TWDB Study: Develop Procedures and Tools to Delineate Areas Designated or Used for Class II Well Wastewater Injectate

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Innovative Water Technologies
Wednesday, December 2nd, 2020
1st Workgroup Meeting
Innovative Water Technologies

Aquifer Storage and Recovery

Water Reuse

Desalination

BRACS
Brackish Groundwater
1,000-10,000 mg/L Total Dissolved Solids

<table>
<thead>
<tr>
<th>Groundwater Salinity Classification</th>
<th>Salinity Zone Code</th>
<th>Total Dissolved Solids Concentration (milligrams per liter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh</td>
<td>FR</td>
<td>0 to 1,000</td>
</tr>
<tr>
<td>Slightly Saline</td>
<td>SS</td>
<td>1,000 to 3,000</td>
</tr>
<tr>
<td>Moderately Saline</td>
<td>MS</td>
<td>3,000 to 10,000</td>
</tr>
<tr>
<td>Very Saline</td>
<td>VS</td>
<td>10,000 to 35,000</td>
</tr>
<tr>
<td>Brine</td>
<td>BR</td>
<td>Greater than 35,000</td>
</tr>
</tbody>
</table>

modified from Winslow and Kister (1956) USGS WSP 1365

- Identify and designate zones in the state;
- Determine groundwater volumes that a zone can produce over 30-year and 50-year periods without causing significant impact to water availability or water quality;
- Make recommendations on reasonable monitoring to observe effects of production within the zone;
- Work with GCDs and stakeholders in general; and
- Provide a summary of zone designations in the biennial report due December 1 of each even-numbered year;
<table>
<thead>
<tr>
<th>Statutory Requirements &amp; Exclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Must have brackish water</strong></td>
</tr>
<tr>
<td><strong>Must have hydrogeologic barriers</strong></td>
</tr>
<tr>
<td><strong>Cannot be within these boundaries</strong></td>
</tr>
<tr>
<td><strong>Cannot be already in use</strong></td>
</tr>
<tr>
<td><strong>Cannot be used for wastewater injection</strong></td>
</tr>
</tbody>
</table>
TWDB-Designated Zone Status

31 Total Zones

October 2016
- 0 Blaine Aquifer
- 1 Carrizo-Wilcox Aquifer
- 4 Gulf Coast Aquifer
- 3 Rustler Aquifer

March 2019
- 3 Blossom Aquifer
- 0 Lipan Aquifer
- 5 Nacatoch Aquifer
- 15 Northern Trinity Aquifer
Step 2 – Apply Statutory Requirements

- Buffer existing well use
  - Agriculture, domestic, and municipal
- Buffer freshwater line
- Buffer injection or disposal wells permitted under TWC Chapter 27
- Buffer state lines
- Ensure hydrogeological barrier exists
- Present results to stakeholders
Step 3 – Board Designation

- Select Board meeting
- Prepare documents
- Route for approval — 2.5 months prior to meeting
- Brief management and the Board
- Present recommendations
- Email board designation to stakeholders
Stakeholder Feedback on Zones

• We applied 15 miles to buffer all Class II injection wells.
• 15 miles too conservative?
Develop Procedures and Tools to Delineate Areas Designated or Used for Class II Well Wastewater Injectate Study

- Goal from this study:
  - develop a technically defensible methodology for determining an appropriate buffer distance.
  - Buffer per each Injection well
  - Buffer per Aquifer type
  - Default Buffer

- Avoid designation of Brackish Groundwater Production Zones in areas already used for wastewater injection.
Workgroup Involvement

• Task 1 – Literature Review

• Task 2 – Aquifer Assessment

• **Task 3 – Aquifer Assessment Presentation**

• Task 4 – Class II Well Data Procedures and Tools

• Task 5 – Mapping Techniques Description

• **Task 6 – Techniques Presentation**

• Task 7 – Injectate Mapping Procedures and Tools

• **Task 8 – Case Study**

• Task 9 – Procedures and Tools Testing

• **Task 10 – Final Workgroup Presentation**

• Task 11 – Draft and Final Reports

• Task 12 – Project Management

--- Introductory meeting
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Innovative Water Technologies - BRACS
WSP & Subcontractors: Update on Project
Future Aquifer Studies

No zones will be designated

Meets House Bill 30 criteria, eligible for zone designation
- CR. Capitan Reef Complex Aquifer
- Dk. Dockum Aquifer
- EBFZ. Edwards (Balcones Fault Zone) Aquifer
- ES. Ellenburger-San Saba Aquifer
- Hk. Hickory Aquifer
- WD. Woodbine Aquifer
- YJ. Yegua-Jackson Aquifer

Does not meet HB30 criteria, ineligible for zone designation
- BA. Brazos River
- BV. Bone Spring-Victorio Peak Aquifer
- EBFZ. Edwards (Balcones Fault Zone) Aquifer
- ETNP. Edwards-Trinity (High Plains) Aquifer
- HB. Hueco-Mesilla Bolsons Aquifer
- Og. Ogallala Aquifer
- Sm. Seymour Aquifer
- WTB. West Texas Bolsons Aquifer

No significant brackish groundwater, ineligible for zone designation
- Ig. Igneous Aquifer
- Ma. Marathon Aquifer
- MF. Marble Falls Aquifer
- RB. Rita Blanca Aquifer

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Class II Injection Wells in Nacatoch Aquifer study area

2,313 injection wells

532 injection wells