Maximum Annual Yield

FACT SHEET

OWRB
the water agency

Groundwater in Oklahoma belongs to the land surface owner and may be used subject to reasonable regulation by the OWRB. State law provides for the OWRB to conduct hydrologic investigations of "groundwater basins" (distinct underground bodies of water under contiguous land having substantially the same geological and hydrological characteristics and yield capabilities) and to determine amounts of water that may be withdrawn by permitted users.

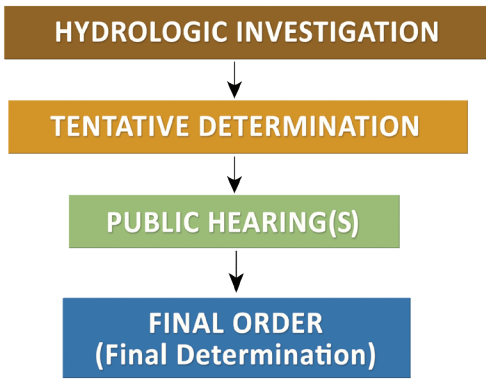
The "maximum annual yield" of a groundwater basin is a term used to describe the total amount of fresh groundwater that can be withdrawn while allowing a minimum 20-year life of the basin. Once the maximum annual yield has been established, the amount of water allocated to each permit applicant will be proportionate to the amount of land owned or leased by that applicant. This is referred to as the landowner's "equal proportionate share."

Oklahoma water law states that certain factors be considered in the determination of the maximum annual yield of a major groundwater basin: total land area overlying the basin, the amount of water in storage in the basin, the rate of recharge to the basin and total discharge from the basin, transmissivity of the basin, and the possibility of pollution from natural sources. Furthermore, for a sensitive sole source groundwater basin, the maximum annual yield will ensure that the natural flow of water from springs or streams emanating from the basin will not be reduced. As of 2013, the Arbuckle-Simpson is the only sensitive sole source groundwater basin.

The first step in determining the maximum annual yield of a major groundwater basin is to conduct a hydrologic investigation or survey. This investigation is usually performed by the OWRB or an outside expert agency or institution such as the U.S. Geological Survey. To obtain the necessary information to evaluate the maximum annual yield, groundwater hydrologists require information on the geology and the hydrogeologic framework (potentiometric maps, hydraulic conductivity, transmissivity, storage properties, and spatial and temporal distribution of rates of groundwater recharge and discharge). Hydrologic information on precipitation, evaporation, surface water runoff, water-level, and geochemical data are used to analyze the movement of groundwater through the system. Most investigations entail the construction of a digital groundwater flow model, which is used to conceptualize the groundwater flow system and to evaluate impacts of water withdrawals on the aquifer.

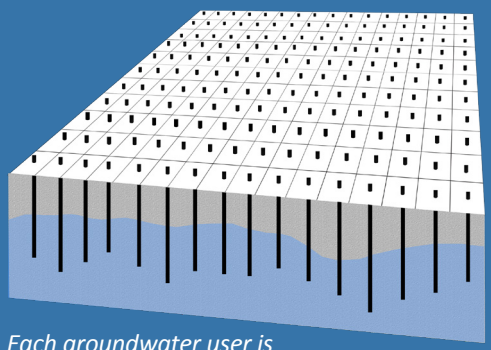
After a hydrologic investigation is complete, the OWRB makes a tentative determination of the maximum annual yield of the basin. Copies of the results of the investigation are made available for public review and one or more hearings are scheduled so that citizens can present evidence supporting or contradicting the evidence behind the tentative determination.

Maximum Annual Yield Determination Process

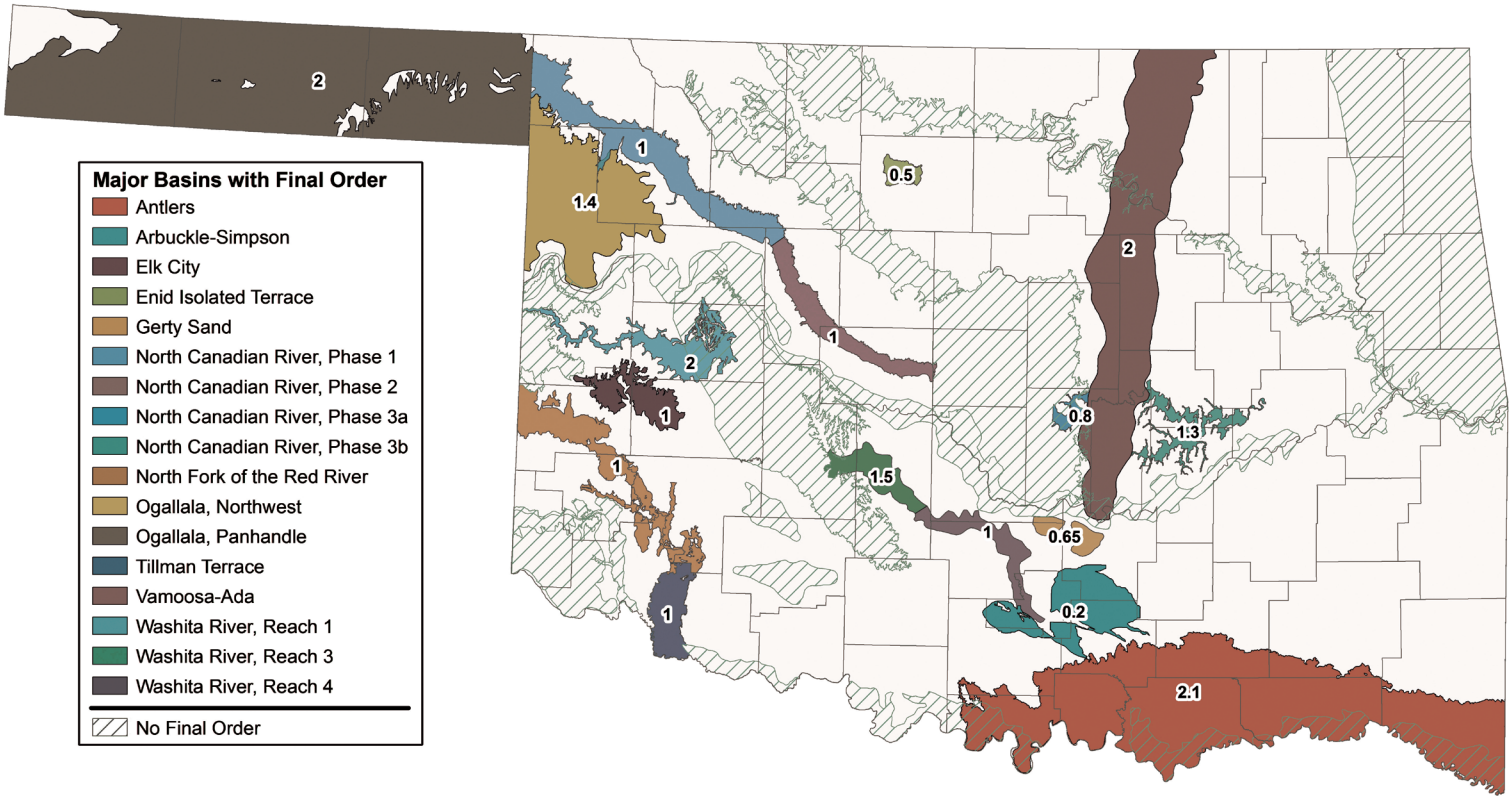


Equal Proportionate Share

When a maximum annual yield has been determined, the OWRB is required by law to distribute the maximum annual yield equally across the basin or subbasin. "Equal proportionate part or share" is defined as the maximum annual yield of water from a groundwater basin or subbasin that is allocated to each acre of land overlying the basin or subbasin. In other words, it is the portion of the maximum annual yield that is equal to the portion of the land overlying the fresh groundwater basin or subbasin that is owned or leased by an applicant for a regular permit.



Each groundwater user is entitled to withdraw an equal share of water proportional to the amount of land owned.

Following the hearings, the OWRB evaluates all the evidence and ascertains the factors stated by the law in the process of making the final maximum annual yield determination. The final determination is issued in a "final order" containing findings of fact and conclusions of law. Thereafter, based on the newly calculated equal proportionate share, regular permits are issued to holders of existing temporary permits and to applicants for new permits.

Equal proportionate shares have yet to be determined on many major groundwater basins in the state. For those aquifers, "temporary" permits are granted to users allocating two acre-feet of water per acre of land per year. Temporary permits authorize use for one year at a time and must be revalidated annually.