

### ***About PHOENIX***

The Department of Energy has partnered with the Pacific Northwest National Laboratory on PHOENIX, a family of spatially enabled web applications providing quick access to decades of valuable scientific data and insight through intuitive query, visualization, and analysis tools.

PNNL-Hanford Online ENvironmental Information eXchange provides a single access point to multiple data sets via standard web browsers. PHOENIX also provides data visualization tools and provides explanations of key data sets to aid understanding. PHOENIX applications are based on the innovative technology applied by the Pacific Northwest National Laboratory (PNNL) to access and visualize other environmental data sets at the Hanford Site.

By integrating previously isolated datasets and developing relevant visualization and analysis tools, PHOENIX applications are enabling DOE to discover new correlations hidden in legacy data, allowing them to more effectively address complex issues at Hanford.

### ***About GIS Explorer***

GIS Explorer provides easy access to the rich set of geospatial data and imagery that characterize historical and current conditions at the Hanford site.

Bookmarks take the user straight to various features on the Hanford site, while a measurement tool provides linear and areal measurements in US or metric units. An "Identify" tool identifies all the features in a user-drawn area on the map and provides the option to send the resulting list to other PHOENIX applications to further investigate environmental sample results or other data associated with the selected features.

GIS Explorer is GPS enabled, using the user's device's GPS capabilities to locate the user on the map.

### ***Questions, Comments, Concerns, Feedback?***

Contact the PHOENIX team: [PHOENIX@pnnl.gov](mailto:PHOENIX@pnnl.gov)

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Click to access the PHOENIX Menu

Use the **Identify** tool to search for or identify features on certain GIS layers (e.g., wells, tanks, tank farms), and send the results to other applications (e.g., Well Dashboard, Well Contaminants Explorer, Well Comparison Explorer, Tank Farms Dashboard).

Use the **Bookmarks** tool to quickly zoom to pre-determined Site locations.

Use the **Measure** tool to measure the distance and area of Site features.

Use the **Legend** tool to view relevant symbology of enabled layers.

Use the + and – icons to zoom in and out of the map. Users can also zoom in and out of the map using the mouse scroll and can use the mouse cursor to pan the map extents.

Click the “PHOENIX” icon to return to the application gallery.

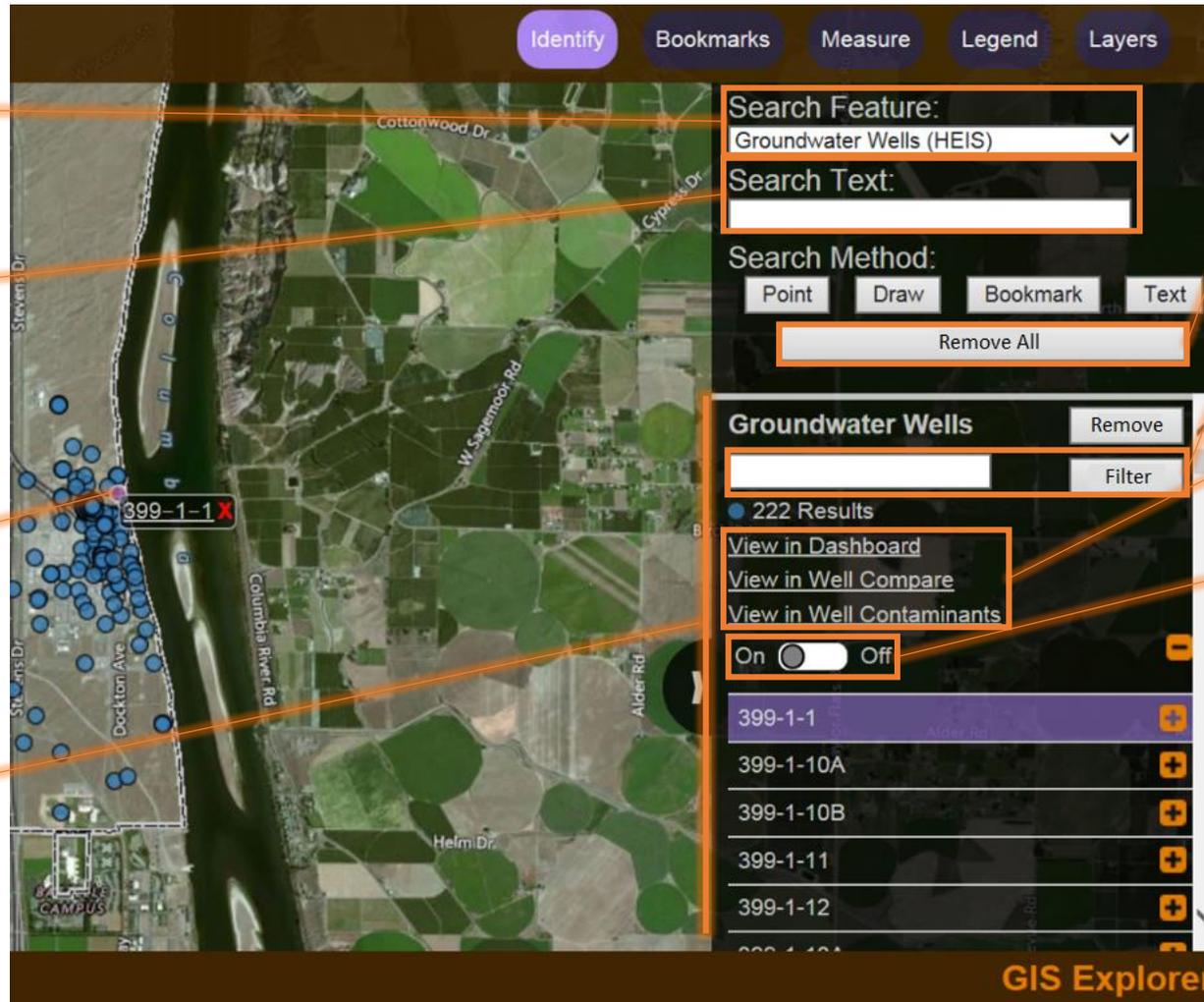
Add data layers to the map view.

Toggle between Bing Aerial image or Bing Roads basemap.

Click on a layer to view on map. Click on the [+ ] icon to expand the layer details to change layer transparency, and view layer metadata.



### Identify Tool – Overview



Select a layer to identify features in the **Search Feature** drop-down.

Optionally put in **Search Text** to refine the Search Feature results. To apply the Search Text, input your text and click the **Text** button.

Selected wells have a name dialog that appears next to the well. Clicking on the well name link will open the Well Dashboard for that well.

Multiple Search Features can be searched at once. Search results will be grouped by search feature and displayed in the order you searched. See next page for an example.

Click **Remove All** or to clear the entire results panel.

Optionally put in text to filter the results. The filter works on all attributes of the features, not just the name. Click **Filter** to apply the search text.

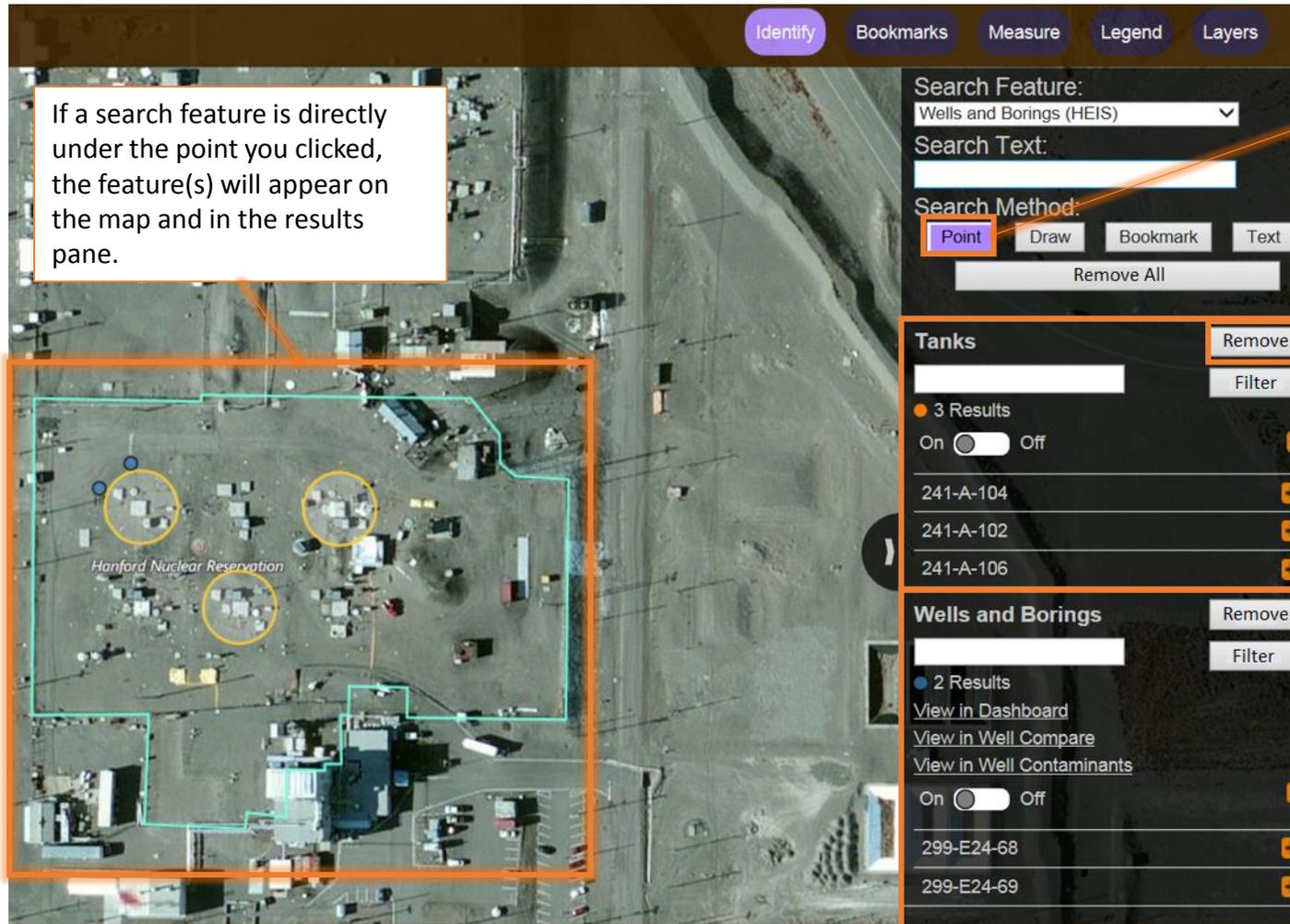
View resulting wells in another application.

Turn the visibility of the results on and off of the map.

Note: Functionality on pages 4 through 7 are applicable to the following GIS spatial layers:

- Wells and Boring (HEIS)
- Groundwater Wells (HEIS)
- Aquifer Tubes (HEIS)
- Inj-Ext Wells (HEIS)
- Tanks
- Tank Farms

### Identify Tool – Point Method



The screenshot shows the GIS Explorer interface with the Identify tool active. The map displays an aerial view of the Hanford Nuclear Reservation. Several features are highlighted with yellow circles. The right-hand panel shows search results for 'Wells and Borings (HEIS)' and 'Tanks'. The 'Point' button is highlighted in the Search Method section. The 'Remove' button is visible for each search feature section.

**Search Feature:** Wells and Borings (HEIS)  
**Search Text:** [Empty field]  
**Search Method:** Point (highlighted), Draw, Bookmark, Text  
**Remove All**

**Tanks** [Remove] [Filter]  
● 3 Results  
On [Off]  
241-A-104 [ + ]  
241-A-102 [ + ]  
241-A-106 [ + ]

**Wells and Borings** [Remove] [Filter]  
● 2 Results  
[View in Dashboard](#)  
[View in Well Compare](#)  
[View in Well Contaminants](#)  
On [Off]  
299-E24-68 [ + ]  
299-E24-69 [ + ]

If a search feature is directly under the point you clicked, the feature(s) will appear on the map and in the results pane.

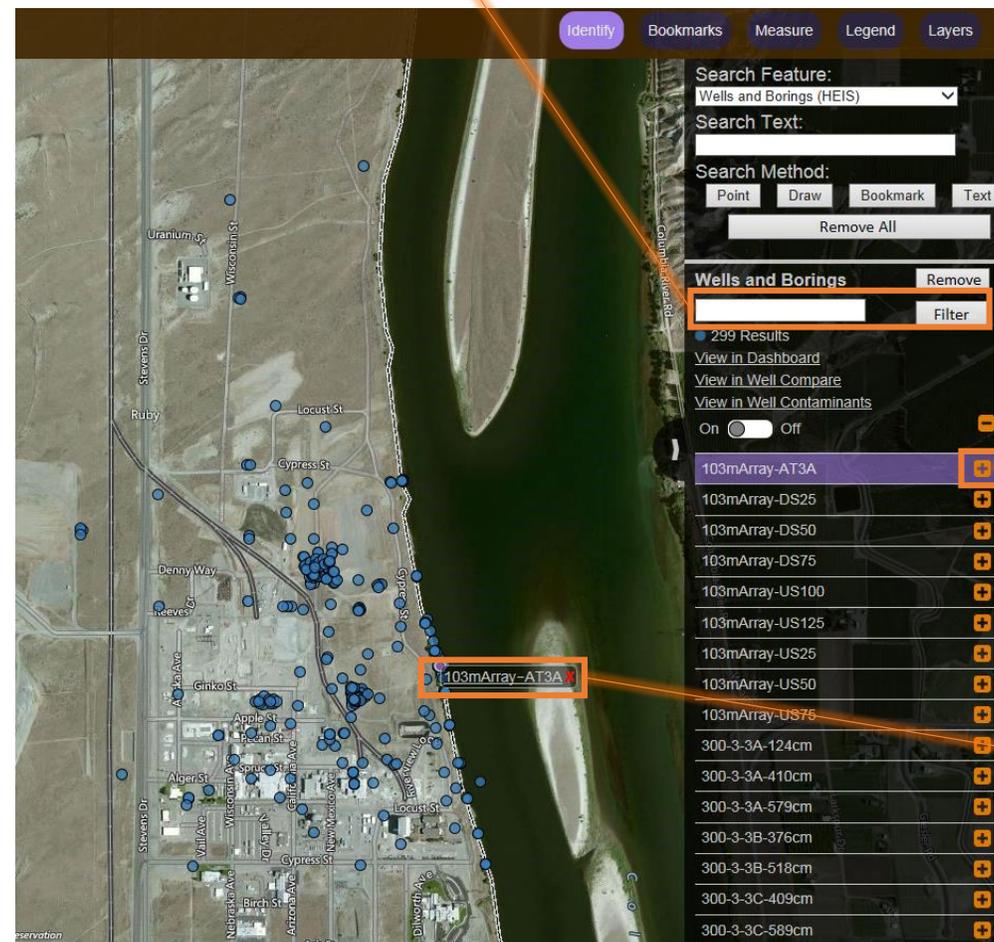
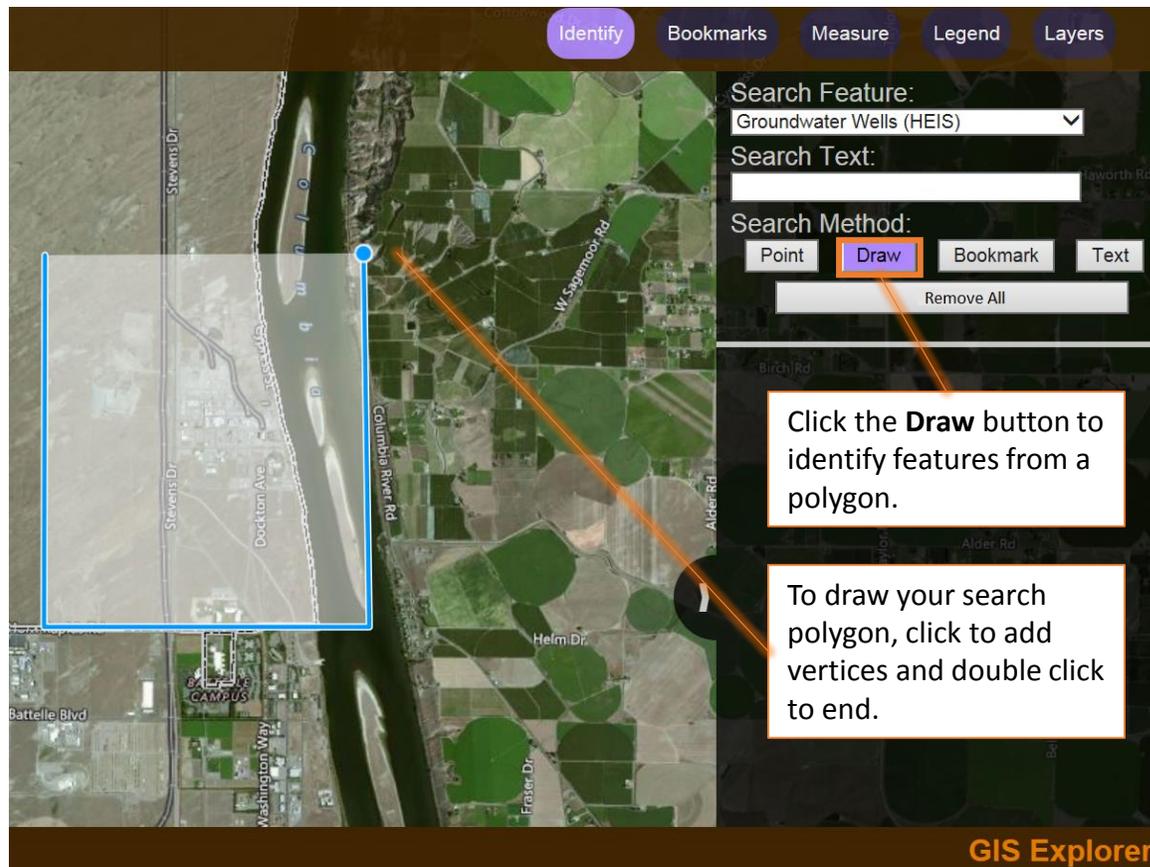
To search for features on the map using the point and click method, highlight the **Point** button and place your cursor on the point you would like to search for features, and click.

You can clear a search feature section by clicking the **Remove** button.

Multiple Search Features can be searched at once. Each feature's search results will be grouped by feature and displayed in the order you searched.

### Identify Tool – Draw Method

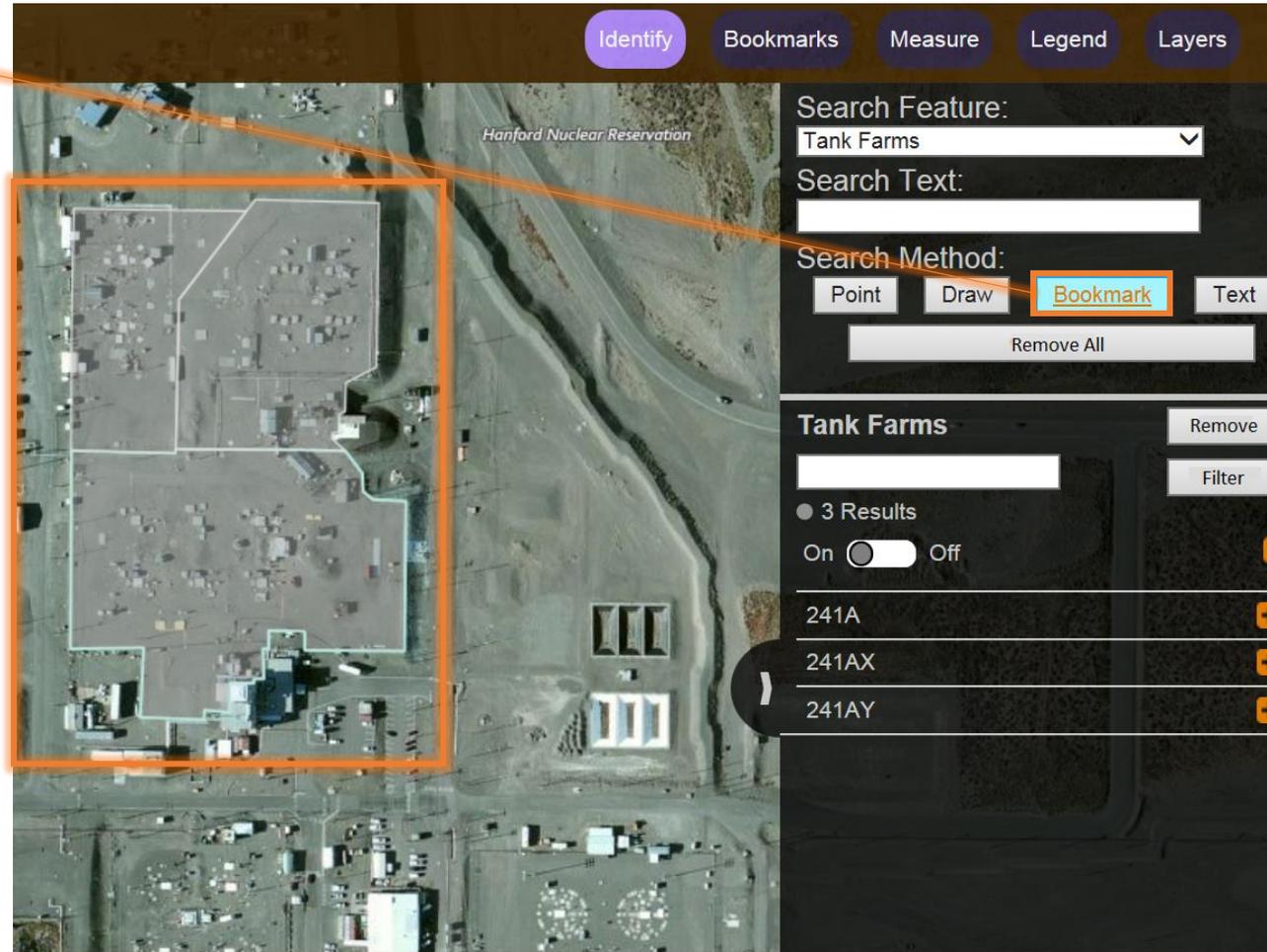
Optionally put in text to filter the results. The filter works on all attributes of the features, not just the name.



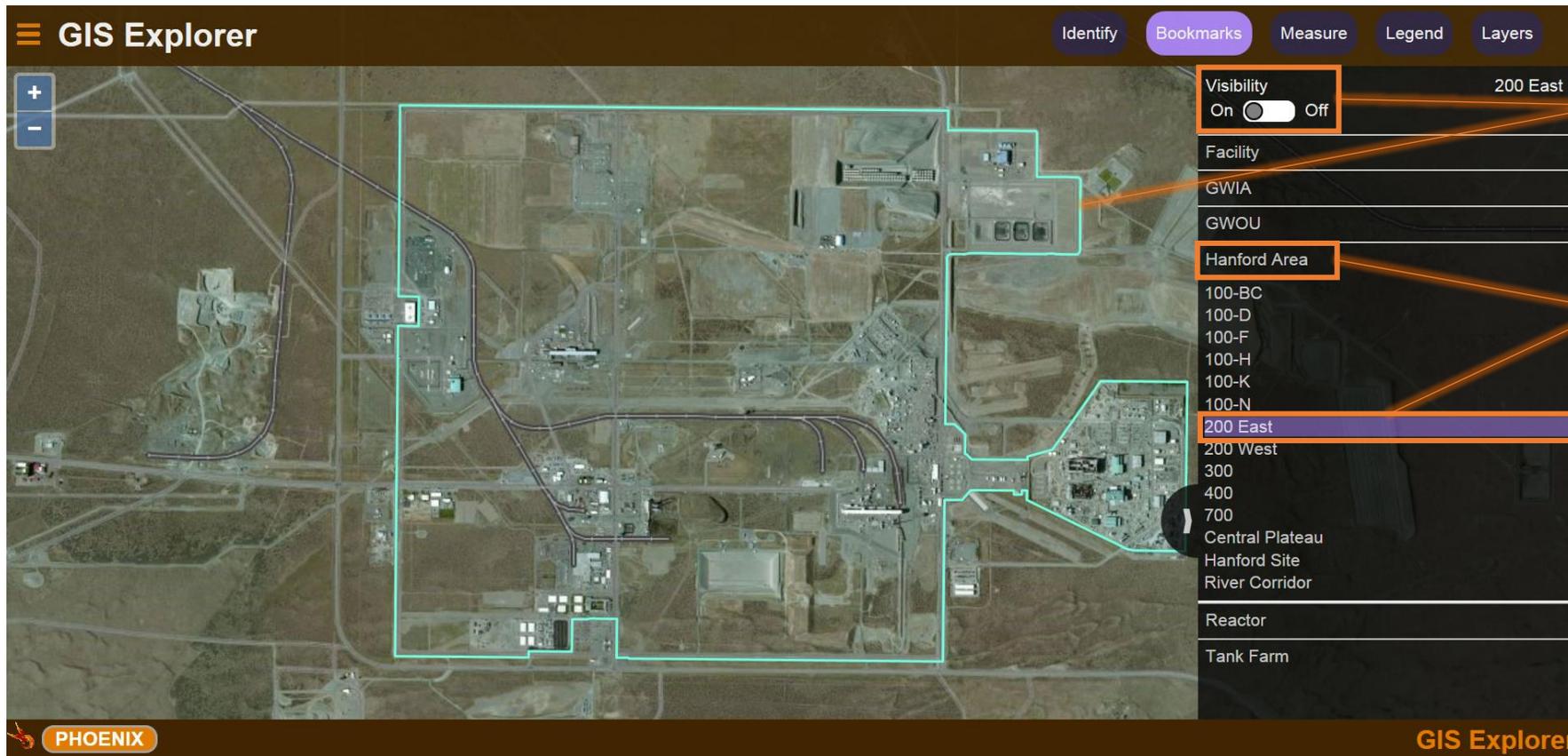
### Identify Tool – Bookmark Method

The **Bookmark** search method allows users to search for features within their currently selected bookmark.

To use this method, go to the Bookmarks tool and select a bookmark based on the area you are interested in searching. Navigate back to the Identify tool, select a Search Feature you want to search for and click the **Bookmark** button. All features within the bookmark extent will be highlighted in the map, and returned in the search results.



### Bookmark Tool



The screenshot shows the GIS Explorer interface. At the top left, there is a menu icon and the text "GIS Explorer". Below this are zoom in (+) and zoom out (-) buttons. The main area is an aerial map with a cyan boundary around a facility. On the right, there is a sidebar with a list of bookmarked locations. The "200 East" location is highlighted in purple. Above the list is a "Visibility" section with a toggle switch set to "On". At the bottom left, there is a "PHOENIX" logo, and at the bottom right, the text "GIS Explorer" is displayed.

Visibility	200 East
On <input checked="" type="checkbox"/>	
Off <input type="checkbox"/>	
Facility	
GWIA	
GWOU	
Hanford Area	
100-BC	
100-D	
100-F	
100-H	
100-K	
100-N	
200 East	
200 West	
300	
400	
700	
Central Plateau	
Hanford Site	
River Corridor	
Reactor	
Tank Farm	

Turn the boundary of the bookmarked feature on and off.

Click on a category to expand the list of bookmarked locations within that category. Click on a bookmark to zoom to the selected location. The selected bookmark will be highlighted in purple.

### Measure Tool

Click the **Polygon** icon to measure an area of a user defined polygon. Click the **Line** icon to measure a distance of a user defined line.



**GIS Explorer**

Identify Bookmarks **Measure** Legend Layers

Measure distance or area

Clear All

Labels  On  Off

Units  Metric  US

84,223.07 ft Sq

398.79 ft

Hanford Nuclear Reservation

PHOENIX GIS Explorer

To draw a polygon for measuring area, click to start the polygon and click to add polygon vertices and double click to end the polygon.

To draw a line for measuring distance, click to start the line and click to add line vertices and double click to end the line.

Click **Clear All** to clear any measurements on the map and begin a new measurement.

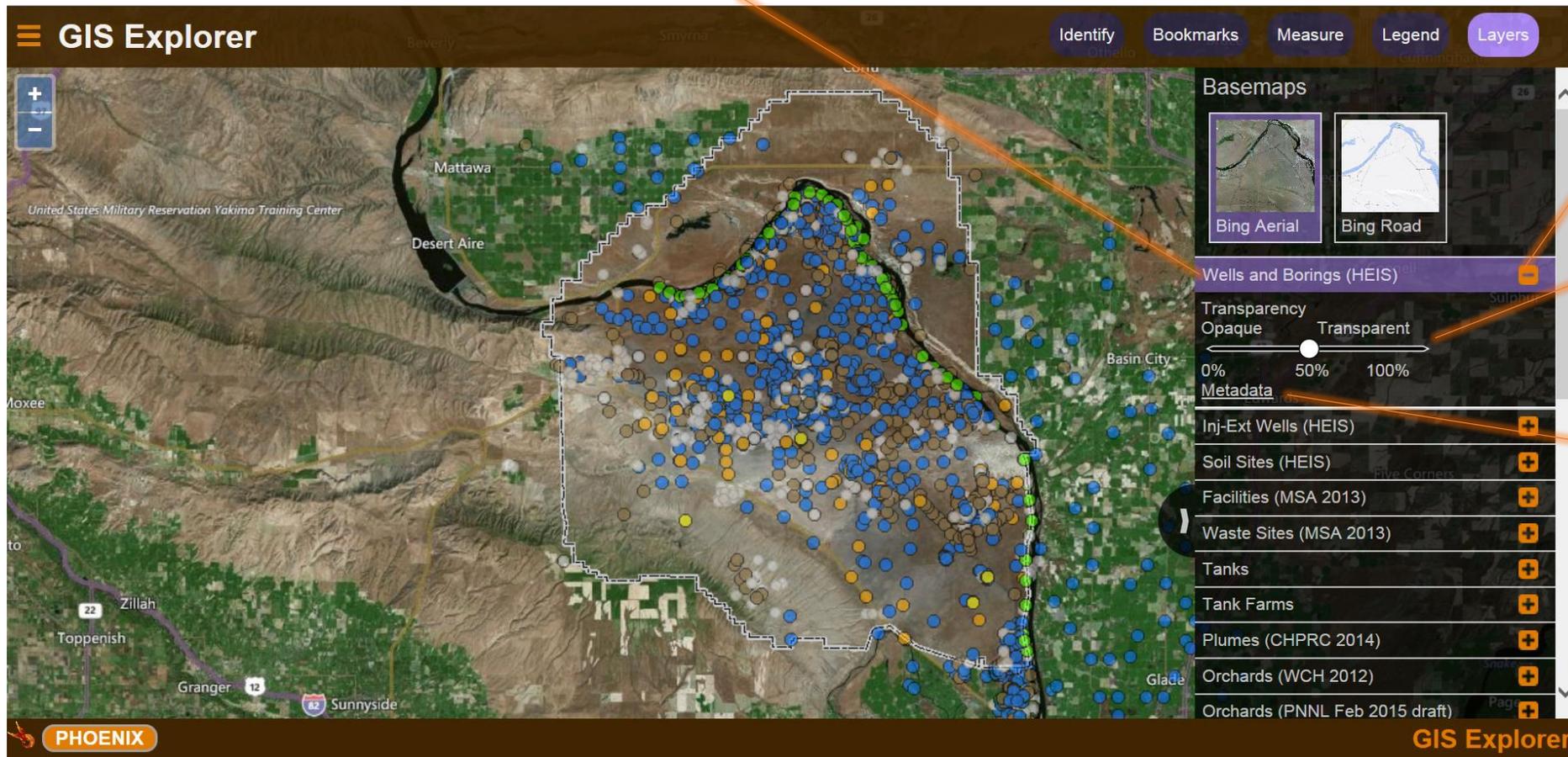
Change the units of measurement from metric (m or sq km) to US (ft or mi).

Toggle the measurement labels on the map on and off.

Measurement results list.

### Layers Tool

Select a layer to display on the map (selected layers will be highlighted in purple). Multiple layers can be selected and viewed at once.



GIS Explorer

Identify Bookmarks Measure Legend Layers

Basemaps

Bing Aerial Bing Road

Wells and Borings (HEIS)

Transparency  
Opaque Transparent  
0% 50% 100%

Metadata

Inj-Ext Wells (HEIS)

Soil Sites (HEIS)

Facilities (MSA 2013)

Waste Sites (MSA 2013)

Tanks

Tank Farms

Plumes (CHPRC 2014)

Orchards (WCH 2012)

Orchards (PNNL Feb 2015 draft)

PHOENIX GIS Explorer

Click on the **[+]** icon to expand the layer.

Users can change the transparency of the layer by moving the bar between 0% (fully shown) and 100% (fully transparent).

Click **Metadata** to view metadata for the layer (Metadata details on next page).

The display order of the layers on the map can be changed by dragging layers to the desired location within the layer list.

## Layers Tool (Metadata)



Click **Metadata** to open a webpage with metadata for a specific layer.

### ng\_facilities\_msa\_sym\_label (MapServer)

**View In:** [ArcGIS JavaScript](#) [ArcGIS.com Map](#) [Google Earth](#) [ArcMap](#) [ArcGIS Explorer](#)

**View Footprint In:** [ArcGIS.com Map](#)

**Service Description:**

**Map Name:** Layers

[Legend](#)

[All Layers and Tables](#)

**Layers:**

- [Facilities \(MSA Sept 2012\)](#) (0)

**Description:**

**Copyright Text:**

**Spatial Reference:** 102113 (3785)

**Single Fused Map Cache:** false

**Initial Extent:**

XMin: -1.325863070787794E7  
YMin: 5856603.324014522  
XMax: -1.3252270475022057E7  
YMax: 5898732.0633884  
Spatial Reference: 102113 (3785)

**Full Extent:**

XMin: -1.33342154125E7  
YMin: 5836860.534500003  
XMax: -1.3276685770399999E7  
YMax: 5895927.076899998  
Spatial Reference: 102113 (3785)

**Units:** esriMeters

**Supported Image Format Types:** PNG32,PNG24,PNG,JPG,DIB,TIFF,EMF,PS,PDF,GIF,SVG,SVGZ,BMP

**Document Info:**

**Title:** FacilitiesOfTheHanfordSite

**Author:** US Dept of Energy, Mission Support Alliance, Geospatial Information Management

**Comments:** Publicly cleared Facilities layer obtained from Mission Support Alliance (MSA) in September 2012. Contact Doug Fenske, MSA, (509) 373-9076 This data depicts facilities of the Hanford Site as polygons that usually match their footprint at grade. Many of the facilities are underground, but are not distinguished as such in the attributes. For some features it can be deduced from the "Narrative" attribute value whether it is underground. This is a subset of the Hanford Geographic Information System dataset called "bggenexs", which also includes some facilities outside of the Hanford Site. Published: 8/28/2012 PNNL Service (non-authoritative source) Layer Modifications: Re-projected features to web Mercator, Simplified polygons, Symbolized and labeled. Version: 1/15/2015

**Subject:** Above and below grade facilities at Hanford

**Category:**

**Keywords:**

**AntialiasingMode:** None

**TextAntialiasingMode:** Force

**Supports Dynamic Layers:** false

**MaxRecordCount:** 1000

**MaxImageHeight:** 2048

**MaxImageWidth:** 2048

**Supported Query Formats:** JSON, AMF

**Min Scale:** 0

**Max Scale:** 0

**Child Resources:** [Info](#)

**Supported Operations:** [Export Map](#) [Identify](#) [Find](#) [Return Updates](#)

View the layer in one of the formats listed.

Spatial reference of the data layer.

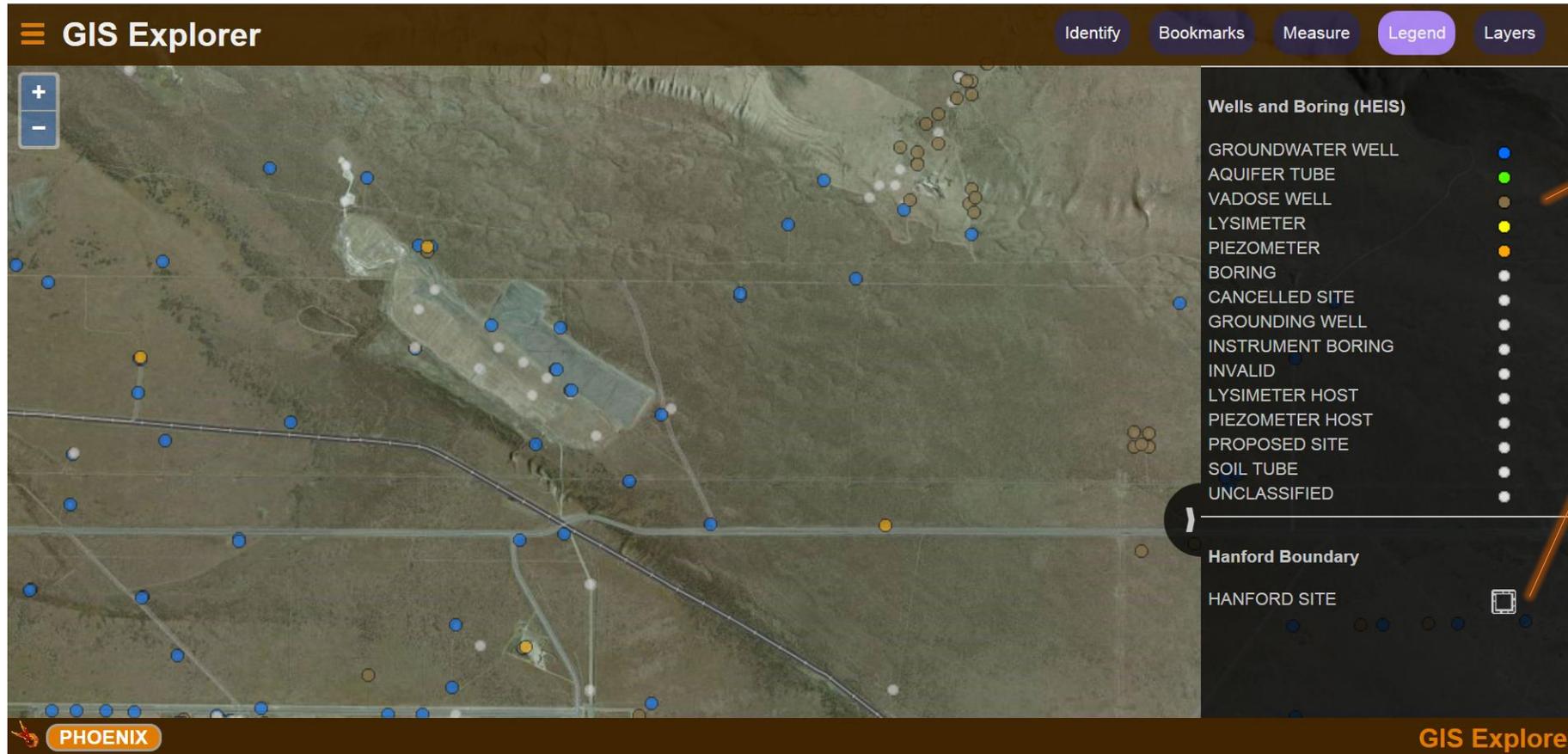
Spatial extent of the data layer.

Spatial units of the data layer.

Document information for the given layer.

User operations with the selected layer.

### Legend Tool



GIS Explorer

Identify Bookmarks Measure Legend Layers

Wells and Boring (HEIS)

- GROUNDWATER WELL
- AQUIFER TUBE
- VADOSE WELL
- LYSIMETER
- PIEZOMETER
- BORING
- CANCELLED SITE
- GROUNDING WELL
- INSTRUMENT BORING
- INVALID
- LYSIMETER HOST
- PIEZOMETER HOST
- PROPOSED SITE
- SOIL TUBE
- UNCLASSIFIED

Hanford Boundary

- HANFORD SITE

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GIS Explorer

View layer symbology for all enabled layers.

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