



COUNTY OF IMPERIAL

WATER SUPPLY ASSESSMENT AND VERIFICATION REPORT

Project: Imperial Center

Prepared by:

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(DRAFT)

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Purpose

This Water Supply Assessment and Verification Report (WSA&V Report) has been prepared by the Development Design & Engineering, Inc. for the County of Imperial. The assessment was prepared pursuant California Water Code Sections 10631, 10657, 10910, 10911, 10912, and 10915 referred to as SB 610 and Business and Professions Code Section 11010 and Government Code Sections 65867.5, 66455.3, and 66473.7 referred to as SB 221. SB 610 and SB 221 amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 requires that the water purveyor of the public water system prepare a water supply assessment to be included in the environmental documentation of certain proposed projects. SB 221 requires affirmative written verification from the water purveyor of the public water system that sufficient water supplies are available for certain commercial subdivisions of property prior to approval of a tentative map.

The County of Imperial requested the water assessment as part of the environmental review of the project known as Imperial Center. The project description is provided below. This water assessment is intended for use by the County of Imperial in its water assessment evaluation of water supplies. The assessment evaluation the following water issues:

- Water available during a normal year
- Water available during multiple dry water years
- Water available during a 20-year projection to meet existing demands
- Expected demands of the project
- Reasonably foreseeable planned future water demands to be served by the Imperial Irrigation District.

The assessment will detail the water received by the project area in prior years and Urban Water Shortage Management and Emergency Preparedness programs.

Project Description

The anticipated land uses at the Imperial Center will provide a variety of commercial uses are intended to serve the needs of regional shoppers and the wholesale market. The Imperial Center is expected to provide approximately one million square feet of commercial facilities. The following summarizes the primary potential uses of the project area:

- Information/Exhibit/Auction Center 15,000 square feet
- A wholesale outlet 460,000 square feet
- Food court 13,000 square feet
- Multiplex cinema 83,000 square feet
- Hotel (200 rooms) 135,000 square feet
- Plaza/Auction Court 95,000 square feet
- Hotel Plaza/Restaurant 5,000-10,000 square feet
- Convenience Market with a Filling Station 37,000 square feet
- Eleven pads each for 5,000 square feet of retail

The highest and best uses identified above are driving the project. However, due to the changing economics and the expected long life of the project area, the listed land uses are subject to change.

Proposal

Currently, the Heber Public Utility District (HPUD) is not able to provide future water service to the Imperial Center Specific Plan Area, although, it is currently in the process of upgrading its water plant. With this new capacity, HPUD will be able to offer both sewer and water services to the Imperial Center.

The Imperial Center will have three different alternatives to pursue to provide the development within the specific plan area sewer and water services. These alternatives are all feasible and approved by the Heber PUD. Which alternative the developers of Imperial Center will select will depend on developer goals.

Alternative One

The following is a summary of the plan to construct and operate a water plant to service Imperial Center:

- Total area of the water facility will be approximately four acres.
- Water Plant building (50' x 40').
- Potable Water Tank Storage (600,000 gallons)
- The water plant will contain two water ponds with a total volume of 874,528 gallons.
- Peak fire capacity = 2,000 gallons per minute for a four (4) hour duration plus domestic.
- Potable Water Pumps: 2,000 Gallons per Minute @ 80 psi
- Raw Water Irrigation Pumps: 200 Gallons per Minute @ 60 psi

This alternative calls for the Imperial Center Specific Plan area to be annexed into the Heber Public Utility District service area.

The water plant would be located in Lot 3 in the northern section of the project. It will be located adjacent to the sewer plant. The water plant will be located an appropriate distance from the sewer plant as determined by the Heber Public Utility District and State of California. The following is a summary of the plan to construct and operate a water plant within the Imperial Center Specific Plan Area:

- Total area of the water facility will be approximately four acres.
- Water Plant building (50' x 40').
- Potable Water Tank Storage (600,000 gallons)
- The water plant will contain two water ponds with a total volume of 874,528 gallons.
- Peak fire capacity = 2,000 gallons per minute for a four (4) hour duration plus domestic.
- Potable Water Pumps: 2,000 Gallons per Minute @ 80 psi
- Raw Water Irrigation Pumps: 200 Gallons per Minute @ 60 psi

Peaking factors of 2 and 4 were used to estimate maximum day and peak hour demands respectively.

The water distribution system was sized to provide a 2,000-gpm fire flow under maximum day demands with a residual pressure of no less than 20 psi or no more than 10-psi pressure drop anywhere in the system under peak hour demands, whichever is greater.

Water storage, treatment and pumping facilities will all be located on on-site. The source of water for the project will be Imperial Irrigation district's All American Canal. Storage for the project will be kept in a potable water tank and raw water reservoir, then the All American Canal. The potable water

reservoir will hold two average day's storage plus fire flow requirements. The raw water reservoir will hold seven and a half days storage requirement.

Water will flow by gravity to the raw water reservoir and will be pump to the water treatment plan when needed. The treatment plant is proposed to be a package system, consisting of modular units, where each unit contains a rapid mix tank, flocculation tank, settling basin and a filter. The modular unit concept will allow the treatment plant to be constructed incrementally, as needed.

Once water passes through the treatment plant, it will flow by gravity to the treated water storage tank. A potable water-booster pump station will pump water from the treated storage tank to the water distribution system.

The distribution system will have a 12-inch diameter pipe looped within the project, which will allow the project to be phased while still maintaining the infrastructure necessary to provide fire flow.

Design and operations of the water treatment facilities, storage reservoirs, and distribution systems will conform to guidelines from the following:

- California Department of Health Services
- County Department of Health Services
Environmental Health
- Air Pollution Control District
- Department of Water Resources Division
of Safety of Dams
- Insurance Services Office
- National Fire Protection Code

Water facilities discussed in this plan are preliminary and may be re-evaluated as development proceeds. Additional water facility options may be proposed and approved as part of the tentative mapping process. For example, smaller pipes may

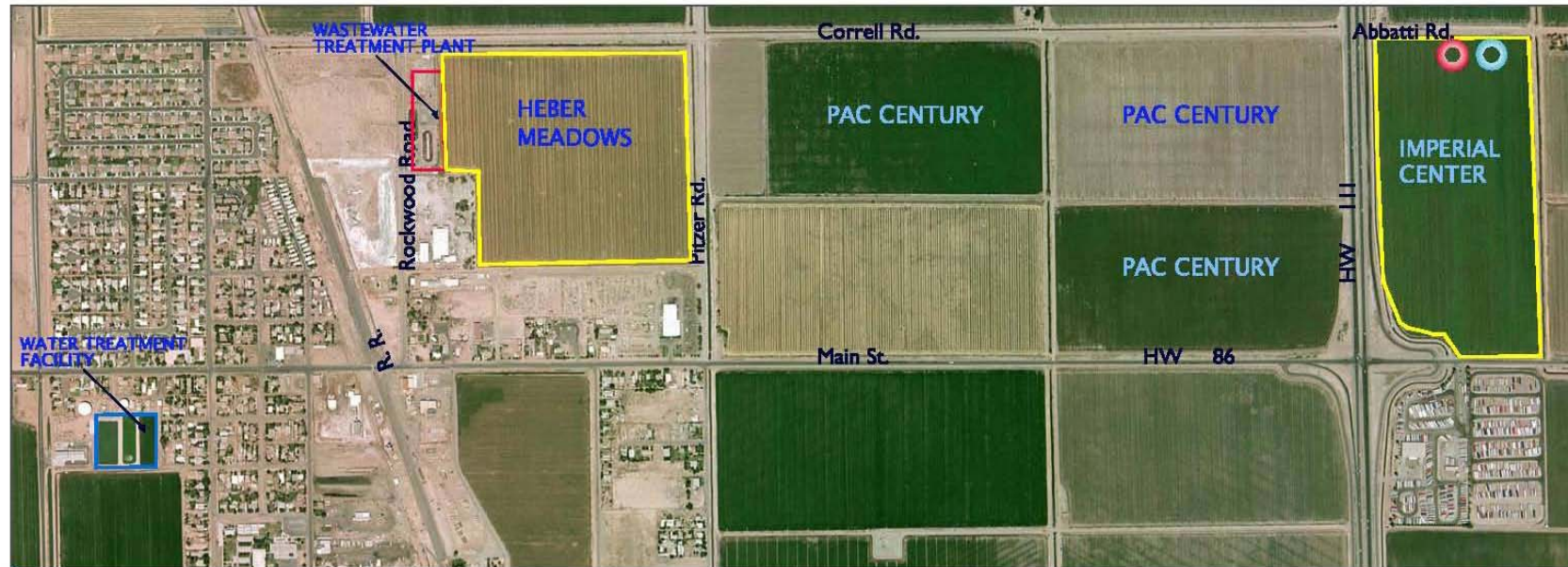
be used if originally anticipated water demands are less than anticipated.

Exhibit 1 provides a graphical detail of the proposed Alternative One.

Reclaimed Water Imperial Center

In an effort to conserve water at the Center, this Alternative will use reclaimed water for all landscaping on site. Standards shall meet County requirements. As an alternative, the Imperial Center management may wish to undertake landscaping irrigation with nearby agricultural water.

IMPERIAL CENTER UTILITY ALTERNATIVES



LEGEND



-  PROPOSED ON SITE WASTEWATER TREATMENT PLANT
-  PROPOSED ON SITE WATER TREATMENT FACILITY

EXHIBIT NO. 1

Exhibit 1: Alternative One

Alternative Two

HPUD would provide both water and sewer services to HPUD in Alternative Two. Alternative Two proposes to extend single project specific sewer and water lines to the Imperial Center project. This alternative would include upgrading the capacity of HPUD's water plant.

The single project specific eight-inch water line would extend from an existing point of connection to Imperial Center. A 12-inch force main sewer line will also be extended from an existing point of connection to Imperial Center. Two pump stations, one for both sewer and water, would be utilized in this alternative. It would not include a looped infrastructure water lines.

Alternative Two would provide water to the Imperial Center during peak hours using water that will be stored in an 800,000-gallon water tank. This tank will be located in Lot 3 on the tentative map. HPUD would replenish the tank during off-peak hours. Fire pressure and water availability would be sufficient to satisfy all fire protection needs.

Alternative Two is estimated to cost \$2.3 million for infrastructure improvements. HPUD has stated that they intend to upgrade their water treatment plant. These improvements may be financed by a variety of mechanisms. Community Facility Districts (CFD's) or developer fees with reimbursement agreements may be used to finance these improvements.

Unlike Alternative One, The demand for water from the Imperial Center will increase in Alternative Two from Alternative One because the Imperial Center will not be able to use recycled water for irrigation purposes. For this reason, water demand for irrigation purposes will increase by 40,186 gallons per day.

Exhibit 2 provides a graphical detail of the proposed Alternative Two.

IMPERIAL CENTER UTILITY ALTERNATIVES



LEGEND	
WATER SYSTEM	
	PROPOSED 8 INCHES LINE
	PROPOSED WATER STORAGE TANK AND PUMP STATION
SANITARY SEWER SYSTEM	
	PROPOSED 12 INCHES FORCE MAIN
	PROPOSED SEWAGE PUMP STATION

EXHIBIT NO. 2

Exhibit 2: Alternative Two

Alternative Three

HPUD would provide both sewer and water services to Imperial Center in Alternative Three. The proposed infrastructure would include improvements that are included, as a full-buildout, in the Heber Public Utility District Service Area Plan.

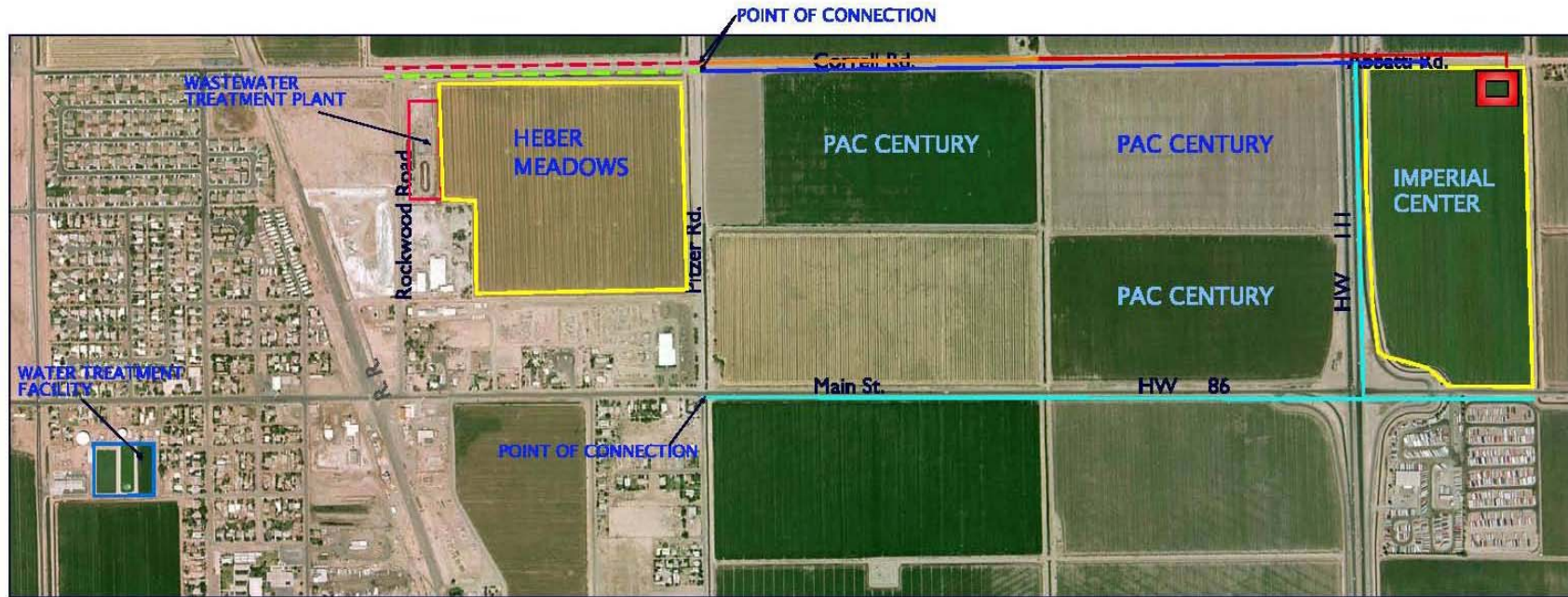
The HPUD would upgrade its water plant capacity under this alternative. This alternative would also include a looped water infrastructure system.

Alternative Three is estimated to cost \$2.4 million for infrastructure improvements. HPUD has stated that they intend to upgrade its infrastructure. These improvements may be financed by a variety of mechanisms. Community Facility Districts (CFD's) or developer fees with reimbursement agreements may be used to finance these improvements.

As in the case of Alternative Two, Alternative Three would not be able to use recycled water for irrigation purposes. The Imperial Center water demand in Alternative Three would be 40,186 gpd greater than in Alternative One.

Exhibit 3 provides a graphical detail of the proposed Alternative Three.

IMPERIAL CENTER UTILITY ALTERNATIVES



LEGEND	
WATER SYSTEM	
	FUTURE 20 INCHES LINE
	PROPOSED 30 INCHES LINE
	PROPOSED 12 INCHES LINE
SANITARY SEWER SYSTEM	
	FUTURE 30 INCHES LINE
	PROPOSED 30 INCHES LINE
	PROPOSED 12 INCHES FORCE MAIN
	PROPOSED SEWAGE PUMP STATION

EXHIBIT NO. 3

Exhibit 3: Alternative Three

Heber Public Utility District

Area Description

Heber is an unincorporated community of Imperial County, California, located six miles north of the United States-Mexico Border between the cities of El Centro and Calexico on Highway 86. Heber is 60 miles west of Yuma, AZ and 120 miles east of San Diego, CA. The development is bounded to the north by McCabe Road (one mile south of Interstate 8), to the east by State Highway 111, to the south by Jasper Road, and the City of Calexico form its southern boundary.

The central service area can be characterized as residential and industrial, with agriculture surrounding the Township of Heber. The Union Pacific Railroad has an important branch that traverses the Township from the northwest to the southeast. The topography of the area is essentially flat, with the ground surface generally sloped downward toward the north. The Imperial Irrigation District has several canals, drains, and laterals in the northeast portion of the Township.

Heber Public Utilities District Background

The Heber Public District's (The District) residents elect a five member Board of Directors. A General Manager reports directly to the Board of Directors and is charged with overseeing District operation and employees. The District contracts legal counsel that reports to the Board of Directors and the General Manager. Operations, administration, parks, and consultants hired by the District report to the General Manager.

The District has a total for eight full time employees, including three office and five operations staff members. The District is searching for a General Manager. The District has temporary help on occasion as needed. FY 2004 expenses for salaries, wages, and fringe benefits totals \$412,000. This cost is divided amount the Water Enterprise Fund, Wastewater Enterprise Fund, and General Fund.

Imperial Irrigation District

Service Area Description

Imperial County is located in the southeastern corner of California. 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 International Boundary with the Republic of Mexico. The Imperial County encompasses an area of 4,597 square miles or 2,942,080 acres.

Approximately fifty percent of lands in Imperial County are undeveloped and under federal ownership and jurisdiction. One-fifth of the nearly 3 million acres in Imperial Valley are irrigated for agricultural purposes, most notably the central area known as Imperial Valley. The Imperial Valley irrigated agriculture consists of 512,163 acres (Imperial County General Plan, 1998, Overview p. 7.) The developed area, where Imperial County's incorporated cities, unincorporated communities, and supporting facilities are situated, comprises less than one percent of the land. The Salton Sea accounts for approximately seven percent of Imperial County surface area.

The Imperial Valley is located in Imperial County. The Imperial Valley area is in the south-central part of Imperial County, and is bounded by Mexico on the south, the Algodones San 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 Area encompasses 989,450 acres (U.S. Department of Agriculture Soil Conservation Service, 1981, p.1).

The Imperial Irrigation District's irrigation services are laying entirely within Imperial County is divided into four units: Imperial, West Mesa, East Mesa, and Pilot Knob, with a gross acreage of 1,061,637 acres.

The Imperial Irrigation water supplier service area is located within the Imperial Valley and is defined as the Imperial Unit of the Imperial Irrigation District's Irrigation Service Area (Imperial Unit). The Imperial Unit includes the urban areas for the cities of Brawley, Calexico, and El Centro and part of the Imperial County's unincorporated area. The Management Plan's water supplier

service area, also known as the Imperial Unit, has a total area of 694,346 acres. See Exhibit 4 for the Imperial Unit's boundaries.

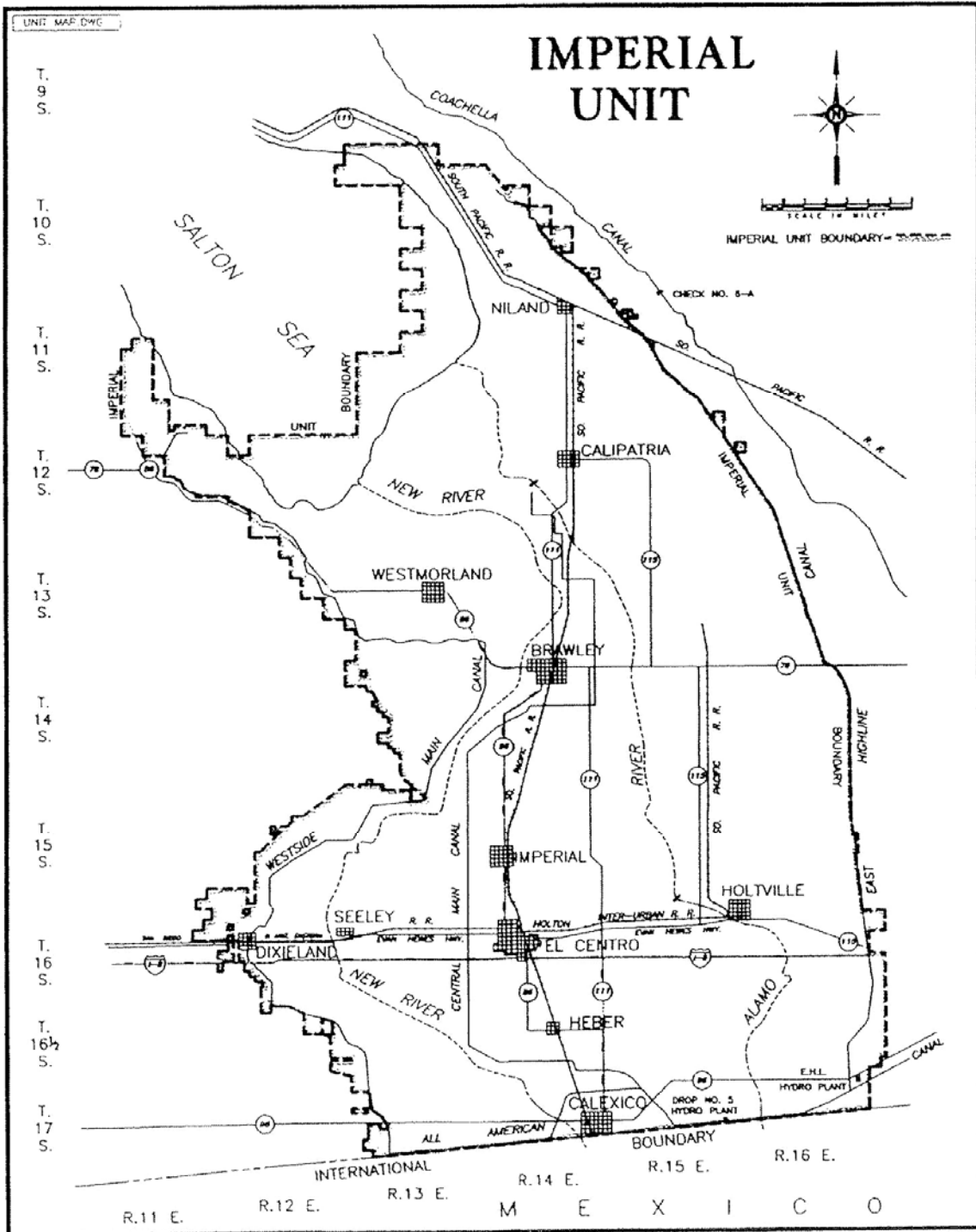


Exhibit 4: Imperial Unit

Climate Factors

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

The average annual rainfall in the Imperial Valley is 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 the elevation is sea level. The southern end of the Salton Sea is located at the northern end of Imperial Valley and the elevation is sea level. The southern end of the Salton Sea is located at the northern end of Imperial Valley and the elevation is 273 feet below sea level. The relatively flat topography of the Imperial Valley and surrounding areas in conjunction with strong night and day temperatures differentials, particularly in the summer months, produce moderate winds and deep thermal circulation systems. The thermal systems facilitate general dispersion of the air.

Population

The Population Research Unit of the California Department of Finance (DOF) estimates annual changes in population. According to DOF's 2004 estimates, the population of Imperial County's unincorporated areas was 34,300 and Imperial County's total population was 156,600. This compares to the 2000 census results of 32,773 people for Imperial County's unincorporated area and 142,361 people for Imperial County's total population.

Population Projections			
	2000 ¹	2004 ²	2010 ³
Imperial County (IC)	143,361	156,600	178,201
Unincorporated IC	32,773	34,300	
California	33,871,648	36,144,000	39,246,767

Table 1: Population Projections

Land Use

The Imperial Unit is predominantly an agriculture area. Agriculture 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 agriculture economy. Imperial Irrigation District is the regional water supplier in Imperial County, delivering Colorado River flows to all agricultural lands and urban water retailers within its contracted water service area. The Imperial Irrigation District operates open channel gravity flow irrigation and drainage systems and continually strives to develop innovative ways to improve its operations, increase reliability and to conserve water.

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 developed areas within the Imperial Unit include unincorporated cities, unincorporated communities, and supporting facilities. The seven incorporated cities in the Imperial Unit are Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland. Heber, Niland and Seeley are unincorporated communities.

Future Land Uses

The economy within the Imperial Unit is gradually becoming more diverse. Agriculture, however, will continue to be the primary industry within the Imperial Unit over the next twenty years. The two principal factors that will affect the increase or reduction of crop acreage within the Imperial Unit will be urban development and the economics of the agricultural market. Over the next twenty years, urbanization is expected to slightly decrease the historically constant acreage of the land developed to agriculture.

¹ 2000 US Census Information

² State of California Department of Finance, <http://www.dof.ca.gov/html/demograp/table1.xls>, 2/21/05

³ State of California Department of Finance, <http://www.dof.ca.gov/html/demograp/E-1table.xls>, 2/21/05

The majority of urban development should occur in and around the ten incorporated and unincorporated cities and communities. Urban development is expected to remain concentrated near the currently established urban centers. There are now two international border crossings in the Imperial Unit, the Calexico Port of Entry and the International Port of Entry. The industrial Mexico/United States International Port of Entry, located east of Calexico, is expected to facilitate urban development within the Imperial Unit.

Undeveloped areas that are being developed or could possibly be developed include areas that surround the incorporated cities, area that surround the unincorporated communities, and areas within the Specific Plan Areas. 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 for development. When adopted, a Specific Plan serves as an amendment to the Imperial County General Plan for a very defined and detailed area. Some of Imperial County's Specific Plan areas are adjacent to incorporated cities and unincorporated communities. Some Specific Plan areas have not completed all of their possible developments.

In October 2001, the total urban area surrounding cities and communities is 49,790 acres or 7.2 percent of the total Imperial Unit. This percentage has increased slightly due to the increase in development we have seen in the past couple of years. The majority of land area is currently being farmed.

Urban areas yet to be developed will be characterized by a full level of urban services, in particular public water and sewer systems, and will contain or propose a broad range of residential, commercial and industrial uses. It is anticipated that most urban developments, yet to be developed, will eventually be annexed or incorporated into existing cities, and provide the full range of public infrastructure normally associated with municipalities such as public sewer and water, drainage improvements, street lights, fire hydrants, and fully improved paved streets with curbs and sidewalks that are consistent with city standards.

Trends in land use point to an increase in the development of existing urban areas to provide for larger residential capacity an increased population. Within an increase in the development of existing urban areas, there will be associated increases in service and infrastructure. The total urban land use in the years 2000

through 2020 will remain small in comparison to agriculture land uses within the Imperial Unit.

Historical and Projected Water Demands

Project Specific

The minimum and maximum potable water use for the project is estimated to be 100,000 gallons and 200,000 (gpd) respectively. Irrigation water is an additional 37,500 and 70,000 gpd respectively. For planning purposes, we assumed the higher estimate, or a 200,000-gpd, as the average daily water demand for the project. This estimate should be re-evaluated as development proceeds to determine if some facilities proposed could be reduced in size. Table 1 provides the water use factors used to estimate project flows. Table 2 provides an engineers' estimate for potable water demand for Imperial Center.

Water Use Factors		
LAND USE	MINIMUM	MAXIMUM
Potable	1250 GPD/AC	2500 GPD/AC
Irrigation	500 gpd/ac	1000 gpd/ac

Table 2: Water Use Factors

Engineers' Estimate for Potable Water Demand for Imperial Center								
Facility	Area	Occupancy ft²/ Person	People/Unit	Gallons/day per capita	Average Gallons/ day	Usage Hours	Peak Flow Factor	Peak Gallons /min
Information Exhibit Rest Rooms	15,000 ft ²	30	500	10	5,000	6	3	42
Wholesale Outlet Mall Restrooms, Interior Landscaping, Food Service Facilities	460,000 ft ²	30	15,333	0.10	46,000	10	2	153
Multiplex Cinema Restrooms, Food Service	83,000 ft ²	14	5,929	3	17,786	6	3	148
Hotel 200 Rooms Rooms, Laundry, Interior Landscape, Janitorial Services, Banquet Services	135,000 ft ²	200	1.75	100	35,000	11	3	159
Hotel/Plaza Restaurant Restrooms, Kitchen	10,000 ft ²	15	667	10	20,000	12	3	83
Plaza Auction Court Restrooms, Janitorial	95,000 ft ²	30	3,167	3	28,5000	6	3	238
Convenience Market/Gas Restroom, Kitchen, Food Service	37,000 ft ²	30	1,233	3	7,400	12	2	21
Retail Pads (eleven) Restrooms, Kitchens	5,000 ft ²	30	167	5	18,333	12	2	560
Total of all Above			26,997		178,019			1,404

Table 3: Engineers' Estimate for Potable Water Demand for Imperial Cent

Heber PUD's Water Treatment Facility Demands & Capacities

Existing Water Demands

Most of the HPUD's water customers are single and multi family units. Other customers include the geothermal plant, schools, and the County Roads Facility. The average daily water consumption in the district is 750,000 gpd. As is the case with most communities in the Imperial Valley, water consumption rises significantly in the summer months. Due to climate, irrigation of parks, schools and landscaping, water consumption increase substantially. According to District records, the average daily consumption in winter months is less than 500,000 gpd. During summer months, the average daily consumption is over 1,000,000 gpd.

Imperial Irrigation District

Water Use / Demand

The Imperial Irrigation District provides wholesale water service. Demand for water in the Imperial Unit service area is divided into three basic categories: agricultural, municipal, and industrial. Historically the Imperial Irrigation District has delivered 98.2 percent of its annual flows to agricultural water users, 1.2 percent to municipalities, and 0.6 percent for industrial purposes.

The seven incorporated and three unincorporated cities within the Imperial Unit each divert water from Imperial Irrigation District's canal system to their treatment facilities prior to distribution to individual water users within their municipalities.

The primary industrial water users outside the urban areas are geothermal plants, Holly Sugar Corporation, chemical and fertilizer producers, a state prison (a second state prison located in the Imperial Unit is served treated water through a private water company), and the U.S. Naval Air Facility.

The Imperial Irrigation District is not a public water system and does not supply potable drinking water. The Imperial Irrigation District does provide raw untreated canal water to small acreage and service pipe connections, some of which are rural homes without any alternative water source. In these instances, the Imperial Irrigation District has complied with state and federal Safe Drinking Water Acts (SDWA) through an exclusionary process unique to irrigation districts. The Imperial Irrigation District ensures that all rural water users (with indoor uses of canal water) also have a source of water delivered to their property for cooking and drinking purposes from a California Department of Health Services Approved Provider. Water use by the Cities of Brawley, Calexico, and El Centro are listed in Table 4.3.1.

The Imperial Irrigation District's consumptive use values include the total use of raw water in the Imperial Unit. These consumptive use values include agriculture, small acreage, service pipes, municipalities, industrial, losses and unaccounted-for raw water. There is no available data that completely distinguishes between these uses of raw water.

Water distribution systems lose water during distribution for several reasons. Specific water distribution losses depend on the type of distribution system. A piped water distribution system can lose water due to pipe failures or leaks. Open channels, ponds, reservoirs, and water basins can lose water from seepage through the soil, surface evaporation into the air, and plant consumption. The Imperial Irrigation District has an open channel gravity flow water distribution system. Its water distribution system losses result from three major conditions: seepage, operational discharges, and evaporation. Operational discharges are excess flows discharged from a channel into another channel or drain. Operational discharges can result from carriage water that is required to fill and empty the reaches of sloping channels; excess water delivered to a channel to ensure adequate and constant delivery to the water users; increases in water user flexibility for water ordering and delivery scheduling; and terminating water deliveries during rainfall events, storm runoff, and flood flows.

The Imperial Irrigation District's water distribution system losses have been reduced through the years by numerous water conservation and demand management programs and projects. The demand management programs and projects are described in detail in the Imperial Irrigation District Demand Management Section of this plan. Table 5 details the Imperial Irrigation District's

recent and projected water usages. The total consumption is projected to remain stable after 2005 as agricultural usage declines and transfer agreements take effect.

Imperial Irrigation District Annual Water Use (Historical, Projected, and Water Conservation and Transfer Program/Projects)							
Water Use	1990	1995	2000	2005	2010	2015	2020
Consumptive Use ^{4,5 & 6} (includes agricultural, service pipe, municipalities, industrial, losses, and unaccounted for)	3,054,188 ⁴	3,070,582 ⁴	3,112,951 ^{5,2}	2,910,000 ⁶	2,722,300 ⁶	2,677,300 ⁶	2,625,300 ⁶
Water Conservation & Transfers							
IID/MWD Transfer ^{7&8}	6,6110 ⁷	74,570 ⁷	109,460 ⁷	110,000 ⁸	110,000 ⁸	110,000 ⁸	110,000 ⁸
IID/San Diego County Water Authority Transfer ⁹	0	0	0	80,000	180,000	200,000	70,000
IID/Coachella Valley Water District Transfer ¹⁰	0	0	0	0	20,000	45,000	70,000
AAC Lining Conservation (MWD) ¹¹	0	0	0	0	56,200	56,200	56,200
AAC Lining Conservation (San Luis Rey Indian Water Rights Settlement Act) ¹¹	0	0	0	0	11,500	11,500	11,500
Total (Acre-Feet)	3,060,298	3,145,152	3,222,411	3,100,000	3,100,000	3,100,000	3,100,000
Units of Measure: Acre-Feet							

Table 4: Imperial Irrigation District Annual Water Use

4 Decree accounting consumptive use data from Compilation of Records in Accordance with Article V. of the Decree of the Supreme Court of the United States in Arizona v. California Dated March 9, 1964 for Calendar Years 1990-1995, by the US Department of the Interior Bureau of Reclamation Lower Colorado River Region, pp.14-17.

5 Estimated using provisional water use data from Diversion from Mainstream-Available Return Flow & Consumptive use of Such Water Calendar Year 2000, by the US Department of the Interior Bureau of Reclamation Lower Colorado River Operations, March 7, 2001, Provisional Water use 2000.

6 Voluntary cap as per the proposed Quantification Settlement Agreement (QSA) for the Colorado River, value closes "Total" to 3,100,000 acre-feet.

7 Imperial Irrigation District All American Canal (38 Years), p.1.

8 Key Terms for Quantification Settlement among the State of California, IID, CVWD, and MWD, October 15, 1999 p.4.

9 Agreement for Transfer of Conserved Water by and between Imperial Irrigation District, a California irrigation district ("IID"), and San Diego County Water Authority, a California county water authority ("Authority"), 1998, Article 3 Quantity, p.13. At full implementation, project savings are between 130,000 and 200,000 acre-feet.

10 Key Terms for Quantification Settlement among the State of California, IID, CVWD, and MWD, October 15, 1999, pp. 6 & 8

11 Key Terms for Quantification Settlement among the State of California, IID, CVWD, and MWD, October 15, 1999, pp. 10 & 11

Historic Water Usage on this Land

The Imperial Center development will demand less water than the current agricultural land-use does. The Imperial Irrigation District provided the historic water use figures, which appear in Tables 6, 7 and 8. These historical usages are close to 50,000 gpd greater than the highest such figure from Imperial Center, for Alternates Two and Three, which appear in table 9. The discrepancy in water consumption between the two land uses would be even greater; but the average was brought down by the fact that the land went un-irrigated in 1994 and 1995.

Annual Water Usage 1987-1995								
1987	1988	1989	1990	1991	1992	1993	1994	1995
514.7	395.1	438.2	485.2	384.0	405.6	209.5	0	0

Table 5: Water Consumption with Agricultural Land Use, 1987-1995

Annual Water Usage 1996-2003							
1996	1997	1998	1999	2000	2001	2002	2003
322.7	425.3	428.4	385.6	368.7	128.1	265.8	355.6

Table 6: Water Consumption with Agricultural Land Use, 1995-2003

Water Consumption with Agricultural Land-Use	
Average Annual Usage	324.3
Acres of Land	77.64
Acre Feet/Acre/Year	4.2
Gallons/Acre Foot	326,000.0
Gallons/Year	105,710,294.0
Days/Year	365.0
Gallons/Day	289,617.0

Table 7: Annual Water Usage 1987-2003

Projected Water Usage Per Day (gpd)		
	Low-End	High-End
Alternative One	100,000	200,000
Alternative Two	140,186	240,186
Alternative Three	140,186	240,186

Table 8: Projected Water Usage Per Day (gpd)

Historical and Project Water Supplies

Heber Public Utility District

The Heber Public Utility District (HPUD) receives all of its water from the Imperial Irrigation District. Based on the 2000 Imperial Irrigation District Urban Plan, the link between water from the Imperial Irrigation District and urban water consumers like HPUD is strong. The plan states that the Imperial irrigation District prioritizes urban water delivery in dry years. Under a worst-case water supply scenario, the Imperial Irrigation District is confident that urban water users (which comprise less than two percent of its annual water deliveries) can be assured delivery of their required water supply. The Plan states that even under the “multiple reduced demand years” where water is restricted, urban water deliveries will not be reduced. 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, the Imperial Irrigation District has never been denied the right to divert the amount of water it has requested for agricultural purposes and other beneficial uses.”

The Imperial Irrigation District supplies raw water to HPUD, which subsequently treats it. The water is then distributed to HPUD customers through its distribution facilities.

The existing distribution facilities are generally small pipelines, with diameters ranging from three to 10 inches. There is a small amount of 18-inch pipe along Dogwood Road south of Main Street, and 12-inch pipe in the new Heberwood Estates development. Pipe materials are a mix of asbestos cement and polyvinyl chloride (PVC). Most of the older systems are of small diameter, asbestos cement pipes. During the mid and late 1980s, several 8-inch, 10-inch and 12-inch pipelines were installed parallel to these pipelines. The normal system operating pressure is 45 psi.

Historical Origins of Imperial Irrigation District’s Water Rights

The Imperial Unit depends solely on the Colorado River for surface water inflows. The Imperial District imports raw Colorado River water and distributes it primarily for agricultural purposes. The Imperial Irrigation District also delivers untreated flows for municipal

and industrial uses. Municipal and/or industrial users treat the raw water to meet state and federal drinking water standards before distribution to urban users.

Rainfall is less than three inches per year and does not contribute to Imperial Irrigation District's water supply, although at times it may reduce agriculture water demand. The groundwater in the Imperial Unit is of poor quality and is generally unsuitable for domestic or irrigation uses.

The Imperial Irrigation District was formed in 1911 to acquire properties of the bankrupt California Development Company and its Mexican Subsidiary. By 1922, the Imperial Irrigation District had acquired 13 mutual water companies, which had developed and operated distribution canals in the Imperial Valley. By the mid-1920's, the Imperial Irrigation District was delivering water to nearly 500,000 acres. Since 1942, water has been diverted at the Imperial Dam on the Colorado River through the All-American Canal, both of which the Imperial Irrigation District operates and maintains.

The Imperial Irrigation District's rights to divert Colorado River water are long standing. Imperial Irrigation District holds legal titles to all its water and water rights in trust for landowners within the district (California Water Code 20529 and 22437; *Bryand v. Yellen*, 447 U.S. 352, 371 (1980), fn.23.). 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 of 10,000 cfs each 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. After the Imperial Irrigation District was formed in 1911, the Southern Pacific Company conveyed all of its water rights to the Imperial Irrigation District on June 22, 1916.

The Imperial Irrigation District'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 were under irrigation. Had the Imperial Irrigation District not subsequently modified its pre-1914 appropriative rights, it would have perfected its pre-1914 appropriative water right at over 7 million acre-feet annually.

Subsequently, in 1921 representatives from the seven Colorado River basin states, with the authorization for their legislatures and at the urging of the Federal government, began negotiations regarding the distribution of waters from the Colorado River. In November of 1922, the representatives from the upper (Colorado, New Mexico, Utah, Wyoming) and lower (Arizona, California, and Nevada) basin states signed the Colorado River Compact (Compact), an interstate agreement giving each basin perpetual rights to annual appropriations of 7.5 million acre-feet of the Colorado River water annually.

The Compact was made effective by provisions in the 1928 Boulder Canyon Project Act (45 Statute 1056), which authorized the construction of Hoover Dam and the All-American Canal and served as the United States consent to accept the Compact. Officially, enacted on June 25, 1929 through a Presidential Proclamation, this act resulted in the ratification of the Compact by six of the basin states and required California to limit its annual consumptive use to 4.4 million acre-feet of the lower basin's apportionment, plus not less than half of any surplus water unapportioned by the Compact. Arizona refused to sign and subsequently filed a lawsuit. California abided by this federal mandate through the implementation of its 1929 Limitation Act. The Boulder Canyon Project Act moreover authorized the Secretary of the Interior (Secretary) to "contract for the storage of water...and for the delivery thereof...for irrigation and domestic uses", and further defined the lower basin's apportionment split by allocating 0.3 million acre-feet of water to Nevada and 2.8 million acre-feet of water to Arizona. While the three states never formally accepted or agreed to these terms, a 1964 Supreme Court decision (*Arizona vs. California*, 373 U.S. 546) declared their consent to be inconsequential since the Boulder Canyon Project Act was authorized by the Secretary.

Following the implementation of the Boulder Canyon Project Act, the Secretary requested California make recommendations regarding the distribution of its allocation of the Colorado River water. In August of 1931, under the direction of the Chairmanship of the State Engineer, the California Seven-Party Agreement was developed and authorized by the affected parties in order to prioritize California water rights. The Secretary accepted this recommendation agreement and established these priorities through General Regulations issued in September of 1931. The first four priority allocations account for California's 4.4 million acre-feet allotment, with agricultural entities utilizing 3.85 million acre-feet of that total. The remaining priorities are defined for years in which the Secretary declares that excess waters are available. Finally, it should also be

noted that a 1944 treaty entitles Mexico to an annual apportionment of 1.5 million acre-feet of Colorado River water and additional 200,000 acre-feet in years that excess water is available.

Pursuant to the provisions of the Boulder Canyon Project Act, adopted in 1929, the California Limitation Act (Act of March 4, 1929; Chapter 16, 48th Session; Statutes and Amendments to the Codes, 1929, p. 38-39.), and the Secretary's contracts, California was apportioned an annual 4.4 million acre-feet out of the lower basin allocation of 7.5 million acre-feet annually, plus 50% of any available surplus water. The Secretary of the Interior made the further apportionment of California's share of Colorado River water by entering into contracts with California water right holders. On December 1, 1932 the Secretary, acting on behalf of the United States, executed a contract with Imperial Irrigation District to deliver Colorado River water.

The Imperial Irrigation District 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 Imperial Irrigation District filed eight California applications between 1933 and 1936 to appropriate water pursuant to the California Water Commission Act. The Imperial Irrigation District 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 acre-feet annually. 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 Imperial Irrigation District's appropriative applications. Permits were granted on the applications in 1950.

At the time the Imperial Irrigation District entered into its contract with the Secretary of the Interior, it was anticipated that the lands to be served with Colorado River water in the Coachella Valley to the north would become a part of the Imperial Irrigation District. However, the Coachella farmers eventually decided that they preferred to have their own delivery contract with the Secretary, and an action was brought by the Coachella Valley Water District to protest the Imperial Irrigation District's court validation of the 1932 Imperial Irrigation District water service and repayment contract with the Secretary of the Interior. In 1934, Imperial Irrigation District and Coachella Valley Water District executed a compromise agreement, which paved the way for Coachella Valley Water District to have its own contract with the Secretary provided it subordinated its

California Colorado River Annual Water Right Priorities			
Priority Order	User	Apportionment	Present Perfected Rights
1.	Palo Verde Irrigation District (for use exclusively upon 104,500 acres of Valley land in, and adjoining district)	3,850,00 AF	219,791 AF (or the consumptive use of 33,604 acres)
2.	Yuma Project (for use on California Division, not exceeding 25,000 acres of land)		38,270 AF (or the consumptive use of 6,294 acres)
3a.	Imperial Irrigation District (lands served by All-American Canal in Imperial and Coachella Valleys)		2,600,000 AF (Imperial Irrigation District only) (or the consumptive use of 424,145 acres)
3b.	Palo Verde Irrigation District (for use exclusively on an additional 16,000 acres of mesa lands)		
4.	Metropolitan Water District (for use on the Southern California Coastal Plain)	550,000 AF	
	Subtotal: [California's Limit (not including surplus waters) of Colorado River Water as per the Boulder Canyon Project Act and the 1929 Limitation Act]	4,400,000 AF	
5a.	Metropolitan Water District (for use on the Southern California Coastal Plain)	550,000 AF	
5b.	City and County of San Diego (through MWD)	112,000 AF	
6a.	Imperial Irrigation District (lands served by the All-American Canal in Imperial and Coachella Valleys)	300,000 AF	
6b.	Palo Verde Irrigation District (for use exclusively on an additional 16,000 acres of mesa lands)		
7.	California Agricultural Use (Colorado River Basin lands in California)	All remaining available water	

Table 9: California Colorado River Annual Water Right Priorities

Colorado River entitlement, in perpetuity, to the Imperial Irrigation District entitlement. In other words, within the third, sixth and seventh priority agricultural pool, as set forth in the Seven-Party Agreement and various California water deliver contracts, Imperial Irrigation District's water use takes precedence over Coachella Valley Water District's use. Under the third priority Coachella Valley Water District receives water out of the annual .385 million acre-feet agricultural pool after water uses y Palo Verde, Yuma Project and the Imperial Irrigation District are deducted.

Both the Colorado River Compact and the Boulder Canyon Project Act contained provisions that required satisfaction of "present perfected rights", or appropriate rights acquired pursuant to state law that were in existence prior to enacting legislation. Imperial Irrigation District's water rights can be classified as two typed, "present perfected" and/or "contract." The 1964 Supreme Court decree (Arizona vs. California, 373 U.S. 546), in conjunction with a supplemental 1979 decree (Arizona vs. California, 439 U.S. 419, 429), awarded the Imperial Irrigation District a "present perfected right" to 2.6 million acre-feet of Colorado River Water annually. This legal decision reinforced the rights to this water that the Imperial Irrigation District had previously established through appropriations based on historical usage. These present perfeced rights are essential to the Imperial Irrigation District as the guarantee priority access to Colorado River water before those without these rights (after Mexico's allotment has been satisfied). Of the Seven-Party Agreement entities, only Palo Verde Irrigation District (PVID), Imperial Irrigation District, and the Yuma Project (non-Indian portions) have present perfected rights. Imperial Irrigation District's remaining water allocations are based on "contract rights" from the December 1932 contract with the Secretary of the Interior (as modified by the 1934 Compromise Agreement with the Coachella Valley Water District). Contract rights for all California entities are described in Article 17 of the 1932 Contract and in their individual contracts with the Secretary. While signatories to the 1931 Seven Party Agreement, Los Angeles, San Diego, and the County of San Diego, who originally was granted a forth priority of 550,000 acre-feet allotment of California's 4.4 million acre-feet apportionment.

Water Supply Sources

Groundwater in the Imperial Unit is of Poor quality and is unsuitable for domestic or irrigation use. Total dissolved solids (TDS) range from a few hundred to more than 10,000 milligrams per liter (mg/l). Generally, the groundwater's fluoride concentration is higher than that recommended for drinking water, while its boron concentration exceeds that recommended for certain agricultural crops.

Surface water is dependent on the inflow of irrigation water from the Colorado River and is non-potable without treatment. There are three general categories of surface water in the Imperial Unit: freshwater, brackish water, and saline water. The freshwater (with TDS generally less than 1,000 ppm) includes all Colorado River inflows delivered by the All American Canal and other canals and laterals within Imperial Irrigation District's Service Area. Brackish water (with TDS in the range of 1,000 to 4,000 ppm) can be found within the Alamo River, New River, and the agricultural drains that discharge into these rivers or directly to the Salton Sea. The Alamo River derives nearly all of its flow from the irrigation water return flows (tailwater and tile water) in the Imperial Unit. The New River derives roughly 65 percent of its volume from irrigation water return flows from the Imperial Unit, with the remaining 35 percent is derived from drainage that flows from the Mexicali Valley across the international border.

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. Imperial Dam, located 20 miles northeast of Yuma Arizona, serves as Imperial Irrigation District's point of diversion from the Colorado River to the All American Canal.

The Imperial Dam is 147 miles downstream from Parker Dam. It was constructed for diversion of water into the All American Canal and the Gila Gravity Main Canal. The All American Canal diverts water to the Reservation and Valley Divisions of the Yuma Project and to Imperial and Coachella Valleys. The Gila Gravity Main Canal diverts water east of the river to the North and South Gila Valleys, to the Welton-Mohawk Irrigation and Drainage District, and to the Yuma Mesa areas. All the water arriving at Imperial dam is accounted for. Water passing Imperial Dam through the sluiceways or otherwise related to the river below Imperial Dam is normally scheduled for delivery to Mexico. Imperial Irrigation District staff is responsible for correct delivery and operational accounting for all water released at Parker Dam and delivered to agency diverters

along the Colorado River and at Imperial Dam. Imperial Irrigation District staff operates the Imperial Dam.

The All American Canal is an 82-mile long gravity flow canal that conducts water to the Imperial Valley from the Imperial Dam. The All American Canal delivers water to three main canals, the East Highline, Central main, and the Westside Main and hundreds of laterals. Through 1,668 miles of canals and laterals, the Imperial Irrigation District delivers water throughout the Imperial Unit. The Imperial Irrigation District has seven regulating and three interceptor reservoirs that have a total storage capacity of approximately 3,400 acre-feet of water. The reservoirs provide increased flexibility and reduce operational losses, but are not designed for long-term storage. The Imperial Irrigation District delivers water through approximately 5,600 delivery gates for irrigation purposes and operates/maintains about 1,460 miles of drainage ditches used to collect surface runoff and subsurface drainage from the 33,600 miles of private farm tile drains. Surface runoff and flows from the tile drains enter the drainage system and ultimately outlet into the Salton Sea via the Alamo and New Rivers. The conveyance system and the off-farm drainage collection system are operated by Imperial Irrigation District, while the tile drains and tailwater discharge systems have been constructed and are operated by landowners.

Current And Projected Water Supplies						
Agency	Water Supply Source	2000	2005	2010	2015	2020
Imperial Irrigation District (IID)	Colorado River Water Rights ¹²	3,296,775 AF ¹³	3,100,000 AF ¹⁴	3,100,000 AF ¹⁴	3,100,000 AF ¹⁴	3,100,000 AF ¹⁴
City of Brawley	IID	2,701 MG	3,139 MG	3,942 MG	4,709 MG	5,840 MG
City of Calexico	IID	1,856 MG	1,965 MG	2,005 MG	2,101 MG	2,200 MG
City of El Centro	IID	8,586 AF	8,843 AF	9,108 AF	9,382 AF	9,663 AF
Units of Measure: AF=Acre Feet MG=Million Gallons						

Table 10: Current and Projected Water Supplies

12. See Table 4.0.1. Imperial Irrigation District's water right is not defined volume but rather a quantity of water to serve a defined area of land.
 13 Water Supply calculated using provisional water use data from Diversions from Mainstream-Available Return Flow & Consumptive Use of Such Water Calendar year 2000, by US Department of the Interior Bureau of Reclamation Lower Colorado River Operations, March 7, 2001, Provisional Water Use 2000.

14 Voluntary cap as per the proposed Quantification Settlement Agreement (QSA) for the Colorado River.

Reliability Comparison

Imperial Irrigation District's present perfected and contract water rights are highly unlikely to be affected by the usual state and regional drought conditions. The water of the Colorado River is used by both the Upper Basin States (Colorado, New Mexico, Utah, and Wyoming) and the lower basin states (Arizona, California and Nevada), as well as by Mexico. Assuming drought conditions on the Colorado River, California's 4.4 million acre-feet 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 one million acre-feet before any other lower basin water entitlement is affected. Additionally, Imperial Irrigation District's 2.6 million acre-feet of present perfected water rights theoretically protect its water users unless changed by future legislative action. Imperial Irrigation District holds legal titles to all its water and water rights in trust for landowners within this service area (California Water Code 20529 and 22437; Bryant v. Yellen, 447 US 352, 371 (1980), fin.23.). While groundwater in the imperial Unit is not used for commercial or major sources of water due to the high salt content, Imperial Irrigation District's Colorado River water supply is consistent and reliable.

The selected average or normal water year for this report is 1995 as it was the median water use year from 1994 through 1998. For the purposes of this plan, the "single dry water year" term is changed to "single reduced demand water year" as Imperial Irrigation District's senior water rights are such that drought conditions have never affected its water supply. Thus for the purpose of this plan, 1992 was selected as the "single reduced demand water year" as this year had the lowest Imperial Irrigation District water usage during the 1989 to 1998 time period. In the 1992, Imperial Irrigation District's available water supply was calculated to be 3,463,992 acre-feet.

Imperial Irrigation District does not have a quantified water right but instead is allotted the right to use flows within a 3.85 million acre-foot agricultural 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, Imperial Irrigation District's third priority water right gives it the right to use whatever flows it can put to reasonable and beneficial use after diversions by the Palo Verde Irrigation District and Yuma Project Reservation Division. Coachella Valley Water District holds the last priority to this

agricultural entitlement, as 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. Thus, in any year each of the agricultural water users' available water supplied can be determined by subtracting the annual diversions of the higher priority water users from the 3.85 million acre-feet agricultural entitlement. In 1992 Imperial Irrigation District's available water supply was calculated by subtracting Palo Verde Irrigation District and Yuma Project Reservation Division diversions (386,008 acre-feet cumulatively) from the 3.85 million acre-foot supply. However, Imperial Irrigation District's 1992 consumptive use was only 2,572,659 acre-feet so the remaining 1,277,341 acre-feet of flows would have been available for Coachella Valley Water District and lower priority Colorado River contractors.

The Imperial Irrigation District's lowest water use during the 1989 through 1998 time period, were 1991 and 1992 with 1992 being lower than 1991. The term "multiple dry water years" is changed to "multiple reduced demand water years." Historically, the most recent California drought period was from 1987 to 1992. For the ten-year period from 1989 through 1998, the Imperial Irrigation District's lowest water use years were 1991, 1992, and 1993.

Imperial Irrigation District Annual Water Supply Reliability					
	Average/Normal Water Year (1995)	Single Reduced Demand Water Year (1992)	Multiple Reduced Demand Water Years		
			Year 1 (1991)	Year 2 (1992)	Year 3 (1993)
Water Use ¹⁵	3,070,582	2,572,659	2,898,963	2,572,695	2,772,148
Water Supply ¹⁶	3,373,233	3,463,992	3,375,173	3,463,992	3,457,909
Unit of Measure is Acre-Feet					

Table 11: Imperial Irrigation District Annual Water Supply Reliability

For the purposes of this report and compliance with the Urban Water Management Planning Act, three years were selected to estimate a minimum annual water supply. The selected three years are 2001, 2002, and 2003. If during the years 2001, 2002, and

¹⁵ Decree accounting consumptive use from the *Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in Arizona v. California Dated March 9, 1964* Calendar Years 1991, 1992, 1993, and 1995, by the US Department of the Interior Bureau of Reclamation Lower Colorado Region.

¹⁶ Water Supply calculated using data from the *Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in Arizona v. California Dated March 9, 1964* Calendar Years 1991, 1992, 1993, and 1995, by the US Department of the Interior Bureau of Reclamation Lower Colorado Region.

2003 there were a minimum water volume supply from the Colorado River, it would be 3.1 million acre-feet according to a voluntary self-imposed cap proposed in the QSA.

Under a worst-case water supply scenario, the Imperial Irrigation District is confident 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, the Imperial Irrigation District has never been denied the right to divert the amount of water it has requested for agricultural purposes and other beneficial uses. Current and projected water supplies exceed current projected water demands for Imperial Unit water consumers.

Project Specific

The HPUD will sign a “will-serve” agreement with Imperial Center ensuring that it plans to service the development with water from the Imperial Irrigation District. This agreement is a guarantee to Imperial Center that it will be supplied with the necessary quantities of water.

Supply and Demand Comparison

Supply and Demand Comparison

Increased water demand in the Imperial Unit will be offset in future years with increased water conversion measures.

The selected average or normal water year for this report is 1995. The Imperial Irrigation District’s yearly median water use volume for 1994 through 1998 is equal to 1995’s volume of water. For the purposes of this plan, the “single dry water year” term is changed to “single reduced demand water year.”

Projected Supply and Demand Comparison ¹⁷					
	2000	2005	2010	2015	2020
Imperial Irrigation District Totals ¹⁸	3,296,775 ¹⁸	3,100,000 ¹⁹	3,100,000 ¹⁹	3,100,000 ¹⁹	3,100,000 ¹⁹
Imperial Irrigation District Demand Totals ^{18&19}	3,112,951 ¹⁸	3,100,000 ¹⁹	3,100,000 ¹⁹	3,100,000 ¹⁹	3,100,000 ¹⁹
Difference	183,824	0	0	0	0
Unit of Measure is Acre-feet/Year					

Table 12: Projected Supply and Demand Comparison

The 1992 annual water use volume was lower than the 1991 annual water use volume. The Imperial Irrigation District's lowest water use year during the 1989 through 1998 period, was the years 1991 and 1992.

Supply Reliability and Demand Comparison					
	1995 Avg./Normal Water Year	1992 Single Reduced Demand Water Year	Multiple Reduced Demand Water Years		
			Year 1 (1991)	Year 2 (1992)	Year 3 (1993)
Imperial Irrigation District Supply Totals ²⁰	3,373,233	3,463,992	3,375,173	3,463,992	3,457,909
Imperial Irrigation District Demand Totals ²¹	3,070,582	2,572,659	2,898,963	2,572,659	2,772,148
Difference	302,651	891,333	476,210	891,333	685,761
Unit of Measure is Acre-feet/Year					

Table 13: Supply Reliability and Demand Comparison

¹⁷ Estimated using provisional water use data from Diversions from Mainstream—Available Return Flow and Consumptive use of Such Water Calendar year 2000, by the US Department of the interior Bureau of Reclamation Lower Colorado River Operations, March 17, 2001, Provisional Water Use 2000.

¹⁸ Water supply calculated using provisional water use data from Diversion from Mainstream—Available Return Flow and Consumptive Use of Such Water calendar Year 2000, by US Department of the Interior Bureau of Reclamation Lower Colorado River Operations, March 17, 2001, Provisional Water use 2000.

¹⁹ Voluntary cap per the proposed Quantification Settlement Agreement (QSA) for the Colorado River Annual Water Rights Priorities are listed in Table 4.0.1.

²⁰ Water supply calculated using data in the Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in Arizona v. California Dated march 9, 1964, Calendar Years 1991, 1992, 1993, and 1995 by the US Department of the Interior Bureau of Reclamation Lower Colorado Region.

²¹ Decree accounting consumptive use from the *Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in Arizona v. California Dated march 9, 1964*, Calendar Years 1991, 1992, 1993, and 1995 by the US Department of the Interior Bureau of Reclamation Lower Colorado Region.

Urban Water Shortage Management

It is unlikely that the urban water supply of Imperial Irrigation District would ever be affected, even under shortage or drought conditions on the Colorado River. Urban water use in the Imperial Unit makes up less than two percent of the total water delivered by the Imperial Irrigation District. Under a worst-case water supply scenario, the Imperial Irrigation District is confident it can meet the demands of urban water users.

Due to the high quality of the Imperial Irrigation District's water rights, Colorado River flows, and the storage facilities on the Colorado River it is highly unlikely that Imperial Irrigation District's water supply will be affected, even in dry years. The entire southern California region, both urban and agricultural, would be in a severe drought emergency before the Imperial Valley's water supply is threatened. Historically, the Imperial Irrigation District has never been denied the right to divert the amount of water it has requested for agricultural irrigation and other beneficial uses.

In the event that there is a water shortage in the Lower Colorado River Basin, the Imperial Irrigation District/San Diego County Water Authority water transfer agreement states that both agencies will share, on a pro-rata basis, any reductions in water to Imperial Irrigation District should a shortage declaration by the Secretary of the Interior for the Lower Colorado River Basin affect the Imperial Irrigation District'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 forecasted to be less than 8.8 million acre-feet, the Imperial Irrigation District and the San Diego County Water Authority have agreed to meet and confer to discuss a supplemental water transfer agreement in anticipation of the shortage.

Should operating conditions on the Colorado River indicate Imperial Irrigation District may be impacted by reductions in water deliveries, the Imperial Irrigation District will notify all of its water users by mail and will conduct an educational outreach program in conjunction with the local media and municipal water systems. The notice will request all water suppliers, and in particular residential, industrial, and commercial water users, to conserve water on a voluntary basis. Urban water suppliers will be responsible for notifying their customers and implementing their own voluntary water conservation measures and programs.

Urban water supply reductions in the Imperial Unit are not likely to occur during the next twenty years. Action stages are noted in this plan in order to comply with California's Urban Water Management Planning Act requirements, and have not been approved by any of the agencies participating in this plan. Urban water supply shortage stage one is voluntary, has cut back conditions of less than 15 percent, and is estimated to provide up to 79 percent of the reduction goal for urban water suppliers. Urban water supply shortage stage two is voluntary, has cut back conditions of less than 15 percent to less than 25 percent, and its estimated to provide 7 to 12 percent of the reduction goal for urban water suppliers. Urban water supply shortage stage 3 is mandatory has cut back conditions of 25b percent to less than 35 percent, and is estimated to provide the remainder of any reduction goals for urban water suppliers. Mandatory provisions to reduce individual urban consumer water use are beyond the jurisdiction of the Imperial Irrigation District. Any urban water use reductions or restrictions are the responsibility of individual urban water suppliers who treat and distribute water within the Imperial Unit. This includes enforcement of any policies to achieve target goals. The Imperial Irrigation District does not expect to enter a stage one or greater urban water shortage at any time over the next 20 years.

Emergency Preparedness

Emergency actions and procedures to be taken by Imperial Irrigation District Water Department staff during an emergency or time of disaster are described in the Emergency Preparedness Plan. The Emergency Preparedness Plan includes required staffs action and procedure to respond to events that impair water operation of canals, laterals, drains, dams, and other facilities. These responses are not normal operation and maintenance activities. Generally, any occurrence that requires and immediate response is classified as an extreme event or emergency.

The Emergency Preparedness Plan defines the role each responsible employee will play during an emergency. Water Department staff conducts emergency and/or disaster response planning in the Water Control Center. Coordination of staffs with other departments will take place in the General Manger's conference room. All American Canal River Division staff planning will be centered in the Imperial Dam Control House. Other staffs meet and coordinate actions at designated areas.

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 disaster. The Imperial Irrigation District's water delivery and drainage systems do not totally shut down during an emergency.

The Imperial Irrigation District has conducted Emergency Preparedness Exercises in the past. Emergency preparedness exercises will be updated with the development of new emergency preparedness exercises. Water Department staffs trained and participated with the US Department of the Interior Bureau of Reclamation's Tabletop Exercise for emergency preparedness.

For the cities in the Imperial Unit, there is a ten-day storage holding capacity requirement. The Imperial County Office of Emergency Services requires this storage holding capacity for the cities (Imperial Irrigation District, 1998, p.22)

Conclusion

Every link in the water supply chain for the Imperial Center is solid. Thus, adequate water supplies for the Imperial Center project are ensured.

The Imperial Center has a detailed plan for water usage, which states how much water will be necessary for each aspect of the finished development, including capacity for emergency situations. This plan will actually represents a decrease in water usage from the land's historical use. This decrease in use is because the amount of water that is projected to be consumed by the project is less than what the same property has consumed as an agricultural property.

The local public utility, HPUD, has signed a "will-serve" letter guaranteeing that they will make all the necessary water available to this development or enter into negotiations to operate the Imperial Center's on-site temporary water plant. In turn, their water supplier, Imperial Irrigation District, has more than sufficient water capacity to service this development. The District has a present perfected right to Colorado River water, and its usage has yet to come near to its limit.

The amount of water available and the stability of the water supply chain ensure that this development's water needs will be met, even in the dry years, during a 20-year projection.