

FACT SHEET

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WHAT IS THE TRANSDUCERS UNIT?

THE AUTOMATED GROUNDWATER MONITORING PROGRAM

The Arizona Department of Water Resources (ADWR) is tasked with providing stewardship of the state's precious and limited groundwater resources through active management and enforcement of the Groundwater Code. The explosive growth in many rural areas of the state, coupled with impacts of the ongoing drought, have significantly increased the interest of Arizona's communities in water supplies. To address areas where information and data are limited, ADWR established the Automated Groundwater Monitoring Program in order to improve our understanding of water supplies in these areas. These data gathered are critical

for current and future water planning needs as well as to mitigate drought impacts. These automated groundwater monitoring sites, in the form of transducers, allow the Department to track changes in the aquifer. These data also tie together other important hydrologic information such as precipitation, snowfall, stream flow, and water use. This gives ADWR the ability to construct timely and accurate water budgets and monitor hydrologic behavior throughout the state.



Transducers Unit Staff



WHAT ARE AUTOMATED GROUNDWATER LEVEL DATA?

Methods for groundwater level data collection include conventional techniques, such as an electric sounder or steel tape that take a discrete measurement, or an automated groundwater monitoring device that records water levels on a predefined frequency on a continuous basis. Both methods of collection have their place in a statewide monitoring network. Economics and the degree of water level fluctuations in particular aquifer systems are driving factors in choosing the best method of data collection.

Automated Remote Monitoring



OVERVIEW OF THE SITE SELECTION PROCESS

There is a need to develop a network of automated groundwater monitoring sites located throughout the state. ADWR hopes to add 20 to 25 new automated monitoring sites per year, for the first five years. The selection of well locations for use in the automated groundwater monitoring program include the following hydrologic and demographic considerations:

WELL SELECTION CRITERIA

1. Aquifer Penetration: Hydrologic units screened and well depth.
2. Well Use: Non-equipped, un-pumped wells needed.
3. Well Location: Away from large aquifer stresses, such as nearby wells or recharge sites.
4. Long Term Use: Potential to use over the long term, well doesn't dry up, and well access/permission to monitor.

LOCATION CRITERIA

1. Land Growth Areas: Declines and rises in water level, and acquisition of baseline data prior to development.
2. Subsidence: Ongoing or potential subsidence leading to infrastructure damage.
3. River/Stream Channel Proximity: Flood recharge, ground water discharge, riparian issues, and water rights issues.
4. Land Use: Ongoing or potential developments, sensitive areas, and water settlement agreements.
5. Superfund, RCRA, LUST, CERCLA Site Proximity: Potential for contaminant migration and pumping of poor quality ground water.
6. Drought: Areas affected by drought conditions.

WHAT MAKES A WELL GOOD FOR MONITORING?

1. Unused well with no pump.
2. Well that is not affected by large nearby pumping wells.
3. Well with a potential for use over the long term.

If you have a well and would like to volunteer it for use in this program, utilization would involve installation of a small pressure transducer in the well casing with a data collection device and battery in a secured enclosure at the top of the well. Data from the transducer site will be collected daily by satellite telemetry and backed up by quarterly field visits by Department staff and posted on our website for public use.

REAL-TIME DATA AND PUBLIC ACCESS



For many of the automated sites in the Active Management Areas, data are collected daily by satellite telemetry. The data are relayed through the Geostationary Operational Environmental Satellite (GOES) system to a Domestic Satellite (DOMSAT) and are processed in near real-time, quality controlled, and then posted on the ADWR website for public use. Data are then backed up or downloaded to a

field computer quarterly during maintenance visits by Department field staff for verification and quality control purposes. The Groundwater Site Inventory (GWSI) database used for storing these data is under modification to improve its ability to deal with the automatic updates and the increased volume of information.



WHAT ARE THE DATA USED FOR?

Long-term continuous groundwater monitoring can provide significant data used to understand the need to protect aquifers during periods of significant land use change, drought, and rapid development. Without long-term and continuous monitoring, effects or trends within the aquifer can be overlooked and cumulative changes in the aquifer misunderstood or not evident for years. Determining the appropriate frequency of measurements is key when attempting to understand the behavior and thus predictive ability of an aquifer system. If water levels in a particular aquifer do not vary significantly due to climatic or water use changes, then water level measurements can be performed on most wells without the installation of expensive automated devices. Data collected are used to make water level change maps, a part of ADWR's Water Level Change Map Series (WLCMS), and consist of short reports on the hydrology of groundwater basins. Data are also used to generate hydrographs of

wells showing changes in water levels over time. Hydrographs consisting of transducer data have the added benefit of clearly showing recharge events, which are often missed when evaluating the sounder/steel tape data alone. These variations in water levels can then be used to make estimates of aquifer parameters when combined with climatic and geologic data. The data, input into GWSI, provide water resource managers needed information to make decisions regarding the future of one of Arizona's most valuable resources, groundwater.



Well Shelter with Automated Measuring Equipment

ASSISTANCE AND GRATITUDE

The Department needs your assistance with obtaining good sites for monitoring statewide groundwater levels using automated devices. We need well owners to volunteer unequipped wells in order to develop a network of automated groundwater monitoring sites, for the benefit of all

Arizona residents. This developing well network will be geographically located throughout the state to better understand water levels within groundwater basins, thus protecting Arizona's most precious natural resource, groundwater, for future generations. As an agency, we rely on you to help us ensure a sustainable water future for the State of Arizona, and we greatly appreciate your participation in our efforts to provide you with reliable water services. Thank you for your assistance and understanding.

Data Are Collected Real-Time and Relayed via Satellite

After collection and processing, data are "posted on the ADWR website for public use"

CURRENT STATEWIDE STATUS

The current ADWR statewide automated groundwater monitoring network (shown right) includes several types of devices:

- 3 Shaft encoders
- 79 Pressure transducers
- 1 Bubbler equipped with real-time GOES telemetry (data are collected daily by satellite)
- 47 non-GOES equipped pressure transducers

To view a current map showing all of ADWR's automated groundwater monitoring sites please visit:
<https://azwatermaps.azwater.gov/gwsi>

