

Appendix G

Water Demand Supporting Information

Appendix G – Water Demand

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WATER DEMAND ASSESSMENT

WORLD ENERGY RENEWABLE FUEL CONVERSION

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APPENDIX A: CAPITAL OUTLAY PROGRAM

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Section 1: Situational Overview

World Energy, in conjunction with its fully owned subsidiary AltAir, is proposing to complete the conversion of the Paramount Petroleum facility from an oil refinery to a renewable fuels production facility (Conversion Project, Project). Initiated in 2015, the Paramount Petroleum AltAir Renewable Fuels Project converted portions of existing refinery equipment to produce renewable diesel, jet fuel, and naphtha. The Conversion project anticipates a 3-year phased timeline allowing new equipment to be brought online and made fully functional before new units are added. Details concerning the project can be found in the May 2020 Paramount Petroleum AltAir Renewable Fuels Project Initial Study.

Among other additions to the facility, the project includes the modification of a Sour Water Stripper to treat increased amounts of sour water generated by the process, additional wastewater treatment facilities, new water treatment for the boiler included in the proposed Hydrogen Generation Unit, and additional water required for the Pretreat Unit. These additions are expected to significantly increase water demand at the facility. Based on Table 1.1, the Paramount facility is anticipating a demand of 1554 gallons per minute (GM) once the conversion is complete.

Table 1.1: Altair Water Use Following Project Completion:

Equipment Consuming Water	Total Facility Water Use (gpm)	Total Facility Water Use (gallons per day)	Total Facility Water use (acre-feet per year (AFY))
Steam Water (R/o Treated)	480		
Pretreat Water (R/o Treated)	90		
Reject Water (20% of total R/o treated)	114		
Cooling Tower Water (untreated)	670		
Potable Use Water	200		
	1554	2,237,760	2,506.6

The facility's historical water use has ranged from 19,631,260 to 132,950,268 gallons per year as shown in Table 1.2.

Table 1.2: Alt Air Historical Water Use:

Year	2011	2014	2015	2018	2019
Water Use (gallons per year)	132,950,268	34,521,696	19,631,260	44,622,688	47,604,874
Water Use (gallons per day) ⁽¹⁾	542,654	94,580	53,784	138,151	161,372
Water Use (AF)	408	105.94	60.25	136.94	146.09

Note: Figures are based on the actual number of days that the facility operated during the year which is sometimes less than 365.

Under the California Environmental Quality Act (CEQA) Section 15155 “Water Supply Analysis; City or County Consultation with Water Agencies,” any proposed project which will demand in excess of, or equivalent to, the amount of water required by a 500 dwelling unit project will be classified as a “Water-Demand Project” and will necessitate the development of a Water Demand Assessment as described in Water Code Sections 10910 through 10915. The estimated water demand for a 500 dwelling unit is roughly 250,000 gallons per day. The projected demand for the facility following completion of the project, based on the rate shown in Table 1.1, would be 2,237,760 gallons per day (816,782,536 gallons per year/2506.6 AFY). The project is expected to result in an increase in water demand of 1,695,106 to 2,183,976 gallons per day, exceeding the threshold, establishing the Paramount Petroleum AltAir Renewable Fuels Project as a Water-Demand Project, and therefore requiring the preparation of a Water Demand Assessment.

The Water Code places the responsibility for development of the Water Demand Assessment on the water supplier. In the case of the Paramount Petroleum AltAir Renewable Fuels Project, the City of Paramount (City) Water Department is ultimately responsible for the completion and viability of the assessment as well as the resulting Capital Outlay Plan. However, in order to maintain project momentum, the City has allowed World Energy to hire RMP to develop portions of the assessment. The following sections include those portions of the assessment which World Energy can complete utilizing open source materials and public documentation. Appendix A is reserved for the City’s Capital Outlay Program and those sections of the assessment which can only be completed by the water supplier.

Section 2: Water Rights & Entitlements

Wat. Code § 10910(d)(1): The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts

Wat Code § 10910(d)(2)(A): An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following: (A) Written contracts or other proof of entitlement to an identified water supply.

Wat Code § 10910(d)(2)(e): If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

The City utilizes both potable and recycled water. The City obtains potable water from two sources: directly pumped groundwater and imported water purchased through the Central Basin Municipal Water District (CBMWD), who in turn receives the water through the Metropolitan Water District of Southern California (MWD) and the State Water Project (SWP). The City provided a total of 208 MG (6,396 acre-feet (AF)) of water to a population of approximately 55,302 in 2015. The City obtains its groundwater from the Central Subbasin, one of four subbasins in the Coastal Plain of Los Angeles. The Central Subbasin is commonly referred to as the Central Basin and is identified

as such through the remainder of the report. The Central Basin is an adjudicated Basin (1965) and the City is allotted 192 MG (5883 AF) in pumping rights every year.

SECTION 2.1: CENTRAL BASIN

Please refer to Section 3 for information on the Central Basin.

SECTION 2.2: STATE WATER PROJECT

The City's Imported water is purchased through the CBMWD. CBMWD obtains its water from a number of sources, including local groundwater supplies and recycled water. However, the majority of water supplied to CBMWD is from MWD as part of the SWP. The SWP is a series of reservoirs, aqueducts, and pumping facilities that convey water from Northern to Southern California. Water is collected and delivered to MWD via the SWP, which is subsequently treated at either the Weymouth Filtration Plant or the Jensen Filtration Plant. Water from either of these filtration plants is then transferred to CBMWD.

As stated in the City's 2015 Urban Water Management Plan, CBMWD delivered 186 MG (572 AF) of water to the City for distribution in 2015. Prior to the construction of Well No. 15 in 2011-2012, the City purchased 933 MG (2,864 AFY) on average from CBMWD. However, with the addition of Well No. 15 and 16, the City has been able to more fully utilize its allowable pumping allocation, and its yearly purchased water deliveries have dropped accordingly. This trend is expected to continue throughout the 20-year planning horizon, and in the future as demand increases, the reduced purchased water demands from CBMWD are expected to continue to be a reliable supply to supplement the City's groundwater source.

SECTION 2.3: RECYCLED WATER

The City is part of an integrated water recycling program that includes the Cities in Los Angeles County as well as water districts, including the MWD. Wastewater is collected and treated by the Los Angeles County Sanitation District (LACSD) sewage system and sent to either the Joint Water Pollution Control Plant (JWPCP) or one of six satellite water reclamation plants (WRPs) as part of the Joint Outfall System (JOS). Wastewater destined for recycled water use undergoes tertiary treatment (as described below) and is subsequently distributed or disposed of as necessary. Wastewater too salty for use as recycled water is sent to the JWPCP where it undergoes secondary treatment and disinfection before being discharged to the ocean. The LACSD reports nearly 4245 MG per year (130,000 AFY) of wastewater was treated to recycled water quality for

FY 2013-2014 in the JOS. The water produced is used either as recycled water for industrial, landscape irrigation, or agricultural use, or for groundwater recharge.

Treated wastewater from the LACSD's Los Coyotes Water Reclamation Plant (WRP) and San Jose Creek WRP is supplied through CBMWD's Century recycled water distribution system to the cities of Bellflower, Bell Gardens, Compton, Downey, Lakewood, Lynwood, Norwalk, Paramount, Santa Fe Springs, South Gate and Vernon. In 2013-2014, San Jose Creek and Los Coyotes Plants treated a total of 298 MG (91,393 AF) of wastewater to recycled water quality standards. Of this, 112 MG (343 AF) was eventually distributed to the City. The system currently consists of 189,900 feet of pipeline, with the backbone being a 30-inch pipeline paralleling the San Gabriel River. Construction of the initial system was completed in 1992, with the delivery of recycled water for applications such as landscape irrigation of parks, schools, and freeway slopes, nursery stock irrigation, and various industrial applications. The system was connected to the Rio Hondo recycled water distribution system in 1994, and both the Century and Rio Hondo systems can be partially supplied with water from either the Los Coyotes or San Jose Creek WRPs, individually or in combination. Most of the recycled water delivered through the Century distribution system actually originated at the San Jose Creek WRP. However, the usage is still reported from the Los Coyotes WRP, as there is no way to differentiate which reuse sites receive which recycled water. Therefore, for the sake of consistency, recycled water usage along the Century facilities is reported as coming from the Los Coyotes WRP, and along the Rio Hondo facilities as coming from the San Jose Creek WRP.

Section 3: Central Basin

Wat. Code § 10910(d)(2)(f)(2):

(A) A description of any groundwater basin or basins from which the proposed project will be supplied

(B) For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree.

Wat. Code § 10910(d)(2)(f)(3): A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records

Wat. Code § 10910(d)(2)(f)(4): A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

As mentioned above, the City pumps water from the Los Angeles County Central Subbasin, a large subbasin that makes up part of the Coastal Plain of Los Angeles Basin. The total surface area of this subbasin is approximately 177,000 acres. It is bounded on the north by a surface divide called the La Brea high, and on the northeast and east by emergent less permeable tertiary rocks of the Elysia, Repetto, Merced and Puente Hills. The southeast boundary between Central Basin and the Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift. The Los Angeles and San Gabriel Rivers drain inland basins and pass across the surface of the Central Basin on their way to the Pacific

Ocean. Average precipitation throughout the Subbasin ranges from 11 to 13 inches with an average of approximately 12 inches.

Central Basin was adjudicated in 1965, and the Department of Water Resources was appointed Watermaster. Every month, extractions are reported to the Watermaster by each individual pumper. This allows the Watermaster to regulate the water rights of the subbasin. The agencies included in the adjudication include the following;

Public:

- City of Bellflower,
- Bellflower-Somerset MWC,
- City of Compton,
- City of Huntington Park,
- City of Long Beach,
- City of Los Angeles DWP,
- City of Montebello,
- City of Paramount,
- City of Pico Rivera,
- City of Santa Fe Springs,
- Sativa LA County WD,
- City of Signal Hill,
- South Montebello ID,
- City of South Gate,
- City of Vernon,
- City of Whittier

Private:

- California-American Water Company,
- Montebello Land and Water Company,
- Bellflower Home Garden Water Co.,
- California Water Service,
- Lynwood Park MWC,
- Maywood MWC,
- Park Water Company,
- Pearless Water Company,
- San Gabriel Valley Water Company,
- Southern California Water Company,
- Tract No. 180 Water Company,
- Tract 349 MWC,
- Western Water Company

Section 4: Urban Water Management Plan

Wat. Code § 10910(d)(2)(f)(1): [the following additional information shall be included in the water supply assessment:] A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

The City of Paramount 2015 Urban Water Management Plan served as the basis for understanding the City's water system and potential for meeting World Energy water requirements. Before preparation of the Water Demand Assessment began, and through the develop process, the City's Urban Water Management Plan was studied to extract relevant information. Throughout the Water Demand Assessment, references to the City's 2015 Urban Water Management Plant demonstrate how relevant information was utilized in the develop of the assessment. The following include examples of utilization of Urban Water Management Plan information.

Chapters 6 System Supplies and 7 Water Supply Reliability of the City's Urban Water Management Plan where heavily relied on for data on water sources and projections for supply and demand. Section 5: Water Supply/Demand Assessment of this report takes many of the tables contained in these chapters and use them to demonstrate the need for additional water supply to meet increased demands at the Paramount facility.

Chapter 7 of the Urban Water Management Plan also includes information about the potential to increase recycled water use which directed some of the efforts to locate additional water supplies and conversations with the CBMWD.

Section 5: Water Supply/Demand Analysis

In order to determine whether the City is able to meet the projected water demand associated with the World Energy – Paramount facility conversion project, an evaluation of the City's water supply against the projected water demand must be performed.

Wat. Code § 10910(c)(3): If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

The City prepared an Urban Water Management Plan (UWMP) in 2015 in accordance with the California Water Code, §10610-10656 and §10608. However, as the 2015 UWMP did not account for the water demand associated with the proposed Paramount facility conversion project, this section aims to fulfill the Water Code requirement, by detailing whether the City's total projected water supplies available during normal, single dry and multiple dry water years over a 20-year projection will meet the projected water demand. The water supply available for the 20-year projection will be compared against the 20-year water demand projection, which includes the Paramount facility's water demand. Throughout this section, it should be noted that the 20-year projection is performed from 2015 and all 'current' values are those used from 2015 to coincide with the UWMP. The water supply and demand portions will be separately evaluated and finally, a supply and demand comparison will be performed.

SECTION 5.1: ACTUAL AND PROJECTED WATER SUPPLIES FOR NORMAL YEAR

As stated in Chapter 6 of the City's 2015 UWMP, the City supplies both potable and recycled water. The City obtains potable water from two sources: directly pumped groundwater and imported water purchased through the CBMWD, who in turn receives the water through MWD as part of the State Water Project (SWP). In 2015, CBMWD (via the SWP) delivered 186 MG (572 AF) of water to the City for distribution. In addition to distributing potable water, the City also has a recycled water system that provided 110 MG (338 AF) of recycled water in 2015.

Groundwater is obtained from the Central Subbasin, commonly referred to as the Central Basin. Since the Central Basin is an adjudicated basin, the City is given a total allotted amount of groundwater from the Central Basin via its pumping rights: 5.25 million gallons per day (MGD) (5,883 AFY). The City used slightly less than this allotted water supply in 2015 (a total of 1,897 MG (5,823 AF)); however, it is assumed that the City will utilize the full allotted amount of groundwater (1,917 MG (5883 AF)) in future years, which contributes to the City's total water supply. The City provided a total of 2194 MG of water to a population of approximately 55,302 in 2015.

The total actual water supplies from 2015 and 20-year projected water supplies from 2015 through 2035, which are available to the city through CBMWD, pumped groundwater, and recycled water, are shown in Tables 5.1 and 5.2, respectively.

Table 5.1: Water Supplies - Actual

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume (MG)	Water Quality	Total Right or Safe Yield (optional)
Groundwater	Central Basin	1,897	Drinking Water	1,917
Purchased or Imported Water	State Water Project and Colorado River	186	Drinking Water	
Recycled Water	LA County Recycling Program	110	Recycled Water	
Total		2,194		1,917

Table 5.2: Water Supplies - Projected

Water Supply	Additional Details on Water Supply	Projected Water Supply			
		2020	2025	2030	2035
		Reasonably Available Volume (MG)	Reasonably Available Volume (MG)	Reasonably Available Volume (MG)	Reasonably Available Volume (MG)
Groundwater	Central Basin	1,917	1,917	1,917	1,917
Purchased or Imported Water	State Water Project and Colorado River	548	548	548	548
Recycled Water	LA County Recycling Program	113	122	122	122
Total		2,578	2,587	2,587	2,587

Note: Groundwater supplies projected based on total allowable pumping allocation; purchased water supplies estimated based on 5-year average deliveries; recycled water supplies estimated based on highest annual deliveries recorded over the past 5 years plus future recycled water project demands, considering the Los Coyotes and San Jose Creek Water Reclamation Plants (WRPs) are producing more recycled water than is currently being used (64% of total used) based on LACSD's 2013-2014 Annual Report.

SECTION 5.2: PROJECTED WATER SUPPLIES FOR SINGLE DRY AND MULTIPLE DRY WATER YEARS

Tables 5.1 and 5.2 provide an outline for the actual and projected water supplies for a normal year. However, as outlined in the Water Code, the total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection must also be evaluated. For the purpose of this assessment, the Department of Water Resources defines average, single-dry, and multiple dry years as follows.

Average Year: A year, or an averaged range of years, that most closely represents the median water supply available to the agency.

Single-Dry Year: The year that represents the lowest water supply available to the agency.

Multiple Dry Years: The period that represents the lowest average water supply availability to the agency for a consecutive multiple year period (three years or more).

Table 5.3 provides a basis for the water supplies data for an average year, single dry year and multiple dry years, which were chosen to represent the water supply from CBMWD as well as the percentage/volume of supply that was available for public use. These percentage values do not represent additional supplies through surplus storage. Instead, they demonstrate the water available to be added to the supply system based on the hydrology of those years.

Table 5.3: Basis of Water Year Data

Year Type	Base Year	Available supplies if year type repeats	
		Volume Available (MG)	% of Avg Supply
Average Year	2010	2,927	100%
Single-Dry Year	2006	2,940	101%
Multiple-Dry Years 1st Year	2006	2,940	101%
Multiple-Dry Years 2nd Year	2007	2,805	97%
Multiple-Dry Years 3rd Year	2008	2,710	95%

In the single dry water year, demand increased and therefore more water was supplied to meet the demand due to increased temperatures, evapotranspiration rates, and a longer growing season. Throughout these years, the groundwater supply available from the Central Basin was assumed to remain consistent, regardless of the water years. Water reserves are available to

provide a reliable source of water in the event of another single dry year with similar hydrology. The only varying source is water available through the MWD, which was provided by the MWD 2015 UWMP.

The ‘percent of average year supply’ values provided in Table 5.3 are used to estimate the water supply totals for a single dry year and multiple dry year events over the 20-year projection. For example, Table 5.3 displays that the total water supply available for a single dry year is 101% of an average year; thus, 101% of the projected water supply total values for a normal year presented in Table 5.2 equates to the projected water supply total for a single dry year. Table 5.4 displays the total projected water supply for a normal year, single dry year, and multiple dry year event.

Table 5.4: Projected Water Supplies – Normal Year, Single Dry Year and Multiple Dry Year Event

Normal Year Supply Totals		2020	2025	2030	2035
<i>(From Table 5.2)</i>		2,578	2,587	2,587	2,587
Single Dry Year Supply Totals		2,604	2,612	2,612	2,612
Multiple Dry Year	First Year Supply Totals	2,604	2,612	2,612	2,612
Multiple Dry Year	Second Year Supply Totals	2,501	2,509	2,509	2,509
Multiple Dry Year	Third Year Supply Totals	2,449	2,457	2,457	2,457

Note: Units are in million gallons (MG).

SECTION 5.3: ACTUAL AND PROJECTED WATER DEMAND FOR NORMAL YEAR

The actual potable and raw water demands by sector for 2015 are presented in Table 5.5 on the following page, which were extracted from the City’s 2015 UWMP. It should be noted that these actual potable and raw demands do not include the Paramount facility’s proposed project water demand as these are actual values from 2015. However, it does include water used at the facility in 2015 (see Table 1.2)

Table 5.5: Demands for Potable and Raw Water - Actual

2015 Actual			
Use Type	Additional Description	Level of Treatment When Delivered	Volume (MG)
Single Family	Single family detached dwellings	Drinking Water	554
Multi-Family	Duplexes, town homes, condominiums, apartments, and trailer parks	Drinking Water	649
Commercial	Commercial, Institutional, and Governmental: hotels, schools, prisons, hospitals, nursing homes, dormitories, retail establishments, office buildings, gas stations, etc.	Drinking Water	211
Industrial	Industrial parks, manufacturing, warehouses, utilities, assemblers	Drinking Water	190
Landscape	Play fields, golf courses, roadways, median strips, cemeteries, parks, and other dedicated landscape	Drinking Water	220
Agricultural irrigation	Irrigation of commercially grown crops and other dedicated agricultural connections	Drinking Water	1
Losses	Distribution System Losses (from AWWA Water System Audit Worksheets)	Drinking Water	225
Other	Unbilled/Unmetered Water Use (from AWWA Water System Audit Worksheets)	Drinking Water	26
Other	Fire	Drinking Water	7
TOTAL			2,084

The Paramount Facility has an estimated total daily requirement of 2,237,760 gallons of water (~2.24 million gallons per day (MGD) or 1554 gallons per minute (gpm)), which translates to ~817 MG over the course of the year, to account for the existing facility operations as well as the water demand associated with the renewable fuels project. This value represents the total water

demand that Paramount Facility will require from the City. It was noted that in 2011, the Paramount facility had a total daily water demand of 542,654 gallons (377 gpm) and overall water use has varied between 542,654 gpd and 54,000 gpd since 2011. In 2016, the Paramount facility changed operation to smaller renewable fuels with a daily water demand of 138,200 to 161,400 gpd. Table 5.6 illustrates the project potable and raw water demands are projected through 2035.

The original values for Table 5.6 are presented in the City's 2015 UWMP Table 4.1.5 – the industrial line item in Table 5.6 has been modified from the table's previous version because the table uses 2014 water demands, a year when the Paramount facility was inactive. To account for the facility's normal demands (which are separate from the proposed expansion) an additional 133 MG was added to the industrial water use section to account for the Paramount facility's normal demands each year. According to the City's 2015 UWMP, the future estimations of water use (by sector) are extrapolated based on the current (2015) values, anticipated population growth, and the Interim (2015) and Final (2020) Target Water Use Reduction Goals.

Table 5.6: Demands for Potable and Raw Water - Projected

Use Type	Additional Description	Projected Water Use			
		2020	2025	2030	2035
Single Family	-	633	647	661	676
Multi-Family	-	742	759	776	792
Commercial	Commercial and Institutional users aggregated into this category.	242	247	253	258
Industrial	Includes a constant additional water demand of up to 133 MG for Paramount facility since the facility was inactive during 2014 when water demand values for the UWMP were taken	350	355	360	365
Landscape	-	252	257	263	269
Agricultural Irrigation	-	8	9	9	9
Losses	Distribution System Losses (per AWWA Water Audit worksheets)	257	263	269	274
Other	Firefighting	1	1	1	1
TOTAL		2,485	2,538	2,592	2,644

Notes: Units are in million gallons (MG).

In addition to potable and raw water demands, there is also recycled/reclaimed water demand. The project is expected to result in an increase in recycled/reclaimed water demand of 1,695,106 to 2,183,976 gpd or about 619 to 797 MG per year that Paramount facility requires from the City via CBMWD. The water demand from the Paramount facility is expected to be consistent and will not fluctuate over the years. As such, this added amount of water demand has been accounted for in the projected recycled water demand table presented in Table 5.7(beginning in 2020)which was extracted from the City's 2015 UWMP Table 6.5.4.

Table 5.7: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

Name of Agency Producing (Treating) the Recycled Water:		Los Angeles County Sanitation District (LACSD)					
Name of Agency Operating the Recycled Water Distribution System:		CBMWD					
Supplemental Water Added in 2015		0					
Source of 2015 Supplemental Water		N/A					
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035
Agricultural irrigation	Produce	Tertiary	1	1	1	1	1
Landscape irrigation (excludes golf courses)	Parks, schools, athletic fields, nurseries, medians, etc.	Tertiary	98	98	107	107	107
Golf course irrigation	Golf course irrigation.	Tertiary	9	9	9	9	9
Commercial use							
Industrial use	Includes a constant additional water demand of 797 MG for Paramount facility/ project year	Tertiary	3	800	800	800	800
Total:			111	908	917	917	917

Note: Units are in million gallons (MG).

The total water demands from 2015 and projected water demands through 2035 for the City are summarized in Table 5.8.

Table 5.8: Total Water Demands

	2015	2020	2025	2030	2035
Potable and Raw Water <i>From Tables 5.5 and 5.6</i>	2,084	2,485	2,538	2,592	2,644
Recycled Water Demand <i>From Table 5.7</i>	111	908	917	917	917
TOTAL WATER DEMAND	2,195	3,393	3,455	3,509	3,516

Note: Units are in million gallons (MG).

SECTION 5.4: PROJECTED WATER DEMAND FOR SINGLE DRY AND MULTIPLE DRY WATER YEARS

Table 5.8 provides an outline for the actual and projected water demand for a normal year. However, as outlined in the Water Code, the total projected water demand during normal, single dry, and multiple dry water years during a 20-year projection must also be evaluated. As identified in the City’s 2015 UWMP, during a single dry year scenario, demand may increase by approximately 0.2% over a normal year. During a multiple dry year, it was identified that the average demand may increase by 0.6% from the last dry year. The Paramount facility conversion project water demand was assumed to remain constant over the years; thus, the additional 390 MG of water demand for the Paramount facility project was not factored into 0.2% or 0.6% increase in demand and instead was a constant value added to each year’s water demand total value. Table 5.9 provides the projected water demand for a normal year, single dry year, and multiple dry year event.

Table 5.9: Projected Water Demand – Normal Year, Single Dry Year and Multiple Dry Year Event

Normal Year Demand Totals		2020	2025	2030	2035
<i>(From Table 5.8)</i>		3,393	3,455	3,509	3,516
Single Dry Year Demand Totals		3,400	3,462	3,516	3,568
Multiple Dry Year	First Year Demand Totals	3,400	3,462	3,516	3,568
Multiple Dry Year	Second Year Demand Totals	3416	3478	3532	3585
Multiple Dry Year	Third Year Demand Totals	3432	3494	3548	3602

Note: Units are in million gallons (MG).

SECTION 5.5: WATER DEMAND AND SUPPLY COMPARISON

Tables 5.10 through 5.12 compare the total supply and demand as identified in Tables 5.4 and 5.9 for normal, single dry, and multiple dry years. It can be seen that the total supply available to the City, as estimated based on groundwater pumping and as provided in the CBMWD and MWD 2015 UWMPs, is less than the total demand for all projected years.

Table 5.10: Supply and Demand Comparison – Normal Year

	2020	2025	2030	2035
Supply Totals	2,578	2,587	2,587	2,587
Demand Totals	3,393	3,455	3,509	3,516
Difference	-815	-868	-922	-929

Note: Units are in million gallons (MG).

Table 5.10 displays that during all projected normal years, the City’s supply totals will not meet the new projected demand totals when accounting for Paramount facility’s additional water demand.

Table 5.11: Supply and Demand Comparison — Single Dry Year

	2020	2025	2030	2035
Supply Totals	2,604	2,612	2,612	2,612
Demand Totals	3,400	3,462	3,516	3,568
Difference	-796	-850	-904	-956

Note: Units are in million gallons (MG).

Table 5.11 also displays that during all projected single dry years, the City's supply totals will not meet the new projected demand totals when accounting for Paramount facility's additional water demand. Although the difference between supply and demand totals is slightly less for a single dry year as compared to a normal year, overall there is a sufficient deficit in which the City is not able to meet the projected demand which has arisen from Paramount facility's conversion project.

Table 5.12: Supply and Demand Comparison — Multiple Dry-Year Events

		2020	2025	2030	2035
Multiple-dry year first year supply	Supply Totals	2,604	2,612	2,612	2,612
	Demand Totals	3,400	3,462	3,516	3,568
	Difference	-796	-850	-904	-956
Multiple-dry year second year supply	Supply Totals	2,501	2,509	2,509	2,509
	Demand Totals	3416	3478	3532	3585
	Difference	-915	-969	-1023	-976
Multiple-dry year third year supply	Supply Totals	2,449	2,457	2,457	2,457
	Demand Totals	3432	3494	3548	3602
	Difference	-983	-1037	-1091	-1145

Notes: Units are in million gallons (MG).

Table 5.12 yet again displays that during all projected multiple dry year events, the City's supply totals will not meet the new projected demand totals when accounting for Paramount facility's additional water demand. For each consecutive dry year, the deficit between the supply and demand increases.

SECTION 5.6: WATER SUPPLY SUFFICIENCY ANALYSIS – GROUNDWATER SUPPLY

Wat. Code § 10910(d)(2)(f)(5): An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand and associated with the proposed project. A water supply assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand and associated with the project was addressed in the description and analysis required by subparagraph (D) of paragraph (4) of subdivision (b) of Section 10631.

As demonstrated through Tables 5.10 through 5.12, it is observed that the total water supply is insufficient to meet the total water demands, which includes the Paramount facility conversion project's new projected water demand. The total water supply accounts for groundwater supplied from the Central Basin, as displayed in Table 5.2. Thus, the current allotment for groundwater pumping rights from the Central Basin is also considered insufficient to meet the total water demand, as demonstrated via the difference/deficiency values identified Tables 5.10 through 5.12.

Section 6: Potential Additional Water Sources

The following sections provide a few suggestions for potential water sources to assist the City and World energy meet project water demands. None of the methods listed below are straightforward solutions meeting the full needs of the Paramount facility. However, these suggestions provide a framework for future efforts to determine a final solution to obtain the water needed to meet increased demands.

SECTION 6.1: WATER RIGHTS LEASES

Central Basin groundwater is shared between multiple agencies. The adjudication of 1965 stipulates how much water each agency can pump to prevent over pumping and maintain the water table. Often, agencies' demands are less than their allotted pumping rights. In this event, that agency has the option to lease the unused portion of their allowable water rights to another agency. Generally, water purchased through a lease agreement is more economic than imported water so it can be a cost-effective solution for increasing water supply. However, leased water rights are provided on a term agreement. Once the term is complete, the leasing agency is under no obligation to continue to renew the lease. The City should consider a scenario where water rights are not available for lease perhaps due to a prolonged drought or increased demand for the leasing agency due to population or industrial growth. Without another alternative, the City may have to consider increased imported water to meet the Paramount facility demand at an increased cost to the City and the facility. That said, it is assumed water leases will be readily available during normal water years based on history in the region. The City and World Energy should consider utilizing water rights leases and making up any additional demand through additional imported water and other additional sources.

SECTION 6.2: ADDITIONAL IMPORTED WATER

As mentioned above, the City received imported water from the SWP via MWD and CBMWD. Based on projection from MWD and CBMWD in their 2015 UWMPs, it is likely sufficient water will be available to meet the Paramount facility's demands. However, the facility and the City will need to anticipate higher premiums than with leased water rights. Although actual costs will need to be assessed, the following table projects imported water costs based on rough estimates of existing water prices and standard premium increases. None of the values in the following table reflect actual prices provided by suppliers. Also, please note these values represent estimated costs to the City. Additional costs may apply for distribution. These values are for planning purposes only.

Table 6.1: Projected Imported Water Costs

Wholesaler	2020	2025	2030	2035
Metropolitan	\$3,990	\$5,863	\$8,614	12,657
CBMWD	\$583	\$700	\$840	\$1,007
Total Cost	\$4,573	\$6,563	\$9,454	\$13,664

Note: Costs are per one million gallons. Original estimated values were provided in acre-feet. Conversions were calculated and then rounded to the nearest whole dollar.

Note: MWD imported water costs were estimated at \$1300/AF. An estimated annual increase of 8% was applied.

Note: CBMWD costs for distribution have varied greatly over the past five years. A stark increase in recent made future estimated increase at a rate that is unlikely to occur. Instead, a 20% increase was applied at each 5-year increment. These estimates are for planning purposes only

Note: Costs were based on rough estimates provided by the City based on experience. None of the data is provided through any agreement with the City and does not constitute any actual, viable costs. The values are for planning purposes only.

The values above represent the worst-case scenario for the Paramount facility. Of the options available to World Energy, imported water represents the highest cost. However, cost can be reduced by incorporating other, less-stable additional water sources.

SECTION 6.3: RECYCLED WATER – CBMWD

In 2008, CBMWD introduced a Recycled Water Master Plan which identified areas for expansion of the entire CBMWD recycled water system. In total, the plan identified an additional 1,807 MG (55,479 AFY) of potential for recycled water use within the service areas of the CBMWD, SGVMWD, and USGVMWD. Of this potential additional use, 1,147 AFY was identified as demand that could be supplied through the City’s recycled water system. Since that time, the program has been implemented and the recycled water system expanded. However, based on feedback from the City, newer developments have been built which have utilized the expanded recycled water. In order for the Paramount facility to explore recycled water as a potential water source, discussions must be had with CBMWD to determine whether recycled water is a viable source for the Paramount facility.

SECTION 6.4: RAINWATER

According to the City’s 2013 Hazard Mitigation Plan, the City receives roughly 7 inches of rainwater annually. World Energy could consider implementing a rainwater collection system which may offset water demands assuming the facility has the capacity to treat collected rainwater to usable levels. World Energy could consider utilizing roof space as well as parking lot areas to maximize collection.

Given the scope of this assessment, it was not possible to fully research the viability of rainwater collection. Although it would only offset project water demands, since rainwater is a sustainable source it might be beneficial for public relations. In addition, there may be grant funding available for construction through a State program seeking to encourage more environmentally friendly operations. To demonstrate the potential viability, the following table projects the potential for rainwater collection.

Table 6.2: Rainwater Collection Estimated Potential

Facility Acreage	63 acres
Estimated percentage of usable area	25% (15.75 acres)
Rainwater Collections (7inchesX15.75acres)	~11 AF/~3.6 MG
Estimated Value of Collected Rainwater (Based on Table 6.1 2020 Water Costs)	\$16,463

SECTION 6.5: RECYCLED WATER – METROPOLITAN WATER DISTRICT

During the development of this assessment, the MWD Regional Recycled Water Program (RRWP) was considered as a potential to bring more water into the City and to the Paramount facility. The RRWP is a joint venture between MWD and the Sanitation District of Los Angeles County which seeks to purify wastewater to usable levels. It is estimated, a full-scale recycled water program would produce up to 150 million gallons daily. Purified water would be delivered to groundwater basins throughout Los Angeles County; include the Central Basin which serves the City.

Although the program would send additional water into the Central Basin and initially appears to a potential solution for meeting water demands, there are several factors that will likely prevent water availability. The Central Basin adjudication agreement still limits the amount of groundwater the City can pump. Currently, the City is already pumping the full amount of its allotted water right. So, any additional water would still need to be purchased through leased water rights.

Additionally, the adjudication agreement allows local agencies to store a certain percentage the allotted water amount as reserves. That percentage has increased over the years and is currently

set at 60%. It is possible that, even with the basin recharge, some agencies may elect to hold their increased reserves rather than release the water through leases.

SECTION 6.6: LOCAL WATER FEATURES

The Assessment team considered utilizing run-off from the Whittier-Narrows dam or collections from the Los Angeles River. From a logistics perspective, obtaining water from either of these sources would require a high level of coordination and approvals from critical stakeholders. The scope of this assessment did not allow research into the viability of either of these local water features as potential sources. Additionally, it should be understood, water for the Los Angeles River would require a high level of treatment prior to use. However, these avenues may have public relations benefits as sustainable sources as well as making use of water that might otherwise be directed to the ocean.

SECTION 6.7 A COMBINED SOLUTION

World Energy and the City should consider a combined approach to meeting water demands. For instance, the facility could rely on leasing rights for the bulk of the water demand, the remainder could be met with imported water. At the same time, the facility could maximize efficiency to reuse process water while considering rainwater or run-off from Whittier-Narrows to further reduce the demands on traditional water sources. While imported water may be the most reliable source, utilizing several of these dynamic sources may help to reduce costs, while managing the overall burden to import additional water supplies.

Section 7: City of Paramount Capital Outlay Program

Wat. Code § 10910(d)(2)

(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

Wat. Code § 10910(d)(2)(g)

(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

(2) Prior to the expiration of the 90-day period, if the public water system intends to request an extension of time to prepare and adopt the assessment, the public water system shall meet with the city or county to request an extension of time, which shall not exceed 30 days, to prepare and adopt the assessment.

Wat Code § 10911(a): If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are

being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:

- (1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.*
- (2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.*
- (3) Based on the considerations set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to be able to acquire additional water supplies.*

b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.

c) The city or county may include in any environmental document an evaluation of any information included in that environmental document provided pursuant to subdivision (b). The city or county shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses. If the city or county determines that water supplies will not be sufficient, the city or county shall include that determination in its findings for the project.

APPENDIX A:
CAPITAL OUTLAY PROGRAM

APPENDIX B:
CENTRAL BASIN ADJUDICATION