Ventura County Grand Jury 2014 - 2015



Final Report

City of Oxnard and its Adjoining Agricultural and Business Water Resources

April 1, 2015

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City of Oxnard and its Adjoining Agricultural and Business Water Resources

Note: See "Glossary" for definitions.

"On the entire history of the world, those nations that have survived and continue to prosper have been the ones successful in providing a continuous and adequate water supply." ~ Arnold Toynbee

Summary

The County of Ventura (County) has a growing population and a robust, diverse economy. Agricultural products are a major element of its economy.

Water is critical to the future of the County and Southern California. The 2014-2015 Ventura County Grand Jury (Grand Jury) was concerned about the current drought and what impact it could have on the County's economy and lifestyle.

The Grand Jury selected the City of Oxnard (Oxnard) to examine how one municipality and its adjoining agricultural area were dealing with water issues. Oxnard was selected because it has had an aggressive water policy for over 15 years. It has the largest city population in the County and has a diversified economy.

Oxnard recognized the problems of increased salinity (salt content) and decreased water availability in the late 1990s and conducted studies to address these issues. In May 2002, Oxnard released the "*GREAT Program Advanced Planning Study*." The primary objective of the study was to propose ways to increase the water supply for Oxnard.

A major component of Groundwater Recovery Enhancement and Treatment (GREAT) was to build a facility, the Advanced Water Purification Facility (AWPF), to further process wastewater from the Oxnard Wastewater Treatment Plant (OWTP). This additional processing would produce "tertiary water"—high-quality, recycled water for use in agriculture, industry, golf courses, and parks. The first of four phases was substantially completed in 2012 at a cost of approximately \$110 million.

For these reasons, the Grand Jury chose to investigate the GREAT program and determine how it could be effectively utilized.

The Grand Jury conducted interviews and examined numerous Internet websites that addressed GREAT. The City of Oxnard website, in particular, was a valuable resource. Additionally, newspaper and magazine articles on the subject were examined.

The Grand Jury found that currently the AWPF is, for most purposes, completed but not operating. Customers for the recycled water have been secured, but construction of additional pipelines to transport water to the newly contracted customers has not been completed. The Grand Jury found that the cost to produce this recycled water is noncompetitive with Oxnard's current suppliers. If the balance of Phase 1 and Phase 2 of GREAT can be funded and completed, the AWPF could produce water at competitive prices.

The Grand Jury found that water needs are not restricted to Oxnard but are countywide issues. These issues are administered by numerous separate, and sometimes competitive, independent entities. There is no overall County organization that has comprehensive regulatory authority over these entities that could compel compliance.

The Grand Jury recommends that the Oxnard City Council (City Council) pursue funding, including additional partnerships and grants, to complete Phase 1 and Phase 2 of the GREAT program. Completion of these phases will substantially increase Oxnard's water supply and make it price competitive with current suppliers. This additional water supply can be sold to other parties and increase Oxnard's revenues.

The Grand Jury recommends that the Oxnard City Council initiate collaboration with and provide assistance to the Fox Canyon Groundwater Management Agency (FCGMA) in establishing a Groundwater Sustainability Plan (GSP) for its aquifer. The GSP will establish regulations and binding consequences for noncompliance. A joint effort could provide a more efficient, sustainable, and equitable process to distribute water throughout the area of the Fox Canyon Aquifer and become a model for the County.

Background

The County has a population of over 800,000 residents distributed in ten incorporated and numerous unincorporated areas. It has a diverse economy with agriculture the largest segment. Other primary elements of the economy are biotechnology, information technology, healthcare services, financial services, and the US Navy bases. [Ref-01]

The Grand Jury was concerned with the current drought and selected Oxnard, the most populous city in the County with approximately 200,000 residents, to examine how it is managing city water resources and its adjoining agricultural water resources. [Ref-02]

The examination revealed that Oxnard has long been concerned about the future availability of water to support its growing population and economy. Particular emphasis has been focused on the large agricultural activity in Oxnard and its adjacent areas. In the 1990s Oxnard initiated a study by an independent consulting firm with expertise in this area. As a result, Oxnard established its GREAT program, a major capital program that requires construction of numerous facilities to provide a stable supply of water. [Ref-03]

The GREAT program is funded by federal, state, and local sources used for infrastructure costs. Oxnard secured a federal grant of \$20 million from the

Department of Interior's Bureau of Reclamation Title XVI Program. The Metropolitan Water District of Southern California (MWD) also provided funding. [Ref-04]

The primary element of the program was construction of the Advanced Water Purification Facility (AWPF) to provide recycled water for agriculture, parks, industry, and golf courses. The facility would take processed water from the OWTP and convert it to recycled water that would then be transported to its distribution areas. The facility was substantially completed in 2012 but is not currently operational. [Ref-03, Ref-05]

Another important element of GREAT was the construction of a desalter completed in 2008. Water from the Fox Canyon Aquifers under Oxnard has high levels of nitrates and other contaminants. The desalter removes them through reverse osmosis. Although currently operating, the desalter was not operational from late 2011 through July 2014. [Ref-03, Ref-06, Ref-07]

Oxnard has significant problems with saltwater intrusion into its aquifers. The drought has lowered the water level of the aquifers, increasing saltwater intrusion from the Pacific Ocean. Recycled water from AWPF could potentially be used to recharge aquifers and thus mitigate saltwater intrusion. [Ref-08]

Water availability and related issues in Oxnard, Ventura County, and Southern California will not be resolved in the near future. Drought conditions could last for many years, significantly affecting the economy and life in Ventura County. For these reasons, the Grand Jury chose to investigate the GREAT program and determine how it could be effectively utilized.

Methodology

The Grand Jury conducted interviews and examined numerous Internet websites that addressed GREAT. The City of Oxnard website, in particular, was a valuable resource. Additionally, newspaper and magazine articles on the subject were examined.

Facts

- **FA-01.** For the past three years, Ventura County has lacked significant rainfall and remains in a prolonged drought. [Ref-09]
- **FA-02.** Droughts have been a repeating pattern in both Ventura County and Southern California. [Ref-09]
- **FA-03.** A primary source of water in Oxnard is groundwater contained in subterranean aquifers accessed by pumping from wells. [Ref-03]
- **FA-04.** Another source of Oxnard water includes the Calleguas Creek Watershed. [Ref-10] (Att-01)
- **FA-05.** Additional water is imported to Oxnard from the California State Water Project (CSWP) and delivered via pipelines connected to the CSWP aqueduct. Water from this source is stored in above- and below-ground

reservoirs located throughout the County. Due to the prolonged drought, this source of water has been severely reduced and could be cut off altogether. [Ref-11]

- **FA-06.** Increasing pumping over the years has caused overdraft conditions. This has resulted in aquifer water levels dropping to below sea level, allowing seawater to intrude into underground basins, contaminating groundwater. The overdraft weakens a natural (geological) Seawater Intrusion Barrier that ordinarily limits the amount of salt water coming into the Fox Canyon Aquifer from the Pacific Ocean. [Ref-12]
- **FA-07.** Oxnard is the most populous city in Ventura County. It is located on the Oxnard Plain, an area with extremely fertile soil and a Mediterranean climate. It sits at the terminus of the Fox Canyon Aquifer. [Ref-02]
- **FA-08.** Oxnard recognized the problems of increased salinity (salt content) and decreased water availability in the late 1990s. Oxnard conducted studies to address these issues. [Ref-03]
- **FA-09.** In May 2002, Oxnard released the *GREAT Program Advanced Planning Study.* GREAT stands for Groundwater Recovery Enhancement and Treatment. [Ref-03]
- **FA-10.** The purposes of the GREAT study were:
 - Increase water supply reliability during droughts
 - Reduce water supply costs
 - Provide sufficient water supply to meet growing water demand
 - Enhance local water stewardship through recycling and reusing a significant portion of the region's wastewater
 - Reap environmental benefits associated with developing and rehabilitating local saltwater wetlands

[Ref-03, Ref-13]

- **FA-11.** GREAT called for a major investment in new construction, including new facilities, pipelines, and underground water storage capabilities. [Ref-03]
- **FA-12.** The existing Oxnard Water Treatment Plant (OWTP) produces "secondary effluent" that currently has no commercial use. This effluent is discharged into the Pacific Ocean via a 48-inch-diameter outfall pipe that is 5,950 feet long and 60 feet under water. [Ref-03, Ref-13, Ref-14]
- FA-13. A major component of GREAT was to build a facility, the Advanced Water Purification Facility (AWPF), to further process the secondary effluent from the OWTP. This additional processing would produce "tertiary water"—highquality, recycled water for use in agriculture, industry, golf courses, and parks. The first of four phases was substantially completed in 2012 at a cost of approximately \$110 million. [Ref-03, Ref-05, Ref-13, Ref-14]

- **FA-14.** Another significant part of GREAT was the construction of the desalter. The desalter uses reverse osmosis to remove dissolved minerals and nitrates from Oxnard aquifer water. The desalter and its associated components were completed in 2008 at a cost of \$63 million. [Ref-03, Ref-13, Ref-15]
- **FA-15.** The desalter was not operational from December 2011 through July 2014 for a variety of reasons. Chief among them were budget problems that caused (1) construction shortcuts, including insufficient backup systems; and (2) inability to repair the desalter system when it failed. This nonoperation phase was further compounded by significant personnel shortages in key positions. [Ref-06, Ref-07]
- **FA-16.** Oxnard was required to purchase water from other sources while the desalter was nonoperational. [Ref-07]
- **FA-17.** The AWPF was planned as a four-phase project. Completing Phase 1 will allow the facility to produce 7,000 acre feet (AF) per year of recycled water. Completing Phases 2 through 4 will each produce the same amount, for a total potential production of 28,000 AF per year. [Ref-03, Ref-13, Ref-14]
- FA-18. Oxnard receives its water from three primary sources: Oxnard wells, United Water Conservation District (UWCD), and the Calleguas Municipal Water District (CMWD). The cost of water from Oxnard wells and UWCD is the same: approximately \$701 per AF. CMWD charges \$1,248 per AF. [Ref-03, Ref-07, Ref-14] (Att-01, Att-02, Att-03)
- FA-19. Oxnard's projection for water rates reflects significant increases in both UWCD and CMWD prices. If these projections are accurate, water from the AWPF will be competitive with water provided by current suppliers. [Ref-13] (Att-03, Att-04)
- **FA-20.** UWCD is Oxnard's wholesale groundwater supplier. It manages water resources of the Santa Clara River and associated aquifers. It also operates several water production and distribution facilities, providing water to municipal and agricultural customers in a 330-square-mile service area in the western part of the County. [Ref-03, Ref-16] (Att-02)
- FA-21. The CMWD is Oxnard's imported water supplier with a service area spanning 375 square miles in the County. CMWD provides this water from the Metropolitan Water District, which receives its water from the California State Water Project (CSWP). [Ref-03, Ref-17] (Att-05)
- **FA-22.** The projected cost to produce water at the AWPF will be reduced from approximately \$1,854 to \$1,298 per Acre Foot (AF) when Phase 1 and Phase 2 are completed. [Ref-14] (Att-03)
- **FA-23.** The projected cost to complete Phase 1 and Phase 2 is \$76 million and \$55 million respectively, for a total of \$131 million. [Ref-18] (Att-06)
- **FA-24.** Initial Phase 1 water production of the Advanced Water Purification Facility (AWPF) will be 7,000 AF per year. AWPF can operate with a limited capacity of 1,800 AF. [Ref-18] (Att-07)

- **FA-25.** Of the Advanced Water Purification Facility's (AWPF) Phase 1 production, 1,800 AF is planned for City and commercial Oxnard customers: River Ridge Golf Club, Riverpark Development, and International Paper (Indy Container Board). The balance of 5,200 AF will be distributed to the Pleasant Valley County Water District (PVCWD), outside the boundaries of Oxnard. [Ref-18] (Att-07)
- **FA-26.** In January 2015 a management use agreement (Full Advanced Treatment Recycled Water Management and Use Agreement) was negotiated wherein Oxnard will provide excess recycled water from the AWPF to the PVCWD. The PVCWD will then distribute the water to farms included in the agreement. [Ref-19]
- **FA-27.** On January 13, 2015, the Oxnard City Council approved the management use agreement with PVCWD to take "all the water they can produce, up to 5,200 AF." [Ref-19]
- **FA-28.** Pleasant Valley County Water District (PVCWD) infrastructure can be used to deliver water to individual farms.
- **FA-29.** It will take 18 months to complete construction of the connecting lines to the PVCWD infrastructure that will deliver AWPF water for agricultural use.
- **FA-30.** An existing pipeline runs from the Advanced Water Purification Facility (AWPF) west along Hueneme Road and north along Ventura Road for approximately nine miles. The pipeline was built to carry AWPF water to nonagricultural customers. [Ref-13, Ref-20] (Att-07, Att-08)
- **FA-31.** An important aspect of the GREAT program is the need to construct storage wells for the excess recycled water. This will be required for those periods when demand for the recycled water is less than the capacity production of the AWPF. [Ref-03, Ref-14]
- **FA-32.** The Fox Canyon Groundwater Management Agency (FCGMA) was "established by the California (State) Legislature in 1982, and is charged with the preservation and management of groundwater resources within the areas or lands overlying the Fox Canyon aquifer for the common benefit of the public and all agricultural, domestic, and municipal and industrial users." The FCGMA protects the Oxnard Plain by regulating the amount of water that may be pumped from the Fox Canyon Aquifer in order to prevent an overdraft condition. [Ref-21] (Att-01)
- **FA-33.** FCGMA protection addresses aquifers within several groundwater basins underlying the southern portion of Ventura County. It covers all land lying above its deep Fox Canyon aquifer, which accounts for much of the water needs for residents in the cities of Ventura, Oxnard, Port Hueneme, Camarillo, and Moorpark, plus the unincorporated communities of Saticoy, El Rio, Somis, Moorpark Home Acres, Nyeland Acres, Point Mugu, and Montalvo. [Ref-21]

- **FA-34.** Oxnard requires a 20% reduction of all water pumped from wells in its jurisdiction, in conformity with 2014 imposed FCGMA pumping restrictions. [Ref-21, Ref-22]
- **FA-35.** Conservation water-pumping allocations from the FCGMA are being granted but cannot be used because of the drought.
- **FA-36.** The City of Camarillo is scheduled to begin building a desalination plant within the next two years. [Ref-23]
- **FA-37.** Calleguas Municipal Water District (CMWD) has identified 10 desalters in its long-term plan. [Ref-24]
- **FA-38.** State Proposition One, 2014, made additional funding and grants available from the State for water-related projects. [Ref-25]
- **FA-39.** No Countywide organization or agency has legislative and/or regulatory authority over all water issues.
- **FA-40.** The Watersheds Coalition of Ventura County (WCVC) is a County government organization created to address regionwide water management and related issues. It is composed of representatives of the following 76 entities:
 - Ten cities
 - Three wholesale water agencies
 - Eight major retail water agencies
 - Six County agencies
 - Thirteen environmental stewardship organizations
 - Four wastewater agencies
 - Four groundwater basin management authorities
 - Six community organizations and recreational interest groups
 - A flood management agency
 - Four agricultural and business groups
 - Seventeen state, federal, and regional agencies and universities
 - Individual members of the Chumash Tribe and Wishtoyo Foundation [Ref-10]
- **FA-41.** The WCVC released the 2014 Integrated Regional Water Management Plan (IRWMP), which does not compel compliance. [Ref-10]
- **FA-42.** The Ventura County Resource Conservation District (VCRCD), a special district of the State of California, provides assistance to both rural and urban communities to conserve, protect, and restore natural resources. VCRCD is not a regulatory entity. [Ref-26]

- **FA-43.** The Association of Water Agencies Ventura County is a voluntary organization for the exchange of information on local and regional water issues. Its Mission Statement is "to develop and encourage cooperation among entities for the development, protection, conservation and improvement of the total water resources for Ventura County." It is not a regulatory agency. [Ref-27]
- **FA-44.** Orange County (OC) has historically experienced similar water problems as those in Ventura County: overdraft conditions in its aquifer and seawater intrusion. [Ref-28]
- **FA-45.** The Orange County Water District was formed in 1933 by a special act of the State legislature to protect OC's Santa Ana River water rights. Its primary responsibility is managing OC's vast groundwater basin in the northern and central portions of OC. It supplies water to 2.3 million people in 20 cities and water agencies. OC recharges its aquifer with both Santa Ana River water and water purchased from the Metropolitan Water District of Southern California (MWD). [Ref-28]
- **FA-46.** On September 16, 2014, the State established the Sustainable Groundwater Management Act (SGMA), which became effective on January 1, 2015. SGMA will require groundwater sustainability agencies (GSA) and groundwater sustainability plans (GSP) be established for important groundwater basins. SGMA creates a framework for sustainable, local groundwater management for the first time in state history. The act empowers local agencies to manage their basins to achieve sustainability within 20 years. [Ref-29]
- **FA-47.** Fox Canyon Groundwater Management Agency (FCGMA) was granted default status as the Groundwater Sustainability Agency (GSA) for the basins within its jurisdiction and will be developing a GSP. [Ref-30]

Findings

- **FI-01.** Oxnard secures its water from a variety of sources, which complicates the City's water management. (FA-03, FA-04, FA-05, FA-18)
- **FI-02.** Overpumping of water from wells, combined with reduced rainfall, has seriously increased salt water intrusion into local aquifers. (FA-06, FA-08)
- **FI-03.** Oxnard displayed prescient long-range planning when it undertook a major study resulting in a program titled GREAT. The intent of GREAT was to provide an additional supply source for water for Oxnard and its adjoining agricultural and business entities. (FA-08, FA-09, FA-10, FA-11, FA-12, FA-13, FA-14)
- **FI-04.** GREAT is an ambitious and financially daring program that has required and will require major capital investments in facility construction to accomplish its objectives. (FA-11, FA-13, FA-14)

- **FI-05.** Most of the Advanced Water Purification Facility's (AWPF) Phase 1 construction has been completed and can produce recycled water. Completion has proven that the advanced technology for producing recycled water is as effective as Oxnard projected. (FA-24)
- **FI-06.** When Phase 1 and Phase 2 of GREAT are funded and completed, the AWPF is projected to produce water at or below competitive prices, which could justify the enormous risk the City Council took in approving the program. (FA-25)
- **FI-07.** Water issues are not restricted to Oxnard but are countywide. County issues are administered by numerous separate, sometimes competitive, independent entities. There is no overall County organization that has comprehensive regulatory authority over these entities that could compel compliance. (FA-01, FA-02, FA-34, FA-39, FA-40, FA-41, FA-42, FA-43)
- **FI-08.** The Watersheds Coalition of Ventura County has too many participating parties to function as an efficient regulatory agency for the County. (FA-40)
- **FI-09.** Oxnard is the last city to receive water flowing through the County's aquifers and rivers. (FA-07)
- FI-10. The State has granted the Fox Canyon Groundwater Management Agency (FCGMA) important status as the Groundwater Sustainability Agency (GSA) to develop the Groundwater Sustainability Plan for the Fox Canyon aquifer. The State is in the process of creating new standards for future and more effective groundwater management. (FA-46, FA-47)

Recommendations

- **R-01.** The Grand Jury recommends that the Oxnard City Council pursue funding, including additional partnerships and grants, to complete Phase 1 and Phase 2 of the GREAT program. Completion of these phases will substantially increase Oxnard's water supply and make it price competitive with current suppliers. This additional water supply can be sold to other parties and increase Oxnard's revenues. (FI-05, FI-06)
- **R-02.** The Grand Jury recommends that the City Council initiate collaboration with and provide assistance to the Fox Canyon Groundwater Management Agency (FCGMA) in establishing the State-required Groundwater Sustainability Plan (GSP) for its aquifer. The GSP will establish regulations and binding consequences for noncompliance. A joint effort could provide a more efficient, sustainable, and equitable process to distribute water throughout the area of the Fox Canyon Aquifer and become a model for the County. (FI-07, FI-08, FI-10)

Responses

Responses required from:

City of Oxnard City Council (FI-06, FI-07, FI-08, FI-09, FI-10) (R-01, R-02)

Responses requested from:

City of Oxnard City Manager (FI-06, FI-07, FI-08, FI-09, FI-10) (R-01, R-02)

City of Oxnard Utilities Department Interim Director (FI-06, FI-07, FI-08, FI-09, FI-10) (R-01, R-02)

Fox Canyon Groundwater Management Agency (FI-06, FI-07, FI-08, FI-09, FI-10) (R-01, R-02)

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- **Ref-10.** Watersheds Coalition of Ventura County, <u>http://www.ventura.org/wcvc/</u> (accessed November 19, 2014)
- **Ref-11.** CA.GOV, Department of Water Resources, "California State Water Project Overview," <u>http://www.water.ca.gov/swp/</u> (accessed November 21, 2014).
- Ref-12. Kelley, Daryl. "Seawater Invading Wells, Report Says," Los Angeles Times, February 15, 2003, <u>http://articles.latimes.com/2003/feb/15/local/me-seawater15</u> (accessed November 21, 2014).
- **Ref-13.** Lynch, Scott. CH2M HILL, Oxnard GREAT Program, "California Section Conference, WateReuse Association," March 2009, <u>https://www.watereuse.org/files/images/Scott_Lynch.pdf</u> (accessed November 14, 2014).
- **Ref-14.** Oxnard City Council, meeting of June 25, 2013, Agenda Item K.2., <u>http://oxnard.granicus.com/MediaPlayer.php?view_id=&clip_id=2413&</u> <u>meta_id=129096</u> (accessed November 14, 2014).
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- **Ref-16.** United Water Conservation District, "Facilities and Strategies," <u>http://www.unitedwater.org/about-us-6/facilities-a-strategies</u> (accessed December 20, 2014).
- **Ref-17.** Calleguas Municipal Water District, "Controlling costs to minimize rate impacts...," <u>http://www.calleguas.com/about-calleguas-municipal-water-district/index.asp</u> (accessed December 20, 2014).
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- **Ref-20.** Kennedy/Jenks Consultants. City of Oxnard, "Final Recycled Water Backbone System Study," October 7, 2005.
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- **Ref-22.** City of Oxnard, Oxnard Water Conservation Program, *Facebook*, <u>https://www.facebook.com/OxnardWaterConservationProgram?hc_location=timeline</u> (accessed November 21, 2014).
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- **Ref-27.** Association of Water Agencies Ventura County, <u>http://www.awavc.org/</u> (accessed November 19, 2014).
- **Ref-28.** Orange County Water District, <u>http://www.ocwd.com/</u> (accessed November 19, 2014).
- **Ref-29.** State of California Groundwater Legislation, <u>http://www.water.ca.gov/cagroundwater/moresgma.cfm</u> (accessed February 11, 2015).
- **Ref-30.** Farm Bureau of Ventura County, January 2015, <u>http://farmbureauvc.com/pdf_forms/newsletters/FB-Newsletter-January-2015.pdf</u> (accessed February 12, 2015).

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- Att-01. Fox Canyon Groundwater Management Agency Groundwater Basins
- **Att-02.** United Water Conservation District Boundary
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- Att-03. GREAT Program Update, City Council Meeting, 25 Jun 2013
- Att-04. Effect Upon Water Costs Stabilized Rates
- Att-05. Calleguas Municipal Water District
- Att-06. Utilities Task Force Meeting, 21 Jun 2012
- Att-07. GREAT Program Update, City Council Meeting, 25 Jun 2013
- Att-08. Advanced Water Purification Facility Pipeline

<u>TERM</u>	DEFINITION				
AF	Acre foot - 325,900 gallons				
Aquifer	An underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using a water well				
AWPF	Advanced Water Purification Facility				
City Council	Oxnard City Council				
CMWD	Calleguas Municipal Water District				
County	County of Ventura				
CSWP	California State Water Project				
Debt service	The cash that is required for a particular time period to cover the payment of interest and principal on a debt				
Effluent	Sewage or other liquid waste that is discharged into a body of water				
FATW	Full Advanced Treatment Water				
FCGMA	Fox Canyon Groundwater Management Agency				
GREAT	Groundwater Recovery Enhancement and Treatment				
GSA	Groundwater Sustainability Agency				
GSP	Groundwater Sustainability Plan				
IRWMP	Integrated Regional Water Management Plan				
MWD	Metropolitan Water District of Southern California				
OC	Orange County, California				
Overdraft condition	More water has been pumped out of the aquifer than has been replenished				
OWTP	Oxnard Wasterwater Treatment Plant				
Oxnard	City of Oxnard				

<u>TERM</u>	DEFINITION
Pumping allocation credit	FCGMA establishes the amount of water (allocation) a water supplier may withdraw from the Fox Canyon aquifer. If the water supplier secures water from another source, the supplier may receive a conservation credit that could be redeemed to pump aquifer groundwater at a later date.
PVCWD	Pleasant Valley County Water District
Recharge	A hydrologic process where water moves downward from surface water to groundwater
Reverse osmosis	A technique for purifying water by forcing impure water through a semipermeable membrane across which salts and other impurities cannot pass
Seawater intrusion barrier	The use of injection wells and a subsurface barrier in the prevention of seawater intrusion
Secondary effluent	After wastewater goes through the first primary treatment, it undergoes a secondary biological process to remove suspended solids and other organic matter.
SGMA	Sustainable Groundwater Maintenance Act
Tertiary water	A third processing of wastewater during which nutrients (such as phosphorous and nitrogen) and most suspended solids are removed
VCRCD	Ventura County Resource Conservation District
Water Storage Well	An excavation or structure created in the ground by digging, driving, boring, or drilling to hold water for future needs
WCVC	Watersheds Coalition of Ventura County
Wetlands	Land or areas (such as marshes or swamps) that are covered, often intermittently, with shallow water or have soil saturated with moisture

Fox Canyon Groundwater Management Agency Groundwater Basins



Groundwater Basins within the FCGMA

Fox Canyon Groundwater Management Agency Groundwater Basins

United Water Conservation District Boundary



United Water Conservation District Boundary

GREAT Program Update, City Council Meeting 25 Jun 2013



Water Source	Approximate Cost per Acre-Ft (AF)						
	2013	2018	2023	2033	2042		
Local (City & UWCD)	\$ 701	\$ 871	\$ 982	\$1,259	\$1,589		
Imported (CMWD)	\$1,248	\$1,608	\$2,055	\$2,762	\$3,604		
Phase 1 AWPF	\$1,854	\$1,948	\$2,056	\$2,327	\$2,650		
Phase 2 AWPF	\$1,298	\$1,386	\$1,488	\$1,742	\$2,045		

Note: Estimates Being Updated

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Effect Upon Water Costs – Stabilized Rates



Effect Upon Water Costs – Stabilized Rates

Calleguas Municipal Water District



Calleguas Municipal Water District

Utilities Task Force Meeting, 21 Jun 2012







GREAT Program Update, City Council Meeting, 25 Jun 2013



GREAT Program Phase 1 Customers •In-City Customers Phase 1A (1,800 AF/Y) •New Indy Containerboard •River Ridge Golf Club •RiverPark •Agriculture Customers Phase 1B (5,200 AF/Y) •Draft Agreement •Pleasant Valley County Water District •United Water Conservation District

•Private Parties

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Advanced Water Purification Facility Pipeline



City of Oxnard and its Adjoining Agricultural and Business Water Resources 31