The City of Imperial

2005 Urban Water Management Plan

Prepared by

Integrated Resource Management, LLC

Adopted

December 21, 2006

Introduction

The City of Imperial is pleased to present to the general public its 2005 Urban Water Management Plan. This is the first year that the city has completed the process of developing such a plan, and we are excited to initiate this new phase of participation in local and regional urban water planning in the Imperial Valley region.

The City of Imperial Water Department runs the city's water system, while the Imperial Community Development Department helps plan for the city's future water resource development. This Urban Water Management Plan is part of that overall planning initiative.

An Urban Water Management Plan, as defined by the California Legislature in the California Urban Water Management Planning Act, informs residents, neighboring agencies and local community groups on how an urban water agency will provide a safe, secure water supply in the short and long term. The following plan attempts to look 25 years into the future to project what the City of Imperial's water supply will look like in 2030. Included in that long-term projection are predictions concerning future water demand, contingency planning in case of short- or long-term droughts and other catastrophes, and potential strategies to enhance and diversify the City of Imperial's water portfolio with recycled water, desalination and water marketing options.

Overall, this plan was developed to be used as a tool to recognize, protect and enhance the value of the City of Imperial's water resources. It should not be viewed as simply another government-mandated report that sits on a shelf collecting dust.

The City of Imperial is fortunate to receive all of its water supply from the Imperial Irrigation District. The Imperial Irrigation District has rights to millions of acre-feet of Colorado River water and is able to assure the city a steady and reliable supply until 2030. In addition, the City of Imperial is in the process of creating new storage capacity by constructing a new two-million-gallon storage reservoir, and is looking into the feasibility of installing two emergency interconnections with the neighboring City of El Centro. In the unlikely occurrence of a critical shortage due to drought, the City of Imperial will implement various water conservation measures such as temporary reductions in commercial and residential use and/or rate increases.

The City of Imperial 2005 Urban Water Management Plan is a living document and will be regularly and routinely updated to reflect the city's current water situation.

Should anyone have any questions or want further information about any of the topics covered in this report, please contact one of the persons preparing the plan listed on the Contact Sheet on page x below.

We thank you for this opportunity to present this plan, and look forward to its reception and your feedback.

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List of Abbreviations

AAC	All-American Canal
AC	Asbestos Cement
Accs.	Accounts
AF	Acre-Foot or -Feet (i.e., 1 acre x 1 foot deep)
AFY	Acre-Feet per Year
BMP	Best Management Practice
CARA	California Rivers Assessment
CEQA	California Environmental Quality Act
cfs	Cubic Feet per Second
CWA	Clean Water Act
CUWCC	California Urban Water Conservation Council
DMM	Demand Management Measure (used by CUWCC)
DWR	California Department of Water Resources
EPA	United States Environmental Protection Agency
ET	Evapotranspiration
°F	Degrees Fahrenheit
FY	Fiscal Year
IID	Imperial Irrigation District
MAF	Million Acre-Feet
MBR	Membrane Biological Reactors
mg/L	Milligrams Per Liter
mgd	Million Gallons Per Day
MLSS	Mixed Liquor Suspended Solids
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
MSCP	Lower Colorado River Multi-Species Conservation Program

NAFTA	North American Free Trade Agreement
No.	Number
NPDES	National Pollution Discharge Elimination System
ppb	Parts Per Billion
PPR	Present Perfected Right
ppt	Parts Per Thousand
psi	Pounds Per Square Inch
PVC	Polyvinyl Chloride
PWS	Public Water System
QSA	Quantification Settlement Agreement
RO	Reverse Osmosis
SB	Senate Bill
SDCWA	San Diego County Water Authority
SCAG	Southern California Association of Governments
TDS	Total dissolved solids
TMDL	Total Maximum Daily Load
USBR	United States Bureau of Reclamation
UV	Ultra Violet
UWMP	Urban Water Management Plan
WCFSP	Bureau of Reclamation Water Conservation Field Services Program
WPCA	City of Imperial Water Pollution Control Plant

Standardized Contact Sheet

Date plan submitted to the Department of Water Resources: **January 6, 2005**

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The water supplier is a: **Municipality**

The water supplier is a: **Retailer**

Utility services provided by the water supplier include: **Water, Wastewater**

Is this agency a Bureau of Reclamation Contractor? **No**

Is this agency a State Water Project Contractor? **No**

1.0 Executive Summary

The City of Imperial 2005 Urban Water Management Plan has been prepared under contract by Integrated Resource Management, LLC in response to the California Urban Water Management Planning Act. The Act requires all publicly and privately owned urban water suppliers that either have 3,000 or more customers or provide over 3,000 acre-feet of water annually to prepare an updated Urban Water Management Plan (UWMP) by the end of the calendar years that end in five or zero. The Act requires that UWMPs describe the suppliers' service area, water use by customer class, water supply and demand, water service reliability and shortage response options, water transfer and exchange opportunities, water recycling efforts and conservation measures. A municipal urban water supplier's UWMP is to be enacted by City Council resolution and submitted to the California Department of Water Resources (DWR) within thirty (30) days of adoption. A UWMP can be a condition of eligibility for state grant funds and other drought assistance allocations. This is the first UWMP that the City of Imperial has been required to prepare. In 2002, the Imperial Irrigation District supplied to the City of Imperial 3,173 acre-feet of water. The city invited the involvement of local agencies, community organizations and the general public in the development of this plan through mailed notifications, newspaper advertisements, draft availability and a public hearing on December 21, 2005.

The City of Imperial is located in the Imperial Valley in south-central Imperial County, and within the Salton Sea Watershed and the Lower Colorado River Basin. The service area of the City of Imperial Water Department covers roughly 3.9 square miles, incorporating the City of Imperial and certain areas located outside the city limits. The City of Imperial Water Department currently delivers, on average, 2.5 million gallons per day (mgd) to a population of 10,289 through 2,949 domestic, commercial and industrial accounts. The city has sufficient excess water capacity to support the accelerated rate of growth expected in the next 25 years.

The City of Imperial receives all of its water from the Imperial Irrigation District. The Imperial Irrigation District diverts surface water from the Colorado River and delivers it to the city via the All-American Canal and the Central Main Canal. The Imperial Irrigation District's rights to appropriate Colorado River water are long-standing. It has 2.6 million acre-feet of present perfected water rights to Colorado River water, as well as potential access to an additional 0.8 million acre-feet. In 2003, the Imperial Irrigation District signed the Quantification Settlement Agreement which provided for the transfer of up to 200,000 acre-feet for a period of 75 years. The City of Imperial currently does not use local groundwater or surface water sources for drinking water purposes and has no plans to do so in the future. There are very few potential threats to the city's water supply, and those that exist are in no way expected to result in inconsistency of the city's water supply. The city currently has no projects or programs in place to increase its potential water supply.

The City of Imperial delivered 1,674 acre-feet of water to 2,311 customers in 2000 and 1,992 acre-feet of water to 2,949 customers in 2005. This represents an 84 percent increase in water deliveries in the past five years. Water deliveries are projected to continue increasing in the next 25 years. The combined current and projected water usage, including system losses, for the City of Imperial is given in the table below:

	2000	2005	2010	2015	2020	2025	2030
Total Water Use (AFY*)	1,959	2,331	2,983	4,340	5,681	6,966	8,200

*AFY = Acre-Feet per Year
Acre-Foot = amount of water required to cover one acre one foot deep

Even though the city does not require new water supply sources, the City of Imperial is committed to implementing water conservation programs at the local and regional levels through legislative and local policy implementation. The city actively participates in regional water conservation public awareness campaigns and is in the process of implementing general water conservation measures which will soon be adopted into its Municipal Code. Beyond elimination of water waste, the City of Imperial has found that it is neither necessary nor economically feasible to implement further water conservation measures.

Water supply reliability is a measure of the City of Imperial's ability to provide an adequate water supply during times of shortage. Reliability focuses mostly on drought, though it must take into consideration the other potential threats to the water supply. Thanks to Imperial Irrigation District, the city has a remarkably reliable water supply for the next 25 years regardless of climatic conditions.

The city has not felt it necessary to write and enact by ordinance a Water Shortage Contingency Plan until required to do so under the Urban Water Management Planning Act. The city has now prepared a draft Water Shortage Contingency Plan which will soon be contained in its revised Municipal Code. The plan outlines three phases of action triggered by shortages of 15, 25 and 50 percent of the city's water supply.

The City of Imperial does not recycle its wastewater, and currently there are no plans for the city to do so in the future.

2.0 General Information

2.1 Urban Water Management Act

Law

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers…

10620. (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

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

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

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

The City of Imperial 2005 Urban Water Management Plan (UWMP) has been prepared under contract by Integrated Resource Management, LLC in response to the California Urban Water Management Planning Act of (Water Code Division 6, Part 2.6, Sections 10610-10657—included as Appendix A). The Act requires all publicly and privately owned urban water suppliers that either have 3,000 or more customers or provide over 3,000 acre-feet of water annually to prepare an updated UWMP by the end of the calendar years that end in five (5) or zero (0). A water supplier can also periodically review and adopt changes or amendments to its UWMP in intervening years.

The Act requires that UWMPs describe the suppliers' service area, water use by customer class, water supply and demand, water service reliability and shortage response options, water transfer and exchange opportunities, water recycling efforts and conservation measures. The state also expects the 2005 plans to reflect changes to the UWMP Act since the last round of UWMP updates in 2000 (see below).

Overall, the UWMP requirements for 2005 reflect a heightened interest in security of infrastructure and water sources through the development of new transfer and exchange opportunities, new water supply sources (recycled water, desalination) and new water treatment technologies. Additionally, recent litigation has added significant weight to documents like UWMPs which provide legal and authoritative assessments of water supply and environmental impacts. Urban planning managers are expected to use UWMPs to determine future development goals as well as vulnerabilities in security infrastructure.

A municipal urban water supplier's UWMP is to be enacted by City Council resolution and submitted to the California Department of Water Resources (DWR) within thirty (30) days of adoption. The DWR reviews the UWMP for completion.

A UWMP can be instrumental in developing a wider-scope Integrated Regional Water Management (IRWM) Plan, and can be a condition of eligibility for state grant funds and other drought assistance allocations.

This is the first UWMP that the City of Imperial has been required to prepare. In 2002, the Imperial Irrigation District (IID) supplied to the City of Imperial 3,173 acre-feet of water.

Due to the fact that IID supplies wholesale untreated water to certain municipalities, including the City of Imperial, as well as to a limited number of individual industrial and residential customers, there has been significant confusion in the past concerning whether IID should be required to develop a UWMP. IID prepared a plan in 2001 for itself and the Cities of Brawley, Calexico and El Centro, and had started to draft its 2005 UWMP Update while continuing to correspond with DWR concerning the issue. Finally, on September 1, 2005, IID received official confirmation from DWR that, since IID does not distribute treated water to the cities it serves, it will no longer be required to develop a UWMP. Portions of the drafted IID 2005 plan are incorporated into this UWMP.

2.1.1 Senate Bill 610 and Senate Bill 221

Since 2000, eight amendments, including two notable bills, Senate Bills (SB) 610 and 221, have been added to the Urban Water Management Planning Act:

- Additional details in the required analysis (SB 610, Costa);
- Verification, in writing, of sufficient water supply for large projects (SB 221, Keuhl);
- Additional discussion of particular water quality issues (AB 901, Daucher);
- Reduction in imported water usage (SB 672, Machado);
- Consideration of UWMP for state grant eligibility (SB 1348, Brulte);
- Allowed usage of data from wholesale water suppliers (SB 1384, Costa);
- Discussion of recycled water (SB 1518, Torlakson); and
- Discussion of desalination (SB 318, Alpert).

SB 610 and 221 require procedures to advance water supply planning efforts in the State of California. They focus on comprehensive water policies and the coordination of local water supply and land use decisions to help provide California's cities, farms and rural communities with adequate water supplies. On October 9, 2001 Governor Davis signed these two bills into law, linking land use development to water supply. These two laws took effect on January 1, 2002.

SB 610's requirement cites that preparation of any water supply assessment starts when a lead agency determines that a project must comply with the California Environmental Quality Act (CEQA). If CEQA is required as part of the Subdivision Map Act approval, then SB 610 relates to that project's water supply. SB 610 requires that a water supply assessment be prepared to assess the reliability and the sustained quantity of water supply for the proposed new land use developments.

When CEQA applies to development of land uses such as residential, commercial, office, hotel/motel, industrial/manufacturing and mixed-use projects, there are certain conditions, parameters or thresholds to be met. The State Water Code (WC§10912) defines SB 610 compliance parameters such as the number of units, floor space, occupants/tenants, acres, increased number or percent of water service connections, and/or whether or not the service is from a public water system. Most of all, SB 610 requirements depend upon the proposed project as being subject to CEQA requirements and the parameters as defined in State Water Code 10912.

Comparatively, SB 221 relates to land use and applies when new development includes a residential subdivision invoking the need of a Subdivision Map Act approval and requires that sufficient water supply for a project be available as a condition of approval for any tentative map, parcel map or development agreement. The finding that sufficient water supply exists must be based on written verification (Government Code §66473) prepared by the local water supplier that will serve the development. Verification concludes whether or not the water supplier can provide sufficient water during normal, single-day and multiple-dry years within a 20-year projection, based on substantial evidence that water could be conveyed to the subdivision when necessary. SB 221 calls for the identification of terms and conditions relating to when new water is being sought, and calls for the timeliness to provide projected water service to the proposed subdivision.

It is the responsibility of the major water retailers and land use agencies to ensure compliance with SB 610 and 221. The City of Imperial is currently working with retailers and land use agencies by providing information and conducting analyses to understand long-term implication of new development.

2.2 Regional Coordination

Law

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

10621. (b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan…

The City of Imperial welcomed local and regional involvement in the development of this plan. The city, through its contracting consultant, sent out individually addressed notifications of UWMP preparation and draft availability to ten local cities, counties, water and planning agencies and community organizations.

Table 1 lists those agencies and organizations that were in any way involved in the development of this plan:

Table 1: Coordination with Appropriate Agencies and Organizations

Agency	Was Sent Notice	Contacted for Assistance	Helped Develop Plan	Attended Public Meetings	Requested & Received Draft	Gave Comments on Draft
Imperial Irrigation District	√	√	√		√	√
County of Imperial	√					
City of El Centro	√					
City of Westmoreland	√					
City of Brawley	√					
City of Holtville	√					

City of Calexico	√					
Imperial Chamber of Commerce	√					
Salton Sea Authority	√					
Salton Sea National Wildlife Refuge	√					

2.3 Public Participation and Plan Adoption

Law *10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published… After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

As said above, the City of Imperial sought a wide range of involvement in the development of this plan, including direct public involvement. The city, through its contracted consultant, ran a 3"x5" advertisement in the November 9th and 16th editions of the *Imperial Valley Press*—the most popular area paper—announcing the initiation of plan preparation (see Appendix F for proof of publication). The community organizations directly contacted by mail reflect the social, cultural and economic diversity of the City of Imperial (see Section 3.1.5 below).

The initial draft of the plan was made available for public inspection in the City of Imperial's City Hall and Central Public Library and on the city's website two weeks before the public hearing scheduled during the City Council Meeting on December 21, 2005. All local cities, counties, water and planning agencies and community organizations listed in Table 1 were notified by mail of the availability of the plan for public inspection and the time and location of the public hearing (see Appendix F).

2.4 Plan Implementation, Submission and Review

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

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

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

10635. (b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to [Article 2.5, Water Service Reliability] to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

The City of Imperial 2005 Urban Water Management Plan was officially adopted by resolution of the City of Imperial City Council during the City Council Meeting held on December 21, 2005 (see Appendix B for copy of signed adoption resolution). A copy of the adopted plan will be available in the City of Imperial Public Services and Community Development office and will be distributed to the California Department of Water Resources, the California State Library, the County of Imperial and other interested parties no later than January 21, 2006.

3.0 Service Area

Law *10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

The service area of the City of Imperial Water Department covers roughly 3.9 square miles, incorporating the City of Imperial and certain areas located outside the city limits (see Figure 2).

Many factors influence the amount of water used by residents of an urban society. This chapter provides an overview for important characteristics of the City of Imperial's service area, including the city's location and water utility, as well as its history, population, socioeconomic conditions, land use, climate and watershed features at both the local and regional levels.

3.1 City of Imperial

3.1.1 Location

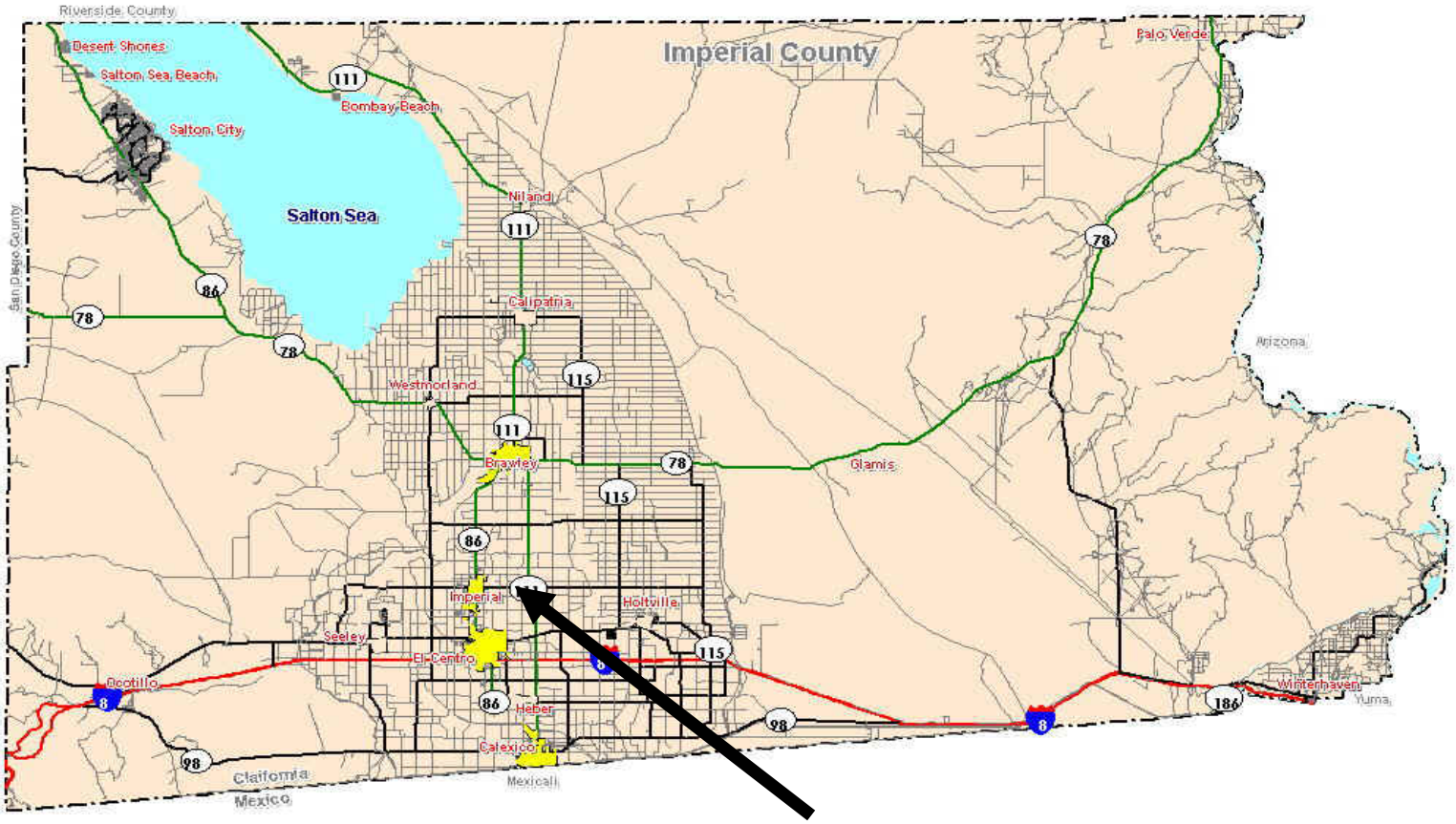
The City of Imperial is located in south-central Imperial County just thirteen miles north of the Mexican border and sandwiched between the more extensive and populous Cities of Brawley and El Centro (see Figure 1).

3.1.2 City of Imperial Water Department

The City of Imperial's public water system (PWS ID No. 1310006) is run through the city's Water Department. The water system covers the entire city (see Figure 2) as well as some areas directly outside its incorporated boundaries, and currently serves a population of 10,289. Average daily demand for the entire water system is 2.5 million gallons per day (mgd). The city provides water to domestic, commercial and industrial customers through 2,949 individual accounts, as well as to the city's fire protection system through hydrants located in public rights-of-way.

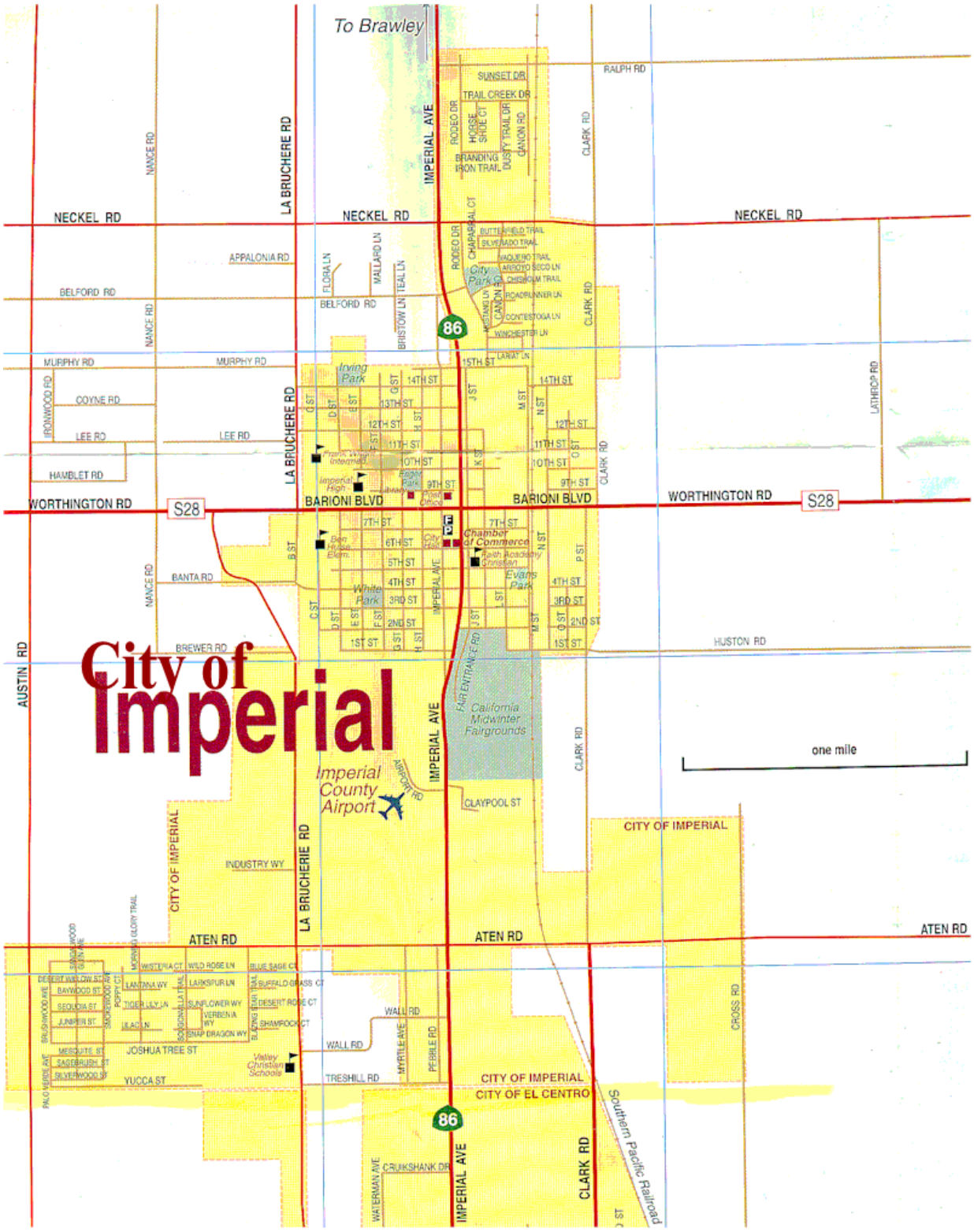
The water system draws all of its current water supply off the Central Main Canal, part of the extensive Imperial Irrigation District (IID) surface water distribution network that transports massive quantities of Colorado River water through the All-American Canal to the Imperial Valley (see Section 4.1.1). The raw canal water is piped to the city's conventional water treatment plant, where it is treated by sedimentation, coagulation, flocculation, filtration and disinfection. The water is stored in a 750,000-gallon water storage tank, from which it is distributed via a series of booster pumps through the city's distribution network of 16-inch or smaller asbestos cement (AC) and polyvinyl chloride (PVC) pipes.

The City of Imperial currently has sufficient excess water capacity in most areas of the city to support its expected accelerated rate of growth. The 7-mgd water treatment plant has excess treatment capacity of 4.5 mgd, and the city plans to replace the current water storage tank with one over three times its size (2.5 million gallons). The city has prepared a Service Plan to identify areas of the city which have inadequate water lines and/or water pressure.



Sources: United States Geological Survey, 2005. WebPages: http://ca.water.usgs.gov. http://www.imperialvalley.net.

Figure 1: Imperial County and City Location



Source: City of Imperial, 2005. WebPages: http://www.imperial.ca.gov.

Figure 2: City of Imperial Boundaries

3.1.3 History

The City of Imperial was founded in the late 1800s by Imperial Land Company prospectors. It was the first town site plotted and staked for the expected settlement boom following the initiation of mass-scale irrigation with Colorado River water in the area. The town offered lots for sale in 1901, and reached a population of 700 by 1904, the year residents voted to incorporate as a city.

Since that time the city has grown slowly, though its central location made it the ideal site for locating county institutions, including the Imperial Valley's first church, school and brickyard, and more recently the Imperial County Airport, the California Mid-Winter fairgrounds, Imperial Valley College, and the Operational Headquarters for the Imperial Irrigation District.

3.1.4 Population

The population of Imperial has remained fairly constant over the years until quite recently. From the 700 residents in 1904, the city had only grown to 3,451 by the 1980 United States Census, adding an average of 360 to its population each decade. However, the 1990 Census showed an increase of 662 to 4,113, nearly doubling the city's normal rate of growth, and the 2000 Census found the population had grown to 7,560, nearly doubling *itself*! The city's rate of growth is projected to average 10 to 15 percent annually over the next 25 years.

The Population Research Unit of the California Department of Finance (DOF), which approximates annual changes in population, estimates that, overall, Imperial County's population increased by about 10 percent between 2000 and 2004, and placed the City of Imperial's 2004 population at 9,425. Joining data from the Southern California Association of Governments (SCAG) with recent annexations, the 2005 City of Imperial Service Area Plan estimates that the City of Imperial's population will increase to 13,260 by 2010 and is expected to grow to 30,970 by 2025 and 36,448 by 2030.

The City of Imperial Water Department currently provides water to 2,949 individual accounts.

Table 2 gives the current and projected population for the City of Imperial:

Table 2: Population – Current and Projected

	2005	2010	2015	2020	2025	2030
Service Area Population	10,289	13,260	19,299	25,259	30,970	36,448

The population of the city is projected to increase at a significantly faster rate in the future. This is due to several factors, including the diversification of the local economy and increased employment in the public sector. The State Department of Corrections is building a new prison approximately 11 miles west of the city which will employ several hundred people. Many of these people will choose to live in the City of Imperial.

The city has a substantial Hispanic population, with Hispanics comprising 4,619 persons or approximately 61 percent of the population in 2000. Also, the population of Imperial is relatively young, with a median age of 29.9 years (state median age is 35.3). The average number of persons per household is 3.26 and per family 3.6, both higher than state averages (2.87 and 3.14, respectively).

3.1.5 Socioeconomic Conditions

The economic base of the City of Imperial and Imperial County is primarily agriculture and agriculture-related industry. Over one in every three workers is directly employed by an agricultural firm, and even more employees are engaged in agricultural-related activities. Production, packaging and distribution of crops such as lettuce, cotton, alfalfa, wheat and melons occur throughout the year. Sugar beets are also an important Imperial Valley crop, and the Holly Sugar Company, located five miles north of the City of Imperial, processes most of the locally grown sugar beet harvest. The Holly Sugar Company employs 350 people, and thus is a major employer in the Imperial Valley and city area.

In addition to agriculture, the city's economy is also impacted positively by the recent location of a General Dynamics Convair facility on county-owned property adjacent to the Imperial County Airport. This manufacturing facility employs approximately 200 persons. The location of the Imperial Irrigation District Headquarters in the city provides jobs for several hundred additional people.

The unemployment rate for Imperial County is quite high: 19 percent. However, it is believed that this figure is skewed due to a large number of residents from Mexicali, Mexico who commute to work in Imperial County and/or file unemployment claims. Imperial County has one of the lowest median family income levels in the state, but poverty data indicates that the residents of the City of Imperial are relatively well off compared to residents of other Imperial County cities.

Employment in the government sector will become much more of a factor in the future due to the construction and operation of two new state prisons in the Imperial Valley. New industrial development within the city is expected to reduce unemployment and provide new job opportunities for city residents.

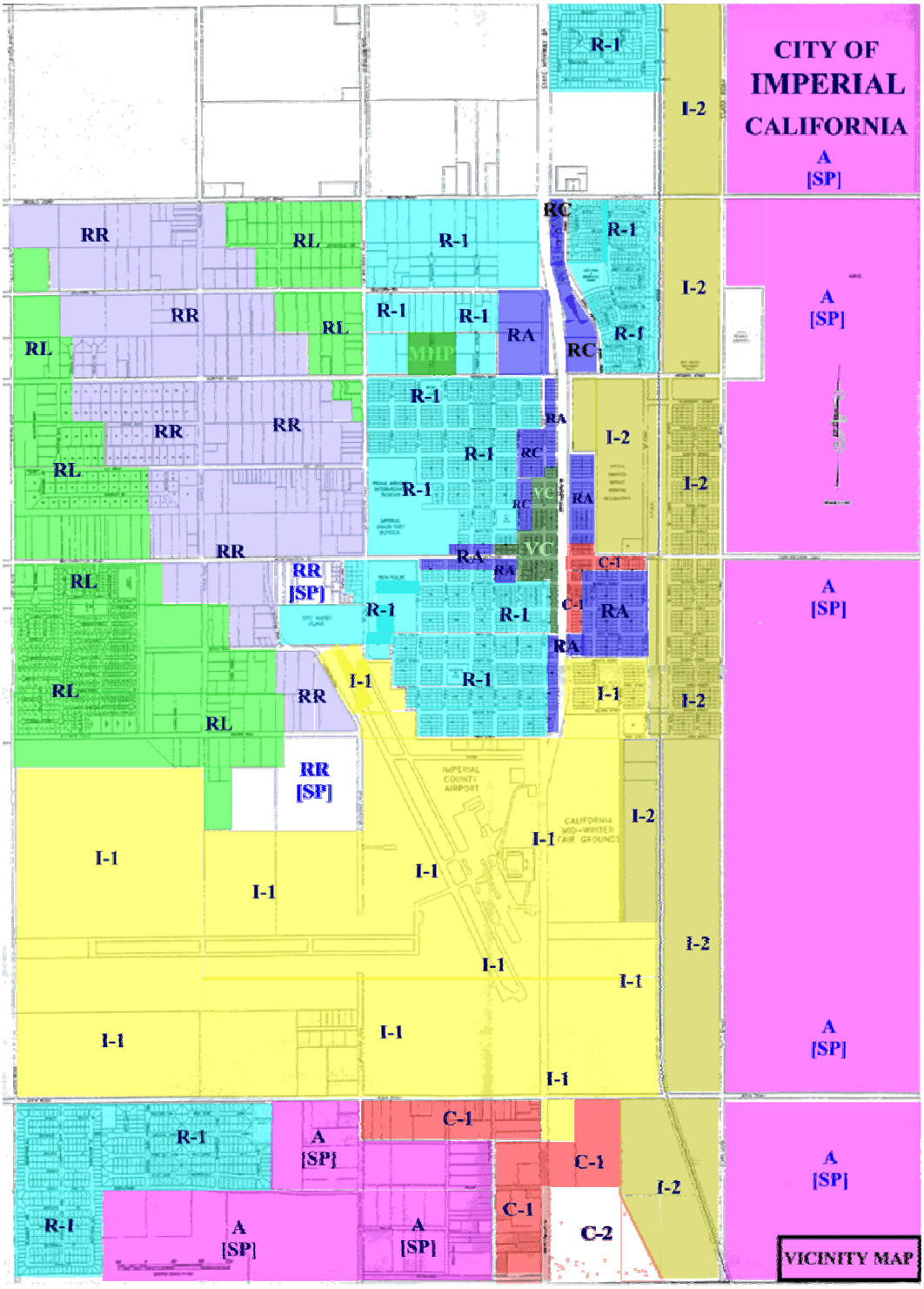
3.1.6 Land Use

A mild climate, year-round growing season, good soils, and a gently sloped topography combined with the strong historical Colorado River water rights make Imperial Valley one of the most productive agricultural regions in the world. Agricultural development in the Imperial Valley began at the turn of the twentieth century and now includes approximately 500,000 acres of irrigated land that support a $1 billion annual local agricultural economy. Roughly 70 percent of Imperial Valley land is utilized for agricultural purposes.

While the agriculture-based economy is expected to continue, land use will vary somewhat over the years as urbanization and growth occurs in the rural areas adjacent to existing urban areas. The Imperial County General Plan, updated September 2004, identifies an 8,480-acre urban area surrounding the City of Imperial (see Figure 3).

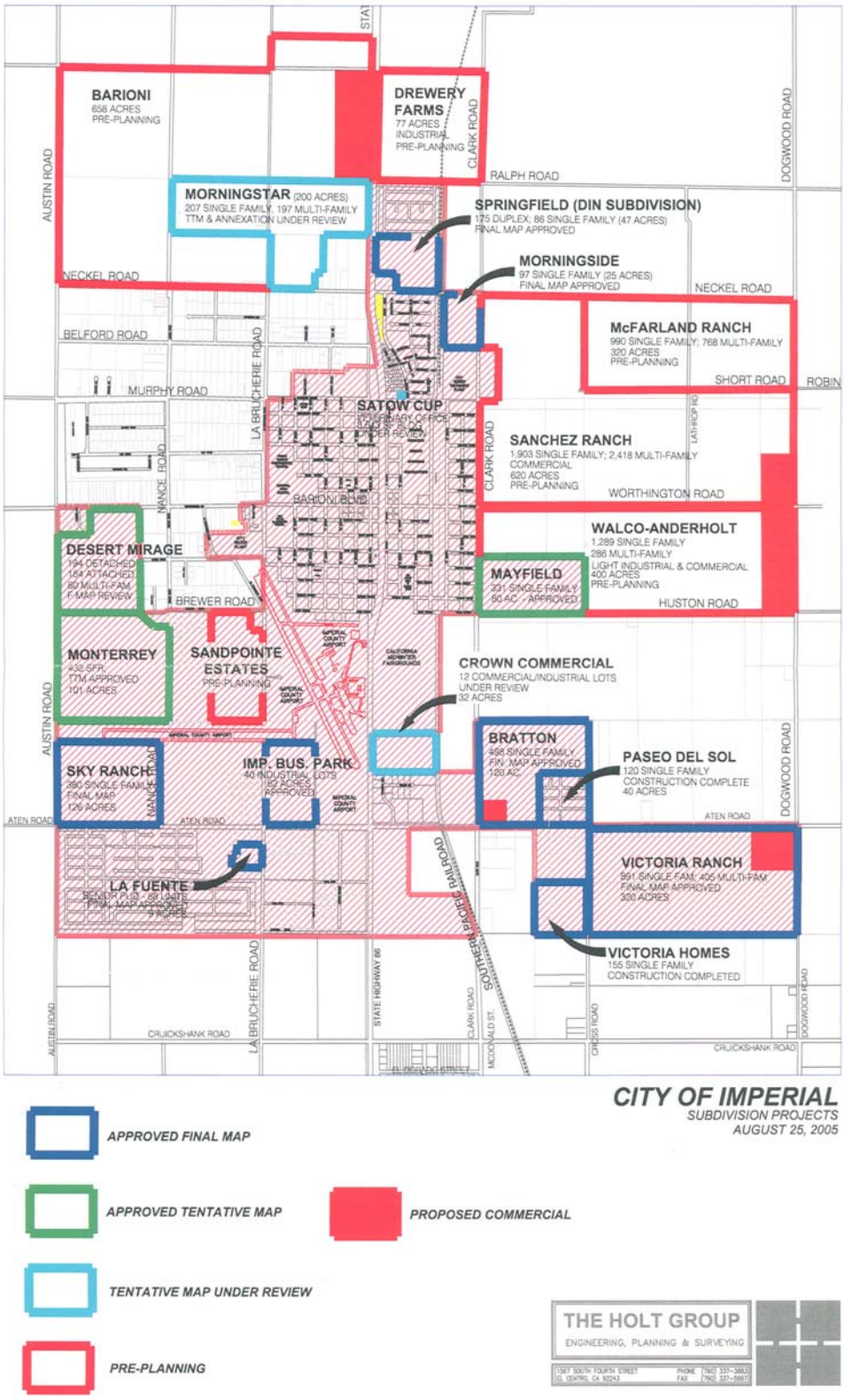
Residential and industrial/commercial development is expected to increase substantially in the City of Imperial in the next 25 years. At present, approximately 50 percent of the city is developed in residential units, with a large percentage of the remaining land within the corporate limits being owned by public entities. Much of the industrial land is presently undeveloped and currently in agricultural production. New residential developments are and will continue to be important in the future, when existing agricultural land is converted to urban uses. One particular pressure for new local developments will be to serve a growing number of San Diegans who are taking advantage of inexpensive home prices and a manageable commute by moving into the area.

Table 3 lists the acreage, units and population figures for projected residential build-out areas in the City of Imperial:



Source: City of Imperial, 2005. WebPages: http://www.imperial.ca.gov.

Figure 3: City of Imperial Planning Map



Source: City of Imperial, 2005.

Figure 4: City Of Imperial Planned Subdivision Projects

Table 3: Residential Build-Out Projections Area within Imperial City Limits

Land Use Designation	Under-Utilized Acres	Vacant Acres	Existing Dwelling Units	Future Dwelling Units	Build-Out Dwelling Units	Build-Out Population
Rural Residential	21.3	94.4	220	116	336	1,094
Low Density Residential	37.3	97.4	13	269	282	921
Low-Medium Density Residential	39.0	206.6	1,874	1,228	3,102	10,111
Residential Condominium	0.8	0.6	210	28	238	777
Multiple Family Residential	32.8	12.3	404	902	1,306	4,257
Mobile Home Park	8.4	0.0	8	67	75	245
Agriculture	0.0	0.0	0	0	0	0
Nonresidential	N/A	N/A	50	(50)	0	0
Totals:	**139.6**	**411.3**	**2,779**	**2,560**	**5,339**	**17,406**

Source: City of Imperial Service Area Plan, 2003.

Additionally, the City of Imperial has identified the subdivision projects listed in Table 4 which are currently at various planning stages for development within the next 25 years (see Figure 4 above for a map of project locations):

Table 4: City of Imperial Subdivision Projects

Stage of Planning / Completion Date	Development Name	Location (see Figure 4)	Number, Type Units	Acres
Approved Final Map **Projected Completion by 2010**	Springfield (Din Subdivision)	Neckel Road & Highway 186	175 Duplex 86 Single Family	47
	Morningside	Neckel & Clark Roads	97 Single Family	25
	Sky Ranch	Aten & Austin Roads	380 Single Family	126
	Imperial Business Park	Aten & La Brucherie Roads	40 Industrial Lots	62
	La Fuente	La Brucherie Road (near Aten Road)	58 Senior PUD	9
	Bratton	Aten & Clark Roads	498 Single Family	120
	Paseo Del Sol	Aten & Cross Roads	120 Single Family	40
	Victoria Ranch	Aten & Cross Roads	891 Single Family 405 Multi-Family	320
	Victoria Homes	Cross Road (opposite Victoria Ranch)	155 Single Family	40

Approved Tentative Map **Projected Completion by 2015**	Desert Mirage	Austin Road & Barioni Boulevard	194 Detached 184 Attached 80 Multi-Family	80
	Monterrey	Austin & Brewer Roads	432 Single Family	101
	Mayfield	Clark & Huston Roads	331 Single Family	80
Tentative Map Under Review **Projected Completion by 2020**	Morningstar	La Brucherie & Ralph Roads	207 Single Family 197 Multi-Family	200
	Crown Commercial	Highway 86 (opposite airport)	12 Commercial/ Industrial Lots	32
Pre-Planning **Projected Completion by 2030**	Barioni	Austin & Neckel Roads	Not Known	658
	Drewery Farms	Clark & Ralph Roads	Industrial	77
	McFarland Ranch	Short & Lathrop Roads	990 Single Family 768 Multi-Family	320
	Sanchez Ranch	Clark & Worthington Roads	1,903 Single Family 2,418 Multi-Family Commercial	620
	Walco-Anderholt	Huston & Dogwood Roads	1,289 Single Family 286 Multi-Family Light Industrial & Commercial	400
	Sandpointe Estates	Brewer and La Brucherie Roads	Not Known	70

Finally, the City of Imperial is in the process of preparing a Specific Plan for a 1,100-acre area to be known as “Rancho Imperial.” Specific Plans are used to implement the Imperial County General Plan for large development projects such as a planned community, or to designate an area of Imperial County where further studies are needed before development. When adopted, a Specific Plan serves as an amendment to the Imperial County General Plan for a very defined and detailed area.

The Rancho Imperial Project site is located in the southeast section of Imperial, north of Aten Road and east of Clark Road (“P” Street). The plan calls for the development of approximately 3,300 new housing units over the next ten years, and includes four new schools and nine new neighborhood parks. When fully developed, over 10,000 people will reside in the Specific Plan area, effectively doubling the 2003 population of Imperial.

3.2 Region

3.2.1 Imperial County and Valley

Imperial County is located in the southeast corner of California (see Figure 1). It is bordered on the west by San Diego County, on the north by Riverside County, on the east by the Colorado River which forms the Arizona boundary, and on the south by 84 miles of the International Boundary with the Republic of Mexico. Imperial County is the ninth largest county in California, encompassing an area of 4,597 square miles, or 2,942,080 acres.

Approximately fifty percent of Imperial County's land area is undeveloped and under federal ownership and jurisdiction, and about seven percent of Imperial County is within the boundaries of the Salton Sea. One-fifth of the nearly 3 million acres in Imperial County are irrigated for agricultural purposes, most notably in the Imperial Valley, making Imperial County among the top ten agricultural counties in the nation.

The Imperial Valley is in the south-central part of Imperial County, and is bounded by Mexico on the south, the Algodones Sand Hills on the east, the Salton Sea on the north, San Diego County on the northwest, and the alluvial fans bordering the Coyote Mountains and the Yuha Desert on the Southwest. The Imperial Valley encompasses roughly 989,450 acres, 512,163 of which are irrigated. The developed area, where Imperial County's seven incorporated cities—Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial and Westmorland—as well as unincorporated communities and supporting facilities are situated, comprises less than one percent of the land but contains approximately 71 percent of the total county population.

3.2.2 Climate

The Imperial Valley region is considered an arid desert, characterized by hot, dry summers and mild winters. Summer temperatures typically exceed 100°F and the winter low temperatures rarely drop below 32°F. The remainder of the year has a relatively mild climate with temperatures averaging in the mid-70s. The average annual air temperature is 72°F and the average frost-free season is about 300 days per year.

Annual rainfall in the Imperial Valley averages less than three inches, with most rainfall associated with brief but intense storms. The majority of the rainfall occurs from November through March. Periodic summer thunderstorms are common in the region.

Imperial Valley elevations range from sea level to 273 feet below sea level. The Mexican Border is located at the southern end of Imperial Valley and its elevation is at sea level. The elevation of the Salton Sea at the northern end of the valley is 273 feet below sea level. The relatively flat topography of the Imperial Valley and surrounding areas in conjunction with strong night and day temperature differentials, particularly in the summer months, produce moderate winds and deep thermal circulation systems, facilitating general dispersion of the air.

Table 5 gives data on the climate of the region as it impinges on its water supplies, including average rainfall, average temperature, and average rate of evapotranspiration (ET—i.e., the rate that water either evaporates or is expired by vegetation into the atmosphere).

Table 5: Climate

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Rainfall (inches)	0.44	0.35	0.28	0.08	0.02	0	0.11	0.26	0.27	0.24	0.21	0.35	**2.61**
Average Temperature (°F)	55.9	59.9	64.6	70.7	77.8	86	91.7	91.4	86.4	75.8	63.6	55.9	**73.31**
Average ET (inches)	2.47	3.24	5.5	7.46	8.92	9.17	9.02	8.46	6.77	5.3	3.09	2.22	**71.62**

Sources: Monthly Average ETo Report (No. No. 87, Meloland Station), California Irrigation Management Information System, Department of Water Resources, Office of Water Use Efficiency, Accessed October 31 2005; Western Regional Climate Center, 2005. Period of Record: 9/1/1953 to 12/31/2004. WebPages: http://www.wrcc.dri.edu.

3.2.3 Watershed/Basin

The terms “watershed” and “basin” are often used interchangeably, but in general they mean a region whose borders are defined by surface water drainage. The term “basin” often refers to a larger area incorporating many watersheds, and is used as well to indicate a region defined by a common groundwater resource (see, for instance, Section 4.1.2 below). Different designations are often given to the same drainage area by various planning or regulatory agencies.

The City of Imperial is located within the Salton Sea Watershed, which can be considered a part of (or at least dependant upon) the Lower Colorado River Basin.

Salton Sea Watershed

The 8,360-square-mile Salton Sea Watershed contains the Coachella and Imperial Valleys in the United States and a portion of the Mexicali Valley in Mexico, all of which drain into the Salton Sea. It includes a small corner of San Bernardino County that drains to the Whitewater River, some of Riverside County, most of Imperial County, the eastern portion of San Diego County, and part of the state of Baja California in the Republic of Mexico. The principal tributaries to the Salton Sea are the Whitewater River, which flows into the north end of the sea, and the Alamo and New Rivers, which flow into the sea from the south. The watershed is shown in Figure 5.

The Salton Sea is a terminal lake with no outlet to the ocean. The bulk of its inflow is from agricultural and municipal drainage, and the ultimate source of most of this inflow is water imported to the region from the Colorado River. Only about three percent of the water that flows into the Salton Sea comes from rainfall within the watershed. Most runoff occurs from November through April and from August through September. During the summer, most of the rainfall is from short, intense thunderstorms.

The total amount of water lost to evaporation from the sea is currently estimated at about 1.36 million acre-feet per year. Since the elevation is approximately steady, the outflow (evaporation) is roughly equivalent to the sum of the inflows.

Lower Colorado River Basin

The Colorado River rises in the mountains of north-central Colorado and zigzags southwest for more than 1,400 miles before reaching the Gulf of California. The river and its tributaries—the Green, the Gunnison, the San Juan, the Virgin, the Little Colorado, and the Gila rivers—are collectively called the "Colorado River Basin." These rivers drain 242,000 square miles in the United States, or one-twelfth of the country's continental land area, and 2,000 square miles in Mexico. The Colorado River Basin states are Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming (see Figure 6).

Each state is party to the Colorado River Compact entered into in Santa Fe, New Mexico, on November 24, 1922. The Colorado River Compact divided the Colorado River Basin into the Upper Basin and the Lower Basin. The division point is Lees Ferry, a point in the main stem of the Colorado River about 30 river miles south of the Utah-Arizona boundary. The "Lower Basin" includes those parts of the States of Arizona, California, Nevada, New Mexico and Utah within and from which waters naturally drain into the Colorado River system below Lees Ferry, and all parts of these states that are not part of the river's drainage system but may benefit from water diverted from the system below Lees Ferry (including the Imperial Valley).

For more on the Colorado River Compact, see Section 4.1.1 below.

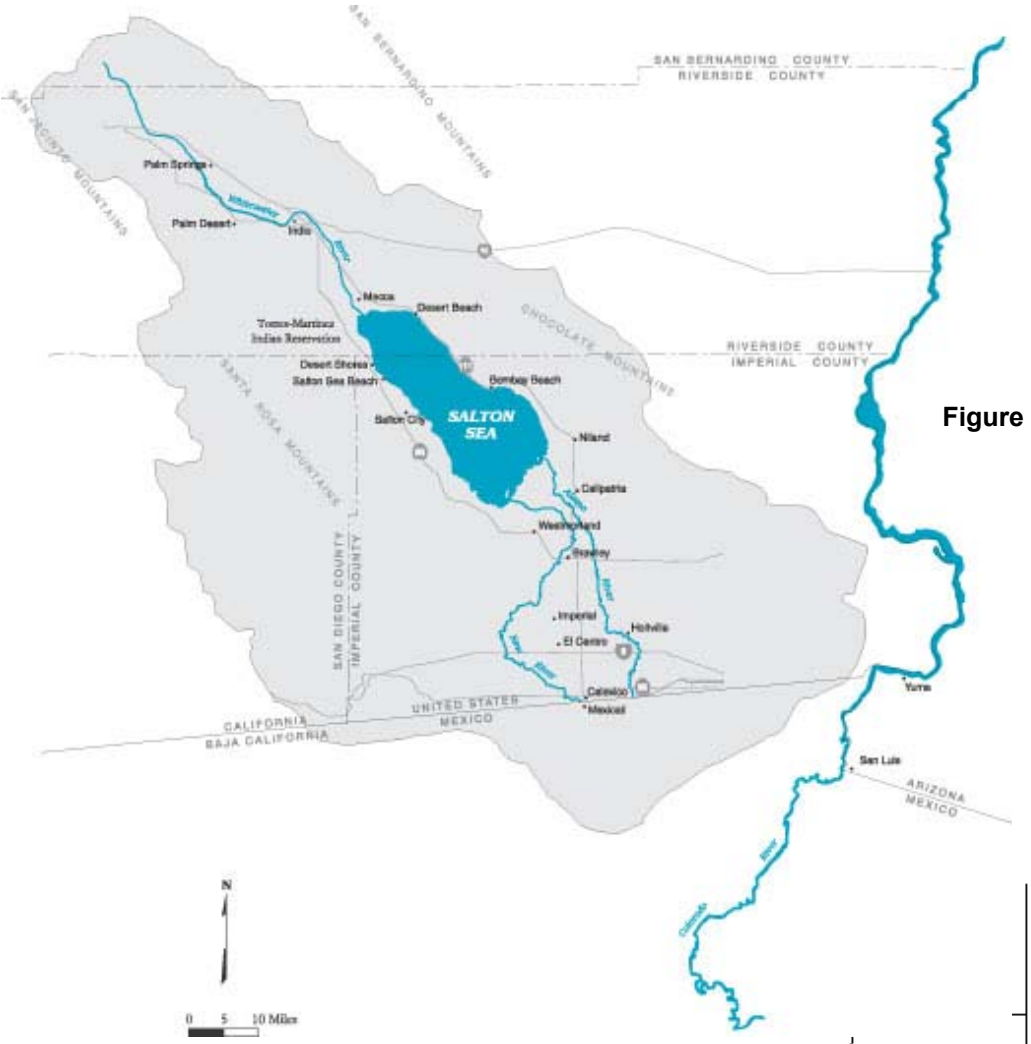


Figure 5: Salton Sea Watershed

Source: California Department of Water Resources, 2005. WebPages: http://www.saltonsea.water.ca.gov

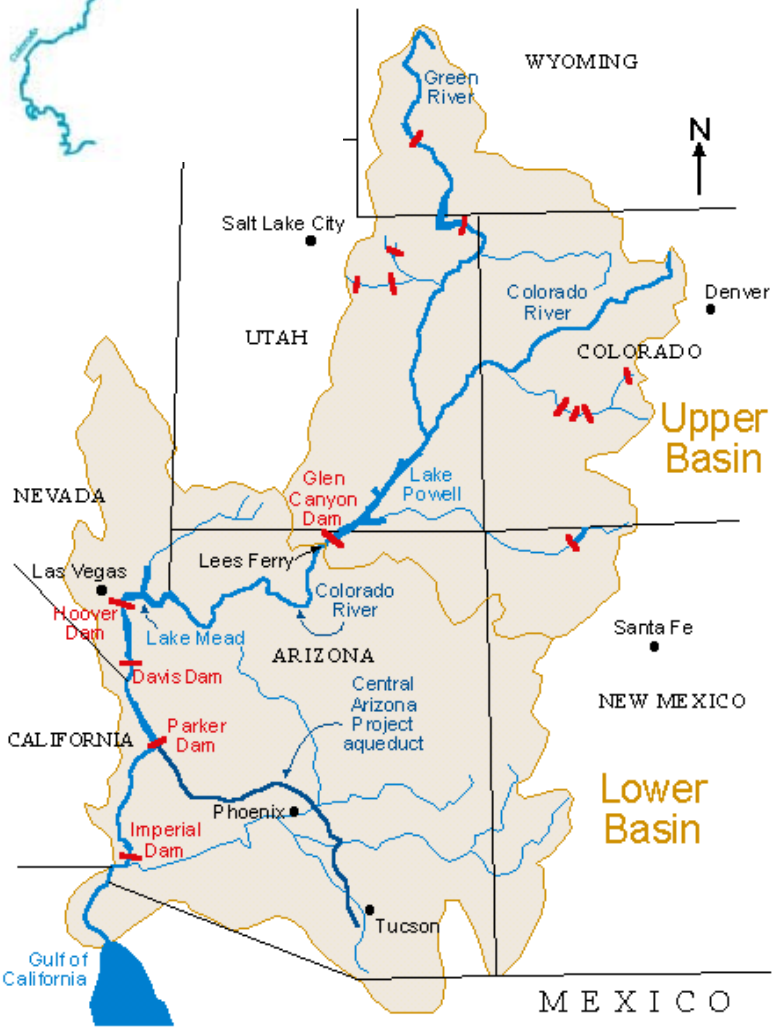


Figure 6: Lower Colorado River Basin

Source: The Good Earth, 2000.

4.0 Water Supply

Law *10631. (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data area available]…*

The City of Imperial receives all of its water from the Imperial Irrigation District. The Imperial Irrigation District water supply to the city is assured for the next 25 years. Other possible local water supply sources, particularly local groundwater, recycled domestic and agricultural wastewater, and transfers from local municipalities, have also been considered.

This chapter provides an overview of the city's current and future water supply picture, including analyses of real and potential sources of supply, threats to the city's current and future water supply portfolio, and planned water supply projects and programs to maintain and, if necessary, increase the availability of potable water supplies in the future.

4.1 Sources of Water Supply

Water supply for the City of Imperial comes from surface water inflows from the Colorado River. The Imperial Irrigation District serves as the regional water supplier, importing raw Colorado River water and delivering it, untreated, to agricultural, municipal and industrial water users within its service area. Municipal and/or industrial users treat the raw water to meet state and federal drinking water standards and then distribute the treated water to urban users.

Rainfall is less than three inches per year and does not contribute significantly to the City of Imperial or the Imperial Irrigation District's water supply. Local groundwater and surface water is of poor quality and would require extensive treatment to make it suitable for domestic use.

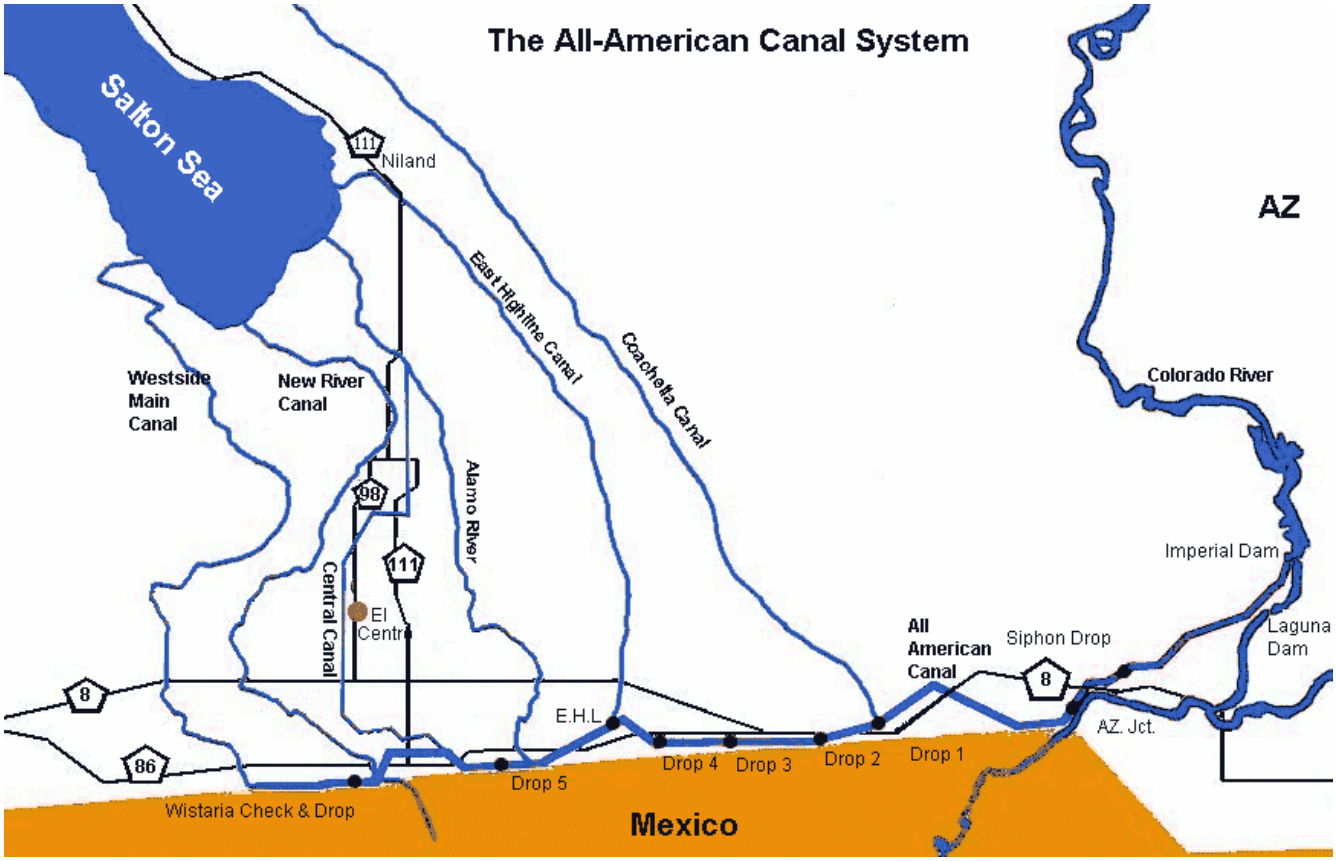
Table 6 lists the current and planned firm water supplies for the City of Imperial through 2030:

Table 6: Current and Planned Water Supplies

Water Supply Sources (AFY)	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Imperial Irrigation District	2,331	2,983	4,340	5,681	6,966	8,200
Total	**2,331**	**2,983**	**4,340**	**5,681**	**6,966**	**8,200**

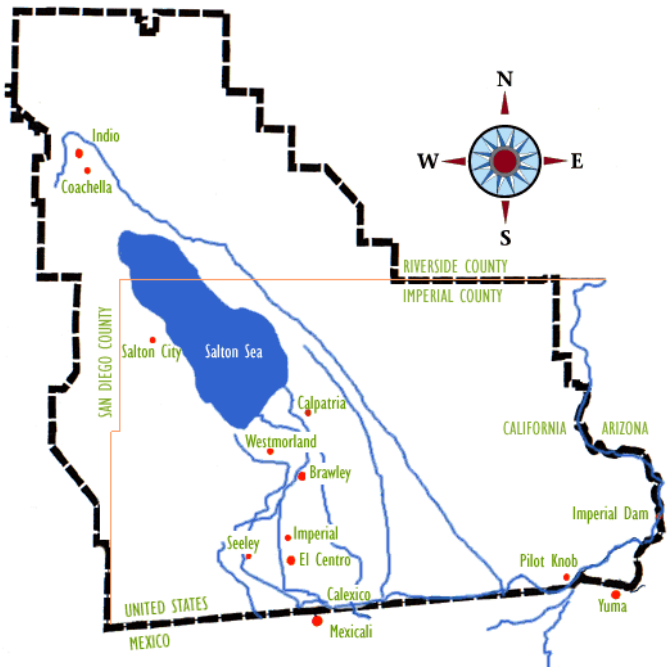
4.1.1 Imperial Irrigation District

The City of Imperial receives all of its water supply from Imperial Irrigation District (IID). IID diverts surface water from the Colorado River at Imperial Dam and delivers it to the city via the 82-mile-long All-American Canal and the Central Main Canal (see Figure 7).



Source: FishingNetwork.net, 2005.

Figure 7: All-American Canal System



Source: Imperial Irrigation District, 2005. WebPages: http://www.iid.com

Figure 8: Imperial Irrigation District Service Area

Established in 1911 under the California Irrigation District Act to acquire properties of the bankrupt California Development Company and its Mexican subsidiary, IID is now the largest water district in the Western Hemisphere, a community-owned utility which provides electrical power and wholesale water service for most of Imperial County (see Figure 8). IID is governed by a five-member board of directors elected by the public.

IID's water is used primarily for agricultural crop irrigation; less than two percent of the district's untreated water is ultimately used for urban or industrial purposes. The City of Imperial is one of seven incorporated cities and three unincorporated cities which divert water from IID's canal system to their treatment facilities. IID also provides raw untreated canal water to industrial water users including geothermal plants, the Holly Sugar Corporation, chemical and fertilizer producers, a state prison and the United States Naval Air Facility, as well as to small acreage and service pipe connections, some of which are rural homes without any alternative water source. IID is not a public water system and does not supply potable drinking water.

Water diverted at Imperial Dam for use in the Imperial Valley first passes through one of three desilting basins used to remove silt and clarify the water. Each desilting basin is designed to remove 70,000 tons of silt per day. From the desilting basins, water is then delivered to the Imperial Valley through the All-American Canal (AAC—see Figure 7). Three main canals—East Highline, Central Main and Westside Main—receive water from the AAC and are used to deliver water to many canals that exist throughout Imperial Valley. Water users—primarily farmers—then divert water directly from these canals. The City of Imperial draws its water supply from canals that siphon water directly off of the Central Main Canal, which flows near the western border of the city.

As part of its operating system, the district maintains an extensive open channel gravity flow irrigation distribution and drainage system. IID serves water through approximately 5,600 delivery gates for irrigation purposes. It operates and maintains more than 1,438 miles of lateral canals and 312 miles of main canals (including the AAC). IID also maintains approximately 1,406 miles of drainage ditches used to collect surface runoff and subsurface drainage from 32,227 miles of tile drains underlying 462,202 acres of farmland within IID's boundaries. Most of these drainage ditches ultimately discharge water into either the Alamo River or New River. Another important component of IID's distribution system are the seven regulating reservoirs and three interceptor reservoirs that have a total storage capacity of more than 3,300 acre-feet of water. IID operations are divided into four units—Imperial, West Mesa, East Mesa and Pilot Knob—and fall under the direction of the United States Bureau of Reclamation (USBR).

IID has a "present perfected" right to 2.6 million acre-feet (MAF) of water annually from the Lower Colorado River (see Section 3.2.3 above) which it uses under a prioritized consumptive right regime under the Seven-Party Agreement as a portion of the 3.85 MAF entitlement shared with Palo Verde Irrigation District, Yuma Project Reservation Division, Metropolitan Water District of Southern California and Coachella Valley Water District (see below). IID holds legal titles to all its water and water rights in trust for landowners within its service area (California Water Code §§20529 and 22437; *Bryant v. Yellen*, 447 U.S. 352, 371 [1980], fn.23.).

IID Colorado River Water Rights and Water Delivery Contract

IID's rights to appropriate Colorado River water are long-standing. Beginning in 1885, a number of individuals, as well as the California Development Company, made a series of appropriations of Colorado River water under California law for use in the Imperial Valley. Pursuant to then-existing California laws, these appropriations were initiated by the posting of public notices for approximately 7 million acre-feet per year (AFY) at the point of diversion and recording such notices in the office of the county recorder. The individual appropriations were subsequently assigned to the California Development Company, whose entire assets, including its water rights, were later bought by the Southern Pacific Company. The IID was formed in 1911. On June 22, 1916, the Southern Pacific Company conveyed all of its water rights to the IID.

The IID's predecessor right holders made reasonable progress in putting their pre-1914 appropriative water rights to beneficial use. By 1929, 424,145 acres of the Imperial Valley's approximately one million irrigable acres was under irrigation, establishing a "present perfected" water right to 2.6 million acre-feet (MAF) of water annually. A 1964 Supreme Court decree in *California v. Arizona* defined these vested district water rights, which preempt the 1902 Reclamation Law and are not subject to reclamation law limitations. Had the IID not subsequently modified its pre-1914 appropriative rights, the IID would have perfected its pre-1914 appropriative water right at over 7 million AFY.

On November 5, 1930, the Secretary of the Interior requested the California Division (now Department) of Water Resources to recommend a proper method of apportioning the water which California was entitled to receive under the 1922 Colorado River Compact and the Boulder Canyon Project Act. A number of users and prospective users of Colorado River water, including the IID and the Metropolitan Water District of Southern California, entered into the Seven-Party Agreement on August 18, 1931.

As a result of the Seven-Party Agreement, with respect to the signatory parties, the IID agreed to limit its California pre-1914 appropriative water rights in quantity and priority to the apportionments and priorities contained in the Seven-Party Agreement. Following execution of the Seven-Party Agreement, the IID filed eight California applications between 1933 and 1936 to appropriate water pursuant to the California Water Commission Act. The IID filed such applications without waiving its rights as a pre-1914 appropriator, and the applications sought rights to the same quantity of Colorado water as had been originally appropriated—over 7 million AFY. However, the applications also incorporated the terms of the Seven-Party Agreement, thus incorporating the apportionment and priority parameters of the Seven-Party Agreement into IID's appropriative applications. Permits were granted on the applications in 1950.

Pursuant to the provisions of the Boulder Canyon Project Act adopted in 1929, the California Limitation Act and the Secretary of the Interior's contracts, California was apportioned 4.4 million AFY out of the lower basin allocation of 7.5 million AFY, plus 50 percent of any available surplus water. The further apportionment of California's share of Colorado River water was made by the Secretary of the Interior by entering into contracts with California right holders. The Secretary entered into a permanent service water delivery contract with the IID on December 1, 1932. The IID's contract with the Secretary incorporated the provisions of the Seven-Party Agreement.

Under the Seven-Party Agreement, the IID does not have a quantified water right but instead is allotted the right to use flows within the 3.85 MAF entitlement. Four agencies share this entitlement, and the right to use these flows is prioritized with the highest priority water user diverting flows first, followed in order of priority by the other three agricultural entities. Thus, IID’s third priority water right gives it the right to use whatever flows it can put to reasonable and beneficial use after diversion by the Palo Verde Irrigation District (Priority 1) and Yuma Project Reservation Division (Priority 2). Coachella Valley Water District holds the last priority to this agricultural entitlement, and is legally entitled to use whatever flows remain from the 3.85 million acre-feet allotment that have not already been diverted by the first three priority holders.

In any year, each of the agricultural water users’ available water supplies can be determined by subtracting the annual diversions of the higher priority water users from the 3.85 million acre-feet agricultural entitlement. The average annual use for Priorities 1 and 2 (minus return flows) is around 420,000 AFY, leaving approximately 3.4 million AFY for use by the IID.

Table 7 lays out the terms of the Seven-Party Agreement:

Table 7: Seven-Party Agreement for California Apportionment of Colorado River Water Rights

Contractor or Decree Name	Contract No. or Decree No.	Contract or Entitlement Date	Diversion (AF)
1) Palo Verde Irrigation District – Gross area of 104,500 acres	Present Perfected Right (PPR) No. 26 for 219,780AF	1877	3,850,000
2) Yuma Project (Reservation Division) – not exceeding a gross area of 25,000 acres	PPR No. 28 Water Rights Certificates	1905	
3(a) Imperial Irrigation District and lands in Imperial and Coachella Valleys to be served by AAC – Coachella Valley Water District	PPR No. 27 for 2,600,000AF Contract Ilr-747 Contract Ilr-781	1901 12-1-1932 10-15-1934	
3(b) PVID – 16,000 acres of mesa lands	N/A	2-7-1933	
4) Metropolitan Water District and/or City of Los Angeles and/or others on coastal plain	Ilr-645 dated 4-24-1930, supplemented 9-28-1931	9-28-1931	550,000
5(a) The Metropolitan Water District and/or City of Los Angeles and/or others on coastal plain	Ilr-645 dated 4-24-1930, supplemented 9-28-1931	9-28-1931	550,000
5(b) City and/or County of San Diego	Ilr-1151	10-2-1934	112,000
6(a) Imperial Irrigation District and lands in Imperial and Coachella Valleys to be served by the AAC	Ilr-747	12-1-1932	300,000
6(b) Palo Verde Irrigation District – 16,000 acres of mesa lands	N/A	2-7-1933	
7 All remaining water available for use in California for agricultural use	N/A	N/A	N/A
Total Acre-Feet of Seven Party Agreement (Consumptive Use): **5,362,000***			

**During the term that the Colorado River Water Delivery Agreement (Federal Quantification Settlement Agreement [see below]) dated October 10, 2003, remains in effect, the delivery of Colorado River water will be in accordance with the terms as set forth in that agreement (see Appendix D, particularly Exhibit B, for specific entitlements during the time the agreement is in effect).*

Quantification Settlement Agreement (IID-San Diego Transfer Agreement)

On October 10, 2003, IID, the San Diego County Water Authority (SDCWA), Coachella Valley Water District, Metropolitan Water District of Southern California and the State of California finalized the historic Quantification Settlement Agreement (QSA) for the transfer of huge amounts of Colorado River water within California. The agreement, some 15 years in the making, finalizes California's push to stay within its 4.4 million acre-foot (MAF) federal entitlement of Colorado River water. The QSA also commits the state to restore the environmentally sensitive Salton Sea.

The QSA consists of the contractual arrangements negotiated between the major California diverters under the oversight of the United States Secretary of the Interior. The primary goal of the QSA is to provide additional water to the municipal and industrial sector through transfers of higher priority agricultural water. The QSA involves the agreement to transfer water from the major agricultural diverters—and in particular IID—to municipal and industrial uses—in particular SDCWA—for a period of 75 years (45 years through 2047, with a possible 30-year extension to 2077). These transfers are intended to maximize the collective value of the normal allotment of California water by allowing the water reductions to occur in the agricultural sectors where the unit value of water is significantly lower.

Under the QSA, IID will conserve water through on-farm or system projects and then transfer that conserved water to SDCWA. Under California State law, IID may conserve and transfer water without the losing their present perfected water rights. The transfer is in its third year of implementation with 30,000 acre-feet (AF) of water scheduled to be transferred to San Diego in 2005. Deliveries are to increase in 20,000-AF increments until a maximum of 200,000 AF is reached in the nineteenth year (2021) of the contract. The minimum amount that can be transferred is 130,000 AF as set forth in the agreement. For a full list of projected transfers see Exhibit B within the QSA, attached to this report as Appendix D.

Included in the QSA is a project to conserve water by lining portions of the All-American Canal. As part of the QSA, SDCWA obtained the rights to the water produced by the projects for 110 years. The All-American Canal project will be constructed in three phases and is projected to save 67,700 AF of water annually upon its completion, scheduled for late 2008.

Additionally, to mitigate impacts to the Salton Sea, IID is required to implement a fallowing program for the QSA's first fifteen years. By the fifteenth year and through the duration of the transfer, system improvements such as canal interceptors, mid-lateral reservoirs and automation along with on-farm improvements such as tailwater recovery systems and micro-irrigation are expected to provide the water needed for the transfer. The fallowing program continues to be one of the most controversial provisions in the QSA.

4.1.2 Local Groundwater

> *10631. (b) …If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*
>
> *(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.*
>
> *(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater… For basins that have not been adjudicated, information…in the most current official departmental bulletin that characterizes the condition of the groundwater basin.*
>
> *(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years…*
>
> *(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier…*

The City of Imperial is located over the Imperial Valley Groundwater Basin. This groundwater basin is not adjudicated or otherwise regulated, and has not been identified or projected to be in overdraft by the California Department of Water Resources.

The City of Imperial currently does not use local groundwater for drinking water purposes and has no plans to do so in the future. Groundwater in the Imperial Valley Groundwater Basin has high salt content and is thus of poor quality and unsuitable for domestic or irrigation use.

However, the city's General Plan does cite long-term water storage as one of the potential benefits of local groundwater. One of its objectives (#8 in the Conservation Element) states as the reason for preventing groundwater contamination "to ensure future viable uses of existing ground water [*sic*] resources" (page 210).

Imperial Valley Groundwater Basin

The 1,200,000-acre (1,870-square-mile) Imperial Valley Groundwater Basin is located south of the Salton Sea in the southeastern part of California at the international border with Mexico. The basin is bounded on the east by the Sand Hills and on the west by the impermeable rocks of the Fish Creek and Coyote Mountains. To the north the basin is bounded by the Salton Sea which is the discharge point for groundwater in the basin, and to the south the basin extends across the international border into Baja California where it underlies a contiguous part of the Mexicali Valley.

The basin has two major aquifers (underground areas of saturated soil), separated at depth by an aquitard (semi-permeable bed of rock or soil). Recharge is primarily from irrigation return, as well as from deep percolation of rainfall and surface runoff, underflow into the basin and seepage from unlined canals which crisscross the valley. Total seepage from the All American Canal from 1942 to 1982 is estimated at 2.2 million acre-feet (MAF), and seepage from the Coachella Canal between the same years is estimated at 1.2 MAF. Another source of groundwater recharge occurs along the lower reaches of the New River, near Calexico. Annual recharge from all sources is estimated to be about 400,000 acre-feet, and total storage capacity for the basin is estimated to be 14 MAF.

Water quality varies extensively throughout the basin but, in general, is unusable for domestic and irrigation purposes without treatment. Concentrations of total dissolved solids (TDS) range from a few hundred to more than 10,000 milligrams per liter (mg/L); water with TDS above 1,000 mg/L is considered to be of poor quality. Additionally, the groundwater's fluoride concentration is higher than that recommended for drinking water, and its boron concentration exceeds that recommended for certain agricultural crops. Finally, recharge from the highly polluted New River (see Section 4.1.3) which drains the Mexicali Valley negatively affects groundwater quality in the basin.

4.1.3 Local Surface Water

The City of Imperial does not draw on any local surface water sources for drinking water purposes, and has no plans to do so in the future. However, the Imperial Irrigation District (IID) water system is primarily a surface water system; for more information, see Section 4.1.1 above.

Local surface water sources include the myriad of agricultural canals, laterals and drains forming IID irrigation canal network; the Central Main Canal, a major artery of the IID network; and the New River. All of these potential surface water sources eventually drain into the Salton Sea 20 miles to the north of the city.

IID Canal Network

IID supplies water to approximately 470,000 acres of irrigated farmland in the Imperial Valley. Water is delivered to farmers through an extensive 1,667-mile network of canals and laterals. The city already receives all of its water supply from the Central Main Canal, a major artery in this network (see below).

Irrigation drainwater or tailwater—irrigation water in excess of crop requirements—is collected by approximately 550 sumps and 10,000 gravity tile outlets located at the tail end of fields into the roughly 1,470 miles of surface drains that discharge to the New or Alamo Rivers or directly into the southern end of the Salton Sea (see Figure 9). Irrigation drainwater contains elevated levels of dissolved salts and high concentrations of selenium, sulfate, boron, molybdenum, lithium, chloride and sodium, and therefore is not suitable for drinking water purposes.

Central Main Canal

The Central Main Canal delivers approximately one-third of the water IID receives from the Colorado River to water users in the central section of the Imperial Valley, including most cities. The canal is one of IID's three primary main canals coming off the All-American Canal—the others are the East Highline and Westside Main (see Figure 7). The Central Main Canal connects to the All-American Canal just north of Calexico, is about 27 miles long and is unlined.

New River

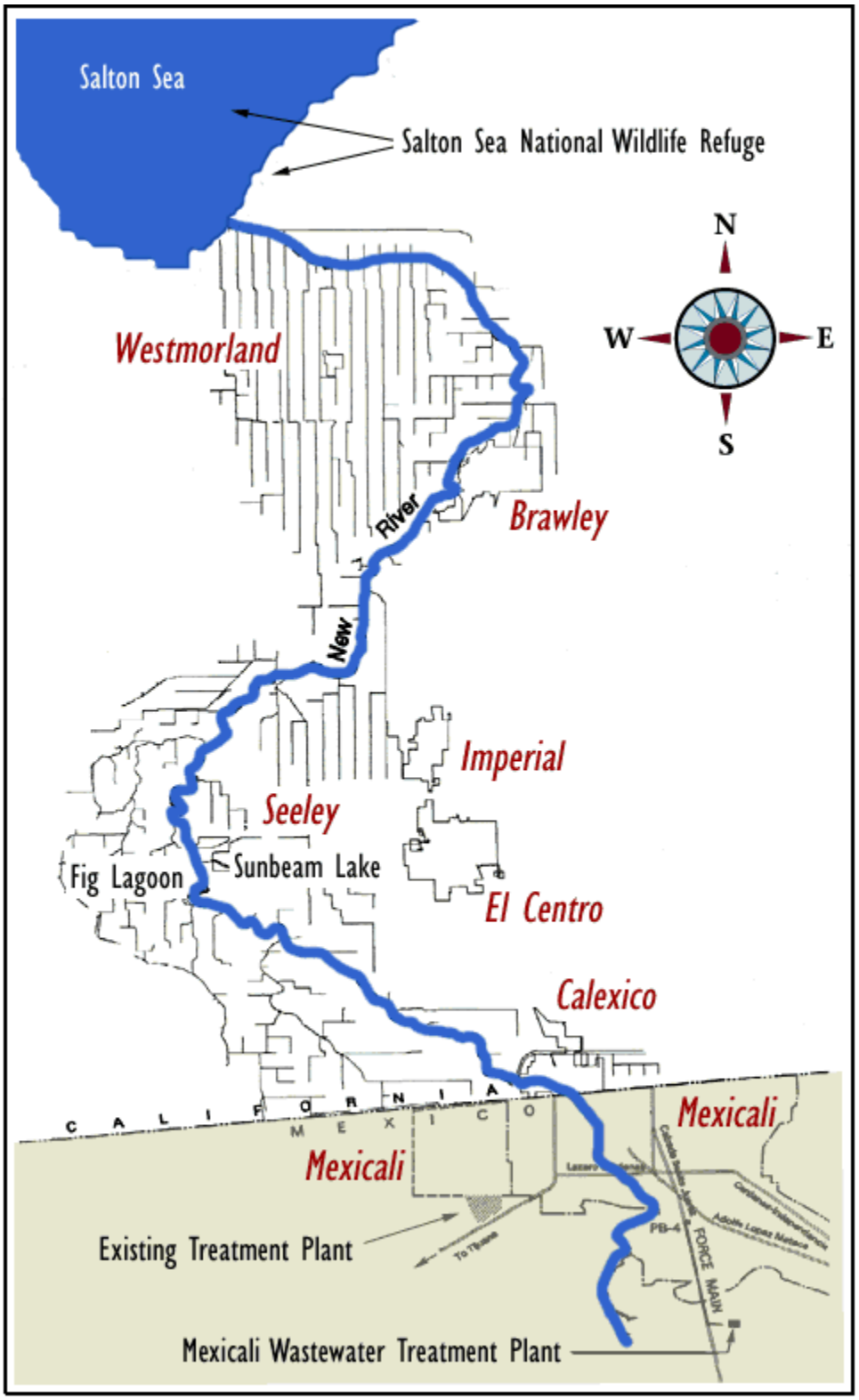
The New River, an international river which flows north from the Mexicali Valley in Mexico to the Salton Sea, is considered to be the most polluted waterway in North America. The present-day channel of the New River was created in 1905-07 when the Colorado River washed out diversionary works, and the entire Colorado River flow coursed into the Salton Basin creating the New and Alamo River channels and the present Salton Sea (thus the name "New" River). Currently, the New River's headwaters originate about 15 miles south of the City of Mexicali, in the Mexicali Valley, Mexico (see Figure 9).

The New River carries urban runoff, untreated and partially treated municipal wastes, untreated and partially treated industrial wastes, and agricultural runoff from the Mexicali Valley into the United States. After it crosses the International Boundary at Calexico, California, the New River travels about 60 miles through Imperial County before it discharges its entire flow into the Salton Sea. The New River collects agricultural drainage water from 56 main and lateral drains belonging to IID. By the time the New River reaches the Salton Sea, about two-thirds of its flow consists of wastewater from 280,000 acres of irrigated agricultural land in Imperial County. The New River flow is approximately 200 cubic feet per second (cfs), or 144,800 acre-feet per year (AFY) at the International Boundary. At its delta with the Salton Sea, its flow is approximately 600 cfs, or 434,400 AFY, which makes it one of the two main tributaries to the Salton Sea (the other being the Alamo River).

Historically, the New River has been recognized as a significant pollution problem since at least the late 1940s, primarily because of its extremely high concentrations of fecal coliform bacteria and offensive odor at the International Boundary. The early history of New River pollution is vague, but it is believed to be closely aligned with population growth. In 1920, the total population of Mexicali was only 6,200 people. In 1955, it was estimated that raw sewage from approximately 25,000 people was being discharged into the New River from Mexicali. In 1975, the population jumped to over 100,000 people and at the turn of the century some estimated it at close to a million.

A focal point of early complaints regarding New River pollution was odor. In the early fifties, the odor of the river near the boundary, particularly at night, was oftentimes overpowering. Beginning around 1956, the flows of the New River at the boundary increased considerably due to development of agricultural drainage return flows from Mexicali Valley. This dilution water temporarily alleviated the odor problem, but in the 1960s the problem became increasingly noticeable as sewage loading increased with the population. In the mid-1980s the extent of the problem was finally recognized, and since then Mexico and the United States began to work cooperatively through the International Boundary and Water Commission and the Border Environment Cooperation Commission to address New River pollution from Mexico.

Since the passing of the North American Free Trade Agreement (NAFTA) in the 1990s, industrial manufacturing has also been an increasingly significant contributor to pollution. Mexico provides more lax environmental regulations on manufacturing plants, or *maquiladoras*, and over the years the New River has been used as a waste drainage system by these plants. Today Mexicali is an industrial border city with over one hundred *maquiladoras*. The problem is expected to worsen, as Mexicali's current population of about 1.3 million continues to expand.



Source: Imperial Irrigation District, 2005. WebPages: http://www.iid.com

Figure 9: New River and IDD Drains

Salton Sea

The Salton Sea, located in the southeastern corner of California, is actually a periodic lake which occupies a desert basin known as the Salton Sink, formed over the millennia by temporary shifts in the Colorado River channel. The current body of water covers a surface area of 376 square miles, making it the largest lake in California. Its location is 227 feet below sea level, its maximum depth reaches 51 feet, and its total volume is about 7.5 million acre-feet. The sea has no outlet, and its water level is maintained by agricultural drainage inflows from the Imperial and Coachella Valleys and evaporation.

The present Salton Sea was formed when flood flows from the Colorado River broke through a temporary diversion that had been designed to bypass the Imperial Canal. The Imperial Canal, which was routed from the Colorado River to the Imperial Valley through Mexico, was completed in 1901, but by 1904 it had become blocked by sediment. On October 11, 1905, a dike failed and nearly the entire flow of the Colorado River flowed uncontrolled into the Salton Basin for the next 18 months. It flooded the railroad line, railroad stations and the salt works on the basin floor. When the breach was finally repaired in 1907, the surface elevation of the Salton Sea had reached 195 feet and it had a surface area of 520 square miles.

The rate of evaporation from the Salton Sea has been variously estimated at between 5.5 to 6.5 feet per year. At this high rate of evaporation, the Salton Sea would have dried up ten years after being filled had it not been for importation of water from outside the basin. The elevation has been fairly constant during the past ten years or so, indicating that the rate of inflow is now approximately equal to the rate of evaporation.

As an agricultural drainage reservoir, the Salton Sea serves an important purpose for the productive agricultural valleys that adjoin it. Ninety percent of the entire inflow to the sea is agricultural runoff from the Imperial, Coachella and Mexicali Valleys. This inflow carries nutrients, such as phosphates and nitrates, and an abundance of salt. Currently, the salinity level of the Salton Sea is 44 parts per thousand (ppt), slightly higher than the 35 ppt of the Pacific Ocean. There is no question that the salinity of the Salton Sea will continue to increase as dissolved salts are carried into the sea and are concentrated by evaporation, therefore making it an unlikely local water supply source any time in the future.

4.2 Threats to Water Supply

Law

10631. (c) Describe the vulnerability [of the water supply] to seasonal or climatic shortage, to the extent practicable… For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources…to the extent practicable.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier … and the manner in which water quality affects water management strategies and supply reliability.

There are very few potential threats to the City of Imperial's water supply, but those that exist must be monitored closely in order to detect and ameliorate future impacts to the availability and sufficiency of the city's water supply. These threats, which are in no way expected to result in inconsistency of the city's water supply, include future extended droughts, legal issues, water quality and environmental concerns. A matrix of these potential threats to the city's current and future water sources are listed in Table 8:

Table 8: Potential Threats to City's Water Supply

Name of supply	Legal	Environ-mental	Water Quality	Climatic
Imperial Irrigation District	Law of River	Recent Leg.	TDS, Nitrate	Drought

4.2.1 Drought

Research into the deep historical record of ancient tree rings suggests that up to 500-year droughts have occurred on the Colorado River Basin, creating the potential for a drastic reduction to water availability from the Colorado River (USGS 2004). Nevertheless, the Imperial Irrigation District (IID) has a solid legal entitlement based on priority to a significant amount of the river's flow, regardless of climatic conditions. IID has made it clear to its urban customers that there is little to no potential for reduced deliveries due to drought (see Section 7.1 below).

4.2.2 Legal

The Colorado River is managed and operated under numerous compacts, federal laws, court decisions and decrees, contracts and regulatory guidelines, collectively known as the "Law of the River" (see synopsis in Appendix C). This collection of documents apportions the water and regulates the use and management of the Colorado River among the seven Colorado River Basin states and Mexico. Additionally, the city's water supplier, IID, is a signatory to many agreements and a party to multiple lawsuits which have had and continue to have significant influence on its water supply. IID's present perfected rights to Colorado River water can only be changed by future legislative action.

4.2.3 Water Quality

In 2005, as in years past, the City of Imperial's tap water met all United States Environmental Protection Agency (EPA) and state drinking water health standards. The city uses conventional treatment, including sedimentation, coagulation, flocculation, filtration and disinfection, to treat the raw water received from IID before distribution to city customers, and monitors for and reports annual nitrate and bacteria levels officially in its Annual Report to the California Department of Health Services Drinking Water Program as well as publicly in its annual Consumer Confidence Report. The city has consistently served quality drinking water to its customers, and will continue to do so.

Lower Colorado River Water Quality

The environmental group American Rivers named the Colorado River America's Most Endangered River of 2004 due to what were perceived to be looming water quality issues concerning perchlorate, nitrates and a uranium mine tailings pile near Moab, Utah. Also, management of salinity in the river is an ongoing program. However, all of these issues are well known and are being addressed, and none are considered a significant danger to the City of Imperial's water supply.

- **Perchlorate** enters the Colorado River from only one source: an old industrial development sites along the Las Vegas Wash that flows into Lake Mead near Henderson, Nevada. Site cleanup is well underway and is steadily reducing the perchlorate levels in the Colorado River. Current levels are less than 4 parts per billion (ppb) below Hoover Dam. The National Academy of Sciences recently recommended that the EPA consider setting its federal water quality standard for perchlorate at 20 ppb.

- **Nitrates** exist at certain locations in the Lower Colorado River from agricultural return flows and from localized concentrations of septic tank/leach field infiltration into the river. There are no significant agricultural return flows upstream of the IID diversion (Imperial Dam). There are no general area problems from leach fields. Local problems are being addressed by installing sewer systems and other official programs arising from local health concerns.

- The **Moab tailings pile** has been addressed and federal officials are determining the best fix. In the interim, it is located outside the normal flood plain and is not contributing to any water quality problems in the Lower Colorado River.

- The **salinity** level, measured as total dissolved solids (TDS), of the Lower Colorado River averages around 700 milligrams per liter (mg/L) at Imperial Dam. Overall, the salinity levels are lower today than 30 years ago, though drought and lower reservoir levels have caused a recent rise in current levels. The Colorado River Basin states and the federal government have an ongoing Salinity Control Program, which has set a TDS numeric salinity limit at Imperial Dam of 879 mg/L.

4.2.4 Environmental

Environmental issues on the Colorado River are not expected to influence IID's ability to deliver water to the City of Imperial in the future.

Lower Colorado River Multi-Species Conservation Program

The Multi-Species Conservation Program is a major environmental effort underway in the Lower Colorado River Basin. The cooperative effort involves federal agencies, the three Lower Basin States, Lower Basin Tribes and environmental organizations, all working together toward the recovery of more than 100 federal- or state-listed sensitive, threatened and endangered fish and wildlife species, and their habitats, along the lower Colorado River corridor.

Developed between 1996 and early 2005 and planned for implementation over a 50-year period, the program's goals are: 1) recover listed species through habitat and species conservation and attempt to reduce the likelihood of additional species listings under the Endangered Species Act; 2) accommodate current water diversion and power production operations; and 3) optimize opportunities for future water and power development.

Implementation of the program began in April 2005 with the signing of a Record of Decision by the Secretary of the Department of the Interior. The Bureau of Reclamation, in consultation and partnership with a Steering Committee made up of representatives from the 56 participating entities (including IID), is the primary implementing agency for this activity.

4.3 Planned Water Supply Projects and Programs

Law *10631. (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

(h) …The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs…that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water … available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types…

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

The City of Imperial currently has no projects or programs in place to increase its potential water supply. The city is in the process of replacing its current supply tank with a two-million-gallon water reservoir at the water treatment plant, and is studying the need to extend the water delivery system to meet the increased demand from the city's projected growth. The following sections explore local transfer, exchange and desalination opportunities, as required by the California Urban Water Management Planning Act.

4.3.1 Transfer or Exchange Opportunities

Urban water management planning in California has been motivated by socioeconomic and environmental considerations. The increasing expense and environmental impact of new traditional water supplies (e.g., dams and reservoirs) has motivated innovative use of existing facilities (e.g., surface and groundwater conjunctive-use and pump and storage schemes) and increased demand management efforts.

Continued growth in imported water demands and increasing environmental concerns have caused even these innovations to yield diminishing returns. Economic and environmental conditions, combined with recent droughts, have motivated further efforts to improve traditional supply augmentation and demand management measures and have motivated the recent use and consideration of water transfers and exchanges.

Recent interest in water transfers and exchanges to Southern California and specifically the City and County of San Diego area are currently being implemented through the recently signed Quantification Settlement Agreement (see Section 4.1.1 above).

The water transfer and exchange concept requires extending water markets to include transfers among water use contractors and other agencies who may exchange with the City of Imperial (e.g., the Cities of Brawley and El Centro). Since all cities served by IID have an assured supply of water for the next 25 years, the transfer and exchange market for the City of Imperial can be considered nonexistent.

However, due to the close proximity of the Cities of Imperial and El Centro's water mains along their common border, the City of Imperial is studying the feasibility of installing emergency interties between their water systems. Such interconnections would allow either city to supply water to their neighbor in case of a treatment plant shutdown or other natural or man-made disaster. The city is also in the process of installing a two-million-gallon underground reservoir tank to increase the city's available stored water supply. For more information, see Section 8.4 below.

4.3.2 Desalination Opportunities

The act of changing salt water into potable or fresh drinking water is called “desalination.” As the demand and competition for water in California increases and traditional ways of increasing water supply (construction of dams, aqueducts and pipelines) becomes less publicly acceptable, alternative ways of developing new water sources are being looked at. In 2004 the California Congress passes legislation requiring urban water suppliers to consider desalination opportunities in their Urban Water Management Plans.

The raw Colorado River water supplied to City of Imperial by the IID is considered fresh water, though it does contain relatively high levels of dissolved solids (salts) which are treated using advanced filtration.

The City of Imperial has evaluated the feasibility of installing a brackish groundwater well field and a reverse osmosis (RO) water treatment plant. Brackish water has a higher salt content than fresh water, but not as high as sea water. RO water treatment converts unusable brackish groundwater into high-quality drinking water supply.

Due to the fact that the City of Imperial has a secure and reliable water supply, the installation of a brackish groundwater production and treatment system is considered unnecessary and too costly for serious consideration at this time.

5.0 Water Usage

Law *10631. (e) (1) Quantify, to the extent records are available, past and current water use…and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:*

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

This chapter provides an overview of water usage in the City of Imperial. It includes the past, current and projected usage numbers, including unaccounted-for water system losses, for the City of Imperial through 2030.

5.1 Past, Current and Projected Water Deliveries by Sector

The City of Imperial delivered 1,674 acre-feet of water to 2,311 customers in 2000 and 1,992 acre-feet of water to 2,949 customers in 2005. This represents an 84 percent increase in water deliveries in the past five years.

Water deliveries are projected to continue increasing in the next 25 years. Short-term projected rates of increase are derived from permits issued for residential and commercial developments as well as construction currently in progress. The bases for long-term projections of demand are the city's General Plan and Revitalization Plan (see Section 3.1.6 above).

Table 9 lists the past, current and projected water deliveries made by the City of Imperial from 2001 through 2030 in 5-year increments. The resulting water use data is separated by sector into the following categories: single-family and multi-family residential usage, commercial and industrial usage, and other.

Table 9: Past, Current and Projected Water Deliveries

Water Use Sectors	2000		2005		2010	
	Accounts	AFY	Accounts	AFY	Accounts	AFY
Single-Family Residential	1,951	1,424	2,292	1,593	2,916	2,039
Multi-Family Residential	103	167	417	299	546	382
Commercial/Industrial	132	50	147	60	109	77
Other	125	33	93	40	73	51
Total	2,311	1,674	2,949	1,992	3,644	2,549

Water Use Sectors	2015		2020		2025		2030	
	Accs.	AFY	Accs.	AFY	Accs.	AFY	Accs.	AFY
Single-Family Residential	4,242	2,967	5,553	3,884	6,810	4,762	8,016	5,606
Multi-Family Residential	795	556	1,041	728	1,276	893	1,503	1,051
Commercial/Industrial	159	112	208	146	255	179	300	210
Other	106	74	139	97	170	119	200	140
Total	5,302	3,709	6,941	4,855	8,511	5,953	10,019	7,007

5.2 Unaccounted-for Water System Losses

Unaccounted-for water system loss is calculated by subtracting metered water usage from the amount of water purchased from IID. The city's water system averages 10 percent production water loss and 6 percent delivery system loss.

Table 10 documents current and projected unaccounted-for production and delivery system losses:

Table 10: Unaccounted-For Water System Losses

Water Use (AFY)	2000	2005	2010	2015	2020	2025	2030
Production Loss	167	199	255	371	486	595	701
Delivery System Losses	118	140	179	260	341	418	492
Total	285	339	434	631	826	1,013	1,193

5.3 Total Water Usage

The combined current and projected water usage, including system losses, for the City of Imperial is given in Table 11:

Table 11: Total Water Use

	2000	2005	2010	2015	2020	2025	2030
Total Water Use (AFY)	1,959	2,331	2,983	4,340	5,681	6,966	8,200

6.0 Demand Management

Law *10631. (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following…*

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

Many water managers today consider water conservation, or "demand management," as essentially a new source of water supply. Even though the city does not require new water supply sources, the City of Imperial is committed to implementing water conservation programs at the local and regional levels. Doing so will make it possible for the city to manage demand of water in the unlikely event of water scarcity.

This chapter gives an overview of regional water conservation efforts, the statewide water conservation Memorandum of Understanding administered by the California Urban Water Conservation Council, current and future the City of Imperial conservation measures, and water and economic savings from implementing these measures.

6.1 Regional Water Conservation Coordination

Regional water conservation programs are coordinated at the regional level by the Imperial Irrigation District (IID) through various local conservation measures, and by the Bureau of Reclamation through its Water Conservation Field Services Program.

6.1.1 IID Demand Management

IID and its agricultural water users have a long history of efficient water use and agricultural-based water conservation or demand management programs. IID and its agricultural water users together have invested more than $625 million towards water conservation efforts over the past 50 years. Completed programs include concrete lining of canals and lateral, seepage recovery systems, regulating reservoirs, lateral interceptors, distribution system automation, on-farm tailwater recovery systems, 12-hour deliveries, non-leak gates, irrigation water management and several operational, administrative, educational and cooperative programs aimed at reducing operational losses and recovering discharges.

IID currently does not sponsor urban water conservation programs. Over 98 percent of IID's water supply is delivered for agricultural purposes, so the Demand Management Measures and Best Management Practices described in the Urban Water Management Planning Act (see below) are not appropriate measures of IID's conservation efforts. Instead, IID has promoted large-scale water conservation efforts using programs that do not negatively affect agricultural businesses, water users or the Imperial Valley economy. Water conservation is a key component of IID's water management efforts as each unit of water conserved frees up a unit for other uses.

6.1.2 Bureau of Reclamation Water Conservation Field Services Program

As a federal agency with a vital role in the administration of Western water resources, the Bureau of Reclamation leads water management planning, conservation education, innovative technology demonstrations, and conservation measure implementation activities through its Water Conservation Field Services Program (WCFSP).

In the Lower Colorado River Basin (see Section 3.2.3), the WCFSP helps residents and agencies in Southern Nevada, Southern California and Arizona achieve local water conservation goals. While many earlier water conservation methods focused on making structural improvements to water delivery systems, the WCFSP focuses on improving the efficiency of water use in homes, on farms and in industry using a combination of new technology and best management practices.

To help local agencies accomplish their goals, the Bureau of Reclamation offers financial and technical assistance to develop water management plans, underwrites the development of classroom materials and teacher training programs, demonstrates new technologies for efficient water management, and offers matching funds to help agencies implement water conservation measures. The WCFSP encourages water conservation practices, helps water agencies develop and implement effective water management and conservation plans, coordinates with state and other local conservation program efforts, and fosters improved water management on a regional, statewide and watershed basis.

6.2 California Urban Water Conservation Council

Law *10631. (j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation…*

The premier statewide organization dedicated to urban water conservation is the California Urban Water Conservation Council (CUWCC). The CUWCC administers the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), the result of a coordinated effort by the California Department of Water Resources, water utilities, environmental organizations and other interested groups to develop a central list of urban water conservation practices.

The CUWCC has identified fourteen (14) principal areas in which there are significant opportunities for urban water conservation, collectively known as “Best Management Practices,” or BMPs. The State Legislature codified these BMPs into the Urban Water Management Planning Act, renaming them “Demand Management Measures,” or DMMs. Table 12 lists these DMMs/BMPs:

Table 12: Demand Management Measures

DMM Number	DMM Name
1	Water Survey Programs for Single-Family Residential and Multi-Family Residential Connections
2	Residential Plumbing Retrofit
3	System Water Audits, Leak Detection and Repair
4	Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections
5	Large Landscape Conservation Programs and Incentives
6	High-Efficiency Washing Machine Rebate Programs
7	Public Information Programs

8	School Education Programs
9	Conservation Programs for Commercial, Industrial and Institutional Accounts
10	Wholesale Agency Assistance Programs
11	Conservation Pricing
12	Conservation Coordinator
13	Water Waste Prohibition
14	Residential ULFT Replacement Programs

The MOU requires that a water utility implement only the DMMs that are economically feasible. If a DMM is not economically feasible, the water utility may request an economic exemption for that DMM. The DMMs as defined in the MOU are generally recognized as standard definitions of water conservation measures.

Water providers who are signatories to the MOU are allowed to submit copies of their mandatory BMP annual reports to the CUWCC in lieu of a description of the DMMs in their Urban Water Management Plans. The City of Imperial is not a signatory to the MOU.

6.3 City of Imperial Water Conservation Measures

Law *10631. (f) (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures…*

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

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

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

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

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

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

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

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

The City of Imperial is a purveyor of treated water supplied by the Imperial Irrigation District (IID). IID focuses its water conservation efforts on large irrigation interests within the district (see Section 6.1) and sale of its conserved water through transfers to the San Diego County Water Authority via the Metropolitan Water District of Southern California (see Section 4.1.1 above). With that said, the City of Imperial is committed to promoting water conservation through legislative and local policy implementation. Imperial also actively participates in regional water conservation public awareness campaigns.

The City of Imperial is in the process of implementing general water conservation measures which will soon be adopted into its Municipal Code (see Appendix E). In addition, the city's General Plan includes as Objective 4 of its Conservation Element that "[n]ew construction and development should conserve water through minimizing water usage and waste" by installing low-flow toilets, showers and faucets, as well as other water-conserving appliances (e.g., washing machines and dishwashers); using drought-tolerant native plants, xeriscaping and drip irrigation (where possible) for landscaping; and preplumbing for reclaimed water use when available.

Elimination of water waste is the only water conservation requirement for all water utility customers (see DMM #13 below). Beyond this, the City of Imperial has found that it is neither necessary nor economically feasible to implement further water conservation measures.

The following water Demand Management Measures (DMMs—see Table 12) have been evaluated for their application in the City of Imperial:

(1) Water Survey Programs for Single-Family Residential and Multifamily Residential Customers

The City of Imperial does not have the staff or capital resources to implement a water use survey for single-family residential and multifamily residential customers in the community at this time. Data generated would not have a significant impact on water use or supply in the City of Imperial and is therefore deemed uneconomical and unfeasible.

(2) Residential Plumbing Retrofit

The City of Imperial does not have the staff or capital resources to implement a residential plumbing retrofit program in the community at this time. Results would not have a significant impact on water use or supply in the City of Imperial and is therefore deemed uneconomical and unfeasible.

(3) System Water Audits, Leak Detection, and Repair

The City of Imperial has an aggressive water audit, leak detection and system repair program in place at this time. The City of Imperial's goal is to reduce system water loss to below three (3) percent.

(4) Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

*The City of Imperial meters **ALL** of its water system connections.*

(5) Large Landscape Conservation Programs and Incentives

The City of Imperial does not have a large landscape issue within its service area that would justify implementation of a landscape conservation programs and incentives program and is therefore deemed uneconomical and unfeasible.

(6) High-Efficiency Washing Machine Rebate Programs

The City of Imperial does not have a high-efficiency washing machine rebate program within its service area at this time. However, should a regional program be implemented by IID or the local electric or gas companies, the City of Imperial would support such a program.

(7) Public Information Programs

The City of Imperial does provide its customer with public information about the numerous reasons for water conservation.

(8) School Education Programs

The City of Imperial does not have a water conservation program specifically designed for its school system. However, should a regional program be implemented by IID, the City of Imperial would support such a program.

(9) Conservation Programs for Commercial, Industrial, and Institutional Accounts

The City of Imperial does not have a water conservation program specifically designed for commercial, industrial and institutional accounts. However, should a regional program be implemented by IID, the City of Imperial would support such a program.

(10) Wholesale Agency Programs

The City of Imperial does not have any wholesale water accounts.

(11) Conservation Pricing

The City of Imperial does not have conservation pricing; the amount of water such a program may save is insufficient to support a program at this time and is therefore deemed uneconomical and unfeasible.

(12) Water Conservation Coordinator

The City of Imperial does not have the staff or capital resources to hire a Water Conservation Coordinator for the community at this time. The effort would not have a significant impact on water use or supply in the City of Imperial and is therefore deemed uneconomical and unfeasible.

(13) Water Waste Prohibition

Wasting water is prohibited as a condition of receiving service from the City of Imperial. City of Imperial municipal ordinance requires all customers of the Imperial water system to not waste water delivered by the water utility, whether they live within the city or outside the city. Water waste within the city limits is prohibited even if the water was not provided by the city water utility.

(14) Residential Ultra-Low-Flush Toilet Replacement Programs

The City of Imperial does not have the staff or capital resources to implement a residential ultra-low flush toilet replacement program in the community at this time. Data generated would not have a significant impact on water use or supply in the City of Imperial and is therefore deemed uneconomical and unfeasible.

Table 13 lists the unit cost of water resulting from non-implemented or non-scheduled DMMs mentioned above:

Table 13: Cost of Non-Implemented DMMs

Non-implemented & Not Scheduled DMM	Cost (per AF)
Water Survey Programs for Single-Family Residential and Multi-Family Residential Connections	**$25**
Residential Plumbing Retrofit	**$50**
System Water Audits, Leak Detection and Repair	**N/A**
Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections	**N/A**
Large Landscape Conservation Programs and Incentives	**$25**
High-Efficiency Washing Machine Rebate Programs	**$25**
Public Information Programs	**N/A**
School Education Programs	**$20**
Conservation Programs for Commercial, Industrial and Institutional Accounts	**$25**
Wholesale Agency Assistance Programs	**N/A**
Conservation Pricing	**$25**
Conservation Coordinator	**$50**
Water Waste Prohibition	**N/A**
Residential ULFT Replacement Programs	**$50**

7.0 Water Service Reliability Plan

Law *10631. (c) Describe the reliability of the water supply…and provide data for each of the following:*

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

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

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years…

Water supply reliability is a measure of the City of Imperial's ability to provide an adequate water supply during times of shortage. Reliability focuses mostly on drought, though it must take into consideration the other potential threats to the water supply discussed in Section 4.2.

The Imperial Irrigation District (IID) provides the City of Imperial with a highly reliable water supply, regardless of climatic conditions. Combining IID's supply assurance with data from Section 5.3 on the city's total projected water demand, this chapter will lay out the city's water service reliability plan for the next 25 years.

7.1 IID Supply Assurance

As described in Section 4.1.1, IID has a present perfected right to 2.6 million acre-feet (MAF) of Colorado River water, as well as potential access through the Seven-Parties Agreement and resulting water service contracts to an additional 0.8 million acre-feet (MAF)—3.85 MAF minus estimated Priorities 1 and 2 usage (see Table 7 in Section 4.1.1). The significance of IID's present perfected right is that in times of shortage, present perfected rights must be satisfied first.

The IID is currently operating under the Quantification Settlement Agreement (QSA—see Section 4.1.1), under which it voluntarily reduces its diversion and use of Colorado River water for up to 75 years. Nevertheless, the IID retains its present perfected rights claims and considers them still legally enforceable if necessary.

Therefore, IID is confident that its present perfected and contract water rights are unlikely to be affected by the usual state and regional drought conditions. Assuming drought conditions on the Colorado River, California's 4.4 MAF water apportionment is not likely to be impacted due to the massive storage quantities in the Colorado River reservoir system and the structure of water priorities. Arizona's Central Arizona Project must reduce its water diversions by 1 MAF before any other lower basin water entitlement is affected. Additionally, IID's 2.6 MAF of present perfected water rights theoretically protect its water users unless changed by future legislative action (see Section 4.2.2).

Though the IID has not officially guaranteed the city's future water supply in writing, IID makes the following claim in its *2000 Urban Water Management Plan for Imperial Irrigation District and the Cities of Brawley, Calexico, and El Centro* (October 2001):

> *"Under a worst case water supply scenario the Imperial Irrigation District has expressed confidence that urban water users (which comprise less than two percent of its annual water deliveries) can be assured delivery of their required water supply. Due to its present perfected water rights and the relatively small water demand of non-agricultural water users, the Imperial Irrigation District would not reduce or cut back urban water deliveries even in years of reduced deliveries. Since its inception in 1911, IID has never been denied the right to divert the amount of water it has requested for agricultural purposes and other beneficial uses."* (Page 32)

There is no reason to believe that IID has backed off from this claim, and IID personnel continue to confirm this claim verbally.

What's more, IID has never requested future demand projections from the City of Imperial and has maintained that they will supply whatever their urban customers demand. Their reasoning is that urban growth in the Imperial Valley will result in a balanced decrease in agricultural land usage (see Section 3.1.6); since agriculture land usage on the whole uses far more water than residential land usage, increased urban water deliveries will necessarily mean *decreased* overall water deliveries in the Imperial Valley.

7.2 Current and Future Water Supply Reliability Scenarios

Table 14 puts together IID and the City of Imperial's current and future water supply reliability scenarios by setting out the consistent total IID water supply according to the Quantification Settlement Agreement (QSA—see Appendix D, Exhibit B) next to its assured supply of the City of Imperial's current and projected demands for the years 2005 through 2030. Since the City of Imperial, by way of the IID, is assured an adequate supply regardless of climate conditions except in the most extreme circumstances—i.e., circumstances not as yet experienced or reflected in the historical record—no base years for single and multiple dry year scenarios are utilized in these projections:

Table 14: IID and City of Imperial Current and Future Water Supply Reliability

Year	**IID** Colorado River Deliveries under QSA (AFY)	**City of Imperial** Projected Demand = IID Assured Supply (AFY)
2005	2,933,500	2,331
2006	2,909,500	2,461
2007	2,903,500	2,591
2008	2,811,800	2,721
2009	2,772,800	2,852
2010	2,733,800	2,983
2011	2,694,800	3,254
2012	2,654,800	3,256
2013	2,614,800	3,797

Year	**IID** Colorado River Deliveries under QSA (AFY)	**City of Imperial** Projected Demand = IID Assured Supply (AFY)
2014	2,589,800	4,069
2015	2,564,800	4,340
2016	2,539,800	4,608
2017	2,524,800	4,876
2018	2,717,800	5,144
2019	2,682,800	5,413
2020	2,645,300	5,681
2021	2,627,800	5,937
2022	2,625,300	6,195
2023	2,622,800	6,452
2024	2,617,800	6,709
2025	2,612,800	6,966
2026	2,607,800	7,213
2027	2,607,800	7,460
2028	2,607,800	7,706
2029	2,607,800	7,953
2030	2,607,800	8,200

8.0 Water Shortage Contingency Plan

Law *10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier…*

(f) *A draft water shortage contingency resolution or ordinance.*

The City of Imperial is assured by the Imperial Irrigation District (IID) a full water supply in all but the most extreme scenarios. As such, the city has not felt it necessary to write and enact by ordinance a Water Shortage Contingency Plan until required to do so under the Urban Water Management Planning Act.

The city has now prepared a draft Water Shortage Contingency Plan which will soon be contained in its revised Municipal Code (City of Imperial Municipal Code Chapter 32, Article III, entitled "Conservation Plan"—see Appendix E). The plan outlines three phases of action triggered by shortages of 15, 25 and 50 percent of the city's water supply. This chapter outlines this plan and its integration with the IID's Urban Water Supply Shortage Plan.

8.1 IID Urban Water Supply Shortage Plan

As explained in Section 7.1, IID has never been denied the right to divert the amount of water it has requested for agricultural irrigation and other beneficial uses. Therefore, it is highly unlikely that the urban water supply provided to the City of Imperial by IID would ever be reduced, even under shortage or drought conditions on the Colorado River, in the next 25 years. Urban water use in the IID service area makes up less than two percent of the total water delivered by IID. Under a worst-case water supply scenario, IID is confident it can meet the demands of urban water users.

The entire Southern California region, both urban and agricultural, would be in a severe drought emergency before the City of Imperial's water supply is threatened. The IID and San Diego County Water Authority (SDCWA) water transfer agreement states that both agencies will share, on a pro-rata basis, any reductions in water to IID should a shortage declaration by the Secretary of the Interior for the Lower Colorado River Basin affect the IID's water conservation and transfer programs. When the amount of water in usable storage in Lake Mead is less than 15 million acre-feet and the unregulated inflow into Lake Powell is forecast to be less than 8.8 million acre-feet, IID and SDCWA have agreed to meet and confer to discuss a supplemental water transfer agreement in anticipation of the shortage.

The IID outlined a multi-stage Urban Water Supply Shortage Plan in an addendum to its *2000 Urban Water Management Plan* dated May 2002. In the plan, a Stage 1 urban water supply shortage has cut back conditions of less than 15 percent, Stage 2 has cut back conditions of 15 percent to less than 25 percent, and Stage 3 has cut back conditions of 25 percent to less than 35 percent. The percentages of urban water supply shortage stages would be calculated from the smaller percentage of total urban water.

During a water shortage the expense of reduced urban water sales would be offset by raising the water rate $0.14 for a 15 percent reduction, $0.24 for a 25 percent reduction and $0.34 for a 35 percent reduction. Measures to overcome revenue and expenditure impacts would include raising the current rate or changing the rate structure.

IID makes clear that the mechanisms used to determine actual individual urban customer reductions will remain beyond IID's jurisdiction. Any urban customer mechanism to determine actual water use reductions will remain the responsibility of individual urban water suppliers.

8.2 Stages of Action

Law *10632. (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*

The City of Imperial follows a three-phase water shortage plan that is keyed to water supply reductions from IID:

- A **Phase I** water shortage is announced if the City Engineer declares a drought and/or IID reduces its water supply to the city by less than fifteen (15) percent;
- A **Phase II** water shortage is announced if IID reduces its water supply to the city by fifteen (15) percent to less than twenty-five (25) percent; and
- A **Phase III** water shortage is announced if IID reduces its water supply to the city by fifteen (25) percent to less than fifty (50) percent.

8.3 Three-Year Minimum Water Supply

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

Table 15 gives the minimum water supply available to the City of Imperial from this year out during normal, one-year and three-year drought scenarios:

Table 15: Three-Year Estimated Minimum Water Supply

Water Supply Source (AFY)	**Normal** (2005)	**Year 1** (2006)	**Year 2** (2007)	**Year 3** (2008)
Imperial Irrigation District	2,331	2,461	2,591	2,721
Total	2,331	2,461	2,591	2,721

8.4 Preparation for Catastrophic Water Supply Interruption

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

The City of Imperial water system receives all of its water supply from IID's All-American Canal, which crosses the San Andreas Fault. Many other fault lines bisect major water facilities throughout the Imperial Valley region. Experts consider it unlikely that the supplies will be disrupted in the event of a major earthquake. Such an event, however, could reduce annual deliveries by up to 100 percent for IID-supplied water.

The Urban Water Management Planning Act requires agencies to consider the effect of a 50 percent cutback in water supplies. This falls within the degree of cutback contemplated by IID's most extreme earthquake disruption scenario.

In the event of a partial or total failure of the City of Imperial water system, the City of Imperial would activate the emergency connection(s) which it is contemplating with the City of El Centro.

- **City of El Centro Interconnection** 9,000,000 gallons per day 50%

Further, the City of Imperial has adopted a federal emergency response procedures called the National Incident Management System (NIMS) which can be implemented by the City of Imperial personnel for a localized event such as an accident at one of City of Imperial's facilities or on a broader based regional event such as an earthquake or flood. This system provides a consistent nationwide template to enable federal, state and local governments (and local private sector and non-governmental organizations) to work together effectively and efficiently to prepare for, prevent, respond to and recover from domestic incidents, regardless of cause, size or complexity, including acts of terrorism. The NIMS procedures are expected to be fully implemented by June 2006.

Complementary to NIMS, City of Imperial has completed Mutual Aid Agreements between itself and its adjacent cities and agencies.

8.4.1 IID Emergency Preparedness Plan

Emergency actions and procedures to be taken by IID's Water Department and staff during an emergency or time of disaster are described in the *Emergency Preparedness Plan*. The *Emergency Preparedness Plan* includes required staff actions and procedures to respond to events that impair water operation of canals, laterals, drains, dams and other facilities.

Established actions and procedures exist for extreme events and emergencies that endanger operation of the water system. Possible emergencies/extreme events that endanger operation of the water system could include earthquakes, storms, rain, runoff from desert washes, flooding, facility or structure damage, power outages, fire vehicles in canals, equipment theft/vandalism or other disasters.

IID's water delivery and drainage systems do not totally shut down during an emergency. For the cities in the IID service area there is a ten-day storage holding capacity requirement. The Imperial County Office of Emergency Service requires this storage holding capacity for cities.

8.5 Prohibitions, Penalties and Consumption Reduction Methods

Law *10632. (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.*

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

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

During each phase of a city-wide water shortage, the City of Imperial institutes certain mandatory prohibitions against particular water use practices. These prohibitions are sector-specific and at times detail watering schedules and percentage restrictions on a sector-by-sector basis.

Table 16 lists the mandatory water use prohibitions for each water shortage phase and the percentage of projected reduction in water usage per prohibition:

Table 16: Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory	Projected Reduction (%)
Restrict excess runoff – general	Phase I	0
Restrict excess runoff – irrigation	Phase I	0
Restrict lawn/landscape irrigation – 6pm-8am	Phase I	0
Restrict commercial agriculture/nursery – 6pm-11am	Phase I	0
No pavement washdown	Phase I	2
No restaurant water service, except by request	Phase I	1
Water meter tampering protection	Phase I	0
Fire hydrant usage protection	Phase I	0
Required conservation plan and irrigation schedule – major irrigators	Phase I	3
Restrict vehicle washing (reclaimed water exemption)	Phase I	2
No aesthetic water usage	Phase I	5
Post notice of water shortage in hotels/motels	Phase I	2
90% limited overall use (single-family limited exemption)	Phase II	10
Restrict pool use	Phase II	1
Restrict lawn/landscape irrigation – every third day, 6pm-6am (reclaimed water exemption)	Phase II	5
Restrict commercial agriculture/nursery, major irrigators – every other day, 6pm-10am (reclaimed water exemption)	Phase II	1
80% limited overall use (single-family limited exemption)	Phase III	20
No lawn/landscape irrigation	Phase III	20
Restrict commercial agriculture/nursery, major irrigators – every third day, 6pm-10am (reclaimed water exemption)	Phase III	2

The City of Imperial has determined the following penalties, fines, restrictions and criminal charges for excessive water use during each of the water shortage phases, depending on number of notices and extent of violation. These actions are listed in Table 17:

Table 17: Penalties and Charges for Excessive Use

Penalties or Charges	Stage When Penalty Takes Effect
$50 Administrative Fine	All Stages; First Violation
$100 Administrative Fine	All Stages; Second Violation
$200 Administrative Fine	All Stages; Third Violation
Flow Restriction Device Installation	All Stages; Third Violation
Misdemeanor Charge	All Stages; Third Violation
Termination of Water Service (Restoration Charge $100)	All Stages; Fourth Violation
Surcharge equal to 25% use exceedance	All Stages; Each Violation

8.6 Revenue and Expenditure Impacts

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

The City of Imperial is developing a water sales contingency reserve fund to balance the budget during abnormally low water use years. To estimate the impact of each stage on revenues, current commodity rates and charges are applied to the water use levels. These revenue reductions are combined with estimated increased expenses resulting from managing the supply shortfall to derive the net revenue shortfalls. An estimated revenue shortfall, without a water sales contingency fund, must be developed for each stage with and without additional purchased water costs.

To simplify the analysis, only the City of Imperial's revenue most sensitive to variation in annual water use and expenses will be significantly altered by the managing of a water shortage. The net change from the "normal" water supply condition is identified for the revenue and expense items and represents the estimated funding requirement.

Presently, the City of Imperial's water sales contingency fund has not yet been initiated. The balance will be maintained to equal ten (10) percent of the water sales revenue projected for the ensuing fiscal year. The present fund balance is projected to be sufficient to match the estimated revenue shortfall for a Phase I water supply shortage. Additional funding for prolonged Phase II or III shortfalls is expected to come from other sources, including a temporary rate increase and/or excess use charges.

8.7 Use Monitoring Procedure

Law *10632. (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.*

Demands must be monitored frequently during emergency water shortages to enable the City of Imperial to effectively manage the balance between supply and demand. This section presents suggested the City of Imperial practices to adequately monitor the drought status finances:

- **Normal Monitoring Procedure**

  In normal water supply conditions, production figures are recorded daily. Totals are reported monthly to the Administrative Services and Public Works Departments.

- **Phase I and II Water Shortages**

  During a Phase I or II water shortage, weekly production figures are forwarded to the Administrative Services and Public Works Department. This department compares the weekly production to the target weekly production to verify that the reduction goal is being met. Monthly reports are sent to the City Council. If reduction goals are not met, the Public Works Director will notify the City Council so that corrective action can be taken.

- **Phase III Water Shortage**

  During a Phase III water shortage, the procedure listed above will be followed, with the addition of a daily production report to the Public Work Director. Additionally, regular patrols will be sent out to directly monitor residential water usage and, if necessary, enforce conservation measures.

9.0 Recycled Water Plan

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

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

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

(c) A description and quantification of the potential uses of recycled water…

The City of Imperial does not recycle its wastewater, and currently there are no plans for the city to do so in the future. The city's Water Pollution Control Plant treats the community's wastewater to high effluent standards before discharging into the Dolson Drain and eventually to the Salton Sea.

9.1 Wastewater Resources

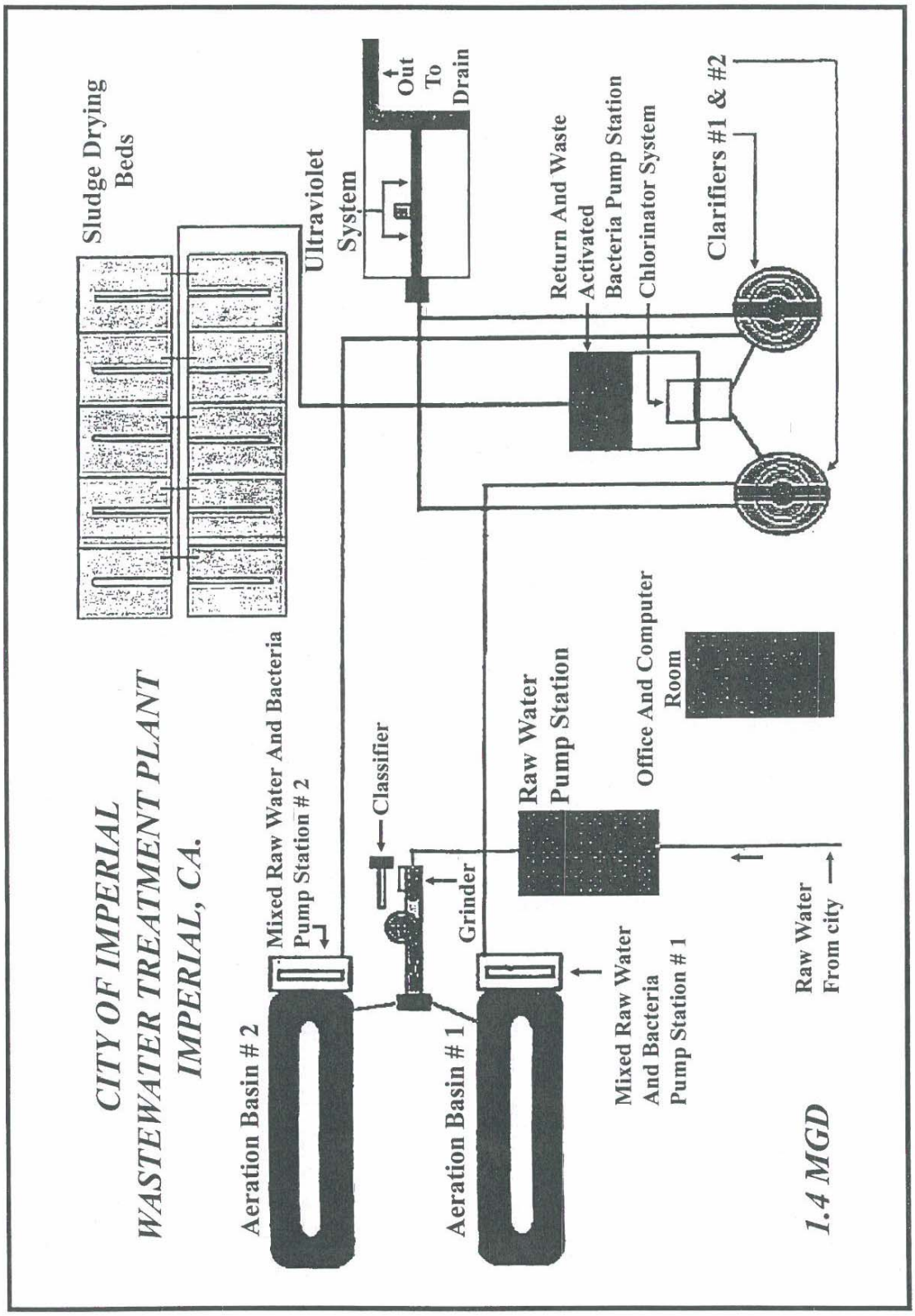
The City of Imperial's wastewater collection and treatment system is operated by the city's Public Works Department. Currently, the district collects an average daily flow of 650,000 gallons per day (mgd) of wastewater from the City of Imperial's water service area.

The City of Imperial Water Pollution Control Plant (WPCA), located at 701 East 14th Street, has a total design capacity of 1.4 mgd. The plant treats the wastewater with a secondary extended aeration and tertiary Ultra Violet (UV) disinfection process (chlorine is used for further disinfection when needed). Dry beds are used for dewatering and sludge handling. See Figure 10 for a graphic illustration of the WPCA.

The WPCA discharges the city's treated wastewater into the Dolson Drain, a water of the United States, which then flows through the Lilac Drain, Rose Drain and Alamo River to the Salton Sea. The discharge is regulated under Section 402 of the Federal Clean Water Act (CWA) and covered by a National Pollution Discharge Elimination System (NPDES) Permit No. CA0104400 for point source discharges issued as Order No. R7-2005-0084 by the California Regional Water Quality Control Board, Colorado River Basin Region.

The annual average concentration of total dissolved solids (TDS) in the discharge of the city's treated wastewater is limited to 4,000 milligrams per liter (mg/L). This is in keeping with the state's EPA-approved 303(d) list of impaired water bodies, which finds the Imperial Valley Drains impaired for sediment/silt, pesticides and selenium. A sedimentation/siltation total daily maximum load (TMDL) for the Alamo River to which Dolson Drain flows was approved by the EPA in June 2002. The Imperial Water Pollution Control Plant's discharge is regulated by its NPDES permit to fall within this TMDL. Additionally, the plant is required to test for two freshwater species—the fathead minnow and the water flea—to monitor chronic and acute toxicity in its outflow into the Dolson Drain.

Table 18 contains estimated current and projected quantities of wastewater collected and treated within the City of Imperial water service area:



Source: City of Imperial General Plan, 1993.

Figure 10: City of Imperial Water Pollution Control Plant

Table 18: Wastewater Collection and Treatment

Type of Wastewater	2001	2005	2010	2015	2020	2025	2030
Wastewater collected & treated in service area	695	918	1,085	1,578	2,066	2,533	2,982
Volume that meets recycled water standard	695	918	1,085	1,578	2,066	2,533	2,982

9.2 Future Recycled Water Uses

Providing treated wastewater for reuse in the City of Imperial simply is not feasible. The costs associated with upgrading treatment systems to produce high-quality effluent and installing pipelines to distribute it locally would be prohibitive compared to the inexpensive water supply available from the Imperial Irrigation District.

Additionally, the city's effluent outflow serves to help maintain the Salton Sea ecosystem; a wastewater recycling system would reduce the city's outflow and potentially cause environmental harm.

For these reasons, the City of Imperial does not plan to generate or use recycled water within the next 25 years.

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