

## Section 4 – Integrated Review of Water Supply Plans

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The objectives of the work described herein are to produce future groundwater production projections and associated replenishment requirements for the Chino Basin parties that use the Chino Basin for all or part of their water supply and to estimate the effective replenishment capacity of the Chino Basin based on the installed wet recharge capacity and other factors that influence the availability of recharge basins and replenishment waters. In the OBMP planning that was conducted in the late 1990s and in the Peace Agreement, which was approved in 2000, it was assumed that the Chino Basin Watermaster (Watermaster) would construct (through the parties and others) recharge capacity to meet all of its replenishment needs through “wet” water recharge. The information presented in this memorandum will be used to develop estimates of the required wet water replenishment capacity for the 2010 Recharge Master Plan Update. The first step in this process is to develop projected water demand and supply plans for each party. These water demands include aggregated demands as well as individual draws on the various water supplies available to the parties. The annual replenishment requirement is estimated from aggregated Chino Basin production projections, the production rights contained in the Chino Basin Judgment, and amendments thereto.

### **4.1 Initial Water Supply Plans for All Entities That Use the Chino Basin**

Several municipal and private water purveyors and private users in the Chino Basin area depend in part or completely on Chino Basin groundwater. Figure 4-1 shows the service areas of Chino Basin area water purveyors. The IEUA consulted with the major water service purveyors and, in 2008, developed a basin wide water demand and supply plan for all municipal water purveyors that produce Chino Basin groundwater (IEUA, 2008a).. The IEUA-developed water supply plans and groundwater production plan were vetted through the Watermaster process during the summer of 2008 and accepted by the appropriators in September 2008. Watermaster developed similar projections for smaller groundwater producers. These projections were used by the IEUA in the environmental documentation for the proposed Dry Year Yield program expansion and the environmental documentation for the Peace II Agreement. The table below contains the aggregate water demand and supply projection prepared by the IEUA and Watermaster.

**Macro Water Demand and Supply Plan for the Chino Basin**  
(acre-ft/yr)

Water Sources	2009-10	2014-15	2019-20	2024-25	2029-30
Chino Basin Groundwater	177,567	182,937	192,520	208,190	220,840
Non Chino Groundwater	33,200	33,200	33,200	33,200	33,200
Local Surface Water	16,918	16,490	16,990	17,990	17,990
Imported Water from Metropolitan	84,578	83,449	84,449	84,449	84,449
Recycled Water for Direct Reuse	18,800	33,870	34,520	34,570	34,570
<b>Total Demand</b>	<b>331,063</b>	<b>349,946</b>	<b>361,679</b>	<b>378,399</b>	<b>391,049</b>

Source: 2008 IEUA Water Supply Plan (attached as Appendix A) for large agencies and the 2009 *Production Optimization and Evaluation of the Peace II Project Description* (WEI, 2009) for small agencies, small water companies and private well owners

The total water demand grows at a compounded rate of just less than one percent per year. With the exception of Chino Basin groundwater production and recycled water, the supply sources—non Chino Basin groundwater, local surface water and imported water from Metropolitan for direct use—were assumed to be constant over the planning period. Chino Basin groundwater production increases about 43,000 acre-ft/yr over the planning period, resulting in a total increase of about 25 percent or a compounded rate of increase of about one percent per year. Recycled water for direct reuse increases by about 15,000 acre-ft/yr during the early part of the planning period and then levels off after 2020, resulting in a total increase of about 84 percent.

## 4.2 Chino Basin Groundwater Production and Replenishment for the Initial Water Supply Plans

A groundwater production projection for the Chino Basin was extracted from these water supply plans. Table 4-1 shows projected groundwater production, and Figure 4-2a shows the aggregate projected groundwater production in the Chino Basin over the planning period. The water supply agencies' water supply plans include existing and planned wells, planned groundwater treatment facilities, existing desalters, and the planned expansion of the Chino Basin desalters. Figure 4-3 shows the location of existing and planned production wells in the Chino Basin. Groundwater production projections for the overlying agricultural pool are based on recent Watermaster projections (WEI, 2008b). Agricultural production is projected to be about 21,000 acre-ft/yr in 2010, to decline to about 5,000 acre-ft/yr by 2020, and remain at about 5,000 acre-ft/yr thereafter. Overlying non-agricultural pool production is estimated to remain constant over the planning period at about 3,150 acre-ft/yr. The total production of the appropriators averages about 183,000 acre-ft/yr and ranges from a low of about 153,000 acre-ft/yr to a high of about 210,000 acre-ft/yr. Total production for the Chino Basin averages about 196,000 acre-ft/yr during the period and ranges from a low of about 178,000 acre-ft/yr to a high of about 220,000 acre-ft/yr.

Watermaster recharges supplemental water into the Chino Basin pursuant to the Judgment and the 2000 Peace Agreement. Total annual replenishment is calculated based on projected

groundwater production, recharge facility capacity, and the following assumptions:

- The safe yield is 140,000 acre-ft/yr through 2010 and the 2007 Watermaster Model-calculated safe yield thereafter.
- The Judgment allows a 5,000 acre-ft/yr controlled overdraft of the Chino Basin through 2017.
- Recycled water recharge was assumed to occur pursuant to Watermaster and the IEUA's recharge permit (Order R8-2007-0039) as amended in October 2009 (Order R8-2009-0057) and as projected by the IEUA: 10,000 acre-ft/yr in 2010, 15,000 acre-ft/yr in 2020, and 24,000 acre-ft/yr in 2030.

Total production rights are about 155,000 acre-ft/yr in 2010 and vary between 150,000 acre-ft/yr to 155,000 acre-ft/yr through 2030. Watermaster's replenishment obligation was estimated using the following assumptions:

- Water in storage accounts as of fiscal year 2009-10 is not used to meet future replenishment obligations. This is a conservative assumption that reserves discretion regarding the use of this water to individual storing parties.
- On a go forward basis, under-producers will transfer un-pumped rights to over-producers each year; that is, there is an efficient market that moves unused production rights from under-producers to over-producers.

For this investigation, the average annual replenishment obligation was assumed to be equal to the greater of zero and the difference between actual production and production rights. Two fundamental replenishment scenarios are discussed herein: a Baseline replenishment scenario and the Peace II replenishment scenario. The Baseline scenario represents the expected replenishment projection without the Peace II Agreement. It is included herein because the CEQA process for the Peace II Agreement had not been completed at the time this report was prepared. The Peace II scenario represents the expected replenishment projection assuming that the Peace II Agreement is in effect. The replenishment obligation for the Baseline scenario is projected to be 34,000 in 2010 and about 67,000 acre-ft/yr by 2030. This assumes that under-producers will transfer un-pumped rights to over-producers each year; as previously stated, there is an efficient market that moves unexercised rights from under-producers to over-producers. This assumption tends to underestimate the replenishment obligation for some years. Though, over the long term, this assumption is valid because the appropriator parties cannot store unused production rights forever, and the demand for replenishment water will provide financial incentives for unused production rights to be sold to over-producers. Figures 4-2a and 4-2b show the projected groundwater production for the Baseline and Peace II scenarios, respectfully, as a stacked bar chart that consists of the production right and replenishment obligation for each year in the planning period. For the Baseline scenario, Figure 4-2a shows the production rights running fairly constant between 150,000 acre-ft/yr to 155,000 acre-ft/yr and an escalating replenishment obligation running from about 32,000 acre-ft/yr in 2009 to about 67,000 acre-ft/yr in 2030. For the Peace II scenario, Figure 4-2b shows the production rights approximately equal to production through 2012 and running fairly constant between 161,000 acre-ft/yr to 167,000 acre-ft/yr thereafter and an escalating replenishment obligation running from about 16,000 acre-ft/yr in 2013 to about 57,000 acre-ft/yr in 2030.

The IEUA has stated that certain factors in its 2008 water demand and supply projections may reduce future water demands. These factors, updated to 2010, include:

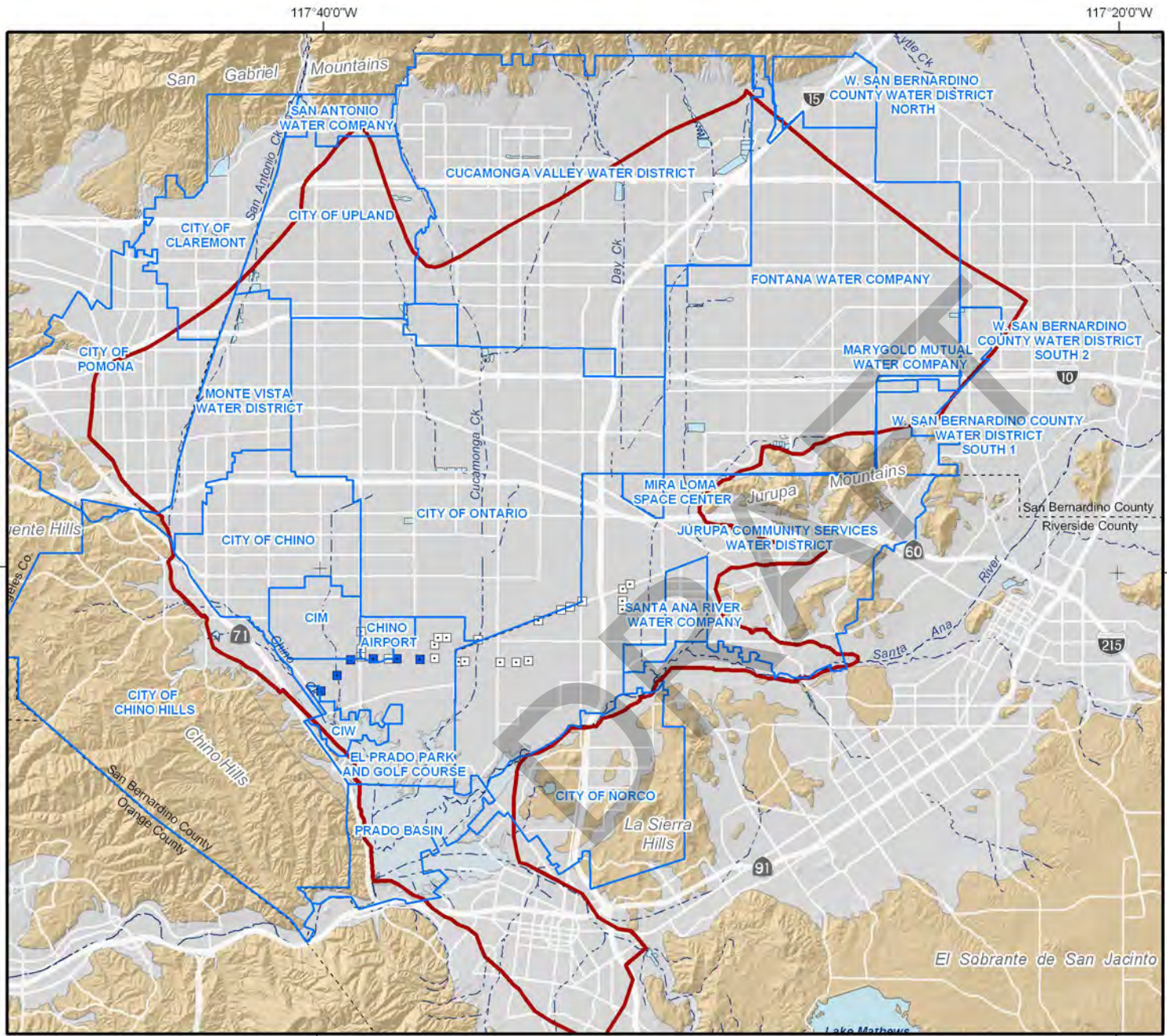
- The continued slowdown of the housing market, which will delay increases in water demand and, thus, the need for additional water supplies;
- Enhanced regional conservation efforts and programs in response to continued statewide dry conditions and environmental restrictions on delta pumping; and
- The SB-7 requirement for a statewide 10-percent reduction in water use by 2015 and a 20-percent reduction by 2020.

The water demands projected by the IEUA and Watermaster may be higher than actually will occur. Reductions in water demand from conservation generally reduce the use of the most expensive water supply(s) available to a water purveyor, which is typically imported water that is served for municipal and industrial uses. Thus, it's possible that even with new conservation efforts, the replenishment projections used herein are representative of future conditions. The recharge master plan uses the Baseline and Peace II scenarios and parametrically adjusted versions of these projections to allow the Watermaster and the water purveyors to consider different recharge alternatives and investment strategies, as discussed further in Sections 8 and 9 of this report.

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**Table 4-1**  
**Projected Groundwater Production for the Chino Basin**  
(acre-ft/yr)

Producer	Production Projection				
	2009/10	2014/15	2019/20	2024/25	2029/30
<b>Overlying Agricultural Pool</b>					
Combined total Agricultural Pool Production	21,492	13,251	5,010	5,010	5,010
<b>Overlying Non-Agricultural Pool</b>					
San Bernardino Cty (Chino Airport)	0	0	0	0	0
Ameron Inc	0	0	0	0	0
California Steel Industries Inc	1,284	1,284	1,284	1,284	1,284
Swan Lake Mobile Home Park	0	0	0	0	0
Vulcan Materials Company	5	5	5	5	5
Space Center Mira Loma Inc.	0	0	0	0	0
Angelica Textile Service	29	29	29	29	29
Sunkist Growers Inc	147	147	147	147	147
Praxair Inc	0	0	0	0	0
General Electric Company	451	451	451	451	451
California Speedway	621	621	621	621	621
Reliant Energy Etiwanda	705	705	705	705	705
<i>Subtotal Overlying Non-Agricultural Pool Production</i>	<i>3,241</i>	<i>3,241</i>	<i>3,241</i>	<i>3,241</i>	<i>3,241</i>
<b>Appropriative Pool</b>					
Arrowhead Mountain Spring Water Company	263	0	0	0	0
Chino Desalter Authority	26,356	39,400	39,400	39,400	39,400
City of Chino	9,971	10,844	11,811	14,900	14,900
City of Chino Hills	4,823	4,823	4,823	4,823	4,823
City of Norco	0	0	0	0	0
City of Ontario	28,796	27,211	32,360	37,508	42,658
City of Pomona	13,000	13,000	13,000	13,000	13,000
City of Upland	1,284	2,140	2,140	2,140	2,140
Cucamonga Valley Water District	16,598	21,229	26,729	32,229	37,729
Fontana Union Water Company	0	0	0	0	0
Fontana Water Company	13,500	10,000	11,000	11,500	12,000
Jurupa Community Services District	20,087	18,123	21,616	21,616	21,616
Inland Empire Utilities Agency	0	0	0	0	0
Marygold Mutual Water Company	0	0	0	0	0
Metropolitan Water District of Southern California	0	0	0	0	0
Monte Vista Irrigation Company	0	0	0	0	0
Monte Vista Water District	16,000	17,000	18,500	20,000	21,500
Mutual Water Company of Glen Avon Heights	0	0	0	0	0
Niagara	657	795	838	770	770
San Antonio Water Company	894	1,149	1,282	1,282	1,282
San Bernardino County (Olympic Facility)	13	16	17	17	17
Santa Ana River Water Company	263	318	335	335	335
Golden State Water Company	329	397	419	419	419
West End Consolidated Water Company	0	0	0	0	0
West Valley Water District	0	0	0	0	0
<i>Subtotal Appropriators</i>	<i>152,834</i>	<i>166,445</i>	<i>184,269</i>	<i>199,939</i>	<i>212,589</i>
<b>Total Production</b>	<b>177,567</b>	<b>182,937</b>	<b>192,520</b>	<b>208,190</b>	<b>220,840</b>

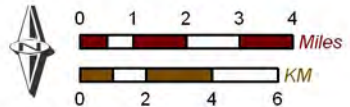


- Main Features**
- Water Service Area Boundaries
- Geology**
- Water-Bearing Sediments**
- Quaternary Alluvium
- Consolidated Bedrock**
- Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks
- Faults**
- Location Certain
  - Location Approximate
  - Location Concealed
  - Location Uncertain
  - Approximate Location of Groundwater Barrier
- Other Features**
- Existing Chino Desalter Well
  - Proposed Chino Desalter Well
  - Groundwater Flow Model Boundary
  - Flood Control/Conservation Basins
  - Streams, Rivers, and Channels

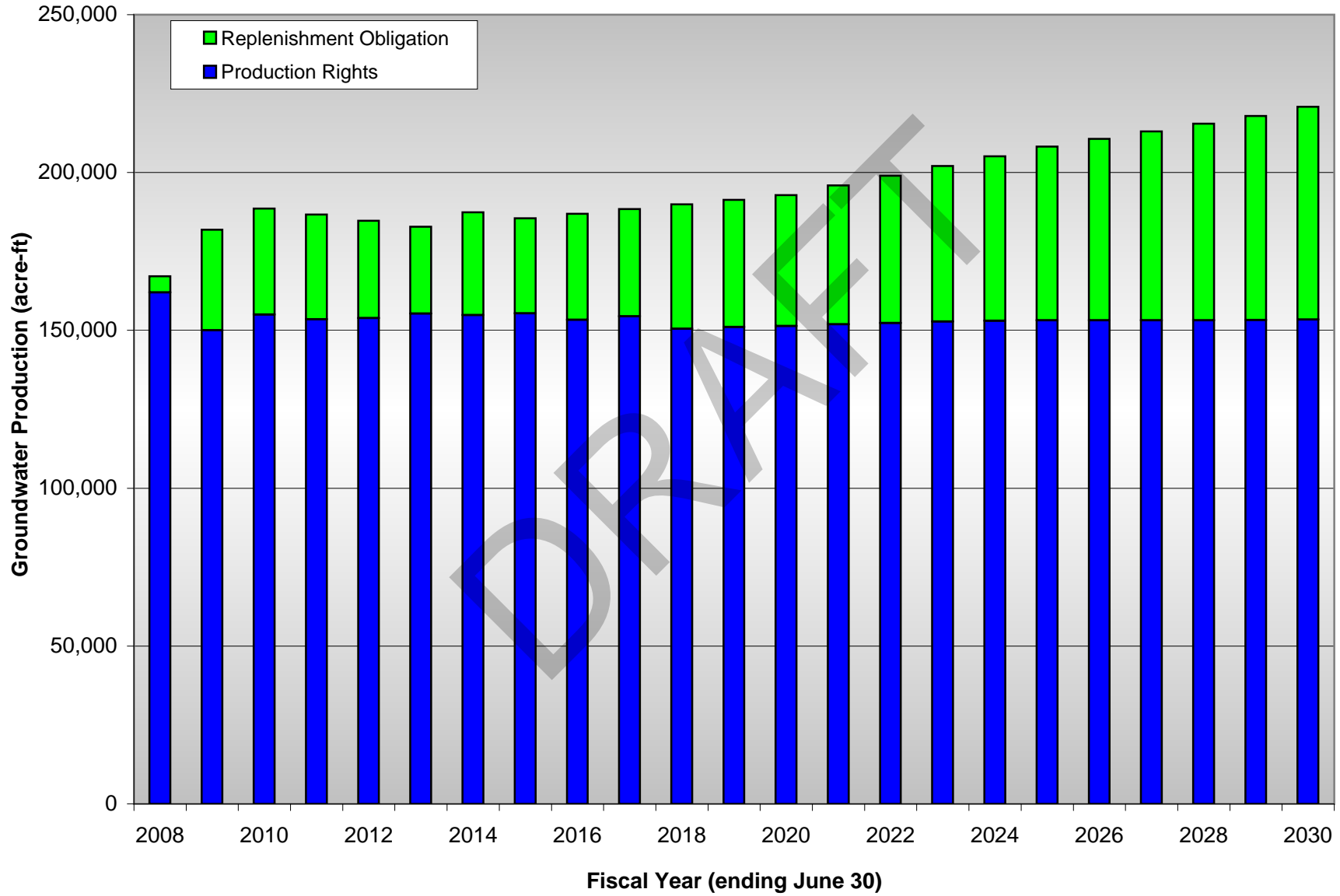


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**Figure 4-2a**  
**Projected Groundwater Production in the Chino Basin for the Baseline Scenario**



**Figure 4-2b**  
**Projected Groundwater Production in the Chino Basin for the Peace II Scenario**

