

Aquifer Exemption Data Release

EPA’s interactive map allows users to view electronically for the first time aquifers that EPA has approved for exemption under the Safe Drinking Water Act Underground Injection Control (UIC) regulations. EPA’s Aquifer Exemption Map brings together data previously available only in paper form or at the state level. The map and accompanying data can be used by states, businesses, communities, and others to view exempted aquifers in the United States, see accompanying aquifer exemption data like depth of injection, local geology, and injected fluid characteristics, and can assist with UIC permit applications and approvals.

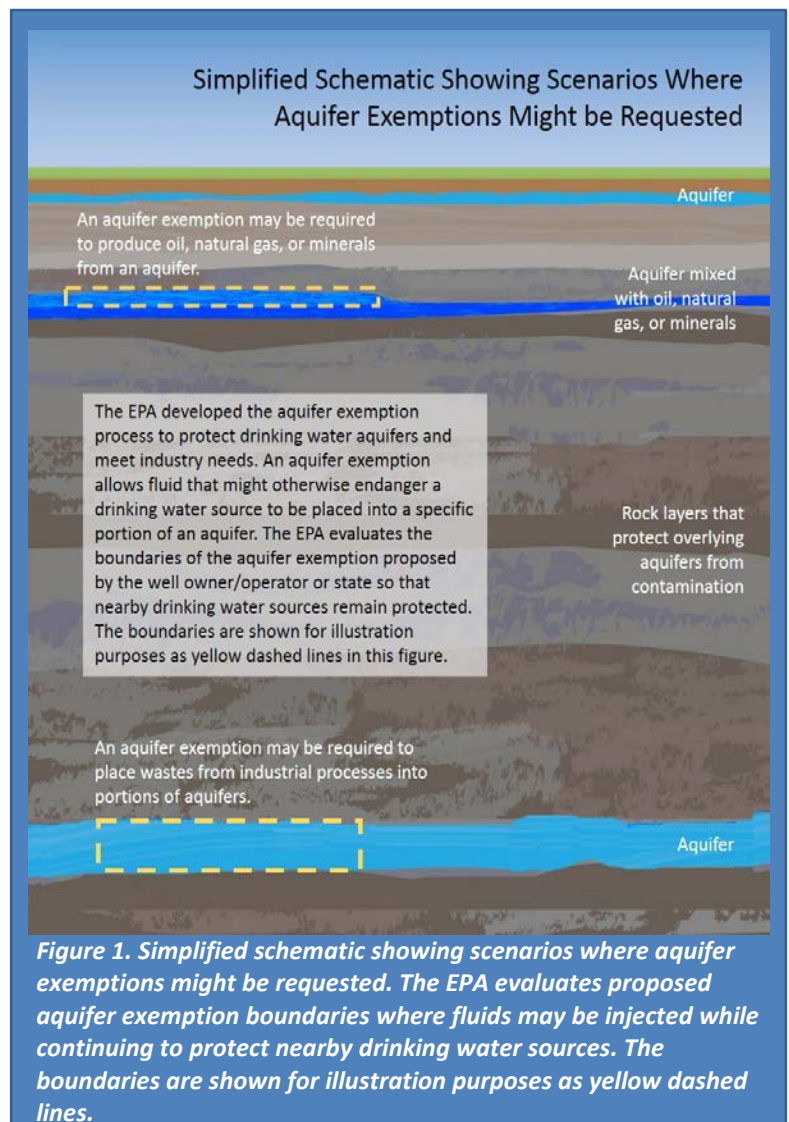
Background on Aquifer Exemptions

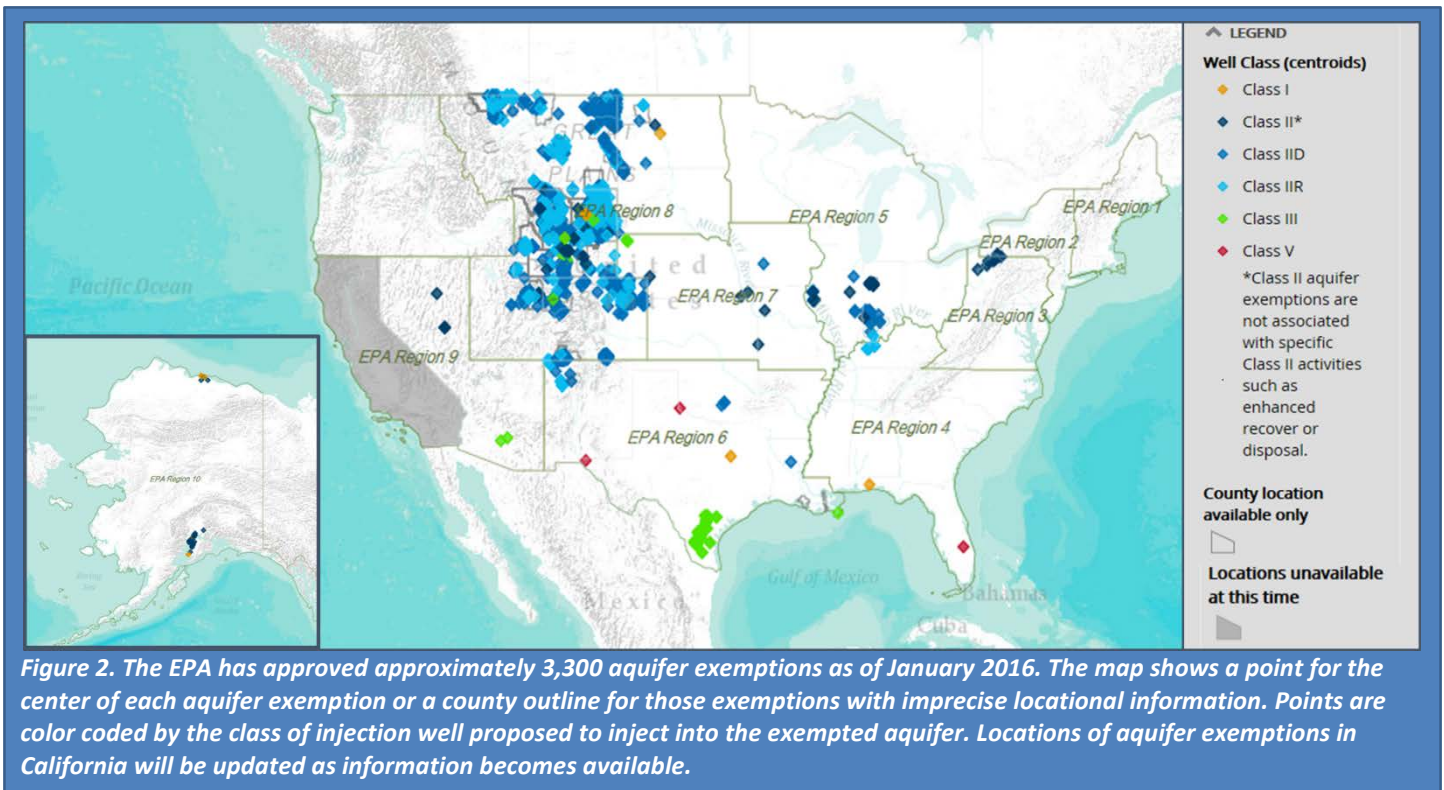
An aquifer is an underground body of rock that provides or could provide ground water to support people’s needs. EPA exempts aquifers if the aquifer does not currently serve as a source of drinking water and will not serve as a source of drinking water in the future, based on certain criteria. Aquifer exemptions allow these underground sources of water to be used by energy and mining companies for oil or mineral extraction or disposal purposes in compliance with EPA’s Underground Injection Control (UIC) requirements. Figure 1 shows simplified scenarios where a well owner/operator or a state might request EPA to approve an aquifer exemption.

The process begins when EPA receives information about the aquifer proposed for exemption from a state agency or well owner or operator. EPA approves the aquifer exemption request if it meets the necessary criteria. Injection of fluids can begin only after EPA approves an aquifer exemption and an underground injection control permit is granted.

Summary of Data on Aquifer Exemptions in the United States

There are about 3,300 aquifer exemptions in the US. The majority of these are located in Montana, Wyoming, Colorado, Utah, Texas, and Indian country, as shown in Figure 2. Aquifer exemptions also exist in California, which are not shown in Figure 2. California is engaged in a process to digitize existing exemption locations and is also currently reviewing numerous requests for new or expanded aquifer exemptions that they expect to submit to EPA for review. As this work progresses, the aquifer exemptions in California will be added to the national dataset. The EPA is also working closely with Texas to better understand cases where Texas





should have requested an exemption for Class II wells injecting oil and gas-related fluids.

Injection Activities Associated with Exempted Aquifers

Aquifer exemptions requested to date are usually associated with three of the six classes of injection wells regulated by the EPA Underground Injection Control program (see Figure 2). About 95 percent of aquifer exemptions are associated with Class II wells for injection of fluids related to oil and gas production. Almost two-thirds of aquifer exemptions associated with Class II wells are for enhanced oil or gas recovery (Class IIR) and one-third are for disposal of wastewater (Class IID). A small percentage of the aquifer exemptions are not associated with specific Class II activities such as enhanced recovery or disposal; those aquifer exemptions are designated as Class II rather than Class IID or Class IIR. About two percent of aquifer exemptions are associated with Class III wells, which assist in recovering minerals such as uranium and salts. The remainder are associated with Class I wells used to inject non-hazardous industrial wastes and others.

Aquifer Exemption Depth

The depth of the exempted aquifers ranges from hundreds to thousands of feet below ground surface. About one percent of aquifer exemptions are 500 feet or less below the surface. Most depths are between 1,000 and 9,000 feet deep although a few are over 10,000 feet deep. In some cases, there is more than one exempted aquifer at the same location, but at different depths and in different bodies of rock.

For comparison, the depths of private drinking water wells measured across the United States ranged from six feet to 1,500 feet below ground surface with an average depth of 172 feet.¹ The depths of measured public drinking water wells ranged from fifteen to 3,534 feet with an average depth of 577 feet below ground surface.²

Aquifer Exemption Boundaries

The boundary of an aquifer exemption contains the portion of the aquifer that may be affected by the injection activity. Aquifer exemption boundaries are determined in a variety of ways. Some aquifer exemptions are defined as a radius (typically $\frac{1}{4}$ or $\frac{1}{2}$ mile) around the well associated with the exemption and are circular. Others are defined by one or more grids in the Public Land Survey System and are squares or combinations of squares. Exemption boundaries can also be irregularly shaped and follow the dimensions of an aquifer, oil or gas field, or mining area. The exemption areas range in size from thousands of square feet to more than a thousand square miles (almost 65 percent are $\frac{1}{4}$ mi radius or smaller). Underground sources of drinking water in the surrounding area continue to be protected from endangerment under the Safe Drinking Water Act.

For More Information

For additional information on aquifer exemptions, including the requirements at 40 CFR 146.4, see <https://www.epa.gov/uic/aquifer-exemptions-underground-injection-control-program>.

For additional information on the UIC program, see <https://www.epa.gov/uic>.

To download the geospatial file and related materials, visit <https://www.epa.gov/uic/aquifer-exemptions-map>.

For information on specific aquifer exemptions, contact the EPA Regional Office that approved the aquifer exemption; contact information is available at <https://www.epa.gov/uic>.

Visit the Safe Drinking Water Hotline at <https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-hotline> or 1-800-426-4791 for help with data-related questions or the Aquifer Exemptions Map.

¹DeSimone, LA, Hamilton, PA, Gilliom, RJ. 2009. Data from *Quality of water from domestic wells in principal aquifers of the United States, 1991-2004*. US Geological Survey.

²Toccalino, PL, Hopple, JA. 2010. Data from *The quality of our Nation's waters—Quality of water from public-supply wells in the United States, 1993-2007*. US Geological Survey.