

# MONITOR WELLS



**Barton Springs  
Edwards Aquifer**  
CONSERVATION DISTRICT

## OVERVIEW

Groundwater levels provide critical information about the hydrologic relationships of recharge and discharge to storage within an aquifer, and the direction of groundwater flow. The District maintains over 40 monitor wells to track water levels using continuous-recording instruments or periodic manual measurements. The District monitors groundwater levels within the Edwards, Upper and Middle Trinity Aquifers. Monitor well types vary from operational water-supply wells to specialized multiport well systems. Hourly data is collected, reviewed for quality assurance, and entered into a database.

Long-term, systematic measurements of water-level data are essential for the District's drought management and conservation program, and for the Aquifer Science team for hydrogeological studies.

## CONTINUOUS MEASUREMENTS

Data is collected continuously within wells that are equipped with a pressure transducer that measures the weight of water and converts the measurement into a water depth (Fig. 1). There are 24 wells that record water-level measurements every hour (or in some cases more frequently). Two of those wells are telemetered and transmit the water-level measurements to a publicly accessible website. The equipment in the remaining wells are visited quarterly and manually downloaded, processed, and reviewed. Pressure transducers record measurements at regular intervals and are calibrated and verified using periodic manual depth to water measurement made with an eline or electric tape (Fig. 4).

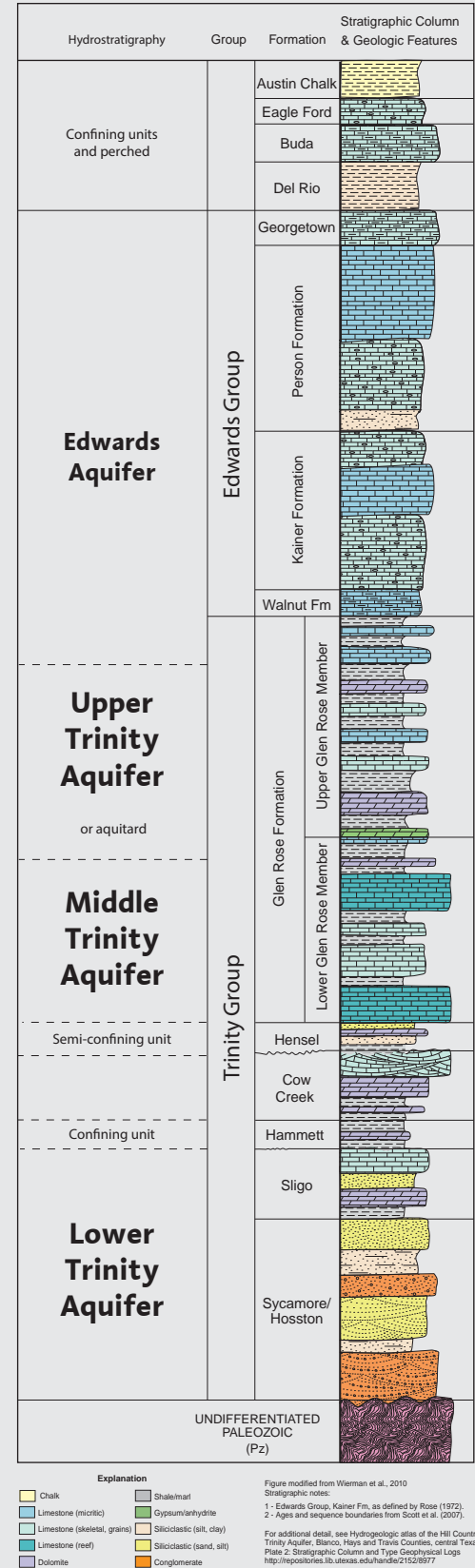


Figure 1: Monitor well equipped with a pressure transducer.

## PERIODIC MEASUREMENTS

Monitor wells that are periodically measured with manual instruments include unused and domestic wells that have historic water level measurements. Manual measurements are made with an eline or electric tape. In addition, periodic measurements are made from six sophisticated multiport wells. The multiport wells (Westbay

## STRATIGRAPHIC COLUMN



## **PERIODIC MEASUREMENTS (CONTINUED)**

Instruments) allow multiple zones within a single borehole to be measured. More than 80 zones are monitored with a specialized winch and pressure transducer system. Data collected include water levels, water quality, and permeability tests from isolated zones (>80) of the aquifers.

Depth-to-water measurements are useful when the depth of the pump and/or total well depth is known, because a well owner can calculate the amount of water above the pump or in the water column, respectively. Water-level elevations make it possible to compare water levels at multiple wells at different locations to track regional aquifer trends, because topography is taken into account.

*Table 1: Telemetry, multiport, and continuous monitoring sites maintained by BSEACD staff. Colors and ID number match the symbols and labels shown in Figure 2.*

### Monitor Sites

Monitoring	ID	SWN	Site Name	Elevation (ft msl)	Well Depth (ft)	Aquifer	Year Drilled	First Measurement
Telemetry	1	5842914	Barton Springs	494		Edwards	-	1896
Telemetry	2	5850301	Lovelady	654	388	Edwards	1949	1949
Telemetry	3	5857502	Hoskins	890	346	Edwards	1963	1977
Multiport	1	5858305	Saline Edwards	658	1100	Saline Edwards	2017	2017
Multiport	2	5858431	Antioch	696	1375	Edwards	2010	2010
Multiport	3	5858434	Antioch Vault	685	220	Edwards	2013	2013
Multiport	4	5857513	Ruby Ranch	815	1120	Edwards & Trinity	2008	2008
Multiport	5	5841408	Travis Co. Precinct 3	989	717	Middle & Lower Trinity	2017	2017
Multiport	6	5764613	Driftwood	1037	857	Upper & Middle Trinity	2017	2017
Continuous	1	5842928	Kai (Frech)	580	300	Saline Edwards	1979	2006
Continuous	2	5858301	United Gas	736	643	Saline Edwards	1943	1943
Continuous	3	5850216	Target	690	582	Edwards	1978	1981
Continuous	4	5850801	Dowell	660	264	Edwards	1939	1941
Continuous	5	5850235	Holiday Inn	692	400	Edwards	ND	2009
Continuous	6	5850511	Johnson	698	260	Edwards	1956	1956
Continuous	7	5858428	Sweeney	683	494	Saline Boundary Edwards	1999	1992
Continuous	8	5850707	McCoys	670	260	Edwards	1960	2006
Continuous	9	5850417	Zumwald	804	330	Edwards	1938	2001
Continuous	10	5850127	Legend Oaks NAWQA	835	220	Edwards	2006	2006
Continuous	11	5857321	Verizon	813	404	Edwards	1997	2009
Continuous	12	5857902	Gregg	822	450	Edwards	<1943	1943
Continuous	13	5849938	Borheim Edwards	787	180	Edwards	2003	2003
Continuous	13	5849925	Borheim Trinity	789	1000	Upper & Middle Trinity	1985	2003
Continuous	14	5849615	Spillar	885	840	Middle Trinity	2007	2013
Continuous	15	5849324	Hunt	1008	484	Middle Trinity	1972	2013
Continuous	16	5857510	Sky Edwards NAWQA	862	197	Edwards	2005	2005
Continuous	16	5857507	Sky Upper Glen Rose	837	285	Upper Trinity	2000	2006
Continuous	16	5857523	Sky Cow Creek	837	980	Middle Trinity	2000	2006
Continuous	17	5841701	Shield House	958	628	Lower Trinity	1967	2016
Continuous	18	5764606	Gluesenkamp	1007	195	Upper Trinity	ND	2015
Continuous	19	5764908	Miller	1066	900	Middle Trinity	2005	2015
Continuous	20	5764607	Lowe	1070	860	Middle Trinity	2015	2015
Continuous	21	5764907	Wood 01	1067	790	Middle Trinity	2010	2015
Continuous	22	6808203	Amos	1130	868	Middle Trinity	2000	2015



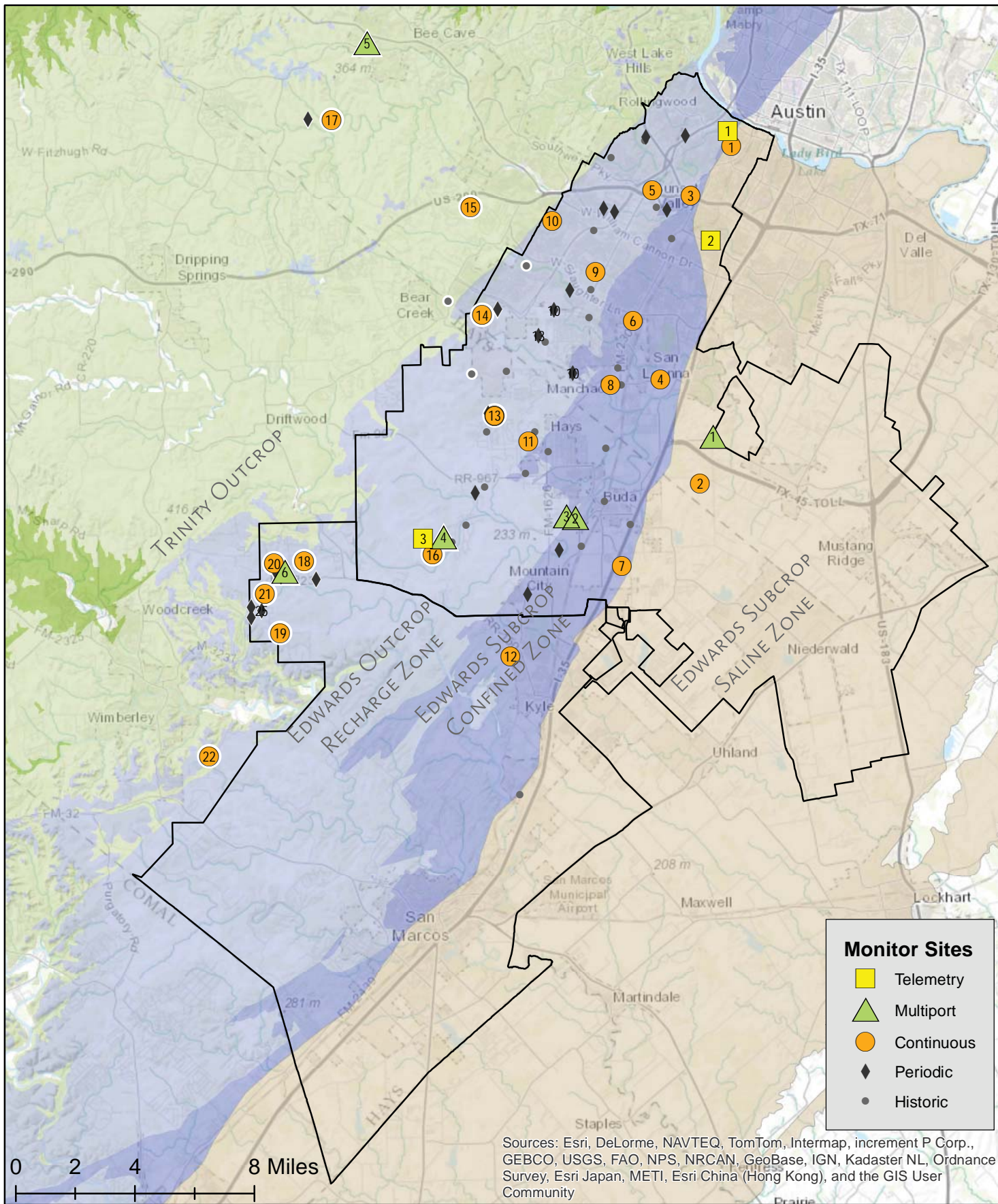


Figure 2: Map showing generalized hydro zones and monitoring sites maintained by BSEACD staff. Trinity sites are outlined in white. Numbered sites are described in Table 1.

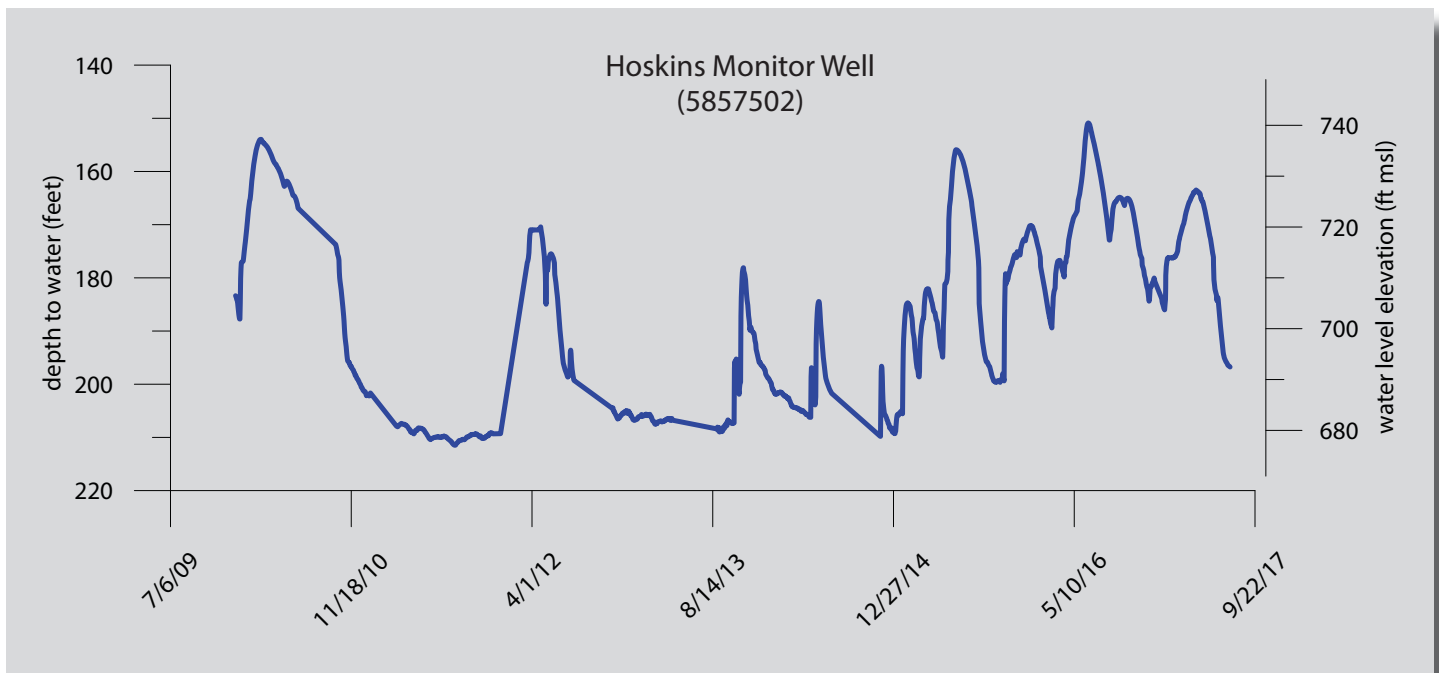


Figure 3: Hydrograph of the Hoskins well (Telemetered site #3 on previous map). Axes show water levels in both depth to water and water level elevation. This is an Edwards Aquifer monitor well in the recharge zone and shows rapid response to rain events.



Figure 4: BSEACD staff uses an eline to take a water level measurement to calibrate the pressure transducer at the Hoskins well. This site has telemetry, so water level data are transmitted to the web.

### **ACKNOWLEDGEMENTS**

The monitoring well network is a partnership with well owners, Edwards Aquifer Authority, Hays Trinity Groundwater Conservation District, City of Austin, Hays County, Travis County, Texas Water Development Board, US Geological Survey and other area scientists. The District would like to thank all the agencies and individuals that have granted access to wells and supported groundwater monitoring efforts.

### **HYDROGRAPHS**

Graphs of water-level measurements through time are called hydrographs (Fig. 3). Water-level measurements can be expressed as depth to water (feet from the land surface) or water-level elevation (elevation of water level above mean sea level).

Hydrographs over a long period of time allow the detection of trends and other hydrologic processes such as drought, recharge, and the effects of pumping.

### **DATA ACCESSIBILITY**

The District maintains a database of water levels that are available upon request. The data is also provided to the Texas Water Development Board annually.

Monitor well data and links to interactive maps, relevant gauging stations, weather data, and reports are available online: [www.bseacd.org/aquifer-science/aquifer-data/](http://www.bseacd.org/aquifer-science/aquifer-data/)

### **SUGGESTED CITATION**

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