

Attachment 2. Drought Impacts

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Attachment 2. Drought Impacts

Attachment 2 consists of two sub-sections: Drought Impacts and Water Conservation Measures.

Drought Impacts – the 2014 Drought in the Imperial Region and a 14-year drought in its source watershed (Colorado River) have caused the region to encounter two major impacts in 2014, as follows:

- Not meeting existing agricultural water demands (ensuring urban demands are met)
- At risk of not meeting ecosystem water demands

Impacts to not meeting agricultural water demand will not continue into 2015 (for reasons described below) but those to the ecosystem will if drought conditions continue into 2015.

Water Conservation Measures – the Region is experiencing mandatory restrictions and has implemented conservation measures in 2014 as a result of the 14-year drought on the Colorado River.

These are described below.

2.1 REGIONAL DROUGHT IMPACTS

The Imperial Region urban water providers and local agriculture, located entirely within California's Colorado Hydrologic Region (**Figure 2-1**), are both overwhelmingly dependent on the Imperial Irrigation District (IID) Colorado River water rights and local rainfall. Only the community of Ocotillo, population of around 200, has an alternate water source.

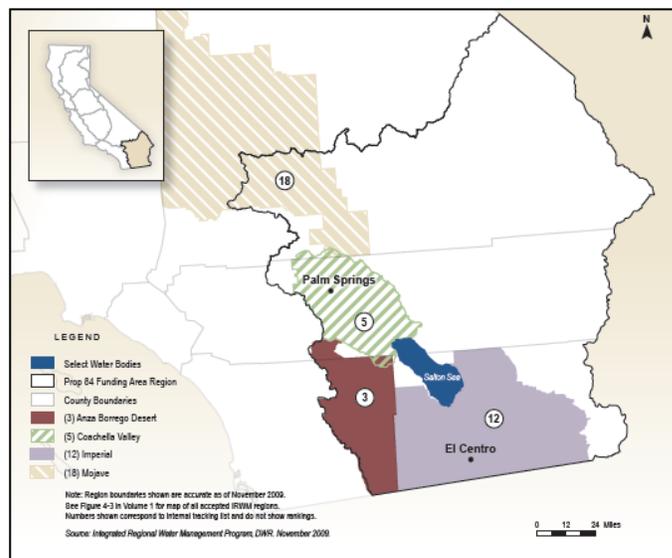


Figure 2-1. Colorado River Hydrologic Region and IRWM Regions

Source: 2012 Imperial IRWM Plan, p 2-12 (Exhibit 2.1)

2.1.1 Colorado River Drought

The Imperial Region has no direct ties to or reliance on the State Water Project, Central Valley Project, groundwater transfers, or other California water supplies. However, under the terms of the *2003 Colorado River*

Water Delivery Agreement (CRWDA), the Region is the source of the largest agricultural to urban water transfer in history.¹ Along with IID, the CRWDA is signed by the Secretary of the Interior, by Coachella Valley Water District (CVWD) in the Colorado River Hydrologic Region, and by Metropolitan Water District of Southern California (MWD) and San Diego County Water Authority (SDCWA) in the South Coast Hydrologic Region, all of which are users of State Water Project water. These interconnections are shown in **Figure 2-2**.

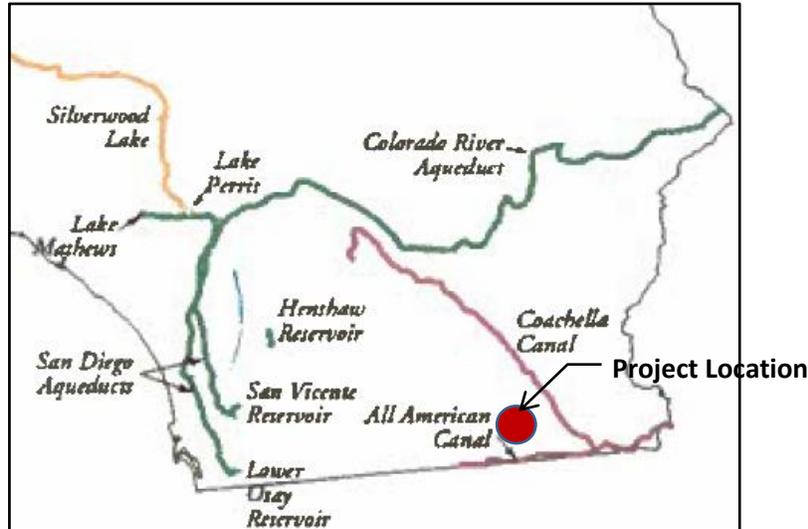


Figure 2-2. Southern California Colorado River and State Water Project Infrastructure and Project Location

Source: California Water Plan update Bulletin 160-98 (Exhibit 2.12)

While not directly impacted by California reservoir shortage conditions due to the 2014 California Drought, the Imperial Region is impacted by reservoir shortage conditions due to a **14-year drought in the Colorado River basin** that began in October 1999 and ended in 2010, but resumed in 2011. The multi-year drought has reduced storage in Lake Mead to 39 percent,² with water levels in Lake Mead falling more than 50 feet below its average elevation of 1,173 feet above mean sea level on Jan 1, 2013 (**Figure 2-3**). The reservoir was last full in 1998, at just under 1,296 feet; and Rose Davis, a bureau spokeswoman in Boulder City has stated that “the bureau expects a slight increase in water level to about 1,083 feet by Jan. 1, 2015”.³

2.1.2 Consequences of Record Low Lake Mead Water Levels

Under the CRWDA Inadvertent Overrun Policy Payback (IOPP), inadvertent overruns of diverted Colorado River water are permitted, and a contractor has between one and three years to pay back its obligation, depending on the elevation of Lake Mead, with a minimum annual payback equal to 20 percent of the entitlement holder’s maximum allowable cumulative overrun account or 33.3 percent of the total account balance, whichever is greater. When Lake Mead water level is 1,125 feet or less on January 1, the IOPP prohibits additional overruns and requires that overruns are to be paid back in the calendar year after that overrun is reported in the Lower Colorado River Decree Accounting Report rather than in three years as allowed under normal conditions.⁴ On January 1, 2013, due to the Colorado River basin drought, the water level in Lake Mead had fallen and put IID into extraordinary payback with no overruns allowed in 2013 or in 2014.⁵

¹ 2003 CRWDA: Federal QSA <<http://www.usbr.gov/lc/region/g4000/QSA/crwda.pdf>> (Exhibit 2.2)

² USBR. Lower Colorado River Supply Report. 7 Jul 2014. <<http://www.usbr.gov/lc/region/g4000/weekly.pdf>> (Exhibit 2.3)

³ Las Vegas Sun, Ken Ritter, 8 Jul 2014. “Water levels at Lake Mead drop to new low, officials say”
<<http://www.lasvegassun.com/news/2014/jul/08/water-levels-lake-mead-drop-new-low/>> (Exhibit 2.4)

⁴ 2003 ROD CRWDA IOPP. <http://www.usbr.gov/lc/region/g4000/crwda/crwda_rod.pdf>, p 18 -19, points 6-10 (Exhibit 2.5)

⁵ Lake Mead Daily Water Levels. <<http://graphs.water-data.com/lakemead/>> (Exhibit 2.6)

The impact is that IID cannot meet its agricultural water users' demands for 2014, ensuring urban demands are met, and instituted an extraordinary water conservation following program to payback nearly 155,000 AF of water to the Colorado River (see **Table 2-1**).

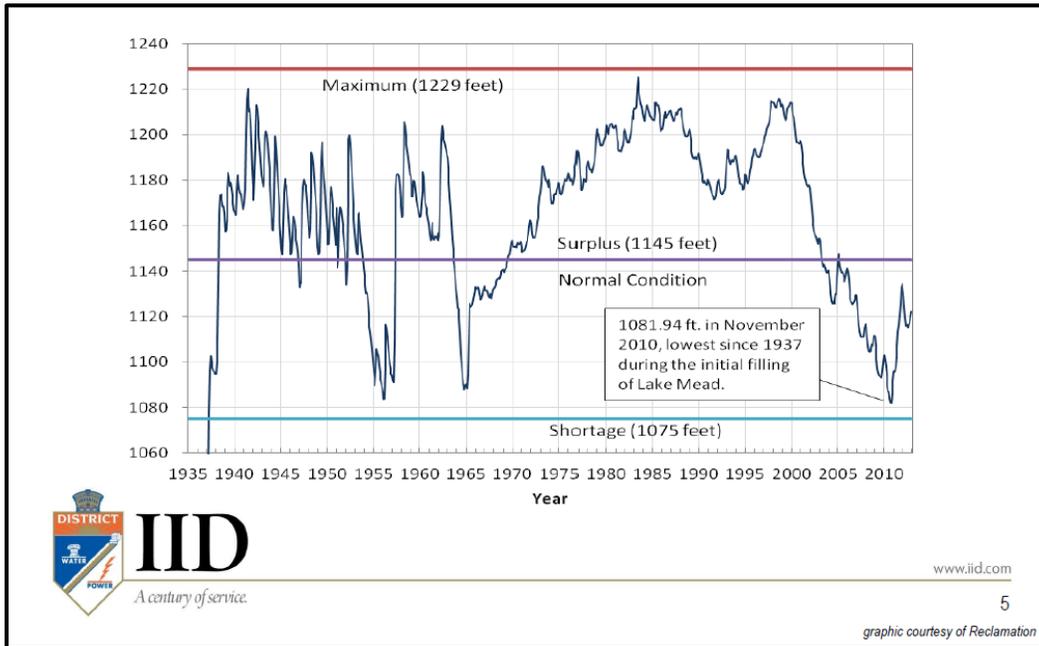


Figure 2-3. Lake Mead Elevation Levels

Source: For latest figure see: <http://www.arachnoid.com/NaturalResources/index.html> (Exhibit 2.7)

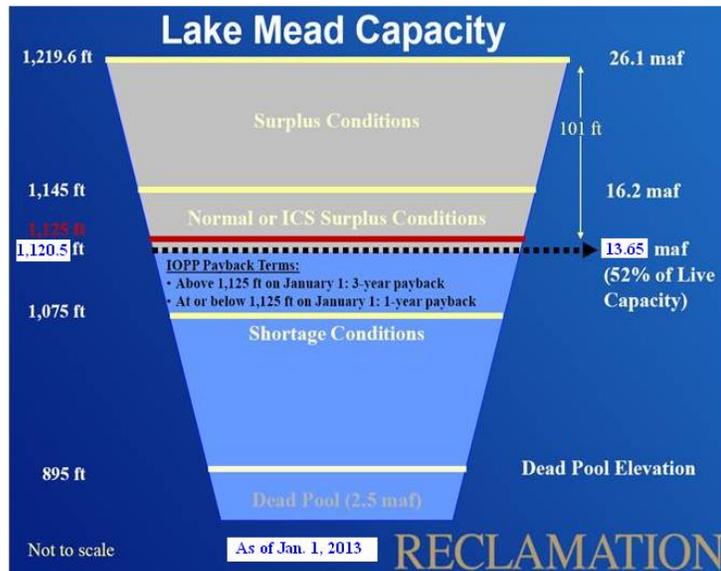


Figure 2-4. Lake Mead Capacity, January 1, 2013

Table 2-1. IID 2014 payback under the IOPP, consumptive use volumes in AF at Imperial Dam

2011 Payback due in 2014	2012 Payback due in 2014	Payback Total for 2014
20,662	134,292	154,954

Source: IID, July 2014 (Exhibit 2.13)

2.1.3 Changed Climate Conditions in California and Colorado Hydrologic Regions

As with the rest of the state, the Imperial Region is in a severe drought condition, with only a trace of rainfall measured in 2014. On average, rainfall in the Imperial Region is 3 inches/year, which translates to around 50,000 acre-feet of net consumptive use (evapotranspiration), which is not available in a drought year and cannot be made up for with Colorado River water when the river is in a shortage condition (as described above).⁶ By optimizing the beneficial use of Colorado River water within the Colorado River and South Coast Hydrologic Regions, the State can boost water system resiliency during the existing drought conditions in California and the extended drought in the Colorado River basin, and assist the Imperial Region to be prepared for future changed climate conditions in either the California Central Valley and/or the Colorado River watersheds.

2.1.4 Drought Impacts to the Ecosystem⁷

The California Drought also impacts the Salton Sea, which receives most of its inflow as discharge from the Region, a critical habitat area for migratory birds in the Pacific Flyway and an important fishery, serving as a food source for the birds. The Sonny Bono Salton Sea National Wildlife Refuge and the Imperial Wildlife Area and the Wister Unit, which are located in the Region, are also important habitat areas. The native and built wetlands on the shoreline of the sea provide habitat for eared grebes, white-faced Ibis, American white pelicans, Yuma clapper rail, black skimmers, double-breasted cormorants, and gull-billed terns, just a few of the species of birds that can be found during various times of the year.

The Salton Sea has no outlet to the Pacific Ocean or Gulf of California, and drainage of all surface water in its watershed flows to the sea. It has a surface area of 376 square miles and a shoreline of 105 miles. Although its physical characteristics have fluctuated over the years, the salinity has been steadily increasing since it was filled in 1905, and its elevation has been steadily declining since the early 2000s as inflow volumes have not kept pace with evaporation. Annual inflows have been decreasing as a result of changes in agricultural practices in the Imperial and Coachella valleys, reduced inflows from Mexico, and **dry to drought weather conditions**.

As part of the IID/SDCWA water transfer mitigation program, IID delivers water to the sea to make up for reductions in inflows from the transfer. Once the mitigation water delivery stops at the end of 2017, the rate of elevation decline and the rate of salinity concentration will increase. Salinity levels of the sea are a critical issue. The inflows from the different sources identified above contribute as much as 4.5 million tons of salts each year. In 2012, the level of salts was approximately 53 parts per thousand (ppt); the Pacific Ocean's concentration is 35 ppt. Recent salinity concentrations are slightly higher than normal because of the decrease in flows from Mexico and below-average precipitation. In 2018, the termination of the IID/SDCWA mitigation deliveries, as specified in the CRWDA, will exacerbate water surface elevations and salinity concentrations. Local fish and invertebrate species will be impacted by the higher levels of salinity, which would then impact migratory and shore-line birds.

Responses to the questions posed are as follows:

At risk of not meeting existing drinking water demands – N/A.

Not meeting existing agricultural water demands – The Imperial Region is one of the most productive farming areas in the United States, and the agricultural industry is the largest economic component of the

⁶ 2012 Imperial IRWMP, page 5-7 (Exhibit 2.1)

⁷ Salton Sea description direct quote from Public Review Draft California Water Plan Update 2013, Volume 2, Regional Reports, Chapter 11, Colorado River HR. pp CR-3 and CR-4. 9 Jul 2014, with additions from IID. <http://www.waterplan.water.ca.gov/docs/cwpu2013/2013-prd/Vol2_ColoradoRiver_RR_PRD_Final_fk_wo.pdf> (Exhibit 2.8)

Region’s economy, with nearly \$2 billion in production in 2011 and in 2012.⁸ IID imports raw water from the Colorado River and distributes it primarily for agricultural use (96 percent of total 2011 delivery),⁹ with a small portion dedicated to urban uses.

In 2014, IID IOPP payback of nearly 155,000 AF due to drought on the Colorado River is coming from extraordinary conservation agriculture following programs. In addition, to date in 2014, the Imperial Region has had only a trace of rainfall, which results in the shortage of another 50,000 AF – **for a total 2014 drought impact of over 205,000 AF**. To adapt to this shortage, growers and owners in the IID service area are in voluntary **fallowing programs affecting some 10 percent of the IID net irrigated acreage. These are not part of the CRWDA water transfer program.**

At risk of not meeting ecosystem water demands – Reduced rainfall amounts of up to 60,000 AF per year due to California drought conditions and changed climate over the Imperial Valley are contributing to the declining Salton Sea water surface levels and increased salinity concentrations, even as IID is making mitigation deliveries of 90,000 AF in 2014, 110,000 AF in 2015, 130,000 AF in 2015, and 150,000 AF in 2017. The permits and related environmental document require that the mitigation water ceases at the end of 2017. Once the mitigation water delivery stops reduced inflows will not only result in significant declines in water surface elevation; but, more importantly, salinity concentrations will increase at an accelerated rate rapidly rendering the lake water uninhabitable for the current wildlife populations.

Drinking water MCL violations – N/A.

Groundwater basin overdraft – N/A.

Discharge water TMDL violations – N/A.

Or other drought related adverse impacts – While the Colorado River watershed for 2014 benefited from a normal year snow-pack and rainfall in the midst of a 14-year record breaking drought, the 2014 annual release from Lake Powell into Lake Mead for use by the Lower Basin states and Mexico was reduced from 8.23 MAF to 7.48 AF for the first time ever. This is indicative of a system in decline that is no longer recovering from year-to-year water use as downstream demands have increased. The river is now known to be over-allocated for normal year hydrology, and very little carry-over storage remains in the reservoirs to meet these annual shortfalls in the absence of above average/wet hydrology.¹⁰ With the implementation of a 3.1 MAF annual water use cap in 2003, any year in which IID overuses this supply will require a subsequent year payback in which, the Imperial Region will experience a “water shortage” condition. In addition, once Lake Mead reaches elevation 1075 triggering a lower basin shortage (currently projected at more than a 50% likelihood in 2016), IID will not be allowed to exceed this annual 3.1 MAF entitlement (less water conservation obligations), potentially limiting is water users if demands exceed that year’s supply.¹¹

⁸ Imperial County Agricultural Commissioner Imperial County Agricultural Crop and Livestock Report. 22 Oct 2013.
http://www.co.imperial.ca.us/ag/crop_&_livestock_reports/Crop_&_Livestock_Report_2012_Low_Res.pdf (Exhibit 2.9)

⁹ 2012 Imperial IRWMP, page 5-7. (Exhibit 2.1)

¹⁰ The New York Times. Jan 5, 2014. Colorado River Drought Forces a Painful Reckoning for States.
<http://www.nytimes.com/2014/01/06/us/colorado-river-drought-forces-a-painful-reckoning-for-states.html?_r=1> (Exhibit 2.10)

¹¹ IID Colorado River Resources Manager. Presentation to IID Water Conservation Advisory Board. Sept 24, 2013.
<<http://www.iid.com/Modules/ShowDocument.aspx?documentid=8228>> (Exhibit 2.11)

The **emergency status** due to the on-going water supply shortage in California exacerbates Southern California's reliance on its Colorado River water supplies, putting additional importance on an already over-taxed watershed. Lake Mead is currently only 8 feet away from its first shortage trigger, at which point water supply reductions to Arizona, Nevada and Mexico would occur and intensify pressure on IID's water conservation requirements and large agricultural water rights.

2.2 WATER CONSERVATION MEASURES

No mandatory or voluntary urban water conservation measures or restrictions have been implemented as a result of the 2014 Drought. Urban water use in the Imperial Region is within the water conservation requirements for the Colorado River Hydrologic Region due to little public landscaping and below average income levels. Metered pricing is already being implemented as a requirement of wholesale purchase of IID surface water.

For agricultural water conservation, IID is implementing following programs to meet water transfer, Salton Sea mitigation requirements, and inadvertent overrun payback outlined in the 2003 CRWDA. The goal of the 2014 IOPP payback following programs is to incentivize agricultural water customers to conserve **154,954** acre-feet, measured at the river.

Regarding ecosystem impacts, as implied above, Mexico is reusing its treated wastewater effluent and may be increasing irrigation efficiency, thus reducing flows discharged into the New River. Solar and urban development in the Imperial Valley also result in reduced discharge, as will IID conservation efficiency measures after mitigation discharges end in 2017. In the meantime, environmental pilot projects have been funded and are being implemented to mitigate for air pollution from exposure of Salton seabed and for loss of habitat due to the lowering of the water levels; and others are in the planning stages.

Furthermore, the 2014 State Drought has reduced habitat value in other areas of the state, making the Salton Sea even more important.