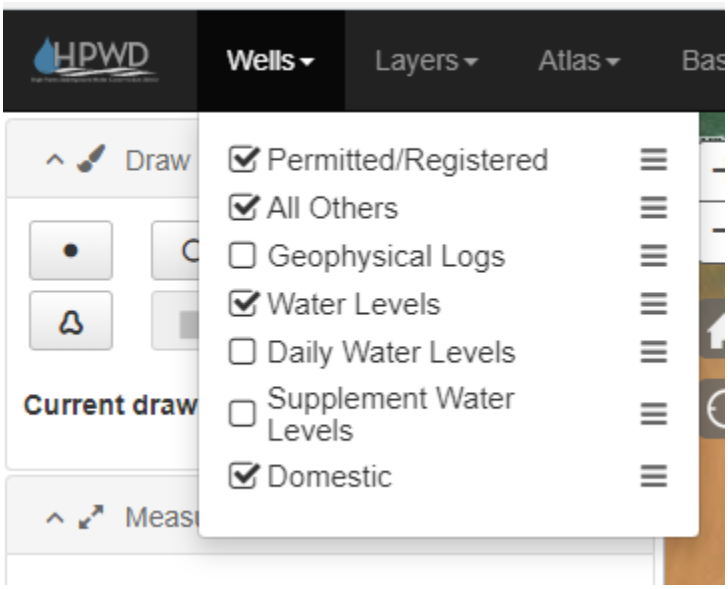
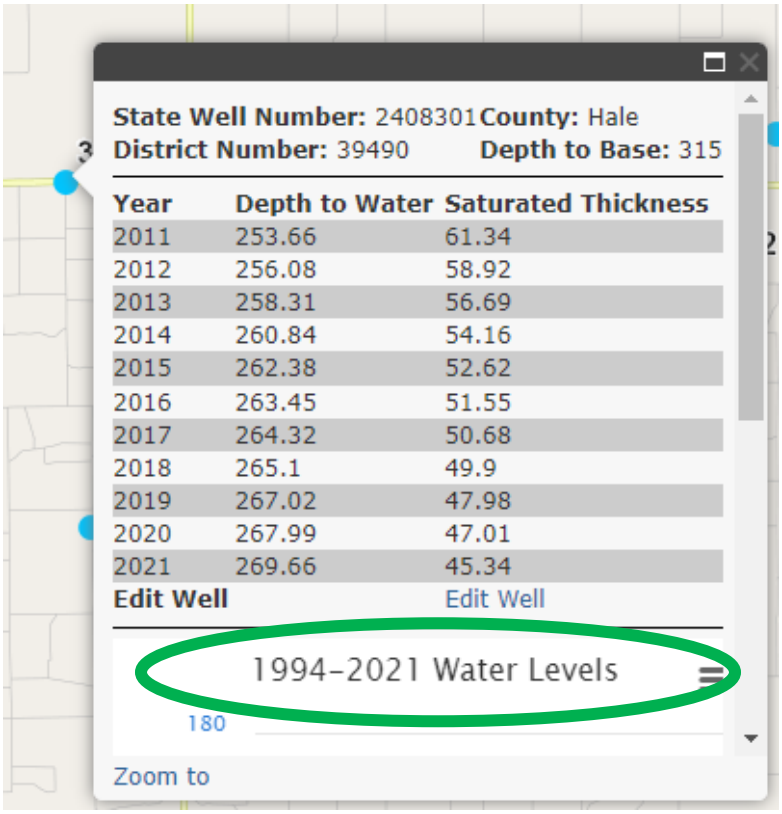
The most visited page on the HPWD web site is the interactive map. This resource includes a wealth of information regarding individual water wells, water levels, and specific estimates of aquifer thickness.

HPWD staff maintain this web map, and update its contents with some frequency. The latest updates were launched in September (???) and are listed here for your information. **NOTE: This is the first of several articles where we explain the latest updates to the interactive map.

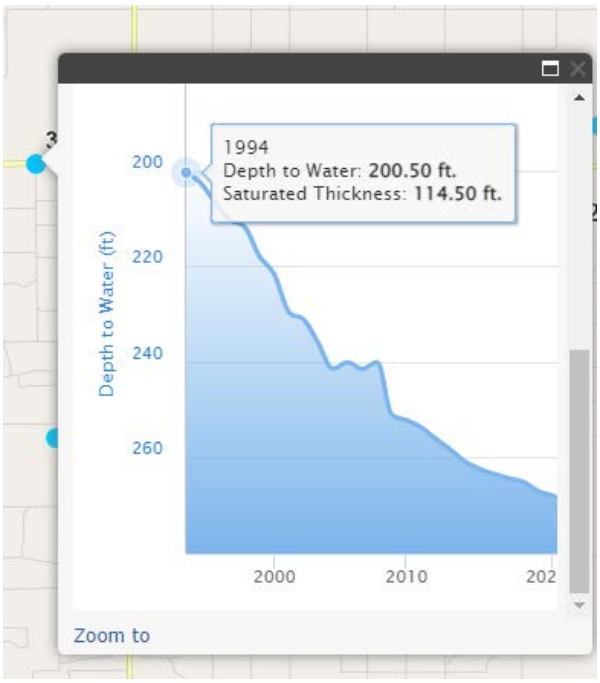


The **Wells** dropdown is now reorganized as shown. Multiple selections are available, as noted in this example. These selections include:

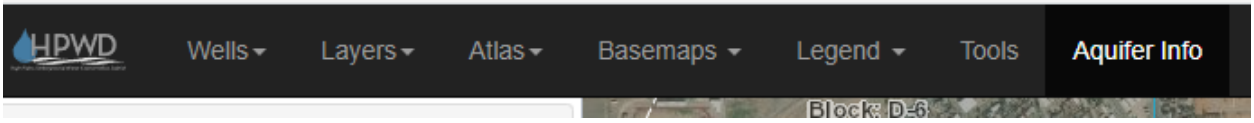
- Permitted/Registered—all current permitted and registered wells in the HPWD database. The symbology for each is noted in the legend, which may be activated at any time. Some of these wells have forms, and some do not. Forms include the driller log, permit application, well registration, or other documents regarding the location and construction of the wells.
- All Others—includes wells that have been plugged, are no longer permitted, not registered, or perhaps cancelled permit applications. Again, this selection may include some with documentation.
- Geophysical logs—the USGS has logged a number of Dockum test holes and Dockum wells in HPWD. We also have several logs for the Edwards-Trinity (High Plains) Aquifer, and one Ogallala Aquifer well log.
- Water Levels—this layer is active as the default layer when the map is first loaded. These data points are part of the annual observation well inventory.
- Daily Water Levels—transducers are installed in a number of wells, and provide daily water level monitoring.
- Supplement Water Levels—we have several areas in the district where information is frequently requested, and these supplemental data are useful.
- Domestic—although HPWD does not require well registration, we query the submitted drillers' logs for domestic wells and present that data here. This information helps us demonstrate the density of wells in housing developments.



Another new feature on the web map includes the entire history of water level observations for each current observation well. The example here indicates water level data for the period 1994-2021. For ease of display, the tabular data still covers an 11-year period, but the full history is available using the scroll bar at the right. Moving the mouse over the chart will then pop-up the water levels and saturated thickness for each year.



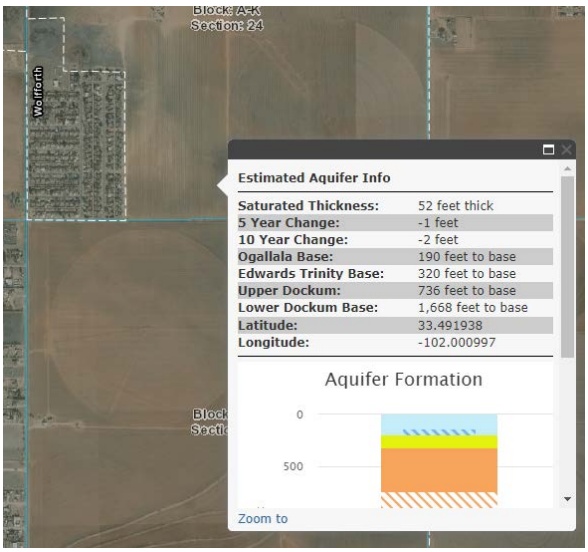
In this chart, we see that the depth to water was 200.50 ft below land surface in 1994, and the saturated thickness was 114.50 feet.



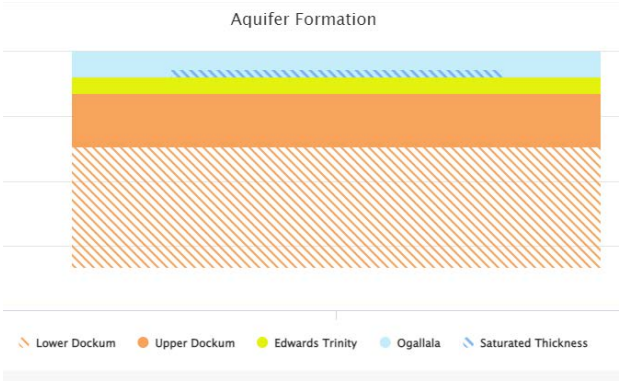
The **Aquifer Info** tool is another new enhancement to the interactive map. When active, the border surrounding this link is a darker shade, and the text is highlighted. Once active, the user may click anywhere within the HPWD service area and obtain estimated aquifer info. If any aquifer unit is not present, there is a note that states "no value found". These parameters include:

- Saturated thickness of the Ogallala Aquifer
- 5 year water level change
- 10 year water level change
- Depth to base of the Ogallala Aquifer
- Depth to base of the Edwards-Trinity (High Plains) Aquifer (where present)
- Depth to base of the Upper Dockum Aquifer (where present)
- Depth to base of the Lower Dockum Aquifer
- Latitude of the specified location
- Longitude of the specified location

These items are listed in the top section of the pop-up (shown below) as tabular data.



In the lower section of the pop-up window is a bar graph that illustrates these aquifer units. Using an appropriate scale, the thickness of each unit is represented by a unique color and pattern. The legend at the bottom serves as a guide to understanding the symbology. A sample of the bar chart and legend is shown in greater detail for your reference.



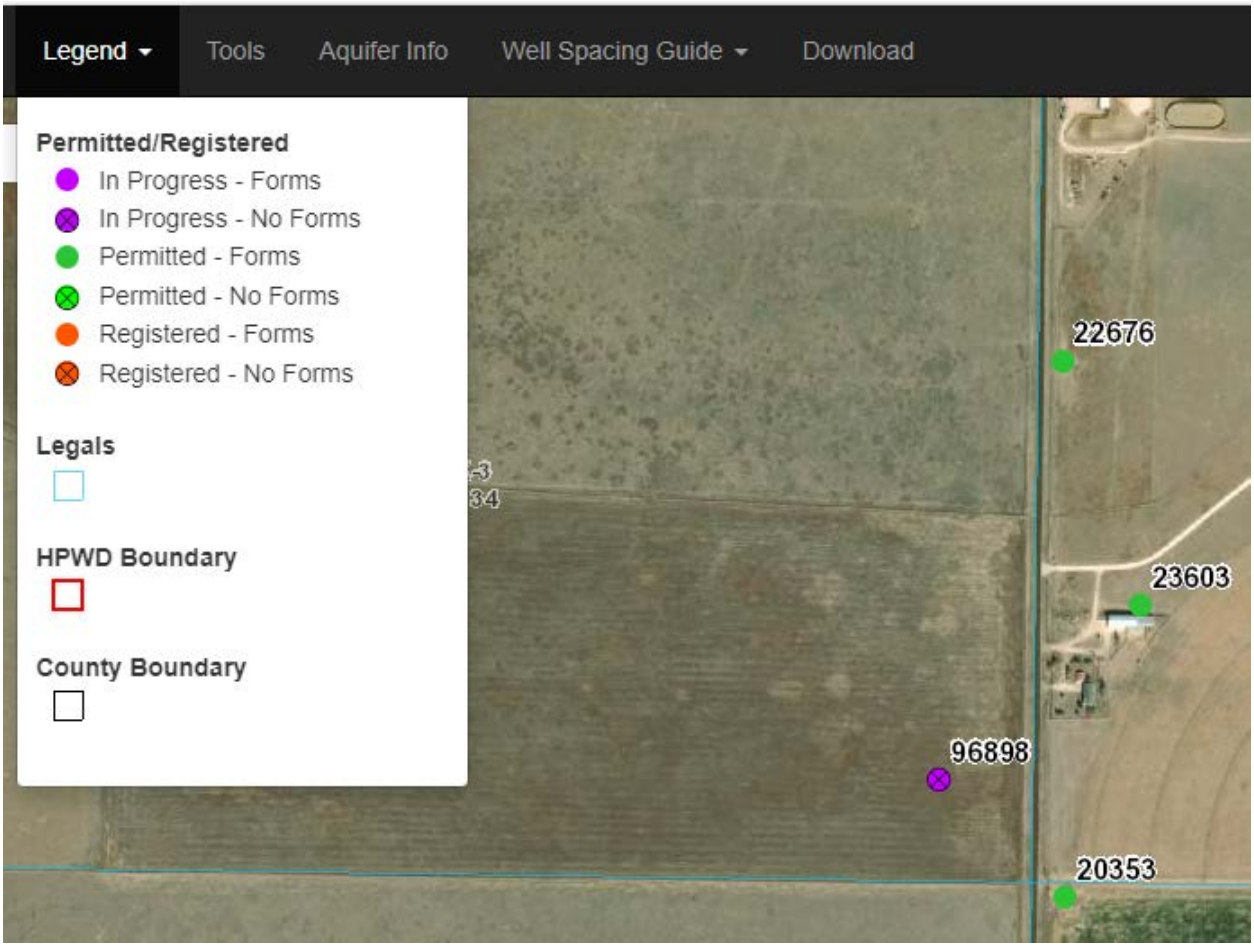
What is the source of data for the aquifer info? This is an excellent question, and we have listed the data source for each aquifer parameter here:

- Saturated thickness—HPWD calculates this value each year by subtracting the water table elevation from the base of aquifer elevation
- 5 year change—HPWD calculates the change in water levels each year, and is able to summarize any period of change. For this exercise, we use a 5 year interval

- 10 year change—HPWD (see notes above)
- Ogallala base—this is actually a combination of data sources from HPWD's older hydrologic atlases and newer data for some counties with limited data
- Edwards-Trinity base—the High Plains Aquifer System (HPAS) Groundwater Availability Model (GAM)included a study of this aquifer unit, and we have taken that data and applied it to this tool.
- Upper Dockum—HPAS GAM (see notes above)
- Lower Dockum—HPAS GAM (see notes above)

In the next article, we will address the **Legend** feature of the interactive map.

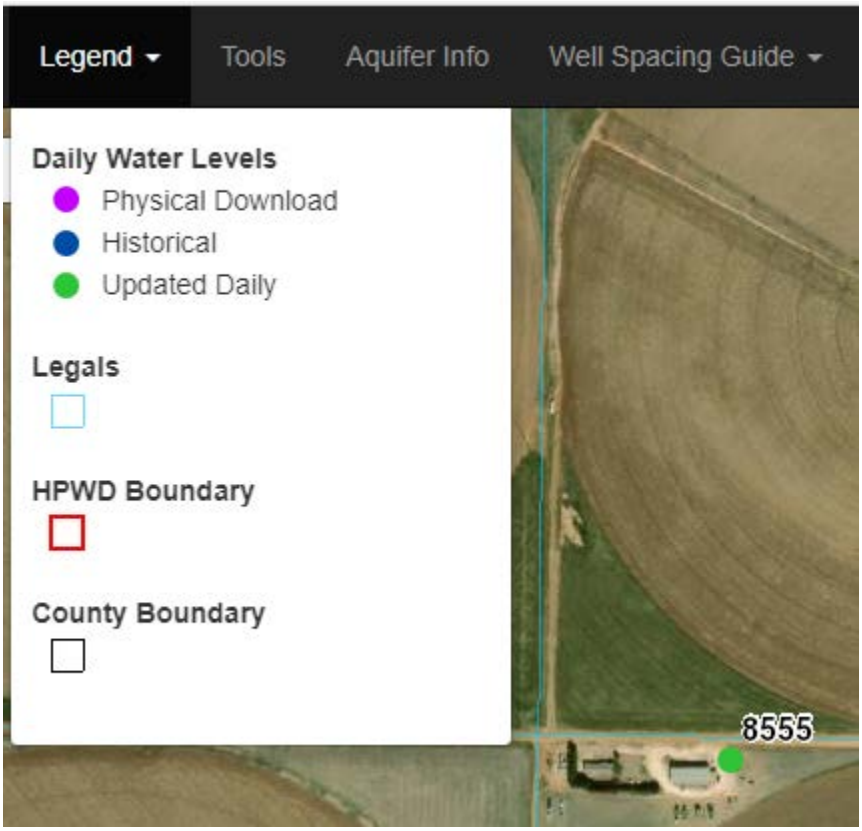
One of the helpful features on any map is its legend. A map legend helps explain the symbols and markers that are currently displayed. When the user clicks on the “Legend” feature, the current map features and their marker symbols are displayed. As the user selects different “Wells” or “Layers”, an explanation of those wells and layers will also change in the legend.



In this screen shot, we include an active legend with several water wells in the screen view. In this view, well 96898 shows to be “In Progress”, with no attached forms at the time. This purple marker is an indicator that a water well permit application has been established at the respective location, but the well and its forms are not yet complete.

Another well shown in this example is 20353. Its green marker indicates it is currently permitted, and has attached forms.

A second example we will review is one where the “Daily Water Levels” layer is active. In this instance, there is a green marker for well 8555. The legend indicates it has water levels that are updated daily. This means that the well is not only equipped with a water level transducer, but also has telemetry equipment installed, which transfers the data to our web map automatically.



The other symbols shown in the legend are “Historical” and “Physical Download”. The historical designation occurs where HPWD no longer has a transducer installed, but the legacy or historical data is still available. For wells that are not equipped with telemetry, we must visit the well site and actually download the stored data. These sites should be updated every month or so.

The wording we included for the legend is meant to be self-explanatory. However, if you ever have questions, please contact HPWD staff. We are pleased to answer any questions and help users navigate and understand the functionality of the interactive map.

Our final article will address the well spacing guide, and provide instructions on its use.