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Overview

The Geospatial Environmental Mapping System (GEMS) was designed to provide dynamic mapping and environmental monitoring data display for sites managed by the U.S. Department of Energy (DOE) Office of Legacy Management (LM). The information made available and the environmental data display tools developed for GEMS are the result of input from various stakeholders including DOE and contractor staff, regulatory agencies, and members of the public.

How to Access the Site

To access GEMS, navigate to the following URL in your browser:

<http://gems.lm.doe.gov/>

Make sure to use a modern browser. Version 2+ works best with Google Chrome (ver. 33+), Mozilla Firefox (ver. 27+), or Microsoft Internet Explorer (IE) (ver. 10).

All data is read-only access and no user settings are persisted.

Home Page Content

By default, the GEMS application opens up in a browser tab with geographic focus set to a map extent depicting all of North America, Central America and the Caribbean, centered on the CONUS (Continental United States), at a mapscale of about 1:37M. Below [Figure 1. GEMS Application Home Page], is the map view and application framework which will be shown when GEMS is loaded to the browser:

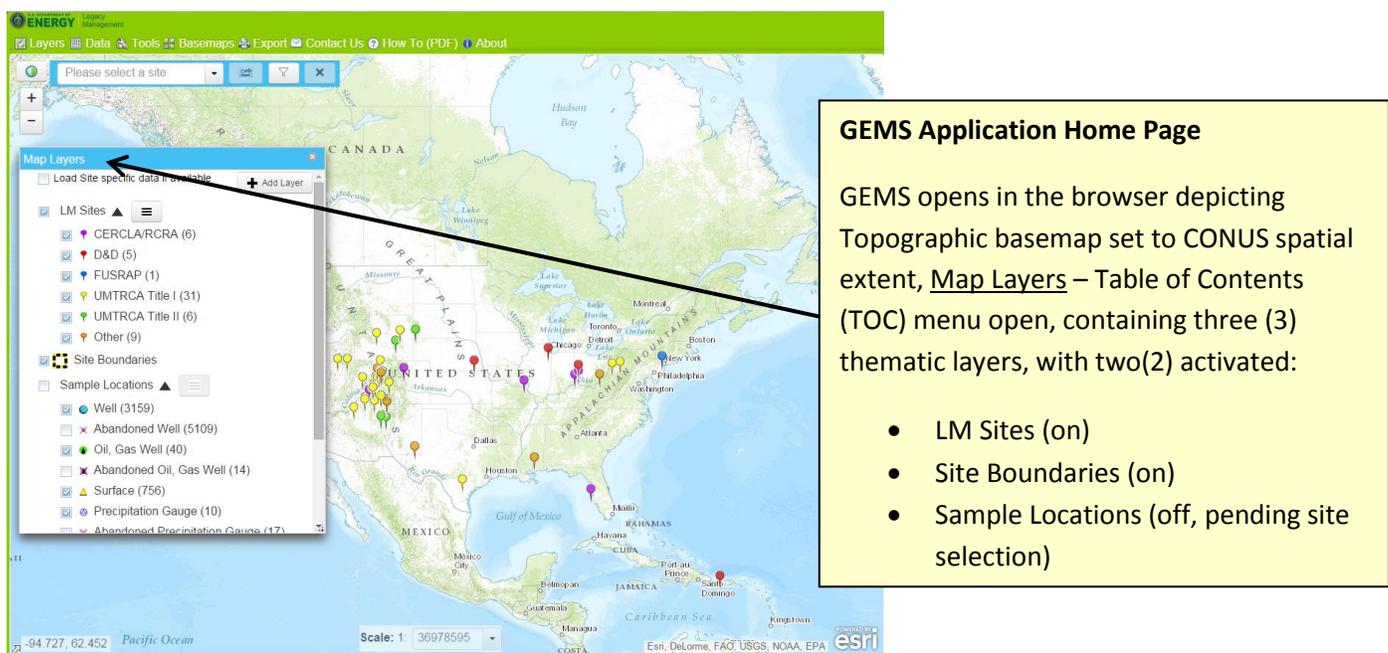


Figure 1. GEMS Application Home Page

BASEMAP: The GEMS map composition emulates the ESRI-ArcGIS OnLine display functionality providing a background “BaseMap”, or cultural feature backdrop, called the “Topographic” view style (this is the default setting). The initial cartographic display is a colorized shaded relief with continental boundaries, shoreline, and generalized hydrography, transportation layers, geo-political boundaries, bathymetry, and more. Please refer to the [Base Maps](#) section of the document [Figure 2 Basemaps Menu Item] for more detailed information on this context reference layer.

MAP LAYERS: In addition to the GEMS home page basemap composition [Figure 1. GEMS Application Home Page], the application also opens with the “Map Layers” Table of Contents (TOC) menu displayed on the left side of the page. Two geographically co-registered thematic layers will be activated for display on the basemap, they are:

- LM Sites – CERCLA/RCRA, D&D, FUSRAP, UMTRCA Title I & II, plus others
- Site Boundaries
- Sample Locations

See the section on Map Layers for further explanation. Reference link: [Map Layers](#)

Map Tools

After exploring and learning the functionality of the GEMS application for Map Layers and Data, please consult the section on [Map Tools](#) for a lesson on powerful map and cartographic utilities provided to the user.

Map Utilities include:

- Locate Address
- Locate Coordinates
- Locate Features
- Measure

Cartographic Utilities include:

- Draw Coordinate
- Draw Text (annotation/label)
- Draw Point, Line and Polygon

These powerful utilities may be used to capture maps, features, and data in support of engineering or scientific reporting. The creative use of GIS tools and Map composition can play an important role as exhibits, figures and diagrams in support of persuasive documentation.



Recent Features and Functionality – What’s New

This section lists some of the recent feature(s) and functionality additions and/or updates to the Geospatial Environmental Mapping System (GEMS) application.

- GEMS now pulls sample results and related data for reporting from SeePro into a standalone warehouse
- GEMS reports now use the data in the warehouse
- GEMS now has a time slider for aerial imagery allowing users to quickly display site-based imagery through time (more years of imagery will be added to GEMS over the next months)
- GEMS now has better coordination between the data available for reports and the data displayed on the map. The location selection in the report widget will honor the current selection of location types from the map layers widget. This is a change from the old behavior of forcing all location types to become selected when running a report.
- The “Show on Map” behavior for a GEMS report now allows the user to click additional sample locations after one has already been clicked
- The links for basemaps in the gallery now have more meaningful names if the base has more than a single layer
- External services with group layers now add and remove from the Layers menu correctly
- When the default GEMS map services are unavailable, GEMS will load and display a message. Previously the “waiting” screen never went away.

Base Maps

A basemap provides a background of geographical context for the content you want to display in a map. When you create a new map, you can choose which basemap you want to use. You can change the basemap of the current map at any time by using the basemap gallery. When the GEMS application loads, the default base map is the Topographic BaseMap.



Figure 2 Basemaps Menu Item

Use the Basemaps feature by clicking the 'Basemaps' menu item. A dialog will appear displaying the basemap options available.

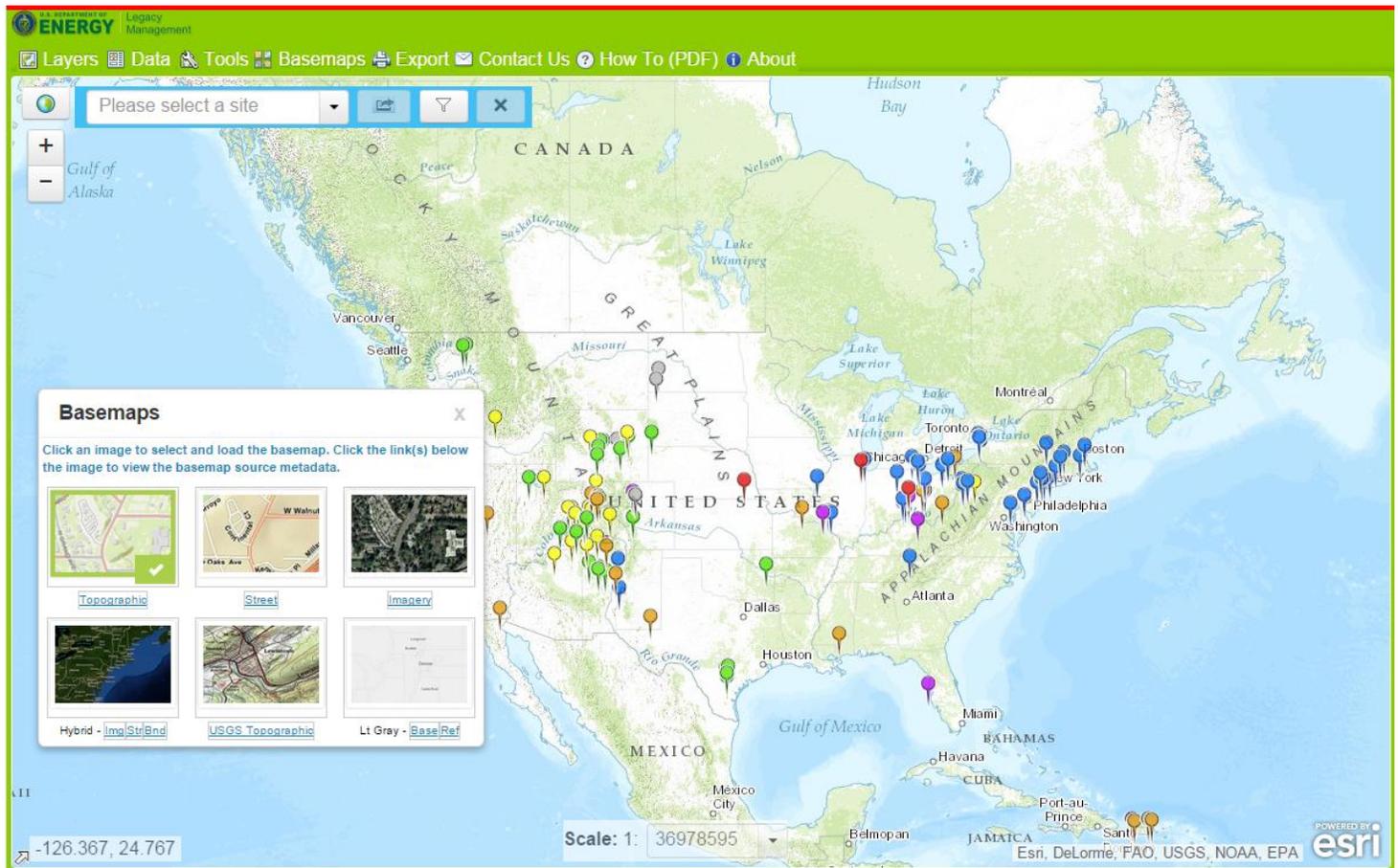


Figure 3 Basemaps Dialog

The basemap gallery includes a variety of choices, including topography, imagery, and streets (transportation layers). The selected base map will have a green checkmark [A Figure 4. Basemap Gallery]. Click on one of the thumbnail images [B Figure 4. Basemap Gallery] in the gallery to select and load the desired view. Click on the Title below the thumbnail image, which is a Hyperlink [C Figure 4. Basemap Gallery] to the base map source metadata.

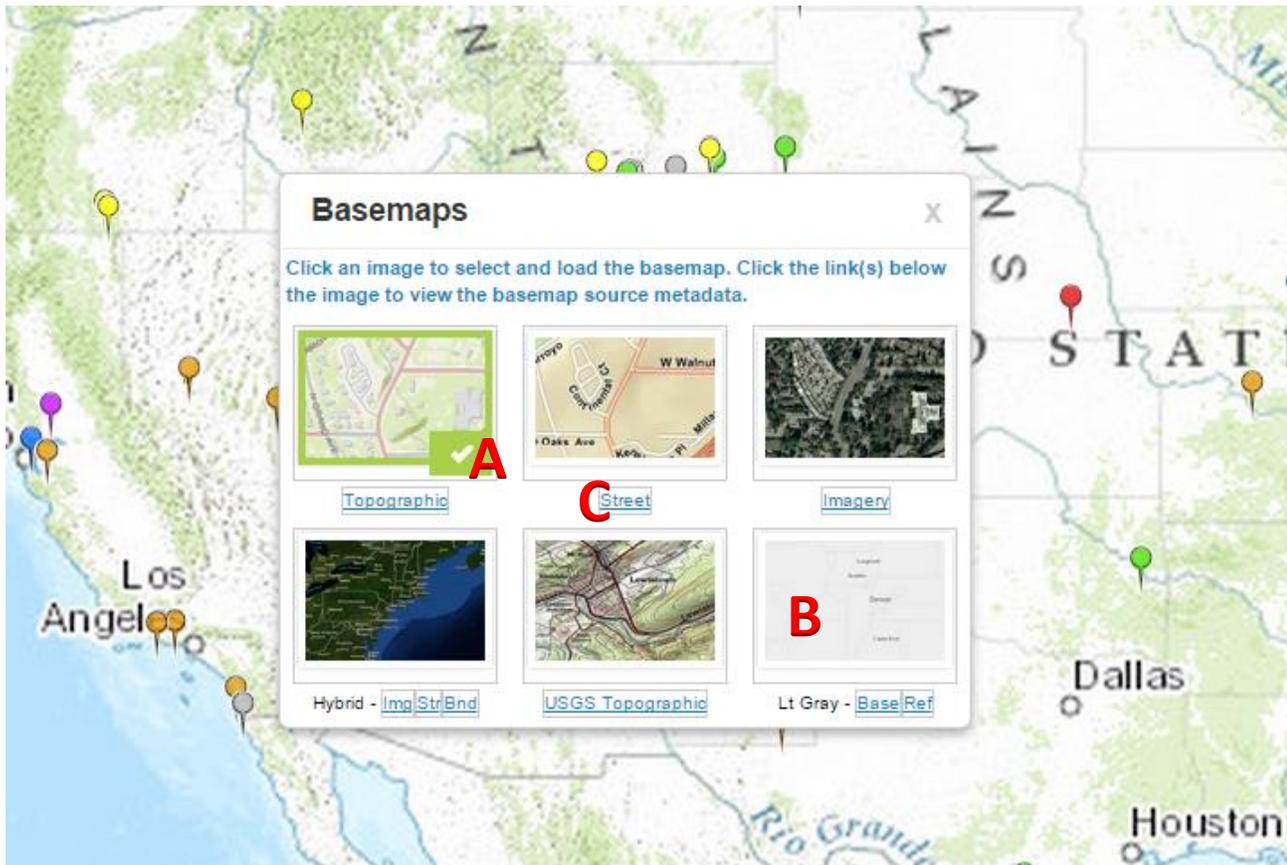


Figure 4. Basemap Gallery

Each basemap (except for Imagery) is composed of scale dependent themes. That is, as the user zooms in to a larger scale view, more fidelity is revealed in the form of detailed vector data, plus descriptive annotation. The map viewer cannot display layers on a map without a working basemap because the basemap establishes the coordinate system of the map composition. For more detailed information on Basemap Considerations, consult [ArcGIS OnLine - Choose Basemap](#).

Map Navigation

Pan

There are several ways to pan around the map:

- Using the mouse, left-mouse click and drag in the map.
- Using the keyboard, use the arrow keys.
- You can also use the **Overview Inset Map**. Click on the small (up) arrow in the lower-left corner, to the left of the coordinate display box, of the BaseMap page to open the Inset panel.



Zoom

There are several ways to zoom in and zoom out on the map:

- On the map there are zoom in and zoom out buttons. Click the '+' button to zoom in. Click the '-' button to zoom out. Refer to Figure 5. Zoom Slider.

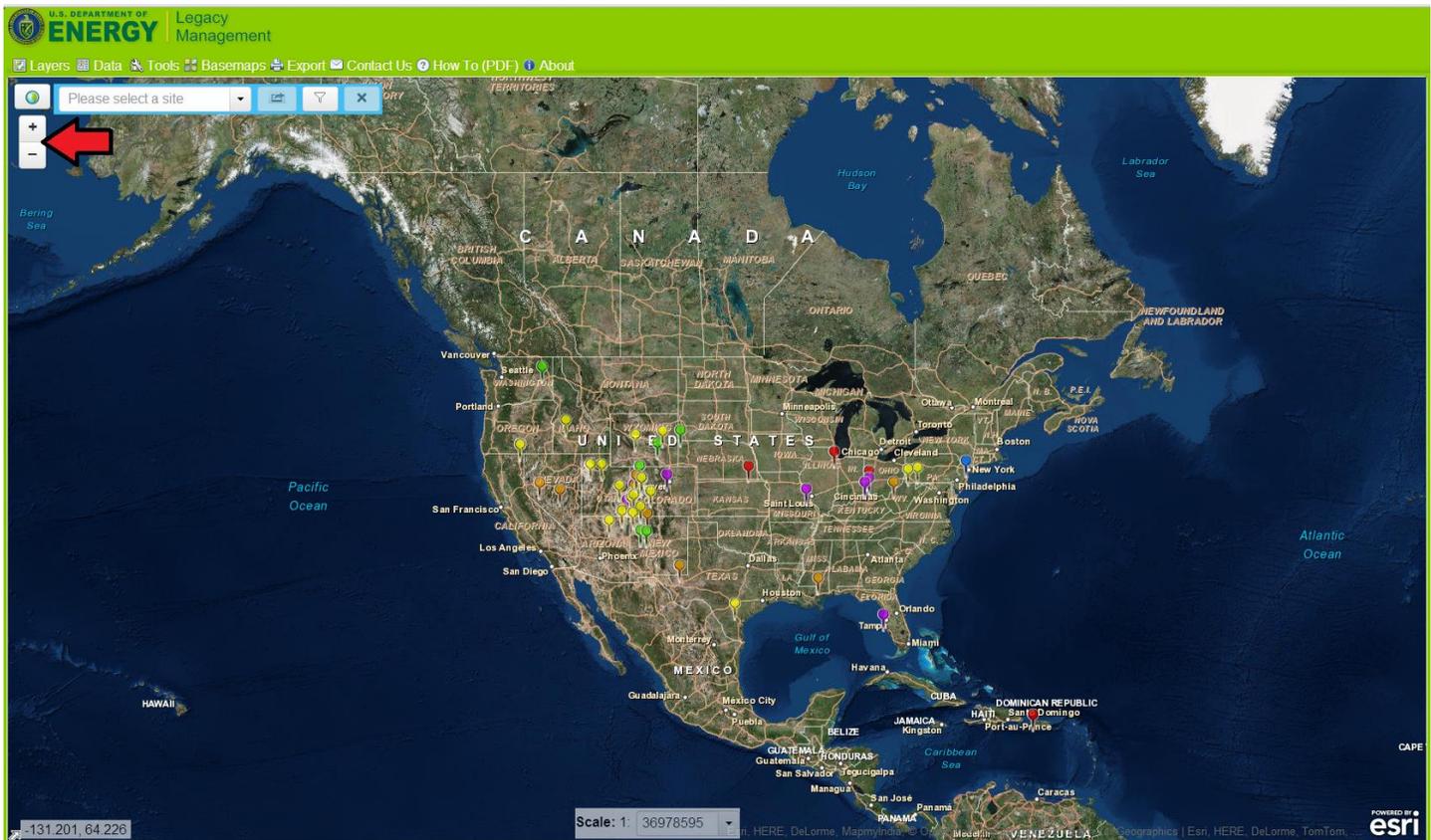


Figure 5. Zoom Slider

- Using the mouse, if it has a scroll wheel, spin the wheel forward to zoom in or spin the wheel backwards to zoom out. Also double clicking the left mouse button on a location on the map will cause the map to zoom in.
- Using the keyboard, the '+' key to zoom in, the '-' key to zoom out.
- To zoom to a specific scale, you can also use the [Scale Pick-list](#).
- By holding down the Shift key on the keyboard and then dragging a rectangle shape with the mouse, you can zoom into a specific area on the map.

Site Selection

To navigate to a DOE LM Site, select from Site Selection list. Refer to Figure 6. Site Selection List.

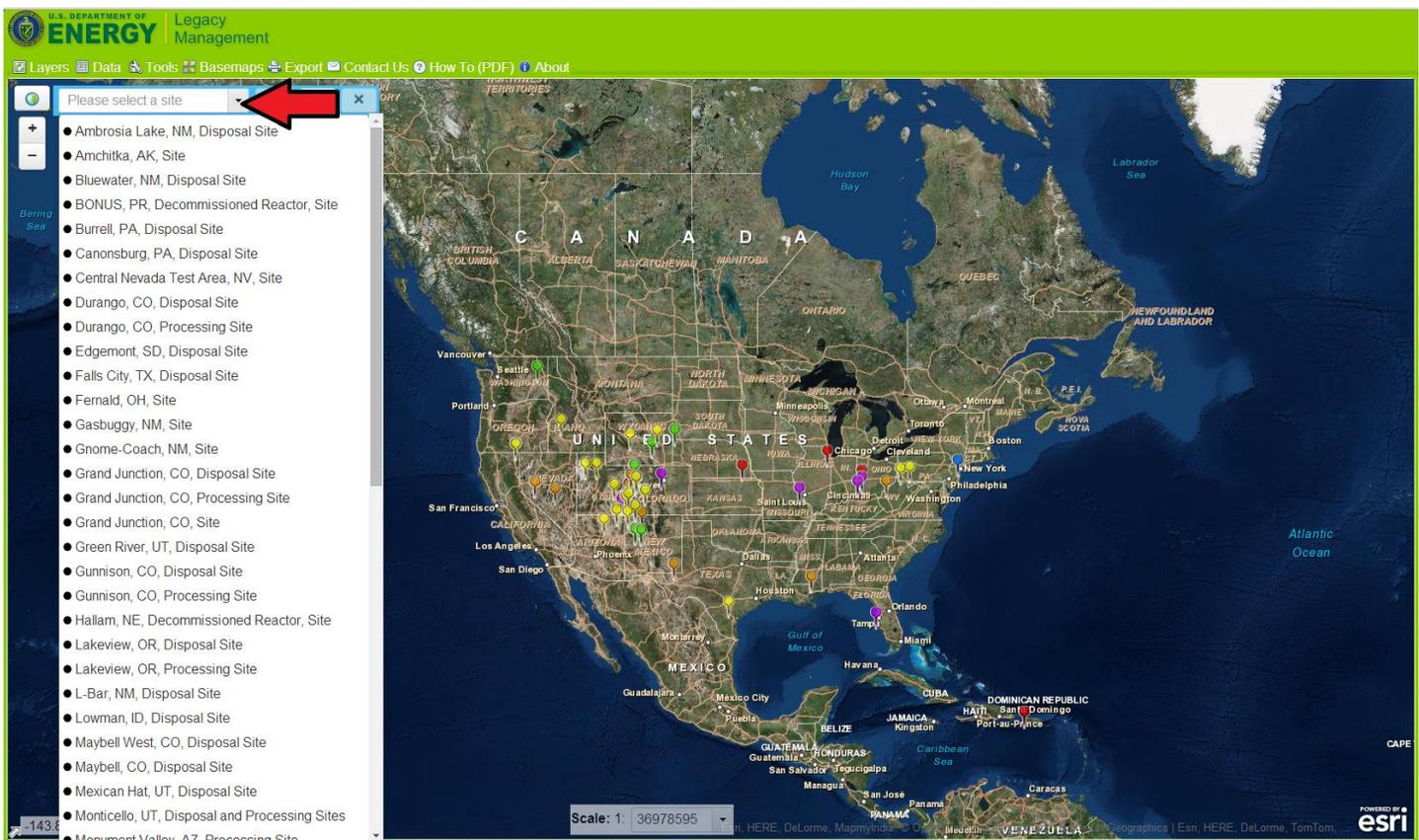


Figure 6. Site Selection List

The drop-down menu will present an alphabetical listing of DOE LM Sites. Upon selecting a Site, the map will automatically select and zoom to the Site's extent and the URL updates to allow [Bookmarking](#) of your favorite Site. You must have a Site selected in order to use [Inspection Photos](#), [Logs](#) and [Environmental Data](#).

If you have a Site selected and navigate away from the Site, you can return to the selected Site by clicking the Navigate to Selected Site button [A Figure 7. Site Selection Toolbar].

To clear the currently selected Site, either select a new Site from the list in the Sites dropdown menu or click the Clear Site button [B Figure 7. Site Selection Toolbar].



Figure 7. Site Selection Toolbar

Site Filtering

There are a few ways to filter the [Site Selection](#) list.

By typing the Site name, the list will automatically filter on the number of Sites available to pick from. Refer to Figure 8. Site Filtering.

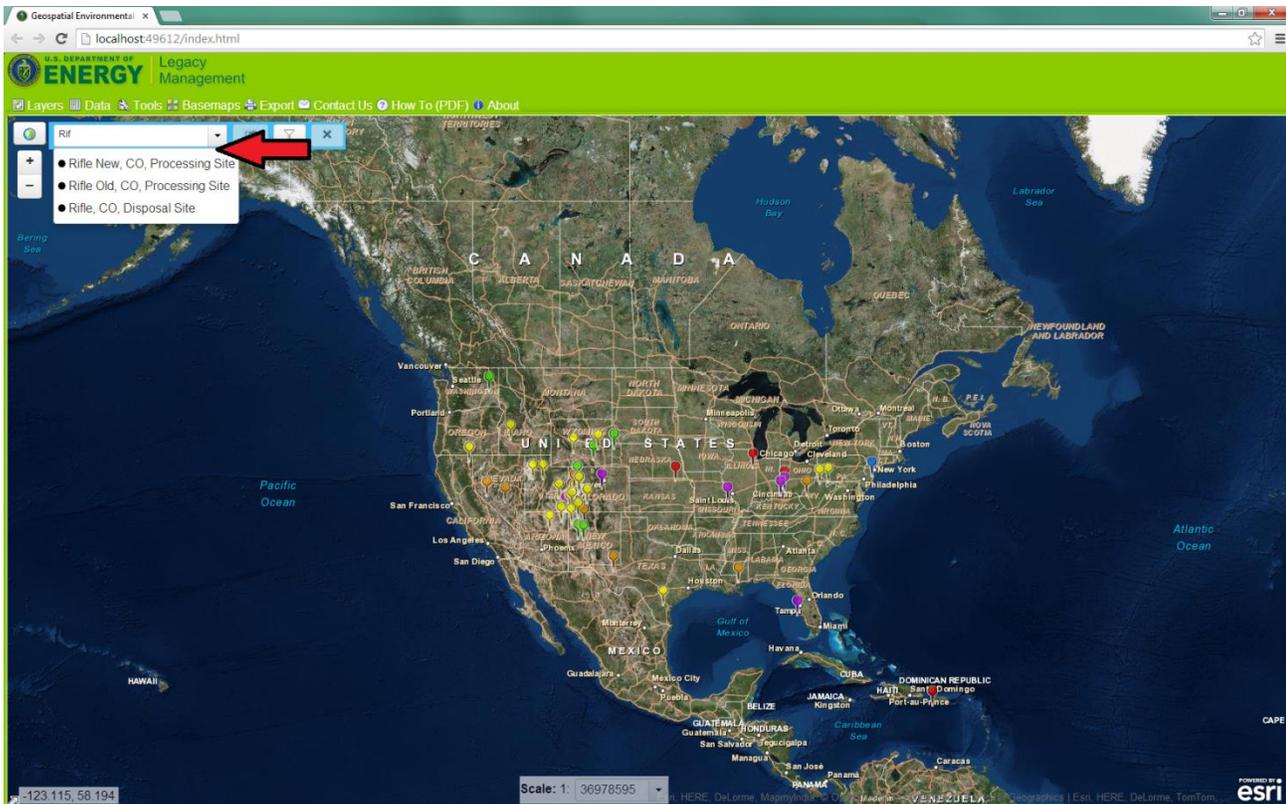


Figure 8. Site Filtering

You can filter by Regulatory Driver and/or Site Name by clicking on the **Filter Site List** icon. Refer to Figure 9. Site Filtering Command.

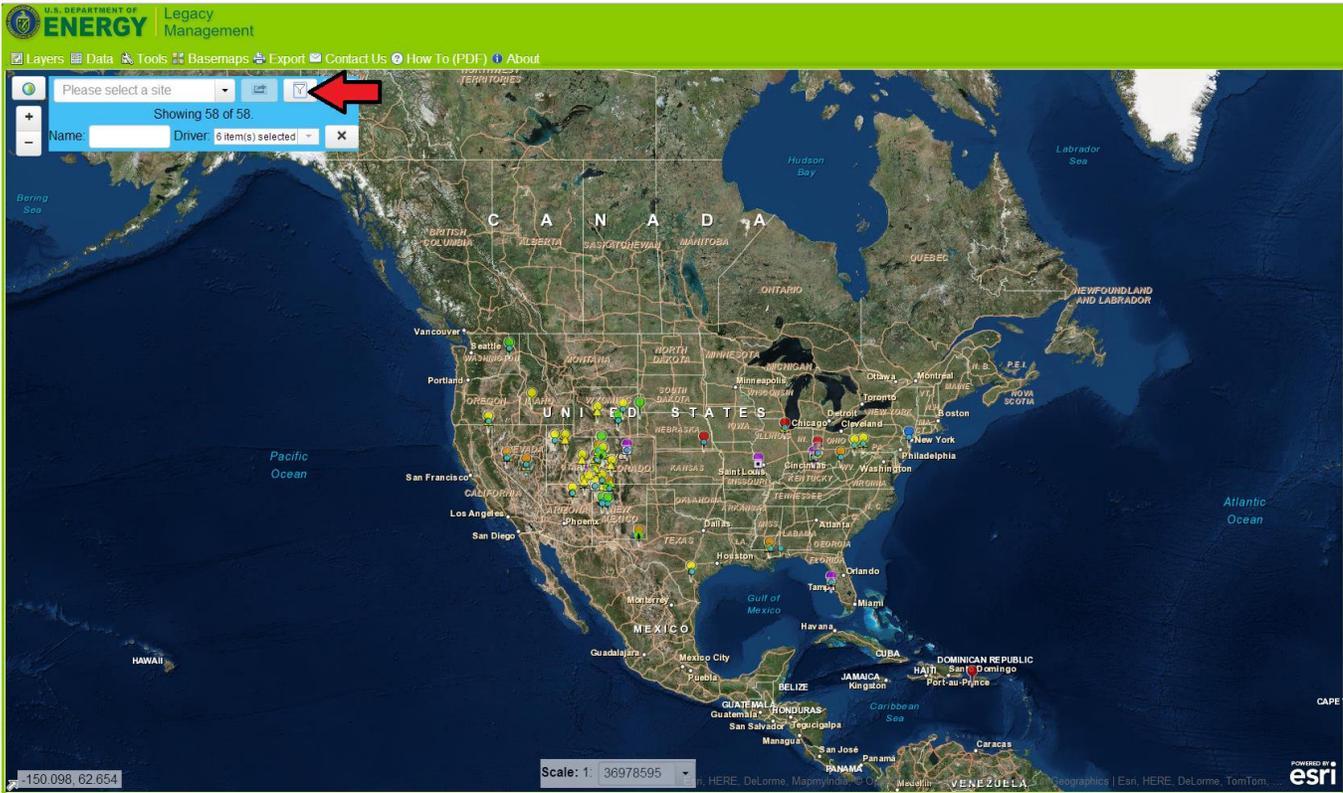


Figure 9. Site Filtering Command

Filter Site List

The number of LM Sites can be quite daunting if you do not know what Site you are looking for, so we have provided a means to pare this list down to a more manageable length.

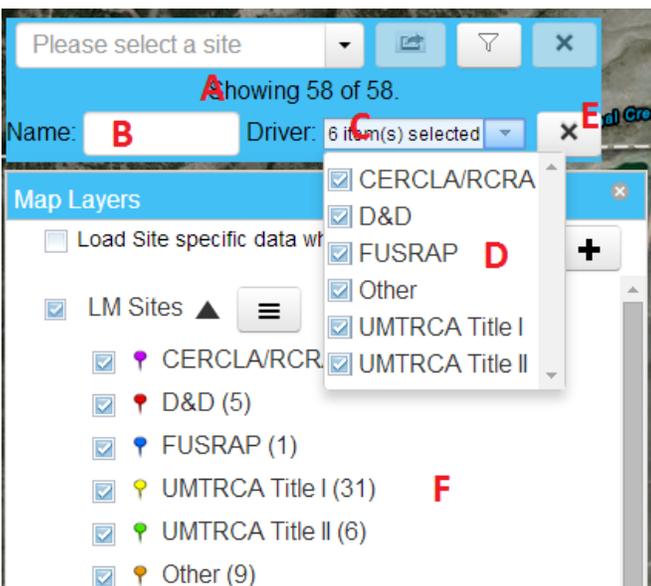


Figure 10. Filter Site List

[A Figure 10. Filter Site List] Informational text denoting how many Sites are available in the **Site Selection** pick-list.

[B Figure 10. Filter Site List] Enter text to filter the **Site Selection** pick-list. Only Sites that contain this text will be included.

[C Figure 10. Filter Site List] Informational text denoting how many Regulatory Driver types are currently selected.

[D Figure 10. Filter Site List] Sites filtered by Regulatory Driver. Selected checkbox means they are included and will appear in the Site Selection pick-list and available on the map (if the **LM Sites Layer** is visible). De-selected checkbox means they are excluded.

[E Figure 10. Filter Site List] Button to clear Regulatory Driver filtering.

[F Figure 10. Filter Site List] Alternate method in the Table of Contents (TOC) in the Map Layers pane to select/de-select sites by Regulatory Driver. Selected checkbox means they are included and will appear in the Site Selection pick-list and be made available on the map (if the **LM Sites Layer** is visible).

Note: Selecting/de-selecting checkboxes in Filter Site List [D] will be reflected in the TOC LM Sites [F] on the Map Layers pane and selecting/de-selected checkboxes in TOC LM Sites [F] on the Map Layers pane will be reflected in the Filter Site List [D]

Bookmarking

When you select a Site in the Site Selection List, the URL updates to denote the selected Site. You can book mark this updated URL so that the GEMS application will automatically navigate to the Site of your choice. Refer to Figure 11. Bookmarking.

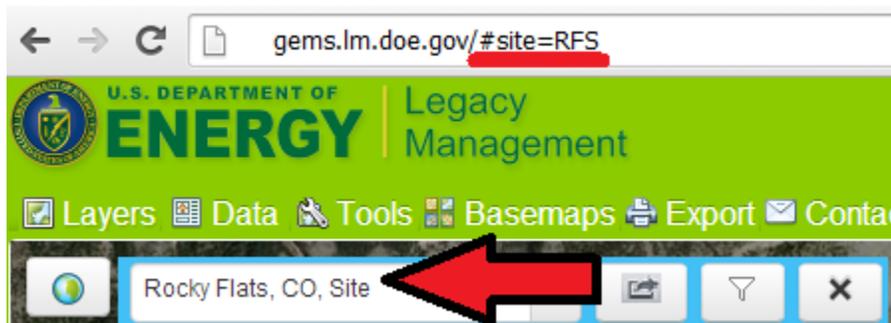


Figure 11. Bookmarking

For example, this is a URL that will go directly to the Rocky Flats, CO, Site:

<http://gems.lm.doe.gov/#site=RFS>

Scale Pick-list

When you zoom in and out on the map, the Scale Pick-list automatically updates to the current scale. You can select a specific scale from the Scale Pick-list, and the map will automatically zoom in or out, depending on the selected scale relative to the current zoom level, at the current map center. Refer to Figure 12. Scale Pick-list.

For reference: [Levels of Detail](#) (ArcGIS-OnLine Reference: Common attributes for maps using the Web Mercator Auxiliary Sphere tiling scheme)

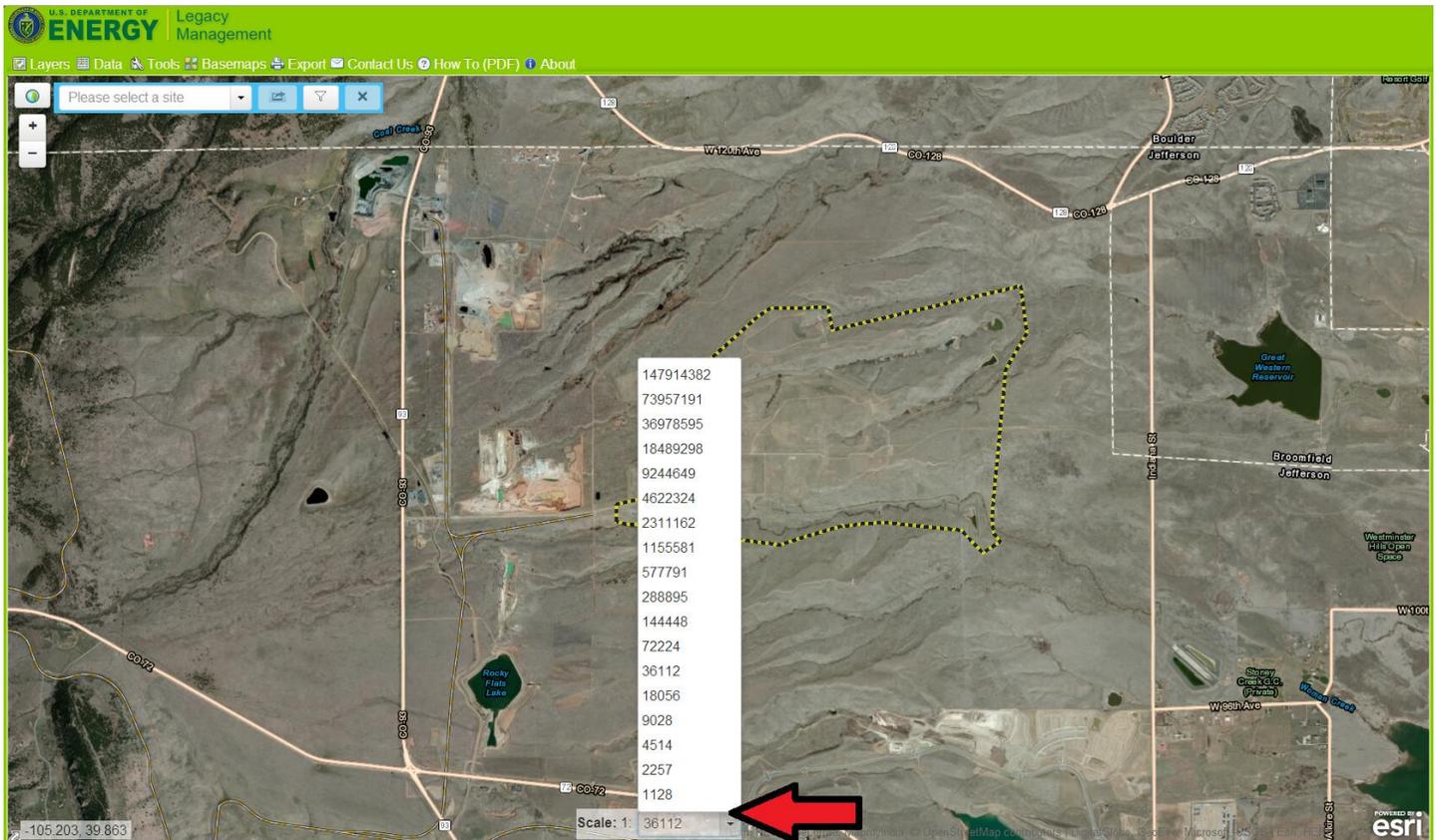


Figure 12. Scale Pick-list

Overview Inset Map

The Overview Inset Map provides a sense of contextual awareness within the map scene viewing area. This tool allows the user to view their current map extent and PAN within a larger viewing window. By default, the Overview Inset Map is minimized. To view and use the Overview Inset Map, click the white arrow in the lower left corner [A Figure 13. Overview Inset Map] of the map, just to the left of the cursor position LON/LAT coordinate display numbers. To hide the Overview Map, re-click the white arrow in the lower left corner of the map.

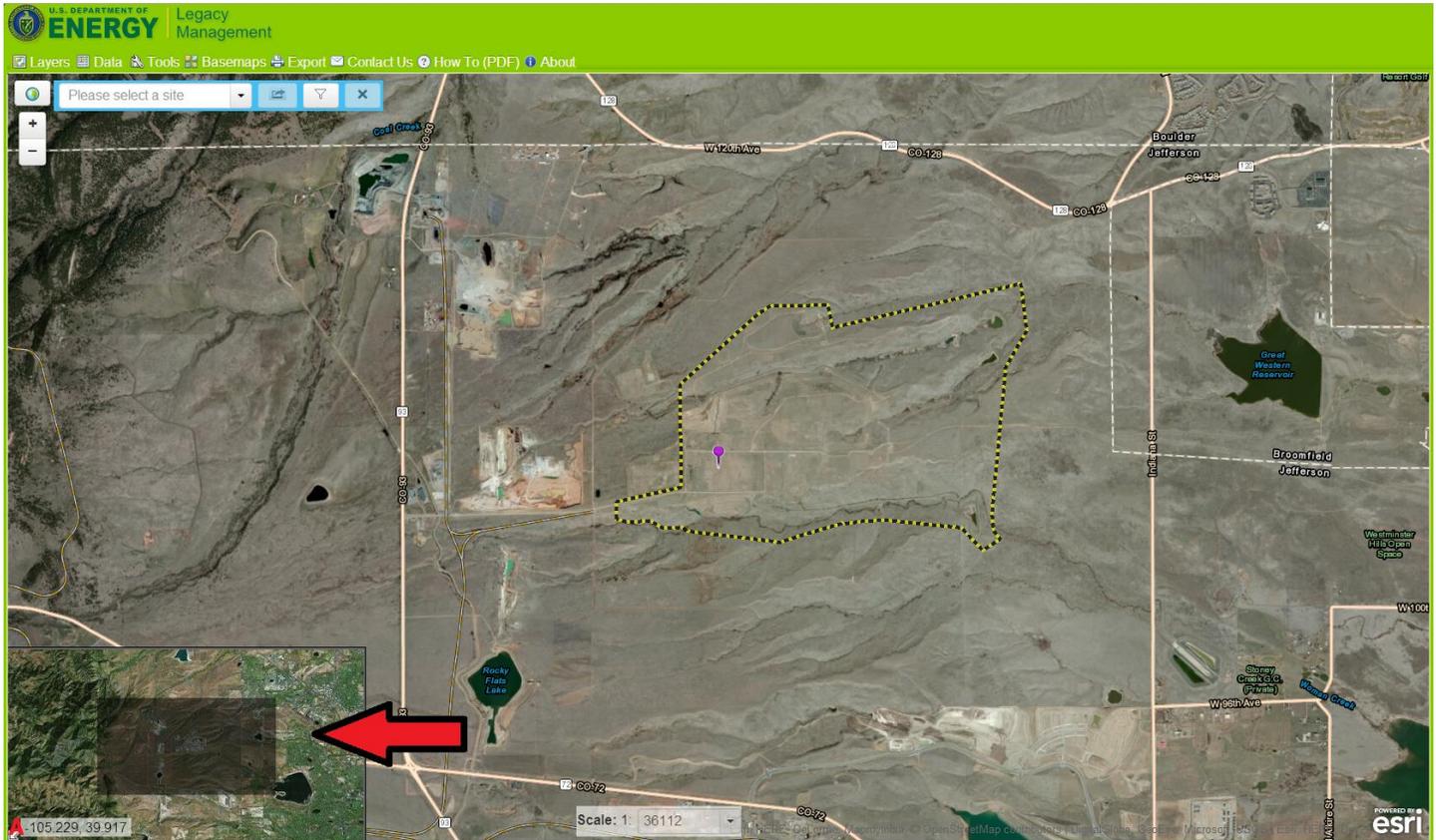


Figure 13. Overview Inset Map

You can pan using the mouse, left-mouse click and drag in the Overview Inset Map.

Coordinate Display

The current coordinate, in Geographic - decimal degrees, of your mouse in the map is displayed in the lower left corner of the map. Refer to Figure 14. Coordinate Display.

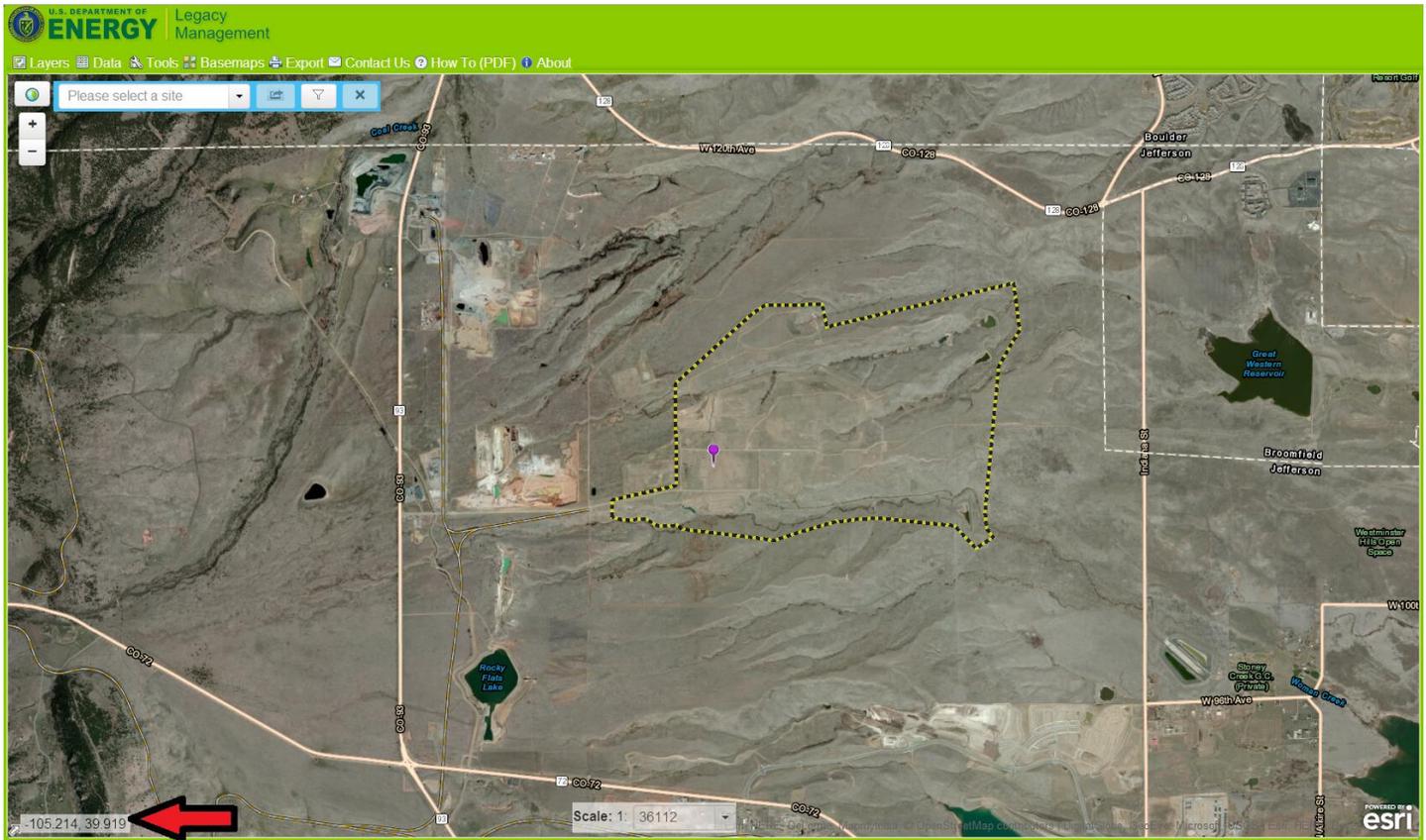


Figure 14. Coordinate Display

Full Extent Zoom

The 'Full Extent Zoom' button will change the map extent to the continental United States. Refer to Figure 15. Full Extent Zoom.

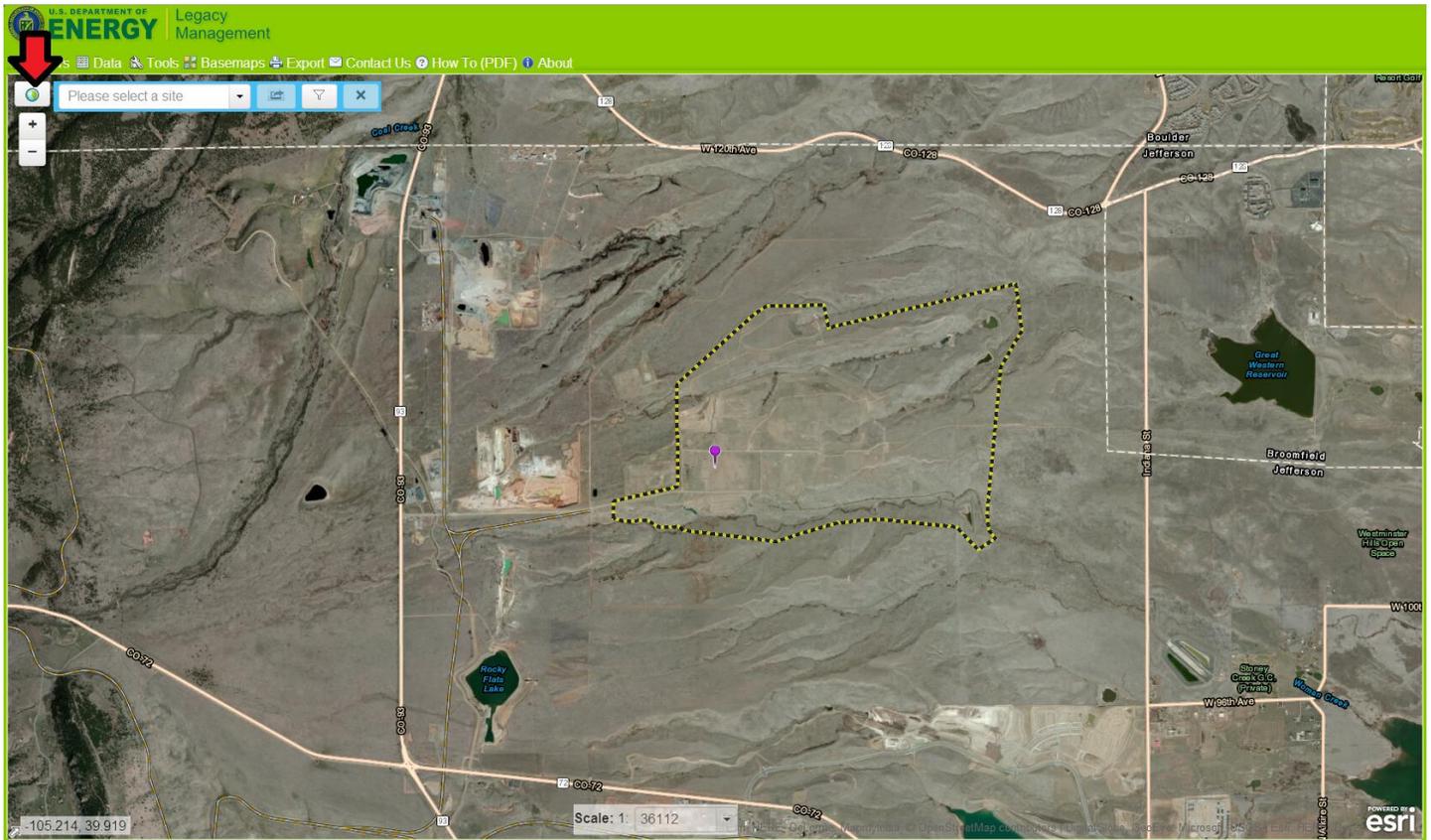


Figure 15. Full Extent Zoom

Map Layers



Figure 16 Layers Menu Item

Use the Map Layers feature by clicking the 'Layers' menu item. A pane will appear with a Table of Contents (TOC). GEMS will initially start with 3 standard layers in the Table of Contents (TOC):

- [A Figure 17. Layers Pane] LM Sites
- [B Figure 17. Layers Pane] Site Boundaries
- [C Figure 17. Layers Pane] Sample Locations

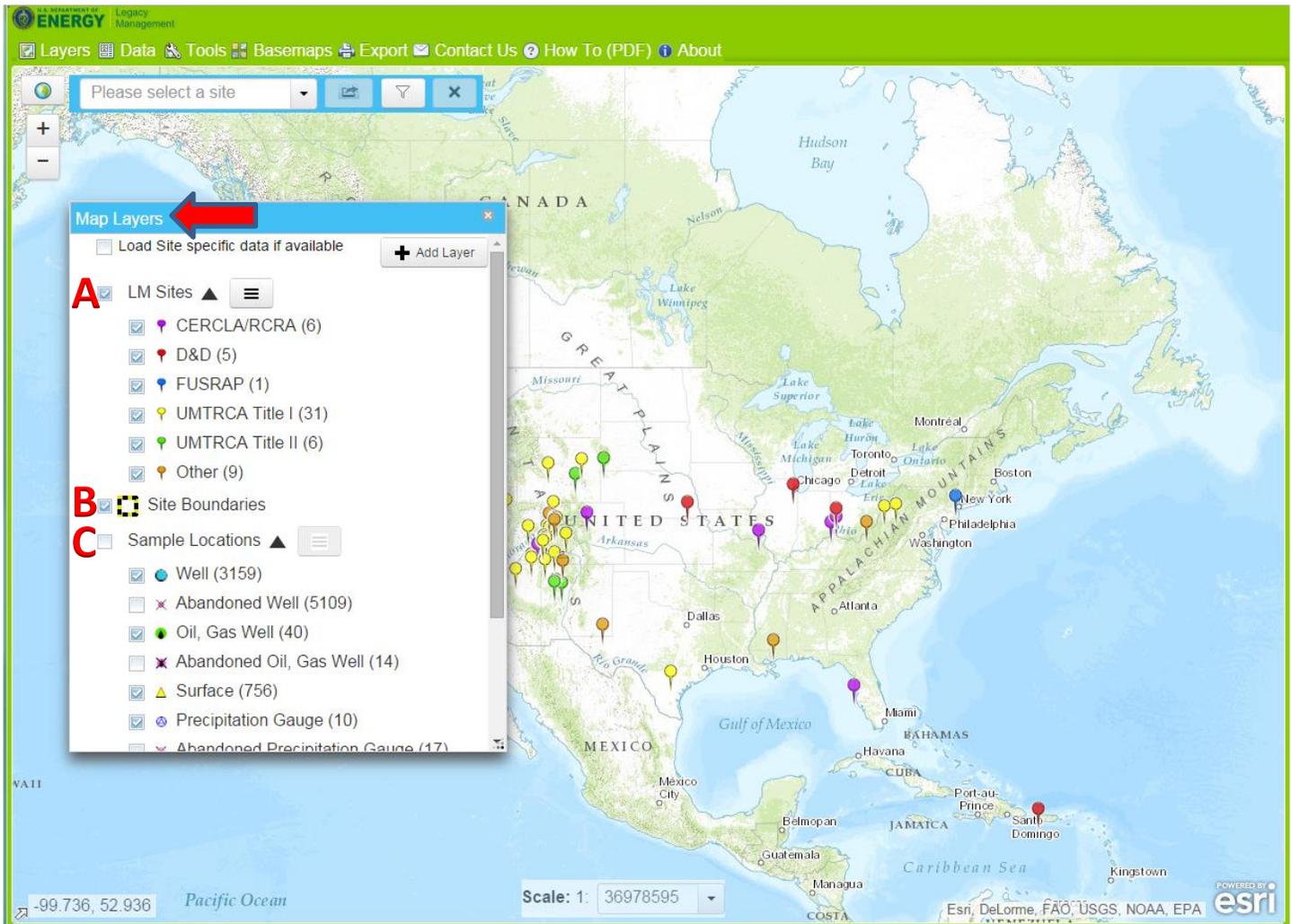


Figure 17. Layers Pane

LM Sites Layer

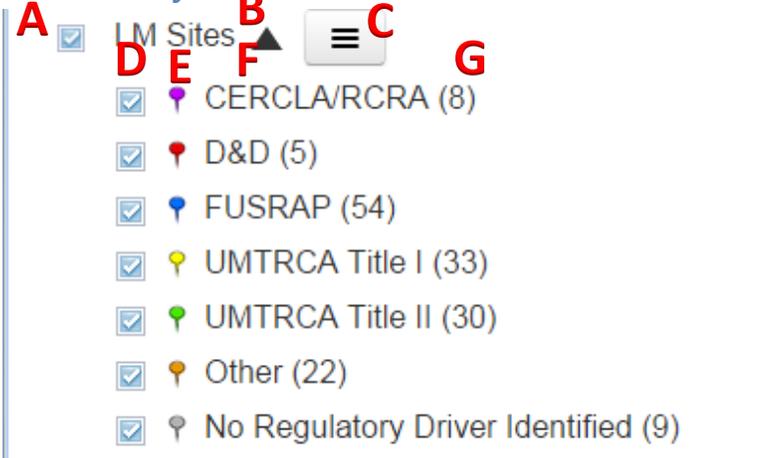


Figure 18. LM Sites Layer

[A Error! Reference source not found.] Select/de-select the checkbox to toggle the LM Sites Layer visibility.

[B Error! Reference source not found.] Click the black triangle icon to minimize/maximize the LM Sites types.

[C Error! Reference source not found.] Click the hamburger icon to display menu options available for the LM Sites Layer.

Refer to [Figure 19. LM Sites Menu Option].

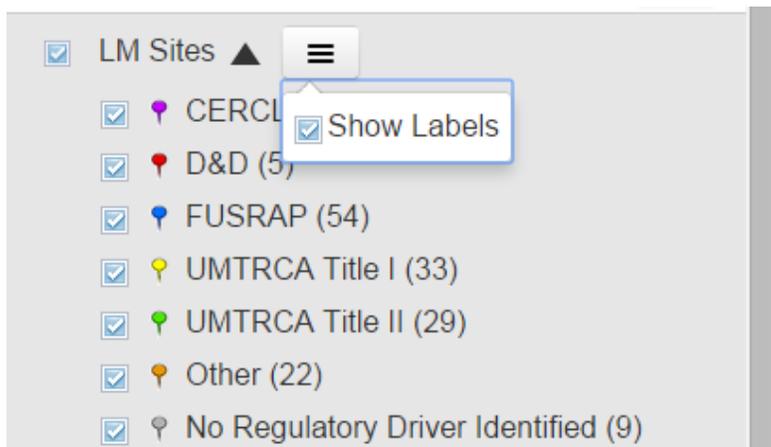


Figure 19. LM Sites Menu Option

[D Figure 18. LM Sites LayerError! Reference source not found.] Select/de-select the LM Site type checkbox to toggle visibility for a specific LM Site type.

[E Figure 18. LM Sites Layer] The legend symbol based on Regulatory Driver for each LM Site.

[F Figure 18. LM Sites Layer] The Regulatory Driver name for each LM Site.

[G Figure 18. LM Sites Layer] The number of Sites designated with this Regulatory Driver

Site Boundaries Layer



Figure 20. Site Boundaries Layer

[A Figure 20. Site Boundaries Layer] Select/de-select the checkbox to toggle the Site Boundaries Layer visibility.

[B Figure 20. Site Boundaries Layer] The legend symbol for Site Boundaries.

[C Figure 20. Site Boundaries Layer] The Site Boundary layer name.

Note: Not all Sites have a boundary identified.

Sample Locations Layer

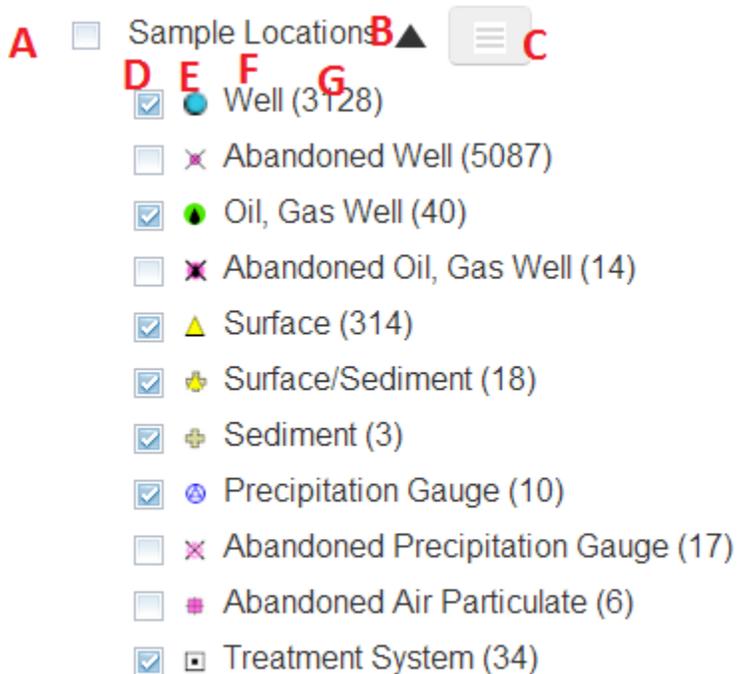


Figure 21. Sample Locations Layer

[A Figure 21. Sample Locations Layer] Select/de-select the checkbox to toggle the Sample Location Layer visibility.

[B Figure 21. Sample Locations Layer] Click the black triangle icon to minimize/maximize the Sample Location types.

[C Figure 21. Sample Locations Layer] Click the hamburger icon to display menu options available for the Sample Locations Layer.

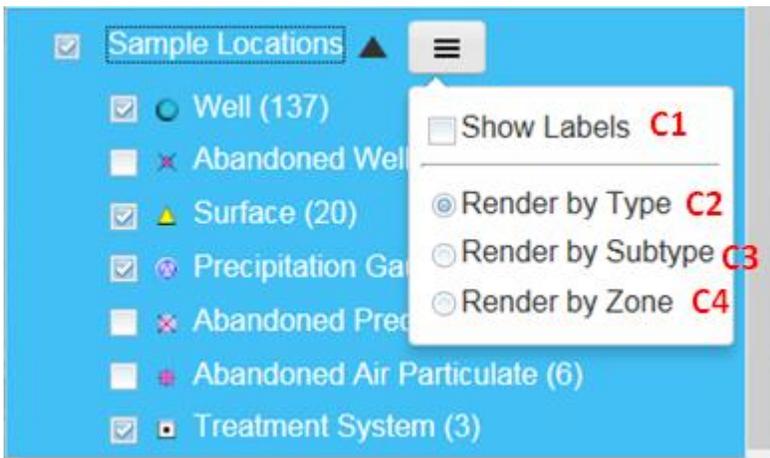


Figure 22. Sample Location Menu Options

[C1 Figure 22. Sample Location Menu Options] Select/de-select to toggle Sample Locations label visibility.

[C2 Figure 22. Sample Location Menu Options] Select to render Sample Locations by Type.

[C3 Figure 22. Sample Location Menu Options] Select to render Sample Locations by Subtype.

[C4 Figure 22. Sample Location Menu Options] Select to render Sample Locations by Completion Zone.

[D Figure 21. Sample Locations Layer] Select/unselect the Sample Location type checkbox to toggle visibility for a specific Sample Location type.

[E Figure 21. Sample Locations Layer] The legend symbol based on the Sample Location type.

[F Figure 21. Sample Locations Layer] The sample location type name for each location.

[G Figure 21. Sample Locations Layer] The number of locations designated with the sample location type

Note:

- Sample Location Label visibility is partially controlled by zoom scale. You will need to be zoomed in far enough to see the labels.
- The Render by Type, Subtype and Completion Zone options are only enabled if a Site has been selected.
- If Render by Subtype or Completion Zone is checked, and a sample point does not have a Subtype or Completion Zone specified, then the location will default render by Type. Refer to Figure 23. Sample Location Subtypes for TOC changes when Render By Subtype or Completion Zone is selected.
- Not all Sites have Sample Locations.



Figure 23. Sample Location Subtypes

[A Figure 23. Sample Location Subtypes] Click the black triangle icon to minimize/maximize the Sample Location subtypes.

[B Figure 23. Sample Location Subtypes] The legend symbol based on the Sample Location subtype.

[C Figure 23. Sample Location Subtypes] The sample location subtype description.

[D Figure 23. Sample Location Subtypes] The number of locations having this sample location subtype.

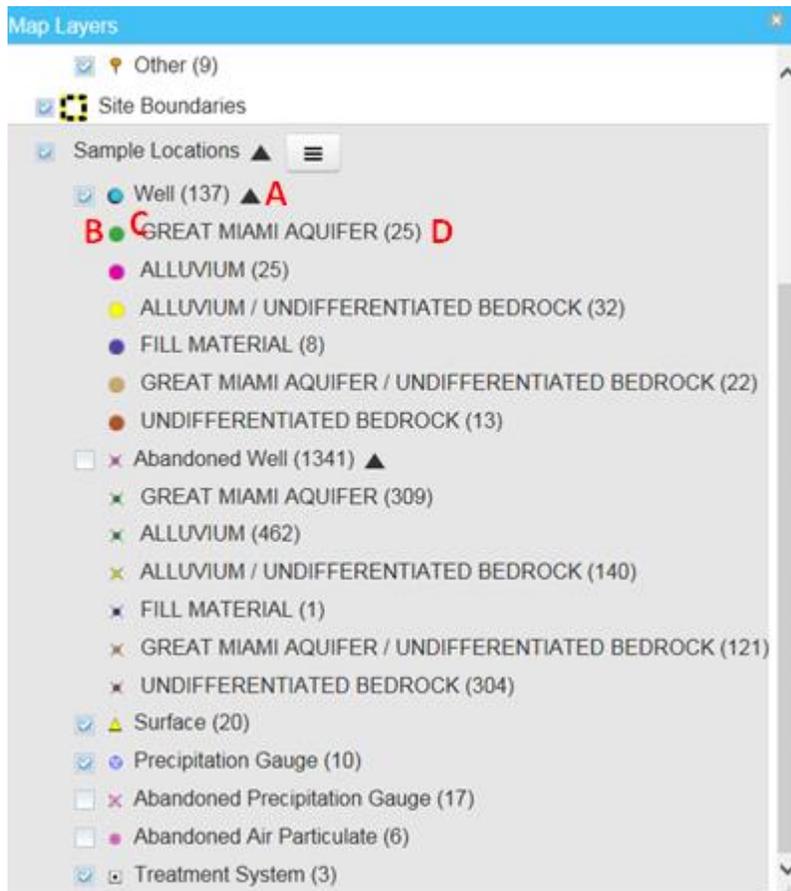


Figure 24. Sample Location Completion Zones

[A Figure 24. Sample Location Completion Zones] Click the black triangle icon to minimize/maximize the Sample Location completion zones.

[B Figure 24. Sample Location Completion Zones] The legend symbol based on the Sample Location completion zone.

[C Figure 24. Sample Location Completion Zones] The sample location completion zone description.

[D Figure 24. Sample Location Completion Zones] The number of locations having this sample location completion zone.

Note:

- Not all sample points have an assigned Subtype or Completion Zone.
- When the Render By Subtype/Completion Zone checkbox was checked, then the Sample Location point symbols on the map were updated for those points having subtypes.
- If the count for a Subtype of Completion Zone value is zero, then it will not appear in the TOC.
- The counts are updated when a site is selected.

Site Specific Base Data

Many of the Sites have Site Specific Base Data. These layers get loaded automatically into the Layer Table of Contents (TOC) when the map zooms to a predefined extent around the Site and the 'Load Site specific data' [A Figure 25. Site Specific Base Data] is checked. The Site Specific Base Data layer will have the same name as the selected Site in the [Site Selection](#) pick-list.

Site Specific Base Data will typically be things like fences, roads, water and aerial imagery. It is up to the user to toggle visibility, by default, Site Specific Base Data visibility is turned off.

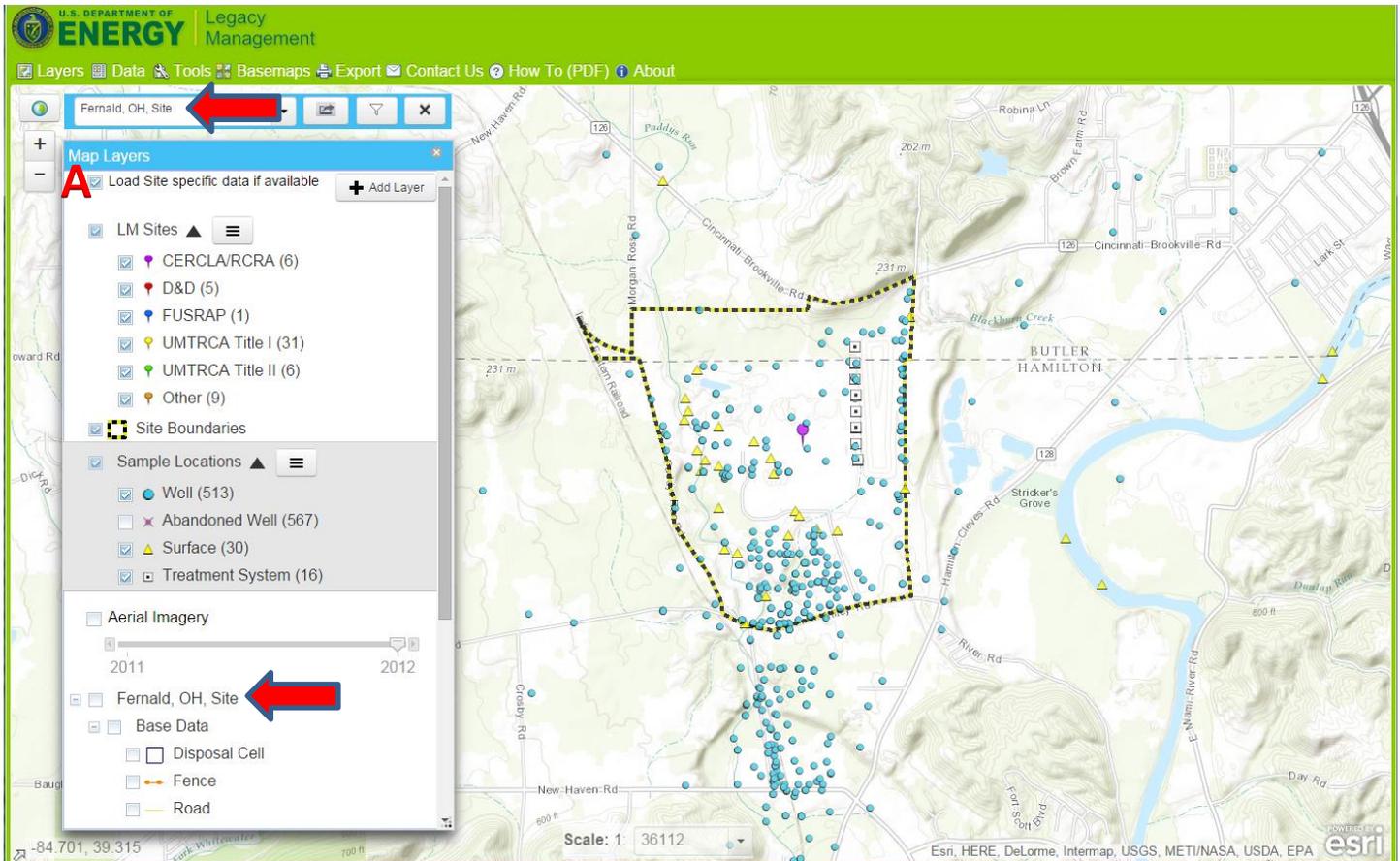


Figure 25. Site Specific Base Data

Note:

- Once the map is zoomed out beyond the predefined extent that automatically loaded the Site Specific Base Data, the Site Specific Base Data layer will be removed from the Layer Table of Contents (TOC) and removed from the map, unless the site is selected in the Site Selector.
- If the user de-selects the 'Load Site specific data' [A Figure 25. Site Specific Base Data], the Site specific data will be removed from the TOC and map.

GEMS - User Documentation

Anytime a base data layer is loaded, the user will be notified with a 'toast' in the lower right corner of the map. Refer to Figure 26. Base Data Notification.

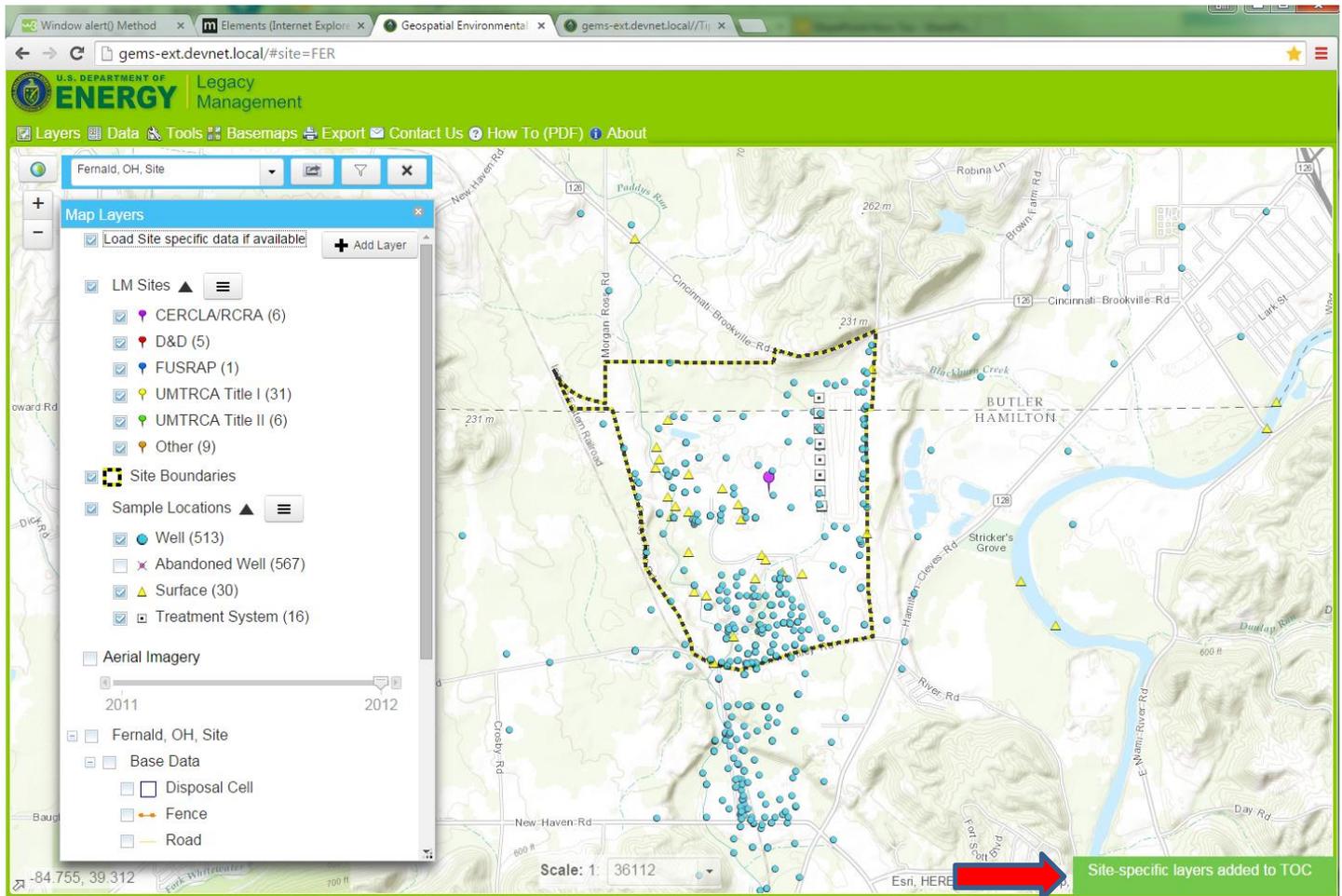
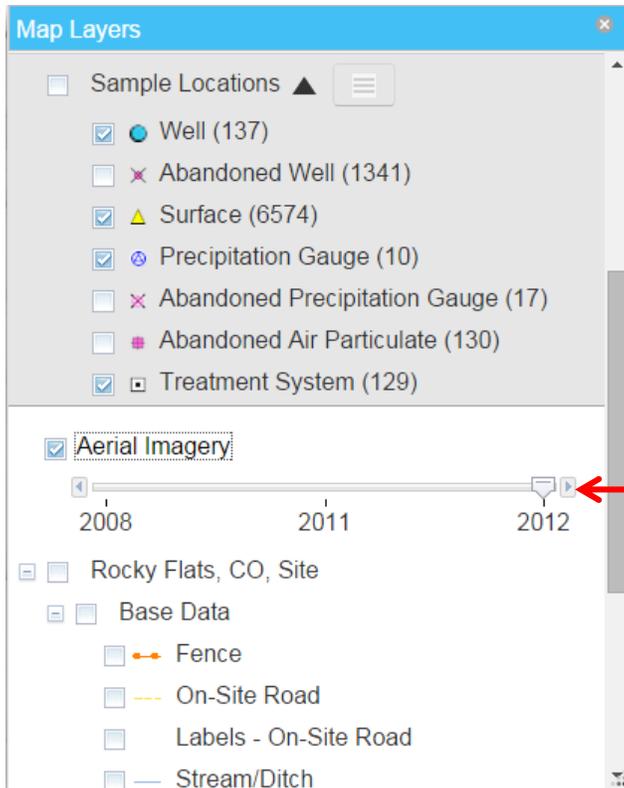


Figure 26. Base Data Notification

Aerial Imagery Layers

Site specific aerial photos are being phased out in GEMS and being replaced with yearly national layers of aerial imagery. The appropriate layers are added to the TOC when a site is selected. Only the years for which imagery exists for the selected site are added to the TOC.



This screen capture of the TOC for Legacy site – Rocky Flats, Colorado – illustrates the selection/view setting for Aerial imagery captured in 2012.

Figure 27. Aerial Imagery Layers

Note:

- The Aerial Imagery Layers are added in the TOC after the Sample Locations layer and before the Site Specific layers if they exist.
- Aerial Imagery thematic layer (raster) is depicted as a TimeSlider bar (Figure 27. Aerial Imagery Layers) that enables the user to select and display the desired remotely sensed imagery (aerial or terrestrial/satellite) via a chronologic sidebar graphic. This tool allows the user to perform a kind of “time series” view to facilitate change detection analysis.
- The Aerial Imagery Layers are currently being phased into the GEMS application and may not exist for some sites which will have site-specific aerial photos instead.

Non-GEMS Map Layers

Users can add non-GEMS layers to the map to help tell their story. To add a non-GEMS layer, click the  button on the Map Layers pane. Refer to Figure 28. Add non-GEMS Layers.

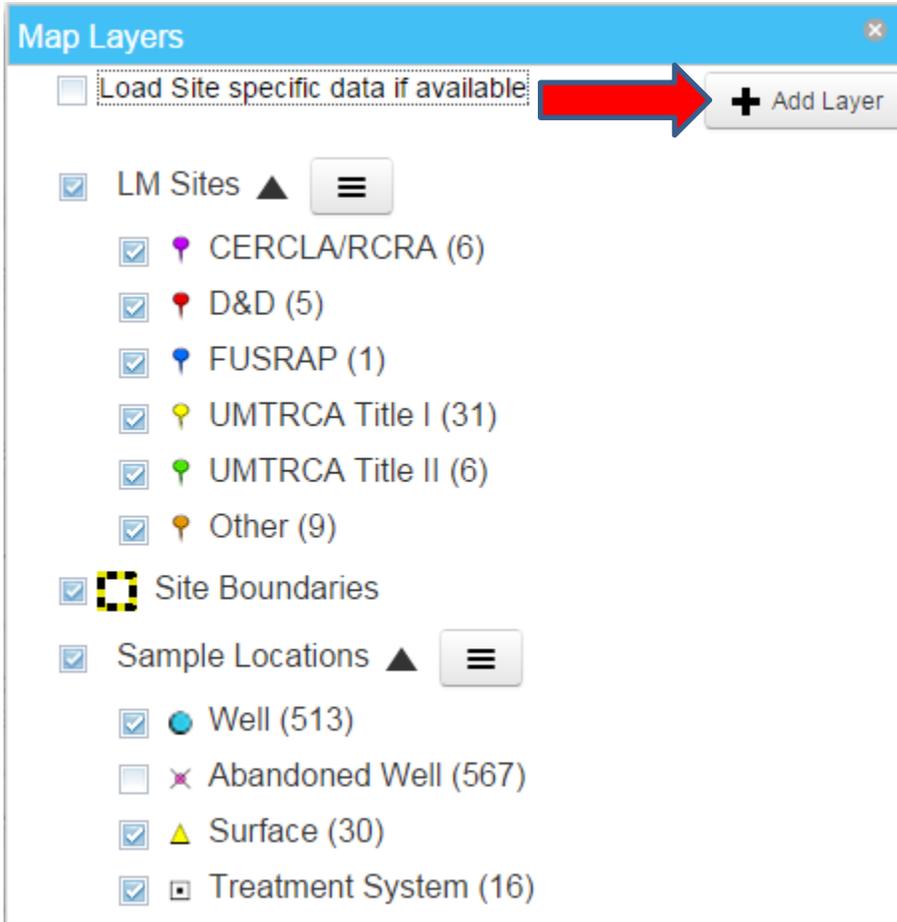


Figure 28. Add non-GEMS Layers

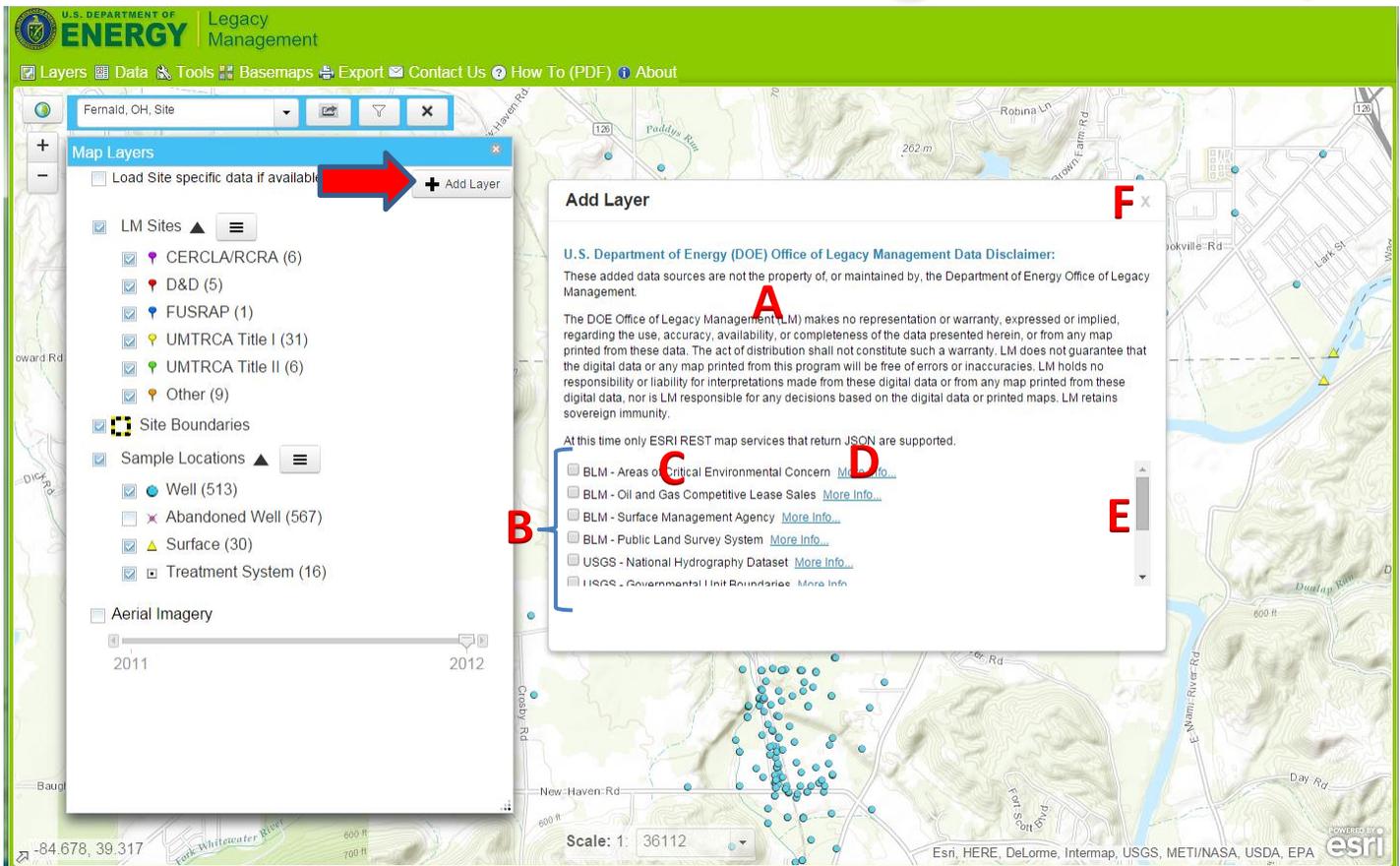


Figure 29. Add non-GEMS Layers Dialog

- [A Figure 29. Add non-GEMS Layers Dialog] The data disclaimer
- [B Figure 29. Add non-GEMS Layers Dialog] Selecting the checkbox(s) will add the layer to the map and to the Table of Contents in the left pane. De-selecting the checkbox will remove the layer from the map.
- [C Figure 29. Add non-GEMS Layers Dialog] The Layer Name.
- [D Figure 29. Add non-GEMS Layers Dialog] Link to the data source metadata.
- [E Figure 29. Add non-GEMS Layers Dialog] Scrollbar to scroll through the entire list.
- [F Figure 29. Add non-GEMS Layers Dialog] Click the X to dismiss the dialog.

Note: At this time only ESRI REST map services that return JSON are supported.

Data disclaimer text:

These added data sources are not the property of, or maintained by, the Department of Energy Office of Legacy Management.

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Anytime a non-GEMS data layer is loaded, the user will be notified with a 'toast' in the lower right corner of the map. Refer to Figure 30. Non-GEMS Layer Notification.

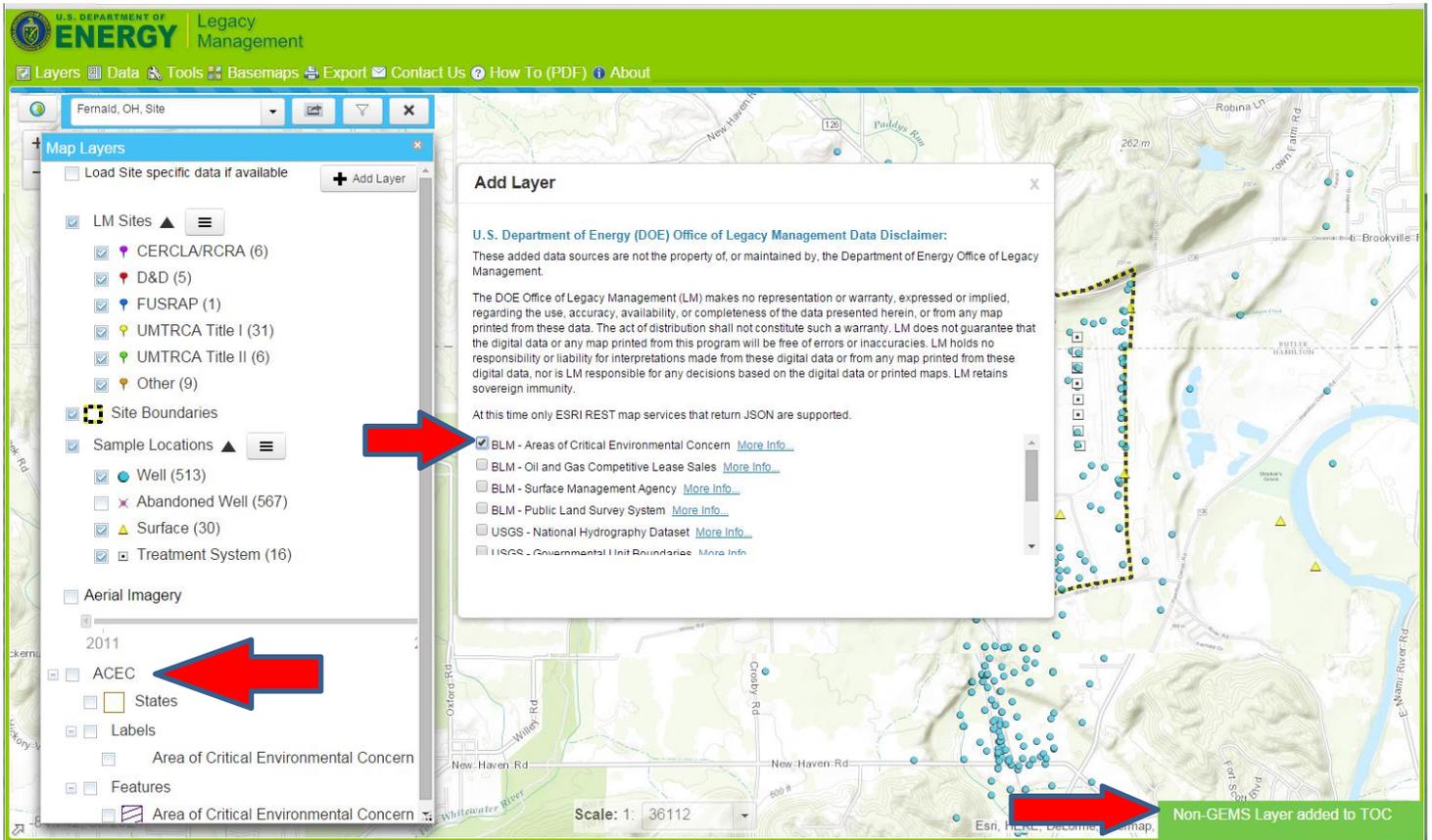


Figure 30. Non-GEMS Layer Notification

If there is a layer you would like to see added to the default available non-GEMS layers list, please **Contact Us** and provide a valid URL System in the Comments field of the Feedback form and your email address if you wish us to let you know when the layer has been added to the list.

Map Data



Figure 31. Data Menu Item

Use the Map Data by clicking the Data menu item. A pane with two tabs will appear: **Environmental Data** and **Assets**.

Environmental Data

To access the Environmental Data select a Site in the **Site Selection** pick-list. Refer to Figure 32. Environmental Data Pane.

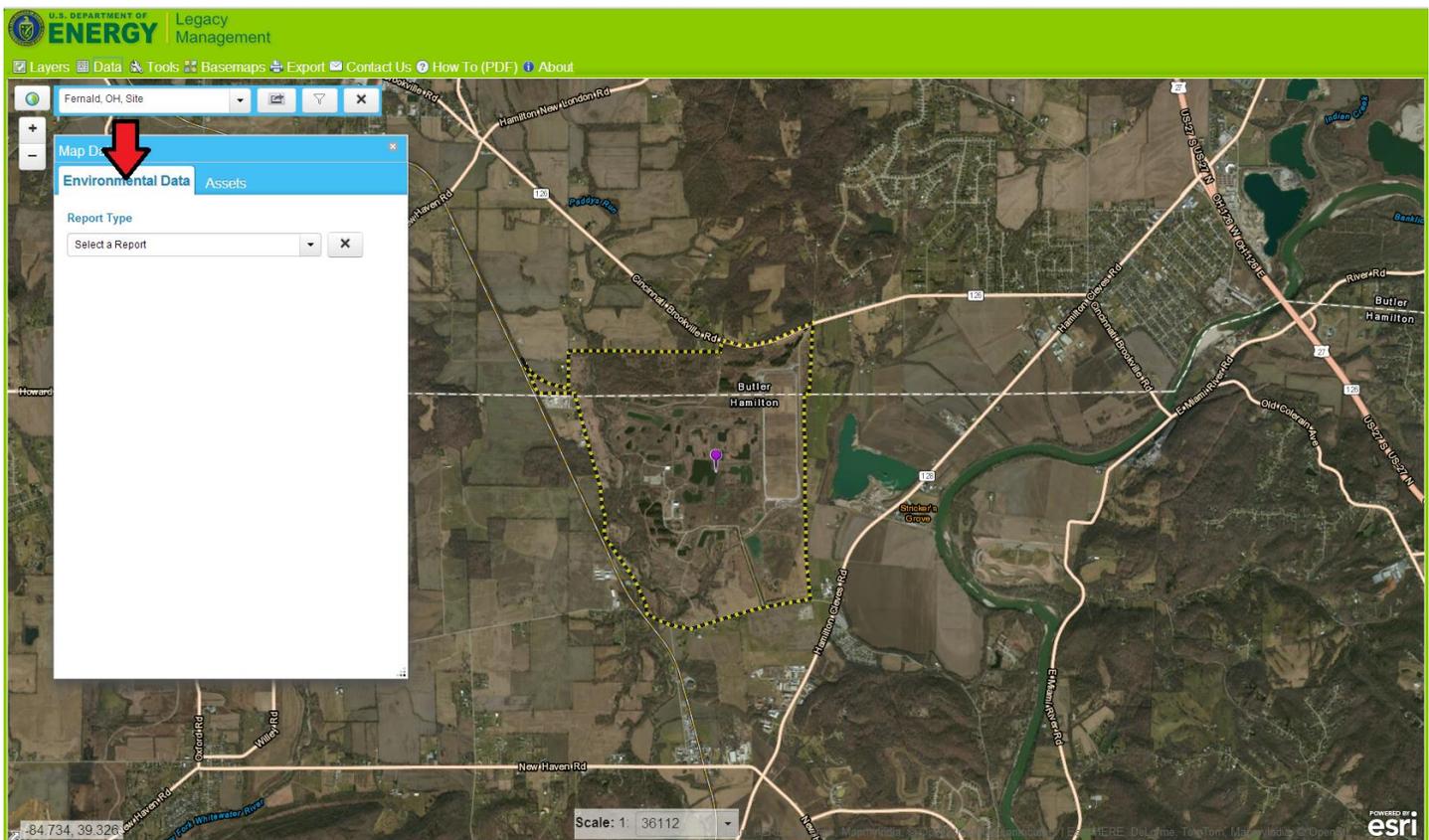


Figure 32. Environmental Data Pane

First, select a Report Type. Only the reports available for the selected Site will be available in the Report Type pick-list [A Figure 33. Report Type]. Click the 'Clear Report' button [B Figure 33. Report Type] to clear the selected report. Only locations having the sample types with checkbox checked in the Layers panel will be available for reports.

Report Type

A screenshot of a web application interface. At the top, the text "Report Type" is displayed in blue. Below it is a dropdown menu with a white background and a grey border. The text "Select a Report" is visible in the menu, followed by a red letter "A". To the right of the dropdown is a small grey button with a white "x" and a red letter "B".

Figure 33. Report Type

Next, select the locations of interest. You can either select from the map by using one of the draw tools: Rectangle [A Figure 34. Report Parameters], Ellipse [B Figure 34. Report Parameters], or Freehand [C Figure 34. Report Parameters]. You can also make a selection from the list [D Figure 34. Report Parameters] of location identifiers or a combination of map and list selection. The selected locations are highlighted as a red point on the map. Note: the more locations you select, the longer the report will take to generate.

Click the 'Clear Location Selection' button [F Figure 34. Report Parameters] to clear the selected locations. Informational text is displayed denoting the number of selected locations [E Figure 34. Report Parameters] of the available locations with report data. The date range [G Figure 34. Report Parameters] defaults to the dates that data is available for the selected locations; however, you can change the data values. Select one or more analytes [H Figure 34. Report Parameters] to report on.

Note: The more analytes and/or locations selected, the longer the report will take to generate.

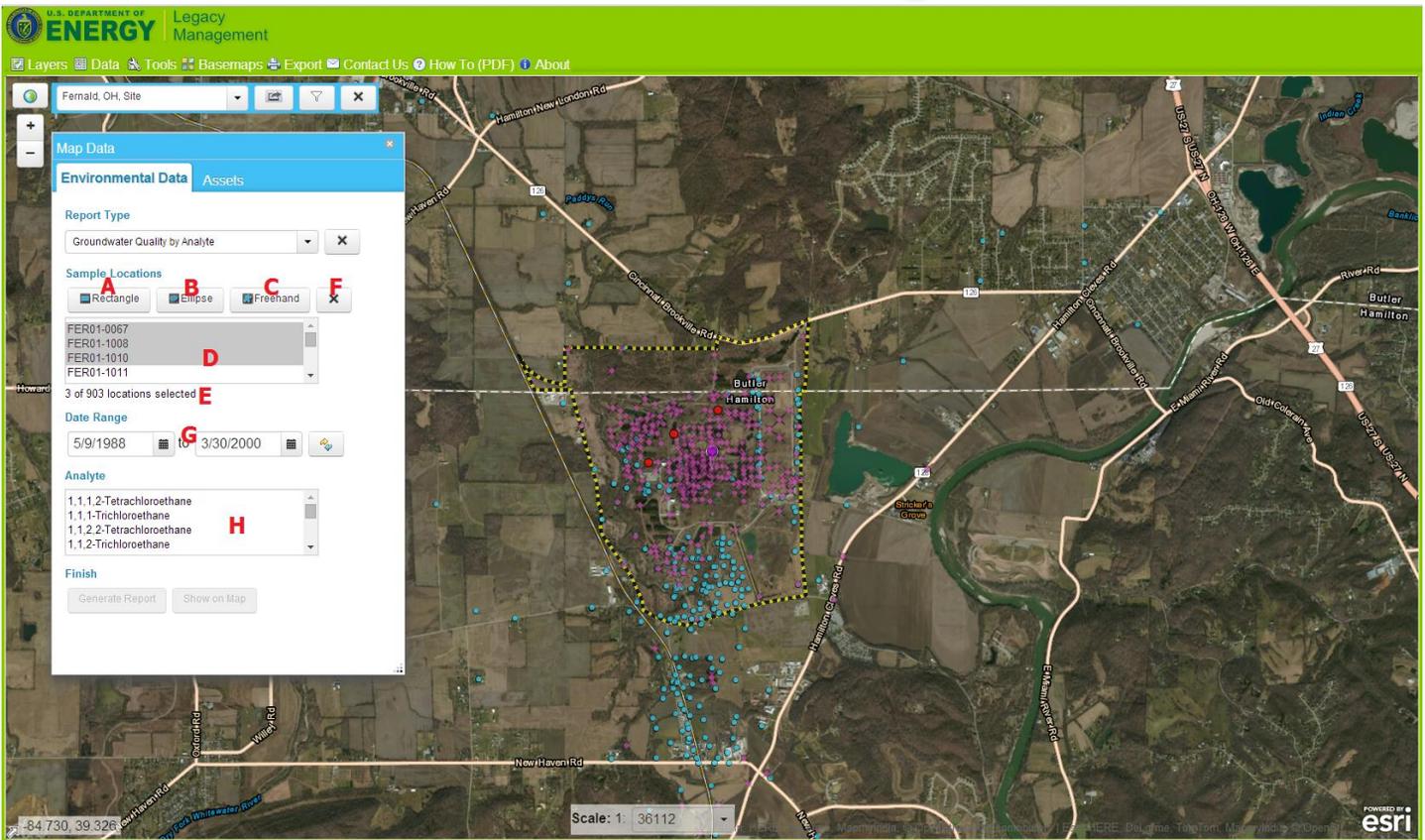


Figure 34. Report Parameters

Finally, you can either generate a report [A Figure 35. Report Data Options] or display the results on the map [B Figure 35. Report Data Options].

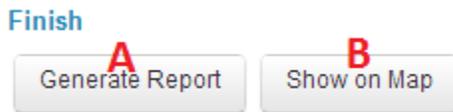


Figure 35. Report Data Options

GEMS - User Documentation



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Generating Report

Generating a Report will open the report in a new browser tab that you can come back to later. The URL [A Figure 36. Report Sample] can be bookmarked to view the report at a later date.

dev-apps-09.devnet.local/GEMS_External/Reporting/GenerateReport.aspx?report=GEMS201&locations=FER01-0067%7CFER01-1008%7CFER01-1010&ar

GROUNDWATER QUALITY BY ANALYTE WITH ZONE (GEMS201)
REPORT DATE/TIME: 4/2/2014 7:45:50 AM

ANALYTE: Uranium
SITE: FER01, Fernald Site [View Graph](#)

UNITS	TYPE	DATE	ID	COMPLETION ZONE	FLOW REL	RESULT	LAB	QUALIFIERS DATA	QA	DETECTION LIMIT	UNCERTAINTY
LOCATION: 0067											
mg/L	WL	1/13/1993	N001			2.4				0.1	
mg/L	WL	8/13/1993	0001			0.0008		J	#	0.0001	
mg/L	WL	8/13/1993	N001			0.020					
mg/L	WL	8/13/1993	N001			0.0084			#	0.0001	
mg/L	WL	7/26/1994	N002			0.0002					
mg/L	WL	7/26/1994	N003			0.0004					
mg/L	WL	8/17/1994	0002			0.0013					
mg/L	WL	8/17/1994	N002			0.0028					
mg/L	WL	1/31/1995	0002			0.0007					
mg/L	WL	1/31/1995	N002			0.0002					
mg/L	WL	7/31/1995	0001			0.0008					
mg/L	WL	7/31/1995	N001			0.0008					
mg/L	WL	7/31/1995	N002			0.013					
mg/L	WL	7/31/1995	N003			0.013					
mg/L	WL	8/1/1995	0002			0.0007					
mg/L	WL	8/1/1995	N002			0.0009					
mg/L	WL	1/31/1996	0001			0.1	U				
mg/L	WL	1/31/1996	0002			0.1	U				
mg/L	WL	1/31/1996	N003			0.1	U				
mg/L	WL	1/31/1996	N006			0.1	U				
mg/L	WL	8/15/1996	0002			0.0007					
mg/L	WL	8/15/1996	0004			0.0008					
mg/L	WL	8/15/1996	N002			0	U				
mg/L	WL	8/15/1996	N004			0.0012					
mg/L	WL	8/28/1997	N003			0.0044					
mg/L	WL	8/28/1997	N006			0.004					
mg/L	WL	1/28/1998	N003			0.0004					
mg/L	WL	1/28/1998	N006			0.0004					
mg/L	WL	8/26/1998	N003			0.0002					
mg/L	WL	8/26/1998	N006			0.0002					
mg/L	WL	8/4/1999	N003			0.00006	U	U	#		
mg/L	WL	8/4/1999	N006			0.00008	U	U	#		
mg/L	WL	3/30/2000	0002			0.0010067		J	#		
mg/L	WL	3/30/2000	0004			0.001086		J	#		
mg/L	WL	3/30/2000	N003			0.0013764			#		
mg/L	WL	3/30/2000	N006			0.0013904			#		
LOCATION: 1008											
mg/L	WL	5/20/1988	N001			0.014		J	#		
mg/L	WL	8/9/1988	N001			0.013			#		

Figure 36. Report Sample

Show on Map

Showing the results will display the results as green points on the map. Click a green result point to open a grid displaying the results in a tabular format.

The screenshot displays the GEMS web application interface. The main map area shows a satellite view of the Fernald, OH, Site with numerous green points representing environmental data. A 'Map Data' panel on the left allows users to filter data by 'Report Type' (Groundwater Quality by Analyte), 'Sample Locations' (Rectangle, Ellipse, Freehand), 'Date Range' (5/9/1988 to 3/30/2000), and 'Analyte' (Uranium, Uranium-234, Uranium-235, Uranium-235/236). A 'Finish' section includes 'Generate Report', 'Update Map', and 'Clear Data on Map' buttons. An 'Environmental Data' panel on the right shows a table of results for the selected location (FER01-0067) and analyte (Uranium).

Location	Analyte	Date	Result
FER01-0067	Uranium	1/13/1993	2.4
FER01-0067	Uranium	8/13/1993	0.0008 (J)
FER01-0067	Uranium	8/13/1993	0.020
FER01-0067	Uranium	8/13/1993	0.0084
FER01-0067	Uranium	7/26/1994	0.0002
FER01-0067	Uranium	7/26/1994	0.0004
FER01-0067	Uranium	8/17/1994	0.0013
FER01-0067	Uranium	8/17/1994	0.0028
FER01-0067	Uranium	1/31/1995	0.0007
FER01-0067	Uranium	1/31/1995	0.0002

Figure 37. Report Show on Map

[A Figure 37. Report Show on Map] Click 'Clear Data on Map' button to clear the report data from the map and dismiss the results grid.

[B Figure 37. Report Show on Map] The 'Select Analyte to Show' pick-list will list the analytes the user selected to report on.

[C Figure 37. Report Show on Map] Click the 'Reset Selection' button to clear the location selection on the map. This does not clear the report results.

[D Figure 37. Report Show on Map] Click the 'Export to CSV' button to export the grid results to a CSV file.

[E Figure 37. Report Show on Map] Click the 'Close' button to dismiss the results grid.

[F Figure 37. Report Show on Map] The report results grid.

When you select the analyte to be analyzed [B], then the results grid [F] will filter to only display the selected Analyte.

Assets

To access the Asset Data select a Site in the [Site Selection](#) pick-list.

Inspection Photos

To view Inspections Photos, if any exist, you must select a Site from the [Site Selection](#) pick-list.

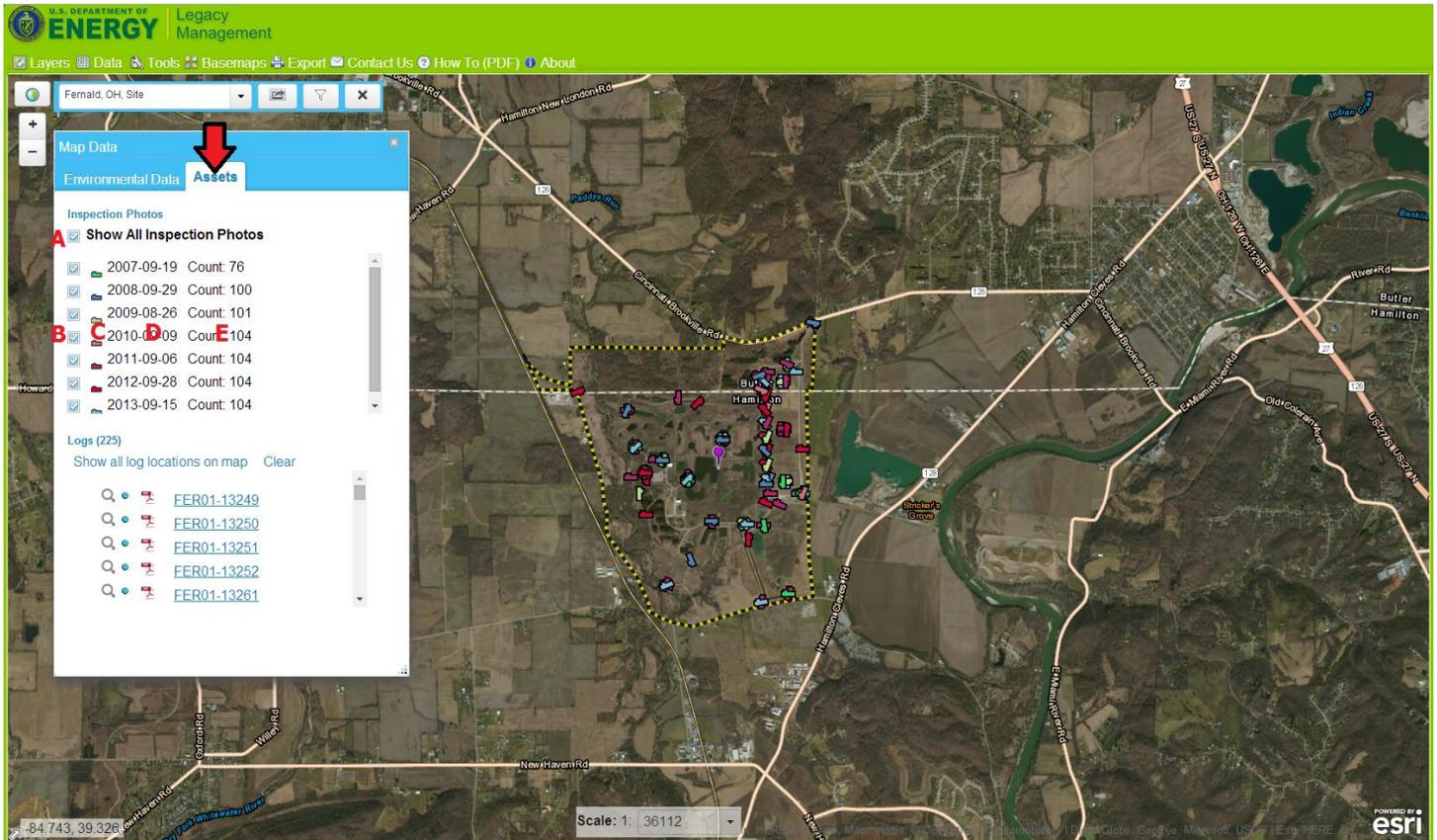


Figure 38. Inspection Photos

[A Figure 38. Inspection Photos] Click 'Show All Inspection Photos' to display all photos.

[B Figure 38. Inspection Photos] Select and de-select checkboxes to toggle visibility of image sets.

[C Figure 38. Inspection Photos] The legend symbol for the image set.

[D Figure 38. Inspection Photos] The date for the image set.

[E Figure 38. Inspection Photos] The number of images in the image set.

Logs

To view Logs, if any exist, you must select a Site from the [Site Selection](#) pick-list.

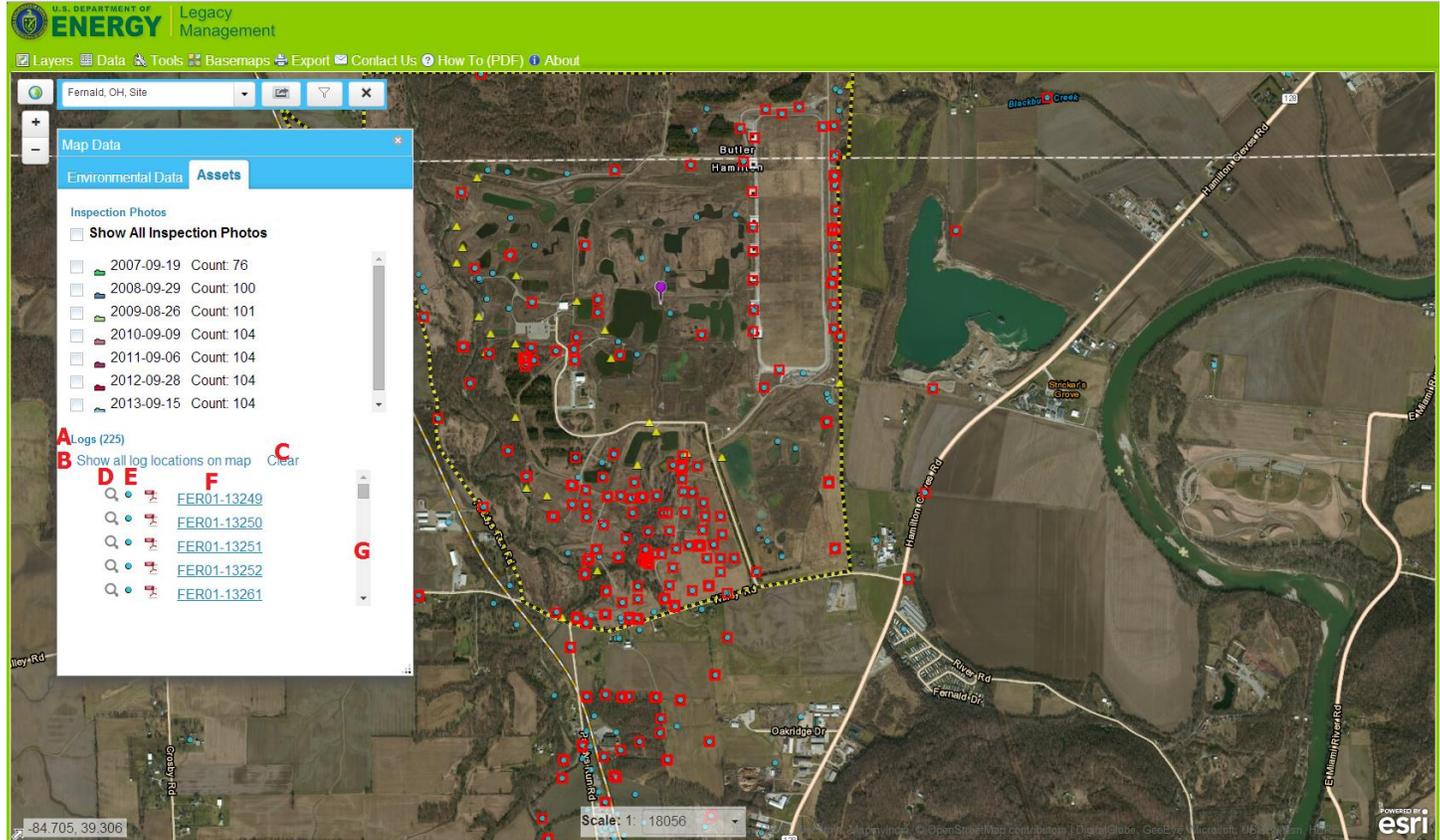


Figure 39. Logs

[A Figure 39. Logs] The number of logs found for the selected Site.

[B Figure 39. Logs] Click 'Show all log location on map' to display locations with log data on the map.

[C Figure 39. Logs] Click 'Clear' to clear graphics from the map.

[D Figure 39. Logs] Click the magnifying glass icon to navigate to the location for the given log.

[E Figure 39. Logs] The legend symbol for the location type.

[F Figure 39. Logs] Click log link to view the log in PDF format.

[G Figure 39. Logs] Scrollbar to scroll through the list of log available for the Selected Site.

Note:

- The query uses the Sample Locations types selected in the Map Layers pane. To determine which location types to get logs for, use the Map Layers pane and toggle the selection of Sample Location types. So if you only want to see Logs for Existing Wells, then only have Existing Wells selected in the TOC.
- If you do not have the Sample Locations layer visible, you will be asked if you want to make that layer visible. [Figure 40. Log Prompt.] You will only be prompted one time for a response.

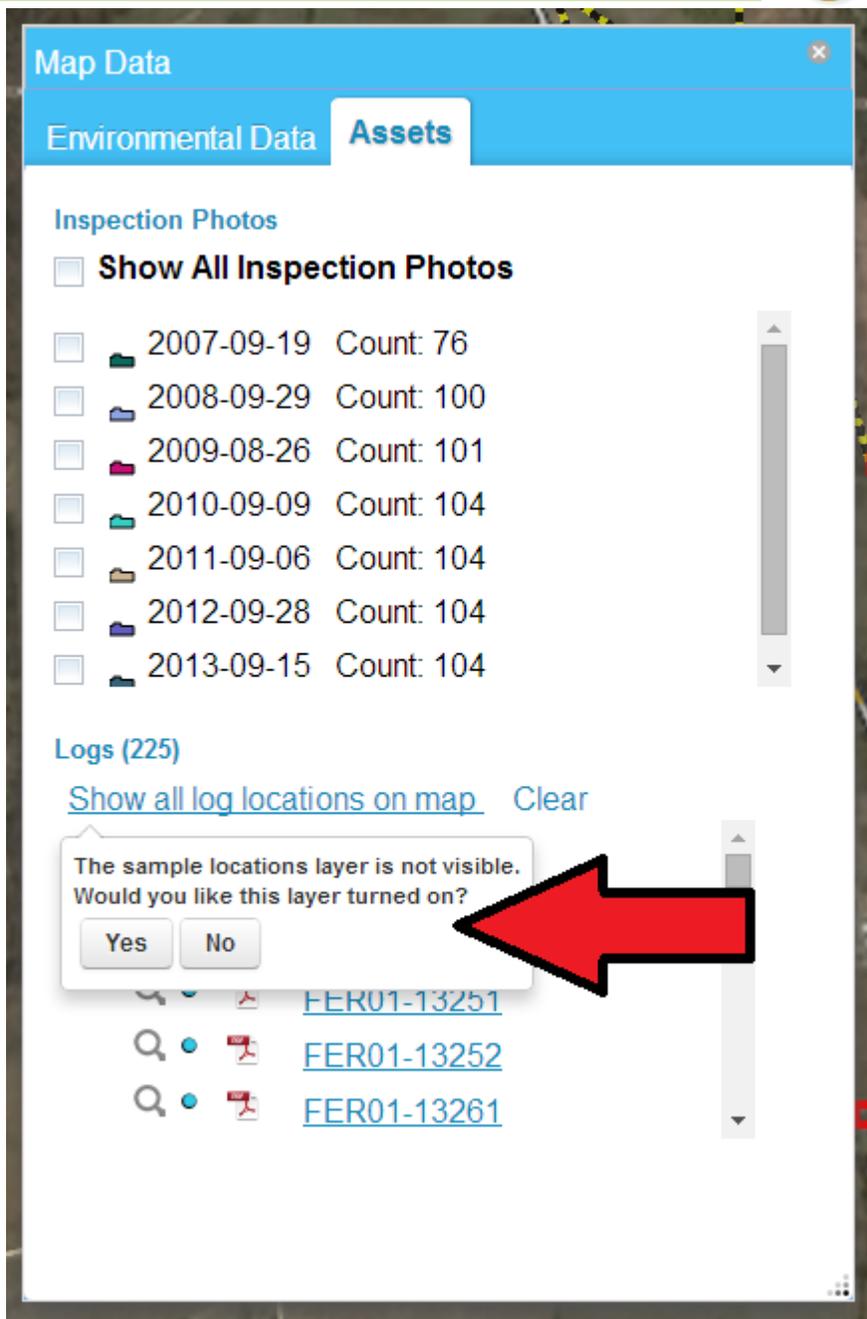


Figure 40. Log Prompt.

You can also view a log for a given location, if one exists, by clicking on the location in map. Scroll down on the location pop-up and click the PDF icon. If you do not see a PDF icon, there is no log available. Refer to Figure 41. Location Pop-up.

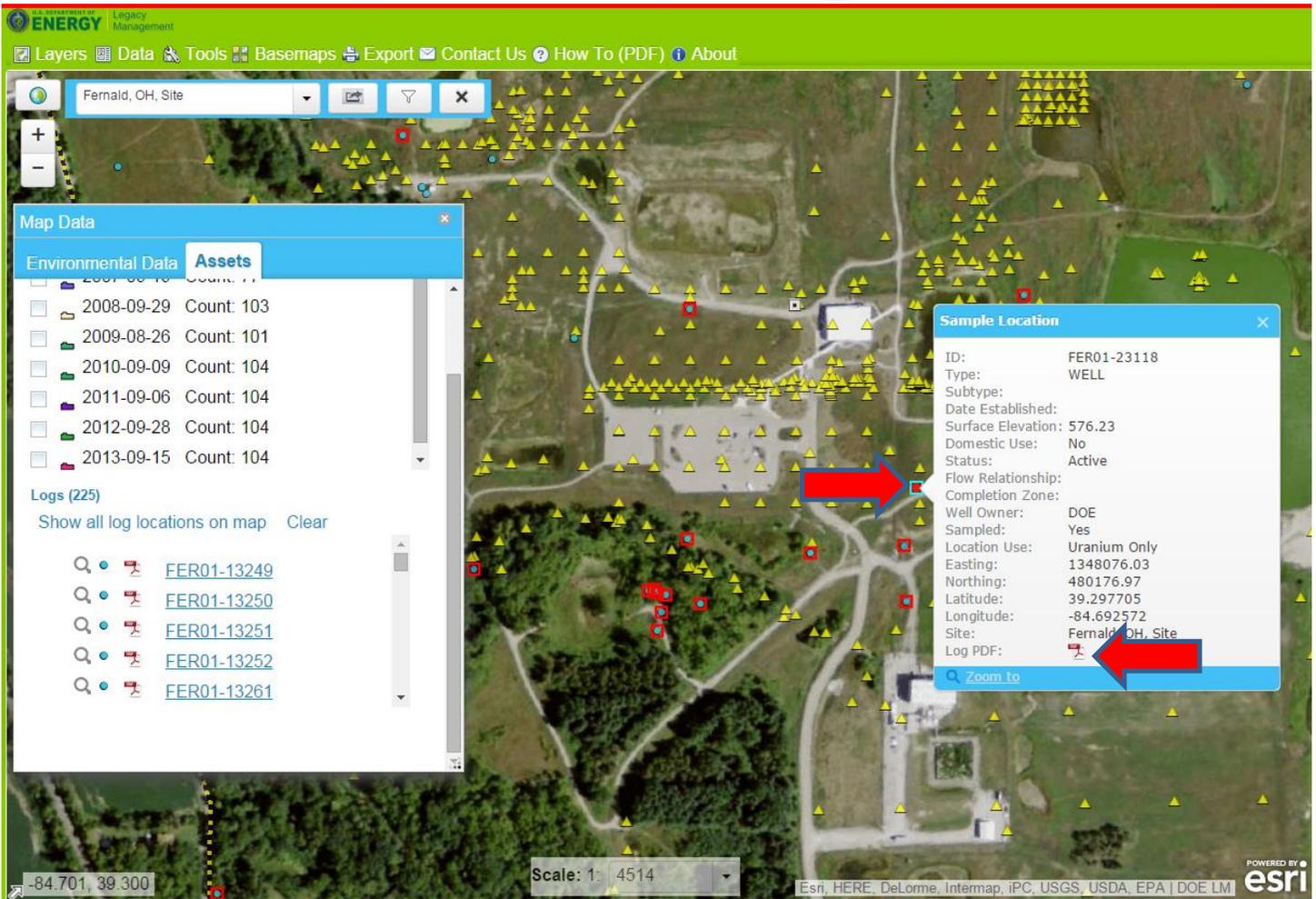


Figure 41. Location Pop-up

Map Export



Figure 42. Export Menu Item

Use the Map Export feature by clicking the 'Export' menu item. A pane will appear allowing the user to create a map in either PDF or PNG format. Refer to Figure 43. Print Export.

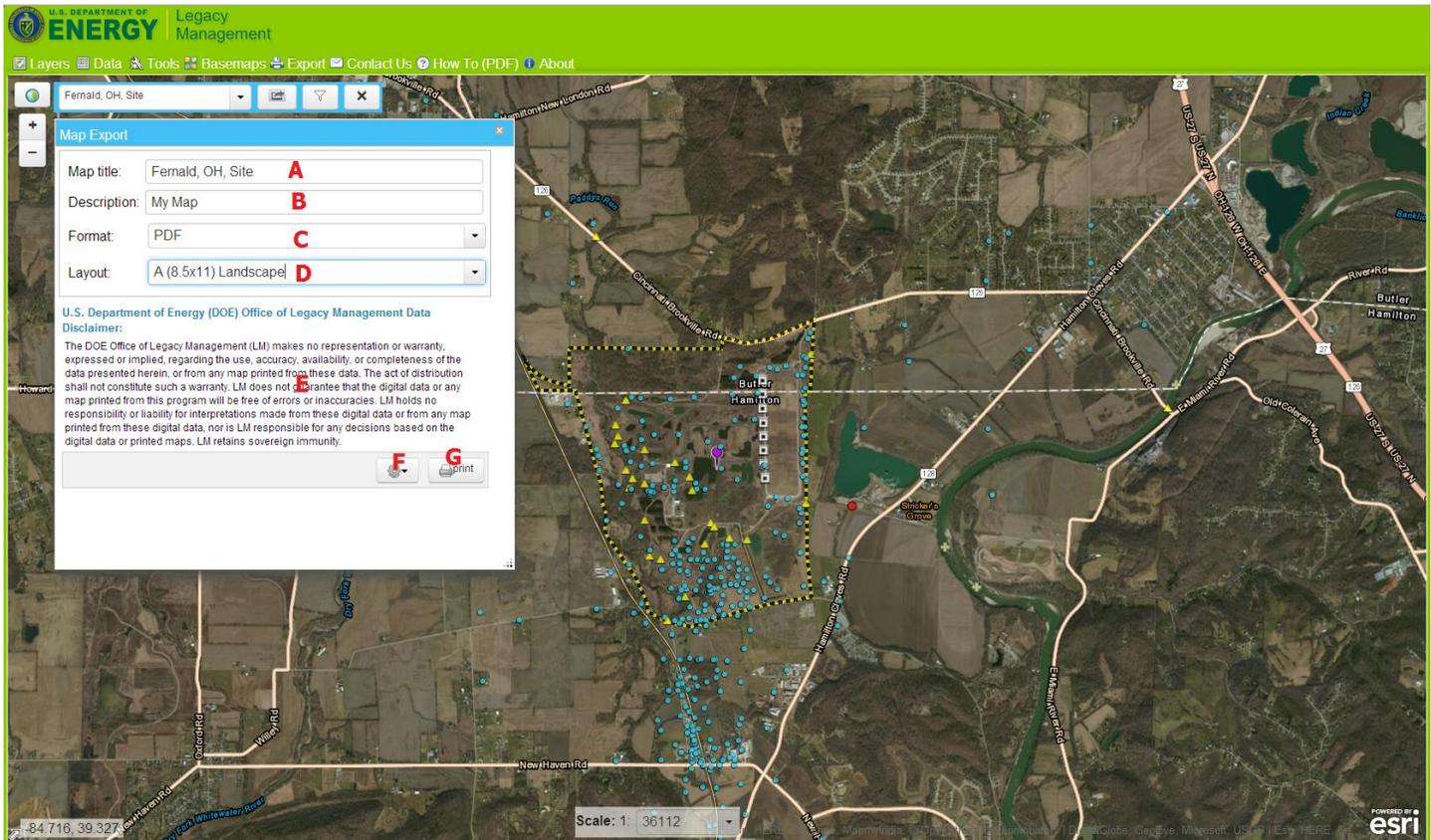


Figure 43. Print Export

[A Figure 43. Print Export] When a Site is selected the Map Title will default to the selected Site, otherwise enter a Map Title.

[B Figure 43. Print Export] Enter a succinct Description.

[C Figure 43. Print Export] Select either PDF or PNG format. Note: PNG is quicker.

[D Figure 43. Print Export] Select a Layout: Letter Landscape, Letter Portrait, Tabloid Landscape or Tabloid Portrait.

[E Figure 43. Print Export] Please read and understand the data disclaimer.

[F Figure 43. Print Export] For additional printing options select the menu with the gear.

[G Figure 43. Print Export] Click the print button to execute the print.

Creating the print:

You do not have to wait until the export has completed to continue use of the GEMS application.

[A Figure 44. Print Export Queue] A PDF icon will display if the user is exporting a map as PDF. A PNG icon will display if exporting a map as PNG.

[B Figure 44. Print Export Queue] Busy Icon will display while the export is executing.

[C Figure 44. Print Export Queue] Click the clear button to clear the list of exports.

Map title:	<input type="text" value="Rocky Flats, CO, Site"/>
Description:	<input type="text" value="THIS IS MY PRINT"/>
Format:	<input type="text" value="PDF"/>
Layout:	<input type="text" value="Letter Landscape"/>

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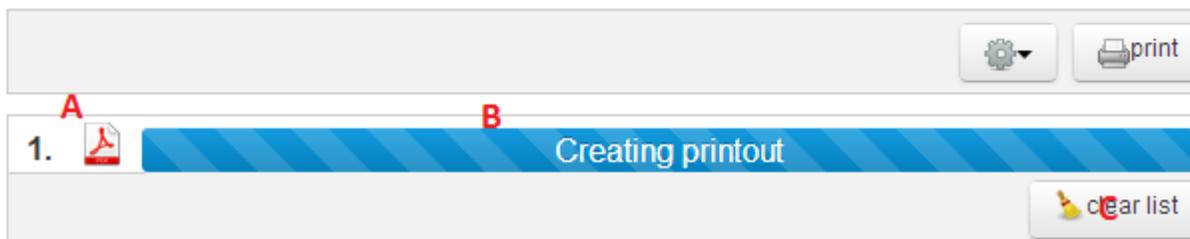


Figure 44. Print Export Queue

Print Completed:

As stated previously, you do not have to wait until the export has completed to continue use of the GEMS application. You will get notified with a 'toast' in the lower right corner of the map when the export has completed. Refer to Figure 45. Print Export Notification

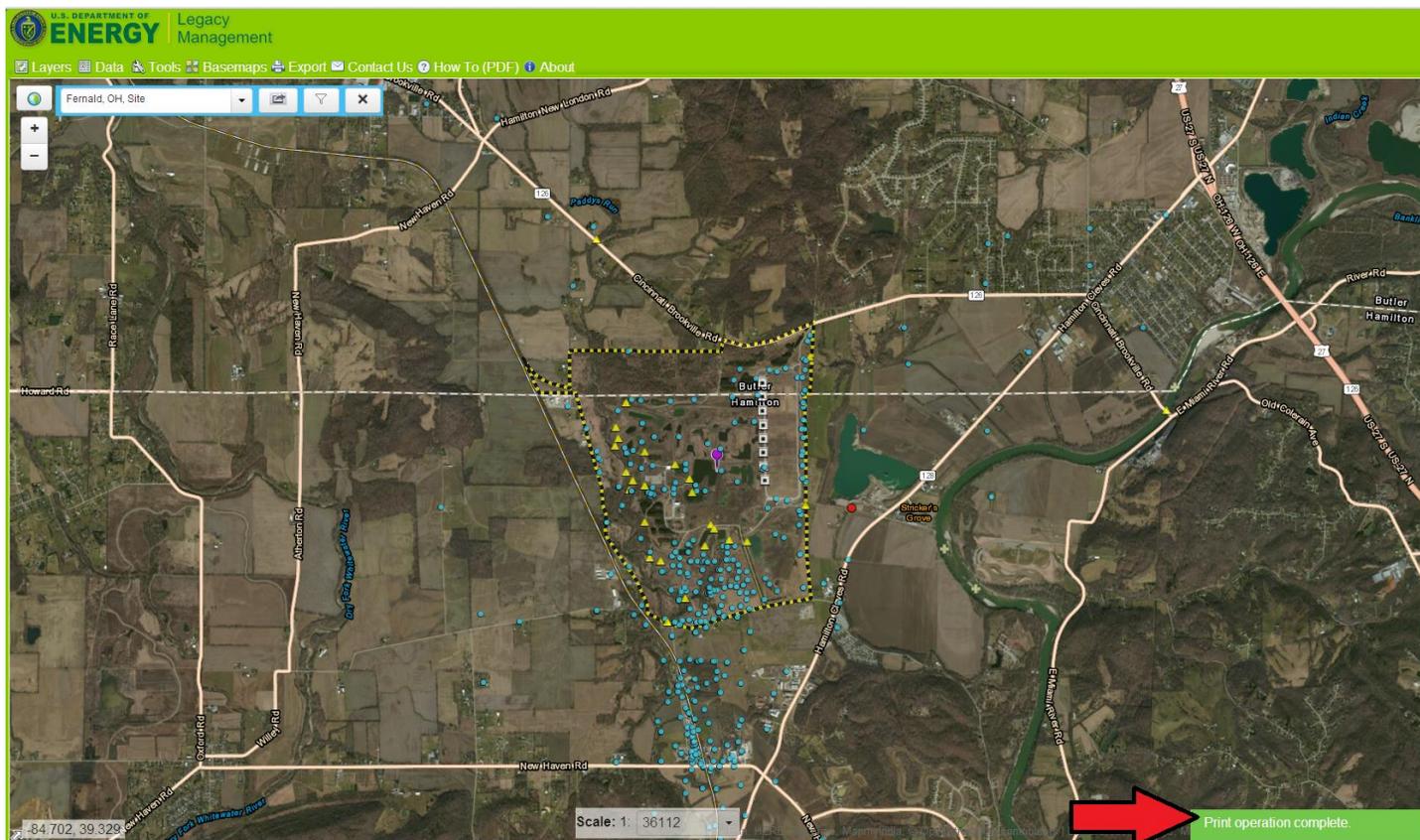


Figure 45. Print Export Notification

Also if you click the Export button, the print menu will show any exports completed [A Figure 46. Print Export Complete] or in-progress [B Figure 46. Print Export Complete]. Click on the completed [A Figure 46. Print Export Complete] export to view the print.



Map title:	<input type="text" value="Fernald, OH, Site"/>
Description:	<input type="text" value="THIS IS MY PRINT"/>
Format:	<input type="text" value="PNG"/>
Layout:	<input type="text" value="Letter Landscape"/>

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1.		A	Rocky Flats, CO, Site
2.		B	Creating printout

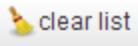


Figure 46. Print Export Complete

Map Tools



Figure 47 Tools Menu Item

Use the Map Tools feature by clicking the 'Tools' menu item. A pane with multiple tabs will appear. Each tab represents a different tool.

Locate Address

Use this tool to perform a search for place names or addresses.

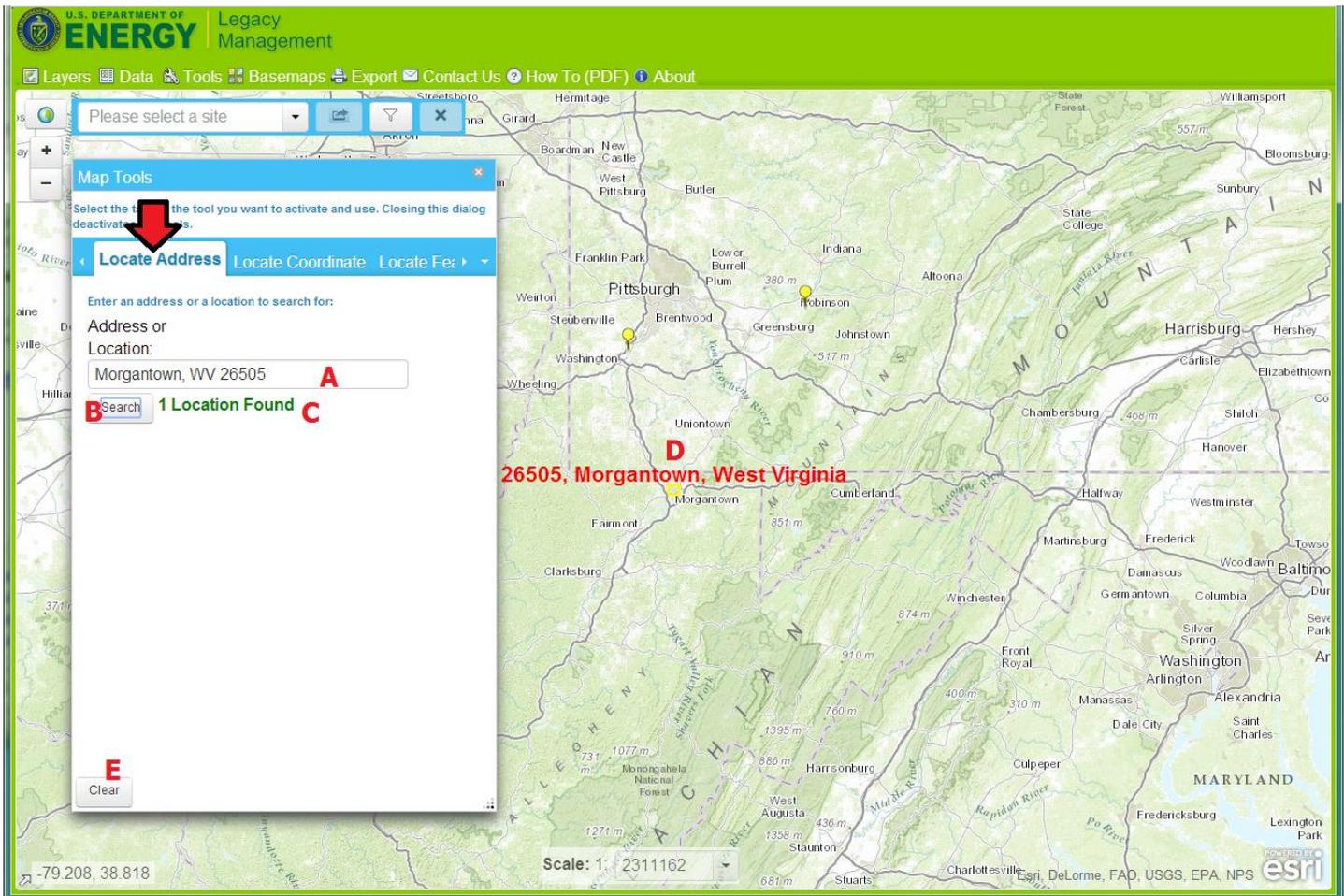


Figure 48. Locate Address Tool

[A Figure 48. Locate Address Tool] Enter the place name or address to search for.

[B Figure 48. Locate Address Tool] Click the Search button to execute the search.

[C Figure 48. Locate Address Tool] Search results count.

[D Figure 48. Locate Address Tool] Map location of search results. Yellow Square is the location.

[E Figure 48. Locate Address Tool] Clear all Locate (Address, Coordinate, Feature) search results.

Locate Coordinates

Use this tool to search for coordinates in either: Geographic, Degrees-Minutes-Seconds (DMS), Decimal Degrees (DD) or additional Spatial Reference (SR) systems available in GEMS.

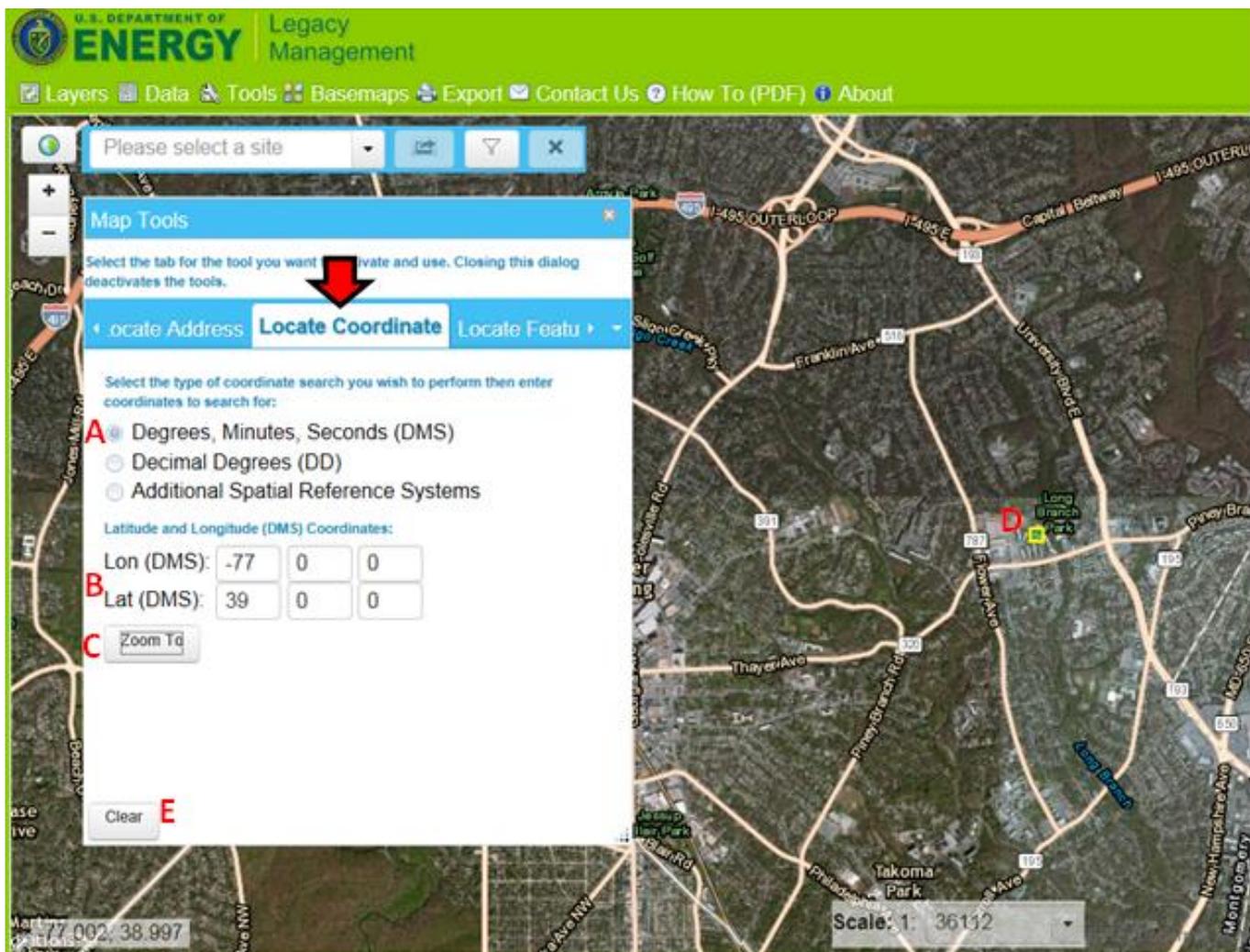


Figure 49. Locate Coordinate Tool – DMS

- [A Figure 49. Locate Coordinate Tool – DMS] Select Degrees, Minutes, Seconds (DMS) for the coordinate type.
- [B Figure 49. Locate Coordinate Tool – DMS] Enter the coordinate values.
- [C Figure 49. Locate Coordinate Tool – DMS] Click the Zoom To button to execute the search.
- [D Figure 49. Locate Coordinate Tool – DMS] Map location of search results. Yellow Square is the location.
- [E Figure 49. Locate Coordinate Tool – DMS] Clear all Locate (Address, Coordinate, Feature) search results.

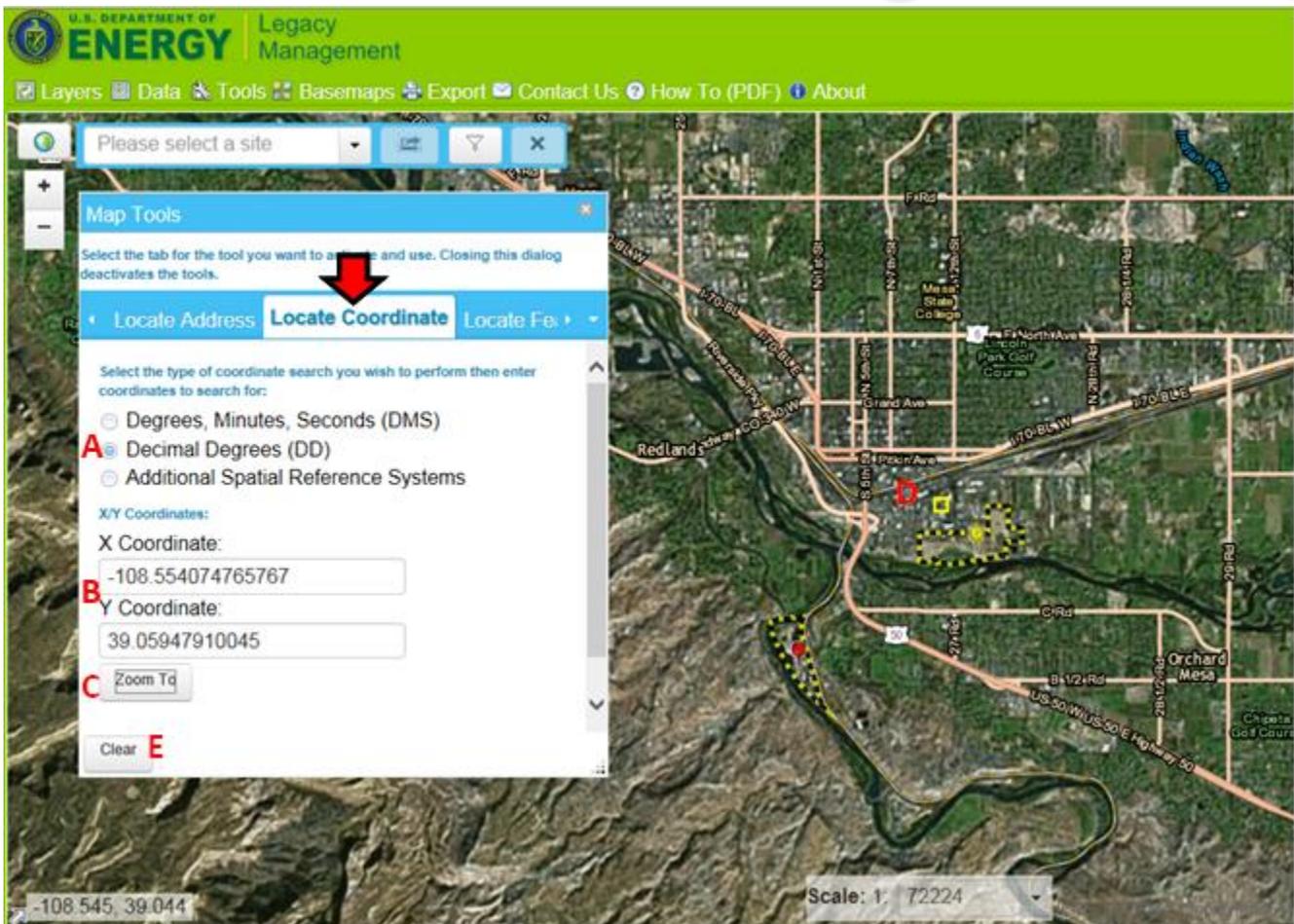


Figure 50. Locate Coordinate Tool – DD

- [A Figure 50. Locate Coordinate Tool – DD] Select Decimal Degrees (DD) for the coordinate type.
- [B Figure 50. Locate Coordinate Tool – DD] Enter the coordinate values.
- [C Figure 50. Locate Coordinate Tool – DD] Click the Zoom To button to execute the search.
- [D Figure 50. Locate Coordinate Tool – DD] Click the Zoom To button to execute the search.
- [E Figure 50. Locate Coordinate Tool – DD] Map location of search results. Yellow Square is the location.
- [F Figure 50. Locate Coordinate Tool – DD] Clear all Locate (Address, Coordinate, Feature) search results.

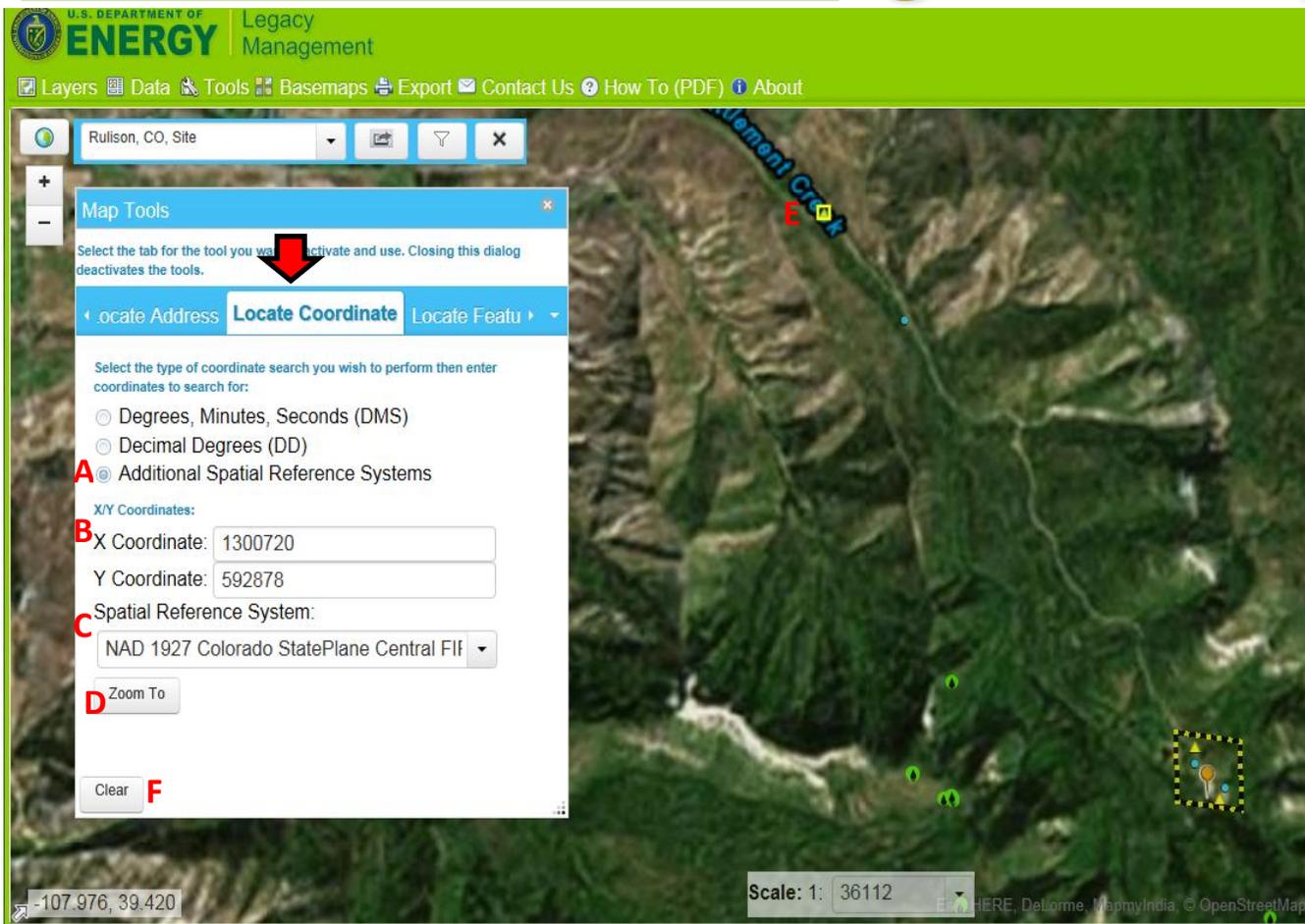


Figure 51. Locate Coordinate Tool - SR

- [A Figure 51. Locate Coordinate Tool - SR] Select Additional Spatial Reference Systems for the coordinate type.
- [B Figure 51. Locate Coordinate Tool - SR] Enter the coordinate values.
- [C Figure 51. Locate Coordinate Tool - SR] Select the appropriate Spatial Reference System.
- [D Figure 51. Locate Coordinate Tool - SR] Click the Zoom To button to execute the search.
- [E Figure 51. Locate Coordinate Tool - SR] Map location of search results. Yellow Square is the location.
- [F Figure 51. Locate Coordinate Tool - SR] Clear all Locate (Address, Coordinate, Feature) search results.

Locate Features

Use this tool to search for Sample Locations by Location Code, Sample Locations by Object ID, LM Sites by Site Name, or LM Sites by Site Mnemonic. You can use partial values to search if you are uncertain of the exact value.

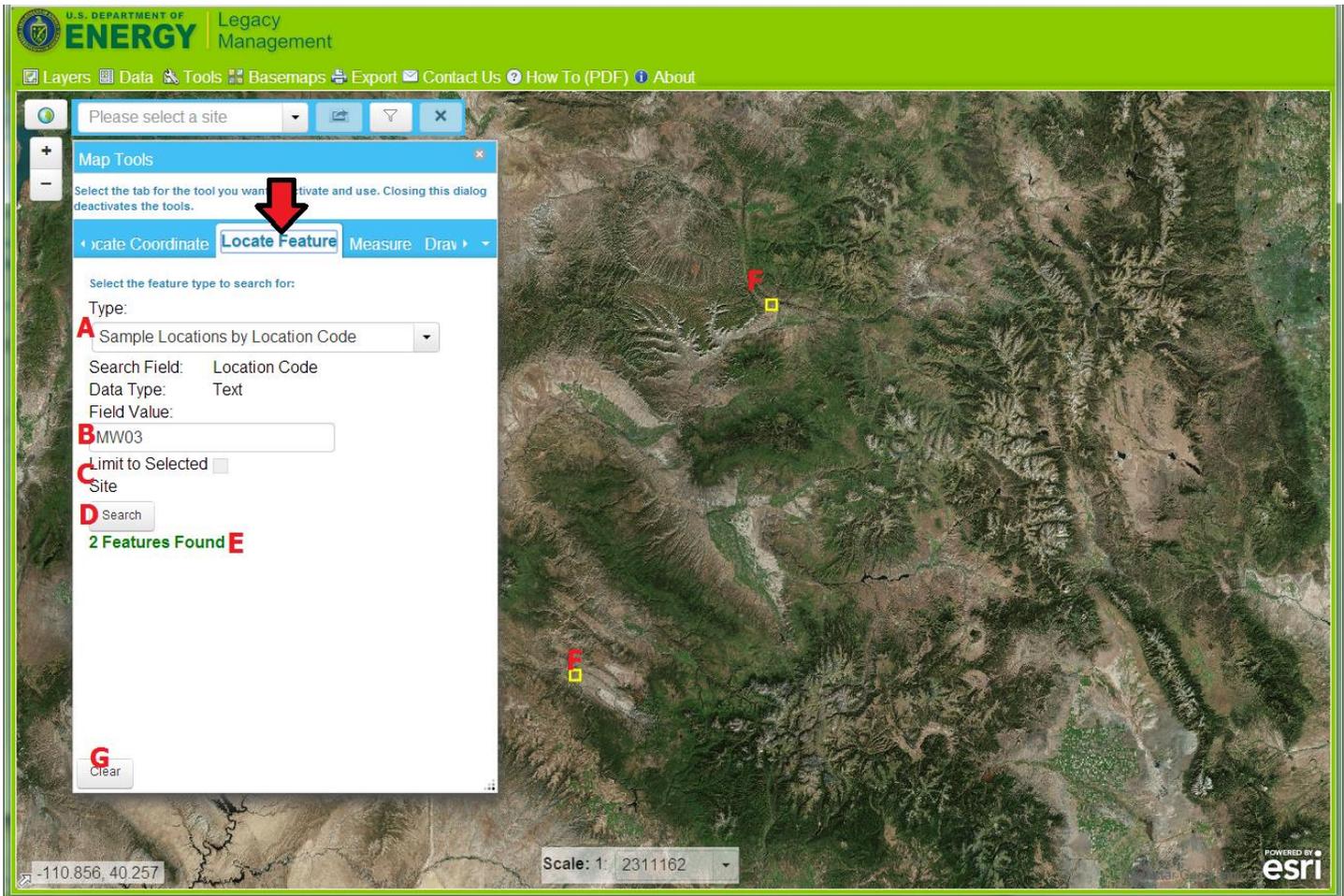


Figure 52. Locate Feature Tool

- [A Figure 52. Locate Feature Tool] Select the feature type to search for.
- [B Figure 52. Locate Feature Tool] Enter the appropriate value for the type selected.
- [C Figure 52. Locate Feature Tool] Some values exist in multiple Sites. Select this to limit to the selected Site in the [Site Selection](#).
- [D Figure 52. Locate Feature Tool] Click the Search button to execute the search.
- [E Figure 52. Locate Feature Tool] Search results count.
- [F Figure 52. Locate Feature Tool] Map location of search results. Yellow Squares are the locations.
- [G Figure 52. Locate Feature Tool] Clear all Locate (Address, Coordinate, Feature) search results.

Measure

Use this tool to measure distance, area, or to get the current coordinates of your mouse pointer.

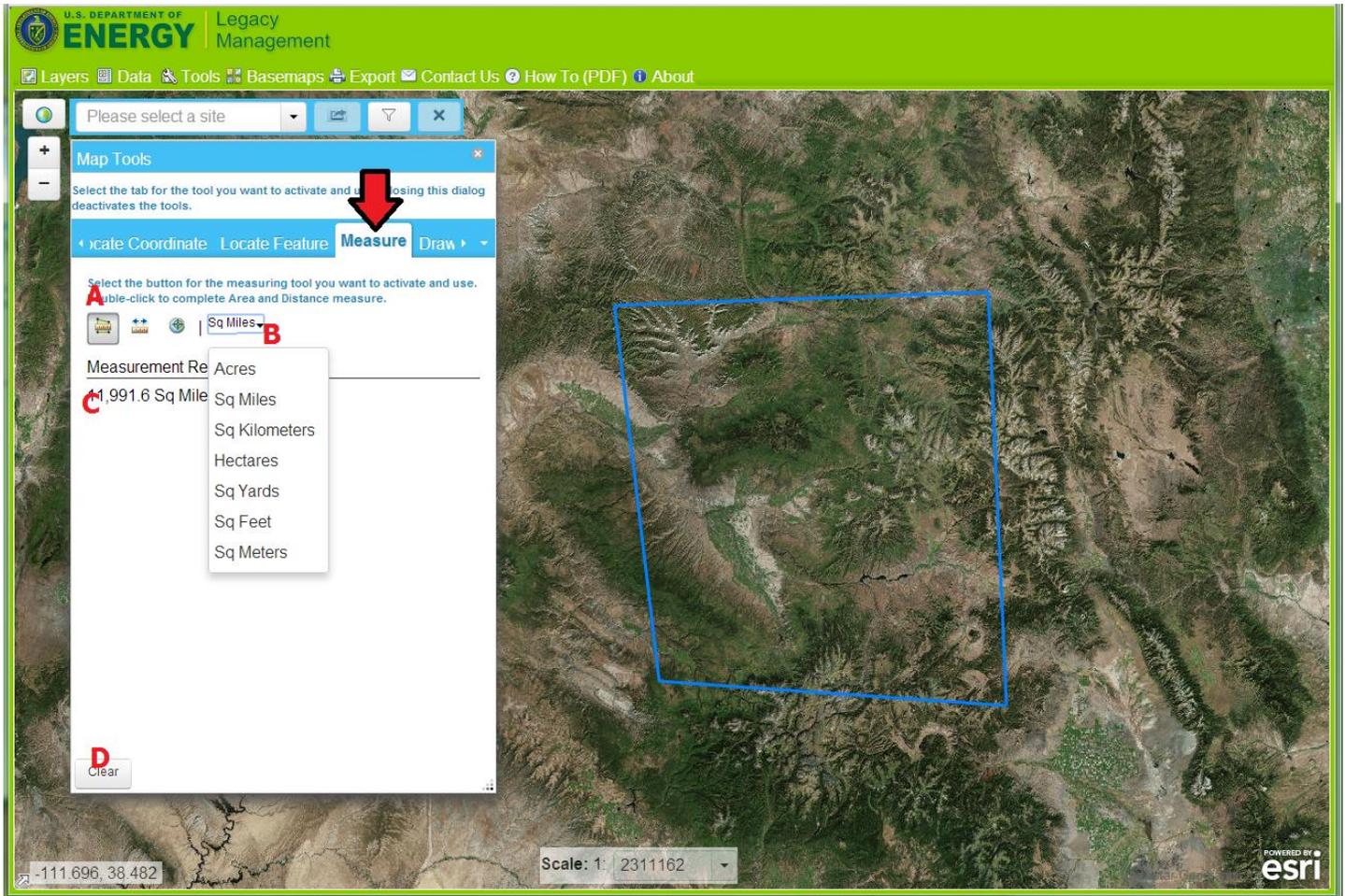


Figure 53. Measure Tool - Area

[A Figure 53. Measure Tool - Area] Click the area measure button.

[B Figure 53. Measure Tool - Area] Select the unit of measure.

[C Figure 53. Measure Tool - Area] The measurement result.

[D Figure 53. Measure Tool - Area] Clear Measure graphics.

Note: Double-click to complete area measure.

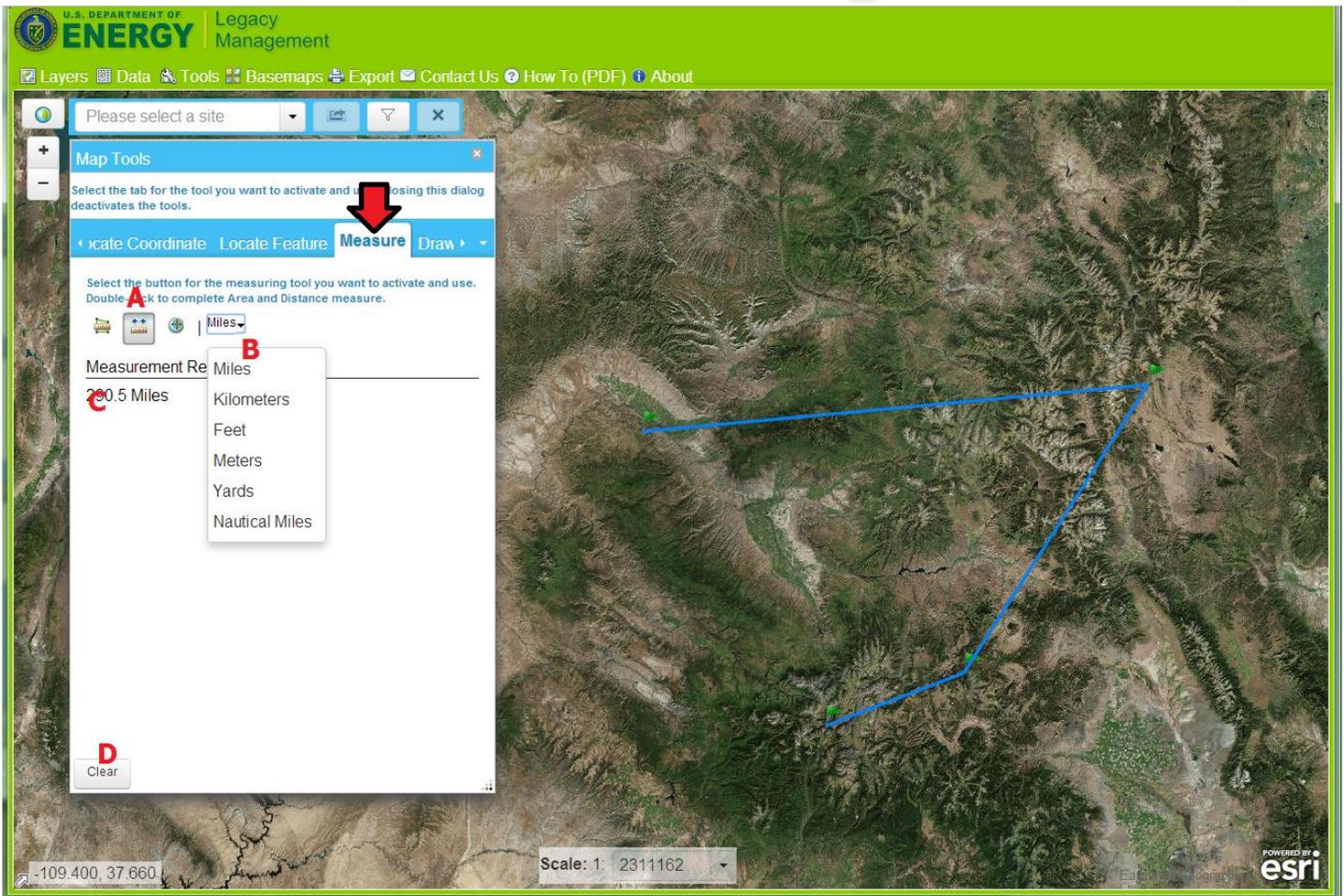


Figure 54. Measure Tool - Line

[A Figure 54. Measure Tool - Line] Click the area measure button.

[B Figure 54. Measure Tool - Line] Select the unit of measure.

[C Figure 54. Measure Tool - Line] The measurement result.

[D Figure 54. Measure Tool - Line] Clear Measure graphics.

Note: Double-click to complete line measure.

Draw Coordinate

Use this tool to place a point on the map and label the point with the selected Spatial Reference System.



Figure 55. Draw Coordinate Tool

[A Figure 55. Draw Coordinate Tool] Select the style of point.

[B Figure 55. Draw Coordinate Tool] Select the color you want your point.

[C Figure 55. Draw Coordinate Tool] Select the color you want your label.

[D Figure 55. Draw Coordinate Tool] Select the appropriate Spatial Reference System.

[E Figure 55. Draw Coordinate Tool] Clear all (Text, Point, Line, Polygon) draw graphics..

[F Figure 55. Draw Coordinate Tool] Clear only selected Draw graphics. Click the button then drag a box around graphics to be removed.

Note: When a site is selected, then the Spatial Reference System dropdown will auto-populate with the Spatial Reference System for the selected site if it is defined. Not all sites currently have defined Spatial Reference Systems.

Draw Text

Use this tool to draw text on the map.

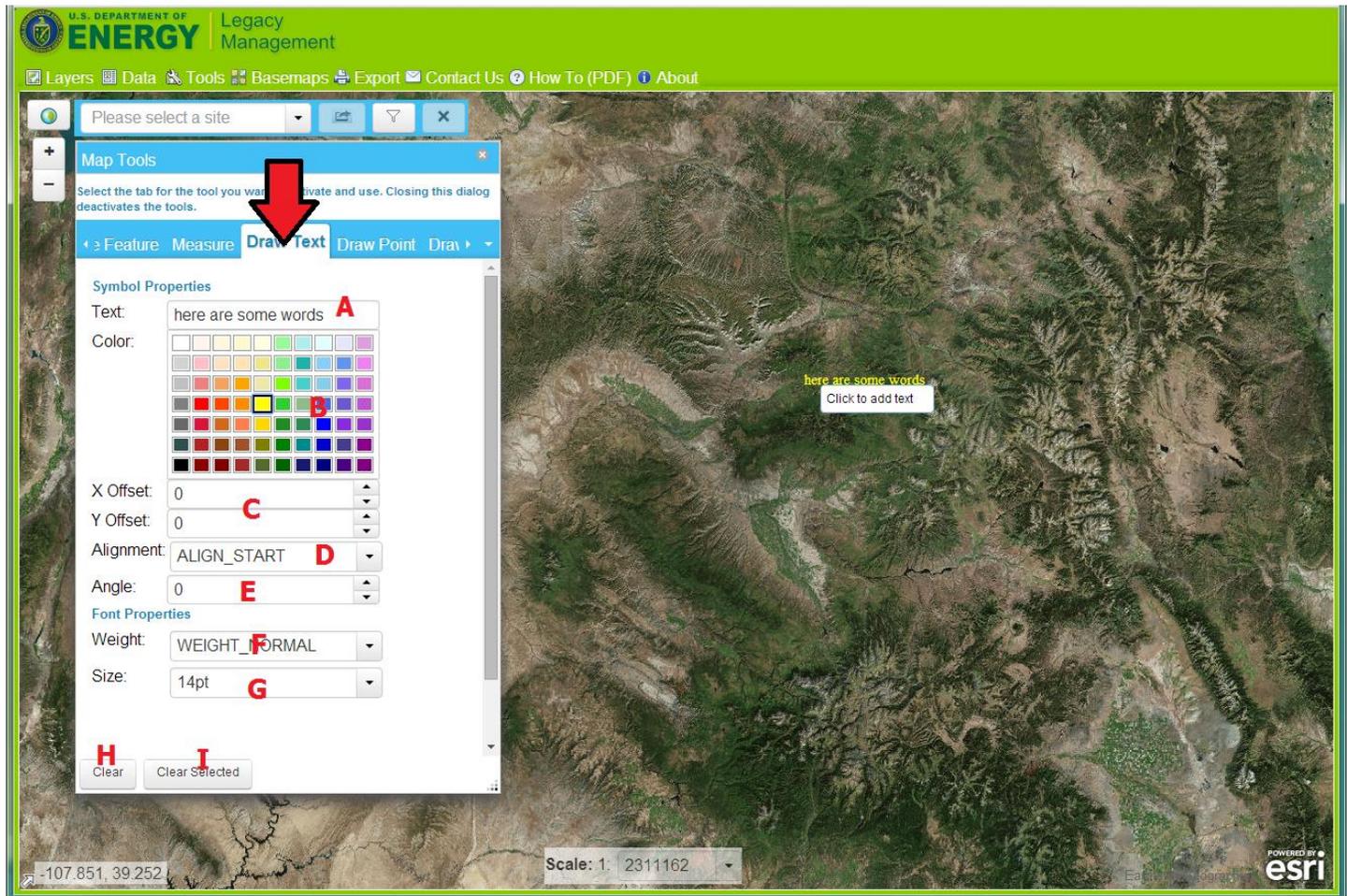


Figure 56. Draw Text Tool

- [A Figure 56. Draw Text Tool] Enter the text you want to place on the map. The default is 'Text'.
- [B Figure 56. Draw Text Tool] Select the color you want your text.
- [C Figure 56. Draw Text Tool] Select the X,Y offset of the text, relative to where you click on the map.
- [D Figure 56. Draw Text Tool] Select alignment of the text, relative to where you click on the map.
- [E Figure 56. Draw Text Tool] Select the angle of the text, relative to where you click on the map.
- [F Figure 56. Draw Text Tool] Select the font weight of the text.
- [G Figure 56. Draw Text Tool] Select the font size of the text.
- [H Figure 56. Draw Text Tool] Clear all (Text, Point, Line, Polygon) draw graphics.
- [I Figure 56. Draw Text Tool] Clear only selected Draw graphics. Click the button then drag a box around graphics to be removed.

Draw Point

Use this tool to draw points on the map.

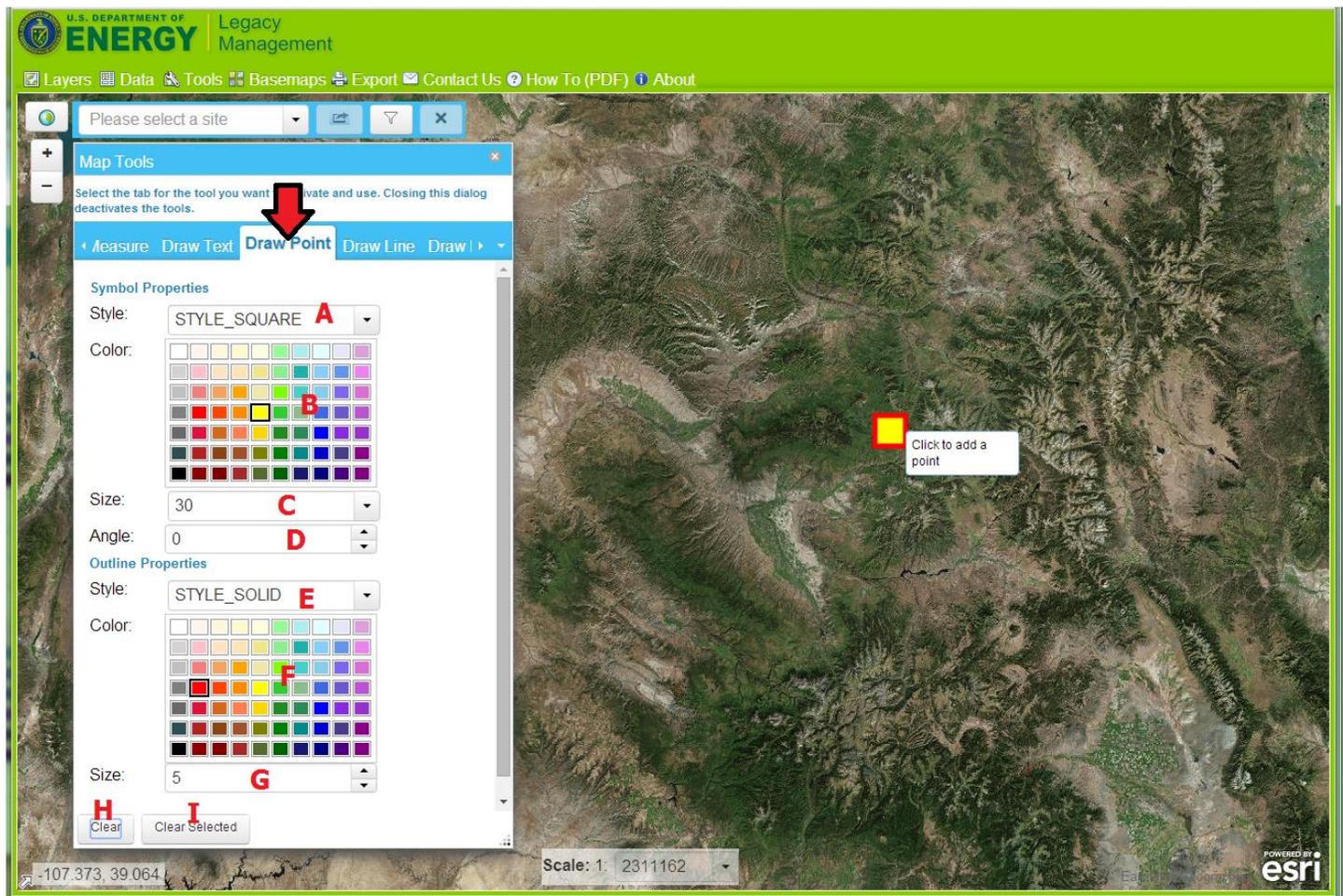


Figure 57. Draw Point Tool

[A Figure 57. Draw Point Tool] Select the style of point.

[B Figure 57. Draw Point Tool] Select the color you want your point.

[C Figure 57. Draw Point Tool] Select the size of your point.

[D Figure 57. Draw Point Tool] Select the angle of your point.

[E Figure 57. Draw Point Tool] Select the outline style of your point.

[F Figure 57. Draw Point Tool] Select the outline color of your point.

[G Figure 57. Draw Point Tool] Select the outline width of your point.

[H Figure 57. Draw Point Tool] Clear all (Text, Point, Line, Polygon) draw graphics.

[I Figure 57. Draw Point Tool] Clear only selected Draw graphics. Click the button then drag a box around graphics to be removed.

Draw Line

Use this tool to draw lines on the map.

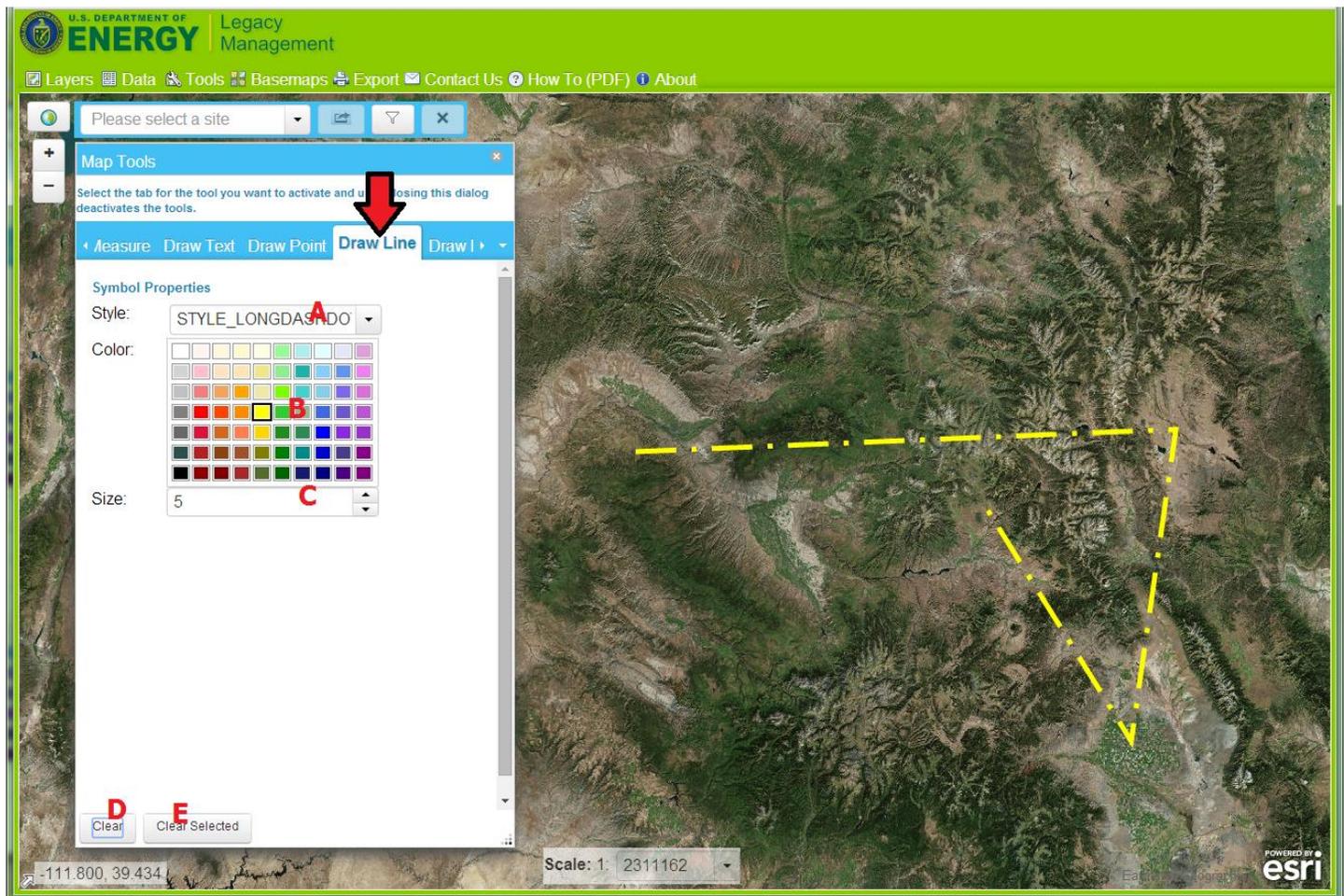


Figure 58. Draw Line Tool

[A Figure 58. Draw Line Tool] Select the style of line.

[B Figure 58. Draw Line Tool] Select the color you want your line.

[C Figure 58. Draw Line Tool] Select the width of your line.

[E Figure 58. Draw Line Tool] Clear all (Text, Point, Line, Polygon) draw graphics.

[F Figure 58. Draw Line Tool] Clear only selected Draw graphics. Click the button then drag a box around graphics to be removed.

Draw Polygon

Use this tool to draw polygons on the map.

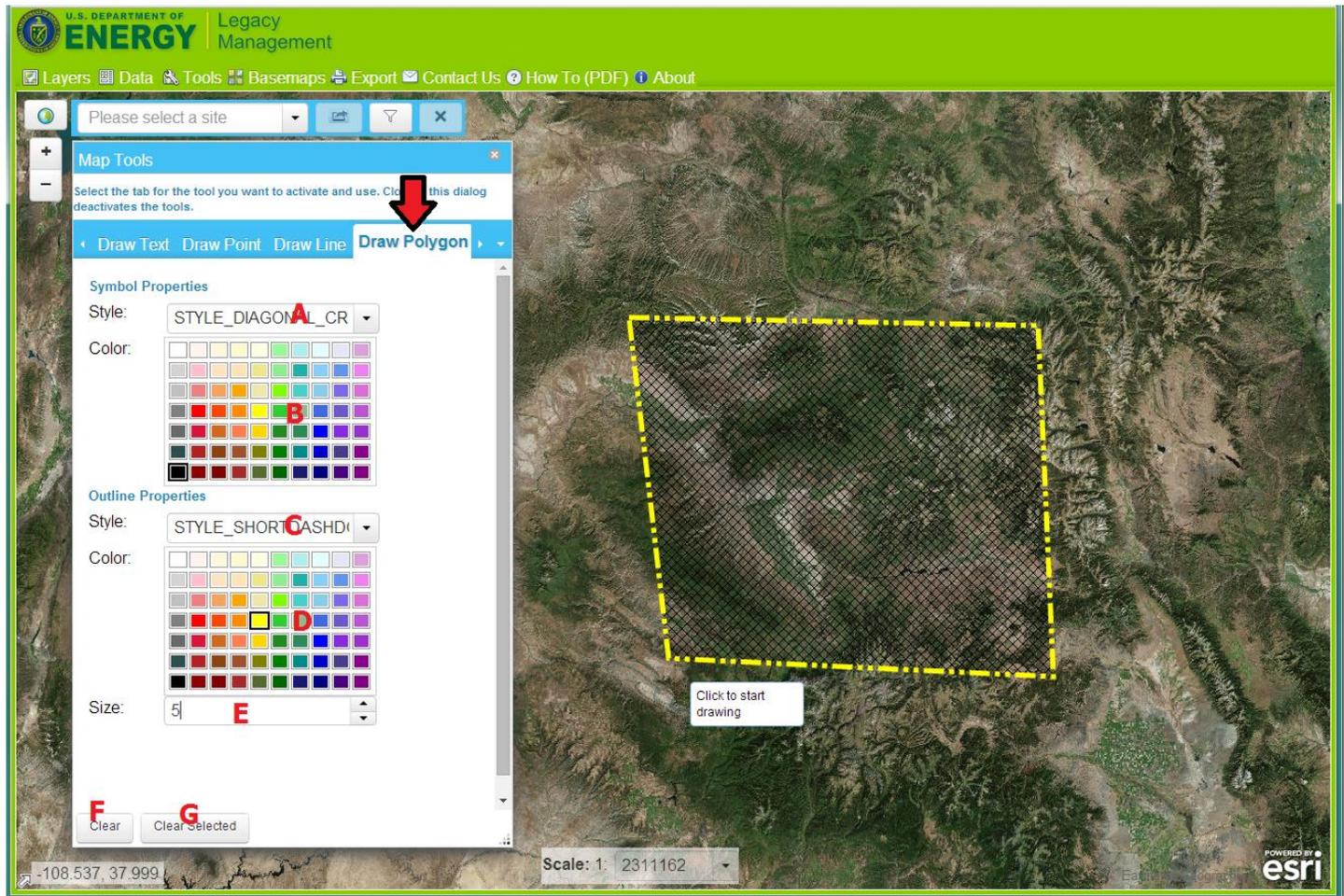


Figure 59. Draw Polygon Tool

- [A Figure 59. Draw Polygon Tool] Select the style of polygon.
- [B Figure 59. Draw Polygon Tool] Select the color you want your polygon. Note: only applies to STYLE_SOLID.
- [C Figure 59. Draw Polygon Tool] Select the outline style your polygon.
- [D Figure 59. Draw Polygon Tool] Select the outline color your polygon.
- [E Figure 59. Draw Polygon Tool] Select the outline width your polygon.
- [F Figure 59. Draw Polygon Tool] Clear all (Text, Point, Line, Polygon) draw graphics.
- [G Figure 59. Draw Polygon Tool] Clear only selected Draw graphics. Click the button then drag a box around graphics to be removed.

Contact Us



Figure 60. Contact Us Menu Item

Use the Contact Us feature by clicking the **Contact Us** menu item. A dialog window will appear to allow the user the ability to provide feedback, ask a question, or just say hello. Refer to Figure 61. Contact Us Dialog.

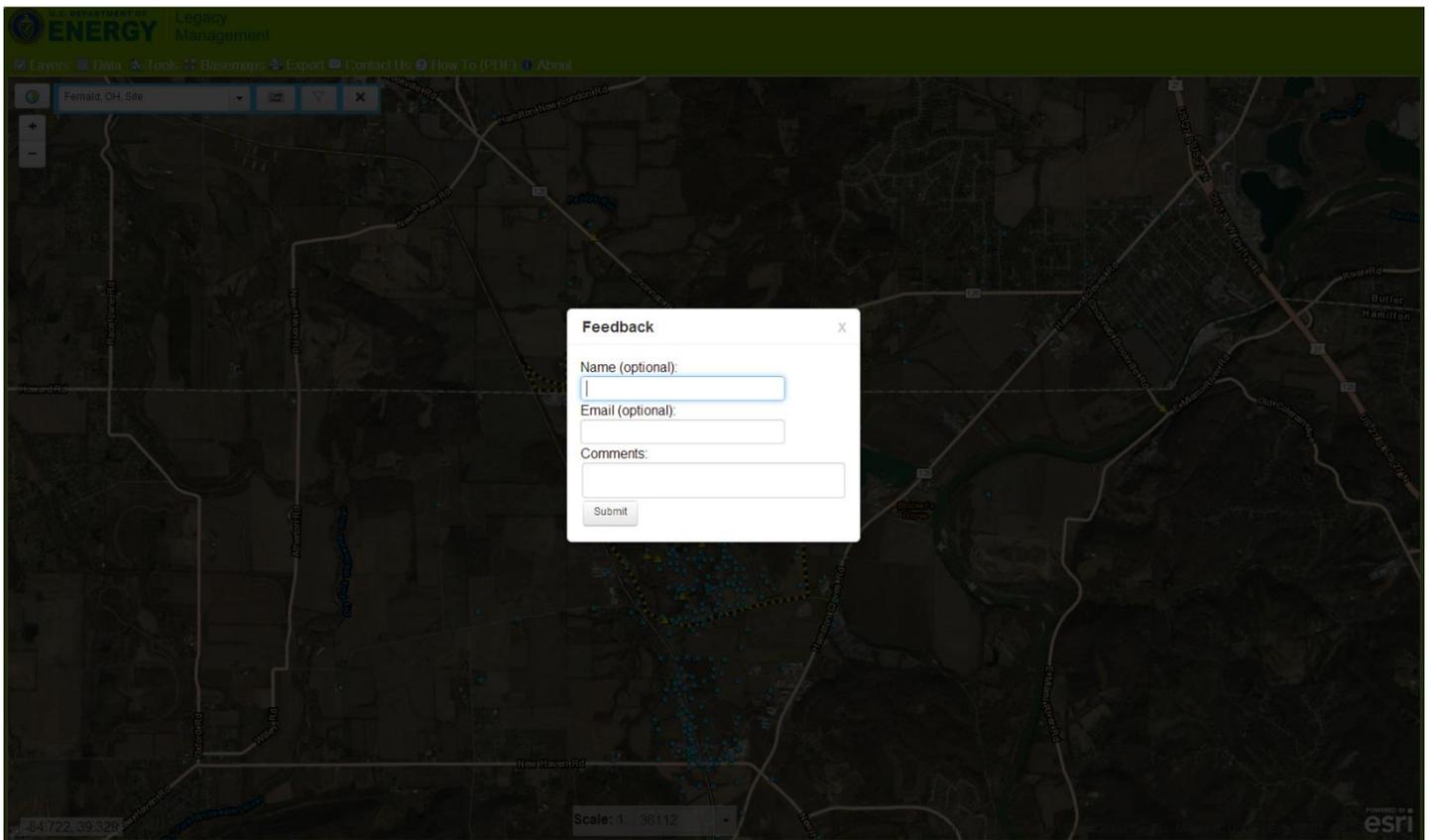


Figure 61. Contact Us Dialog

How To(PDF)



Figure 62. How To Menu Item

Access the comprehensive application user guide by clicking the **How To (PDF)** menu item. This action will launch the **'GEMS – User Documentation'** information pages in a new tab or window. Refer to Figure 62. **How To** Menu Item.

About



Figure 63. About Menu Item

Use the 'About' feature by clicking the **About** menu item. A dialog will appear with a welcome message, the version number, data disclaimer and links to our [Map Services](#) and [Reporting Service](#). How to [Contact Us](#) and [How To\(PDF\)](#) as well as the [Department of Energy](#), the [Office of Legacy Management](#), and [LM Sites](#). Refer to Figure 64. About Dialog.

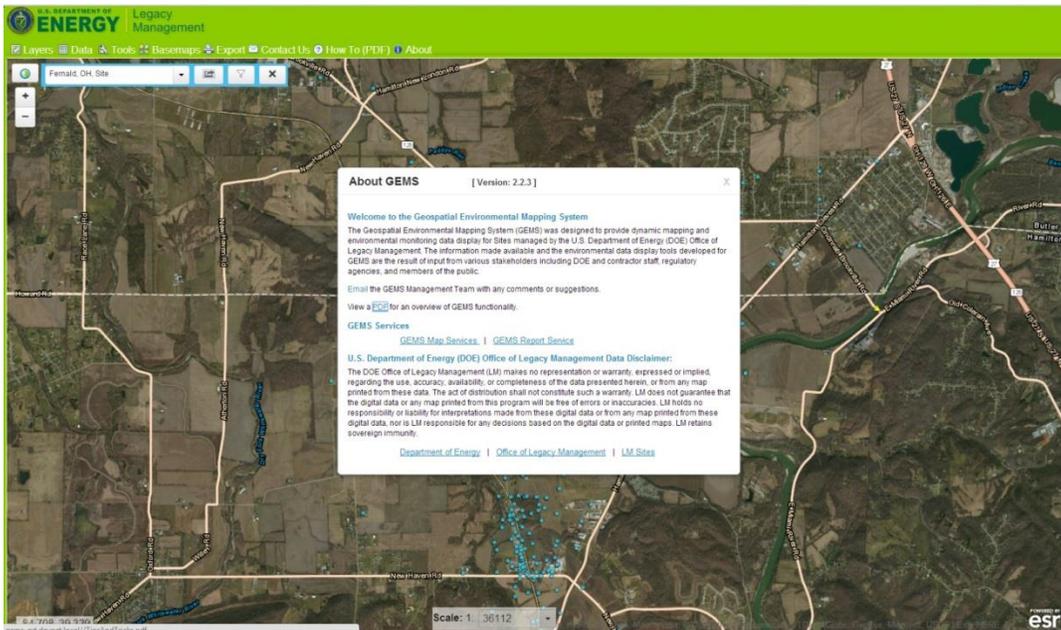


Figure 64. About Dialog

Busy Indicator

Anytime the map is updated you will see a busy icon across the top, full width of the map. This includes zooming in or out, panning, and turning on a layer. Refer to Figure 65. Busy Indicator.

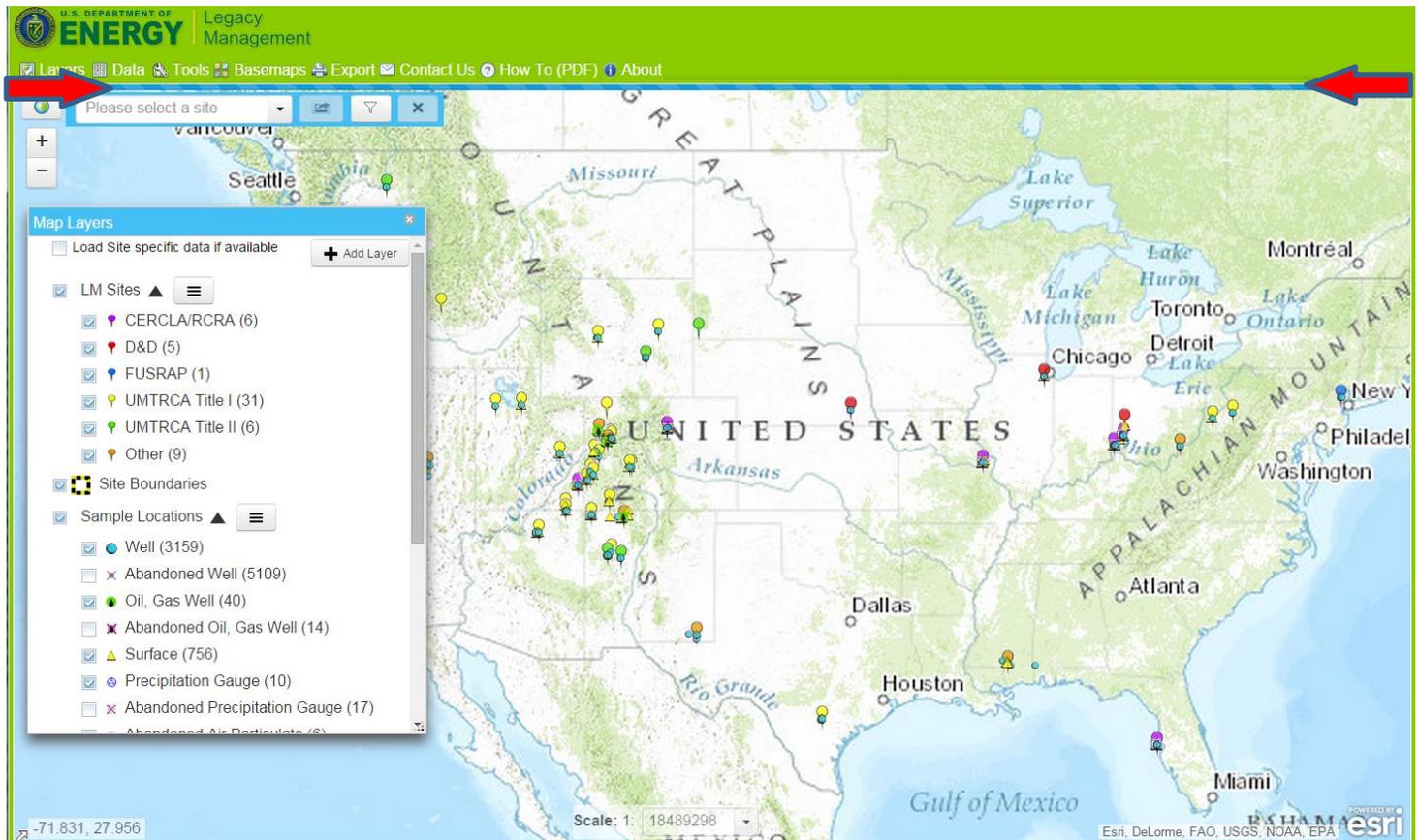


Figure 65. Busy Indicator

Services

Map Services

The GEMS arcgis->rest->services link is: <http://gems.lm.doe.gov/arcgis/rest/services>

The GEMS folder contains the national dataset services we use for GEMS. The GEMS SiteBase folder contains the **Site Specific Base Data** services we use for GEMS. Refer to Figure 66. Map Services.



← → ↻ gems.lm.doe.gov/arcgis/rest/services

ArcGIS REST Services Directory

[Home](#) > [services](#)

[JSON](#) | [SOAP](#)

Folder: /

Current Version: 10.21

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

Folders:

- [GEMS](#)
- [GEMS_EXT](#)
- [GEMS_EXT_SiteBase](#)
- [GEMS_SiteBase](#)

Services:

None

Supported Interfaces: [REST](#) [SOAP](#) [Sitemap](#) [Geo Sitemap](#)

Figure 66. Map Services

Reporting Service

For Reporting Services, the link is: <http://gems.lm.doe.gov/Reporting/Services/help>

← → ↻ gems.lm.doe.gov/Reporting/Services/help

Operations at <http://gems.lm.doe.gov/Reporting/Services>

This page describes the service operations at this endpoint.

Uri	Method	Description
AvailableAnalytes	POST	Service at http://gems.lm.doe.gov/Reporting/Services/AvailableAnalytes
AvailableAnalytes/{report}	GET	Service at http://gems.lm.doe.gov/Reporting/Services/AvailableAnalytes/{report} &locationCodes={LOCATIONCODES}&startDate={STARTDATE}&endDate={ENDDATE}
AvailableDateRange	POST	Service at http://gems.lm.doe.gov/Reporting/Services/AvailableDateRange
AvailableDateRange/{report}	GET	Service at http://gems.lm.doe.gov/Reporting/Services/AvailableDateRange/{report} &locationCodes={LOCATIONCODES}
AvailableLocations	GET	Service at http://gems.lm.doe.gov/Reporting/Services/AvailableLocations &siteCodes={SITECODES}
AvailableReports	GET	Service at http://gems.lm.doe.gov/Reporting/Services/AvailableReports &siteCodes={SITECODES}
ReportInfo/{report}	GET	Service at http://gems.lm.doe.gov/Reporting/Services/ReportInfo/{report}

Figure 67. Report Services