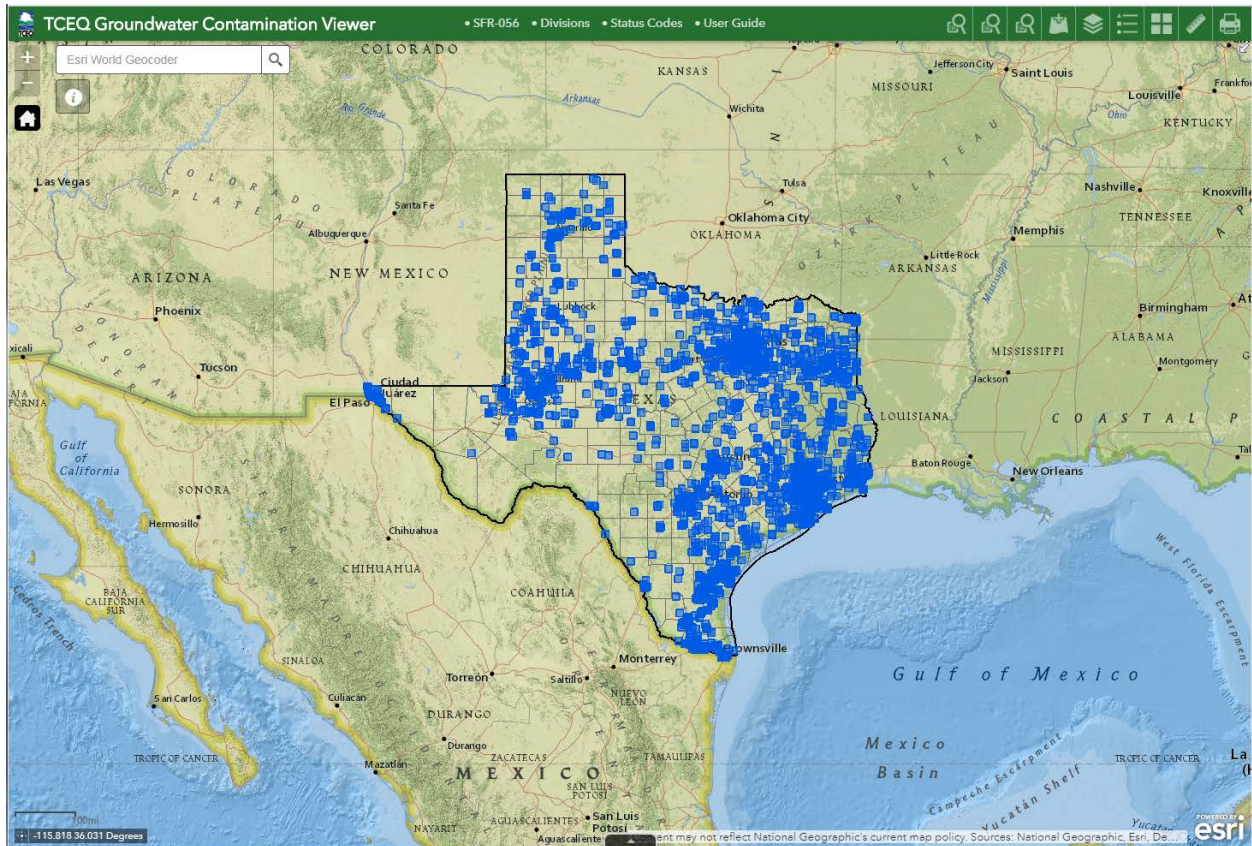


# Texas Commission on Environmental Quality (TCEQ) Groundwater Contamination Viewer

## User Guide

January 29, 2018



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## Introduction

Created by the Texas Legislature in 1989, the Texas Groundwater Protection Committee<sup>1</sup> (TGPC) strives to improve coordination between state and federal agencies involved in groundwater-related activities. A major responsibility of the TGPC is the publication of an annual *Joint Groundwater Monitoring and Contamination Report*<sup>2</sup> ("*Joint Report*"). For an audience of health and elected officials, Groundwater Conservation Districts (GCDs), and citizens in the state, the *Joint Report* describes the current status of groundwater monitoring activities conducted or required by each member of the TGPC, the groundwater protection programs of each TGPC member, and the enforcement status of each active and historic groundwater contamination case in the state.

Groundwater is defined by the TGPC as water existing below the land surface in a zone of saturation – that is, the water which completely fills the interconnected pore spaces of the rock or sediment. Groundwater contamination is defined by the TGPC as any detrimental alteration of the naturally-occurring quality of groundwater; it is limited, however, to contamination suspected of being associated with activities under the jurisdiction of the contributing agencies and affecting usable quality groundwater. Groundwater monitoring is conducted by members of the TGPC in order to assure regulatory compliance with groundwater protection, assess ambient groundwater quality, and conduct research activities.

This interactive, online map ("*Viewer*") of the active groundwater contamination cases in Texas that are documented in the current issue (and some previous issues) of the *Joint Report* has been developed in order to provide users with the ability to query the database and obtain spatial relationship information about the cases. Historic groundwater contamination cases can be found in the published report and will be added to this application in the near future. Over a dozen natural and administrative boundaries have also been provided in the *Viewer* for reference.

This map was generated by the Water Availability Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Water Availability Division at [wras@tceq.texas.gov](mailto:wras@tceq.texas.gov) or (512) 239-4691.

## Software requirements

For the best performance with this Viewer and its tools, please use the latest version of one of the browsers listed below:

- IE 9 and higher (Compatibility View is not supported);
- Edge;
- Firefox;
- Chrome;
- Safari;
- iOS Safari; or,
- Chrome for Android.

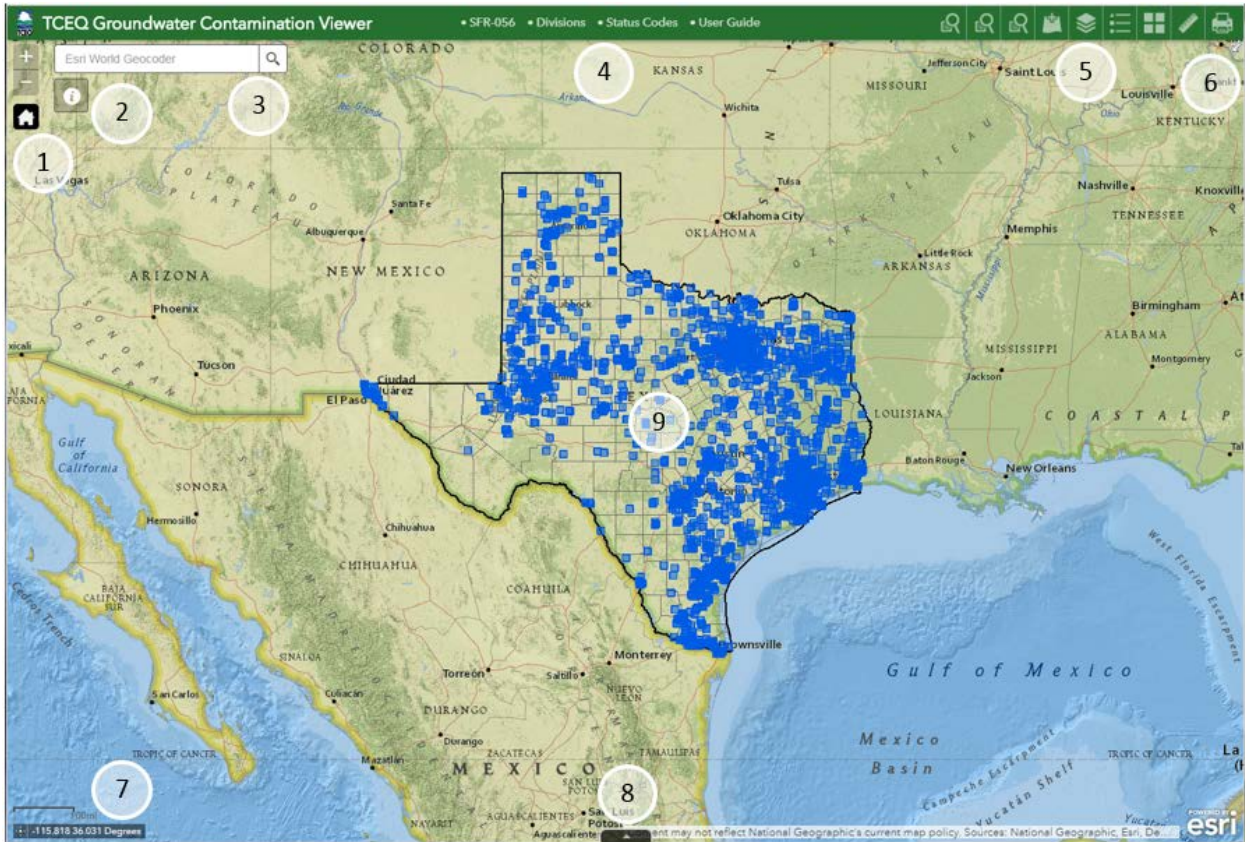
Please note that this Viewer works best in a Chrome browser.

## Author

The TCEQ Groundwater Planning and Assessment Team (GPAT) in the Water Availability Division (Office of Water) developed and maintains this application. Please contact us at [wras@tceq.texas.gov](mailto:wras@tceq.texas.gov) or (512) 239-4691 if you have any questions or find errors in the Viewer.

## Application Overview

The image below provides an overview of the Viewer's layout and tools. The following sections of this *User Guide* describe this information in greater detail.



1. Zoom In/Out and Home (Default extent)
2. Background Information
3. ESRI World Geocoder and Search
4. Links
5. Active File Number Search, Active File Name Search, Active Contamination Description Search, Add Data, Layer List, Legend, Basemap Gallery, Measurement, and Print
6. Show Map Overview
7. Scale Bar and Coordinate Display
8. Open Attribute Table
9. Points

## 1. Zoom In/Out and Home (Default extent)


### *Zoom In/Out*

Located in the top left portion of the Viewer's map, the Zoom In/Out buttons



provide interactive zoom controls in the map display. Click the plus or minus buttons to zoom in or out on the map. Scrolling the mouse wheel also zooms in and out; click and drag the mouse to pan across the map. Note that the ESRI ArcGIS Web AppBuilder 2D Widget Overview<sup>3</sup> provides additional details on all of the tools used in this Viewer.

### *Home (Default extent)*

Under the Zoom In/Out buttons, the Home (Default extent) button  returns the map to the initial map extent.

## 2. Background Information


To the right of the Zoom In/Out buttons, the Background Information button



provides additional content about the Viewer.

## 3. ESRI World Geocoder and Search

Above the Background Information button, the ESRI World Geocoder and

Search box  enables users to find locations or search features on the map. When you enter a place name or a keyword in the search box, you see suggestions below it as you type, and you can click on the best choice to select and zoom to it. You can also click on the magnifying glass on the right side to search on the word(s). When you execute your search, a pop-up appears at the location of the place name or feature and displays any available attribute information. Click on the ellipsis (i.e., the "..." icon) in the bottom right portion of the pop-up for additional functionality.

#### 4. Links

The following links can be found in the center of the Viewer's top green banner:

- SFR-056 – the webpage for the current version of the *Joint Report*;
- Divisions<sup>4</sup> – a PDF file that lists the Division acronyms for the groundwater contamination cases;
- Status Codes<sup>5</sup> – a PDF file that lists the Enforcement Status, Activity Status, and Data Quality codes for the groundwater contamination cases; and,
- User Guide<sup>6</sup> – this PDF file.

#### 5. Active File Number Search, Active File Name Search, Active Contamination Description Search, Add Data, Layer List, Legend, Basemap Gallery, Measurement, and Print

The following tools can be found on the right side of the Viewer's top green banner and they will be described in greater detail below.

#### *Active File Number Search, Active File Name Search, and Active Contamination Description Search*

The Active File Number Search, Active File Name Search, and Active



Contamination Description Search buttons enable queries of the active groundwater contamination cases database. They differ only in their search criteria. The Active File Number Search button will be explained here as the example, and the features of the other two queries are the same.

In the Tasks tab, click on the operational layer that you want to query; on the next Tasks panel, you can select a different operational layer by clicking on the left arrow at the top of the panel. Default text (not case sensitive) is displayed in the Query criteria text box. Click the green Apply button at the bottom of the Tasks tab and the default query results will be highlighted on the map and listed in the Results tab. Note that the query results include *all* of the records that *contain* the text that was entered (i.e., not just an exact match). Click on the ellipsis in the top right portion of the Results tab for additional functionality.

Go back to the Tasks tab and enter new text (not case sensitive) for a custom search. The default spatial filter is "Return features within full extent of the map", but you can also select "Only return features within current map extent" or "Only return features that intersect with the shape drawn on the map" from the pulldown. The latter two spatial filter options allow you to refine your query:

- If you leave the text box empty, select "Only return features within current map extent", and zoom in on the map, you can reduce your search results.
- If you leave the text box empty, select "Only return features that intersect with the shape drawn on the map", zoom in on the map, draw a shape (rectangle, circle, polygon, or freehand polygon) on the map, and apply a search distance (if desired), you can select specific records within your area of interest.
- If you enter new text in the text box, select "Only return features that intersect with the shape drawn on the map", zoom in on the map, draw a shape (rectangle, circle, polygon, or freehand polygon) on the map, and apply a search distance (if desired), you can limit the search results to only those records that meet your search criteria within your area of interest.

In the Results tab, note that the last field in each record is GEOLOCATION ACCURACY CONFIDENCE LEVEL; its values are either HIGH, MEDIUM, or LOW, as explained below:

- All Superfund Site records have confirmed latitude and longitude coordinate values and were assigned a GEOLOCATION ACCURACY CONFIDENCE LEVEL of HIGH;
- All other records that were submitted with latitude and longitude coordinate values were assigned a GEOLOCATION ACCURACY CONFIDENCE LEVEL of MEDIUM; and,
- Records without latitude and longitude coordinate values had to be geocoded and were therefore assigned a GEOLOCATION ACCURACY CONFIDENCE LEVEL of LOW. In addition, any records whose submitted latitude or longitude coordinate values had to be adjusted (e.g., the longitude was missing the "-" sign) were also assigned a GEOLOCATION ACCURACY CONFIDENCE LEVEL of LOW.



## *Add Data*



The Add Data button enables users to temporarily add data by searching for layers in ArcGIS Online or Portal for ArcGIS, entering URLs, or uploading local files including shapefiles, CSV, KML, GPX, and GeoJSON. Note that users cannot save this data to the map.

On the Search tab, choose the scope of your search from the three pulldown choices, and then click ADD on the specific Search Result item to add it to the map. The added layer will appear in the Layer List, as well. Similarly, additional content can be added through the URL and File tabs.

## *Layer List*



The Layer List button provides a list of operational layers and their symbols, and allows you to turn individual layers on and off. Each layer in the list has a check box that allows you to easily control its visibility on the map. Layers having gray expansion arrows on the left indicate that they contain sublayers or subtypes; click on the arrow to expand the layer. Click on the ellipsis to the right of each layer, as well as the three-line check mark in the upper right portion of the Layer List, for additional functionality (e.g., View in Attribute Table).

## *Legend*



The Legend button displays labels and symbols for the layers and sublayers that are visible in the map.

## *Basemap Gallery*


The Viewer's default basemap is National Geographic. The Basemap Gallery



button allows the user to select a different basemap from 11 other options.


## Measurement




The Measurement button  allows the user to measure the area of a polygon, length of a line, or find the location (i.e., latitude and longitude coordinate values) of a point in various units. Note that this Viewer uses the Web Mercator projection which distorts area and distance as scale decreases (i.e., as you zoom out), and therefore the Measurement tool may not provide data suitable for legal, engineering, or surveying purposes.

## Print



The Print button  connects the web application with a printing service (if available). Users can enter a map title, select the type of layout and format for the exported map, and then click on the Print button. Click on the Advanced button to open a menu with advanced print options related to map scale/extent, labels, layout metadata, map size, and print quality.

## 6. Show Map Overview

Found on the map in the top right corner of the Viewer, just under the green banner, the angled white Overview Map arrow  displays the current extent of the map within the context of a larger area and updates whenever the map extent changes. The current extent of the map is represented in the Overview Map as a gray rectangle, and the current extent can be modified by clicking and dragging the gray rectangle.

Click the angled white Overview Map arrow to expand or fold up the Overview Map. When the Overview Map is expanded, click the four-arrow box to temporarily maximize it; click the four-arrow box again, or click and drag the gray rectangle, to exit the temporary view.

## 7. Scale Bar and Coordinate Display


### Scale Bar

Located in the bottom left portion of the Viewer's map, the Scale Bar




is updated dynamically when the map's scale changes.

## Coordinate Display

Located below the Scale Bar, the Coordinate Display  provides latitude and longitude coordinate values which change dynamically when the mouse pointer moves to different locations on the map. By clicking on the four-line box on the left side, you can then click on the map to add a point, highlight the coordinates in the Coordinate Display, and then copy/paste the coordinates; click the four-line box again to reset the Coordinate Display.

## 8. Open Attribute Table


The Attribute Table button  in the bottom center of the Viewer's map displays a tabular view of the attributes for the current active groundwater contamination cases and any other operational layers that were added using the Layer List tool or a pop-up. Click on the button to open and close the Attribute Table; click and drag the gray horizontal line under the arrow on the button to resize the Attribute Table.

Clicking on a row in the left most column of the Attribute Table selects a record in the table and highlights the corresponding feature in the map. Use the Shift or Ctrl keys to select and deselect multiple records. Double-clicking any field in the selected record(s) will zoom to the feature(s) on the map and open its pop-up. The total number of features, and the number of selected features, are shown in the lower left portion of the Attribute Table.

Tools available in the upper left portion of the Attribute Table include Options, Filter by Map Extent, Zoom to, Clear Selection, and Refresh. Note that the Filter by Map Extent tool is turned off by default; clicking on this tool will turn it on and populate the Attribute Table with only those records for that operational layer that can currently be seen on the map. Clicking the Home button also resets the Attribute Table. The Options tool allows you to Show Selected Records, Show Related Records, Filter, Show/Hide Columns, and Export to CSV. You can also show or hide columns by clicking the + icon in the top right portion of the Attribute Table.

## 9. Points

The Viewer should open with the active groundwater contamination cases as

per the current *Joint Report* symbolized as colored points  on the map; if your device has a small display, zoom in until you see the points. The points from each issue of the *Joint Report* are symbolized differently. If you click on one of these points, or anywhere inside Texas, the selected

feature(s) will be highlighted and you will get a pop-up with information about the operational layers that are checked on at that location. Depending on the size of your device:

- Click on the white arrow on the right side or top right portion of the pop-up to scroll forward and backward through the layer information; and,
- Click on the ellipsis in the bottom left or bottom right portion of the pop-up to Pan to, Add a marker, and View in Attribute Table.

On devices with large displays, click on the "Zoom to" link in the bottom left portion of the pop-up to zoom to the layer feature.

Note that:

- Although the Texas layer is turned on, its default pop-up information has been disabled; and,
- If you click too close to multiple features in a layer (e.g., close to a county border), the pop-up will include the information for all of those features; zoom in on the map to refine the results.

## References

<sup>1</sup> Texas Groundwater Protection Committee, <http://tgpc.texas.gov/>

<sup>2</sup> *Joint Groundwater Monitoring and Contamination Report*, TCEQ publication SFR-056, <https://www.tceq.texas.gov/publications/sfr/056>

<sup>3</sup> ESRI ArcGIS Web AppBuilder 2D Widget Overview, <http://doc.arcgis.com/en/web-appbuilder/create-apps/widget-overview.htm>

<sup>4</sup> Divisions, [https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/joint\\_report/Divisions.pdf](https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/joint_report/Divisions.pdf)

<sup>5</sup> Status Codes, [https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/joint\\_report/StatusCodes.pdf](https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/joint_report/StatusCodes.pdf)

<sup>6</sup> *User Guide*, [https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/joint\\_report/UserGuide.pdf](https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/joint_report/UserGuide.pdf)