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*Managing Water in the West*

## **Colorado River Citizens' Forum Start up of the Yuma Desalting Plant**

**March 8, 2010**



U.S. Department of the Interior  
Bureau of Reclamation

## Update topics

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- Drought on the Colorado River
- Yuma Desalting Plant – a new water supply
- Pilot Run Plans
- Anticipated Operating Issues
- Research Project

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# Colorado River drought

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- We are in an unprecedented drought
- Average Colorado River flow since calendar year 2000 is the lowest ten-year average in 100 years of record keeping
- On March 4, 2010 the elevation of Lake Mead was 1,102.76 feet
- Lake Mead is at 45% of capacity
- This elevation remains nearly 28 feet above the trigger for shortage declaration under the Colorado River Interim Guidelines for Lower Basin Shortages of December, 2007

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# Overview of guidelines

Elevation (feet)	Lake Mead Operational Diagram	Storage (maf)
1,220	Flood Control or 70R Surplus	25.9
1,200	----- Domestic Surplus	22.9
1,145	----- Normal Operations	15.9
1,125		13.9
1,075	----- Shortage 333 kaf	9.4
1,050	----- Shortage 417kaf	7.5
1,025	----- Shortage 500 kaf and Consultation	5.8
1,000		4.3
895		0

**333,000 shortage:** 13,000 acre-feet is Nevada's share and 320,000 acre-feet is Arizona's share

**417,000 shortage:** 17,000 acre-feet is Nevada's share and 400,000 acre-feet is Arizona's share

# Lake Mead

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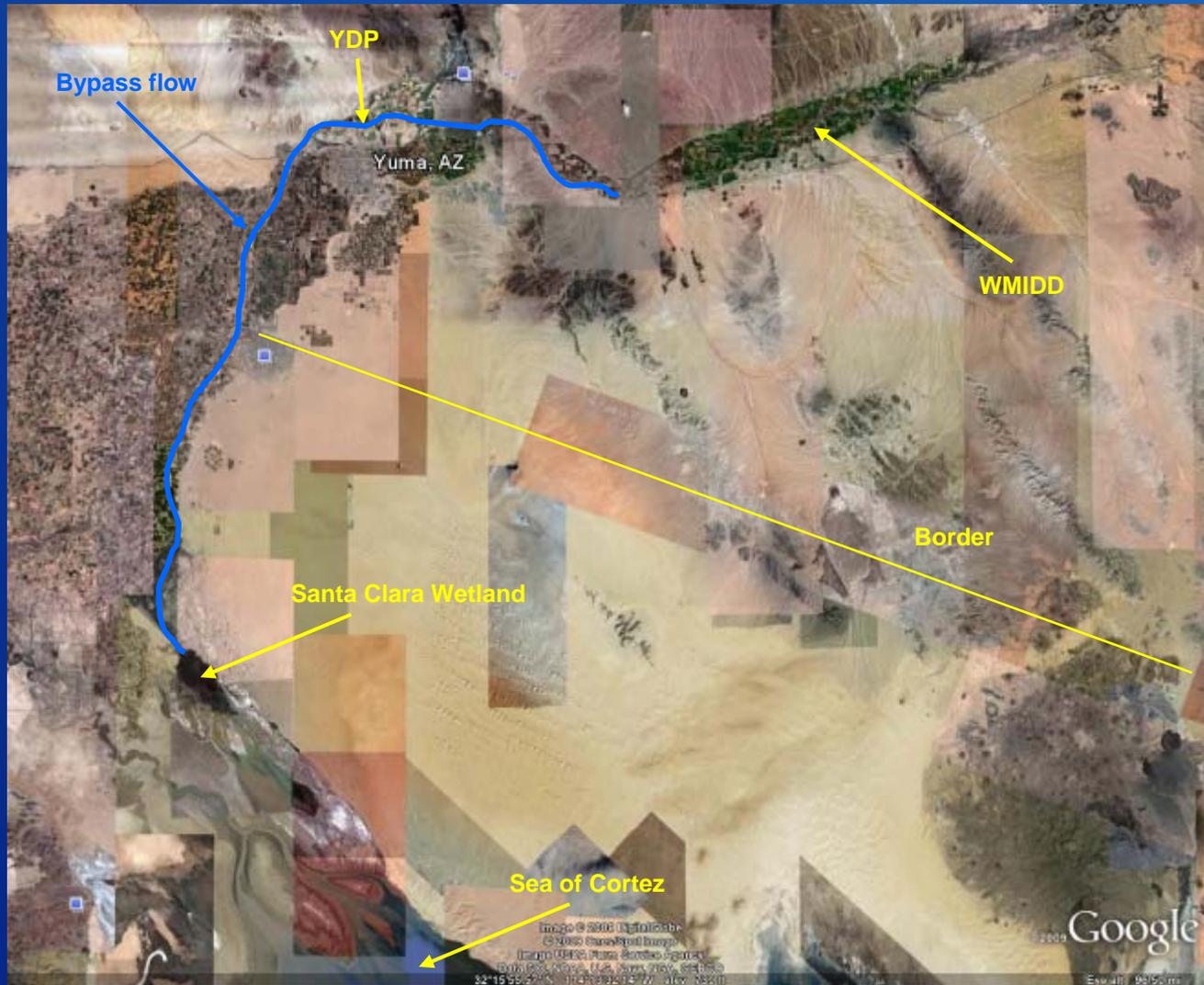


The mineral deposit ring is approximately 100 feet high



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# Geographic overview



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# Santa Clara Wetland

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# Yuma Desalting Plant

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- 72 MGD plant as currently configured
- Conventional pretreatment and cellulose acetate RO membranes
- Construction largely completed in 1992
- Built to desalinate the bypass flow
- Each gallon recovered by the plant makes a gallon available in system storage for U.S. use
- Demonstration Run in 2007



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# New water supply

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- Drought conditions on the Colorado River have placed an increasing demand on system storage
- California is the hardest hit and in the greatest need for water
- The lower Basin States view the Yuma Desalting Plant (YDP) and recovery of the bypass flow water as a potential means to extend existing water supplies
- In 2008 a group of Municipal Utilities approached Reclamation with a request to operate the YDP
  - Metropolitan Water District of Southern California
  - Southern Nevada Water Authority
  - Central Arizona Water Conservation District
- A Pilot Run was contemplated as a means to gather data to support long-term decision making

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# Characteristics of the Pilot Run

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- **Operate at 1/3 capacity for 365 days within a 12 to 18 month period**
  - 1/3 capacity reflects actual design
  - 365 days covers seasonal variation and provides adequate time to achieve the purpose of the run
- **The purpose of the Pilot Run is to:**
  - Gather performance and cost data
  - Determine whether any additional corrective action to the plant is necessary for long-term operation
  - Test changes and corrections which have already been implemented

# Water recovered

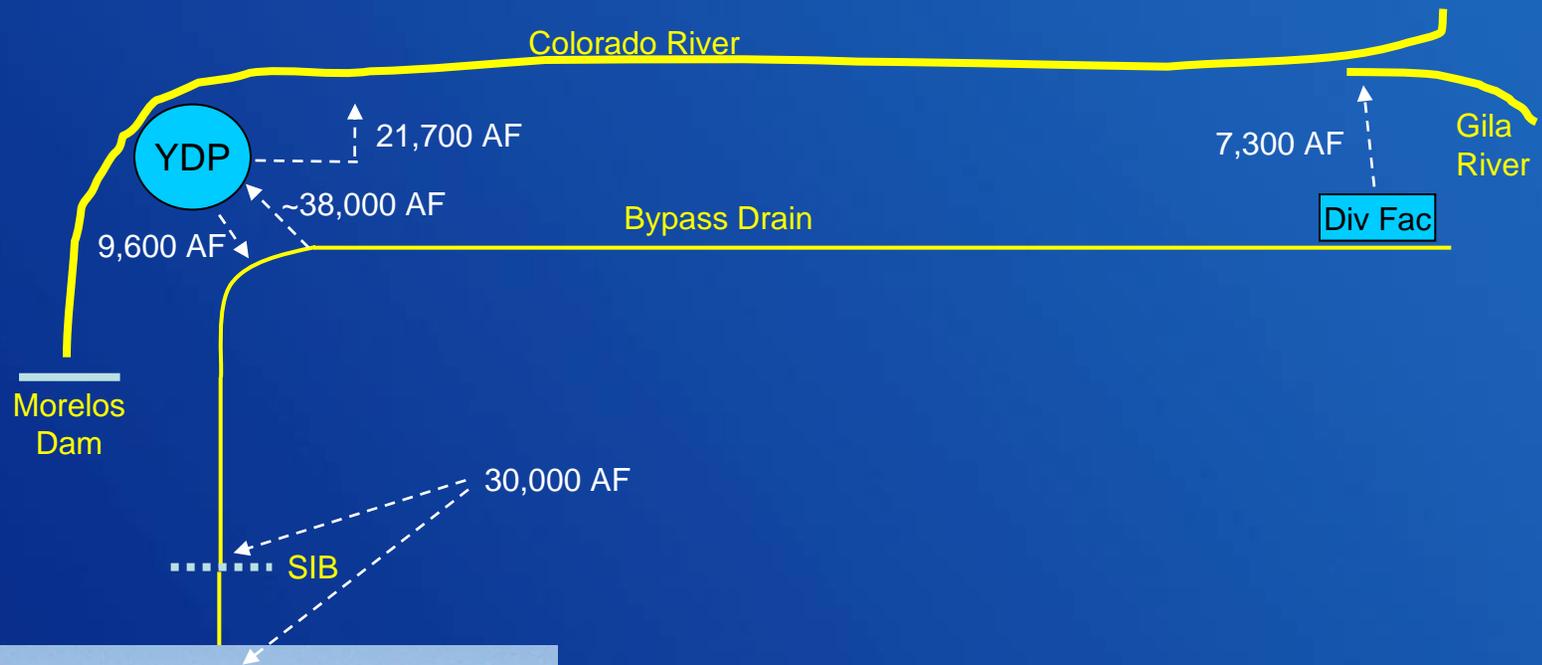
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- Approximately 29,000 acre feet of recovered water
  - The plant sits adjacent to the Colorado River and is about 4000 feet upstream of the border with Mexico
- Municipal Utilities will receive water credits in proportion to their capital contributions and water recovered during the Pilot Run.
- Pilot Run total cost is about \$23.2 million:
  - \$6.6 million for preparation
  - \$16.6 for operations & maintenance



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# How it works



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## Current status

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- Conveying water to the Cienega as part of binational agreement
- Environmental assessment and Finding of No Significant Impact are complete
- Necessary agreements for the Pilot Run have been executed
- Discharge permit for the plant has been issued
- Chemicals have been acquired
- Supplemental personnel have completed necessary training and certification
- Membrane transport from cold storage is underway
- Equipment testing and repair is also underway
- Pilot Run is on schedule to commence in May 2010

## Discharge permit

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- Permit application was submitted to the Arizona Department of Environmental Quality (ADEQ) in March, 2009
  - Five months of consultations resulted in the draft permit being received by Reclamation in August, 2009
  - Final permit was received in January, 2010
- Permit is renewable every 5 years
- Permit negotiations went smoothly with the ADEQ
- ADEQ's emphasis was on removal of residual chloramines. Granted mixing zone for pH, boron and Whole Effluent Toxicity
- Reclamation did make a strategic decision prior to submitting its permit application:
  - Untreated bypass flow will be added to the Colorado River upstream of the YDP and helped to protect the current regulatory treatment of agricultural return flow water in Arizona

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# Anticipated operating issues

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- Plant's aluminum bronze piping will leak
- Use of 20 year old membranes is uncharted territory for the industry



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# Aluminum bronze piping

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- YDP contains over 11,000 linear feet of aluminum bronze piping.
  - Varies of 2 to 78 inches in diameter
  - 83% of the piping is high pressure
- Nine leaks occurred during the Demonstration Run. 6 were successfully repaired.
- Thorough assessment performed:
  - Metallurgical tests, ultrasonic thickness gauging, shear wave flaw detection, x-rays, physical inspection, and coupon testing
  - Long term sustained operation of the plant would require HP piping replacement
- Numerous risk mitigation measures being implemented for the Pilot Run:
  - Selected segment replacement, controlled access zone, specialized start-up procedure, video cameras...

# Water Quality Improvement Center

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- Advanced water treatment research facility
- Dual focus – YDP and Technology Transfer
- Cooperative Research and Development Agreements (CRADA) available to State and municipal governments, academia, and the private sector



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# Current CRADA

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- Largest ever undertaken by the Department of the Interior
- Separate action from the Pilot Run
- Funded by Municipal Utility partners
- Kick-off in May 2010
- Test alternative configurations of the YDP:
  - Pre-treatment
  - Membranes
  - Alternative feed water
- Pilot Run results + CRADA results = Thorough YDP perspective

## Upcoming Event / YDP Tours

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- In April Reclamation will be hosting an event to celebrate the Pilot Run of the Yuma Desalting Plant and the completion of the Drop 2 Reservoir
- In addition, regular tours of the plant can be arranged year round
- If you're interested in additional information about the event or scheduling a tour contact Mr. Doug Hendrix at [dhendrix@usbr.gov](mailto:dhendrix@usbr.gov) or Ms. June Wolfe at [jwolfe@usbr.gov](mailto:jwolfe@usbr.gov)



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