as forest land or timberland exists on the project site or within the vicinity of the proposed project (CDFFP 2003). Therefore, the proposed project would not conflict with existing zoning for forest land or timberland. No impact would occur.

- d. Result in the loss of forest land or conversion of forest land to non-forest use?**

No Impact. As discussed in Response II(c), no land zoned as forest land or timberland exists within the project site (CDFFP 2003). Therefore, proposed project would not conflict with existing zoning for forest land or timberland. No impact would occur.

- e. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?**

No Impact. No agricultural land uses, forest land, or timberland exist on the project site or in the vicinity of the proposed project. Therefore, the proposed project would not involve changes to the existing environment that would result in conversion of farmland to non-agricultural use or forest land to non-forest use. No impact would occur.

III. Air Quality	Potentially Significant Impact	Less-than- Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Would the project:

a. *Conflict with or obstruct implementation of the applicable air quality plan?*

No Impact. The proposed project is located within the South Coast Air Basin (Basin). The South Coast Air Quality Management District (SCAQMD) is required, pursuant to the Federal Clean Air Act, to reduce emissions of criteria pollutants for which the Basin is in nonattainment (i.e., O₃, PM₁₀, PM_{2.5}, and lead). As such, the proposed project would be subject to the SCAQMD's Air Quality Management Plan (AQMP). The AQMP contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving ambient air quality standards. These strategies are developed, in part, using regional population, housing, and employment projections prepared by the Southern California Association of Governments (SCAG).

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and it addresses regional issues relating to transportation, economy, community development, and environment. With regard to air quality planning, SCAG has prepared the Regional Comprehensive Plan and Guide (RCPG), which includes Growth Management and Regional Mobility chapters that form the basis for the land use and transportation control portions of the AQMP. These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the RCPG and AQMP are based, in part, on projections originating with County and City general plans.

Detailed in the Project Description, the proposed project includes the destruction and abandonment of the existing OPA Well-3 and the construction and operation of a replacement well (IRWD OPA Well 1) on the same property as OPA Well-3. The proposed well would serve the existing OPA service area, accommodating the need for a reliable source of groundwater for the OPA service area. The proposed project would not result in either an increase in population or the number of new permanent employees in the area that would affect growth (see Section XIII, Population and Housing, for additional information regarding population). Furthermore, the proposed project would be largely maintenance free and similar to existing conditions, thereby resulting in non-net-increase employment in the region. The proposed project is consistent with both the County of Orange General Plan and City of Orange General Plan designation and zoning.

Because the proposed project is consistent with the local general plan and the regional growth management plan, pursuant to SCAQMD guidelines, the proposed project is considered consistent with the region's AQMP. No impact would occur.

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less-than-Significant Impact. As discussed in Response III(a), the proposed project site is located within the Basin. State and federal air quality standards are often exceeded in many parts of the Basin. A discussion of the proposed project's potential short-term construction-period and long-term operational-period air quality impacts is provided here.

Regional Construction Impacts

The SCAQMD has established methodologies to quantify air emissions associated with construction activities such as air pollutant emissions generated by operation of onsite construction equipment; fugitive dust emissions related to trenching and earthwork activities; and mobile (tailpipe) emissions from construction worker vehicles and haul/delivery truck trips. Emissions would vary from day to day, depending on the level of activity, the specific type of construction activity occurring, and, for fugitive dust, prevailing weather conditions.

Construction activities for the proposed project include the destruction of OPA Well-3, and construction and operation of IRWD OPA Well-1. A construction-period mass emissions inventory was compiled based on an estimate of construction equipment as well as scheduling and phasing assumptions. More specifically, the mass emissions analysis takes into account the following:

- Combustion emissions from operating onsite construction equipment.
- Fugitive dust emissions from ground disturbance activities.
- Mobile-source combustion emissions from worker commute travel.

For the purpose of estimating emissions associated with construction activities, it was assumed construction activities would begin in the Spring of 2012 and last approximately 14 months. Emissions were calculated using the URBEMIS 2007 emissions inventory model. The quantity, duration, and the intensity of construction activity have an effect on the amount of construction emissions and related pollutant concentrations occurring at any one time. As such, the emission forecasts reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction would occur in a relatively intensive

manner.¹ Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner-burning construction equipment fleet mix, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval). Therefore, the analysis of air quality impacts is a conservative estimate of the proposed project's regional mass emissions during construction. Table 3-1 shows that based on a conservative estimate of the proposed project's regional mass emissions during construction, all criteria pollutant emissions would be below their respective thresholds (detailed calculations and URBEMIS worksheets are provided in Appendix C). Impacts from construction would therefore be less than significant.

Table 3-1. Forecast of Regional Construction Emissions

	Criteria Pollutant Emissions (pounds per day)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Maximum Regional Project Emissions	4	36	18	<1	3	2
SCAQMD Regional Emissions Threshold (pounds/day)	75	100	550	150	150	55
Exceed Threshold?	No	No	No	No	No	No

URBEMIS 2007 outputs are provided in Appendix C.

Localized Construction Impacts

When quantifying mass emissions for localized analysis, only emissions that occur on site are considered. Consistent with SCAQMD Localized Significance Threshold (LST) methodology guidelines, emissions related to offsite delivery/haul truck activity and employee trips are not considered in the evaluation of localized impacts. As shown in Table 3-2, localized emissions for all criteria pollutants would remain below their respective SCAQMD LST significance threshold (detailed calculations and URBEMIS worksheets are provided in Appendix C). Localized impacts that might result from construction-period air pollutant emissions would therefore be less than significant.

¹ Detailed assumptions regarding the construction equipment mix and the duration can be found in the URBEMIS output in Appendix C.

Table 3-2. Forecast of Localized Construction Emissions

	Criteria Pollutant Emissions (pounds per day)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Maximum On-Site Total Emissions	4	36	17	<1	3	2
SCAQMD Localized Significance Threshold (pounds/day) ^a	--	81	485	--	4	3
Exceed Threshold?	No	No	No	No	No	No

^a These localized thresholds were taken from tables provided in the SCAQMD Localized Significance Thresholds Methodology guidance document based on the following: (1) The proposed project site is located in SCAQMD Source Receptor Area No. 17, (2) sensitive receptors are located within 25 meters of construction activity, and (3) the maximum site area disturbed is less than 1 acre. URBEMIS 2007 outputs are provided in Appendix C.

Regional and Localized Operations Impacts

Operations associated with the proposed project generally include facility inspection and maintenance activities and are expected to be similar to or less than existing conditions. Because the proposed project would require very little maintenance once construction is completed and only on an as-needed basis, emissions generated once operational would be minimal and the impact would be less than significant.

- c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?**

Less-than-Significant Impact. The SCAQMD's approach for assessing cumulative impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the Federal and State Clean Air Acts. As discussed in Response III(a), the proposed project is consistent with the AQMP, which is intended to bring the Basin into attainment for all criteria pollutants.² In addition, the mass regional emissions calculated for the proposed project (Table 3-1) are lower than the applicable SCAQMD daily significance thresholds that are designed to assist the region in attaining the applicable state and national ambient air quality standards. Cumulative impacts would be less than significant.

- d. Expose sensitive receptors to substantial pollutant concentrations?**

Less-than-Significant Impact. As described in III-b, construction of the proposed project would not result in any substantial localized or regional air pollution impacts and therefore would not expose

² CEQA Guidelines Section 15064(h)(3) states "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project shall comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the cumulative problem (e.g. water quality control plan, air quality plan, integrated waste management plan) within the geographic area in which the project is located. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency."

any nearby sensitive receptors to substantial pollutant concentrations.³ Impacts related to substantial pollutant concentrations would be less than significant.

e. Create objectionable odors affecting a substantial number of people?

Less-than-Significant Impact. According to the SCAQMD *CEQA Air Quality Handbook* (SCAQMD 1993), land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors and therefore would not produce objectionable odors. Currently IRWD has disinfection facilities with similar sodium hypochlorite solution that would be used during operation of the proposed project and has not experienced any odor complaints. Similar precautionary measures, such as containment areas and spill plans, would continue to be employed to guarantee that operations continue to be free of odor violations (See Section VIII, Hazards and Hazardous Materials, for additional details regarding the disinfection system). Impacts related to objectionable odors would be less than significant.

Potential sources that might emit odors during proposed project construction activities include diesel exhaust/fumes from well drilling equipment and on-site emergency generators for construction work, asphalt paving, etc. SCAQMD Rule 1108 limits the amount of volatile organic compounds from cutback asphalt. Through mandatory compliance with SCAQMD Rules, no construction activities or materials are proposed that would create a significant level of objectionable odors. Existing regulations that are relevant to the proposed project include:

- Rule 1108 limits the amount of VOC/ROG contained in any cutback asphalt for sale to no more than 0.5%.
- Rule 402 restricts the release of emissions which cause injury, nuisance, or annoyance.
- Rule 403 reduces the amount of anthropogenic fugitive dust by requiring actions to prevent, reduce or mitigate dust emissions.

Construction impacts related to objectionable odors would be less than significant.

³ SCAQMD has a published set of localized significance thresholds which include the criteria pollutants CO, NO_x, PM₁₀ and PM_{2.5} related to Threshold (d). Since the sodium hypochlorite and ammonia would not contribute to any of these designated criteria pollutant emissions they are not analyzed under air quality thresholds. For additional information regarding the disinfection system please see Section VIII Hazards and Hazardous Materials.

IV. Biological Resources	Potentially Significant Impact	Less-than- Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

- a. ***Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?***

Less-than-Significant Impact with Mitigation Incorporated. The project site is located within a developed, urban area. The project site is a developed site with an existing well and aboveground infrastructure. The project site is devoid of vegetation except for the ornamental landscaping. Since

construction is proposed to start in the spring of 2012, construction of the proposed project would likely occur during the nesting season for birds and therefore has a moderate probability of construction affecting nesting birds in the ornamental landscaping. However, mitigation measure BIO-1 would be implemented to comply with the Migratory Bird Treaty Act and to reduce impacts to nesting birds to less than significant. No candidate, sensitive, or special-status species are known to exist on the project site based on the existing developed characteristics of the project site, the lack of habitat, and the immediate urban developed surroundings. Furthermore, according to Figure 5.4-2 of the City of Orange General Plan Program EIR, the project site is not located within the Natural Community Conservation Plan and Habitat Conservation (NCCP/HCP) Habitat Reserve area (City of Orange 2009). Since the project site lacks appropriate habitat for candidate, sensitive, or special-status species, the proposed project would not modify habitat. Therefore, impacts would be less than significant.

Mitigation Measure

BIO-1: If the removal of ornamental trees on site is scheduled during the avian nesting season (approximately February 1 through August 31), a preconstruction survey for nesting birds shall be conducted by a qualified biologist no more than 7 days prior to the start of construction. If nesting birds are detected within the disturbance limits, a buffer around the nest shall be determined by a qualified biologist. If the biologist determines that the construction activity within the buffer has the potential to disturb an active nest, construction activities may be limited or halted until the biologist has determined that the nesting activity is complete.

b. *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

Less-than-Significant Impact. According to Figure 5.4-2 of the City of Orange General Plan Program EIR, the project site is not located within the NCCP/HCP Habitat Reserve area (City of Orange 2009). The project site is devoid of vegetation except for ornamental landscaping. Therefore, the project site does not contain riparian habitat or other sensitive natural communities, such as coastal sage scrub, identified by the Orange County NCCP/HCP. Immediately surrounding the project site are developed residential uses with ornamental landscaping. Therefore, construction and operation of the project would not have a substantial adverse effect on any riparian or other sensitive natural community located on the project site because these types of communities do not exist on the project site.

Currently, drainage at the project site flows into an existing catch basin located in the northwest corner of the project site, near the existing OPA Well-3. The catch basin is connected to an 18-inch storm drain that flows to the Orange County Flood Control District (OCFCD) E08P06 Santiago Creek Channel (Irvine Ranch Water District 2010, OCFCD 2010). The project site is located in the Santa Ana River Watershed where the Santa Ana River is the major drainage course. As shown in Figure 5.8-1 of the City of Orange General Plan Program EIR, most of the City's drainage runoff is conveyed to the Santa Ana River through City storm water drainage systems either directly or via the Santiago Creek (City of Orange 2009).

All discharge water generated during the construction period would comply with the Orange County Drainage Area Management Plan (DAMP) and would be disposed of in accordance with OCFCD and NPDES discharge permits. Per the requirements of the NPDES de minimus discharge permit, the proposed project would provide advanced notice to the SARWQCB and County of Orange prior to

any discharge to the storm drain system or OCFCD channel, including an estimate of the amount of discharge anticipated for each discharge event. Also under the requirements of the NPDES permit, IRWD would collect samples and submit monthly reports to the SARWQCB for discharge compliance. Furthermore, construction and operation would not significantly change the existing drainage pattern of the site. See Section XI, Hydrology and Water Quality, for additional details regarding hydrology, water quality, and discharge and the regulatory requirements governing discharge. The water from any source related to construction or storm runoff generally would not be allowed to leave the project site. All flow from the well during construction would be initially conveyed to a series of temporary storage tanks (i.e., Baker tanks) located on the project site. The purpose of the Baker tanks is to allow suspended sediment to separate from fluids prior to discharge (Irvine Ranch Water District 2010). If de-chlorination is necessary, it would occur on site at the existing catch basin prior to release into the existing 18-inch storm drain. In addition, Best Management Practices (BMPs) would be developed for the proposed project and implemented to limit the introduction of pollutants to the environment, ground surface or offsite drainages during construction. These include preparation of a spill prevention plan and an erosion control plan (Irvine Ranch Water District 2010). Therefore, no substantial adverse effects to riparian or any other sensitive natural communities in the Santa Ana River or Santiago Creek would result from construction of the proposed project.

The project site is within 300 feet of the southern border of the Santiago Creek Recharge Basin. The project site is separated from the basin by Bond Avenue, a row of residential homes, and a steep slope down into the basin, which is approximately 10 to 20 feet below the grade of Bond Avenue. While there may be habitat within the basin that is considered riparian, construction of the proposed project would not affect this habitat because construction generated water would not be discharged into the basin. Furthermore, Bond Avenue, residential homes, and the slope into the basin would buffer any other construction related impacts to the basin.

As discussed in Response IX(b), construction and operation of the proposed project would not significantly change groundwater levels in the Orange County Groundwater Basin; therefore, operation of the proposed project would not indirectly affect riparian or any other sensitive natural communities in the Santa Ana River or Santiago Creek. Therefore, construction and operation of the proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community. Impacts would be less than significant.

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?

Less-than-Significant Impact. The project site is devoid of vegetation except for ornamental landscaping and is devoid of any water resources. Therefore, the project site does not contain wetlands, marshes, vernal pools, or coastal wetlands. Immediately surrounding the project site are developed residential uses. Therefore, construction and operation of the project would not have a substantial adverse effect on any wetlands located on the project site because these types of communities do not exist on the project site.

As discussed above, the Santiago Creek Recharge Basin is located north of the project site. While there may be habitat within this basin that is considered wetland habitat, construction activities at the project site would not result in direct removal, filling, or hydrological interruption of this basin. Construction of the replacement well would be confined to the project site. Furthermore, as

discussed above, any construction water generated during construction activities would be properly treated on the project site and then discharged into the storm drain system, which does not discharge into the recharge basin.

The project site drains into a catch basin in the northwest corner near the existing OPA Well-3, which then drains into the Santiago Creek Channel. As discussed in Response IX(a), construction and operation of the proposed project would not violate any water quality standards or waste discharge requirements. Therefore, the proposed project would not indirectly affect any federally protected wetlands that may be located in the Santa Ana River or Santiago Creek.

As discussed in Response IX(b), construction and operation of the proposed project would not significantly change groundwater levels in the Orange County Groundwater Basin. Therefore, the proposed project would not indirectly affect any federally protected wetlands that may be located in the Santa Ana River or Santiago Creek. Therefore, construction and operation of the proposed project would not have a substantial adverse effect on any federally protected wetland. Impacts would be less than significant.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less-than-Significant Impact. The proposed project would not result in direct impacts to any portion of the Santiago Creek Recharge Basin or Orange County NCCP/HCP. No fish or wildlife nursery sites occur on the existing project site, and construction activities would not impact Santiago Creek where these biological resources could occur as discussed above in Response IV(b) and (c). As a result, implementation of the proposed project would not impact either the movement of native resident or migratory fish species and would not impede the use of established native wildlife nursery sites.

Furthermore, the proposed project would not interfere with established native resident or migratory wildlife corridors. The proposed project is not located within a reserve area identified by the Orange County NCCP/HCP (County of Orange 2005). The project site is located over 1 mile west of the nearest Orange County NCCP/HCP designated reserve and special linkage areas. Construction and operational activities on the existing IRWD property would not preclude wildlife movement through the habitats associated with the Santiago Creek Recharge Basin or the Orange County NCCP/HCP. The scale and height of the proposed well facilities would be the same as or similar to the existing OPA Well-3 facilities. Thus, the proposed project is not expected to interfere with avian flight patterns. Vegetation associated with the recharge basin, which may include riparian and marsh habitats, would remain unaffected and available for use by migratory birds and small mammal species moving through the region. Although project construction would require periodic 24-hour drilling, it would not interfere with the movement of nocturnal species because construction crews would restrict their activities to the project site where these species are not known to occur. Therefore, construction and operation of the proposed project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Impacts would be less than significant.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less-Than-Significant Impact. As stated previously in Response IV(a), the proposed project would be located within the boundaries of an existing IRWD property. With the exception of ornamental landscaping, the project site supports no vegetation; therefore, development of this area would not conflict with any local policies or ordinances protecting biological resources. Chapter 12.32 of the City of Orange Municipal Code is the Tree Preservation Ordinance and identifies the purpose of tree preservation as: the regulation of large scale tree removal from undeveloped property in that large parcels of undeveloped acreage are more likely to have vast numbers of trees, the removal of which is more likely to have an adverse effect upon the surrounding environment. This ordinance makes it unlawful to destroy or remove any tree as defined in Section 12.32.020 from an undeveloped or public interest property as defined in Section 12.32.040 and 12.32.050. The project site is not public interest property, but may meet the definition of undeveloped property (more than six trees, as defined in Section 12.32.020 exist on real property either before or after any proposed division of such real property). If the project meets this definition, IRWD would comply with the Tree Preservation Ordinance by obtaining a permit for tree removal from the City prior to removing trees and by identifying on any grading plans the location of each tree proposed to be removed. The Director of Community Services may attach reasonable conditions to the permit obtained ensure compliance with the intent and purpose of the ordinance such as the planting of replacement trees. Therefore, impacts would be less than significant.

f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The City of Orange is a signatory to a Natural Resource Community Conservation Plan agreement. However, according to Figure 5.4-2 of the City of Orange General Plan Program EIR, the project site is not located within the NCCP/HCP Habitat Reserve area (City of Orange 2009). Therefore, the proposed project would not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. There would be no impact.

V. Cultural Resources	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

No Impact. The proposed project would not directly impact known historical resources within the proposed project area. The OPA Well-3 was constructed in 1980. It does not possess any quality of significance in history or architecture that would raise it to level of exceptional importance required of properties under the age of 50 to qualify for the National Register of Historic Places.

A record search was conducted on February 22, 2010, at the South Central Coast Information Center at Fullerton. According to available records and data for the area, within 0.25-mile radius of the project site there are no National Register properties, no California Register of Historical Places properties, no California Historical Landmarks, and no California Points of Historical Interest. The closest historic resource to the project site that is listed on the National Register is Old Town Historic District, located in the City of Orange, approximately 2 miles away from the proposed project site (National Register Information System 2011). The proposed project would not affect this historic resource. Therefore, construction and operation of the proposed project would not result in a substantial adverse change to a historical resource as defined in Section 15064.5 and impacts would not occur.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less-than-Significant Impact. The proposed project is not anticipated to affect archaeological resources within the project site. The proposed project would occur within the boundaries of an existing IRWD property where the ground surface has been previously graded and disturbed. For this reason, no archaeological resources survey was performed for the proposed project.

A record search conducted for the entire OPA service area on February 22, 2010, indicated that approximately 420 acres of the 646-acre OPA service area have been previously surveyed for archaeological resources, primarily in the 1970s. Two prehistoric archaeological sites were located within the OPA service area during those surveys, CA-Ora-702 and CA-Ora-774; neither is located in or adjacent to the proposed project. Additional prehistoric archaeological sites recorded within a 0.5-mile radius of the OPA service area are primarily located along Santiago Creek, the major nearby water source. Furthermore, no Native American cultural resources were identified in a Native American Heritage Commission Sacred Land File search. However, the absence of archaeological items at the surface level does not preclude their existence at the subsurface level once ground-breaking activity is underway (pers. comm. Singleton 2011). Given that the proposed project would take place within an existing IRWD property and would be constructed adjacent to the existing OPA Well-3, the probability for discovering Native American cultural resources is low.

According to the City of Orange General Plan Program EIR, numerous studies have been conducted in or near the City of Orange, resulting in the recordation of some 28 prehistoric archaeological sites. Most of the sites are located to the east of Orange and occupy upland, hill, and valley locations with a few exceptions. The known site distribution, however, is strongly biased by the presence of open land at the time of the survey or site record. The distribution of prehistoric remains within the developed lowland area in Orange is poorly understood, as episodes of early flooding and the subsequent development of the existing urban area may have buried or destroyed sites that once existed in the valley areas (City of Orange 2009). The project site is not located in an area identified as having a high sensitivity for archaeological resources based on Figure 5.5-2 of the City of Orange General Plan Program EIR. This and the record search information suggest that the potential for discovery of prehistoric cultural materials during construction of the proposed project is low.

The proposed project area is located near areas identified on Figure 5.5-2 of the City of Orange General Plan Program EIR to have Spanish/Mexican and Early Town Development, which has some historical sensitivity (City of Orange 2009). There is a limited possibility that historic-period archaeological materials could be unearthed during ground-disturbing activities. However, the project site has been previously disturbed and there would be no significant grading for the proposed project; in addition, depth of sediment disturbance would be less than 3 feet, with the exception of the exact location of the replacement well, which would be located at depths of approximately 800 feet. Archaeological resources are typically found within the first 15 feet of the surface and since the potential for archeological resources to exist on the project site is low, it would be highly unlikely for the exact location of the replacement well to result in a substantial adverse change to a significant archaeological resource. However, should any potential undocumented buried archaeological resources be uncovered during construction, IRWD's standard operating procedures for contractors involve ceasing construction immediately within 50 feet of the discovery, contacting a qualified archaeologist to assess the significance of the find and, if necessary, develop appropriate treatment measures before proceeding with construction. Therefore, because the record search information suggests that the potential for discovery of historical cultural materials during construction of the proposed project is low and the other resources (City of Orange, County of Orange) indicate the potential is low; impacts would be less than significant.

c. *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

Less-than-Significant Impact. The proposed project area is situated on Quaternary alluvium (Morton 1981). Quaternary Holocene-age alluvium has a low potential for vertebrate fossils, but

older Quaternary deposits have a higher potential for vertebrate fossils, primarily of mammals of the Pleistocene epoch. Surface grading or very shallow excavation in the project site is unlikely to uncover significant fossil vertebrates. Deeper excavations that extend into older Quaternary deposits may encounter significant fossil vertebrate remains.

According to the Orange County General Plan, Orange County has a history and prehistory that, despite the rapid change of the recent past, has left a rich heritage of valuable cultural resources. The ancient geological formations have yielded and still contain paleontological resources of major significance (County of Orange 2004). Although the project site is not located in any of the sensitivity areas identified in Figure VI-9 of the Orange County General Plan, it is located near the Northern Santa Ana Mountains sensitivity area (County of Orange 2004). This suggests that the potential for discovery of prehistoric paleontological cultural materials during construction of the proposed project is low. However, should any potential undocumented buried paleontological fossil resources be uncovered during construction activities, IRWD's standard operating procedures for contractors involve ceasing construction immediately within 50 feet of the discovery, contacting a qualified paleontologist to assess the significance of the find and, if necessary, develop appropriate treatment measures before proceeding with construction. Therefore, based on the potential for discovery of prehistoric paleontological resources and the location of the project site, impacts would be less than significant.

d. *Disturb any human remains, including those interred outside of formal cemeteries?*

No Impact. The proposed project site is not a formal cemetery and is not adjacent to a formal cemetery. The project parcel is not known to contain human remains interred outside formal cemeteries, nor is it known to be located on a burial ground. As discussed in Response V(b), numerous studies have been conducted in or near the City of Orange for archaeological resources. Prehistoric archaeological sites were located during those studies, none of which contained any prehistoric human remains. This suggests that the potential for discovery of human remains during construction of the proposed project is low.

The project site has been previously disturbed and there would be no significant grading for the proposed project; in addition, depth of sediment disturbance located in most of the project site would be less than 3 feet, with the exception of the exact location of the replacement well, which would disturb sediment up to depths of approximately 800 feet. Therefore, it is highly unlikely the proposed project would disturb any human remains during construction of the proposed project, and no impacts would occur. If, in the highly unlikely event human remains are uncovered during construction, IRWD's standard operating procedures involve implementing actions as specified by State Health and Safety Code Section 7050.5. This section states that no further disturbance would occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. If such a discovery occurs, excavation or construction would halt in the area of the discovery, the area would be protected, and consultation and treatment will occur as prescribed by law. If the Coroner recognizes the remains to be Native American, he or she would contact the Native American Heritage Commission, who would appoint the Most Likely Descendent. Additionally, if the bones are determined to be Native American, a plan would be developed regarding the treatment of human remains and associated burial objects, and the plan would be implemented under the direction of the Most Likely Descendent.

VI. Geology and Soils	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

a1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

Less-than-Significant Impact. Under the Alquist-Priolo Act, the California State Geologist identifies areas in the state that are at risk from surface fault rupture. These areas are known as Earthquake Fault Zones (EFZs). The proposed project site is not located within an EFZ (California Geological Survey 2010). However, the proposed project site is located within a seismically active region that has been subject to major earthquakes in the past. The San Andreas Fault, Whittier-Elsinore Fault, Newport-Inglewood Fault, and San Jacinto Fault are large, active faults located within 30 miles of the proposed project. Smaller fault traces are located in the vicinity of the project site, including the El Modena and Peralta Hills Faults, which are located within 2 miles and run northeast of the project site. These faults are not considered capable of producing major earthquakes (City of Orange 2005). Impacts from fault rupture generally occur within the immediate area surrounding the fault due to the variations on the ground surface. Therefore, impacts associated with construction and operation of the proposed project would be less than significant.

a2. Strong seismic ground shaking?

Less-than-Significant Impact. As discussed in Response VI(a1), the proposed project is not located within an EFZ. However, the proposed project area is known to contain multiple fault traces, and all communities in Southern California are subject to seismic ground shaking. The proposed project would be constructed in accordance with all applicable building codes to minimize seismic ground shaking impacts on the proposed groundwater well and support infrastructure from seismic activity. Furthermore, construction and operation of the proposed project would not create any new habitable structures and therefore would not expose people or structures to potentially substantial adverse effects involving strong seismic ground shaking. Impacts would be less than significant.

a3. Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact with Mitigation. As discussed in Response VI(a1), the proposed project site is located in a seismically active region subject to strong ground shaking. Furthermore, according to Figure 5.6-2, Environmental and Natural Hazard Policy Map, of the City of Orange General Plan Program EIR, the project site is located in an area identified as a Liquefaction Hazards Area (City of Orange 2009). However, a geotechnical report prepared for IRWD in the project site vicinity along Bond Street evaluated depths of up to 16 feet and determined the area to have a low potential for liquefaction (Converse Consultants 2009). Furthermore, the proposed project would be constructed in accordance with all applicable building codes to minimize impacts on the proposed groundwater well and support infrastructure from seismic activity. In addition, the proposed project would not create any new habitable structures and therefore would not expose people or structures to potentially substantial adverse effects involving seismic-related ground failure. Per the Project Technical Specifications in Section 1044 and **Mitigation Measure GEO-1**, the IRWD would commission the preparation of a geotechnical report by a qualified geologist or geotechnical

engineer. Implementation of **Mitigation Measure GEO-1** would require preconstruction geotechnical assessments to characterize the soils to be encountered in and around each project component and to determine the site-specific design criteria to reduce potential risks of project construction and operation due to lateral spreading, liquefaction, and subsidence. In addition, all project components would be designed and constructed in compliance with the California Building Code Title 24 to minimize impacts due to seismic-related ground failure, including liquefaction. Impacts would be less than significant with mitigation.

Mitigation Measure

GEO-1: A design-level geotechnical investigation, including collection of site-specific subsurface data, will be completed by IRWD. The geotechnical investigation will be conducted by a certified engineering geologist or registered geotechnical engineer. The geotechnical investigation will identify appropriate engineering considerations for the planned project area, including density profiles, depth of groundwater based on borings and historical and regional groundwater data, vertical and lateral extent of the saturated sand/silt layers that could undergo liquefaction, and potential presence of expansive soils. The geotechnical investigation will recommend site-specific design criteria to reduce potential risks due to liquefaction, lateral spreading, subsidence, and expansive soils. The project shall be designed and constructed in accordance with the recommendations of the geotechnical report.

a4. Landslides?

No Impact. The project site has a flat topography with no relief to support landslides. Furthermore, Figure 5.6-2, Environmental and Natural Hazard Policy Map, of the City of Orange General Plan Program EIR do not identify the project site as a Landslide Hazard Area (City of Orange 2009). Therefore, construction and operation of the proposed project would not expose people or structures to landslides. No impact would occur.

b. Result in substantial soil erosion or the loss of topsoil?

Less-than-Significant Impact. The project site is generally flat and includes the existing OPA Well-3 and above ground infrastructure. There is gravel and concrete in the immediate area surrounding OPA Well-3.

Construction of the proposed project would involve earthwork activities such as site preparation, grading, stockpiling of soils, and excavation. Construction activities would disturb surface soils that are currently covered by concrete, gravel, or vegetation and could potentially expose them to erosive forces such as wind and water. As discussed in Section IX, Hydrology and Water Quality, since project construction would encompass an area less than 1 acre, project construction would not require the preparation or implementation of a formal stormwater pollution prevention plan (SWPPP). However, per the Project Technical Specifications, construction plans and activities would include the preparation and implementation of an erosion control plan to minimize runoff during construction. All discharge water generated during project construction would be disposed of in accordance with NPDES and OCFCD discharge permits. The disposal of fluids would be performed under existing NPDES de minimum permits. Furthermore, prior to discharge to the storm drain, all construction flows from the replacement well would be initially conveyed to a series of Baker tanks located on the project site. The purpose of the Baker tanks is to allow suspended sediment to separate from fluids prior to discharge. If de-chlorination is necessary, it would occur at the existing catch basin prior to release. Discharge water would meet OCFCD requirements for discharge and

would then be discharged into the existing 18-inch storm drain. Sand bags, earthen berms, and other devices would be used to form barriers to prevent runoff and would be included in the erosion control plan as Best Management Practices.

Once operational, there would be a negligible change in impermeable surface area. Approximately 1/3 of the project site would remain as impervious surfaces due to concrete around the replacement well, the treatment structure, the surge tank, the wet well, and other ancillary infrastructure. Furthermore, since the project site is currently flat with very little relief, the site under operating conditions would be the same. Therefore, operation of the proposed project would not substantially alter the existing drainage pattern of the site and would not substantially change the impervious area on the project site. As discussed in Section IX, Hydrology and Water Quality, operation of the proposed project would comply with City of Orange Municipal Code Chapter 7.01 (Water Quality and Stormwater Discharges), the provisions set forth in the NPDES permit, and the Orange County Drainage Area Management Plan (DAMP). The proposed project would not result in substantial erosion or the loss of topsoil during construction or operational activities. Therefore, impacts would be less than significant

c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less-than-Significant Impact with Mitigation. The project site has been developed and is located in an area identified by the City of Orange General Plan Program EIR in Figure 5.6-2 as having a potential for soil liquefaction (City of Orange 2009). Construction of the proposed project would involve earthwork activities such as site preparation, grading, stockpiling of soils, and excavation. The approximate depth of the replacement well would be 850 feet bgs. However, the proposed project would not involve the construction of any habitable structures and would be developed in accordance with City and state building and safety standards. Furthermore, as discussed in Response VI (a4), no impacts on people or structures would occur as a result of landslide. Per the Project Technical Specifications in Section 1044, Noise Control Measures, and **Mitigation Measure GEO-1**, IRWD would prepare a geotechnical report by a qualified geologist or geotechnical engineer. In addition, all project components would be designed and constructed in compliance with the California Building Code Title 24 to control for any potential effects associated with landslides, liquefaction, and subsidence. Impacts on people or structures as a result of seismic-related ground failure, including liquefaction, lateral spreading, subsidence, or collapse would be less than significant with mitigation.

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less-than-Significant Impact with Mitigation. Expansive soils are fine-grained soils (generally high plasticity clays) that can undergo a significant increase in volume with an increase in water content and a significant decrease in volume with a decrease in water content. Changes in the water content of an expansive soil can result in severe distress to structures constructed upon the soil. Expansive soils are found associated with soils, alluvium, and bedrock formations that contain clay minerals susceptible to expansion under wetting conditions and contraction under drying conditions. The County of Orange General Plan Safety Element indicates that much of Orange County contains soil with expansive characteristics (City of Orange 2009, County of Orange 2004). As discussed in Response VI (c), construction of the proposed project would involve earthwork

activities such as site preparation, grading, stockpiling of soils, and excavation. The approximate depth of the replacement well would be 850 feet bgs. However, the proposed project would not involve the construction of any habitable structures and would be developed in accordance with city and state building and safety standards. Per the Project Technical Specifications in Section 1044, Noise Control Measures, and **Mitigation Measure GEO-1**, IRWD would prepare a geotechnical report by a qualified geologist or geotechnical engineer. In addition, all project components would be designed and constructed in compliance with the California Building Code Title 24 to reduce potential effects associated with expansive soils. Impacts on people or structures as a result of expansive soils would be less than significant with mitigation.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?

No Impact. The proposed project would not include any habitable structures, septic tanks, or alternative wastewater disposal systems. The proposed project would include a restroom and potential impacts associated with wastewater generation are discussed in Section XVII, Utilities and Service Systems. No impact would occur.

VII. Greenhouse Gas Emissions	Potentially Significant Impact	Less-than- Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Would the project:

- a. ***Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?***

Less-than-Significant Impact. Table 3-3 presents an estimate of proposed project construction- and operation-related greenhouse gas (GHG) emissions of CO₂, CH₄, and N₂O in terms of CO₂e (carbon dioxide equivalent). As shown therein, total CO₂e emissions would be below the SCAQMD threshold for industrial projects (detailed calculations and URBEMIS worksheets are provided in Appendix C). Impacts would therefore be less than significant.

Table 3-3. Estimate of Proposed Project Greenhouse Gas Emissions

	Annual CO ₂ e (metric tons)
Proposed Project Emissions	
Construction-Period Emissions	
2012	322.1
2013	300.6
Total Construction-Period Emissions ^a	21
Operation-Period Emissions	
Total Annual Emissions	
	1,719
SCAQMD Significance Threshold	10,000
Exceed Threshold?	No
Proposed Project Emissions	

^a Total Construction-Period Emissions are amortized over 30 years per SCAQMD methodology. Source: ICF 2011. URBEMIS 2007 outputs are provided in Appendix C.

b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less-than-Significant Impact. Assembly Bill 32 (AB 32), passed by the California State Legislature in 2006, aims to reduce GHG emissions in California to 1990 levels by the year 2020. AB 32 identified the acceptable level of GHG emissions in California in 2020 as 427 million metric tons of CO₂e, which is the same as the 1990 GHG emissions level, is approximately 12% less than the current level (480 million metric tons CO₂e in 2004), and is approximately 28.5% less than 2020 Business As Usual (BAU) conditions (596 million metric tons CO₂e). To achieve these GHG reductions, widespread reductions of GHG emissions must be made across California. Some reductions will need to come in the form of changes in vehicle emissions and mileage, changes in electricity sources, and increases in energy efficiency by existing facilities, as well as other measures. The remainder of the necessary GHG reductions will need to come from requiring new facility development to have lower carbon intensity than BAU conditions. Therefore, this analysis uses a threshold of significance that is in conformance with the state's goals.

On December 12, 2008, the California Air Resources Board (CARB) approved the AB 32 Scoping Plan, which contains emission reduction measures targeting sources of GHG emissions called for in AB 32. The scoping plan has a range of GHG reduction actions that include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program.

Proposed project operational GHG emissions would result from onsite electricity consumption. In their AB 32 Scoping Plan, CARB has set in place aggressive energy efficiency measures requiring that 33% of all energy consumed in California come from renewable sources by 2020. Assuming conformity with CARB standards, GHG emissions in 2020 associated with operation of the proposed project are expected to be 33% less than under BAU conditions. Impacts would be less than significant.

VIII. Hazards and Hazardous Materials	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

- a. *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*

Less-than-Significant Impact. The existing project site is comprised of the OPA Well-3 and above ground infrastructure. Currently, there are hazardous materials stored on site in a locked enclosed

structure as part of the existing well's disinfection system. A hazardous materials disclosure, emergency response plan, site map, and business identification form has been submitted to the Orange County Fire Authority for the materials stored on site. This system is located adjacent to the well and holds two 55-gallon drums of 12.5% sodium hypochlorite solution, which are refilled by IRWD personnel as needed. The solution is stored offsite at the Michelson Water Recycling Plant and transported to the site as needed (typically once per month). Sodium hypochlorite is used to disinfect the pumped groundwater prior to the discharge into the distribution system.

Construction of the proposed project would require the abandonment of the existing OPA Well-3, construction of IRWD OPA Well-1 and associated infrastructure including the disinfection system. Site preparations would include removal of the existing well pump and delivery of all components to the IRWD's Michelson Water Reclamation Plant. The existing disinfection system and building would be removed; however, electrical improvements would remain intact for development of the new IRWD OPA Well-1. Prior to removing the hypochlorite tanks from the building, the sodium hypochlorite solution would be removed from the tanks and reused at other IRWD facilities. The tanks could then be cleaned at the Michelson Water Recycling Plant and either reused elsewhere in the IRWD or disposed following all appropriate protocols, procedures, and regulations.

Construction activities would be short term in nature and may involve the limited transport, storage, use, and disposal of hazardous materials such as fuel and lubricating grease for motorized heavy equipment. Some examples of typical hazardous materials handling include fueling and servicing construction equipment on the site and transporting fuels, lubricating fluids, solvents, and bonding adhesives. These types of materials are not acutely hazardous, and all storage, handling, and disposal of these materials are regulated by local, county, and state laws.

Operation of the proposed project would involve the use of a disinfection system, which would require routine transport, storage, use, and disposal of hazardous materials. The disinfection system would utilize chloramination. There would be two tanks to contain the disinfection mixture—one tank would contain the 12.5% sodium hypochlorite and the other tank would contain the 29% ammonia. It is estimated that the sodium hypochlorite and ammonia tanks would be approximately 2,500 gallons and 200 gallons in size, respectively. The proposed project would result in the addition of the use of ammonia at the project site. It would also result in an increase in the volume of disinfection mixture over the existing 110 gallons currently located at the project site. Sodium hypochlorite (12.5%) is a nonflammable and noncombustible liquid and therefore has no potential for explosion (HASA MSDS 2011). Its primary potential routes of entry to humans is dermal (skin contact) and it can cause skin and eye irritation or burns (HASA MSDS 2011). It is unlikely to be inhaled and it is not typically anticipated to be ingested; however, vapor may cause irritation to the upper respiratory tract if inhaled (HASA MSDS 2011). It is not listed by the Occupational Safety and Health Administration (OSHA) as a carcinogen (HASA MSDS 2011). Ammonia (29%) is a noncombustible, nonflammable liquid and therefore has no potential for explosion (MSDS 2011). However, ammonia vapors are released if the chemical is heated (MSDS 2011). Primary potential routes of entry to humans are dermal (skin) contact and respiratory (breathing). Ammonia vapors are known to be strong irritant to the eyes, skin, and respiratory tract (MSDS 2011).

Both tanks would have double containment or would be located in a spill containment area. The tanks would be located in a locked building with an intrusion alarm. IRWD would conduct regularly scheduled inspection and maintenance on the replacement well and disinfection system as they do for the existing OPA Well-3. The maintenance would be scheduled as needed and would include checking the disinfection system and operation of the pumps, as well as testing water quality. It is

estimated that the disinfection tanks would be refilled once a month. Because of these precautionary design features, it is highly unlikely a spill of the sodium hypochlorite or ammonia would occur. However, in the unlikely event a spill did occur, the primary hazard to humans would be direct contact with skin and respiratory irritation, as it currently is with the existing disinfection system. Eye wash and shower stations would be installed in the chemical area that could be used if chemicals come into direct contact with a person.

The transport, handling, and use of hazardous materials are regulated by several different state and local agencies. The transport of hazardous materials is regulated by Caltrans. Transporters of hazardous materials are required to be certified by Caltrans. Therefore, all hazardous material deliveries would be tracked and vehicles would be required to use roadways approved for the transportation of hazardous materials. IRWD would be subject to the Hazardous Materials Release Response Plans and Inventory Act (also known as the Business Plan Act), which requires an entity or business using hazardous materials to prepare a business plan describing the facility, inventory, emergency response plans, and training programs and submit it to the City of Orange Fire Department. Furthermore, IRWD will comply with the California Accidental Release Prevention (CalARP) program and prepare a Risk Management Plan (RMP) if required per CalARP. The RMP is a detailed analysis of the potential accident factors and mitigation measures that can be implemented to reduce accident potential. The RMP may include items such as safety information, hazard review, operating procedures, emergency response plan, training requirements, and compliance audits.

To comply with the Hazardous Materials Release Response Plans and Inventory Act (also known as the Business Plan Act), IRWD would prepare or update its business plan and/or hazardous materials and inventory disclosure form to describe the proposed facility, hazardous materials inventory, emergency response plans/risk management plans, and training programs. The plan would demonstrate that adequate controls, containment, and clean-up protocols are in place to minimize risks to the population and environment. The plan would be submitted to and approved by the City of Orange Fire Department prior to operating the disinfection facility. To facilitate approval, prior to putting project plans out to bid, IRWD would submit drawings to the City of Orange Fire Department for their review, approval, and stamp as required by the Business Plan Act. IRWD is responsible for implementing the approved plan.

Construction and operation of the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Furthermore, regularly scheduled maintenance during project operations would occur as they currently do for the existing OPA Well-3. Refilling the disinfection tanks would take place as often as the current conditions and would be managed by the existing standards and regulations as the current refilling is. Refilling the disinfection tanks would not create a significant hazard to the public. Therefore, impacts would be less than significant.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less-than-Significant Impact. The City of Orange Fire Department provides a wide array of services to the City, including hazardous materials first response (City of Orange 2011). Furthermore, according to City of Orange General Plan Safety Element, the Orange County Fire Authority (OCFA) has coordinated preparation of the Orange County Hazardous Waste Management Plan. The plan establishes countywide policy for waste treatment, transportation, and disposal (City

of Orange 2005). Furthermore, city regulations include Chapter 15.33, Hazardous Materials, of the City of Orange Municipal Code and implementation of the California Accidental Release Prevention Program.

Construction activities would be short term in nature and may involve the limited transport, storage, use, and disposal of hazardous materials such as fuel and lubricating grease for motorized heavy equipment. Some examples of typical hazardous materials handling include fueling and servicing construction equipment on the site and transporting fuels, lubricating fluids, solvents, and bonding adhesives. These types of materials are not acutely hazardous, and all storage, handling, and disposal of these materials are regulated by local, county, and state laws. Furthermore, the Project Technical Specifications state the proposed project would prepare and implement a spill prevention plan prior to the start of construction. BMPs required in the plan include all construction workers be educated in the proper handling and storage of construction materials; all spills be soaked up using absorbent materials and disposed of properly; and outdoor storage of all oils, solvents, cleaners, and other liquid materials be stored within secondary containment (Irvine Ranch Water District 2010).

Operation of the proposed project would involve the use of a disinfection system, which would require routine transport, storage, use, and disposal of hazardous materials as described above in Response VIII(a). The proposed project would result in the addition of the use of ammonia at the project site. It would also result in an increase in the volume of disinfection mixture over the existing 110 gallons currently located at the project site.

Although operation of the proposed project would use and store hazardous substances, it would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions. With implementation of the spill prevention plan during construction and adherence to city, county, and state agency requirements, construction and operation of the proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, impacts would be less than significant.

c. *Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

Less-than-Significant Impact. Only one school, Prospect Elementary School, is within 0.25 mile of the project site. The proposed project would not emit hazardous emissions; therefore, it would not do so within 0.25 mile of a school. The proposed project would handle hazardous materials associated with disinfection for potable drinking water purposes; however, these materials would be stored with double containment or within a spill containment area, in a locked and alarmed building and handled in accordance with IRWD's RMP. Furthermore, compliance with city, county, and state requirements would further minimize the potential for the accidental release or upset of hazardous materials, helping to ensure public safety. Therefore, impacts would be less than significant.

d. *Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*

Less-than-Significant Impact. The project site is located at 678 North Gravier Street, and although it is not on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, project operation does require handling and storing hazardous materials. A search of

678 North Gravier Street in the California Environmental Protection Agency (CalEPA) Cortese List as a Department of Toxic Substances and Control Hazardous Waste site did not yield any results, and the proposed project site address is not in the EnviroStor data base of hazardous substances release sites (CalEPA 2011a, 2011b). Geotracker, the California database of leaking underground storage tanks, lists two incidents within approximately 0.6 mile of the project site at 454 North Prospect Street and 3920 East Spring Street that have been remediated. However, the database does not report any current leaking underground storage tanks at the project site or in the vicinity of the project site (Geotracker 2011). Finally, there are no active Cease and Desist Orders or Clean Up and Abatement Orders for hazardous materials/facilities in the project vicinity or at the project site (CalEPA 2011c). Therefore, the proposed project would not create a significant hazard to the public or the environment, and impacts would be less than significant.

- e. Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?*

No Impact. The closest airport is John Wayne (Orange County) Airport, approximately 8 miles south of the project site. The project site is not located within the boundaries of the Airport Environs Land Use Plan (AELUP) for John Wayne Airport. Therefore, construction and operation the proposed project would not result in a safety hazard for people residing or working in the project area. No impact would occur.

- f. Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?*

No Impact. The proposed project is not located within the vicinity of a private airstrip. Therefore, construction and operation proposed project would not result in a safety hazard for people residing or working in the project area, and there would be no impact.

- g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

No Impact. The proposed project would not involve expansion beyond the existing IRWD property boundaries; therefore, conflicts with any emergency evacuation plan would not occur. Furthermore, the project site is not located along any of the major arterials that could serve as major evacuation routes. Finally, the hazardous materials associated with disinfection would be stored with double containment and would be located in a locked building with an intrusion alarm, and the City of Orange Fire Department would have the RMP and would be made aware of the chemicals through the Hazardous Materials Disclosure. Therefore, construction and operation of the proposed project would not impair or physically interfere with any emergency plan, and there would be no impact.

- h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?*

No Impact. According to the City of Orange General Plan Safety Element, the project site is not located near any areas identified as Wildland Fire Hazard Areas (City of Orange 2005). Furthermore, construction and operation of the proposed project would not involve housing units. Therefore, construction and operation of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, and no impact would occur.

IX. Hydrology and Water Quality		Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f.	Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g.	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h.	Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i.	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j.	Contribute to inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

City of Orange CEQA Hydrology Thresholds		Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
k.	Potentially impact stormwater runoff from construction activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
l.	Potentially impact stormwater runoff from post-construction activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
m.	Result in a potential for discharge of stormwater pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
n.	Result in the potential for discharge of stormwater to affect the beneficial uses of the receiving waters?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
o.	Create the potential for significant changes in the flow velocity or volume of stormwater runoff to cause environmental harm?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
p.	Create significant increases in erosion of the project site or surrounding areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Would the project:

a. Violate any water quality standards or waste discharge requirements?

Less-than-Significant Impact. Land within the City of Orange is included in four watersheds: Santa Ana River, San Diego Creek, Carbon Creek, and Westminster. Each of these watersheds is under the jurisdiction of the Santa Ana Regional Water Quality Control Board (SARWQCB) and subject to the objectives, water quality standards, and BMP requirements established in the Santa Ana River Basin Plan and Orange County Drainage Area Management Plan (DAMP). The County of Orange and the City of Orange are signatories of the Orange County DAMP (SARWQCB 2010). The DAMP is a management structure for compliance efforts; a formal agreement to underpin cooperation; and a detailed municipal effort to develop, implement, and evaluate various BMPs or control programs in the areas of public agencies activities, public information, new development and construction, public works construction, industrial discharger identification, and illicit discharger/connection identification and elimination (SARWQCB 2010).

The project site is located in the Santa Ana River watershed. The Santa Ana River Watershed encompasses approximately 2,800 square miles extending from the Big Bear region in San Bernardino County and from east Hemet in Riverside County, and includes most of the City of Orange and Orange County. Approximately 4.8 million people live within this watershed. The Lower

Santa Ana River basin underlies the entire western portion of the City of Orange. The Santa Ana River is the major drainage course for the Santa Ana River basin (City of Orange 2009).

Under the provisions of the City of Orange Municipal Code Chapter 7.01 (Water Quality and Stormwater Discharges), any discharge to or from the stormwater drainage system or to a receiving water that is not composed entirely of stormwater is prohibited. Non-stormwater discharges authorized by a separate NPDES Permit are allowed provided compliance with all permit conditions is maintained. New development and significant redevelopment are required to ensure pollutant discharges from development are reduced to the maximum extent practicable and in accordance with the NPDES permit, the DAMP, and the City's Local Implementation Plan, a planning document detailing the City's implementation of the DAMP (City of Orange 2004).

Per the requirements of the NPDES de minimus discharge permit, the proposed project would provide advanced notice to the SARWQCB and County of Orange prior to any discharge to the storm drain system or OCFCD channel, including an estimate of the amount of discharge anticipated for each discharge event. Also under the requirements of the NPDES permit, IRWD would collect samples and submit monthly reports to the SARWQCB for discharge compliance.

The proposed project would include earthwork activities such as site preparation, grading, stockpiling of soils, and excavation. Construction activities would disturb surface soils that are currently covered by concrete, gravel, or vegetation. Once disturbed, soils could be exposed to the effects of wind and water erosion, causing sedimentation in stormwater runoff. Project construction would also involve the use of chemicals and solvents such as fuel and lubricating grease for motorized heavy equipment. Inadvertent spills or releases of such chemicals could cause an adverse water quality impact. Refer to Section VIII, Hazards and Hazardous Materials, for additional information.

Project construction would encompass an area less than 1 acre; therefore, project construction would not require the preparation or implementation of a formal SWPPP. However, per the Project Technical Specifications, construction plans and activities would include the preparation and implementation of an erosion control plan to minimize runoff during construction. All discharge water generated during project construction would be disposed of in accordance with NPDES and OCFCD discharge permits. The disposal of drill cuttings, rotary fluids and other well construction by-products would be performed under existing NPDES de minimus permits. Furthermore, prior to discharge to the storm drain, all construction flows from each well would be initially conveyed to a series of Baker tanks located on the project site. The purpose of the Baker tanks is to allow suspended sediment to separate from fluids prior to discharge. If de-chlorination is necessary, it would occur at the existing catch basin prior to release. Discharge water would meet OCFCD requirements for discharge and would then be discharged into the 18-inch storm drain. Water from the Baker tanks that meets OCFCD requirements for discharge would be conveyed to the storm drain in the northwest corner of the project site near the existing OPA Well-3. Sand bags, earthen berms, and other devices would be used to form barriers to prevent runoff as implementation of Best Management Practices incorporated into the erosion control plan.

Once the replacement well is operating, it would provide an estimated annual average demand of approximately 900 AFY of potable water, which is less than the design capacity of the existing well, but a nominal increase over the existing 700 to 900 AFY at which the well is currently operating. The groundwater produced by IRWD OPA Well-1 would be pumped to the wet well where it will be temporarily stored and then conveyed to customers through the distribution system in the OPA

service area. Since the amount of impervious surface would generally remain the same under operating conditions when compared to existing conditions, the project site would not generate any substantial increase in stormwater runoff and therefore would not violate any discharge requirements. Operation of the proposed project would comply with City of Orange Municipal Code Chapter 7.01 (Water Quality and Stormwater Discharges), the provisions set forth in the NPDES permit, and the Orange County DAMP (all described at the beginning of this response). Therefore, the proposed project would not violate any water quality standards or waste discharge requirements during construction or operational activities, and impacts would be less than significant.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

Less-than-Significant Impact. Water supply in the IRWD service area, which includes small portions of the City of Orange, other cities in Orange County, and parts of unincorporated Orange County, comes from several sources including water from northern California via the State Water Project, the Colorado River, local groundwater basins, local watersheds, reclamation, and water reuse projects. The Orange County Water District (OCWD) manages the Orange County Groundwater Basin (Basin), which is one of the City's and IRWD's primary sources of water supply. Groundwater conditions in the Basin are naturally influenced by the following natural conditions: natural hydrologic conditions of rainfall, groundwater seepage, and stream flow. Groundwater extraction and injection through wells, the use of imported water for groundwater replenishment, and water use efficiency practices also influence the groundwater conditions in the Basin (City of Orange 2009). OCWD manages annual production, recharge, and replenishment in the Basin through financial incentives (discussed in Chapter 2 and Section XVII, Utilities and Service Systems) and implementation of a Groundwater Management Plan. Furthermore, OCWD maintains and uses a Basin groundwater model to plan for the future effects of groundwater extraction by the various purveyors, including IRWD, within the Basin.

The Basin covers an area of approximately 350 square miles beneath the broad lowlands known as the Tustin and Downey Plains. The aquifers comprising the Basin extend over 2,000 feet deep and form a complex series of interconnected sand and gravel deposits. (Orange County Water District 2009.)

OCWD operates recharge facilities to maximize groundwater recharge. Recharging water into the Basin through natural and artificial means is essential to support pumping from the Basin. The Basin's primary source of water for groundwater recharge is flow from the Santa Ana River (Orange County Water District 2009). Groundwater recharge facilities within or adjacent to the City of Orange include the Santa Ana River, which performs groundwater recharge in areas along its entire route, and Santiago Creek. The upper portions of Santiago Creek are characterized by large, abandoned sand and gravel mining pits. In particular, the pits located approximately north-northeast of Bond Street serve groundwater recharge purposes (City of Orange 2009).

The proposed project would not interfere with groundwater recharge as it introduces a negligible change in impervious surfaces (see Response IX (c), (d), and (e) for more discussion regarding impervious vs. pervious surfaces). Furthermore, the proposed project would not introduce a new long-term source of withdrawal of groundwater because it is intended to replace the existing OPA

Well-3 and would not significantly increase production over the current conditions. The existing OPA Well-3 located in the northwest corner of the project site is in very poor condition and is currently producing approximately 900 gpm, far below its original rate of approximately 1,900 gpm. As part of the proposed project, the existing OPA Well-3 would be abandoned and construction and operation of IRWD OPA Well-1 would occur on the same IRWD property as the abandoned well. The proposed project would allow a slightly greater proportion of the OPA service area demand to be served by groundwater, rather than imported water, as historically has been the case. Normal production capacity from the proposed IRWD OPA Well-1 would provide an estimated annual average of approximately 900 AFY of potable water to the OPA service area, 100 to 200 AFY more than the existing deteriorated operation conditions of OPA Well-3.

There are numerous inactive and abandoned/destroyed wells within the vicinity of the project site. There are also several active production wells within close proximity to the project site. These include two production wells owned and operated by the City of Orange, identified as O-23 and O-24, and two production wells owned and operated by the EOCWD, which are identified as EOCWD-W and EOCWD-E. Since the proposed project would pump at a rate similar to historic conditions, it is not anticipated that these wells would experience significant lowering of the groundwater table (drawdown) as a result of the proposed project.

OCWD conducted modeling runs of the Basin for the previous project when two wells were being considered (Appendix D). The model was calibrated based on 9 years of monthly production data of the existing wells in the Basin and indicated potential effects in groundwater levels of the shallow, principal, and deep aquifers as a result of pumping from the two wells. Interpolation of the data found in the model revealed there is a linear relationship between capacity and drawdown. At historic conditions (approximately 700 AFY) the draw down is 0 feet. Through extrapolation for the proposed project (approximately 900 AFY), it was determined the drawdown at the nearest City of Orange well (O-24) would be approximately 0.44 feet and approximately 0.26 feet of drawdown at EOCWD nearest well (EOCWD-W). Pumping associated with the proposed project would produce no significant water level change in the shallow or deep aquifer. Since the proposed project would pump at an annual capacity similar to historic conditions, groundwater levels within the principal aquifer in the immediate vicinity of the replacement well would be essentially unchanged. Overall, there would be no significant changes across the Basin. Implementation of the proposed project would not result in a significant lowering of groundwater levels.

As described in Chapter 2 under Well Operations, IRWD and the City of Orange established a Joint Groundwater Engineering and Management Committee to coordinate groundwater production, monitoring and the mitigation of possible impacts to existing wells in accordance with the existing 2006 Annexation Agreement. This agreement is attached as Appendix B. This agreement and committee is the existing framework for IRWD and the City of Orange to address well and groundwater issues on a case-by-case basis.

Even though no significant lowering of groundwater level is expected, pursuant to the 2006 Annexation Agreement, the Joint Groundwater Engineering and Management Committee could be convened as necessary to evaluate physical conditions, actual drawdowns, and production rates experienced at the existing O-23 and O-24 wells and any actual significant changes that are observed and verified during the operation of the IRWD OPA Well-1. EOCWD would be invited by IRWD to participate in the Joint Groundwater Engineering and Management Committee meetings. Any actual significant changes that are observed and verified at EOCWD-W and EOCWD-E could be addressed

between IRWD and EOCWD outside of the committee meeting framework. However, no significant changes are anticipated.

Operation of the proposed project would result in a minor increase in the amount of pumping as compared to historic conditions. The maximum drawdown would be essentially unchanged and the nearby City of Orange and EOCWD production wells would not be affected as a result of implementation of the proposed project. Therefore, impacts associated with the drawdown of the local groundwater level would be less than significant.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?

Less-than-Significant Impact. The existing project area is located in the Santa Ana River Watershed. The project site drains into a catch basin in the northwest corner of the site, which drains to the Santiago Creek Channel. No streams or rivers are currently located on or around the project site and therefore the proposed project would not directly affect the flow of a river or stream.

Construction of the proposed project would involve minimal earthwork activities, such as site preparation. Construction activities would disturb surface soils that are currently covered by concrete, gravel, or vegetation. These activities would temporarily alter the existing drainage pattern of the project site during construction; however, as described above in Response IX(a), construction of the proposed project would comply with the requirements of the NPDES and OCFCD permits. Furthermore, the proposed project would implement an erosion control plan and BMPs consistent with the DAMP in order to limit erosion and sedimentation and subsequent damage to the Santiago Creek and Santa Ana River.

The volume of stormwater runoff generated by a project site is related to the amount of impervious (e.g., concrete) and pervious surfaces (e.g., lawn). The more impervious the project site, the more stormwater runoff generated. High volumes of stormwater runoff from a project site can result in erosion or siltation on or off site depending on the erodability nature of the surrounding soil. The project site includes the existing OPA Well-3 and aboveground infrastructure. There is gravel and concrete in the immediate area surrounding OPA Well-3. Approximately 1/3 of the project site is impervious surfaces. Once operational, there would be no substantial change in impervious surface area. The disinfection treatment system would be located in an enclosed structure in impervious spill containment areas. The surge tank and the area around the well would also be considered impervious surfaces. Therefore, there would not be a substantial alteration of the project site impervious to pervious surfaces, and the volume of stormwater runoff would generally remain the same and not result in erosion or siltation on or off site. Impacts would be less than significant.

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?

Less-than-Significant Impact. There are no streams or rivers located on the project site. The project site does drain to the Santiago Creek Channel; however, construction and operation of the proposed project would not directly affect the flow of a river or stream. During construction, runoff quantities and velocities from the project site would be minimized through implementation of an erosion control plan and BMPs consistent with the DAMP in order to limit stormwater discharge. As

discussed above in Responses IX(a) and (c), operation of the proposed project would not substantially alter the existing drainage pattern nor would it substantially change the impervious area on the project site. Therefore, construction and operation of the proposed project would not substantially alter the existing drainage pattern of the project site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site. Impacts would be less than significant.

e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less-than-Significant Impact. The project site is located in an urban area and is composed of the OPA Well-3 and aboveground infrastructure. There is gravel and concrete in the immediate area surrounding the existing OPA Well-3. Currently, drainage at the project site flows into a catch basin located in the northwest corner of the project site, near the existing OPA Well-3. The catch basin is connected to an 18-inch storm drain that flows to the OCFCD E08P06 Santiago Creek Channel (Irvine Ranch Water District 2010, OCFCD 2010).

During construction of the proposed project, pumping and testing of the well would be required. This would generate water that would initially be conveyed to a series of Baker tanks located on the project site as previously discussed. The purpose of the Baker tanks is to allow suspended sediment to separate from fluids prior to discharge (Irvine Ranch Water District 2010). If de-chlorination is necessary, it would occur at the existing catch basin prior to release. Discharge water would meet OCFCD requirements for discharge and would then be discharged into the existing 18-inch storm drain. Testing the well could generate volumes of water of up to approximately 3,700 gpm. The existing storm facility would be sufficient to convey the expected flows from well construction. The slope of the 18-inch line would allow up to 3,700 gpm at 75% full (Irvine Ranch Water District 2010). Furthermore, a flood control encroachment permit would be required to discharge into this existing stormwater drain and would stipulate any relevant discharge conditions.

As discussed above in Responses IX(a), (c), and (d), operation of the proposed project would not substantially alter the existing drainage pattern of the site nor would it substantially change the impervious area on the project site. Therefore, the proposed project would not substantially increase the volume or velocities of stormwater flow, contribute to the exceedance of stormwater drainage capacities, or provide additional sources of pollutants. Impacts would be less than significant.

f. Otherwise substantially degrade water quality?

Less-than-Significant Impact. The proposed project would not substantially degrade water quality. As outlined under Responses IX(a) and (e), construction and operation of the proposed project would not substantially increase surface runoff, would not substantially alter the drainage of the existing project site, and would comply with all requirements of the NPDES and OCFCD permits. Furthermore, the proposed project would not drain into the Santiago Recharge Basin. Impacts on water quality would be less than significant.

g. Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. The proposed project does not include the construction of housing units. Therefore, the proposed project would not locate housing within a 100-year flood hazard area. There would be no impact.

h. Place within a 100-year flood hazard area structures that would impede or redirect floodflows?

Less-than-Significant Impact. The project site is located within 500 feet of the Santiago Creek Recharge Basin and approximately 0.25 mile east of the lower Santiago Creek. According to Figure IX-7 of the Orange County General Plan, the Santiago Creek Recharge Basin is located in the Santiago Creek Overflow Area and is susceptible to a 500-year flood (County of Orange 2004 and FEMA Map Panel FM06059C0162 2011). Furthermore, according to the City of Orange General Plan, the Santiago Creek is identified as a 100-Year Flood Area (City of Orange 2005). However, the project site is located approximately 0.25 mile east of the Santiago Creek and is not identified as a 100-year flood area (City of Orange 2005). The proposed project involves constructing small structures to house the disinfection system and aboveground pipes associated with the replacement well. The scale and height of these types of structures are not large enough to impede or redirect flows in the Santiago Creek or Santiago Recharge Basin. Therefore, the proposed project would not impede or redirect 100-year floodflow, and impacts would be less than significant.

i. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

Less-than-Significant Impact. As discussed in Response IX(g), the proposed project is not located in a flood zone area (County of Orange 2004, City of Orange 2005). However, according to the County of Orange General Plan Figure IX-9, Prado Dam and Santiago Reservoir Inundation Areas, the proposed project is located in the Santiago Reservoir Inundation Area (County of Orange 2004). Although the proposed project is located within 500 feet of the Santiago Creek Recharge Basin and approximately 0.25 mile east of the lower Santiago Creek, the proposed project does not involve the construction of habitable structures that would impede or redirect flows in the event of a dam failure at the Santiago Reservoir. Therefore, the proposed project would not expose people to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. As discussed in Response IX(g), the scale and height of the proposed project structures would not redirect flows associated with a levee or dam failure, and the loss of these structures would not be significant as IRWD would replace them in the event of a failure. Impacts would be less than significant.

j. Contribute to inundation by seiche, tsunami, or mudflow?

Less-than-Significant Impact. A seiche is a tidal change in an enclosed or semi-enclosed water body caused by sustained high winds or earthquake. A tsunami is a large tidal wave generated by an earthquake, landslide, or volcanic eruption. Mudflows (or debris flows) are rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt, change the earth into a flowing river of mud (City of Orange 2009).

The proposed project site is relatively flat and located over 14 miles away from the Pacific Ocean. The project site is also within 500 feet of the Santiago Creek Recharge Basin and approximately 0.25 mile east of the lower Santiago Creek.

Implementation of the proposed project would not increase exposure to inundation by seiche, tsunami, or mudflow. According to the Safety Elements of the Orange County and City of Orange General Plans, the project site is not located in a 100- or 500-year flood zone area (County of Orange 2004, City of Orange 2005). Although seiches have not historically occurred within the City of Orange, it is possible that a seiche could occur within the Santiago Creek Recharge Basin. Due to the

absence of historical data, no local mapping is available for adjacent areas that might be affected (City of Orange 2009). However, the proposed project does not involve the construction of any habitable buildings or structures that would contribute to inundation by seiche and the site is at a higher elevation.

The proposed project site is located over 14 miles away from the Pacific Ocean and is generally considered too far away to be subject to a tsunami. Furthermore, according to the City of Orange Safety Element, the potential for mudflow at the project is low since this type of event is associated with erosion during land development activities in and adjacent to hillsides mainly in the eastern portion of the City of Orange due to removal of natural vegetation and creation of steep graded slopes (City of Orange 2009).

As stated above, the proposed project does not involve the construction of any habitable buildings or structures that would contribute to inundation by seiche or mudflow. Furthermore, the proposed project is not located in a tsunami inundation zone. Therefore, impacts would be less than significant.

k. Potentially impact stormwater runoff from construction activities?

Less-than-Significant Impact. As discussed in Response IX(a), the proposed project would comply with all requirements of the NPDES and OCFCD permits. Per the Project Technical Specifications, construction plans and activities would include the preparation and implementation of an erosion control plan to minimize runoff during construction. All discharge water generated during project construction would be disposed of in accordance with NPDES and OCFCD discharge permits. Furthermore, prior to discharge to the storm drain, all construction flows would be initially conveyed to a series Baker tanks located on the project site. As discussed in Response IX(e), construction of the proposed project would not result in an exceedance of the existing stormwater capacity. The proposed project would not substantially impact stormwater runoff from construction activities, and impacts would be less than significant.

l. Potentially impact stormwater runoff from post-construction activities?

Less-than-Significant Impact. Responses IX(a), (c), and (d) identify the location of the project site. Once operational, there would be no substantial change in impermeable surface area. Operation of the proposed project would not substantially alter the existing drainage pattern of the site nor would it substantially change the impervious area on the project site. Post-construction activities of the proposed project would not result in substantial impacts on stormwater runoff. Impacts would be less than significant.

m. Result in a potential for discharge of stormwater pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas?

Less-than-Significant Impact. As discussed in Response VIII(a), construction activities would involve limited use of hazardous materials, and operation would involve the routine transport, use, and storage of hazardous materials for maintenance of the disinfection system. Also, as discussed in Response VIII(b), construction equipment has the potential to release oils, greases, solvents, and other finishing materials through accidental release or upset and could have the potential to affect stormwater runoff. Construction-related spills of hazardous materials are not uncommon. However, the enforcement of the spill protection plan and demolition standards, including BMPs by

appropriate local and state agencies including the development of a spill prevention and control plan, would reduce the potential for an accidental release of petroleum products and/or hazardous materials to result in stormwater pollutants. Operation of the proposed project includes a disinfection system, which would be located within a spill containment area to prevent hazardous materials from being released and generating an increase in stormwater pollution. The proposed project would not involve vehicle or equipment fueling, vehicle or equipment maintenance, loading docks, or other outdoor areas. Therefore, the proposed project would result in a low potential for discharge of stormwater pollutants from construction and operational activities, and impacts would be less than significant.

n. Result in the potential for discharge of stormwater to affect the beneficial uses of the receiving waters?

Less-than-Significant Impact. During construction, as discussed in Responses IX(a), (e), and (f), the proposed project would discharge into a catch basin, 18-inch storm drain, and ultimately into the Santiago Creek Channel. All discharge water generated during construction would be disposed of in accordance with NPDES and OCFCD discharge permits. Per project design specifications for the proposed project, water from any source related to the work or storm runoff would not be allowed to leave the project site. All flow generated by each well during construction would be initially conveyed to a series of Baker tanks located on the project site. In addition, BMPs would be developed for the proposed project and implemented to limit the introduction of pollutants to the environment, ground surface, or offsite drainages during construction. These include preparation and implementation of a Spill Prevention Plan and an erosion control plan (Irvine Ranch Water District 2010). As discussed above, operation of the proposed project would not substantially alter the existing drainage pattern of the site nor would it substantially change the impervious area on the project site. Therefore, the proposed project would not result in the potential for discharge of stormwater to affect the beneficial uses of the receiving waters (Santiago Creek Channel) and impacts would be less than significant.

o. Create the potential for significant changes in the flow velocity or volume of stormwater runoff to cause environmental harm?

Less-than-Significant Impact. As discussed in Responses IX(c), (d), and (e), construction of the proposed project would not result in significant changes to the flow velocity or volume of stormwater runoff. The existing 18-inch drain is appropriately sized to handle the volume of water that would be discharged during construction activities. As discussed in Responses IX(c), (d), and (e), operation of the proposed project would not substantially change the impervious and pervious surfaces on the project site and therefore would not result in an increased stormwater volume. Therefore, construction and operation of the proposed project would not create the potential for significant changes in the flow velocity or volume of stormwater runoff to cause environmental harm. Impacts would be less than significant.

p. Create significant increases in erosion of the project site or surrounding areas?

Less-than-Significant Impact. As discussed in Response IX(c), the proposed project would involve minimal earthwork activities such as site preparation. Construction activities would minimally disturb surface soils that are currently covered by concrete, gravel, or vegetation. However, these activities would not substantially alter the existing drainage pattern of the project site. Once operational, there would not be a substantial change in impermeable surface area. Construction and operation of the proposed project would comply with the requirements of the NPDES and OCFCD

permits. Furthermore, the proposed project would implement an erosion control plan and BMPs consistent with the DAMP in order to limit erosion and sedimentation and subsequent damage to the Santiago Creek and Santa Ana River. Therefore, the proposed project would not create significant increases in erosion of the project site or surrounding areas, and impacts would be less than significant.

X. Land Use and Planning	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

a. Physically divide an established community?

No Impact. The proposed project involves improvements that would occur on the project site and within an existing IRWD property. The current residential community has grown around the project site; therefore, the project site is located within the established community. The proposed project would not involve the addition of large aboveground structures, and no element of the proposed project would have the ability to physically divide an established community. No impact would occur.

b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less-than-Significant Impact. The proposed project is generally consistent with the City of Orange General Plan. The project site is designated as Low Density Residential (LDR) per the General Plan Land Use Element and is intended to support single family residential land uses (up to 6 dwelling units per acre). The properties in the surrounding project area have the land use designations of Low Density Residential, Low Medium Residential, Public Facilities, and Open Space (City of Orange 2005). Although the proposed project would eliminate the residential use and expand the infrastructure use on a site that is General Planned (and therefore primarily intended) for residential land use, infrastructure projects are generally accommodated within most non-infrastructure land use designations. Therefore, though the project does not necessarily further the intent of the LDR land use designation, it also does not conflict with it.

The following City of Orange General Plan goal is applicable to the proposed project:

- Land Use Element Goal 11.0: the City's infrastructure system must be adequate to meet the needs of existing and future residents.

Because the proposed project would include abandonment of one existing well and construction and operation of IRWD OPA Well-1 within the boundaries of an existing IRWD property, it would not conflict with any of the above goals, policies, or objectives or any other applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed project adopted for the purpose of avoiding or mitigating an environmental effect. The proposed project is consistent with the above goals, policies, and objectives in that the proposed facilities would provide upgrades to existing water infrastructure to provide adequate service to residents.

The City of Orange Zoning Code is intended to carry out the policies of the City of Orange General Plan. It is the intent of the zoning code to protect, promote, and enhance the public health, safety, and general welfare; ensure consistency between the zoning district and the general plan land use diagram; and promote compatibility between the natural and built environment. The project site is zoned R1-7 (Single Family Residential District). This zoning allows the development of single-family homes with a minimum lot area of 7,000 square feet. Section 17.14.030 of the zoning code identifies permitted uses in residential districts and conditionally permits public utilities or structures, such as water wells, to locate in any type of residential zone. The water facilities to be constructed in the proposed project are exempt from both building and zoning ordinances under Government Code 53091 (d) and (e), which states that building ordinances and zoning ordinances of counties and cities do not apply to the location or construction of facilities for the production of water. Therefore, impacts would be less than significant.

c. Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. See Response IV(f). The proposed project would not conflict with any applicable habitat conservation plan or natural community conservation plan. There would be no impact.

XI. Mineral Resources	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Would the project:

- a. 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?**

Less-than-Significant Impact. According to the Open Space and Conservation Element of the City of Orange General Plan, the project site overlays a regionally significant aggregated resource area (City of Orange 2005). However, the project site is currently developed with residential and infrastructure uses and is located in a residential neighborhood. As discussed in Section X, Land Use and Planning, the project site is designated as Low Density Residential per the City of Orange General Plan and zoned Single Family Residential per the City’s zoning code. Furthermore, the properties in the surrounding project area have the land use designations of Low Density Residential, Low Medium Residential, Public Facilities, and Open Space (City of Orange 2005, City of Orange 2006). Although the proposed project is located in a regionally significant aggregate resource area, the land use designation is not Resource Area nor is it zoned for sand and gravel extraction, which would allow for mining of aggregate resources. Currently, there are no extraction activities on or near the project site, and the proposed project would not interrupt or preclude future sand and gravel extraction activities. Therefore, construction and operation of the proposed project would not contribute to the loss of availability of a known mineral resource, and impacts would be less than significant.

- b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?**

Less-than-Significant Impact. As discussed in Response XI(a), the proposed project area overlays a regionally significant aggregate resource area according to the Open Space and Conservation Element of the City of Orange General Plan. However, the project site is currently developed with residential and infrastructure uses and is located in a residential neighborhood. As discussed in Section X, Land Use and Planning, the project site is designated as Low Density Residential per the City of Orange General Plan and zoned Single Family Residential per the City’s zoning code. Furthermore, the properties in the surrounding project area have the land use designations of Low Density Residential, Low Medium Residential, Public Facilities, and Open Space (City of Orange 2005, City of Orange 2006). Although the proposed project is located in a regionally significant

aggregate resource area, the land use designation is not a Resource Area nor is it zoned for sand and gravel extraction which would allow for important mineral resource recovery. Currently, neither the project site or surrounding neighborhood are delineated on a local general plan, specific plan, or other land use plan as an important mineral resource recovery site. Therefore, construction and operation of the proposed project would not contribute to the loss of availability locally important mineral resource recovery site and impacts would be less than significant.

XII. Noise	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Expose persons to or generate excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

- a. Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?**

Less-than-Significant Impact with Mitigation Incorporated. The proposed domestic water supply improvements would occur within the City of Orange, and is therefore subject to city noise regulations.

The City of Orange Noise Ordinance identifies construction noise standards that would apply to the proposed project. The City of Orange Noise Ordinance designates an exterior noise standard of 55 dBA between the hours of 7:00 a.m. and 10:00 p.m. and 50 dBA between the hours of 10:00 p.m. and 7:00 a.m. at all residential property lines. This ordinance exempts construction activities from quantitative limits associated with residential land uses in the City’s noise ordinance, provided that construction occurs between 7 a.m. and 8 p.m. Monday through Saturday. Construction activities outside of these hours or on Sundays and federal holidays are not exempt and are subject to the quantitative noise limits established in the ordinance unless a temporary variance is granted by the

Health Officer and the Noise Variance Board (City of Orange 2009). If construction activities are to occur outside the time frames provided by the noise ordinance, the Noise Variance Board (Board) can evaluate an application for a variance from the requirements of the noise ordinance. The Board can grant variances with respect to time for compliance and can set terms, conditions, and requirements on the variance, which may include limitations on noise levels and operating hours. Each variance granted sets forth in detail the approved method of achieving maximum compliance and a time schedule for its accomplishment. In its determinations, the Board considers the magnitude of nuisance caused by the offensive noise; the uses of property within the area of impingement by the noise; the time factors related to study, design, financing, and construction of remedial work; the economic factors related to age and useful life of equipment; and the general public interest and welfare. Any variance granted by the Board is done by resolution and is transmitted to the Health Officer for enforcement. Any violation of the terms of the variance is unlawful.

It is unlawful for any person at any location within the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on any other residential property to exceed:

- The noise standard for a cumulative period of more than thirty minutes in any hour; or
- The noise standard plus five dB(A) for a cumulative period of more than fifteen minutes in any hour; or
- The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour; or
- The noise standard plus fifteen dB(A) for a cumulative period of more than one minute in any hour; or
- The noise standard plus twenty dB(A) for any period of time.

In the event the ambient noise level exceeds any of the categories above, the cumulative period applicable to said category would be increased to reflect the ambient noise level. Furthermore, the maximum permissible noise level would never exceed the maximum ambient noise level.

Construction

The proposed project would include destruction and abandonment of OPA Well-3 and construction of IRWD OPA Well-1. These activities would begin in the spring of 2012 and last approximately 14 months. The destruction and abandonment of OPA Well-3 would take place during normal working hours, per the City of Orange's noise ordinance (City of Orange 2009). Construction of IRWD OPA Well-1 would require 24-hour drilling and testing that would take place over approximately 6 to 8 weeks.⁴

Construction activities would cause elevated noise levels within the residential area surrounding the proposed project site. Onsite noise generated during construction would occur primarily from the use of construction equipment used in the demolition of OPA Well-3 as well as a drill rig, small hand-held electric equipment, or combustion engine-driven heavy construction equipment for

⁴ The drill rig must run 24 hours a day to prevent the borehole walls from collapsing and compromising the integrity of well construction.

construction of IRWD OPA Well-1. Noise is also generated by pumping activities, well testing and during construction of proposed buildings and structures.

Noise from construction equipment would likely dominate noise levels in the area surrounding the project site. Residents adjacent to the property may be affected by noise from construction as the closest sensitive receiver would likely be less than 20 feet from the drill rig and other equipment used in the process of drilling the IRWD OPA Well-1.

The proposed project would include development of a 24-foot-high temporary sound wall surrounding the construction site and drill rig on all sides during well drilling. Generally, noise levels during well drilling range from 58 dBA to 69 dBA at distances of 100 to 160 feet even with erected sound barriers. Therefore, noise levels associated with well drilling would be audible at the closest sensitive receiver adjacent to the project site. Construction would comply with the City's municipal code time frames for demolition of OPA Well-3 and all other construction activities (with the exception of well drilling) and therefore meet City noise standards. However, for well drilling, noise levels are likely to exceed established noise levels in the City's Noise Ordinance. As part of the project, and prior to construction, IRWD will secure, as determined to be necessary, a variance from the City of Orange's Noise Variance Board that would exempt construction of IRWD OPA Well-1 from the City's 8:00 p.m. to 7:00 a.m. noise and construction hours limitations to accommodate continuous drilling and well testing over a 24-hour period when necessary (City of Orange 2009).

While the variance may address exceedance of the noise standards, noise from well drilling and construction would continue to be elevated for surrounding receptors during limited periods of time. The following mitigation measure would be incorporated into the project contract specifications to reduce construction noise effects. With the inclusion of the sound walls during well drilling as project design features and compliance with Mitigation Measure NOI-1, impacts would be less than significant.

Mitigation Measure

NOI-1: To reduce noise generated by the proposed project, IRWD and the contractor will implement the following measures:

- All mobile or fixed noise-producing equipment used on the project that is regulated for noise output by a local, state, or federal agency will comply with such regulation while in the course of project activity.
- The Contractor shall install noise attenuating panels including a 24 foot tall noise wall and additional sound blankets to fully enclose the drill rig during drilling operations.
- The Contractor shall use a drilling rig that is equipped with a muffler system such that the drilling rig generates reduced noise levels.
- Noise levels shall be monitored periodically during 24-hour well drilling or testing. If noise levels at surrounding residential property lines exceeds nighttime noise standards (between the hours of 8:00pm to 7:00am), IRWD shall provide on a case-by-case basis, affected residents options to reduce or avoid elevated noise levels. Options may include, but are not be limited to, temporarily relocating affected residents to reasonably priced local hotels during periods of nighttime work.
- Electrically powered equipment instead of pneumatic or internal combustion powered equipment will be used, where feasible.

- Material stockpiles and mobile equipment staging, parking, and maintenance areas will be located as far as practicable from noise-sensitive receptors.
- Construction site speed limits will be established and enforced during the construction period.
- For all construction other than well drilling, well development and pump testing associated with IRWD OPA Well-1, including noisy maintenance activities and all spoils and material transport, will be performed during daytime hours specified in the noise ordinance unless otherwise approved by the City of Orange.
- The use of noise-producing signals, including horns, whistles, alarms, and bells will be for safety warning purposes only.
- No project-related public address or music system will be used during nighttime hours.
- The onsite construction supervisor will have the responsibility and authority to receive and resolve noise complaints. A clear appeal process will be established prior to construction commencement that will allow for resolution of noise problems that cannot be immediately solved by the site supervisor.
- Construction signs will be posted at the project site identifying a contact name and phone number to register noise complaints. In addition, at least ten days prior to starting nighttime activities, the Contractor/IRWD shall notify adjacent residents (in writing) of the start of nighttime work. The Notice shall identify estimated nighttime work hours, nighttime work duration, and a contact name and phone number for complaints.

Operation

Under current operating conditions, the pump at existing OPA Well-3 site is not contained within an enclosed structure and produces noise. As described below, the proposed project will be designed and constructed in a manner that will likely improve noise levels.

Under operating conditions of the proposed project, pumps used for potable water extraction and transference to the wet well and Santiago Reservoir 5 will generate noise, but would be located within fully enclosed structures designed to attenuate noise. These structures would be constructed with grout filled concrete masonry unit (CMU) walls with sound blankets on the inside (or some other equally effective design) to attenuate noise. **Mitigation Measure NOI-2** and **NOI-3** would be implemented to further reduce potential operational noise impacts to less-than-significant levels.

Mitigation Measures

NOI-2: Once the proposed project is operational, IRWD shall conduct a post-construction noise survey to ensure that operation of the well equipment is within the City of Orange's Noise Ordinance at the project boundary and will be available to the City of Orange upon request.

NOI-3: Noise generating well maintenance activities shall be restricted to daytime hours (exempt from the City of Orange Noise Ordinance), unless otherwise approved by the City of Orange.

b. Expose persons to or generate excessive groundborne vibration or groundborne noise levels?

Less-than-Significant Impact. Proposed project construction would generate varying degrees of groundborne vibration, depending on the construction equipment being used. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the construction site's

vicinity often varies depending on soil type, ground strata, and construction characteristics of the receiver buildings. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

The types of potential impacts from construction vibration include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would usually not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond in the same way to vibration generated by construction equipment.

While the City of Orange has not adopted their own quantitative thresholds for vibration, the Federal Transit Administration (FTA) has compiled typical vibration levels generated by construction equipment, which are commonly used as a reference for construction vibration level analysis. The vibration produced by construction equipment is outlined in Table 3-4.

Table 3-4. Typical Vibration Levels for Construction Equipment

Equipment	Approximate peak particle velocity at 25 feet (inches/second)	Approximate peak particle velocity at 75 feet (inches/second)
Caisson Drilling	0.089	0.03
Loaded trucks	0.076	0.03
Small bulldozer	0.003	0.001

Notes:
 Peak particle velocity measured at 25 feet unless noted otherwise.
 Root mean square amplitude ground velocity in decibels (VdB) referenced to 1 micro-inch/second.
 Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006.

Groundborne vibration decreases rapidly with distance. Based on the FTA data in Table 3-4, vibration velocities from typical heavy construction equipment operation that would be used during project construction range from 0.003 to 0.089 inch per second peak particle velocity (PPV) at 25 feet from the source of activity. At 50 feet from the source activity, PPV ranges from 0.001 to 0.03 inch per second.

Because neither the state nor the local municipalities maintain regulatory standards for vibration sources, potential structural damage and human annoyance associated with vibration from construction activities were evaluated based on California Department of Transportation (Caltrans) vibration limits (Table 3-5). A vibration level of 0.10 inches per second PPV was used to determine impacts on nearby receivers because this level represents the boundary between barely perceptible and distinctly perceptible vibration as recognized by Caltrans.

Table 3-5. Reaction of People and Damage to Buildings at Various Continuous Vibration Levels

Vibration Level - Peak Particle Velocity (PPV) (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibration)	Threshold at which there is a risk of “architectural” damage to normal dwelling-houses with plastered walls and ceilings; special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage

Source: California Department of Transportation, Transportation- and Construction-Induced Vibration Guidance Manual, 2004.

Groundborne vibration from the proposed project would be generated primarily during drilling activities. The closest noise-sensitive receiver would likely be located less than 20 feet of the drill rig and potential heavy construction activity. Because each construction vibration value is well below the 0.10 inch-per-second PPV significance threshold, vibration impacts associated with construction would be less than significant, and no mitigation measures are required. Impacts from groundborne vibration or groundborne noise would be less than significant.

c. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less-than-Significant Impact with Mitigation Incorporated. As discussed in Response XII(a), construction of the proposed project would primarily generate temporary increases in ambient noise levels in the vicinity of the construction activity. However, these impacts would be temporary, lasting only for the duration of construction activities. Long-term operation of the proposed project would include the use of pumps, disinfection system, various maintenance activities, periodic deliveries of disinfection chemicals and related equipment associated with IRWD OPA Well-1. These pumps and other activities would generate noise, which could potentially increase noise levels at sensitive receivers. **Mitigation Measures NOI-2 and NOI-3** would be implemented to reduce noise levels. Impacts would be less than significant with mitigation incorporated.

d. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less-than-Significant Impact with Mitigation Incorporated. As described in Response XII(a), construction-related activities and equipment used during construction of the proposed project would result in a temporary or periodic increase in ambient noise levels above existing levels. The proposed project would adhere to Title 8, Section 8.24.070, of the City of Orange Municipal Code's for destruction and abandonment of OPA Well-3. With the implementation of **Mitigation Measure NOI-1**, impacts would be less than significant.

e. Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?

Less-than-Significant Impact. The nearest airport is John Wayne Airport, located approximately 8 miles south of the proposed project site. The proposed project site is not within the vicinity of any airport or within any airport land use plan. Therefore, no impact would occur.

f. Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?

No Impact. The proposed project is not located in the vicinity of a private airstrip. No impact would occur.

XIII. Population and Housing	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

- a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?**

Less-than-Significant Impact. The proposed project would not include new homes or businesses. The proposed project would include the construction and operation of one replacement groundwater well, and is intended to improve the domestic water service provided to existing residents within the OPA service area. The proposed project would not directly induce population growth because it would serve as a replacement to the deteriorating OPA Well-3 which is proposed to be abandoned and demolish as part of this project. The proposed project would increase production between 100 to 200 AFY, however, this increased production would only make up for the deteriorated OPA Well-3 pumping conditions and therefore would still pump at a maximum operational capacity of approximately 900 AFY. Therefore, since the proposed project is intended to service the existing OPA residents and would not result in substantial population growth in the area, impacts would be less than significant.

- b. Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?**

No Impact. The proposed project would not displace any existing housing units. Construction and operation activities would take place within the boundaries of an existing IRWD property and would include destruction and abandonment of the existing OPA Well-3 and construction and operation of IRWD OPA Well-1 on the same property as the abandoned well. Therefore, construction and operation of the proposed project would not displace a substantial number of existing housing units, and there would be no impact.

c. Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?

No Impact. As stated in Response XIII(b), the proposed project would not displace any housing. Therefore, the proposed project would not displace a substantial number of people, and there would be no impact.

XIV. Public Services	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

a1. Fire protection?

Less-than-Significant Impact. The abandonment of one existing well and construction and operation of a replacement well within the boundaries of an existing IRWD property would not change City of Orange Fire Department response times or substantially affect demand for fire protection services at the facility. Under the proposed project, fire services may be needed in the unlikely event of a chemical spill related to the disinfection system. However, the low risk of a chemical spill from the proposed system is similar to the existing low risk from the existing disinfection system on site for the current well. Therefore, there would be a negligible change in the demand for fire or emergency services between the proposed project and existing conditions. As discussed in Section VIII, Hazards and Hazardous Materials, the proposed project would implement a spill prevention plan, and all hazardous materials would be located in a spill containment area within an enclosed structure and maintained on a regular basis. Therefore, construction and operation of the proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, and impacts would be less than significant.

a2. Police protection?

No Impact. The proposed project would not involve the introduction of structures outside of the existing IRWD property boundary. Further, the proposed project would not include the addition of housing, schools, or other community facilities that might require additional police protection. The proposed project is an infrastructure project and inherently would not require the services of police. Furthermore, the proposed project would be surrounded by a locked gate and 6- to 8-foot-high concrete masonry wall under operating conditions. Only IRWD personnel would have access. The proposed project would have lighting on the buildings for security purposes. Therefore, construction and operation of the proposed project would not affect local police response times or demand for police protection services, and there would be no impact.

a3. Schools?

No Impact. School services in the City are provided by the Orange Unified School District. The demand for new schools is generally associated with population increases or impacts on existing schools. As discussed in the Response XIII(a), the proposed project would not induce population growth. Therefore, construction and operation of the proposed project would place no new demands on schools, and there would be no impact.

a4. Parks?

No Impact. The demand for parks is generally associated with the increase of housing or population in an area. As discussed in Response XIII(a), the proposed project would not induce population growth. Therefore, construction and operation of the proposed project would place no new demands on parks, and there would be no impact.

a5. Other public facilities?

No Impact. As discussed in Response XIII(a), the proposed project would not induce population growth. Therefore, construction and operation of the proposed project would place no new demands on other public facilities, and there would be no impact.

XV. Recreation	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

- a. *Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?***

No Impact. The proposed project is inherently an infrastructure project and would not affect neighborhood or regional parks or other recreational facilities. An increase in the use of parks is generally associated with an increase of housing or population in an area. As discussed in Response XIII(a), the proposed project would not induce population growth. Therefore, construction and operation of the proposed project would place no new demands on recreational facilities, and there would be no impact.

- b. *Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?***

No Impact. As discussed in Response XIII(a), the proposed project would not induce population growth. The proposed project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse effect on the environment. There would be no impact as a result of construction and operation of the proposed project.

XVI. Transportation/Traffic	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Would the project:

- a. Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?**

Less-than-Significant Impact. Although the proposed project is located entirely within an existing IRWD property, there is a potential for project-related traffic to affect adjacent roadways providing access to the project site during construction and operation.

Construction Period

No road or lane closures are expected to result from construction of the proposed project. Access to the project site during construction would be provided via North Gravier Street. Approximately three to six construction workers would be required at the project site. This equates to approximately 12 one-way trips per day to and from the project site during construction. Additional trips would be required throughout the construction period to bring construction equipment (e.g., drill rig) to the project site. As identified by the City of Orange General Plan EIR, currently the intersections within proximity of the project site are operating at the following levels of services:

- North Prospect from Spring to Walnut: LOS B
- North Prospect from Walnut to Bond: LOS B
- North Hewes from Chapman to Walnut: LOS A
- North Hewes from Bond to Santiago Canyon: LOS A

The proposed project would implement project technical specifications section 1040(H) pertaining to construction traffic control (Irvine Ranch Water District 2010). These specifications include construction signing, vehicular traffic control, pedestrian traffic control and safety, access to adjacent properties, and permanent traffic control devices and are identified in **Mitigation Measure TR-1**. Furthermore, traffic control associated with the proposed project would conform to the ordinances and regulations of the City of Orange including Title 10, Vehicles and Traffic; Title 17.34, which regulates off-street parking and loading requirements; and the City's traffic control guidelines for encroachment permits. The trips generated during construction would not result in a substantial decline in the existing levels of service at the intersections within proximity of the project site. Finally, construction would be temporary, and the slight increase in localized traffic associated with construction would be reduced once construction was complete.

IRWD would obtain a City encroachment permit for any work within City right of way. Furthermore, a transportation/ haul permit would be obtained for haul vehicles or construction vehicles traveling on City streets. A traffic control plan would be prepared as part of the permit process, which would typically specify that haul routes (avoiding residential streets to the greatest extent possible) and "off-peak" hours for delivery and hauling activities.

Therefore, the impact of construction generated traffic on area traffic volumes would be less than significant prior to the implementation of **Mitigation Measure TR-1**. They would be further reduced with the implementation of the measure.

Operation Period

During operation, substantial increases in traffic volumes are not expected to result from the operation of IRWD OPA Well-1. IRWD would continue their regular maintenance of the well and the disinfection system as they currently do for OPA Well-3 at the project site. One additional trip per month would be required to maintain the disinfection system. Thus, operational traffic volume impacts would be less than significant.

Mitigation Measure

TR-1: The construction contractors will prepare and implement a traffic control/traffic management plan subject to approval by the City of Orange prior to construction. The plan will:

- Identify the hours of construction for deliveries.
- Include discussion of haul routes, work area delineation, traffic control, and flagging.
- Identify all access and parking restrictions, pavement markings, and signage requirements (e.g., speed limit, temporary loading zone).
- Maintain access to residences driveways and public facilities at all times.
- Minimize access disruptions to residences.
- Layout a plan for notifications and process for communication with affected residences and transit agencies prior to the start of construction. Advanced public notification will include providing written notification to adjacent residences at least 10 days prior to construction start and providing appropriate signage of construction activities. The written notification will include the construction schedule, exact location and duration of activities, and a toll-free telephone number for receiving questions and complaints.

b. Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways?

Less-than-Significant Impact. The Orange County Transportation Authority (OCTA) is the designated Congestion Management Agency for Orange County. The OCTA prepares the Orange County Congestion Management Program (CMP), which is meant to reduce traffic congestion and provide a mechanism to coordinate land use and development decisions that support the regional economy. The CMP is a network of state highways and major arterials, LOS standards, and related procedures. Within the defined Orange County CMP highway network, intersections and freeway segments are not allowed to deteriorate to a condition worse than LOS E, or the base year LOS if worse than E. The LOS Standards for roadways that are part of the CMP network are intended to regulate long-term traffic increases resulting from the operation of new development. According to Figure 2 of the OCTA CMP, there are no CMP designated intersections within proximity of the project site. (Orange County Transportation Authority 2009.)

As discussed in Response XVI(a), although the proposed project would result in minor temporary increases in traffic on local area roadways, this short-term construction-related traffic would not create a substantial impact on traffic volumes nor change traffic patterns in such a way as to conflict with any congestion management programs. Furthermore, operation of the proposed project would not result in any long-term increases over existing traffic conditions as discussed in Response XVI(a). Since the proposed project would not introduce any new facilities that would generate long-term changes in traffic, the proposed project would not conflict with the applicable congestion management plan. Impacts would be less than significant.

c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. Neither construction nor operation of the proposed project is expected to have any effect on air traffic patterns. There would be no impact.

d. Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. No obstacles to sight distance are expected to result from construction of the proposed project. No sharp roadway curves currently exist in the project area, nor would such curves be created as a result of the proposed project. There would be no impact.

e. Result in inadequate emergency access?

Less-than-Significant Impact. No lane closures would occur, and emergency access would be maintained to the project site and on surrounding roadways. The impact of construction-generated traffic on emergency vehicle access would be minimized with implementation of IRWD project technical specifications Section 1040(H) and the general requirements Section 01300 pertaining to construction traffic control. Prior to the start of construction operations, notification would be given to the local police and fire departments, giving the expected starting date, completion date, and the name and telephone number of the responsible person who would be contacted at any hour in the event of a condition requiring immediate correction (Irvine Ranch Water District 2010a and 2010b). Finally, **Mitigation Measure TR-1** would be implemented during construction, reducing the already less than significant impacts even further. Therefore, impacts during construction would be less than significant.

Once operational, the proposed project would not result in inadequate emergency access. Operational impacts would be less than significant.

f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less-than-Significant Impact. The proposed project would not conflict with any alternative transportation policies, plans, or programs within the City of Orange. Because public transit service does not run on the project site access road (Gravier Street) or any of the roads nearby (Bond Avenue), construction- and operations-related traffic is not expected to interfere with transit operations. Therefore, impacts to alternative transportation would be less than significant.

XVII. Utilities and Service Systems	Potentially Significant Impact	Less-than- Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Would the project:

a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Less-than-Significant Impact. As described in Response XIII(a), the proposed project would not include new homes or businesses and would not induce population growth. The proposed project would serve the existing OPA service area. The proposed project would not induce population growth and would not cause any existing wastewater source to exceed treatment requirements of the SARWQCB.

Wastewater service in the project vicinity is provided by the City's Public Works Department. The City's Public Works Department is responsible for installation and maintenance of local wastewater collection facilities, which convey wastewater to Orange County Sanitation District (OCSD) trunk

sewers. OCSD operates two wastewater treatment facilities, which include Reclamation Plant No. 1 in Fountain Valley and Treatment Plant No. 2 in Huntington Beach, and numerous pump stations and sewer lines that cross its service area. Average flows for Reclamation Plant No. 1 and Treatment Plant No. 2 are 92 million gallons per day (mgd) and 129 mgd, respectively. Reclamation Plant No. 1 has a design capacity of 108 mgd with average daily flow of 92 mgd. Treatment Plant No. 2 has an average daily flow of 129 mgd with a design capacity of 168 mgd (City of Orange 2009). Therefore, Reclamation Plant No. 1 and Treatment Plant No. 2 are operating at approximately 85% and 77% of their respective capacities.

The proposed project would include a chemical building with a restroom, which would be used intermittently by IRWD crews because the building would not be permanently staffed. The restroom would connect to the existing sewer facility, and could generate a maximum of 36 gallon per day of wastewater.⁵ However, since the building would not be permanently staffed and the restroom would be used on an irregular basis, the projected wastewater generation is conservative and the proposed project is not expected to consume this much wastewater. Nonetheless, this would result in a slight increase in wastewater generation over the existing conditions.

Given that both the Reclamation Plant No. 1 and Treatment Plant No. 2 are operating well below their capacity, it is expected that the proposed project would not exceed the wastewater treatment requirements of the SARWQCB. Furthermore, OCSD is proposing to update the level of wastewater treatment at both of its treatment plants to meet secondary treatment standards for the projected 2020 effluent flow of 240 to 320 (mgd) (City of Orange 2009). Therefore, the proposed project would not cause any violation of standards set forth by OCSD, and impacts would be less than significant.

b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less -Than-Significant with Mitigation Incorporated. The subject project consists of the replacement of existing groundwater infrastructure. As described in Response XVII(a), the proposed project would serve the existing OPA service area. A disinfection system would be part of the proposed project. However, as disclosed in the resource sections of this environmental document, the construction of the proposed replacement well and disinfection system would not result in impacts that cannot be mitigated to less than significant. Therefore, significant impacts would not occur with the incorporation of mitigation measures.

Mitigation Measures:

BIO-1 identified in Section IV, Biological Resources.

GEO-1 identified in Section VI, Geology and Soils.

NOI-1, 2, and 3 identified in Section XII, Noise.

TR-1 identified in Section XVI, Transportation/Traffic.

⁵ The Los Angeles CEQA Thresholds Guide (City of Los Angeles 2006) was used to approximate the wastewater generation for the proposed project. The "Storage: Building/Warehouse" generation factor has an average daily flow of 20 gallons per day per 1,000 gross square feet. Given that the chemical building would be approximately 1,800 square feet, the proposed project would generate approximately 36 gallons per day.

c. *Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*

Less-than-Significant Impact. As described in Section IX, Hydrology and Water Quality, the proposed project would not affect existing stormwater drainage facilities requiring the need to construct new facilities. As discussed in Responses IX(a), (e), and (f), construction of the proposed project would result in discharges into a catch basin, 18-inch storm drain, and ultimately into the Santiago Creek Channel. Testing the well could generate volumes of water of up to approximately 3,700 gpm. The slope of the 18-inch line would allow up to 3,700 gpm at 75% full (Irvine Ranch Water District 2010); thus, the existing 18-inch storm drain is appropriately sized to handle the volume of water that would be discharged during construction of the well. A flood control encroachment permit would be required to discharge into this existing stormwater drain and would stipulate any relevant discharge conditions. All discharge water generated during construction would be disposed of in accordance with NPDES and OCFCD discharge permits. The water from any source related to the work or storm runoff would generally not be allowed to leave the project site. All flow generated during construction would be initially conveyed to a series of Baker tanks located on the project site. In addition, BMPs would be developed for the proposed project and implemented to limit the introduction of pollutants to the environment, ground surface, or offsite drainages during construction. These include preparation and implementation of a Spill Prevention Plan and an erosion control plan (Irvine Ranch Water District 2010). As discussed above, operation of the proposed project would not substantially alter the existing drainage pattern of the site nor would it substantially change the impervious area on the project site. Impacts would be less than significant.

d. *Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?*

No Impact. The proposed project would serve the existing OPA service area. The Orange County Groundwater Basin is managed by OCWD and encompasses over 299,000 acres in 20 cities as well as unincorporated areas on the coastal plain in central and north Orange County. Groundwater pumping rights within the Basin are not adjudicated; however, groundwater production by all purveyors, including IRWD, is managed by OCWD through financial incentives as discussed in Chapter 2. As discussed in Section IX, Hydrology and Water Quality, the proposed project would not modify the capacity of the Basin, which is determined by the amount of water that is recharged and OCWD management actions to maintain the Basin's sustainable yield. The yield of the basin is subject to operational constraints, such as the need to maintain the seawater intrusion barrier along the coast. OCWD has the ability to increase or decrease groundwater levels as desired to meet certain management goals through the implementation of the financial incentives discussed above.

Since the proposed project involves drilling and constructing a replacement well for the deteriorating OPA Well-3, no element of the proposed project would result in an increase in the demand for water supplies. The proposed project would pump at a rate of approximately 900 AFY, resulting in pumping an additional 100 to 200 AFY above baseline conditions. Therefore, the proposed project would have sufficient water supplies available to serve the project from existing entitlements and resources. The proposed project would not require new or expanded entitlements, and no impact would occur.

- e. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

No Impact. The proposed project would not generate wastewater or the need to treat additional wastewater. No impact would occur.

- f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?**

Less-than-Significant Impact. Construction activities would generate solid waste in the form of demolition debris from the destruction of OPA Well-3 and demolition of the disinfection system and building. The existing OPA Well-3 pump and associated components would be delivered to IRWD's Michelson Water Reclamation Plant. The existing disinfection system and building would be removed; however, electrical improvements would remain intact for development of the new IRWD OPA Well-1. Prior to removing the hypochlorite tanks from the building, the sodium hypochlorite solution would be removed from the tanks and reused at other IRWD facilities. The tanks could then be cleaned at the Michelson Water Recycling Plant and either reused elsewhere in the IRWD or disposed following all appropriate protocols, procedures, and regulations.

Three landfills exist in the vicinity of the proposed project: the Frank R. Bowerman Landfill in Irvine, the Olinda Alpha Landfill in Brea, and the Prima Deshecha Landfill in San Juan Capistrano. In total these facilities are permitted to accept 23,500 tons of solid waste per day and are scheduled to continue accepting waste throughout the entire length of project construction activities. The total solid waste disposal needs of the proposed project could be accommodated by any combination of the three landfills in the vicinity of the proposed project.

As described in Response XIII(a), the proposed project would not include new homes or businesses and would not induce population growth that would increase the need for solid waste disposal. Impacts would be less than significant.

- g. Comply with federal, state, and local statutes and regulations related to solid waste?**

No Impact. The proposed project would comply with all regulations related to solid waste, including the California Integrated Waste Management Act and City recycling programs. No impact would occur.

XVIII. Mandatory Findings of Significance	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Does the project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

Would the project:

- a. ***Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?***

Less-than-Significant Impact with Mitigation Incorporated. The proposed project involves the destruction and abandonment of one existing well, and construction and operation of IRWD OPA Well-1 and associated appurtenances. The project site is already developed with the existing OPA Well-3 and is located in a primarily residential area in the City of Orange. As discussed in Section IV, Biological Resources, the project site contains no vegetation that would be considered valuable wildlife habitat. The proposed project would not have a substantial adverse effect on any sensitive habitat or adversely affect populations or communities of fish or wildlife. Furthermore, the proposed project would not reduce the number or restrict the range of rare or endangered plants or animals. **Mitigation Measure BIO-1** is incorporated to comply with the Migratory Bird Treaty Act and to reduce impacts to nesting birds to less than significant. No historical cultural resources would be affected by the construction or operation of the proposed project. Therefore, impacts would be less than significant with mitigation incorporated.

- b. Does the project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)**

Less-than-Significant Impact. Due to its limited size and magnitude, the proposed project, in conjunction with other area projects, would not result in cumulative impacts on the physical environment. The proposed project would create a minimal increase in water supply within the OPA service area. In addition, OCWD’s basin management programs would ensure that the less-than-significant effects on groundwater elevations and gradients from the proposed project and other projects would not be cumulatively considerable. Therefore, the proposed project would not have impacts that are individually limited but cumulatively considerable, and impacts would be less than significant.

- c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?**

Less-than-Significant Impact with Mitigation Incorporated. Based on the analysis of the above-listed topics, the proposed project would have potentially significant environmental effects on geology and soils that could cause substantial adverse effects on human beings, either directly or indirectly. However, implementation of **Mitigation Measure GEO-1** would reduce these impacts to a less-than-significant level. Furthermore, construction and operation of the proposed project would generate noise and produce air emissions. However, air emissions generated by construction and operation of the proposed project would not be significant and would not adversely affect human beings. With incorporation of **Mitigation Measures NOI-1 through NOI-3**, temporary and permanent impacts associated with operational noise impacts to neighboring sensitive receptors at the proposed well would be less than significant. Construction and operation of the proposed project requires the use, handling, and transport of hazardous materials. As discussed in Section XIII, Hazards and Hazardous Materials, compliance with the spill prevention plan and local, county, and state regulations pertaining to use, handling, and transport of hazardous materials would ensure that substantial adverse effects to human beings would not occur due to accidental upset of materials. Finally, incorporation of **Mitigation Measure TR-1** would include specifications regarding construction signing, vehicular traffic control, pedestrian traffic control and safety, access to adjacent properties, and permanent traffic control devices to reduce transportation impacts associated with construction. Therefore, the proposed project would not cause substantial direct or indirect adverse effects to human beings and impacts would be less than significant with mitigation.

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Appendix A

2006 Agreement Between City of Orange and IRWD

SECOND AMENDED AGREEMENT
WATER SUPPLY AND SERVICE
SEWER AND RECLAIMED WATER
SUPPLY AND SERVICE
NATURAL TREATMENT SYSTEM SERVICE

THIS SECOND AMENDED AGREEMENT is made as of the 28th day of August, 2006, by and between the CITY OF ORANGE, a California municipal corporation ("ORANGE"), and the IRVINE RANCH WATER DISTRICT, a California water district formed and existing pursuant to Section 34000 et seq. of the California water code ("IRWD").

RECITALS

A. ORANGE and IRWD entered into an agreement dated November 5, 1984, entitled "Water Supply and Service Agreement," for the purpose of creating a joint water supply arrangement for that certain real property (the "Property") located in Orange County, California, consisting of approximately 9,300 acres, as depicted on Exhibit "A" attached hereto. The November 5, 1984 agreement was amended and superseded in its entirety by the November 21, 1994 agreement between the parties entitled "First Amended Water Supply and Service Agreement and Sewer and Reclaimed Water Supply and Service Agreement" (the "Existing Agreement"). The Existing Agreement provided for a modified joint water supply arrangement and also incorporated arrangements concerning sewer and nonpotable water service to the Property.

B. It continues to be the parties' intent to provide for separate service and supply arrangements to apply to the areas depicted on Exhibit "B" as "Santiago Hills I" (comprising the portion of the Property referred to in the Existing Agreement as the "Developed Area") and in Exhibit "C" as "Santiago Hills II," "East Orange Area I," and "East Orange Area II."

C. It is acknowledged that Santiago Hills I essentially comprises the portions of the Property which are within ORANGE's 736 foot elevation zone (such 736 Zone is equivalent to IRWD's Zone 5), for water service purposes, and the portions of the Property which are within the Consolidated Revenue Area of the Orange County Sanitation District ("OCSD") (successor to the County Sanitation Districts of Orange County), for sewer service purposes. Similarly, it is acknowledged that Santiago Hills II, East Orange Area I and East Orange Area II are within elevation zones higher than the ORANGE 736 Zone (IRWD's Zone 5) for water service purposes and are within (or subject to IRWD-SCWD consolidation, will be within) Revenue Area 14 of OCSD for sewer service purposes. The definitions of "Property," "Santiago Hills I," "Santiago Hills II," "East Orange Area I," "East Orange Area II," "Future Development

Area” and “SHII/East Orange Area” and Exhibits B and C notwithstanding, it is intended that the Joint Engineering and Management Committee described herein may make minor adjustments between the respective areas where appropriate to achieve efficiency in service arrangements.

D. Existing subarea service master planning for the Future Development Area has proceeded and reflects various changes to development and service plans that have occurred since the date of the Existing Agreement. In response to these changes, as well as the need to modify the Existing Agreement to address areas adjacent to the Future Development Area that have become included in IRWD through consolidation, the parties desire to implement the modified joint water, sewer and nonpotable water supply and service arrangements and natural treatment system service arrangements set forth herein, in order to maintain the most effective use of the parties’ sources of supply, facilities, financing and service and payment structure in the provision of services to the ultimate consumer.

E. The parties intend that this Second Amended Agreement (the “Agreement”) shall supersede the Existing Agreement in its entirety.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals and of the following mutual covenants and conditions, IRWD and ORANGE agree as follows:

1. Design Criteria. The parties acknowledge that design criteria for developing and implementing the provision of water, sewer, nonpotable water and natural treatment system service to the “SHII/East Orange Area” will be as established by IRWD through its subarea master planning. The “SHII/East Orange Area” is depicted on Exhibit “C”.

2. Potable Water, Sewer, Nonpotable Water and Natural Treatment System Service for SHII/East Orange Area.

a. Potable Water: IRWD will provide all retail and wholesale potable water service to the SHII/East Orange Area.

b. Nonpotable Water: IRWD will provide all nonpotable water service to the SHII/East Orange Area, to the extent the provision of such service to the SHII/East Orange Area is determined to be feasible by IRWD. Portions of the on-site water systems in the SHII/East Orange Area may be designed with dual-system capability so that it will be possible in the future to provide potable or nonpotable water for irrigation of parks, greenbelts, golf courses and such other uses as may be approved from time to time under applicable laws and regulations.

c. Sewage Collection, Treatment, and Disposal: The SHII/East Orange Area is tributary to and will receive service from IRWD by means of IRWD's Harvard Avenue Trunk Sewer (“HATS”). The collection systems within the SHII/East Orange Area shall be designed to deliver sewage to HATS. The SHII/East Orange Area is within Revenue Area 14 of

OCSD, such that the SHII/East Orange Area may be served by the facilities of OCSD in addition to those of IRWD. Agreements among IRWD and OCSD provide that IRWD shall be the local sewerage agency within Revenue Area 14.

d. Natural Treatment System (NTS): IRWD will own, operate and maintain six NTS water quality basin facilities on four sites in Santiago Hills II and East Orange Area I. In addition, IRWD will conduct periodic inspections, and may perform maintenance and repairs subject to reimbursement by the homeowners' association in the event the association fails to perform the same, on up to 20 water quality basin facilities to be owned by homeowners' associations in Santiago Hills II and East Orange Area.

e. General: Subject to Section 8(b), IRWD will provide the retail services described in this Section under its rules and regulations applicable to each respective class of customers.

f. Re-Opener: In the event IRWD fails to provide adequate water, sewer, and non-potable water service to the SHII/East Orange Area consistent with applicable regulations, laws and industry standards, ORANGE shall notify IRWD in writing of the inadequacy. IRWD agrees to correct the inadequacy within 180 days of such notice or explain why the service level is consistent with applicable regulations, laws and industry standards. If IRWD fails to make the correction or provide such explanation, ORANGE may initiate negotiations to amend this Agreement such that ORANGE would become the service provider for the SHII/East Orange Area.

3. Potable Water, Sewer, and Nonpotable Water Service to Santiago Hills I.

a. Potable Water, Sewer, and Nonpotable Water Service: ORANGE will provide all retail and wholesale potable water and sewer service and all retail nonpotable water service to Santiago Hills I.

b. Nonpotable Water Supply: IRWD will provide all wholesale nonpotable water service to Santiago Hills I, to the extent the provision of such service to Santiago Hills I is determined to be feasible by IRWD.

c. General: ORANGE will provide the retail services described in this Section under its rules and regulations applicable to each respective class of customers.

4. Services to Other Areas:

a. Irvine Regional Park: The property owned by the County of Orange and known as "Irvine Regional Park" shall not be deemed included in Santiago Hills I or the Property for purposes of this Agreement. Potable water service to Irvine Regional Park shall be provided by ORANGE, and sewer service and nonpotable water service to Irvine Regional Park shall be provided by IRWD.

b. Nonpotable Water Service to Other Areas of ORANGE: IRWD agrees to cooperate with ORANGE to develop a source of nonpotable water (reclaimed or untreated water) for retail distribution within areas of ORANGE not addressed in Sections 2, 3 or 4(a) hereof.

5. Mutual Consent for Service

Each of the parties hereby consents to service by the other within the consenting party's territory in accordance with this agreement.

6. Customer Service

Notwithstanding the above-described service structure or the provisions of Section 7, the parties agree that the service structure is not intended to delay or encumber response to customer matters involving the parties' systems. Accordingly, the party first contacted by a customer concerning, or otherwise learning of, a repair or other facilities situation needing attention will determine as soon as reasonably possible which party is the responsible party for the service requested and, if such contacted party is not the responsible party, will immediately inform the responsible party. If the party contacted deems the service request to be of such an emergency nature that the time taken in determining who is the responsible party and/or informing that party may be detrimental to the public's health, safety or welfare, then the contacted party may perform the necessary work or otherwise respond. If the responding party is not the party responsible under the service structure or Section 7, the responding party will seek reimbursement of the costs incurred in responding, and the responsible party shall promptly reimburse such amount within 30 days of receipt of an invoice from the responsible party. Any disagreement regarding the amount of or entitlement to such reimbursement shall be resolved by the parties pursuant to Section 10.

7. Financing, Construction and Ownership of Facilities.

a. SHII/East Orange Area: IRWD will finance and construct (or cause to be donated by the developer or property owner), and will own, operate and maintain, all facilities (other than regional water wholesaler or OCS D facilities) for provision of potable water, sewage collection, treatment and disposal, and nonpotable water service to the SHII/East Orange Area. IRWD's financing will be provided through its Improvement District Nos. 105 and 250, and Nos. 153 and 253, as applicable.

b. Santiago Hills I: ORANGE will own, operate and maintain all facilities (other than regional water wholesaler or OCS D facilities) for provision of potable water and sewage collection, treatment and disposal service to Santiago Hills I; IRWD has financed and constructed (or caused to be donated by the developer) a portion of such water facilities through its Improvement District No. 105. IRWD will finance and construct (or cause to be donated by the developer or property owner), and will own, operate and maintain the wholesale

and retail nonpotable water facilities to supply nonpotable water to Santiago Hills I. IRWD's financing of such nonpotable water facilities will be provided through its Improvement District No. 252. IRWD will use the existing tax receipts (ad valorem assessments levied for debt service on bonds of Improvement District No. 250) collected within Improvement District No. 252 to construct nonpotable water facilities or capacity therein serving only Santiago Hills I. IRWD will preserve and maintain its existing authority to collect ad valorem debt service taxes within Improvement District 252; provided no future taxes will be levied or collected by IRWD for Improvement District No. 252 without the explicit written consent of Orange. The subject non-potable facilities shall be constructed prior to issuance of the first Certificate of Occupancy issued by ORANGE in the Santiago Hills II development. If IRWD fails to construct the subject nonpotable facilities by the date of the first Certificate of Occupancy, then IRWD will refund the existing tax receipts.

c. Irrespective of facility ownership, all reasonable interconnections between ORANGE and IRWD facilities for operational efficiency and/or emergency purposes shall be allowed as determined by the Joint Engineering and Management Committee.

d. Design of all developer-donated facilities for potable water, sewage collection, non-potable water and natural treatment system service shall be in accordance with applicable design criteria of IRWD, and prior to construction thereof, ORANGE will require the developer to obtain IRWD's approval of the design. Following completion and prior to use of developer-donated facilities, ORANGE will require the developer to obtain IRWD's approval of the facilities.

8. Fees and Charges.

a. Connection Charges; Standby Charges; Taxes: IRWD will be entitled to collect all of its customary water and sewer connection charges from developers of the SHII/East Orange Area. Prior to issuance of certificates of occupancy, ORANGE will require the receipt from IRWD of an occupancy release letter in the form attached as Exhibit "D", as evidence of the payment of such connection charges to IRWD. In addition, IRWD will be entitled to collect taxes (ad valorem assessments for debt service on bonds) from property owners within Improvement District Nos. 105, 250, 252, 153 and 253, as applicable, and also will be entitled to collect potable and nonpotable water and sewer standby charges from property owners within the SHII/East Orange Area. No general tax rate (except for such assessments for debt service and IRWD's share of the general 1% property tax levy) is to be imposed by IRWD on the ultimate water or sewer service consumer.

b. User Rates: The rates collected by IRWD for water (including natural treatment system), sewer and non-potable water service in the SHII/East Orange Area shall be set in a manner consistent with the principles used in setting rates generally applicable in IRWD under its rules and regulations applicable to all classes of customers. (For this purpose, "rates generally applicable in IRWD" shall mean rates that IRWD sets generally, plus applicable pumping surcharges based on actual cost of pumping, but shall not mean the rates determined

under special rate agreements governing all or portions of former service areas of water agencies that have become part of IRWD through reorganization). The foregoing notwithstanding, the cumulative total of IRWD water charges in the SHII/East Orange area, including fixed and water commodity charges but not including any pumping surcharges, sewer, natural treatment system, or non-potable water charges, for an average residential customer using the IRWD median amount of water (“Cumulative IRWD Charges”) shall not exceed the cumulative total charges that would have been paid by an identical customer under the prevailing ORANGE water rate structure (“Cumulative Cap”). For purposes of making the foregoing comparison between the Cumulative IRWD Charges and the Cumulative Cap, the water charges for such average SHII/East Orange Area residential customer shall be aggregated for the most recently concluded IRWD billing period and all prior IRWD billing periods since the date of this Second Amended Agreement, using the applicable IRWD and ORANGE rate structures that were in effect during each such billing period. The ORANGE and IRWD water rates will be reviewed by the Joint Engineering and Management Committee as requested by ORANGE, but no more frequently than once per year. If the Committee finds that the Cumulative IRWD Charges have exceeded the Cumulative Cap, then prospective adjustments to the fixed and/or commodity water rates in the SHII/East Orange area will be applied by IRWD at the time of its next annual budget approval. Adjustments applied by IRWD to future fixed and/or commodity water charges shall be the sole method of bringing such charges back into conformance with the Cumulative Cap, and no retroactive adjustments or refunds for any period prior to adjustment will be required hereunder.

c. ORANGE Rates and Charges: ORANGE will not impose any connection charges or other rates and charges with respect to potable or nonpotable water service or sewer service to the SHII/East Orange Area.

d. OCSD Fees: IRWD shall be responsible for collecting and remitting any OCSD fees in the SHII/East Orange Area and shall defend and indemnify ORANGE against any claims by OCSD made after the date hereof that fees due OCSD from the SHII/East Orange Area have not been paid.

e. Collection of Rates and Charges: IRWD may, as permitted by law and upon taking proceedings as appropriate, collect sewer rates and charges within the SHII/East Orange Area by means of property tax bills. IRWD agrees to coordinate with ORANGE to include ORANGE’s fees for municipal services such as paramedic billing, trash collection and tree trimming, in IRWD’s retail water service bills for the SHII/East Orange Area.

9. Annexations. a. ORANGE agrees not to oppose, or support any proposal inconsistent with, the annexation to Orange County Water District (“OCWD”) of that portion of the SHII/East Orange area not currently within OCWD, for the purpose of supplying groundwater to the residents thereof.

b. If the Local Agency Formation Commission proposes a reorganization of the East Orange County Water District (“EOCWD”) and ORANGE seeks to retain the portion

of the EOCWD service area that is currently within ORANGE's city limits, IRWD agrees not to oppose ORANGE's request or support any request inconsistent with ORANGE's request.

10. Joint Engineering and Management Committee.

The parties shall continue in existence the Joint Engineering Committee created under the Existing Agreement, hereby renamed the Joint Engineering and Management Committee (the "Joint Committee"), and shall each continue to appoint one representative and one alternate representative to the Joint Committee. The primary purpose of the Joint Committee shall be to facilitate communication between the parties and aid in the administration of this Agreement. The parties shall give full consideration to all recommendations of the Joint Committee. The Joint Committee shall meet periodically, but at least once a year, to perform such tasks as may be assigned to it by the parties from time to time, including, but not limited to, the following:

(a) Make minor adjustments between Santiago Hills I and the SHII/East Orange Area as may be necessary or appropriate from time to time to achieve the most efficient service arrangements based on facilities, system looping, continuity of neighborhoods, gravity flow and similar factors. Any such adjustments shall be depicted in addenda to Exhibits B and C or new exhibits which shall, upon approval by the parties, supersede such exhibits;

(b) Resolve disagreements pursuant to Section 6 this Agreement;

(c) Perform such other tasks as may be assigned by the parties hereto.

11. Groundwater Production. ORANGE and IRWD will review and evaluate cooperative groundwater production opportunities. Any municipal groundwater production wells operated by IRWD within the Sphere of Influence of ORANGE shall only serve water customers within the Sphere of Influence of ORANGE (to be determined on the basis of water accounting, showing no net export) unless otherwise authorized by ORANGE's prior written consent.

12. Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original.

13. Modifications. This Agreement cannot be changed, amended, modified or supplemented except in writing signed by the parties hereto.

14. Entire Agreement. This Agreement and its exhibits constitute the entire agreement between the parties hereto pertaining to the subject matter hereof, and the final, complete and exclusive expression of the terms and conditions thereof. All prior agreements, representations, negotiations and understandings of the parties hereto, oral or written, express or implied, are hereby superseded and merged herein.

15. Notices. All notices and other communications given hereunder shall be

in writing and shall be delivered or mailed by registered or certified mail, return receipt requested, and postage prepaid, addressed as follows:

If to IRWD: IRVINE RANCH WATER DISTRICT
 ATTENTION: GENERAL MANAGER
 P.O. Box 57000
 15600 Sand Canyon Avenue
 Irvine, California 92619-7000

If to ORANGE: CITY OF ORANGE
 ATTENTION: WATER MANAGER
 189 South Water
 Orange, California 92666

16. Term of Agreement. This Agreement shall continue in effect until terminated by mutual agreement of the parties.

17. Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns.

18. Attorneys' Fees. In the event any declaratory or other legal or equitable action is instituted between ORANGE and IRWD in connection with this Agreement, then the prevailing party shall be entitled to recover from the losing party all of its costs and expenses, including court costs and reasonable attorneys' fees.

19. Exhibits. The following exhibits are incorporated into this Agreement by this reference:

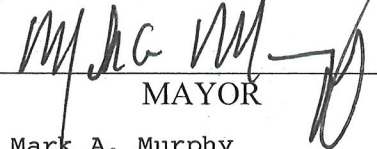
- Exhibit "A" - Property [Recital A]
- Exhibit "B" - Santiago Hills I [Recital B]
- Exhibit "C" - SHII/East Orange Area [Recital B]
- Exhibit "D" - Form of Occupancy Release [Section 8a]

The parties hereto cause this Agreement to be executed on the day and year first above written.


City of Orange

City of orange

BY


MAYOR
Mark A. Murphy

ATTEST:


CLERK
Mary E. Murphy

Irvine Ranch Water District

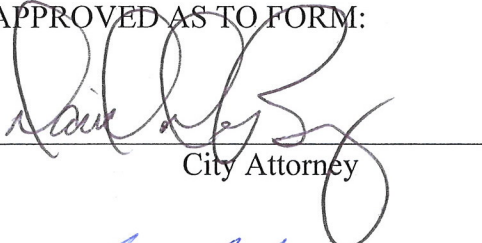
BY


PRESIDENT

ATTEST:


SECRETARY

APPROVED AS TO FORM:


City Attorney


Attorney for Irvine Ranch Water

District

jca/ 031406

EXHIBITS

- A: Property
- B: Santiago Hills I
- C: SHII/East OrangeArea
- D: Form of Occupancy Release

EXHIBIT A

DEPICTION OF THE PROPERTY

EXHIBIT "A"

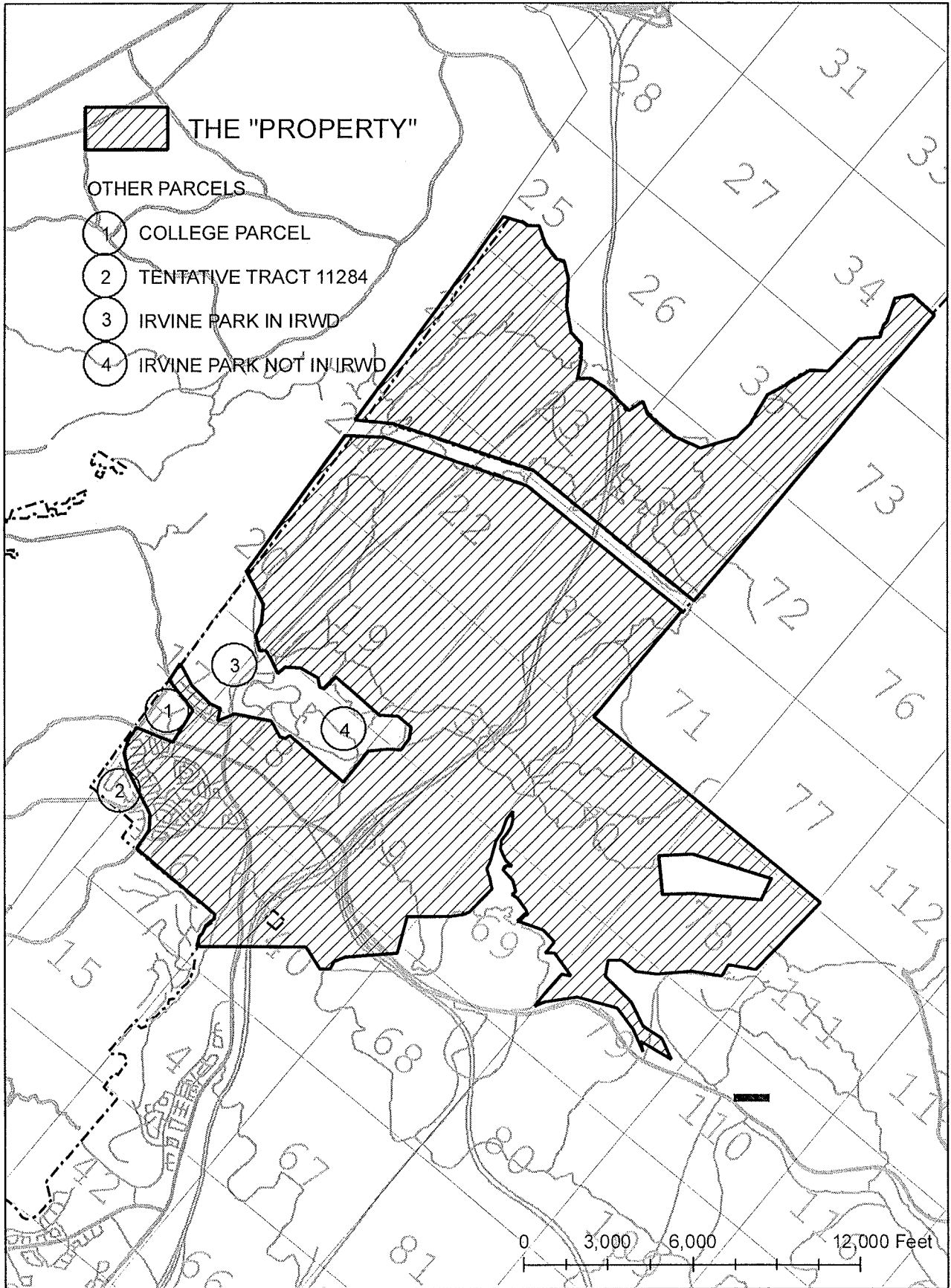


EXHIBIT B

DEPICTION OF THE SANTIAGO HILLS I

EXHIBIT "B"

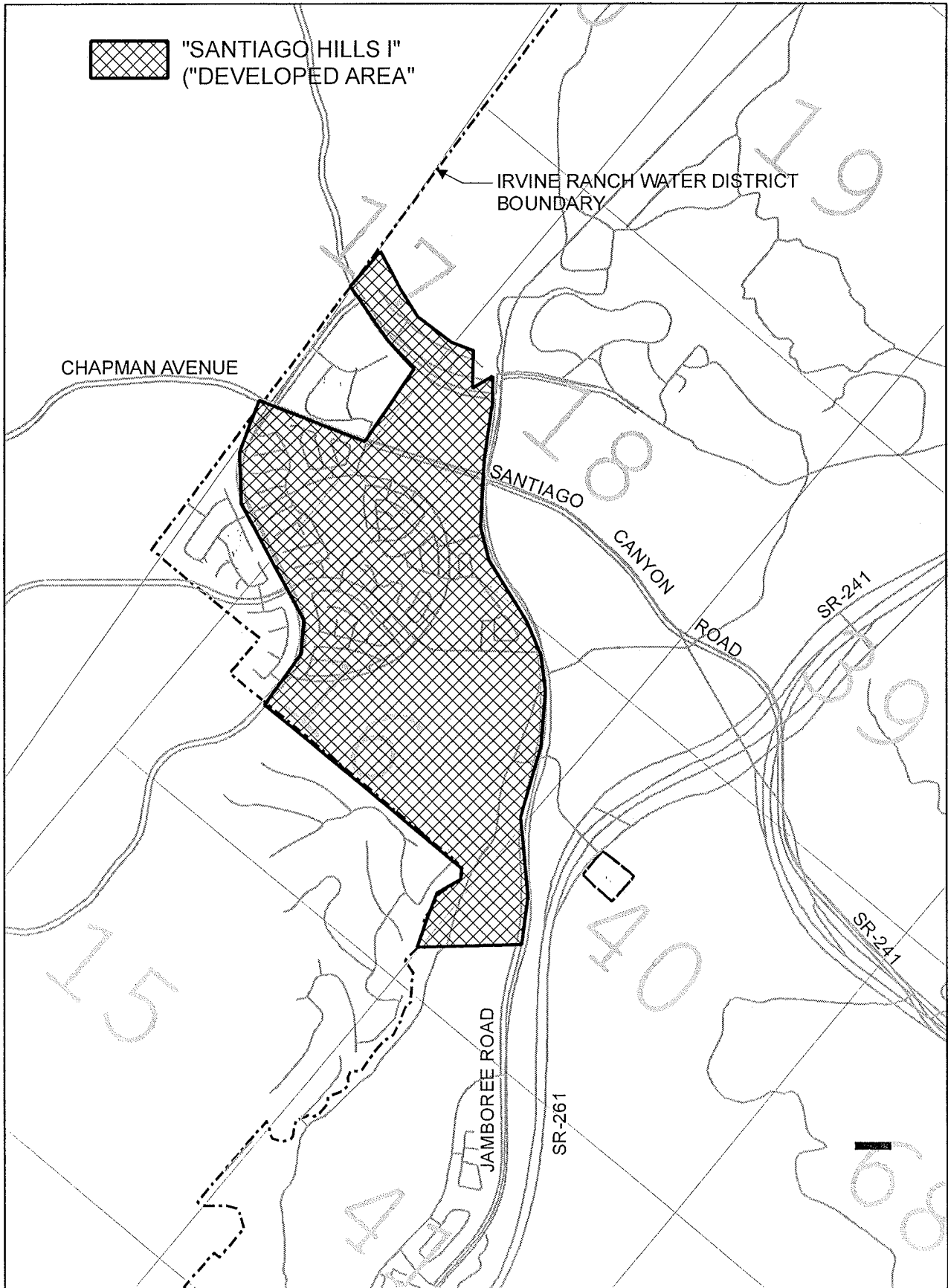


EXHIBIT C

DEPICTION OF THE SH II/EAST ORANGE

EXHIBIT "C"

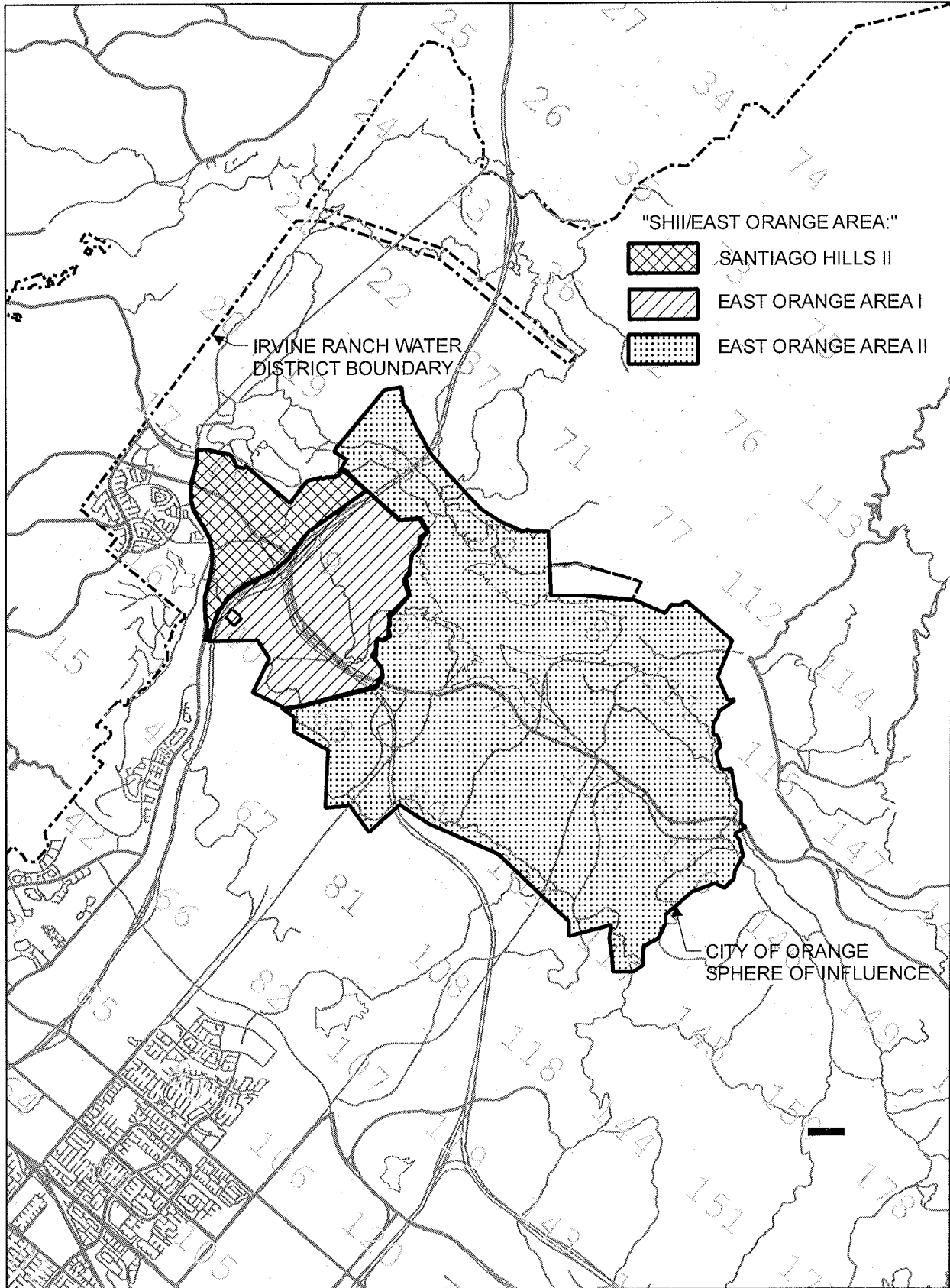


EXHIBIT D

FORM OF OCCUPANCY RELEASE



IRVINE RANCH WATER DISTRICT

15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

Date

MST00001
SD1.
Ref. Code:

Name
Building Official
City of Orange
300 East Chapman Avenue
Orange, CA 92866

Subject: Release for Residential Use

Dear Mr. Nguyen:

Irvine Ranch Water District hereby releases Lot Nos. _____ of Tract No. _____ for the following:

RELEASE FOR OCCUPANCY - Sewage can be accepted in sewer system. Water meter has been installed by developer.

Yours truly,

Mike Jack
Construction Inspection Manager

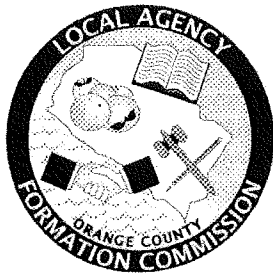
MJ/

cc: Developer -
IRWD Inspector -
IRWD Developmental Services
IRWD Customer Service (2)
IRWD Greg Springman FAX# 949-476-2854
Chron

Appendix B
LAFCO Annexation Agreement

Item 7b

Orange Park Acres
Annexation to the
Irvine Ranch Water
District
(DA 07-26)



December 19, 2007

TO: Local Agency Formation Commission

FROM: Executive Officer

SUBJECT: Proposed "Irvine Ranch Water District Annexation of Orange Park Acres Mutual Water Company (DA 07-26)"

CHAIR
BILL CAMPBELL
Supervisor
Third District

VICE CHAIR
JOHN WITHERS
Director
Irvine Ranch Water District

ROBERT BOUER
Councilmember
City of Laguna Woods

PETER HERZOG
Councilmember
City of Lake Forest

JOHN MOORLACH
Supervisor
2nd District

ARLENE SCHAFER
Director
Costa Mesa
Sanitary District

SUSAN WILSON
Representative of
General Public

ALTERNATE
PAT BATES
Supervisor
5th District

ALTERNATE
PATSY MARSHALL
Councilmember
City of Buena Park

ALTERNATE
RHONDA MCCUNE
Representative of
General Public

ALTERNATE
CHARLEY WILSON
Director
Santa Margarita
Water District

JOYCE CROSTHWAITE
Executive Officer

PROPOSAL:

The Irvine Ranch Water District (IRWD) Board has adopted a resolution to amend the District's sphere of influence and concurrently annex the 646-acre service area of the Orange Park Acres Mutual Water Company (OPAMWC). The purpose of the annexation is to provide water and ultimately local sewer service to the residents of Orange Park Acres.

The unincorporated Orange Park Acres community is generally located north of Chapman Avenue, south and west of Jamboree Road, and east of Cannon Street. (Exhibit A, attached to this report, is a map of the proposed annexation area.) The area is characterized by equestrian-oriented, single family homes.

In August of 2006 the OPAMWC Board circulated a Request for Information to several agencies, including IRWD, the City of Orange and Golden State Water Company, regarding interest in merging with OPAMWC. The OPAMWC Board wanted to determine if OPAMWC's customers might receive more efficient and cost-effective service through consolidation with a larger agency. Based on the responses received, the OPAMWC Board decided to enter into negotiations with IRWD.

While a relatively simple annexation, the proposal is different from other annexations because it involves a mutual water company. A general overview of mutual water companies is included in subsequent paragraphs followed by a discussion of water and sewer issues in Orange Park Acres.

General Overview of Mutual Water Companies

Mutual water companies have been critical in the development of California. They were typically formed in isolated areas where access to larger public water systems, such as special districts and cities, was not available. They are still formed today, usually by developers in connection with subdivisions. For example in Riverside County several mutual water companies were formed in the past few years to provide water to golf courses. As the surrounding area develops, those buying into the development also pay for their share in the mutual water company. Orange County has, to the best of the LAFCO staff's knowledge, four mutual water companies.

Mutual water companies are formed under either the General Corporation Law or Non-Profit Corporation Law and are private corporations. Shares are issued to customers of the water company who are usually land owners within the boundaries of the mutual water company. The landowners give the mutual water company their water rights (if any) and provide revenue, through rates, to secure and distribute water to their land.¹

Mutual water companies, as private corporations, are not regulated by the Public Utilities Commission (PUC), LAFCO or other public agencies. The PUC can assert jurisdiction, however, if the water company serves water to other than its shareholders. The Department of Corporations and Department of Real Estate gets involved if additional shares of stock in the mutual water company are issued.

Mutual water companies are at a financial disadvantage compared to public agencies due to an inability to receive or levy property taxes and to a lack of access for some funding. Since the revenue comes from the shareholders, it's not unusual for mutual water companies to have facilities in need of repair since the cost of replacing or rehabilitating the system may be cost-prohibitive to the mutual's shareholders.

Therefore, the challenge for public agencies acquiring such systems is they are usually in need of substantial capital replacement funding. Attempting to isolate such costs to the former service area of the mutual raises the same cost-prohibitive issues as faced by the mutual water company although a public agency has more access to public grant funds or other public funding.

Another challenge is the process of acquiring a mutual water company. Since it is a private corporation, a public entity must complete an analysis of the mutual water company system to determine a fair and reasonable value per share. Then a formal offer is made to the existing shareholders; a simple majority of existing shareholders is needed for approval..

Annexation and Water Service

The OPAMWC was incorporated on March 13, 1929. OPAMWC provides water service to approximately 530 customers located within 646 acres, delivering an average of 800 acre feet of potable water annually. Average monthly customer demand is approximately 5,700 cubic feet. The water system consists of approximately 15 miles of pipelines, a single well, a one-million gallon storage reservoir, and five small pump stations. Much of the water infrastructure has reached the end of its useful life and needs to be replaced now or in the near future. Water rates are among the highest in the county. The combination of high user rates and the need for significant capital upgrades were the primary impetus for the OPAMAC Board of Directors to consider consolidation with a larger agency.

The Company is shareholder-owned with approximately 722 shares of stock outstanding that were issued in 1929. In addition, there are approximately 170 shares of stock that were issued in

¹ Conversation with John Schatz, General Manager of Santa Margarita Water District

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RE: IRWD-OPA Annexation

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1962 to fund a planned expansion that never materialized. An affirmative vote by a simple majority of the shareholders will be required to successfully merge the OPAMWC into IRWD. ✓

A pre-annexation agreement (see Exhibit B, attached) was executed by OPAMWC and IRWD which incorporates terms and conditions for a transfer of OPAMWC's responsibilities and liabilities to IRWD. The agreement recognizes five key components which are summarized below:

- (1) Recognition of Equity: IRWD has established an "acquisition balance" to ensure equity to current customers of both IRWD and OPAMWC. The acquisition balance consists of a buy-in by current OPAMWC customers of IRWD's water infrastructure and consists of costs to upgrade and/or replace existing OPAMWC water infrastructure. Funding to retire the acquisition balance will come from the difference in revenues between the reduced water rates OPAMWC customers will immediately receive and the standard IRWD water rates. Upon retirement of the acquisition balance, user rates in the OPAMWC service area will have the same rates as the rest of IRWD's customers. IRWD estimates approximately eight (8) years to retire the acquisition balance for OPAMWC.
- (2) Rates: Upon the effective date of annexation, water rates in the OPAMWC service area will be reduced by 20%. Overall, a typical residential customer in the OPAMWC service area will see a reduction in monthly charges from approximately \$160.00 to \$128.00 each month or savings of \$384.00 per year.
- (3) Governance and Local Representation: The executed agreement provides for the formation of a Management Advisory Committee comprised of up to three of the current OPAMWC Board members. Under the terms of the agreement, the Management Advisory Committee will remain as a subcommittee of the IRWD Board of Directors through the retirement of the acquisition balance and completion of specific infrastructure upgrades.

One feature of the agreement (Section 10.9) involves LAFCO. If a dispute arises in the future with customers in the Orange Park Acres area, the agreement lists a three level dispute resolution procedure. The dispute is reviewed by the General Manager and if resolution is not achieved, then the dispute is heard by the IRWD Board. If no resolution is reached at the Board level, the item is sent to LAFCO for a binding decision. ✓

- (4) System Integration and Levels of Service: Under the terms of the agreement, OPAMWC customers will have access to additional water supply reliability, substantial emergency response capabilities, preventive maintenance programs, enhanced customer service capabilities, and state-of-the-art computing and information technologies. In addition, the OPA service area will benefit from a number of significant water improvements to its water infrastructure. Major improvements include:

- A new 6,600 linear foot 16" transmission main built in Chapman Avenue
- Removal and abandonment of the OPAMWC 1 million gallon storage tank
- Rehabilitation of the existing well

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RE: IRWD-OPA Annexation

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- Replacement of the 16" well transmission line in Bond Avenue with a new line rated for higher pressure
- Replacement of approximately 5,300 feet of 1927 steel pipe
- Installation of two Pressure Reducing Stations to equalize pressures throughout the system
- Possible abandonment of four the five existing pump stations due to the increased pressure from IRWD's Zone 5 reservoir

(5) Community Issues and Involvement: Terms in the agreement recognize the ongoing role of the Orange Park Acres Homeowner's Association as the central representative for the interest of OPAMWC customers.

Annexation and Sewer Service

The proposed annexation to IRWD would also address long-standing issues of sewer service provision. A 2003 septic system study completed for the County of Orange in 2003 found 84% of all homes (or approximately 332 residences) in Orange Park Acres are on septic. The ongoing use of septic tanks presents both public health and water quality concerns, as these systems are prone to failure for a variety of reasons (i.e., lack of maintenance, age, root intrusion from landscaping, etc.). Continued use of septic systems makes the area highly susceptible to groundwater contamination and urban runoff.

Previously when a property owner applied for a building permit in Orange Park Acres, they were required to connect to a public sewer system. This involved annexing to the Orange County Sanitation District (OCSD). The property owners were required to pay OCSD and LAFCO annexation fees as well as the cost for construction of sewer mains. In one case, the cost of construction of the main sewer line was approximately \$300,000 for 1500' of line. Property owners financing the construction could be reimbursed as other residents hooked into the main line,

However property owners had more hurdles to overcome than just financing. OCSD provides regional collection and treatment and, while it provides some local sewer collection, it has consistently stated it will not provide additional local sewer service. The most logical provider of local sewer service in Orange Park Acres was the City of Orange.

Residents generally opposed annexation to the City of Orange. However since the mid 1990s the City, in the interests of good government and efficient service provision, agreed to provide local sewer service outside its corporate boundaries through out-of-area service agreements (OASA) with individual property owners. The OASAs, in addition to specifying reimbursement to the property owner and dedication of the lines, also requires that the property owner not oppose annexation to the City. But neither the City nor the residents initiated any subsequent annexations.

In some instances, the City of Orange accepted the dedication of the completed lines and didn't in other areas. The City could maintain lines within their boundaries but did not have an agreement with the County of Orange to maintain lines in the County. Thus the City could not

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issue permits to connect to the sewer but presumably could not respond to problems/repairs. Technically some of the sewer lines were private, some were City lines, some were OCSD and the status of others unknown. Within the last year the City of Orange stated it would no longer provide sewer service outside its boundaries due to these legal and financial issues. ✓

By IRWD providing local sewer service (through an improvement area) these sewer issues can be addressed; IRWD would then become the local sewer service provider and a clear and coherent process for public sewer service could be implemented. It is expected that IRWD would establish a two tiered approach to the sewer issues in Orange Park Acres. In general, IRWD would most likely separate sewer issues into the short-term acute issues and the long-term master plan/financing issues. IRWD would try to resolve the short-term, acute issues on a case-by-case basis after the effective date of the annexation. The long-term sewer master plan would require a thorough engineering study, meetings with the community and acceptance by the community of financing obligations, if they so choose. This could take some time but would ensure the community's participation in and acceptance of any solutions. ✓

In addition upon annexation IRWD could propose purchasing all the sewers owned by the City of Orange in the unincorporated area at a replacement value depreciated for use and could also look at acquiring other local sewers that were constructed under some reimbursement/out-of-area service agreement with the City. IRWD could then take full responsibility for all operation and maintenance of the sewers acquired by IRWD and could bill customers monthly for their use per the agency's standard practice. ✓

Portions of the Orange Park Acres community are not in the boundaries of the OCSD. But OCSD has submitted an application to LAFCO for annexation of the remainder of the area and it is expected that the Commission will consider that annexation at their January 9th, 2008 meeting. After annexation to OCSD, residents will work with IRWD to ultimately receive local sewer service. ✓

City of Orange

Groundwater is increasingly important in Orange County and concerns were expressed by the City of Orange regarding the pumping and use of groundwater in the annexation area. In order to coordinate groundwater production, monitoring and the mitigation of impacts from new wells, IRWD and the City of Orange have agreed to establish a Joint Groundwater Engineering and Management Committee. Each agency shall appoint one representative and one alternate representative to the Joint Committee. The primary purpose of the Joint Committee shall be to facilitate communication between IRWD and the City of Orange and to cooperatively monitor and evaluate groundwater production and distribution activities in Orange Park Acres and in the East Orange area. The Committee shall coordinate its activities and recommendations with the Orange County Water District (OCWD) and shall request OCWD's participation. The Joint Committee shall meet at least once a year and its charges shall include but not be limited to, the following: ✓

- Monitoring of groundwater levels and production
- Monitoring of water quality

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- Reviewing any proposed IRWD and City of Orange well sites .
- Development of mitigation measures for IRWD and City of Orange wells
- Allocation of cost of groundwater mitigation measures.
- Development of programs to augment groundwater production

CONCLUSION

IRWD will extend a buyout offer to the shareholders of the OPAMWA. In the event that IRWD does not obtain a simple majority of the shareholder votes, the OPAMWA would continue to provide water service and the proposed annexation would not be recorded. LAFCO staff is recommending that the effective date be the date of recordation; if the acquisition of the OPAMWC by IRWD is not successful, the annexation would not be recorded.

Creation of an improvement area for IRWD to provide local sewer service is also requested and has also been included as a term and condition. With the potential annexation of the remaining portions of Orange Park Acres to OCSA expected at the January 2008 LAFCO meeting, residents will also be able to receive local sewer service from IRWD if requested. The two annexations will save residents annexation fees, provide a clear process for receiving sewer service and will protect water quality in the area.

This proposal is supported by both the IRWD and OPAMWC Boards of Directors. Both parties concur that the proposal, if implemented, will produce efficiencies in service delivery and will benefit the residents and ratepayers of each district. The primary objective of the proposed annexation is to maximize economic and operational efficiencies while maintaining equity to the ratepayers and property owners in each district. Annexation of OPA by IRWD will result in a significant reduction to current OPA water rates and charges without negative impacts to current IRWD customers. It will also provide for more diverse and reliable water and sewer service provision to OPA, greater operational flexibility and reliability, and enhanced emergency preparedness. Participation by members of OPA's current Board in a post-annexation Management Advisory Committee will provide local participation in decision making.

ENVIRONMENTAL REVIEW

As lead agency, the Irvine Ranch Water District has determined that the proposed annexation is categorically exempt from the California Environmental Quality Act (Class 1, 2, 3 and 20).

PROPERTY TAX EXCHANGE

No property tax exchange will occur as a result of this proposal pursuant to the Master Property Tax Agreement adopted by the Board of Supervisors for enterprise special district reorganization proposals.

RECOMMENDATIONS

Staff recommends that the Commission approve the proposed change to the Irvine Ranch Water District sphere of influence to include the Orange Park Acres Municipal Water Company territory and concurrently annex the territory into Irvine Ranch Water District. The proposed

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action is contingent on a successful buyout of existing OPAMWC shareholders by IRWD. Specifically, staff recommends that the Commission take the following actions:

1. Adopt the Statement of Determinations for the proposed IRWD sphere of influence change pursuant to Government Code Section 56425 (Exhibit D).
2. Adopt the resolution approving the sphere of influence change for IRWD to include the OPAMWC service area and concurrently annexing the same territory into IRWD subject to the terms and condition contained therein.

Respectfully submitted,


JOYCE CROSTHWAITE

- Exhibits:
- A. Location Map
 - B. Pre-annexation agreement – IRWD and OPAMWC
 - C. MOU – IRWD and City of Orange
 - D. Statement of Determinations – Sphere of Influence Change
 - E. LAFCO Resolution

Exhibit B

RESOLUTION NO. 2007-35

RESOLUTION OF THE BOARD OF DIRECTORS OF THE
IRVINE RANCH WATER DISTRICT MAKING APPLICATION
TO THE LOCAL AGENCY FORMATION COMMISSION FOR
THE ANNEXATION OF TERRITORY (ANNEXATION NO. 28
TO IRVINE RANCH WATER DISTRICT)

WHEREAS, the Orange Park Acres Mutual Water Company ("OPAMWC") provides water service to the service area generally depicted on the map attached hereto and incorporated by reference as Exhibit "A;" and

WHEREAS, the governing boards of OPAMWC and the Irvine Ranch Water District ("IRWD"), based on an evaluation of efficiencies in service delivery, have determined that it would be in the best interest of their respective customers and property owners for IRWD to acquire and absorb the water system of OPAMWC; and

WHEREAS, IRWD and OPAMWC have developed and entered into an Agreement For Acquisition and Annexation ("Agreement"), a copy of which is attached hereto as Exhibit "B", setting forth the terms and conditions of the merger of OPAMWC into a California limited liability company controlled by IRWD and the completion of proceedings for the annexation of the OPAMWC service area into IRWD; and

WHEREAS, the Agreement will provide for measures to assure continuity and transitional representation of the former OPAMWC service area, to maximize economic and operational efficiencies to the extent possible while maintaining equity to the ratepayers and property owners of the respective service territories, and for the interim operation of the former service territories of OPAMWC and IRWD as separate economic units to facilitate the satisfaction of equity considerations with the ultimate objective of a uniform rate structure; and

WHEREAS, OPAMWC and IRWD desire to obtain approval of such annexation by the Local Agency Formation Commission of Orange County ("LAFCO"), subject to the terms and conditions set forth in the Agreement; and

WHEREAS, subject to the successful completion of the merger and assumption of OPAMWC's water service by IRWD, it is contemplated that IRWD will make retail sewer service available if and to the extent desired by the inhabitants within all or portions of the annexed territory following the development of necessary institutional arrangements; and

WHEREAS, application for annexation can be made by adoption of a resolution of application to LAFCO by the legislative body of IRWD, pursuant to California Government Code section 56654 and other requirements set forth in the Cortese-Knox-Hertzberg Local Government Reorganization Act; and

WHEREAS, the territory of OPAMWC is outside the existing sphere of influence of IRWD; and

WHEREAS, acting as lead agency under the California Environmental Quality Act (CEQA), IRWD has determined that, with regard to water service, the annexation is categorically exempt from CEQA (Categorical Exemption Classes 1, 2, 3 and 20) as a project consisting of repairs and minor alterations of existing utility facilities involving negligible or no expansion of use; addition of safety and health protection devices in conjunction with existing facilities; demolition and removal of individual small structures; replacement or reconstruction of existing utility systems and facilities involving negligible or no expansion of capacity, where the new facilities will be located on the same sites as the facilities replaced; construction and location of limited numbers of new, small facilities or structures; and changes in organization of local agencies not changing the area in which existing powers are exercised, under the California Code of Regulations, Title 14, Article 19, Sections 15301, 15302, 15303 and 15320; and

WHEREAS, acting as lead agency under CEQA, IRWD has determined that, (1) if and to the extent sewer service is provided by IRWD within the Orange Park Acres area following the annexation of such area to IRWD, such action IRWD triggers an associated action, the annexation to OCSD of the portions of the subject sewer service area not currently within OCSD, to allow for wastewater to be treated using IRWD's capacity in OCSD's regional treatment facilities; (2) OCSD'S 1999 Strategic Plan and Collection System Improvement Plan describe improvements to the regional wastewater collection and treatment facilities to ensure capacity for wastewater flows in Northern and Central Orange County; (3) the 1999 Strategic Plan PEIR and the PEIR for the Collection System Improvement Plan analyze environmental impacts associated with construction and operation of the OCSD wastewater collection and treatment facilities; (4) an Addendum to the PEIR has been prepared to address the sewer service actions as described above; (5) regional capacity in OCSD's facilities sufficient to serve the subject area is contemplated in OCSD's strategic planning, and IRWD's use of its Revenue Area 14 capacity in OCSD's regional treatment facilities for flows from the subject annexation area can be more than offset by equivalent flows that IRWD can divert from area outside Revenue Area 14 and treat at IRWD's Michelson Water Reclamation Plant (MWRP) as a result of the expansion of MWRP presently underway the actions as described herein would not result in new significant environmental effects or a substantial increase in the severity of significant effects from those determined by the 1999 Strategic Plan PEIR certified by the OCSD Board of Directors on October 27, 1999 and by the PEIR for the Collection System Improvement Plan certified by the OCSD Board of Directors on August 22, 2007, there are no mitigation measures or alternatives that were previously found infeasible or that are considerably different from those analyzed in the EIR and that would substantially reduce one or more significant effects, and no additional mitigation measures or alternatives are required; and (6) appropriate CEQA proceedings will be conducted in the future to address any local sewer collection facilities as such time as sufficient information on such facilities is available;

NOW THEREFORE, the Board of Directors of IRWD DOES HEREBY RESOLVE,

DETERMINE and ORDER as follows:

Section 1. This resolution of application is submitted pursuant to Title 5, Division 3, Part 3 (commencing with section 56650) of the California Government Code.

Section 2. The Board of Directors of IRWD does hereby make the following described proposal for a change of organization and request that proceedings to approve such proposal be taken by LAFCO.

Section 3. The proposal consists of an annexation, hereby designated "Annexation No. 28 to the Irvine Ranch Water District" for purposes of the records of LAFCO.

Section 4. A map of the affected territory is attached as Exhibit "A" to this Resolution, and shall be subject to such changes therein as may be made to conform to the requirements of the County Surveyor. The affected territory generally consists of the service territory of OPAMWC. The affected territory is "inhabited territory" as defined in Government Code section 56046.

Section 5. This change of organization is proposed by the IRWD Board of Directors subject to each and all of the terms and conditions set forth in the Agreement, attached as Exhibit "B" hereto, and the separate, supplemental terms and conditions, attached as Exhibit "C" hereto, which shall be deemed incorporated herein by reference.

Section 6. This change of organization is proposed for the purpose of more efficiently providing water, sewer and reclaimed water services within the annexed area. Services will be provided pursuant to the Plan of Services, which, upon completion thereof in final form, shall be deemed incorporated herein by reference and shall be submitted to LAFCO to accompany this application.

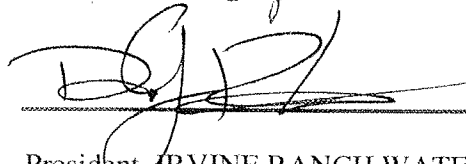
Section 7. The following persons are hereby designated to receive notices in these proceedings for IRWD:

Douglas Reinhart, President
Paul Jones, General Manager.

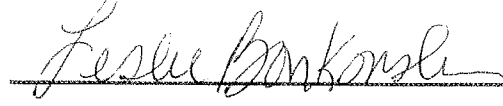
Section 8. The proposal is inconsistent with the sphere of influence of IRWD. It is hereby requested that the IRWD sphere of influence be amended to include the annexed territory, in conjunction with the proposed change of organization.

Section 9. The Secretary is hereby authorized and directed to file a certified copy of this Resolution with the Executive Officer of LAFCO. The Secretary and each other officer, employee and agent of IRWD are hereby authorized and directed to supply any other supporting information as may be requested from IRWD's staff by LAFCO and to pay required fees and take such other actions as may be necessary to carry out the purposes of this Resolution.

ADOPTED, SIGNED AND APPROVED this 24 day of September 2007.



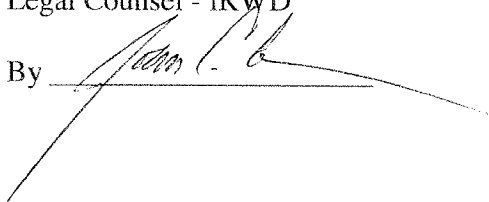
President, IRVINE RANCH WATER DISTRICT and of the Board of Directors thereof.



Secretary, IRVINE RANCH WATER DISTRICT and of the Board of Directors thereof

APPROVED AS TO FORM:

BOWIE, ARNESON,
WILES & GIANNONE
Legal Counsel - IRWD

By 

STATE OF CALIFORNIA)
) SS.
COUNTY OF ORANGE)

I, Leslie Bonkowski, Secretary of the Board of Directors of Irvine Ranch Water District, do hereby certify that the foregoing Resolution was duly adopted by the Board of Directors of said District at a regular meeting of said Board held on the 24th day of September, 2007, and that it was so adopted by the following vote:

AYES: DIRECTORS Swan, Matheis, Reinhart, and Miller

NOES: DIRECTORS None

ABSTAIN: DIRECTORS None

ABSENT: DIRECTORS Withers*

(SEAL)



Secretary of IRVINE RANCH WATER
DISTRICT and of the Board of
Directors thereof

STATE OF CALIFORNIA)
) SS.
COUNTY OF ORANGE)

I, Leslie Bonkowski, Secretary of the Board of Directors of Irvine Ranch Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 2007-35 of said Board, and that the same has not been amended or repealed.

Dated: 9/26/07



Secretary of IRVINE RANCH WATER
DISTRICT and of the Board of
Directors thereof

(SEAL)

EXHIBIT "A"

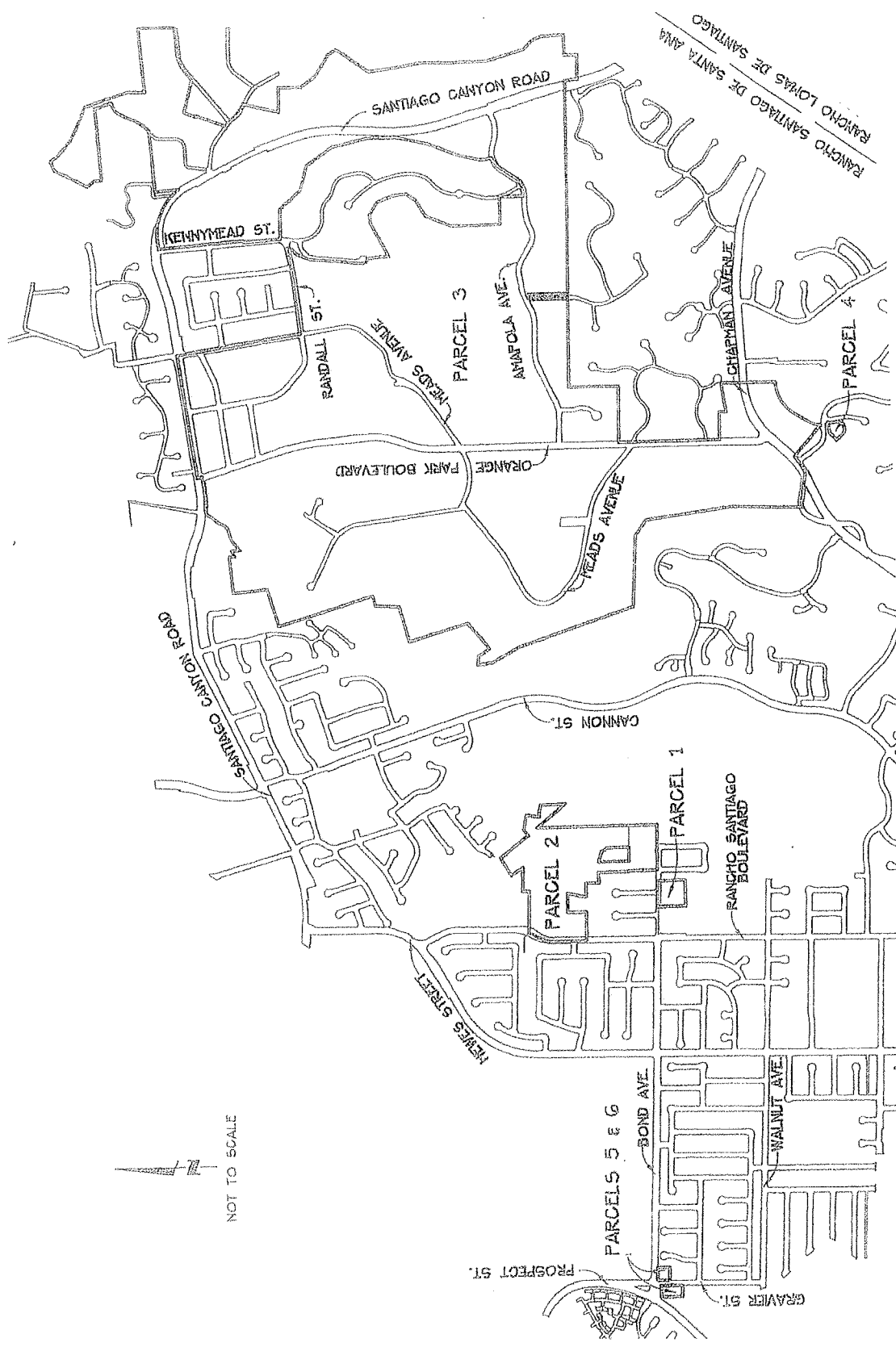


EXHIBIT "B"

09/18/07 Revision

AGREEMENT FOR ACQUISITION AND ANNEXATION

This AGREEMENT FOR ACQUISITION AND ANNEXATION ("Agreement") is entered into this 24th day of September, 2007, by and between ORANGE PARK ACRES MUTUAL WATER COMPANY, a California corporation ("OPAMWC"), and IRVINE RANCH WATER DISTRICT, a California water district organized and existing pursuant to Section 34000 *et seq.* of the California Water Code ("IRWD").

RECITALS:

A. OPAMWC provides water service to the service area generally depicted on Exhibit "A," which exhibit is attached hereto and incorporated herein by this reference.

B. The governing boards of OPAMWC and IRWD, based on an evaluation of efficiencies in service delivery, have determined that it would be in the best interest of their respective customers and property owners for IRWD to acquire and absorb the water system of OPAMWC. More particularly, the parties have determined to pursue the merger of OPAMWC into a California limited liability company to be formed by IRWD, proposed to be called the Irvine Ranch Water District Water Service Company LLC II ("LLC II"), together with the annexation of the OPAMWC service area into IRWD, all in accordance with the terms and provisions set forth in this Agreement.

C. It is the objective of the parties that the merger and annexation be accomplished in a manner that will maximize economic and operational efficiencies to the extent possible, while maintaining equity to the ratepayers and property owners of each party.

D. It is the intent of the parties that following the merger and annexation, customers within the former service territory of OPAMWC will ultimately be under the same water rate structure as other IRWD customers. For a transitional period, the former service territory of OPAMWC will be operated as a separate economic unit within IRWD's service area to facilitate the satisfaction of equity considerations as described in this Agreement, with the objective that the transitional period be as short as possible.

E. The parties desire to provide for measures to assure continuity and transitional representation of the former OPAMWC service area.

F. OPAMWC and IRWD desire to set forth proposed terms of the annexation, including but not limited to the terms of completing the merger, to be submitted by IRWD to the Local Agency Formation Commission of Orange County ("LAFCO").

NOW, THEREFORE, in consideration of the premises and the mutual agreements herein contained, the parties hereto agree as follows:

I. GENERAL

Section 1.1. Concurrent Merger and Annexation. It is the intent of the parties that this Agreement will provide for the company, operations and system of OPAMWC to become a part of IRWD through two parallel processes, the completion of each of which shall be conditioned upon the successful completion of the other as more particularly set forth herein: (A) the merger of OPAMWC into LLC II, and (B) an annexation to include OPAMWC's service territory within the jurisdictional boundary of IRWD.

Section 1.2. Effective Date. It is the further intent of the parties that the filing of the certificate of merger and the filing of LAFCO's certificate of completion of the annexation shall have the same effective date (the "**Effective Date**"). This Agreement contains provisions regarding matters to exist, occur or be performed prior to the Effective Date, as well as the commencement of water service by IRWD within the former OPAMWC service territory, water system upgrades and other matters herein contemplated to be carried out after the Effective Date in conjunction with such service. The Effective Date shall be the first date on which all of the following have occurred:

- 1.2.1 The satisfaction of all conditions, or waiver of all conditions and rights of termination, pursuant to Section 9.5;
- 1.2.2 The filing of the necessary certificates to complete the merger; and
- 1.2.3 The filing of LAFCO's certificate of completion of the annexation.

II. MERGER

Section 2.1. Merger Agreement. Subject to approval by OPAMWC's shareholders as required by law, including without limitation any shareholder approval that may have been obtained or initiated prior to the effective date of this Agreement, OPAMWC shall be merged with and into LLC II (the "**Merger**"). The Merger shall be implemented in accordance with a merger agreement between OPAMWC and LLC II in the form attached hereto as Exhibit "B," which exhibit is attached hereto and incorporated herein by this reference (the "**Merger Agreement**"). The Merger shall not become effective without the approval of the shareholders.

Section 2.2. Maintenance of LLC II. IRWD may maintain LLC II in existence for as long as IRWD deems appropriate and useful in accomplishing the objectives of this Agreement. IRWD may dissolve LLC II and/or may cause LLC II to transfer any property, rights, obligations or activities to IRWD or another IRWD subsidiary entity so that IRWD or such entity may carry out any of the functions of LLC II, and IRWD may use the below-described planning area and/or any other accounting mechanisms as IRWD deems necessary to carry out such functions within

IRWD, with or without the assistance of LLC II. Unless otherwise specified herein, it is intended that the merger process, application of water rate differentials, system improvements and other obligations of IRWD herein may be performed either by IRWD or LLC II or another IRWD subsidiary entity on IRWD's behalf, and performance of any obligation hereunder by any of the foregoing shall constitute performance by IRWD under this Agreement. OPAMWC agrees that the agreements, promises and representations made herein by OPAMWC to IRWD are also made for the benefit of, and may be relied upon by, LLC II and any such other IRWD successor entity.

Section 2.3. Cash-Out Payment for Stock. The parties agree that if all conditions to the Merger have been satisfied or waived, all OPAMWC shares will be canceled and paid for in cash as provided herein (in a so-called "cash out merger"). Pursuant to the Merger Agreement, the cash-out payment for the stock of OPAMWC shall be submitted for approval by the shareholders in the amount of \$579.94 per share.

Section 2.4. Completion of the Merger. The necessary filings to complete the Merger will be effectuated by IRWD and OPAMWC during or as soon as possible after the approval of the Merger and the satisfaction or waiver of all conditions set forth in this Agreement, subject to compliance with requirements of California law applicable to mergers. Shares will become payable on the first business day following the Effective Date.

Section 2.5. Presentation of Shares. IRWD will specify the method for delivery of the shares with appropriate instruments of transfer. Payment will be made promptly by check. If IRWD so determines, payment may be made through an escrow agent or depository, selected by IRWD and acceptable to OPAMWC. Prior to the Effective Date, OPAMWC will assist IRWD with information on the ownership of shares, the addresses of share owners and similar information necessary or useful in the processing of the share payments.

Section 2.6. Recordation; Out of Area Service. A copy of this Agreement or memorandum thereof may be recorded by IRWD, for the purpose of notifying future property owners within the OPAMWC service territory of the provisions of this Agreement. IRWD may require each customer within the OPAMWC service territory to acknowledge in writing the receipt of a copy of this Agreement or memorandum thereof as a condition of obtaining service from IRWD.

III. ANNEXATION

Section 3.1. Application. IRWD shall make application to LAFCO for the annexation of the OPAMWC service territory to IRWD, upon the terms and conditions constituting this Agreement (the "**Annexation**") and other terms and conditions as IRWD may specify that are not inconsistent herewith and do not create any additional burden that is not provided in this Agreement on the customers within Planning Area No. 156 (defined in Section 3.2). The application shall request that the terms and conditions of the annexation include the fixing of the effective date of the Annexation to be concurrent with the effective date of the Merger established by the filing of the certificate of merger. IRWD shall cause the preparation of a

survey and legal description of such territory meeting LAFCO's requirements and other applicable legal requirements.

Section 3.2. Planning Area No. 156. Effective upon the Effective Date, all of the service territory of the former OPAMWC shall be designated by IRWD as a water planning area to be known as "Planning Area No. 156." Future financial participation by Planning Area No. 156 in the construction and acquisition of facilities and other property of IRWD shall be in accordance with the terms of this agreement, including the terms relating to the Acquisition Balance (defined below), and otherwise at the discretion of IRWD's board on the basis of benefit to be received, consistent with IRWD's funding policies and practices.

IV. ACQUISITION BALANCE

Section 4.1. Water Service. Upon the Effective Date, the provisions of this Agreement governing water rates and charges shall be considered a special contract under IRWD's Rules and Regulations For Water, Sewer, Recycled Water, and Natural Treatment System Service ("Rules and Regulations"). To the extent of any inconsistency, the provisions of this Agreement shall control over inconsistent provisions of the Rules and Regulations.

Section 4.2. Commodity Rate Reduction and Differential. Upon the Effective Date, the water commodity charges within Planning Area No. 156 will be reduced to 80% of the respective OPAMWC water commodity charges for all classes of service and meter sizes that were in effect on the Effective Date. Until the Acquisition Balance equals zero, whenever IRWD's standard commodity charges are changed, each commodity charge within Planning Area No. 156 will be changed by the amount necessary to maintain constant the dollar amounts of the differences (that resulted from the initial percentage reduction) between each such commodity charge and IRWD's corresponding standard commodity charge. If the Metropolitan Water District of Southern California or any intermediate wholesaler modifies its rate structure in a way that causes an unintended effect in the foregoing method of indexing the commodity charges for Planning Area No. 156, IRWD may modify such method of indexing in order to preserve the intent of this subparagraph to maintain constant the dollar amounts of the differences between each Planning Area No. 156 commodity charge and IRWD's corresponding standard commodity charge.

Section 4.3. Service Charge Reduction and Differential; Other Charges. Upon the Effective Date, the water service charges within Planning Area No. 156 will be reduced to 80% of the OPAMWC water service charges that were in effect on the Effective Date. Until the Acquisition Balance equals zero, whenever IRWD's standard water service charges are changed, the service charges within Planning Area No. 156 will be changed by the amount necessary to maintain constant the dollar amounts of the differences (that resulted from the initial percentage reduction) between such water service charges and the respective standard water service charges of IRWD. All other water fees and charges for Planning Area No. 156 shall be IRWD's standard fees and charges. A summary of OPAMWC's water commodity and service charges and

IRWD's corresponding standard water commodity and service charges, revised as of the Effective Date, shall be attached hereto as Exhibit "C" and incorporated herein by this reference.

Section 4.4. Application of Commodity Rate and Service Charge Differentials.

Commencing on the Effective Date, the difference between (1) water revenues actually collected by IRWD within Planning Area No. 156 at the commodity rates and service charges in effect pursuant to Sections 4.2 and 4.3 above and (2) water revenues that would have been collected using IRWD's base commodity rates and service charges in effect at such time will be computed and applied by IRWD after each billing period to reduce the remaining Acquisition Balance.

Section 4.5. Connection and Capacity Charges. Connection and capacity charges within Planning Area No. 156 shall be set by IRWD based upon the sub-area master plan (SAMP) to be prepared by IRWD for the Planning Area or other method consistent with connection and capacity charge-setting in other portions of IRWD.

Section 4.6. Rates After Retirement of Acquisition Balance. Upon the reduction of the Acquisition Balance to zero, water user rates and water service charges within Planning Area No. 156 will be established in the same manner as in other portions of IRWD. It is acknowledged by IRWD that IRWD's current practice is, and its historical practice has been, to use planning areas as a mechanism for setting separate connection fees, not user rates, in different portions of IRWD (other than areas that are or have been subject to interim area-specific user rates pursuant to terms of an annexation or consolidation).

Section 4.7. Allocation-Based Rate Structure in Planning Area No. 156. IRWD has established and revises from time to time in its discretion an allocation-based rate structure as a "best management practice" for the purpose of encouraging conservation of water. The water commodity rates imposed within Planning Area No. 156 shall be transitioned to IRWD's allocation-based rate structure after an appropriate customer education and information period, but in no event prior to reduction of the Acquisition Balance to zero.

Section 4.8. Acquisition Balance. Commencing on the Effective Date, Planning Area No. 156 will make an equitable contribution toward the cost of the existing IRWD replacement fund and the cost of correcting existing OPAMWC system deficiencies, equal to the sum of following amounts (the "Acquisition Balance"):

- 4.8.1 Replacement fund contribution, agreed to be \$1,060,000; ✓
- 4.8.2 Capital cost to fund the following listed existing system upgrades, not to exceed the actual cost thereof or the aggregate amount of \$7,607,250.00, whichever is less. It is mutually understood that all lineal feet, quantities and similar figures set forth below are approximations and are subject to engineering and field verification of need:

- 4.8.2.1 Installation of 6,600 feet of 16-inch transmission main

in Chapman Avenue between Jamboree Road and Orange Park Boulevard, to connect to IRWD Zone 5 service zone;

- 4.8.2.2 Remove four of five existing hydropneumatic pump stations and repipe as required to bypass;
- 4.8.2.3 Install two pressure reducing stations as needed to protect system and pressure reducing valves on individual services as needed to protect services where maximum pressure will exceed approximately 80 pounds per square inch (psi);
- 4.8.2.4 Refurbish and equip existing well to provide capability to pump to IRWD's Zone 5 Santiago Hills Reservoir;
- 4.8.2.5 Replace existing chlorine disinfection system at well with sodium hypochlorite system;
- 4.8.2.6 Replace 6,000 feet of 16-inch transmission main segments constructed circa 1929, as needed where pressures will exceed approximately 150 psi (between well and intersection of Rancho Santiago and Glen Albyn Lane);
- 4.8.2.7 Replace 5,300 feet of 16-inch and 10-inch transmission main segments constructed circa 1929, and other distribution pipelines as needed;
- 4.8.2.8 General system modifications, consisting of installations, replacements, refurbishments and removals of the following components: pipelines, laterals, valves, pumps, tanks, casings, pressure regulation devices, disinfection equipment, hydrants, pavement, concrete, and associated fittings, boxes, vaults, housings and appurtenances;
- 4.8.2.9 Remove one million gallon (mg) tank, including importation and placement of backfill;
- 4.8.3 One-half of the costs of preparation of the survey and legal description of the Annexation area and LAFCO fees to process the Annexation;
- 4.8.4 Outstanding debts of OPAMWC, including without limitation any

deferred balances under the Operation Agreement (defined below), and the cost of payment or discharge of all liabilities of OPAMWC incurred or accrued prior to the Effective Date, excluding: (i) the cost to correct any structural, sanitary or other defect in the physical condition of the OPAMWC water system following transfer to IRWD, and (ii) the portion of any liability covered by the proceeds of insurance paid to IRWD;

- 4.8.5 The fees and costs incurred to obtain an independent accounting firm's review of OPAMWC's financial records and preparation and updating of closing financial statements, pursuant to Section 5.3;
- 4.8.6 Any pipeline relocation costs incurred as a result of lack of valid prior easement rights in areas affected by non-party public agency capital projects identified by either party in writing to the other prior to the execution of this Agreement;
- 4.8.7 Deferred balance, if any, of cost of improvement work performed pursuant to Operation Agreement (defined in Section 5.4);
- 4.8.8 Any costs allocable to the Acquisition Balance pursuant to Section 10.9.6.

It is acknowledged that the Acquisition Balance is based on the assumption that the entire OPAMWC service area will be included in the area that will be annexed to IRWD and will be designated as Planning Area No. 156. If less than such area is included in the Annexation, the amount of the Acquisition Balance shall be reduced proportionately on the Effective Date by the same methodology as provided in Section 4.10.6.

Section 4.9. Stock Payment. The Acquisition Balance shall be increased by the amount of the cash-out payment for the OPAMWC stock at the amount per share specified in Section 2.3, and any payment for OPAMWC stock and associated fees and costs incurred by IRWD in connection with the exercise of shareholder's rights as described in Section 9.2 hereof.

Section 4.10. Acquisition Balance Reductions. The Acquisition Balance shall be reduced by the following amounts:

- 4.10.1 Actual cash balances in OPAMWC funds transferred to the operating funds of IRWD pursuant to Section 5.2 hereof;
- 4.10.2 Value of 0.67 acre reservoir site, agreed to be \$875,000.00, which represents the appraised value of the vacant land at the highest and best use, adjusted for entitlement status, less the cost of the appraisal (\$1,250.00);

- 4.10.3 Value of headquarters site (three parcels and prorated acreage of fourth parcel not used as well site), totaling 0.645 acres, agreed to be \$1,125,000.00, which represents the appraised value of the vacant land at the highest and best use, adjusted for entitlement status, less the cost of the appraisal (\$1,250.00);
- 4.10.4 The following listed prorated values of capacity to serve IRWD areas other than OPAMWC, agreed to be \$3,114,100 in the aggregate (based on the listed minimum prorated values; if any of such minimum values are increased by IRWD, the increase will be added to such aggregate amount):
- 4.10.4.1 Pro rata share (minimum 42.01%, or greater if determined by IRWD) of transmission main replacement cost described in Section 4.8.2.1;
 - 4.10.4.2 Pro rata share (minimum 42.01%, or greater if determined by IRWD) of transmission main replacement cost described in Section 4.8.2.7;
 - 4.10.4.3 Pro rata share (minimum 56.51%, or greater if determined by IRWD) of well refurbishment and equipment cost described in Section 4.8.2.4;
 - 4.10.4.4 Pro rata share (minimum 56.51%, or greater if determined by IRWD) of transmission main replacement cost described in Section 4.8.2.6;
- 4.10.5 All rate-differential credits applied by IRWD on a periodic basis under Section 4.4 above;
- 4.10.6 The fractional share, as of the date of removal, of the remaining Acquisition Balance attributable to any parcel removed (by detachment or otherwise) from Planning Area No. 156 after the Effective Date. The share shall be determined in proportion to projected water use for the removed parcel, taking into consideration usage records, projected changes in use of the parcel and other relevant information. This Section 4.10.6 shall not apply to service connections or land hereafter removed from Planning Area No. 156 in accordance with the executory provisions of Section 4, 5, or 6 of that certain Compromise and Settlement Agreement, dated as of September 18, 1979, by and between the City of Orange and OPAMWC.

Section 4.11. New Development in Planning Area No. 156. It is acknowledged and agreed that the Acquisition Balance contributions have been determined based on existing connections within Planning Area No. 156. The contribution to water system costs by future development that may occur within Planning Area No. 156 shall be determined as described in Section 4.5. Nothing herein shall be deemed to satisfy any contribution that may be required from future development occurring within Planning Area No. 156 in addition to such development's payment of the rate differentials applied to the Acquisition Balance. Connection and capacity charges shall not be applied to reduce the Acquisition Balance.

Section 4.12. Reports on Acquisition Balance. On a quarterly basis, IRWD will cause its staff to generate a report on (i) the Acquisition Balance as computed pursuant to Section 4.8 and 4.9 and the reductions applied to the Acquisition Balance pursuant to Section 4.10 and (ii) the status of the system upgrades described in Section 4.8.2, and provide such report to the management advisory committee established pursuant to Section 6.1 until the Acquisition Balance has been retired and the upgrades have been completed.

V. SERVICE TRANSITION

Section 5.1. Continuation of Water Service. Upon completion of the Merger and Annexation in accordance with the provisions of this Agreement, IRWD shall, as the successor-in-interest to OPAMWC, assume OPAMWC's obligations to provide the property owners and customers in Planning Area No. 156 with water service to such property. Except as otherwise specifically provided herein, service to Planning Area No. 156 shall be provided in accordance with the Rules and Regulations.

Section 5.2. Assets and Liabilities. The acquisition of OPAMWC shall include all assets, real or personal, tangible or intangible, licenses, claims or rights of any kind, including but not limited to cash balances, vehicles, office furniture and equipment and documents, which shall be transferred to IRWD. Upon the Effective Date, IRWD will assume all outstanding liabilities, debts and obligations of OPAMWC that exist at the Effective Date, subject to Section 4.8.4. Existing contracts of OPAMWC shall be canceled or transferred to IRWD at IRWD's discretion.

Section 5.3. Funds and Accounting. Operations of OPAMWC shall be consolidated into IRWD's operating budget. Segregation of operating funds shall not be required except as needed to carry out the provisions in Section IV or as otherwise deemed necessary by IRWD. IRWD will retain (or has retained prior to the execution of this Agreement) an independent accounting firm to review OPAMWC's financial records and prepare closing financial statements with the highest level of assurance such firm is able and willing to provide for the period ended June 30, 2007, and to update such closing financial statements from June 30, 2007 to the Effective Date. OPAMWC will provide management representations reasonably requested by such firm in preparing such statements. Notwithstanding any separate accounting required by or necessary under this Agreement, funds or other assets or operational expenses may, at the discretion of

IRWD, be commingled for investment and operating purposes.

Section 5.4. Water System Maintenance. Until the Effective Date, maintenance of facilities will continue to be performed under the agreement between the parties titled "Agreement To Perform Contract Services For Interim Operation Of Water System Of Orange Park Acres Mutual Water Company," dated as of March 1, 2007, as it may be subsequently amended (the "Operation Agreement").

Section 5.5. Permits. All permits issued to and by OPAMWC will be transferred and assigned to IRWD as of the Effective Date, in full force and effect.

Section 5.6. Completion of Water System Upgrades. IRWD will complete the system upgrades described in Section 4.8.2 within five (5) years of the Effective Date, except to the extent completion of any upgrade(s) is delayed by unforeseen circumstances. In consultation with the management advisory committee pursuant to Section 6.1, IRWD may make modifications and substitutions to the listed upgrade items; provided that the combined resulting level of function and service will be at least equivalent to that of the original list.

Section 5.7. Sewer Service; Other Services. Sewer service is provided to some portions of the area within OPAMWC by the City of Orange or Orange County Sanitation District; other portions are currently on septic systems. Reclaimed water service and natural treatment system service are not presently contemplated but may be provided in the future within the former OPAMWC service area at the discretion of IRWD.

VI. MANAGEMENT ADVISORY COMMITTEE

Section 6.1. Committee Formation and Duties. A management advisory committee shall be formed, consisting of up to three (3) of the OPAMWC board members in office immediately prior to the Effective Date, who shall be selected by the OPAMWC board, to initiate and/or review and make recommendations concerning all matters coming before IRWD's board that pertain to the former OPAMWC service area, including but not limited to matters pertaining to the implementation of this Agreement. The term of the management advisory committee shall be until the Acquisition Balance has been retired and the system upgrades described in Section 4.8.2 have been completed. The eligibility criterion for service as a member of the management advisory committee shall be legal residence within Planning Area No. 156. Any vacancy on the committee as a result of loss of eligibility or other cause shall be filled by appointment by IRWD's board of a person who is recommended by a majority of the remaining members of the committee and who meets such eligibility criteria. The committee shall sit as an advisory committee with one member of the IRWD board, and shall meet (i) up to once per month during the first three (3) years after the Effective Date and (ii) for the remainder of the committee's term, shall meet annually and on an ad hoc basis as required pursuant to Section 10.9.4.

Section 6.2. Directors' and Officers' Liability. IRWD agrees that all indemnification rights existing in favor of the current officers and directors of OPAMWC, for liabilities incurred prior to the Effective Date while acting as such officers and directors within the course and scope

of their duties, as provided in the Articles of Incorporation and Bylaws of OPAMWC, will continue in full force and effect for three years following the Effective Date, and has agreed that OPAMWC's existing directors and officers liability insurance policy (or a comparable insurance policy) will be maintained in force for three years following the Effective Date. OPAMWC represents and warrants that, except as disclosed by OPAMWC in writing to IRWD prior to the date on which IRWD's Board of Directors approved this Agreement, (i) there are not now (a) pending, asserted or existing, or to the best of the knowledge of the current members of the OPAMWC Board of Directors threatened, any claims or actions of the type which would be covered by the indemnification provisions of this paragraph or (b) to the best of the knowledge of the current members of the OPAMWC Board of Directors, any facts upon which any such claims or actions could be based, and (ii) that such officers and directors are not entitled to any indemnification rights other than as described in this paragraph.

VII. CONDITIONS TO EFFECTIVENESS OF MERGER AND ANNEXATION

Section 7.1. Operation Pending Effective Date; Notice of Unbudgeted Expenditures.

Pending the Effective Date, OPAMWC agrees to operate only in the ordinary course of business and to use its best efforts to preserve intact its existing business organization. Until the Effective Date, OPAMWC shall give IRWD reasonable advance notice of any expenditure greater than \$25,000 approved or made by OPAMWC, except to the extent the expenditure is identified in an adopted budget or budget amendment, a copy of which has previously been provided to IRWD. OPAMWC agrees that there shall not be any payment of dividends or other distribution pending the Effective Date.

Section 7.2. Reserved.

Section 7.3. Notice of Events. Each party shall give prompt written notice to the other party of the occurrence or threatened or impending occurrence of any event which, if known on the date of this Agreement, would have been required to be disclosed under this Agreement, or which would cause any of its representations, warranties or covenants herein to be inaccurate or otherwise misleading or which might result in the non-fulfillment of any condition herein.

Section 7.4. Regulatory Approvals; No Legal Proceedings. There shall not be any legal proceedings pending seeking to prohibit the Merger, Annexation or any other transaction contemplated herein; and all regulatory approvals required by law shall have been obtained.

Section 7.5. Reserved.

Section 7.6. Corporate Matters. OPAMWC agrees to call such meetings of its shareholders as may be needed to vote upon the approval of the Merger and other corporate matters necessary to carry out the transactions contemplated in this Agreement. If the Merger is duly submitted to a vote of the shareholders and is disapproved, at IRWD's request OPAMWC shall call such meetings of its shareholders as may be needed to seek reconsideration by the shareholders.

Section 7.7. Other Proposals. If, prior to the vote of the OPAMWC's shareholders on this Agreement, the OPAMWC Board of Directors receives any proposal from any person or entity to acquire OPAMWC or any interest in OPAMWC that requires approval by the shareholders ("third-party proposal"), OPAMWC's Board of Directors may disclose such third-party proposal to OPAMWC's shareholders as it deems appropriate in the conduct of its fiduciary duties. If OPAMWC (1) recommends such proposal to its shareholders, or recommends against or withdraws its approval of the Merger or this Agreement in favor of the competing proposal, or otherwise acts to favor the competing proposal with its shareholders in opposition to this Agreement or the Merger, and, (2) the Merger fails to be submitted for, or fails to receive, an approving vote of the shareholders, and, (3) an acquisition transaction is accepted and implemented by OPAMWC and its shareholders with the person or entity who submitted the third-party proposal or an affiliated person or entity within thirty (30) months of the date of the failure, then OPAMWC shall pay to IRWD an amount equal to all reasonable costs and expenses incurred by or on IRWD's behalf in connection with negotiating, drafting, executing and implementing this Agreement, not to exceed the sum of Two Hundred and Fifty Thousand Dollars (\$250,000.00); provided, the foregoing shall not apply to limit costs and expenses incurred under any other agreement, including without limitation the Operation Agreement. The costs and expenses payable under the preceding sentence shall be and remain payable notwithstanding the termination of this Agreement. This is not intended to be a prevailing party attorneys fees clause pursuant to Civil Code Section 1717. The action of one or more individual Board members of OPAMWC shall not be deemed the action of OPAMWC under this Section unless such individual Board members collectively constitute a majority of the OPAMWC Board or such action has been approved by a majority of the OPAMWC Board. Allowing a minority of Board members to state their position shall not constitute "approval" under this Section when the majority does not concur in the minority position.

Section 7.8. Certain Further Conditions For the Benefit of OPAMWC. IRWD shall not be in default of any material obligation contained in this article or other provision of this Agreement, and no event shall have occurred which would constitute a material breach of IRWD's representations or warranties contained in this Agreement or would cause such representations or warranties to be inaccurate in any material respect if made as of the Effective Date.

Section 7.9. Certain Further Conditions For the Benefit of IRWD. OPAMWC shall not be in default of any material obligation contained in this article or other provision of this Agreement, and no event shall have occurred which would constitute a material breach of OPAMWC's representations or warranties contained in this Agreement or would cause such representations or warranties to be inaccurate in any material respect if made as of the Effective Date. Representations made herein shall be accurate in all material respects. There shall not have been any material adverse change in the financial condition or business of OPAMWC from the date of the closing financial statements prepared by an independent accounting firm as contemplated pursuant to Section 5.3 to the Effective Date. OPAMWC must have good title at the Effective Date to its water system and the properties described in Sections 4.10.2 and 4.10.3 hereof. There must not be more than 722.42 shares of OPAMWC stock and there must not be any options, warrants, rights or similar agreements by which OPAMWC is bound with respect to

the issuance, voting or sale of issued or unissued stock. All required state and federal tax returns shall have been filed by OPAMWC and all tax liabilities of any kind that are due and owing shall have been paid. There shall be no material litigation or regulatory action other than as disclosed by OPAMWC to IRWD in writing prior to execution hereof. There shall have been no condemnation of the facilities or property of OPAMWC for which OPAMWC will not receive insurance or condemnation proceeds sufficient to completely rebuild, replace or restore the condemned facilities. IRWD shall have completed the Annexation without the imposition by LAFCO of any unusual or burdensome requirements on IRWD.

Section 7.10. Procedural Revisions. The parties agree that procedural matters set forth in this Agreement shall be deemed revised as necessary to allow compliance with applicable laws governing the Annexation and Merger, provided that no material change in the terms hereof results except with the approval of the parties.

VIII. REPRESENTATIONS AND WARRANTIES

Section 8.1. Material Events. OPAMWC represents that, except as disclosed to IRWD in writing prior to the date on which IRWD's Board of Directors approved this Agreement, there is no material litigation (pending or to the best of the knowledge of the current members of the OPAMWC Board of Directors threatened), regulatory action (pending or to the best of the knowledge of the current members of the OPAMWC Board of Directors threatened), liability, unplanned expenditure, defect in title to its water system or either of the properties described in Sections 4.10.2 and 4.10.3 hereof, loss, contingency, or similar item materially affecting the financial or operating condition of OPAMWC. OPAMWC has disclosed in writing to IRWD prior to the date on which IRWD's Board of Directors approved this Agreement, any known environmental contamination in its water system or either of the properties described in Sections 4.10.2 and 4.10.3 hereof and any investigations within the last five years to determine the existence of any such environmental contamination. For purposes of the preceding sentence, "known" shall be limited to the knowledge of the current members of the OPAMWC Board of Directors, and "environmental contamination" shall mean contamination by any hazardous or toxic substance, material or waste which is regulated by any local government authority, the State of California or the United States Government including, (i) any "hazardous materials" as defined in Section 25501(o) of the California Health and Safety Code or predecessor statute, and (ii) petroleum hydrocarbons or any fractions or byproducts therefrom, but shall not mean any contamination or pollution of the water produced, delivered through or stored by the OPAMWC system.

Section 8.2. Financial Condition. OPAMWC represents that it shall promptly disclose to IRWD any material adverse change in its financial or operating condition from the date of the closing financial statements prepared by an independent accounting firm as contemplated pursuant to Section 5.3 to the Effective Date.

Section 8.3. Board Approval. OPAMWC hereby represents that its board of directors has approved this Agreement and determined that the terms of the Agreement are fair to and in the best interests of OPAMWC's shareholders.

Section 8.4. Good Standing; Outstanding Contracts. OPAMWC represents that it is a corporation in good standing under the laws of the State of California, and is not required to be qualified to do business in any other state, and that there are no outstanding contracts affecting OPAMWC or to which OPAMWC is a party (other than the Operation Agreement and OPAMWC's service contract with the East Orange County Water District), involving obligations exceeding \$25,000 and which are not terminable by OPAMWC within 90 days.

IX. TERMINATION

Section 9.1. General. In addition to other events permitting termination hereunder, this Agreement may be terminated as provided in this article.

Section 9.2. By Either Party. Either party shall have the right to terminate this Agreement, without any penalty, upon written notice to the other party, which shall be given not later than thirty (30) days after the end of the period during which OPAMWC shareholders may exercise dissenting shareholder's rights in connection with the Merger by demanding the purchase of shares, or any share or portion thereof may be identified by its holder as a dissenting share, if any such exercise or identification occurs during such period. If the parties waive their rights to terminate under this Section, the parties agree to meet and confer in good faith to determine their approach in responding to such exercise of rights, and neither OPAMWC nor IRWD shall settle, reject a settlement of, or contest any such exercise of rights if the other objects.

Section 9.3. OPAMWC's Right To Terminate. In the event there is a failure of a condition to OPAMWC's obligation, as set forth in Section 7.8, OPAMWC may terminate this Agreement, without any penalty, by giving written notice to IRWD not later than ten (10) days after the condition has failed.

Section 9.4. IRWD's Right To Terminate. In the event (A) the Merger is duly submitted to a vote of the shareholders and is disapproved; or (B) the Annexation is disapproved by LAFCO or is terminated by LAFCO pursuant to LAFCO's protest proceeding; or (C) there is a failure of a condition set forth in Section 7.4 or 7.5; or (D) there is a failure of a condition to IRWD's obligation, as set forth in Section 7.9, IRWD may terminate this Agreement, without any penalty, by giving written notice to OPAMWC not later than ten (10) days after such event or after such failure of a condition.

Section 9.5. Waiver of Condition. Each party shall have the right to waive any condition for its benefit or any termination right it may have.

Section 9.6. Effect of Termination or Failure To Terminate. A party's failure to terminate this Agreement upon the failure of a condition shall be deemed a waiver of the condition which has failed. No such waiver or failure to terminate shall affect amounts includable in the Acquisition Balance pursuant to Section 4.8.4 or 4.9. Termination of this Agreement shall not release any party thereto from any claim arising or derived from its breach

of this Agreement. Termination of this Agreement will terminate the Merger Agreement.

Section 9.7. Automatic Termination. If the matters specified in Sections, 1.2.1, 1.2.2, and 1.2.3 have not occurred on or before December 31, 2008, then this Agreement shall automatically terminate.

Section 9.8. Costs. Notwithstanding the termination hereof, in the event of such termination each party shall bear its own legal fees, filing fees and other costs incurred in the preparation of this Agreement and the implementation of the Merger and Annexation transactions contemplated herein, except as provided in Section 7.7.

X. MISCELLANEOUS

Section 10.1. Counterparts. This Agreement may be executed in one or more counterparts. Each will be deemed an original and all, taken together, will constitute one and the same instrument.

Section 10.2. Successors and Assigns; Entire Agreement. No party may assign its rights or obligations under this Agreement without the prior written consent of the other parties to this Agreement. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of OPAMWC and IRWD. This Agreement constitutes the entire agreement between OPAMWC and IRWD and supersedes all prior understandings and agreements between the parties with respect to the subjects hereof.

Section 10.3. No Effect on Operation Agreement. The Operation Agreement shall remain in effect until its termination as provided therein.

Section 10.4. Amendment. This Agreement may be amended only in writing signed by the parties hereto.

Section 10.5. No Waiver. A waiver by any party of a breach of any of the covenants, conditions or agreements under this Agreement to be performed by the other party shall not be construed as a waiver of any succeeding breach of the same or other covenants, agreements, restrictions or conditions of this Agreement.

Section 10.6. Jurisdiction and Venue. This Agreement shall be construed under the laws of the State of California in effect at the time of the signing of this Agreement. The parties consent to the jurisdiction of the California courts with venue in Orange County.

Section 10.7. Titles and Captions. Titles and captions are for convenience of reference only and do not define, describe or limit the scope or the intent of this Agreement or of any of its terms. References to section numbers are to sections in this Agreement, unless expressly stated otherwise.

Section 10.8. Cooperation. Each party agrees to cooperate with the other and, in that

regard, agrees to sign any and all documents which may be reasonably necessary, helpful, or appropriate to carry out the purposes and intent of this Agreement.

Section 10.9. No Third-Party Beneficiaries. No customer, shareholder or other person or entity other than OPAMWC and IRWD, LLC II and other IRWD-affiliated entities shall be deemed to be a beneficiary hereof, and nothing in this Agreement, either express or implied, is intended to confer upon any customer, shareholder or other person or entity, other than the parties, LLC II and other IRWD-affiliated entities and their respective successors and assigns, any rights, remedies, obligations or liabilities under or by reason of this Agreement. The foregoing notwithstanding, customers within Planning Area No. 156 shall have the right under this Agreement to obtain resolution of any disputes they may have regarding the performance by IRWD, LLC II and other IRWD-affiliated entities under this Agreement, which right shall be limited to the use of the procedure and measures provided in this Section 10.9, below.

- 10.9.1 Dispute Resolution Procedure For Certain Non-Parties. The procedures set forth in Sections 10.9.1 through 10.9.9, inclusive, provide the exclusive method by which customers within Planning Area No. 156 may obtain resolution of a dispute as to the performance by IRWD, LLC II or other IRWD-affiliated entities (each, an "IRWD Entity") of its obligations under this Agreement. Said procedure shall not limit any rights that any persons may have other than under this Agreement. Said procedure shall be available only to Customers as specified in Section 10.9.2.
- 10.9.2 Scope. The right of a Planning Area No. 156 water service customer ("Customer") to use the below procedure shall be limited to alleged non-performance by an IRWD Entity of obligations contained in the Agreement. It is acknowledged by the parties that the procedure is intended to encompass disputes as to performance under the following Sections of this Agreement: Sections 4.2; 4.3; 4.4; 4.6; 4.7; 4.8; 4.9; 4.10; 4.12; 5.6; 10.9.1 through 10.9.9, inclusive, and, with regard to the existence of the Management Advisory Committee, only, but not any activities, deliberations or recommendations of such Committee, Section 6.1.
- 10.9.3 Initial Dispute Resolution Measure: General Manager Review. The Customer desiring to seek resolution of a matter under this procedure shall first send a written communication to the IRWD General Manager, specifying the alleged non-performance, stating which section(s) of the agreement contains the obligation(s) and including a description of supporting facts and other information necessary or useful to an understanding of the issue. The IRWD General Manager shall provide a written response to the Customer within thirty (30) days of the Customer's written communication. By mutual agreement the General Manager and Customer may

extend such time for the purpose of gathering more information. If the Customer is dissatisfied with General Manager's response under Section 10.9.3, then within thirty (30) days of the date of the General Manager's response, the Customer will so notify General Manager in writing. Within thirty (30) days of Customer's notice described in the preceding sentence, either the General Manager or Customer may in writing request an informal meeting to attempt to resolve the dispute, and the other party shall reasonably cooperate with the scheduling of and participation in such meeting.

10.9.4 Second Dispute Resolution Measure: Board Review. If the Customer believes the issue is unresolved after the steps in Sections 10.9.3, then within thirty (30) days of the informal meeting (or sixty (60) days from the notice that was delivered by the Customer under Section 10.9.3 indicating dissatisfaction with the General Manager's response, if no meeting was requested) the Customer will provide written notice to the General Manager requesting to have the matter considered by the IRWD Board of Directors. Upon receiving the request the General Manager will submit the matter to a meeting of the OPAMWC Management Advisory Committee held within thirty (30) days of receipt of said notice, and will submit the matter to a meeting of the IRWD Board of Directors held within sixty (60) days of the receipt of the notice. If the Management Advisory Committee is no longer meeting monthly at such time pursuant to Section 6.1, then IRWD shall convene the Management Advisory Committee on an ad hoc basis. The Customer must attend the Committee and Board meetings. The General Manager will notify the Customer of the decision of the Board.

10.9.5 Third Dispute Resolution Measure: LAFCO Executive Officer Review. If Customer is dissatisfied with the decision of the IRWD Board, then within thirty (30) days of the date of the General Manager's notice of that decision, the Customer may submit a written request to the General Manager to have the matter submitted to the Executive Officer of LAFCO. The request must be signed by, or accompanied by similar requests signed by, a minimum of ten (10) other Customers. The Executive Officer will notify the General Manager and the Customer of a schedule for submission of materials by both parties and meeting date(s). The Executive Officer may conduct meetings of the parties to mediate a resolution of the dispute. Any materials submitted to the Executive Officer concerning the dispute will first be served on the other party, and the Executive Officer's decision will be based upon the materials submitted and the information provided at

meetings concerning the dispute at which both parties are present. If the dispute is not resolved, the Executive Officer will render a decision, which shall be binding.

10.9.6 Costs. Each party will bear any and all of its costs in the above procedure. The costs of the Executive Officer (and Executive Officer's counsel, should the Executive Officer elect to have advice of counsel) will be divided equally between the Acquisition Balance and IRWD.

10.9.7 Availability of Procedure. The procedure described in this Section shall be available only until the retirement of the Acquisition Balance and completion of the upgrades. IRWD shall designate as "FINAL" the quarterly report that is prepared under Section 4.12 following the date of the reduction of the Acquisition Balance to zero or the filing of a notice of completion on the last upgrade to be completed, whichever occurs last. Any procedure not initiated prior to the date of such final quarterly report shall be deemed untimely and invalid. For purposes of the filing of quarterly reports as described herein, the reduction of the Acquisition Balance to zero shall be determined without regard to the addition of any amount to the Acquisition Balance under Section 10.9.6 that occurs or may occur because any procedures are pending when the Acquisition Balance would otherwise have been retired. Except as limited in this Section 10.9.7, this procedure may be initiated at any time, provided, however, that the General Manager, IRWD Board and LAFCO Executive Officer may take into consideration the timeliness of such initiation, resulting prejudice and good cause for the delay.

10.9.8 Timely Responses. The failure of the Customer to timely give a notice or complete any other requirement specified herein shall be deemed to conclusively indicate the Customer's acceptance of the results to that point as satisfactory, and no further proceedings will be taken. In the event of the failure of IRWD to timely complete any requirement specified herein, the Customer may omit any remaining steps in Sections 10.9.3 and 10.9.4 and submit the matter directly to the Executive Officer of LAFCO in accordance with Section 10.9.5.

10.9.9 LAFCO's Acceptance of Executive Officer's Duties. The inclusion of the terms and conditions of this Agreement in the terms and conditions of the Annexation pursuant to Section 3.1 shall constitute LAFCO's acceptance of the duties assigned herein to the Executive Officer.

Section 10.10. Severability. The provisions for the Annexation and the provisions for the Merger are not intended to be severable from one another. Except to that extent, if any covenant, term, condition, or provision of this Agreement shall, to any extent, be invalid or unenforceable, the remainder of this Agreement shall be valid and enforceable to the fullest extent permitted by law unless that covenant, term, condition, or provision declared to be invalid is so material that its invalidity deprives any party of the basic benefit of their bargain or renders the remainder of this Agreement meaningless.

Section 10.11. California Environmental Quality Act (CEQA). The parties agree that IRWD shall be the lead agency for purposes of compliance with or determination of exemption from CEQA with respect to the actions contemplated in this Agreement.

Section 10.12. Notices. Any notice or other document and all billings and payments required or permitted to be given by either party hereto to the other party shall be deemed received upon delivery in person to the recipient or within two (2) business days after the date of deposit in the United States mail in the State of California, with postage prepaid, and addressed to the party for whom intended at the following address:

To OPAMWC: Orange Park Acres Mutual Water Company
678 North Gravier Street
Orange, CA 92869
Attn: Bruce Williams

With a copy to:

Michael Rubin, Esq.
Rutan & Tucker, LLP
611 Anton Boulevard, Suite 1400
P.O. Box 1950
Costa Mesa, CA 92626-1950


To IRWD: Irvine Ranch Water District
15600 Sand Canyon Avenue
P.O. Box 57000
Irvine, CA 92619-7000
Attn: General Manager

Section 10.13. Legal Advice. Each party represents and warrants to the other the following: they have carefully read this Agreement, and in signing this Agreement, they do so with full knowledge of any right which they may have; they have received independent legal advice from their respective legal counsel as to the matters set forth in this Agreement, or have knowingly chosen not to consult legal counsel as to the matters set forth in this Agreement; and, they have freely signed this Agreement without any reliance upon any agreement, promise,

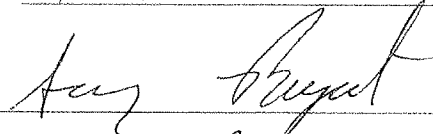
statement or representation by or on behalf of the other party, or their respective agents, employees, or attorneys, except as specifically set forth in this Agreement, and without duress or coercion, whether economic or otherwise.

IN WITNESS WHEREOF, each of the parties hereto, pursuant to the authority given by resolutions adopted by its Board of Directors and by its Articles of Incorporation, respectively, has caused this Agreement to be executed as of the date first written above.

ORANGE PARK ACRES MUTUAL WATER COMPANY

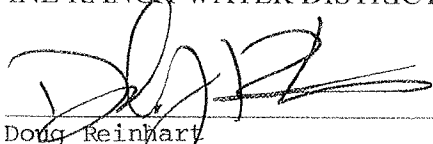
By 

Title: Pres

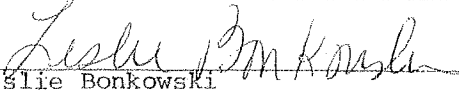
By 

Title: VICE PRES

IRVINE RANCH WATER DISTRICT

By 
Doug Reinhart

Title: President

By 
Leslie Bonkowski

Title: Secretary

EXHIBIT "A"

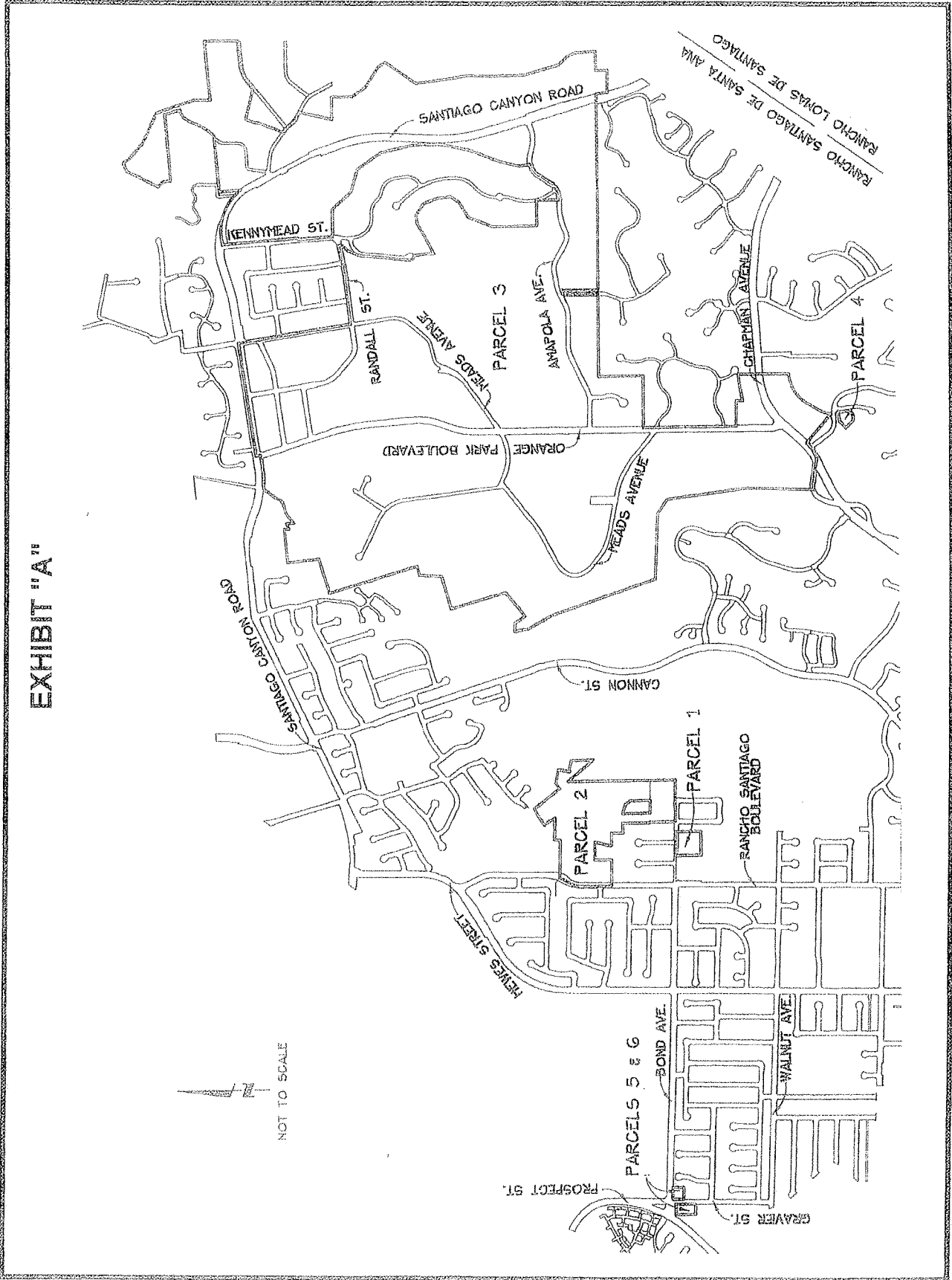


EXHIBIT "B"

09/12/07 Draft

AGREEMENT OF MERGER

This AGREEMENT OF MERGER ("Agreement") is entered into this ____ day of _____, 2007, by and between Orange Park Acres Mutual Water Company, a California corporation ("OPAMWC"), and Irvine Ranch Water District Water Service Company LLC II, a California limited liability company ("LLC II"). OPAMWC and LLC II are sometimes hereinafter collectively referred to as the "Constituent Entities."

WHEREAS, Irvine Ranch Water District, a California water district ("IRWD") and OPAMWC have entered into an Acquisition and Annexation Agreement, dated as of _____, 2007, which contemplates, among other things, the merger of OPAMWC with and into LLC II in accordance with the terms of this Agreement.

NOW, THEREFORE, in consideration of the premises and the mutual agreements herein contained, the parties hereto agree as follows:

ARTICLE I

MERGER

In accordance with the provisions of this Agreement and the California Corporations Code (the "Corporation Law"), at the Effective Time (as defined in Article II hereof), OPAMWC shall be merged with and into LLC II (the "Merger"), the separate corporate existence of OPAMWC shall cease, and LLC II shall continue as the surviving entity (the "Surviving Entity") under its present corporate name, but doing business also under the name of OPAMWC upon filing of a separate Fictitious Business Name Statement where required.

ARTICLE II

EFFECTIVE TIME OF THE MERGER

As used in this Agreement, the "Effective Time" of the Merger shall mean 5:01 p.m. on the date on which an executed original (with respect to which the execution may be in counterparts) of this Agreement, together with a Certificate of Merger duly executed by the appropriate member(s) of LLC II and officers of OPAMWC, has been duly filed with the Office of the California Secretary of State.

ARTICLE III

PAYMENT AND CONVERSION OF SHARES

3.1 Payment.

3.1.1 On the first business day after the Effective Time, each holder of a certificate or certificates representing Common Stock, par value of \$100 per share (the "Common Stock") of OPAMWC or fractions thereof, shall be entitled, upon the surrender

IN WITNESS WHEREOF, each of the parties hereto, pursuant to the authority given by resolutions adopted by its Board of Directors and by its Articles of Incorporation, respectively, has caused this Agreement to be executed as of the date first written above.

ORANGE PARK ACRES MUTUAL WATER
COMPANY

By _____

Title: _____

By _____

Title: _____

IRVINE RANCH WATER DISTRICT WATER
SERVICE COMPANY LLC II

By: IRVINE RANCH WATER DISTRICT,
Manager

By _____

Title: _____

By _____

Title: _____

EXHIBIT "C"

**COMPARISON TABLE OF EXISTING AND PROPOSED RATES & CHARGES
FOR ORANGE PARK ACRES**

	Existing Rates for Orange Park Acres (FY 2006-07)		Proposed Rates for Orange Park Acres (with 20% reduction)		Comments
Monthly Service Charge (Irvine Ranch Area Residential Service Charge: FY 2007-08 - \$7.50)	1/2"	\$20.00	1/2"	\$16.00	
	5/8"	\$20.00	5/8"	\$16.00	
	3/4"	\$20.00	3/4"	\$16.00	
	1"	\$20.00	1"	\$16.00	
	1 1/2"	\$20.00	1 1/2"	\$16.00	
	2"	\$20.00	2"	\$16.00	
	3"	\$20.00	3"	\$16.00	
	4"	\$20.00	4"	\$16.00	
	5"	\$20.00	5"	\$16.00	
	6"	\$20.00	6"	\$16.00	
	8"	\$20.00	8"	\$16.00	
	10"	\$20.00	10"	\$16.00	
Commodity Rate	Tier I	\$1.984	Tier I	\$1.587	0 – 10 ccf
	Tier II	\$2.318	Tier II	\$1.854	11 – 40 ccf
	Tier III	\$2.896	Tier III	\$2.317	41+ ccf
Delinquency and Service Restoration Charges:					
	Previous Balance	Penalty 10%	Penalty 10.0%		
	Second Month	Penalty 10%	Unpaid Balance 1.5%		
		discontinue water service	discontinue water service		
	Reconnect Charge:	\$100.00	\$100.00		
	Non-Sufficient Funds:	\$25.00	\$25.00		
If original NSF is paid with second NSF:	\$100.00	\$100.00		If not paid in full then service is discontinued	

EXHIBIT "C"

TERMS AND CONDITIONS FOR ANNEXATION OF ORANGE PARK ACRES MUTUAL WATER COMPANY SERVICE AREA TO IRVINE RANCH WATER DISTRICT

Revised 10 December 2007

Condition No. 1 – Annexation Agreement.

The annexation ("Annexation") of the Orange Park Acres Mutual Water Company ("OPAMWC") into the Irvine Ranch Water District ("IRWD") shall be subject to the terms and conditions set forth in the Agreement for Acquisition and Annexation, dated as of September 24, 2007, by and between Orange Park Acres Mutual Water Company and Irvine Ranch Water District (the "Annexation Agreement").

Condition No. 2 – Designation of Successor

IRWD is designated as the successor to the OPAMWC for the purpose of succeeding to all of the rights, duties and obligations of OPAMWC with respect to enforcement, performance or payment of any outstanding contracts and obligations of OPAMWC upon its merger into IRWD's limited liability company as provided in the Annexation Agreement. The foregoing designation shall include, but not be limited to, that certain Compromise and Settlement Agreement, dated as of September 18, 1979, by and between the City of Orange and OPAMWC, as affected by Agreement Between Korbel Family Inter-Vivos Trust and Orange Park Acres Mutual Water Company For Release of Certain Appurtenant Water Rights, Abandonment of Service Area and Quitclaim of Interests In Real Property, dated January 13, 1992; as further affected by Agreement Between Orange Park Acres Mutual Water Company and Certain Property Owners Within Glen Arran Section of Orange Park Acres Mutual Water Company Service Area, dated January 20, 1992; and as further affected by Water Service Area Agreement, dated October 12, 1995, by and between the City of Orange and OPAMWC (collectively, the "1979 Service Area Agreement").

Condition No. 3 – Service Area

The annexing territory is within the Sphere of Influence of the City of Orange and a portion of the annexing territory is within the City of Orange. However, the 1979 Service Area Agreement provides, with respect to water service, that the City of Orange and OPAMWC will each provide water service within their respective service areas, only, except as to certain identified parcels for which the future water service provider may be changed under certain circumstances and in the manner provided in the 1979 Service Area Agreement.

EXHIBIT "C"

TERMS AND CONDITIONS FOR ANNEXATION OF ORANGE PARK ACRES MUTUAL WATER COMPANY SERVICE AREA TO IRVINE RANCH WATER DISTRICT

Condition No. 1 – Annexation Agreement

The annexation shall be subject to the terms and conditions set forth in the Agreement For Acquisition and Annexation, dated as of September 24, 2007, by and between Orange Park Acres Mutual Water Company and Irvine Ranch Water District (the "Annexation Agreement").

Condition No. 2 – Designation of Successor

Irvine Ranch Water District ("IRWD") is designated as the successor to the Orange Park Acres Mutual Water Company ("OPAMWC"), for the purpose of succeeding to all of the rights, duties and obligations of OPAMWC with respect to enforcement, performance or payment of any outstanding contracts and obligations of OPAMWC upon its merger into IRWD's limited liability company as provided in the Annexation Agreement. The foregoing designation shall include, but not be limited to, that certain Compromise and Settlement Agreement, dated as of September 18, 1979, by and between the City of Orange and OPAMWC, as affected by Agreement Between Korbel Family Inter-Vivos Trust and Orange Park Acres Mutual Water Company For Release of Certain Appurtenant Water Rights, Abandonment of Service Area and Quitclaim of Interests In Real Property, dated January 13, 1992; as further affected by Agreement Between Orange Park Acres Mutual Water Company and Certain Property Owners Within Glen Arran Section of Orange Park Acres Mutual Water Company Service Area, dated January 20, 1992; and as further affected by Water Service Area Agreement, dated October 12, 1995, by and between the City of Orange and OPAMWC (collectively, the "1979 Service Area Agreement").

Condition No. 3 – Service Area

The annexing territory is within the sphere of influence of the City of Orange and a portion of the annexing territory is within the City of Orange. However, the 1979 Service Area Agreement provides, with respect to water service, that the City of Orange and OPAMWC will each provide water service within their respective service areas, only, except as to certain identified parcels for which the future water service provider may be changed under certain circumstances and in the manner provided in the 1979 Service Area Agreement. It is acknowledged that the 1979 Service Area Agreement can be amended only by mutual agreement of the City and IRWD, as OPAMWC's successor.

Condition No. 4 – Compensation For Removal of Service Territory

(A) Protection of the Acquisition Balance. Under the Annexation Agreement, IRWD acquire the OPAMWC stock and will provide a means for the OPAMWC customers to correct deficiencies in the water system and to make a contribution and obtain participation in the IRWD replacement fund to pay for refurbishments that may be needed in such system in the future, by advancing the cost thereof (the “Acquisition Balance” as defined in the Annexation Agreement) and recovering such amount through a water rate differential borne by all former OPAMWC customers. Any future removal of parcels from the area of IRWD containing the former service area of OPAMWC (designated by IRWD as “Planning Area No. 156”) shall be conditioned upon the payment to IRWD by the new water service provider of the amount representing the fractional share of the then-remaining Acquisition Balance attributable to the removed parcels.

(B) Lost Fixed Charges. In addition to compensation for the loss of water rate differentials that will retire the Acquisition Balance, removal of service area parcels from Planning Area No. 156 will result in the loss of future fixed meter charge payments. Any future removal of parcels from Planning Area No. 156 shall be conditioned upon the payment to IRWD of an amount representing the loss of this revenue, computed by escalating the then-current IRWD fixed meter charge and determining the discounted lump-sum value of the future cash flow therefrom, at reasonable escalation and discount rates and term.

(C) Value of Facilities. In addition to the foregoing, if the removal of service parcels includes the transfer of any water system capacity or facilities, any future removal of parcels from Planning Area No. 156 shall be conditioned upon the payment to IRWD of an amount representing depreciated replacement value of the capacity or facilities to be transferred.

(D) Facilities Retained. Under the Annexation Agreement, IRWD will achieve cost and operational efficiencies for the mutual benefit of the former OPAMWC customers and IRWD’s existing service territory, by interconnecting and utilizing portions of IRWD’s current system in lieu of refurbishing some of the deteriorated OPAMWC facilities. Any future removal of parcels from Planning Area No. 156 shall be conditioned upon the retention by IRWD of ownership of any facilities that have capacity in excess of the needs of the removed area and that are used to serve areas that remain in IRWD. In the instance of such facilities, only capacity would be transferred to the new provider in respect of the removed areas. A further condition shall be an appropriate mechanism for the allocation of flows if such sewer transfers result in combined tributary flows to any sewers.

Conditions 4(B), (C) and (D) above shall apply to both water and sewer service. Condition 4(A) is applicable to water service.

Condition No. 4 – Future Annexation of Former OPAMWC Service Area to the City of Orange

If through future LAFCO action, the former OPAMWC service area is annexed in its entirety into the City of Orange (“City’s Annexation”), IRWD will cooperate with the City of Orange, at its request, to transfer water and sewer service and facility ownership to the City. Any transfer will require that the City assume both water and sewer service, will secure detachment of the area in its entirety from IRWD through LAFCO, and will secure an administrative transfer through Orange County Sanitation District (“OCSD”) of the area from Revenue Area 14 (IRWD) to the OCSD Consolidated Revenue Area. Notwithstanding the City of Orange’s ability to exercise its general police powers, under no circumstances, except as provided in the terms and conditions, shall this reorganization permit the City’s concurrent provision of water or sewer service to the Orange Park Acres Mutual Water Company service area.

In addition, such transfer of territory or service provision will result in no negative financial or operational impacts to IRWD or to the customers formerly served by OPAMWC, and will be subject to an agreement to terminate the 1979 Service Area Agreement based upon the following:

(A) Maintenance of Obligations. As a condition of water service and facility ownership transfer, the City of Orange will assume all then-current and remaining obligations of IRWD to the former customers of the OPAMWC contained in the Annexation Agreement.

(B) Compensation for Water Facilities. Any transfer of water service facilities or capacity to the City shall be conditioned upon payment to IRWD of an amount representing the depreciated replacement value of:

1. The current OPAMWC water system in existence on the effective date of the annexation of the OPAMWC service area into IRWD;
2. Upgraded or replaced facilities constructed by IRWD as described in the Annexation Agreement; and
3. Other facilities or upgrades to facilities constructed by IRWD in the OPAMWC service area as a result of system deficiencies, wear or failures encountered by IRWD during its ownership of the system.

Attachment A hereto shows the methodology for the valuation using the current OPAMWC water system value and cost estimates for recommended upgrades to that system included in (B)1, and (B)2, above. The City’s payment to IRWD shall be reduced by a “credit” representing the cumulative amount paid by OPAMWC residents through water rates and charges to IRWD from the effective date of the Annexation to the effective date of the City’s Annexation for upgraded or replaced facilities constructed by IRWD as described in the Annexation Agreement. The “credit” shall be decreased by the cumulative amount representing the rate and charge reductions provided by IRWD to former OPAMWC customers as described in Sections 4.2, 4.3 and 4.6 of the Annexation

Agreement from the effective date of the Annexation to the date of the City's Annexation, and any costs incurred by IRWD for planning, engineering, legal, and other infrastructure design and construction related expenses, including staff time, as well as costs for implementing the Annexation and merger as identified in the Annexation Agreement.

(C) Compensation for Sewer Facilities. Any transfer of sewer service facilities and treatment and disposal capacity at OCSD to the City shall be conditioned upon payment to IRWD of an amount representing:

1. The depreciated replacement value of all sewer infrastructure existing or acquired by IRWD from the effective date of the Annexation of the OPAMWC service area into IRWD to the effective date of the City's Annexation,
2. The depreciated replacement value of all sewer infrastructure constructed by IRWD from the effective date of the Annexation to the effective date of the City's Annexation, including any master planned facilities and any facilities constructed to remedy system deficiencies, or to correct wear or failures encountered by IRWD during its ownership of the system;
3. OCSD annexation fees applicable at the time of the City's Annexation, plus the cumulative costs incurred by IRWD from the effective date of the Annexation to the effective date of the City's Annexation for OCSD regional sewage treatment and disposal capacity including equity payments and payments to the Capital Outlay Revolving Fund (CORF); and
4. Expenses incurred by IRWD for planning, engineering, legal, debt issuance and other related expenses, including staff time, through the effective date of the City's Annexation.

The City's payment to IRWD shall be reduced by a "credit" representing the cumulative amount of principal payments made by former OPAMWC residents from the effective date of the Annexation to the date of the City's Annexation through IRWD levied taxes, sewer rates or other capital charges for sewer infrastructure included in (C)2, and regional sewage treatment and disposal capacity related expenses included in (C)3, less any equity adjustments attributable to the transfer of flows from OCSD Revenue Area 14 (IRWD) to the Consolidated Revenue area as a result of the City's Annexation.

(D) Acquisition and Ownership of Facilities and Capacity. As provided in (B), above, the City may acquire and own all pipes, pumps, wells and appurtenant equipment ("water system") purchased or installed by IRWD as part of the Annexation Agreement. IRWD shall retain capacity ownership in the water system not needed to serve the OPAMWC service area, as provided for in the Annexation Agreement. The foregoing notwithstanding, well and well capacity ownership will be made subject to alternative ownership arrangements as may be necessary to meet the requirements of Orange County Water District without impairing the optimal utilization of the wells or the capacity rights

described herein. City will be obligated to operate the acquired facilities in which IRWD retains and utilizes capacity, subject to emergency, facility destruction, regulatory requirements and other appropriate exceptions. IRWD will reimburse the City of Orange for costs associated with the operation and maintenance of the acquired facilities on a pro-rata basis. The foregoing will be detailed in an agreement to be entered into by IRWD and Orange prior to the City's Annexation. ✓

Conditions 4(B) and (D) above shall apply to water service. Condition 4(C) is applicable to sewer service.

Condition No. 5 – Annexation of Future Development Parcels within the Former OPAMWC Service Area to the City of Orange

IRWD will cooperate to transfer service responsibility for any parcels that are formerly served by the OPAMWC and undeveloped as of the effective date of the Annexation ("Future Development Parcels") when such parcels are located in the City of Orange and can be more logically served from City water and sewer systems. These transfers would be evaluated on a case-by-case basis pursuant to mutual agreement of the City and IRWD and in accordance with the 1979 Service Area Agreement, and would require landowner consent. Any transfer of service responsibility for Future Development Parcels to the City will require that the City assume both water and sewer service, and secure detachment of the parcels from IRWD through LAFCO. In addition, such transfer will result in no negative financial or operational impacts to IRWD or to the customers formerly served by OPAMWC. Any subsequent agreement(s) between IRWD and the City regarding changes in the service area boundary to transfer service responsibility for Future Development Parcels will require executing an amendment to the 1979 Settlement Agreement between OPAMWC and the City of Orange, and will also be subject to the following: ✓

(A) Protection of the Acquisition Balance. Under the Annexation Agreement, IRWD will acquire the OPAMWC stock and will provide a means for the OPAMWC customers to correct deficiencies in the water system and to make a contribution and obtain participation in the IRWD replacement fund to pay for refurbishments that may be needed in such system in the future, by advancing the cost thereof (the "Acquisition Balance" as defined in the Annexation Agreement) and recovering such amount through a water rate differential borne by all former OPAMWC customers. Any transfer of service responsibility for Future Development Parcels to the City shall be conditioned upon the payment to IRWD by the City, as the new water service provider, of the amount representing the fractional share of the then-remaining Acquisition Balance attributable to the future development parcels.

(B) Lost Fixed Charges. In addition to compensation for the loss of water rate differentials that will retire the Acquisition Balance, transfer of service responsibility for Future Development Parcels to the City will result in the loss of future fixed meter charge

Condition No. 7 – Sewer Service

Sewer service will be provided in the annexing area at the request of area residents, subject to: (1) successful completion of the merger of OPAMWC; (2) successful annexation to OCSD; and (3) IRWD's investigation of the physical, institutional, and financial feasibility of providing sewer collection service to all or a part of the annexing area desiring such service, and if found to be feasible, development of necessary institutional arrangements and implementation of a financing mechanism to fund the required facilities that is acceptable to the residents of the service area, design and construction of sewer facilities. Within twelve (12) months of the effective date of the Annexation, IRWD shall provide and activate IRWD sewer service to the properties within Planning Area No. 156 currently served by the City pursuant to out of area sewer service agreements ("Out of Area Agreements"). Prior to said activation, IRWD would acquire sewer system facilities or capacity owned by the City of Orange or other owners, as needed, based upon replacement value less depreciation or other method as specified by existing Out of Area Agreements. Upon said activation, IRWD shall be the City's successor to City's right and obligation to provide sewer service under each Out of Area Agreement, City shall retain the right to receive any then accrued and unpaid sums due from any customer and shall retain and discharge, prior to activation of service, any obligations for sums owed to any customer under such Out of Area Agreement, and the Agreement shall be extinguished.

Condition No. 8 – Effective Date

The effective date of the Annexation shall be the date of recordation which shall generally correspond to the effective date of the merger of OPAMWC into IRWD's limited liability company, as such date is established by the filing of the certificate of merger. The effectiveness of any separate or concurrent annexation to OCSD of the portion of the herein subject territory which is not already within OCSD, shall be conditioned upon the effectiveness of the Annexation and the receipt of IRWD's commitment to be the local sewer service provider.

Condition No. 9 – Coordination of Groundwater Production, Monitoring and Mitigation of Impacts from New or Upgraded Wells

The Second Amended Agreement between the City of Orange and IRWD (dated August 28, 2006) regarding water service to the SHII/East Orange Area, provides that any municipal groundwater production wells operated by IRWD within the Sphere of Influence of the City of Orange shall only serve water customers within the Sphere of Influence of the City of Orange (to be determined on the basis of water accounting, showing no net export) unless otherwise authorized by the City of Orange's prior written consent.

In order coordinate groundwater production, monitoring and the mitigation of impacts from new wells, IRWD and the City of Orange shall establish a Joint Groundwater Engineering and Management Committee and shall each appoint one representative and one alternate representative to the Joint Committee. The primary purpose of the Joint Committee shall be to facilitate communication between IRWD and the City of Orange and to cooperatively monitor and evaluate groundwater production and distribution activities in OPAMWC and the SHII/East Orange Area. IRWD and the City of Orange shall give full consideration to all recommendations of the Joint Committee. The Committee shall coordinate its activities and recommendations with the Orange County Water District (OCWD) and shall request OCWD to participate in the Committee's tasks. The Joint Committee shall meet periodically, but at least once a year, to perform such tasks as may be assigned to it by IRWD and the City of Orange from time to time, including, but not limited to, the following:

- Monitoring of groundwater levels and production in the OPAMWC and east Orange area
- Monitoring of water quality in the OPAMWC, east Orange area.
- Reviewing any proposed IRWD and City of Orange well sites for drawdown impact and spacing considerations within OPAMWC and East Orange areas.
- Development of mitigation measures for IRWD and City of Orange wells effected by increased pumping or water quality changes.
- Allocation of cost of groundwater mitigation measures.
- Development of programs to augment groundwater production in the east Orange area.

Appendix C
Air Quality Calculations

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\Work\IRWD\OPA Wells\Analysis\IRWD OPA Wells.urb924

Project Name: IRWD OPA Wells

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2011 TOTALS (lbs/day unmitigated)	2.86	28.42	12.93	0.00	2.21	1.18	3.38	0.46	1.08	1.54	5,489.22
2012 TOTALS (lbs/day unmitigated)	4.03	36.07	17.91	0.01	2.21	1.63	3.28	0.46	1.50	1.51	6,792.06
2013 TOTALS (lbs/day unmitigated)	3.82	32.75	17.79	0.00	0.02	1.26	1.27	0.01	1.16	1.16	6,792.04

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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Time Slice 7/1/2011-8/31/2011 Active Days: 44	1.64	12.35	8.32	<u>0.00</u>	0.02	0.80	0.82	0.01	0.74	0.74	1,535.66
Building 07/01/2011-08/31/2011	1.64	12.35	8.32	0.00	0.02	0.80	0.82	0.01	0.74	0.74	1,535.66
Building Off Road Diesel	1.49	10.93	6.10	0.00	0.00	0.74	0.74	0.00	0.68	0.68	1,111.56
Building Vendor Trips	0.12	1.35	0.98	0.00	0.01	0.06	0.06	0.00	0.05	0.05	264.83
Building Worker Trips	0.04	0.07	1.25	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.27
Time Slice 9/1/2011-9/30/2011 Active Days: 22	<u>2.86</u>	23.49	<u>12.93</u>	0.00	<u>2.21</u>	<u>1.18</u>	<u>3.38</u>	<u>0.46</u>	<u>1.08</u>	<u>1.54</u>	2,371.69
Fine Grading 09/01/2011-09/30/2011	2.86	23.49	12.93	0.00	2.21	1.18	3.38	0.46	1.08	1.54	2,371.69
Fine Grading Dust	0.00	0.00	0.00	0.00	2.20	0.00	2.20	0.46	0.00	0.46	0.00
Fine Grading Off Road Diesel	2.83	23.44	11.96	0.00	0.00	1.17	1.17	0.00	1.08	1.08	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.06	0.98	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.37
Time Slice 10/3/2011-11/30/2011 Active Days: 43	2.78	<u>28.42</u>	11.42	0.00	0.00	1.07	1.07	0.00	0.98	0.98	<u>5,489.22</u>
Trenching 10/01/2011-11/30/2011	2.78	28.42	11.42	0.00	0.00	1.07	1.07	0.00	0.98	0.98	5,489.22
Trenching Off Road Diesel	2.75	28.38	10.68	0.00	0.00	1.07	1.07	0.00	0.98	0.98	5,395.95
Trenching Worker Trips	0.02	0.04	0.73	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.28
Time Slice 12/1/2011-12/30/2011 Active Days: 22	1.82	15.81	9.09	<u>0.00</u>	0.02	0.80	0.82	0.01	0.74	0.75	2,547.98
Building 12/01/2011-08/31/2012	1.82	15.81	9.09	0.00	0.02	0.80	0.82	0.01	0.74	0.75	2,547.98
Building Off Road Diesel	1.66	14.39	6.87	0.00	0.00	0.74	0.74	0.00	0.69	0.69	2,123.88
Building Vendor Trips	0.12	1.35	0.98	0.00	0.01	0.06	0.06	0.00	0.05	0.05	264.83
Building Worker Trips	0.04	0.07	1.25	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.27

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Time Slice 1/2/2012-8/14/2012 Active Days: 162	1.72	14.34	8.82	0.00	0.02	0.71	0.73	0.01	0.65	0.66	2,547.96
Building 12/01/2011-08/31/2012	1.72	14.34	8.82	0.00	0.02	0.71	0.73	0.01	0.65	0.66	2,547.96
Building Off Road Diesel	1.58	13.07	6.76	0.00	0.00	0.66	0.66	0.00	0.61	0.61	2,123.88
Building Vendor Trips	0.11	1.20	0.90	0.00	0.01	0.05	0.06	0.00	0.04	0.05	264.83
Building Worker Trips	0.04	0.07	1.16	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.25
Time Slice 8/15/2012-8/31/2012 Active Days: 13	3.55	25.22	17.31	<u>0.01</u>	0.03	<u>1.63</u>	1.66	0.01	<u>1.50</u>	<u>1.51</u>	3,771.71
Asphalt 08/15/2012-08/31/2012	1.83	10.89	8.49	0.00	0.01	0.92	0.93	0.00	0.85	0.85	1,223.75
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.72	10.64	6.84	0.00	0.00	0.91	0.91	0.00	0.84	0.84	979.23
Paving On Road Diesel	0.01	0.16	0.06	0.00	0.00	0.01	0.01	0.00	0.01	0.01	26.92
Paving Worker Trips	0.05	0.09	1.59	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.61
Building 12/01/2011-08/31/2012	1.72	14.34	8.82	0.00	0.02	0.71	0.73	0.01	0.65	0.66	2,547.96
Building Off Road Diesel	1.58	13.07	6.76	0.00	0.00	0.66	0.66	0.00	0.61	0.61	2,123.88
Building Vendor Trips	0.11	1.20	0.90	0.00	0.01	0.05	0.06	0.00	0.04	0.05	264.83
Building Worker Trips	0.04	0.07	1.16	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.25
Time Slice 9/3/2012-10/31/2012 Active Days: 43	1.09	7.86	5.80	0.00	1.27	0.54	1.81	0.27	0.50	0.76	1,001.25
Demolition 09/01/2012-10/31/2012	1.09	7.86	5.80	0.00	1.27	0.54	1.81	0.27	0.50	0.76	1,001.25
Fugitive Dust	0.00	0.00	0.00	0.00	1.26	0.00	1.26	0.26	0.00	0.26	0.00
Demo Off Road Diesel	0.98	6.77	4.49	0.00	0.00	0.49	0.49	0.00	0.45	0.45	700.30
Demo On Road Diesel	0.08	1.04	0.40	0.00	0.01	0.04	0.05	0.00	0.04	0.04	176.60
Demo Worker Trips	0.03	0.05	0.91	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.35

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Time Slice 11/1/2012-11/30/2012 Active Days: 22	2.72	22.00	12.42	0.00	<u>2.21</u>	1.08	<u>3.28</u>	<u>0.46</u>	0.99	1.45	2,371.66
Fine Grading 11/01/2012-11/30/2012	2.72	22.00	12.42	0.00	2.21	1.08	3.28	0.46	0.99	1.45	2,371.66
Fine Grading Dust	0.00	0.00	0.00	0.00	2.20	0.00	2.20	0.46	0.00	0.46	0.00
Fine Grading Off Road Diesel	2.69	21.95	11.51	0.00	0.00	1.07	1.07	0.00	0.99	0.99	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.05	0.91	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.35
Time Slice 12/3/2012-12/31/2012 Active Days: 21	<u>4.03</u>	<u>36.07</u>	<u>17.91</u>	0.00	0.01	1.43	1.44	0.00	1.31	1.32	<u>6,792.06</u>
Trenching 12/01/2012-01/31/2013	4.03	36.07	17.91	0.00	0.01	1.43	1.44	0.00	1.31	1.32	6,792.06
Trenching Off Road Diesel	4.00	36.01	16.78	0.00	0.00	1.42	1.42	0.00	1.31	1.31	6,636.63
Trenching Worker Trips	0.03	0.06	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.01	155.43
Time Slice 1/1/2013-1/31/2013 Active Days: 23	<u>3.82</u>	<u>32.75</u>	<u>17.79</u>	0.00	0.01	<u>1.26</u>	<u>1.27</u>	0.00	<u>1.16</u>	<u>1.16</u>	<u>6,792.04</u>
Trenching 12/01/2012-01/31/2013	3.82	32.75	17.79	0.00	0.01	1.26	1.27	0.00	1.16	1.16	6,792.04
Trenching Off Road Diesel	3.79	32.69	16.74	0.00	0.00	1.25	1.25	0.00	1.15	1.15	6,636.63
Trenching Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.01	155.41
Time Slice 2/1/2013-10/31/2013 Active Days: 195	1.60	13.06	8.58	<u>0.00</u>	<u>0.02</u>	0.62	0.64	<u>0.01</u>	0.57	0.57	2,547.94
Building 02/01/2013-10/31/2013	1.60	13.06	8.58	0.00	0.02	0.62	0.64	0.01	0.57	0.57	2,547.94
Building Off Road Diesel	1.47	11.93	6.67	0.00	0.00	0.57	0.57	0.00	0.53	0.53	2,123.88
Building Vendor Trips	0.10	1.06	0.83	0.00	0.01	0.04	0.05	0.00	0.04	0.04	264.83
Building Worker Trips	0.03	0.06	1.08	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.23

Phase Assumptions

Phase: Demolition 9/1/2012 - 10/31/2012 - Residence Demo

Building Volume Total (cubic feet): 30000

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Building Volume Daily (cubic feet): 3000

On Road Truck Travel (VMT): 41.67

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Fine Grading 9/1/2011 - 9/30/2011 - OPA Well 1 Site Preparation

Total Acres Disturbed: 0.7

Maximum Daily Acreage Disturbed: 0.18

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 11/1/2012 - 11/30/2012 - OPA Well 2 Site Preparation

Total Acres Disturbed: 0.7

Maximum Daily Acreage Disturbed: 0.18

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Phase: Trenching 10/1/2011 - 11/30/2011 - OPA Well 1 Drilling

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 24 hours per day
- 1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 4 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

Phase: Trenching 12/1/2012 - 1/31/2013 - OPA Well 2 Drilling

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 24 hours per day
- 2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 8/15/2012 - 8/31/2012 - Default Paving Description

Acres to be Paved: 0.23

Off-Road Equipment:

- 4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
- 1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
- 1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 12/1/2011 - 8/31/2012 - OPA Well 1 Final Construction

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 6 hours per day
- 1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day
- 2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Building Construction 7/1/2011 - 8/31/2011 - Deconstruction of OPA Well 3

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Off-Road Equipment:

- 1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day
- 2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
- 1 Pumps (53 hp) operating at a 0.74 load factor for 6 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Building Construction 2/1/2013 - 10/31/2013 - OPA Well 2 Final Construction

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 6 hours per day
- 1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day
- 2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\Work\IRWD\OPA Wells\Analysis\IRWD OPA Wells.urb924

Project Name: IRWD OPA Wells

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2011 TOTALS (tons/year unmitigated)	0.15	1.32	0.67	0.00	0.02	0.06	0.09	0.01	0.06	0.06	205.92
2012 TOTALS (tons/year unmitigated)	0.26	2.11	1.28	0.00	0.05	0.11	0.16	0.01	0.10	0.11	349.83
2013 TOTALS (tons/year unmitigated)	0.20	1.65	1.04	0.00	0.00	0.07	0.08	0.00	0.07	0.07	326.53

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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2013	0.20	1.65	1.04	0.00	0.00	0.07	0.08	0.00	0.07	0.07	326.53
Trenching 12/01/2012-01/31/2013	0.04	0.38	0.20	0.00	0.00	0.01	0.01	0.00	0.01	0.01	78.11
Trenching Off Road Diesel	0.04	0.38	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	76.32
Trenching Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
Building 02/01/2013-10/31/2013	0.16	1.27	0.84	0.00	0.00	0.06	0.06	0.00	0.06	0.06	248.42
Building Off Road Diesel	0.14	1.16	0.65	0.00	0.00	0.06	0.06	0.00	0.05	0.05	207.08
Building Vendor Trips	0.01	0.10	0.08	0.00	0.00	0.00	0.01	0.00	0.00	0.00	25.82
Building Worker Trips	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.52

Phase Assumptions

Phase: Demolition 9/1/2012 - 10/31/2012 - Residence Demo

- Building Volume Total (cubic feet): 30000
- Building Volume Daily (cubic feet): 3000
- On Road Truck Travel (VMT): 41.67
- Off-Road Equipment:
 - 1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day
 - 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day
 - 2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Fine Grading 9/1/2011 - 9/30/2011 - OPA Well 1 Site Preparation

- Total Acres Disturbed: 0.7
- Maximum Daily Acreage Disturbed: 0.18
- Fugitive Dust Level of Detail: Default
- 12.22 lbs per acre-day
- On Road Truck Travel (VMT): 0
- Off-Road Equipment:
 - 1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day
 - 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

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1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 11/1/2012 - 11/30/2012 - OPA Well 2 Site Preparation

Total Acres Disturbed: 0.7

Maximum Daily Acreage Disturbed: 0.18

Fugitive Dust Level of Detail: Default

12.22 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 10/1/2011 - 11/30/2011 - OPA Well 1 Drilling

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 24 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

Phase: Trenching 12/1/2012 - 1/31/2013 - OPA Well 2 Drilling

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 24 hours per day

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 8/15/2012 - 8/31/2012 - Default Paving Description

Acres to be Paved: 0.23

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Off-Road Equipment:

- 4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
- 1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
- 1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 12/1/2011 - 8/31/2012 - OPA Well 1 Final Construction

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 6 hours per day
- 1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day
- 2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Building Construction 7/1/2011 - 8/31/2011 - Deconstruction of OPA Well 3

Off-Road Equipment:

- 1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day
- 2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
- 1 Pumps (53 hp) operating at a 0.74 load factor for 6 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Building Construction 2/1/2013 - 10/31/2013 - OPA Well 2 Final Construction

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 6 hours per day
- 1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day
- 2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Table 6. Total estimated GHG emissions from construction

Year of Construction	Input Emissions					
	Off Road Emissions			On road Emissions		
	CO2 (metric tons/yr)	CH4 (metric tons/yr)	N2O (metric tons/yr)	CO2 (metric tons/yr)	Other (metric tons/yr)	CO2e (metric tons/yr)
2011	171.0	0.0	0.0	15.8	0.8	189.2
2012	273.7	0.0	0.0	43.7	2.3	322.1
2013	257.1	0.0	0.0	39.1	2.1	300.6
Total Construction Emissions	701.8	0.0	0.0	98.6	5.2	812.0

Sources: URBEMIS 2007; CCAR 2008. 27.1

Diesel Fuel	CO2	CH4	N2O
kg CO2/gal diesel	10.15	0.00058	0.00026
g/gal diesel construction equip		0.58	0.26
ratio	1	5.71429E-05	2.56158E-05

Source: CH4 and N2O from Construction

tons/metric ton	Percent other	GAS	CH4	N2O
0.90718474	5.00%	GWP	21	310

Greenhouse Gas (GHG) Emissions Calculations

Project Name: IRWD OPA Wells

Indirect Greenhouse Gas Emissions From Project Use of Electricity (Power Plant Emissions)

Estimated Project Annual Electrical Use: 5,148,000 kWh/year
5,148 mWh/year

Indirect GHG	Emission Factor (lb/mWh) ¹	Project Electricity (mWh)	GHGs (metric tons)	CO2 Equivalent Factor ²	CO2 Equivalent Emissions (metric tons)
Carbon Dioxide (CO2)	724.12	5,148	1,691	1	1,691
Nitrous Oxide (N2O)	0.0081	5,148	0.019	310	6
Methane (CH4)	0.0302	5,148	0.071	21	1
Total Indirect GHG Emissions from Project Electricity Use =					1,698

Conversion:

Pounds per Metric Ton 2204.6226

Sources:

- 1: California Climate Action Registry. General Reporting Protocol Version 3.1. Appendix C Table C.2
- 2: California Climate Action Registry. General Reporting Protocol Version 3.1. Appendix C Table C.1

Appendix D
OCWD Basin Model Runs



DRAFT #2
TECHNICAL MEMORANDUM

DATE: May 24, 2011
TO: Patricia Uematsu (IRWD), Bob Baehner (City of Orange)
FROM: Tim Sovich, Roy Herndon

SUBJECT: OCWD Basin Model Runs for Proposed Orange Park Acres Pumping

This technical memorandum was commissioned by the Joint Groundwater and Engineering Committee comprised of IRWD, City of Orange, and OCWD, to document the input assumptions and to summarize the output results of computer simulations conducted by OCWD staff. The OCWD basin-wide groundwater flow model (basin model) was used to forecast the incremental water level decline (drawdown) resulting from the proposed pumping increase by IRWD at the Orange Park Acres (OPA) site in the City of Orange. Two new wells are proposed on the OPA site, one to replace existing well “OPWC” and a second well to accommodate anticipated future growth.

Two 2035 baseline conditions were formulated for this analysis, one at a lower basin recharge volume (supporting a basin production percentage (BPP) of approximately 52%) and one at a higher basin recharge volume (supporting a BPP of 75%). The lower recharge baseline condition is based on recent projections by OCWD of limited water supplies for recharging the groundwater basin in 2035, especially reduced Santa Ana River (SAR) base flows based on SAWPA projections of increased reclamation in the upper SAR watershed. The higher recharge baseline condition incorporates more optimistic future water supply projections that would support a higher BPP so that a potential maximum amount of OPA pumping can be quantified and evaluated. Both baseline conditions assumed that OPA pumping without the proposed expansion was 700 AFY, which is representative of the current average production from existing well “OPWC” at the OPA site.

A total of four model runs were conducted:

- Run 1: Low-BPP baseline with OPA pumping of 700 AFY
- Run 2: Low-BPP scenario with future OPA pumping of 4,256 AFY
- Run 3: High-BPP baseline with OPA pumping of 700 AFY
- Run 4: High-BPP scenario with future OPA pumping of 6,210 AFY

For all four model runs, OPA pumping was assumed to follow IRWD’s existing demand curve, i.e., OPA pumping was varied on a monthly basis, with somewhat more pumping in the summer and less in the winter. In other words, the annual OPA pumping

Tech Memo Draft #2 – OPA Basin Model Runs

amounts for each of the four runs listed above were multiplied by the monthly IRWD demand percentages to obtain the monthly OPA pumping amounts used in the model. The IRWD monthly demand percentages are listed below:

- Jan: 6.17%
- Feb: 5.80%
- Mar: 6.26%
- Apr: 7.54%
- May: 10.05%
- Jun: 10.11%
- Jul: 11.53%
- Aug: 10.81%
- Sep: 10.83%
- Oct: 8.15%
- Nov: 6.71%
- Dec: 6.04%

Since the groundwater produced from the future OPA wells is not expected to require any water quality treatment based on existing well OPWC, the OPA pumping is not expected to qualify for a Basin Equity Assessment (BEA) exemption and thus was assumed to be part of IRWD's pumping below the BPP for all model runs rather than being above the BPP.

The two proposed wells at the OPA site were assumed to have the same screened interval as existing well OPWC. Therefore, the vertical distribution of future OPA pumping was assumed to be the same as existing well OPWC: 98.5% from the Principal aquifer (basin model layer 2) and only 1.5% from the Deep aquifer (basin model layer 3). Existing well OPWC is predominantly screened in the Principal aquifer but does extend slightly down into the Deep aquifer. However, since the Deep aquifer has a much lower permeability than the Principal aquifer in this area, the flow contribution from the Deep aquifer is estimated to be nearly negligible at 1.5%. Since nearly all (98.5%) of both the existing and future OPA pumping modeled herein is from the Principal aquifer, the maximum drawdown will also be in the Principal aquifer. Furthermore, nearby wells of concern (e.g., existing City of Orange production wells) for where OPA-induced drawdown is to be evaluated, are also screened primarily in the Principal aquifer. Therefore, only Principal aquifer (model layer 2) simulation results are presented in this technical memorandum. Model results for layers 1 and 3 were reviewed, and the simulated drawdown was verified to be significantly less than in model layer 2.

After OCWD had completed these four model runs, IRWD staff refined their estimate of average annual OPA water demand (and thus proposed pumping) for OPA to be 4,800 AFY. Since the revised future OPA pumping estimate of 4,800 AFY is relatively close to the modeled low-BPP case of 4,256 AFY (Run 2), the drawdown results from Run 2 were scaled up based on the proportional increase in total OPA pumping rather than conducting additional model runs. This approach is technically valid since drawdown is

Tech Memo Draft #2 – OPA Basin Model Runs

linearly proportional to pumping. The calculated results for this revised case are discussed later in this memo and summarized in Table 2.

Upon review of the draft version of this technical memo, City of Orange staff subsequently requested that OCWD evaluate the predicted drawdown for three different future OPA annual pumping amounts of 4,645 AFY, 5,107 AFY, and 6,129 AFY. Since these three OPA pumping amounts are all within the range of the two previously modeled amounts of 4,256 and 6,210 AFY, the same approach as described above was used to factor the previously modeled drawdown amounts for these three new cases rather than conducting new model runs. The calculated results for these three new cases are discussed later in this memo and summarized in Table 2.

Background Conditions Common to All Four Model Runs

2035 water demand projections were used from the producer survey conducted by MWDOC during spring 2008. These demands are approximately 91,500 AFY more than in 2008-09. Annual groundwater production is calculated by multiplying each producer's 2035 water demand projection by the designated BPP for each scenario.

All model runs presented herein assume average hydrology but with a low-basin accumulated overdraft condition of approximately 500,000 AF. Basin-wide production and recharge are sufficiently balanced on an annual basis such that the model-calculated storage change is negligibly small over the course of each model run. Each model run is simulated for 9 years, with each of the 9 years having identical production and recharge input conditions for the entire basin model area, including 9 years of proposed OPA pumping. Carrying out the model runs for 9 years allowed sufficient time for the OPA-induced drawdown to reach its maximum value and stabilize before the end of the model run.

All model runs assumed no In-Lieu Program for 2035, since MWD is not expected to have this surplus water available in most years.

All model runs included existing groundwater quality treatment projects. The amount of pumping above the BPP that was used for the low-BPP model runs is listed below. For the high-BPP model runs, these pumping amounts were reduced slightly to prevent these 3 producers' overall pumping from being greater than their demand.

- IRWD Deep Aquifer Treatment System (DATS): 8,000 AFY
- IRWD Irvine Desalter Project (IDP): 8,593 AFY
- MCWD Colored Water (MCWD wells 6 and 11): 8,700 AFY
- Tustin Nitrate Removal: 1,400 AFY; Tustin Desalter Project: 2,800 AFY

The four model runs completed for this drawdown analysis are summarized below:

Run 1: OPA Baseline Pumping of 700 AFY for Low Recharge Case (52% BPP)

This 2035 baseline scenario used a lower basin recharge volume, which supports a BPP of 51.5%, approximately 10% lower than today's 62% BPP. As was mentioned above, water supplies available for groundwater recharge in 2035 may be reduced, most markedly SAR base flow due to increased conservation and reclamation in the upper SAR watershed. Average hydrology is assumed for purposes of defining incidental recharge and storm flow. Baseline Run 1 includes 18,000 AFY of Mid-Basin Injection supplied by GWR System Phase 2 expansion.

A model-simulated groundwater elevation contour map for model layer 2 (Principal aquifer), representing August 15 of the final year of Run 1, is included in the appendix (Figure A-1).

Run 2: Future OPA Pumping of 4,256 AFY for Low Recharge Case (52% BPP)

Run 2 had all of the same background conditions as baseline Run 1 so that the incremental effect of adding the future OPA pumping could be quantified. The 4,256 AFY of future OPA pumping represented the maximum amount that IRWD could pump while staying within the 51.5% BPP after including all higher priority IRWD pumping. The breakdown of IRWD pumping is shown in Table 1. Two IRWD baseline wells (IRWD-106 and IRWD-53) were removed from Run 2 to offset the OPA pumping increase, thereby keeping total IRWD pumping unchanged from the baseline Run 1.

Figure 1 shows the difference in simulated groundwater elevations between Run 2 and Run 1, representing the incremental water level change due solely to the future OPA increase of **3,556 AFY** above the baseline. A negative water level change represents a decline in simulated water levels from baseline Run 1 to Run 2. The model-predicted water level change in Figure 1 represents August 15 of the final year of the model run (year 9), at which time the water level decline was at a maximum due to the assumed seasonal distribution of future OPA pumping. The maximum water level change at the OPA site was approximately -32 feet (32 feet of drawdown) and reduced radially outward from the site. The drawdown was approximately 8 feet at the nearest large system production wells, O-23 and O-24. Table 2 shows the model-predicted drawdown at other nearby production wells.

The simulated water level rise in the Irvine area (Figure 1) is a by-product of having to remove wells IRWD-106 and IRWD-53 from Run 2 to offset the increase in OPA pumping.

A model-simulated groundwater elevation contour map for model layer 2 (Principal aquifer), representing August 15 of the final year of Run 2, is included in the appendix (Figure A-2).

Run 3: OPA Baseline Pumping of 700 AFY for High Recharge Case (75% BPP)

A second baseline condition was formulated using a higher basin recharge volume, which supports a BPP of 75% and is considered to be a future maximum BPP. Using a higher-recharge/maximum-BPP baseline condition subsequently enabled modeling the maximum amount of future OPA pumping for Run 4. More optimistic 2035 water supply projections for SAR base flow and storm flow were assumed for this baseline condition. Average hydrology was still assumed for incidental recharge.

Baseline Run 3 included Phase 3 GWR System expansion of an additional 10,000 AFY which was assumed to be recharged via Mid-Basin Injection. Run 3 also assumed a more optimistic projection of MWD imported water purchases (36,000 AFY) for direct replenishment. These optimistic water supply assumptions were made for the purpose of developing a baseline condition and future scenario to support a high BPP of 75%.

As with baseline Run 1, baseline Run 3 included 700 AFY of pumping from existing well OPWC at the OPA site. To accommodate the higher BPP of 75%, Run 3 also includes additional future pumping for IRWD: wells 21, 22, 51, 52, 53, and a future Tustin Legacy well. Table 1 shows the assumed production amounts for IRWD wells.

A model-simulated groundwater elevation contour map for model layer 2 (Principal aquifer), representing September 15 of the final year of Run 3, is included in the appendix (Figure A-3).

Run 4: Future OPA Pumping of 6,210 AFY for High Recharge Case (75% BPP)

Run 4 had all of the same background conditions as baseline Run 2 so that the incremental effect of adding the future OPA pumping could be quantified. The 6,210 AFY of future OPA pumping represented the maximum annual amount specified by IRWD staff at the time of this modeling. To accommodate the future OPA pumping increase of 5,510 AFY above the baseline, the Tustin Legacy well was removed, and wells 21 and 22 were both reduced, thereby keeping the total IRWD pumping volume the same as baseline Run 3. Table 1 shows the assumed production amounts for IRWD wells.

Figure 2 shows the difference in simulated groundwater elevations between Run 4 and Run 3, representing the incremental water level change due solely to the future OPA increase of **5,510 AFY** above the baseline. A negative water level change represents a decline in simulated water levels from baseline Run 3 to Run 4. The model-predicted water level change in Figure 2 represents September 15 of the final year of the model run (year 9), at which time the water level decline was at a maximum due to the assumed seasonal distribution of future OPA pumping. The maximum water level change at the OPA site was approximately -49 feet (49 feet of drawdown) and reduced radially outward from the site as before. The drawdown was approximately 12 feet at the nearest large system production wells, O-23 and O-24. Table 2 shows the model-predicted drawdown at other nearby production wells.

As before, the simulated water level rise in the Irvine/Tustin area (Figure 2) is a by-product of having removed and/or reduced IRWD wells from Run 4 that were included in baseline Run 3, so as to offset the OPA pumping increase and to keep IRWD total pumping constant between runs 3 and 4. Therefore, this water level rise is a by-product of the pumping assumptions.

To illustrate the seasonal variation in drawdown, Figure 3 shows the simulated water levels for the last 12 months (year 9) of all four model runs at nearby production well EOCW-W. The simulated water level difference from Run 1 to 2 and from Run 3 to 4 is largest in August/September and smallest in February, March, and April, as expected.

A model-simulated groundwater elevation contour map for model layer 2 (Principal aquifer), representing September 15 of the final year of Run 4, is included in the appendix (Figure A-4).

Drawdown Calculations for Other Potential Future OPA Pumping Amounts

As mentioned earlier, IRWD staff recently revised their estimate of average annual OPA water demand to 4,800 AFY. Rather than conducting a new model run with an OPA pumping amount of 4,800 AFY, drawdown results from Run 2 (4,256 AFY) were multiplied by a factor of 1.13 based on the proportional increase in total OPA pumping: $4,800 / 4,256 = 1.13$. The total OPA pumping of 4,800 AFY represents an increase of 4,100 AFY above the baseline OPA pumping amount of 700 AFY.

Figure 4 shows the calculated drawdown contours based on scaling up the maximum drawdown from Run 2 by a factor of 1.13. Since this factor is very close to one, the calculated drawdown is only slightly more than Run 2 and the pattern is essentially the same. The maximum drawdown at the OPA site was 36 feet, as compared to 32 feet in Run 2. At the two nearest production wells O-23 and O-24, the drawdown was 9 feet, as compared to 8 feet in Run 2. Table 2 shows the calculated drawdown at other nearby large system production wells.

Three other proposed OPA pumping amounts were subsequently requested by the City of Orange for this drawdown analysis. As discussed earlier, these three OPA pumping amounts are 4,645 AFY, 5,107 AFY, and 6,129 AFY. All three represent potential future OPA pumping from the two proposed wells at the OPA site. The OPA pumping increase above the baseline is 700 AFY less than the amounts stated above. Since all three proposed OPA pumping amounts are within the range already modeled, the drawdown results from the previous model runs will be factored to obtain the drawdown for these three new cases rather than conducting three new model runs. Table 2 shows the calculated drawdown at nearby large system production wells for these three new cases.

Conclusions and Recommendations

In summary, maximum drawdown simulated in model layer 2 (Principal aquifer) caused by the proposed OPA pumping increase at City of Orange wells 23 and 24 (Orange wells closest to the OPA site) was 8 feet for the low-BPP scenario and 12 feet for the high-BPP scenario. For the other potential OPA pumping cases that were added after the model runs were completed, the calculated drawdown based on factoring the model results ranged between the 8 and 12-foot modeled drawdown results for Orange wells 23 and 24, as expected.

Upon construction and start-up of the first proposed OPA well, and later after the second well is constructed and placed on-line, it is recommended that both static and pumping levels be measured at least monthly at the OPA site. In addition, static water level measurements at nearby monitoring and production wells should be analyzed periodically to estimate the incremental water level decline in the Orange area due to the OPA pumping. However, due to both seasonal and long-term water level fluctuations in the Orange area due to other factors, it may be very difficult to isolate the observed effect of the OPA pumping.

Table 1. IRWD Pumping Distribution for OPA Basin Model Runs

	Run 1	Run 2	Run 3	Run 4
Existing and Future IRWD Wells	Low -BPP Baseline (afy)	Low BPP with Future OPA (afy)	High-BPP Baseline (afy)	High BPP with Future OPA (afy)
Above BPP.....				
DATS	8,000	8,000	8,000	8,000
IDP Potable	4,093	4,093	3,580	3,580
IDP Non-Potable	3,900	3,900	3,900	3,900
IDP SGU	600	600	600	600
Subtotal:	16,593	16,593	16,080	16,080
BPP Pumping.....	51.5%	51.5%	75.0%	75.0%
DRWF	28,000	28,000	28,000	28,000
IDP Potable	0	0	513	513
Well OPWC	700	0	700	0
Well 115	900	900	900	900
OPA (future)	0	4,256	0	6,210
Well 106	1,300	0	1,300	1,300
Well 72	0	0	0	0
Well 51	0	0	2,468	2,468
Well 52	0	0	2,468	2,468
Well 53	2,256	0	2,903	2,903
Well 21	0	0	4,500	2,481
Well 22	0	0	2,900	1,000
Tustin Legacy No.1	0	0	1,591	0
Subtotal:	33,156	33,156	48,242	48,242
Grand Total:	49,749	49,749	64,322	64,322

Table 2. Model-Simulated Drawdown at Nearby Production Wells

	<i>Modeled</i> OPA 4,256 AFY	<i>Modeled</i> OPA 6,210 AFY	<i>Interpolated</i> OPA 4,800 AFY	<i>Interpolated</i> OPA 4,645 AFY	<i>Interpolated</i> OPA 5,107 AFY	<i>Interpolated</i> OPA 6,129 AFY
Large System Production Well	Max Drawdown (ft) ¹ Due to OPA Pumping Increase of 3,556 AFY ²	Max Drawdown (ft) ¹ Due to OPA Pumping Increase of 5,510 AFY ²	Max Drawdown (ft) Due to OPA Pumping Increase of 4,100 AFY ⁴	Max Drawdown (ft) Due to OPA Pumping Increase of 3,945 AFY ⁴	Max Drawdown (ft) Due to OPA Pumping Increase of 4,407 AFY ⁴	Max Drawdown (ft) Due to OPA Pumping Increase of 5,429 AFY ⁵
EOCW-W	5	7	6	5	6	7
O-22	2	4	2	2	2	4
O-23	8	12	9	9	10	12
O-24	8	12	9	9	10	12
O-25	2	4	2	2	2	4
OPWC ³	32	49	36	35	38	49
RHWC-E	2	3	2	2	2	3
SA-38	2	2	2	2	2	2
SID-3	6	8	7	7	7	8
T-PROS	1	0	1	1	1	0
T-YORB	1	2	1	1	1	2

Notes:

1. Model-predicted drawdown due to simulated pumping from two future IRWD Orange Park Acres (OPA) wells located at same site as existing well OPWC).
2. Modeled OPA pumping increase from baseline conditions under low- and high-BPP scenarios:
 3,556 AFY OPA pumping increase (51.5% BPP): 700 AFY baseline up to 4,256 AFY future
 5,510 AFY OPA pumping increase (75.0% BPP): 700 AFY baseline up to 6,210 AFY future
3. Location of maximum regional drawdown is at the OPA site, or at existing well OPWC. The modeled drawdown does not represent localized drawdown in the proposed pumping wells themselves. Rather, the simulated drawdown represents an average over the entire 500-ft grid cell containing the OPA wells.
4. The model-predicted drawdown from the 4,256 AFY OPA scenario was multiplied by a factor representing the proportional increase in OPA pumping:
 $4,800 \text{ AFY} / 4,256 \text{ AFY} = 1.13$
 $4,645 \text{ AFY} / 4,256 \text{ AFY} = 1.09$
 $5,107 \text{ AFY} / 4,256 \text{ AFY} = 1.20$
5. The model-predicted drawdown from the 6,210 AFY OPA scenario was multiplied by 0.99 (6,129 / 6,210), representing the proportional decrease in OPA pumping relative to that model run. Since the OPA pumping amounts only differ by 81 AFY, the drawdown is the same as the modeled 6,210 AFY case.

FIGURE 1
Simulated Water Level Change for 3,556 AFY OPA Pumping Increase

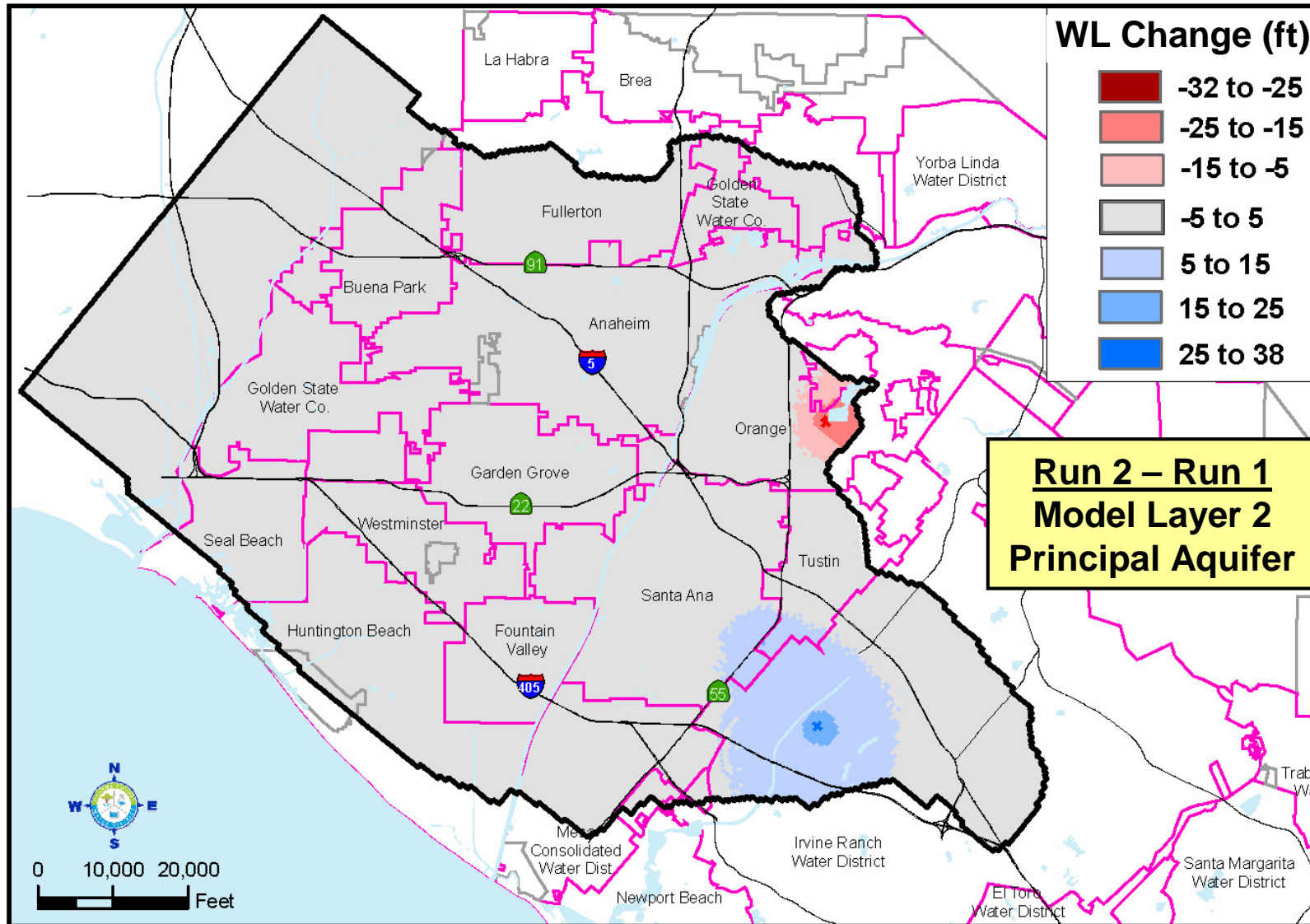


FIGURE 2
Simulated Water Level Change for 5,510 AFY OPA Pumping Increase

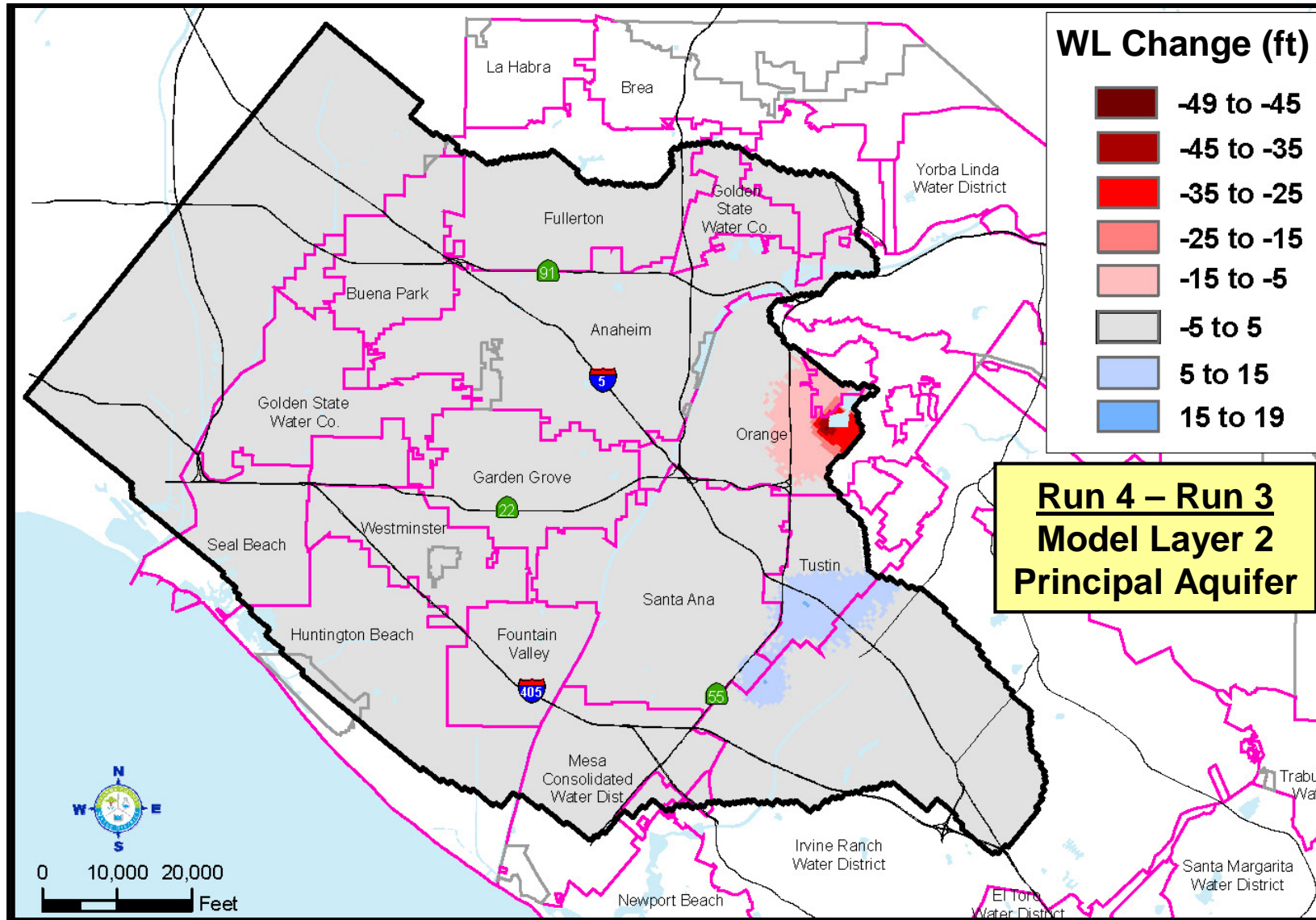
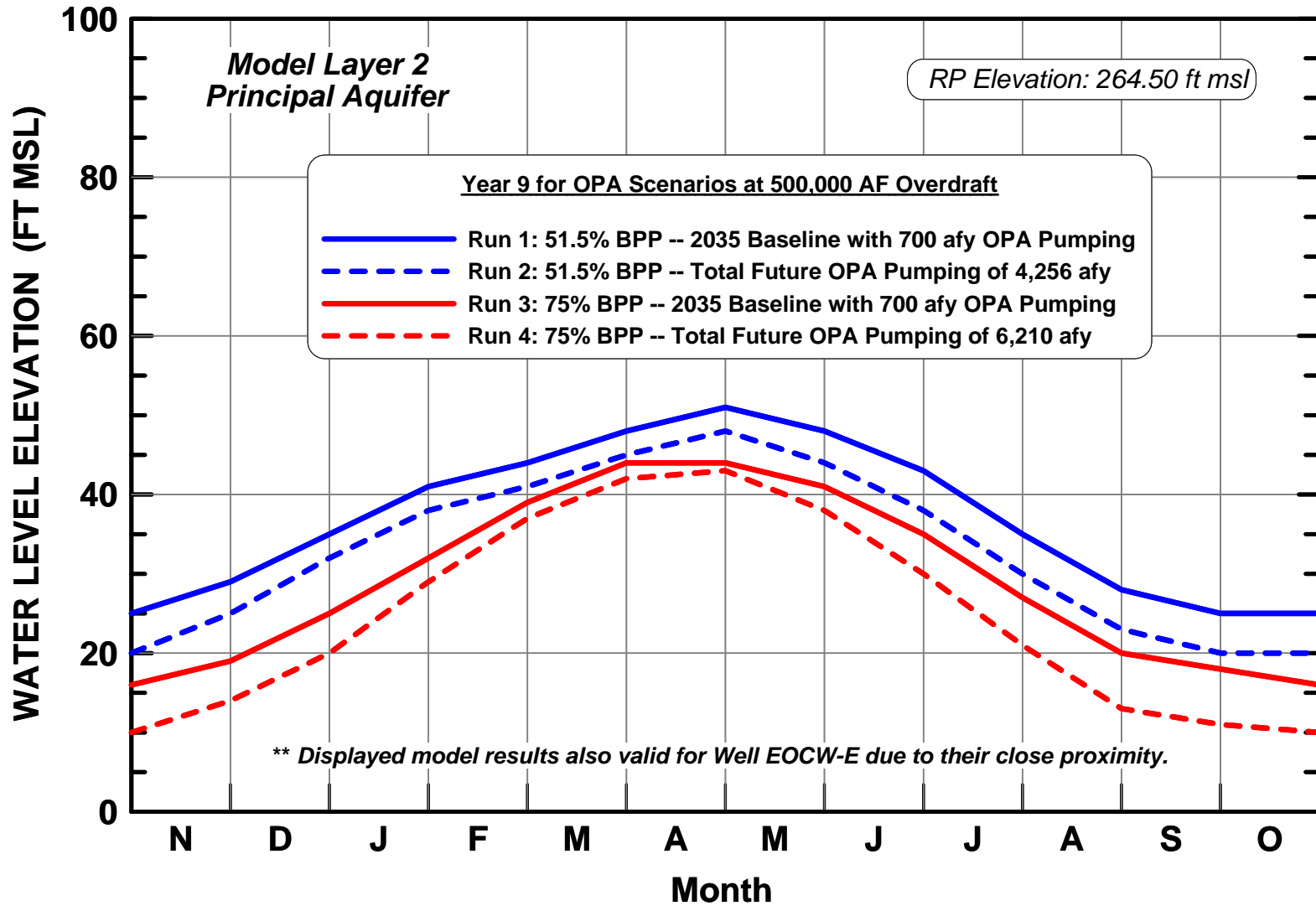
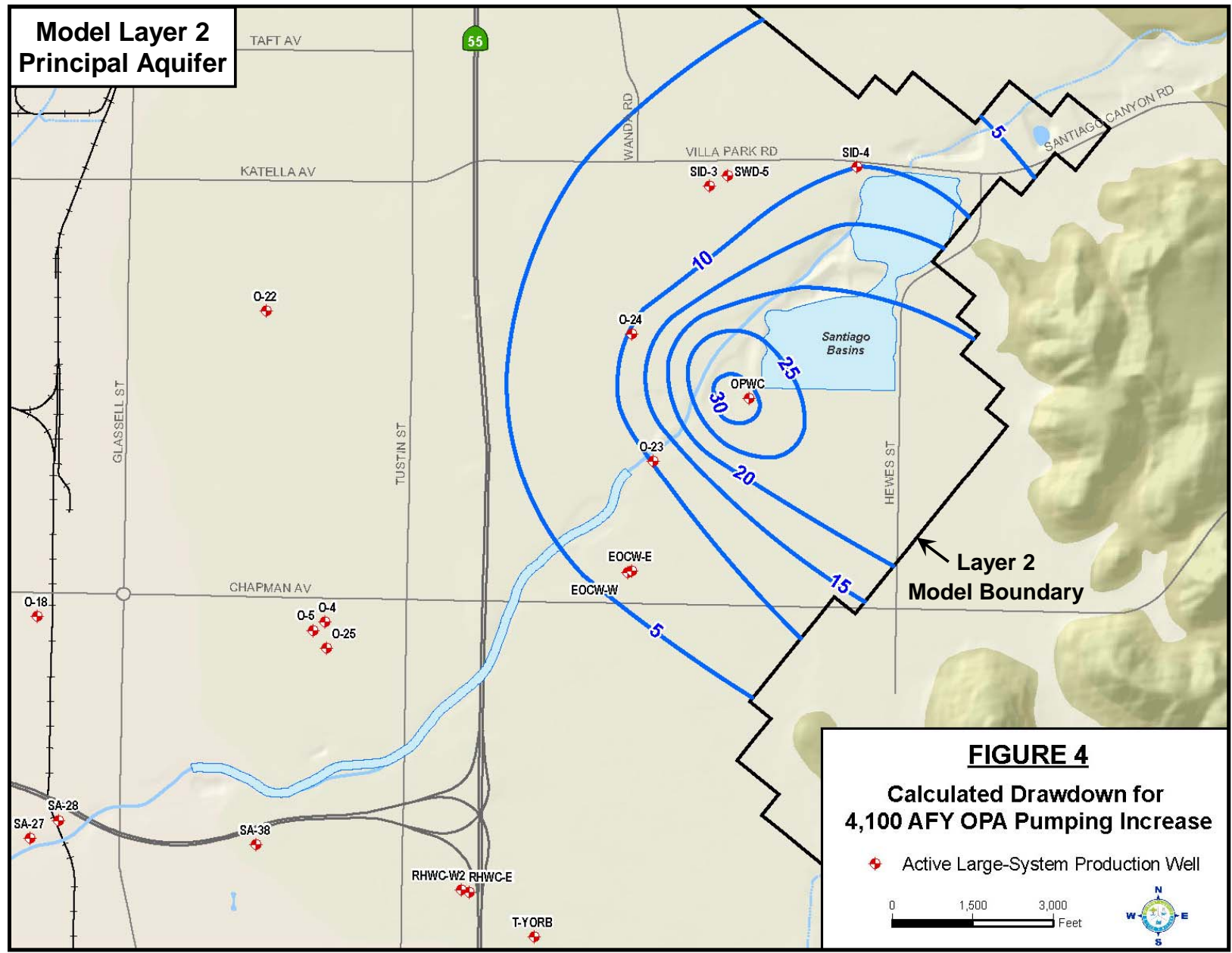


FIGURE 3

Simulated Water Level Elevations Near Production Well EOCW-W **





APPENDIX

Model Layer 2 Simulated Groundwater Elevation Contour Maps for the Four OPA Runs

