

GAM Run 05-08

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Groundwater Availability Modeling Section
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REQUESTOR:

Rima Petrossian on behalf of the Santa Rita Underground Water Conservation District (UWCD)

DESCRIPTION OF REQUEST:

What is the water budget of Reagan County?

METHODS:

We used the steady-state Groundwater Availability Model (GAM) for the Edwards-Trinity (Plateau) aquifer (Anaya and Jones, 2004) to determine the water budget of Reagan County. We extracted water budget data from the GAM for a zone representing Reagan County.

PARAMETERS AND ASSUMPTIONS:

- See Anaya and Jones (2004) for assumptions and limitations of the GAM. Root mean squared error for this model is 134 ft.
- Anaya and Jones (2004) calibrated the steady-state model to 1980 hydrologic conditions.
- The water budget and recharge data presented in this report is for all of Reagan County and has not been adjusted to reflect the boundaries of the Santa Rita Underground Water Conservation District.

RESULTS:

Table 1 contains water-budget data for each layer that constitutes the GAM for the Edwards-Trinity (Plateau) aquifer in Reagan County. These layers, the Edwards and Trinity aquifers, constitute Layers 1 and 2 in the model.

Total recharge for Reagan County for 1980, based on the GAM, was approximately 22,500 acre-feet (Table 1). Average recharge for Reagan County for the period 1971 through 2000, based on the GAM, was 21,100 acre-feet (see table in GAM run 04-17).

Table 1. Water budget for Reagan County from the Groundwater Availability Model of the Edwards-Trinity (Plateau) aquifer. Flow terms expressed in acre-feet per year.

Flow Term	In	Out	In-Out
Layer 1: Edwards			
Horiz. Exchange	3,400	4,000	-600
Vertical exchange (lower)	80	20,300	-20,220
Wells	0	840	-840
Drains (springs)	0	840	-840
Recharge	22,500	0	22,500
Head-dep. bounds	n/a	n/a	n/a
Stream leakage	n/a	n/a	n/a
Sum of the layer	25,980	25,980	0
Layer 2: Trinity			
Horiz. Exchange	9,800	9,580	220
Vertical exchange (upper)	20,300	80	20,220
Wells	0	23,040	-23,040
Drains (springs)	n/a	n/a	n/a
Recharge	20	0	20
Head-dep. Bounds	3,740	1,160	2,580
Stream leakage	n/a	n/a	n/a
Sum of the layer	33,860	33,860	0

Explanation:

n/a: Not applicable to Reagan County

Horiz. exchange: Horizontal groundwater flow into and out of Reagan County

Vertical exchange: Vertical groundwater flow between the Trinity and Edwards components of the Edwards-Trinity (Plateau) aquifer.

Drains (springs): Drains are used to simulate spring discharge along the edge of the aquifer. Note: drains do not simulate discharge from specific springs.

Recharge: Recharge is defined as the infiltrating precipitation that reaches the water table. Recharge from losing streams is included in the stream leakage flow term.

Head-dep. bounds: Head-dependent boundaries are used to simulate vertical groundwater flow between the Edwards-Trinity (Plateau) aquifer and the underlying Dockum aquifer.

REFERENCES:

Anaya, R. and Jones, I. C., 2004, Groundwater availability model for the Edwards-Trinity (Plateau) and Cenozoic Pecos Alluvium aquifer systems, Texas: Texas Water Development Board GAM report, 208 p. http://www.twdb.state.tx.us/gam/eddt_p/eddt_p.htm