



Informational
Mini Series:

**How will LADWP
Protect Non-LADWP
Pumping Wells while
Using Groundwater
for Dust Mitigation?**

The Groundwater Working Group (GWG) identified two aspects of non-LADWP wells to be protected

Resource Protection Protocols (RPPs) will protect non-LADWP well's:

- Groundwater level and production capability
- Groundwater quality



*The **GWG**, co-chaired by LADWP and Inyo County representatives, is charged with providing recommendations on the use of groundwater for dust control on the lake*

Process of developing the Resource Protection Protocol (RPP) for non-LADWP wells

- Non-LADWP wells were identified as a resource to be protected by the Groundwater Working Group
- A Work Plan was developed to address Non-LADWP wells and baseline data collection
- A database of all wells surrounding Owens Lake was developed
- Outreach to well owners was conducted to solicit participation in monitoring program
- A monitoring program was developed
- Water quality sampling rounds 1 and 2 was conducted



Outreach to non-LADWP well owners was conducted for participation in a sampling program for water quality and groundwater levels

Flyer sent to local well owners:

Your Participation is the Key

The City of Los Angeles Department of Water and Power (LADWP) is mitigating dust emissions from Owens Lake. As part of this effort, LADWP is working with stakeholders to develop an "Owens Lake Master Project" designed to implement more efficient dust mitigation measures, maintain habitat value, and conserve water.

How can you participate?

Currently, LADWP is evaluating the addition of water from beneath Owens Lake to its portfolio of water supplies available for dust mitigation at Owens Lake. This includes development of a monitoring program to establish a baseline and to identify potential changes in groundwater levels and quality due to planned groundwater use for dust mitigation. LADWP is seeking volunteer well owners to provide information on their wells and potentially participate in the monitoring program. The monitoring plan would consist of groundwater quality sampling and groundwater level measurements at no cost to the well owners. All data collected from wells will be provided to the well owners.

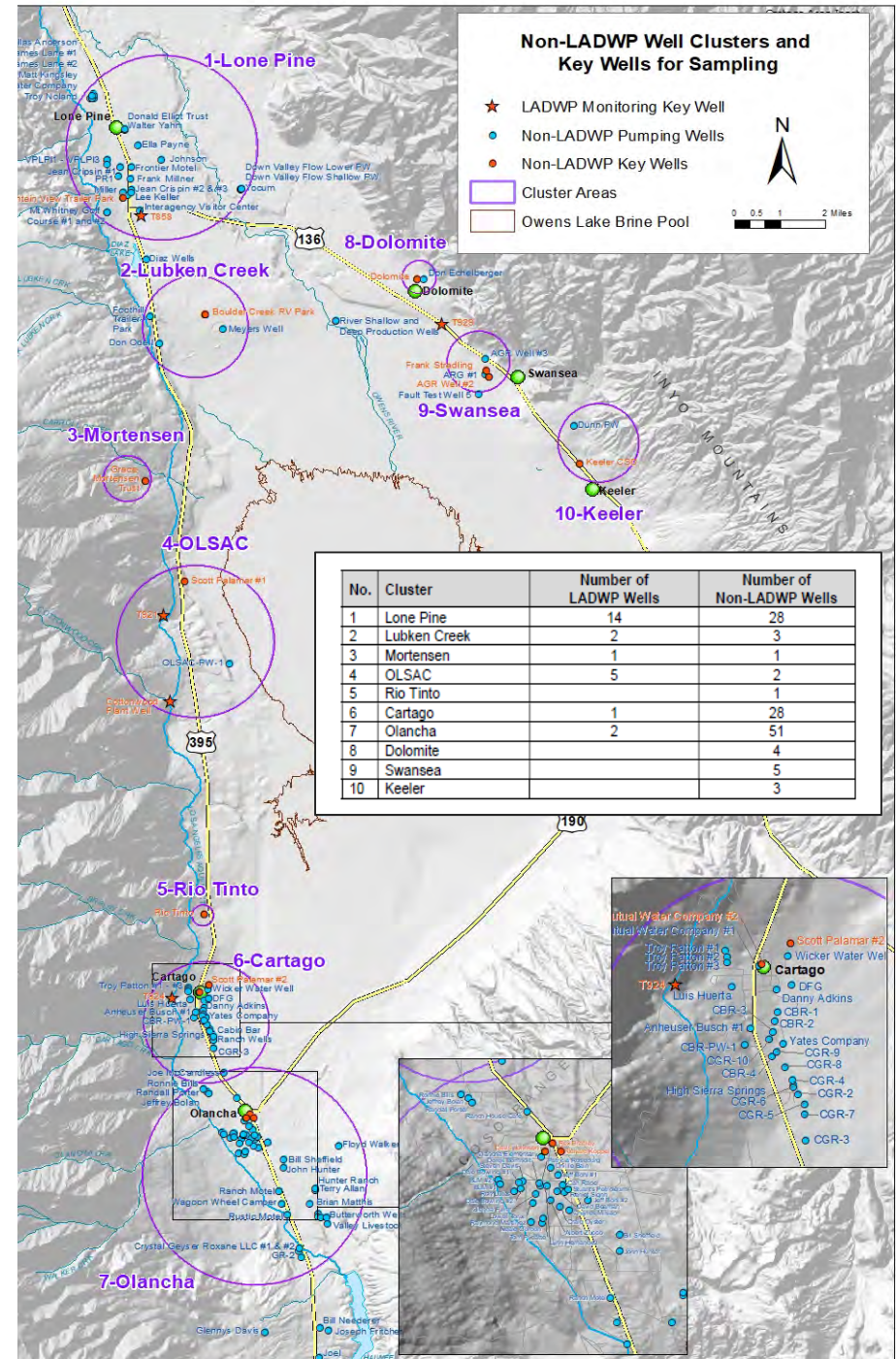
Owens Lake Master Project Seeks Volunteers from the Well Owners in the Vicinity of Owens Lake



Process of grouping and clustering wells

Well Clusters

- After detailed review of available records and reconnaissance around the lake, non-LADWP wells were grouped into “clusters” around the lake.
- A suite of 10 well clusters was identified.
- Select “key” wells that represent each cluster were picked for monitoring groundwater levels and water quality.



Documentation of baseline environmental conditions

- The next step was to document baseline* conditions in all key wells, including depth to groundwater and groundwater quality.
- The initial sampling was conducted at each key well in 2017.



*Baseline Period

The baseline period refers to the period of time prior to pumping by LADWP for dust control during which environmental monitoring is conducted and data are compiled.

*Baseline Levels

Baseline levels are quantitative environmental measurements (such as depth to water in a monitoring well) taken before pumping by LADWP for dust control. The numerical value of baseline levels may be averaged or seasonally adjusted based on historical data and are anticipated to be finalized prior to by LADWP based on mutual agreement with regulatory entities.

Baseline sampling of Non-LADWP wells was very comprehensive and included the following laboratory analyses:

Organics

1,2 Dibromoethane (EDB)
1,2-Dibromo-3-Chloropropane (DBCP)
Organohalide Pesticides and PCB's
Organonitrogen/Organophosphorus Pesticides
Chlorinated Herbicides
Volatile Organics
Semi-Volatile Organics
Carbamate Pesticides
Glyphosate
Endothall
Diquat
Dioxin
Trihalomethanes (THM's)
Methyl-tert-butyl ether (MTBE)

Inorganics

Primary Standards

Nitrate (as NO₃)
Nitrate + Nitrite (as N)
Fluoride
Cyanide
Asbestos
Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Mercury, Nickel, Selenium, Thallium)

Secondary Standards

Metals (Copper, Iron, Manganese, Silver, Zinc)
General Physical (Color, Odor, Turbidity)
Corrosivity
MBAS (Foaming Agents)



Based on water quality sampling conducted in 2017, indicator constituents were identified

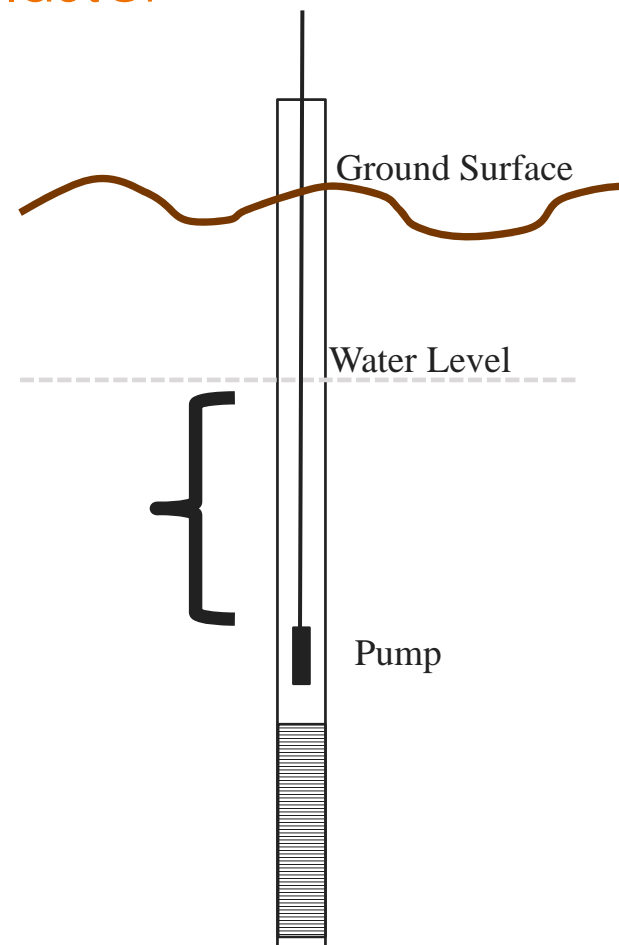
- Arsenic
- Boron
- Flouride
- Total Uranium
- Total Dissolved Solids



"Indicator constituents" were chosen based on observed concentrations that either currently exceed a safe drinking water limit (Maximum Contaminant Level [MCL]), or Notification Level, or might be the first to exceed if groundwater quality deteriorates.

The criteria to protect Groundwater Production Capacity at each non-LADWP well cluster is based on the shallowest (or most sensitive) well in the cluster

Groundwater pumping by LADWP for dust mitigation is managed by the RPP to limit drawdown resulting from LADWP pumping such that the groundwater level in the shallowest non-LADWP well in each cluster remains above pump – thereby protecting all wells in the cluster.



The criteria for protecting Water Quality at each well cluster is based on the change from the baseline water quality

Groundwater pumping by LADWP for dust mitigation is managed by the RPP, preventing water quality changes due to LADWP pumping that significantly increases the concentration of indicator constituents.

Example:
Arsenic

MCL: 10 parts per billion

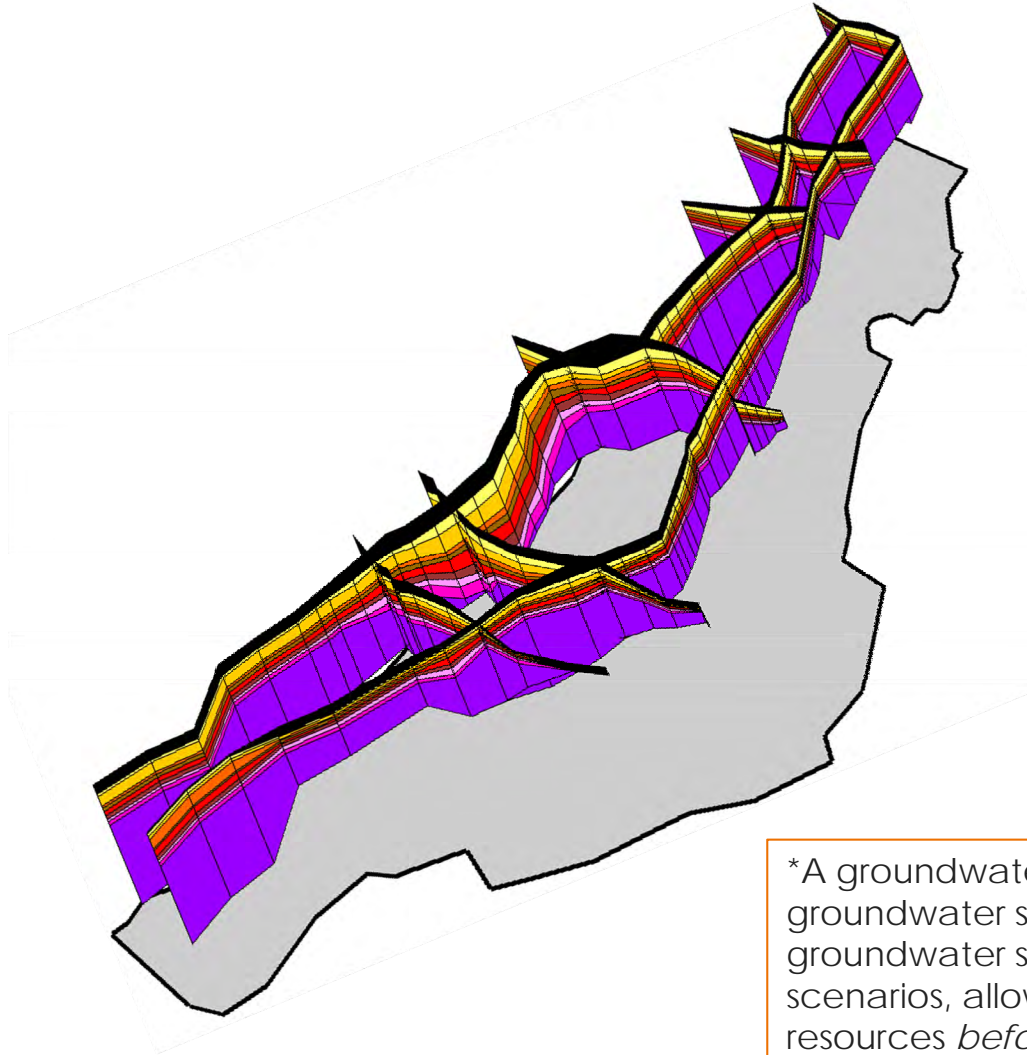
Baseline: 8 parts per billion



The extensive monitoring program and frequency is illustrated below:

Monitoring Type	Monitoring Location	Monitoring Method	Monitoring Frequency	Monitoring Objective
Groundwater Level Monitoring	Key wells	Depth to Groundwater Measurement (manual)	Quarterly	Update groundwater level data and hydrographs. Update contour map of groundwater level change from baseline annually.
	Most sensitive wells in each cluster	Depth to Groundwater Measurement (manual)	Quarterly	
	Other LADWP wells and piezometers	Depth to Groundwater Measurement (transducer)	Quarterly	
Groundwater Quality Monitoring	Key wells	Water quality analytical data	Annually	Evaluate changes in water quality

As part of developing annual pumping plan, groundwater model* will be utilized to estimate effects on non-LADWP wells



- The groundwater model simulation can predict groundwater level drawdown in non-LADWP wells *prior* to start of pumping.
- The groundwater model will also be used to estimate changes in groundwater flow that may lead to groundwater quality changes.

*A groundwater model is a computer representation of the groundwater system, which can estimate changes in the groundwater system under various pumping and climate scenarios, allowing for prediction of effects on sensitive resources *before* they occur.

As with other RPPs, Adaptive Management Strategy will be implemented to protect non-LADWP wells

Adaptive management is the process of modifying monitoring methods, management indicators or triggers, pumping plans, or management actions based on observed conditions. The goal of these modifications is to improve methods to protect sensitive resources based on operational experience.

For Further Information:

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