GMA 12 Groundwater Data Sharing System
Scope and Fee Proposal

Background

Halff Associates, Inc. (Halff) has extensive experience developing groundwater management systems and currently hosts systems for 23 districts in Texas, including all districts in GMA 12.

Summary

The Halff Groundwater Management System (GMS) clients of GMA 12 desire a web-based data-sharing application created to share identified groundwater data. Halff proposes to develop this system using Esri's ArcGIS Server and Microsoft's SQL Server applications to store and manage the shared data.

The Groundwater Data Sharing System (GDSS) will be flexible and expandable, allowing application enhancements as new requirements are identified.

The GDSS will be freely available to any groundwater conservation district using the Halff GMS version 6 or later. For districts that wish to join after the initial GDSS deployment, there will be a one-time charge of $3,000 to the district to integrate the district's GMS database with the GDSS. Halff will require a single technical contact from the district for integration questions and scheduling.

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Scope of Services

Halff will create a new shared information database separate from each district's database. This database will be populated with select well information, water level data, water quality test results, and water production from each participating Halff Groundwater Management System (GMS) district database. Data will be automatically collected from each participating Halff GMS district daily. Wells marked as *confidential* in a district's GMS will not be included in the shared database. Water levels marked as *not publishable* in a district's GMS will not be included in the shared database.

Access to the GDSS will be secured, allowing access only to participating districts.

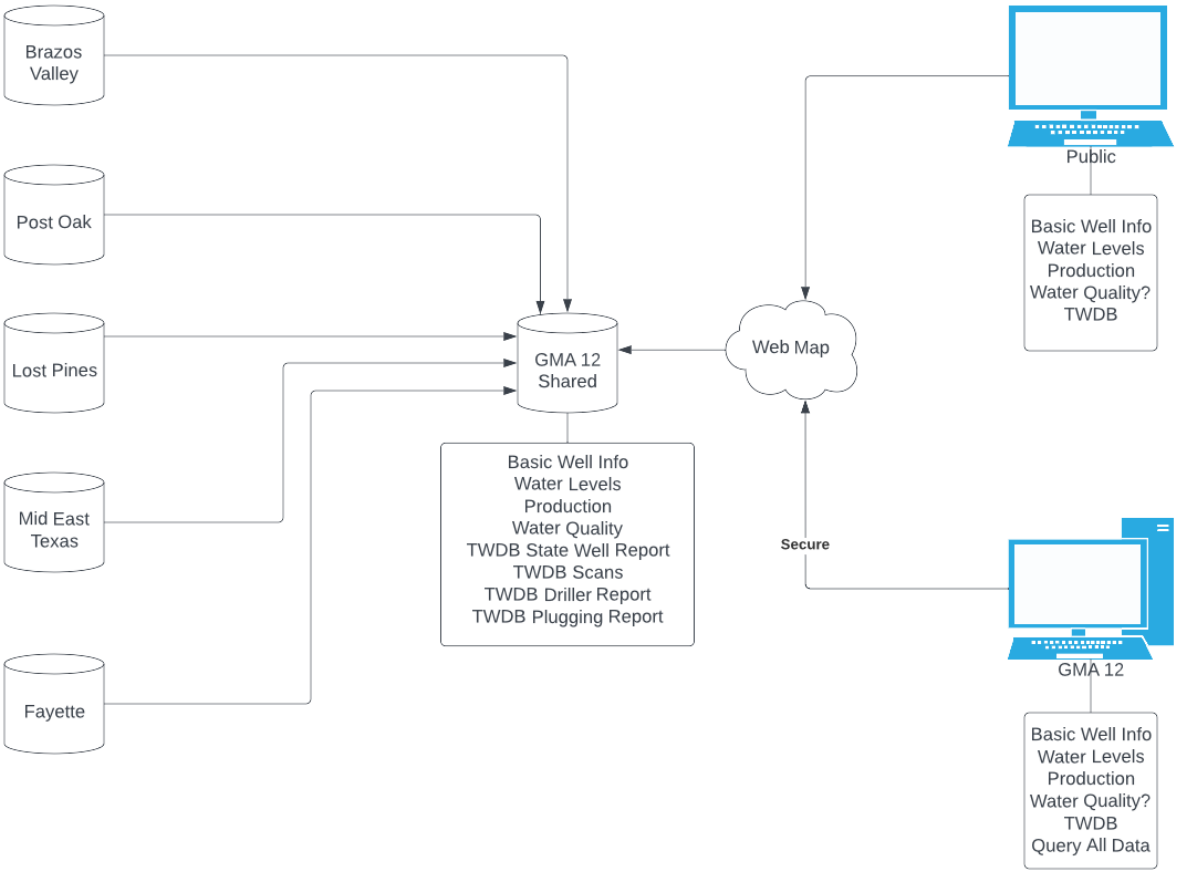

Figure 1:Proposed Sharing Design

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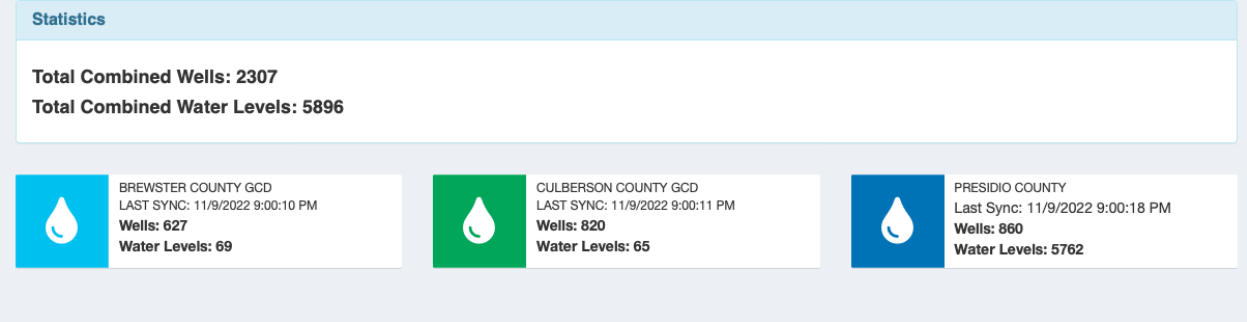
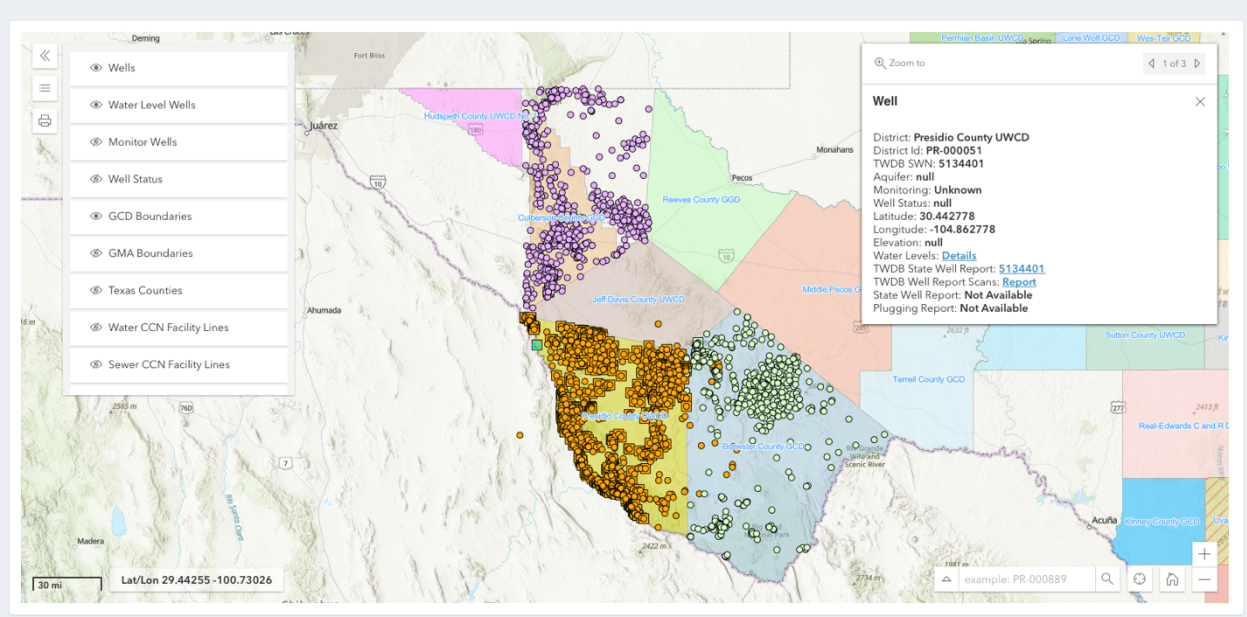
A GDSS dashboard will show GMA-wide attributes, such as the number of wells, production reported, etc. There will also be a GMA production explorer and graphs for well use and type.



A web map will display information for wells of each district participating in the GDSS.

The web map will include a layer showing only wells with water level readings, allowing you to focus on those wells with water level data. A similar tool will only show wells that have production reported. A third tool will only show wells that have water quality reports. A GMA-wide virtual bore tool will be available on the web map, allowing a user to click on any cell within the GMA and see the aquifer layer and depth information at that point.



The web map will include the following features (assuming they have been populated in the originating district's GMS):

- Wells. Clicking a well will show:
  - The district it belongs to
  - The designated aquifer
  - The Lat/Lon Coordinates
  - Well depth

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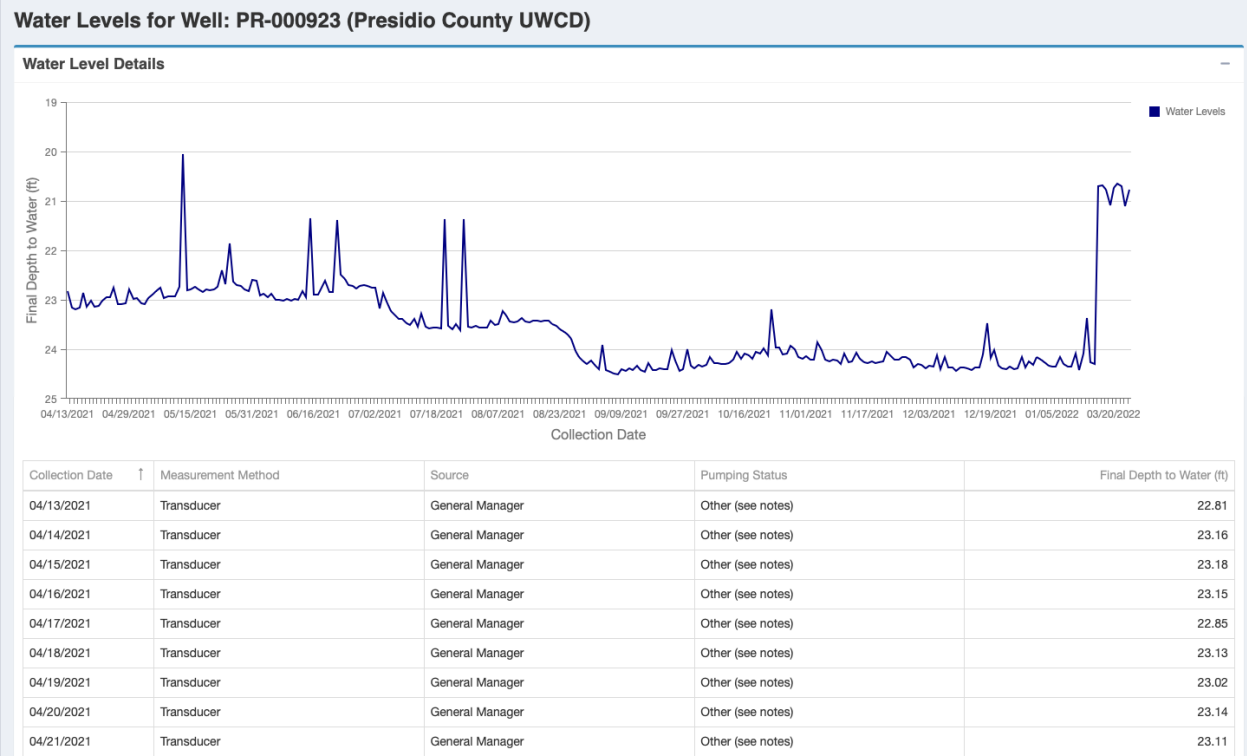
- District id for the well
- Whether it is a monitored well
- Well status
- TWDB state well number
- State well report
- The plugging report.
- A link to more well information (see above)
- Water levels. A link on the well information menu will open a water level reading page for the well. A graph of water levels will be shown, along with a tabular view of the actual readings.
- Link to production history, if any.
- Link to water quality history, if any.



Collection Date	Measurement Method	Source	Pumping Status	Final Depth to Water (ft)
04/13/2021	Transducer	General Manager	Other (see notes)	22.81
04/14/2021	Transducer	General Manager	Other (see notes)	23.16
04/15/2021	Transducer	General Manager	Other (see notes)	23.18
04/16/2021	Transducer	General Manager	Other (see notes)	23.15
04/17/2021	Transducer	General Manager	Other (see notes)	22.85
04/18/2021	Transducer	General Manager	Other (see notes)	23.13
04/19/2021	Transducer	General Manager	Other (see notes)	23.02
04/20/2021	Transducer	General Manager	Other (see notes)	23.14
04/21/2021	Transducer	General Manager	Other (see notes)	23.11

- Web map functionality
  - Toggle layers on and off
  - Printing
  - Measurement tool
  - Search

GIS Reference Layers – Halff will include data available from publicly available sources like TWDB, TNRIS, USGS, TCEQ, and others. Additional datasets can also be obtained or created to meet the needs of the GDSS. Reference layers available include:

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- TWDB/USGS monitoring wells
- TWDB Major/Minor aquifers
- Political jurisdictions
- TWDB groundwater index grid
- Groundwater Conservation District (GCD) boundaries
- FEMA floodplains
- CCN boundaries
- Geologic Atlas of Texas
- Surface water features, i.e., streams and water bodies
- NWS rainfall measurements/accumulations

Basemap Layers – standard basemap layers available from Esri:

- Aerial/Satellite imagery
- Streets
- Hybrid of imagery and streets
- Topographic
- National Geographic
- Light gray canvas

All web map GIS layers will be stored in Esri's enterprise geodatabase format. The geodatabase format supports importing and exporting the GIS data from various formats.

A query tool is included, allowing custom reports to be created from all data in the GDSS. The query tool will allow individual fields to be selected and unlimited filtering with advanced AND/OR conditions. For example, show all wells that are monitored AND are in Aquifer ABC AND with a water level reading between March 1 and September 30 in 2002 OR a water level reading anytime in 2004. The results of the queries can be downloaded as either CSV or an Excel file. If desired, predefined queries can be created to be selected as is or as a starting point for custom queries.

Estimated One-Time Fees

1.	GDSS Database setup:	$9,000
2.	District Setup (covering all districts in GMA 12):	$10,000
3.	Secure application:	$3,000
4.	Water Quality:	$6,500
5.	Production:	$4,000
6.	Dashboard:	$3,500
7.	GMA Aquifer Bore:	$7,800
8.	QA/QC:	$3,600

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Total: $47,400

Recurring Fees

1. ESRI named user license for each secured user login $100

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