DMS USER MANUAL

Kern County Subbasin Data Management System (DMS)

Submitted to:
Kern County Subbasin GSAs
1800 30th Street, Suite 280
Bakersfield, CA 93301

Submitted by:
GEI Consultants, Inc.
5001 California Avenue, Suite 120
Bakersfield, CA 93309
661-327-7601

Consulting Engineers and Scientists

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ABBREVIATIONS AND ACRONYMS

BLM	Bureau of Land Management
CDEC	California Data Exchange Center
CGS	California Geological Survey
DMS	Data Management System
DWR	California Department of Water Resources
GAMA	Groundwater Ambient Monitoring and Assessment
GIS	Geographic Information System
GL	Groundwater Levels
GS	Groundwater Storage
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
InSAR	Interferometric Synthetic Aperture Radar
ISW	Interconnected Surface Water
JPL	NASA Jet Propulsion Laboratory
LS	Land Subsidence
NASA	National Aeronautics and Space Administration
NCCAG	Natural Communities Commonly Associated with Groundwater
OSWCR	Online System for Well Completion Reports
SAGBI	Soil Agricultural Groundwater Banking Index
SGMA	Sustainable Groundwater Management Act
SMC	Sustainable Management Criteria
SSURGO	Soil Survey Geographic Database
TDS	Total Dissolved Solids
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey
WQ	Water Quality

1. Getting Started

The Kern County Subbasin Data Management System (Kern DMS) is designed to meet the requirements of the Sustainable Groundwater Management Act (SGMA). This User Manual provides instructions to publicly use the features of the DMS.

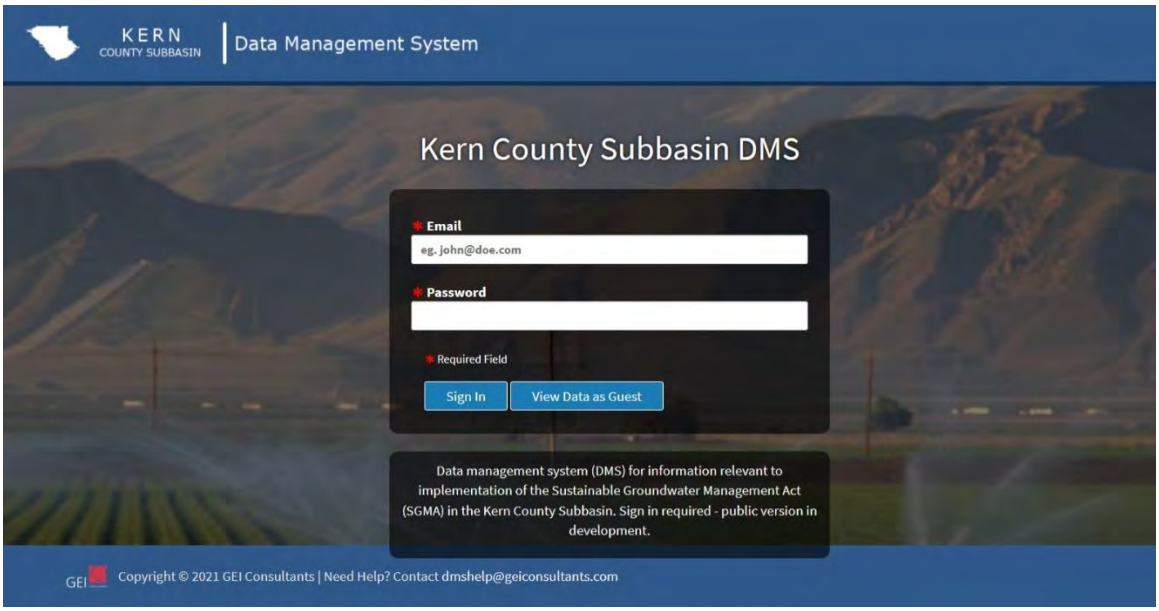
1.1 Public access to site

To publicly access the site, follow the steps below.

1. Access the DMS through the Groundwater Sustainability Agencies website.
   The login page appears (Figure 1).
2. Click View Data as Guest to access the site.

Note: Public access only allows for data to be view through the Map viewer. Login credentials are not required.

Figure 1. Login Page



1.2 Exploring Further

This User Manual provides detailed instructions for public use on how to use the map viewer of the DMS interface. The User Manual is primarily a reference that explains functionality of the tools. Use the Table of Contents to navigate to your specific topics of interest.

If you have questions, please email the DMS Help Desk.

2. Using the Map Viewer

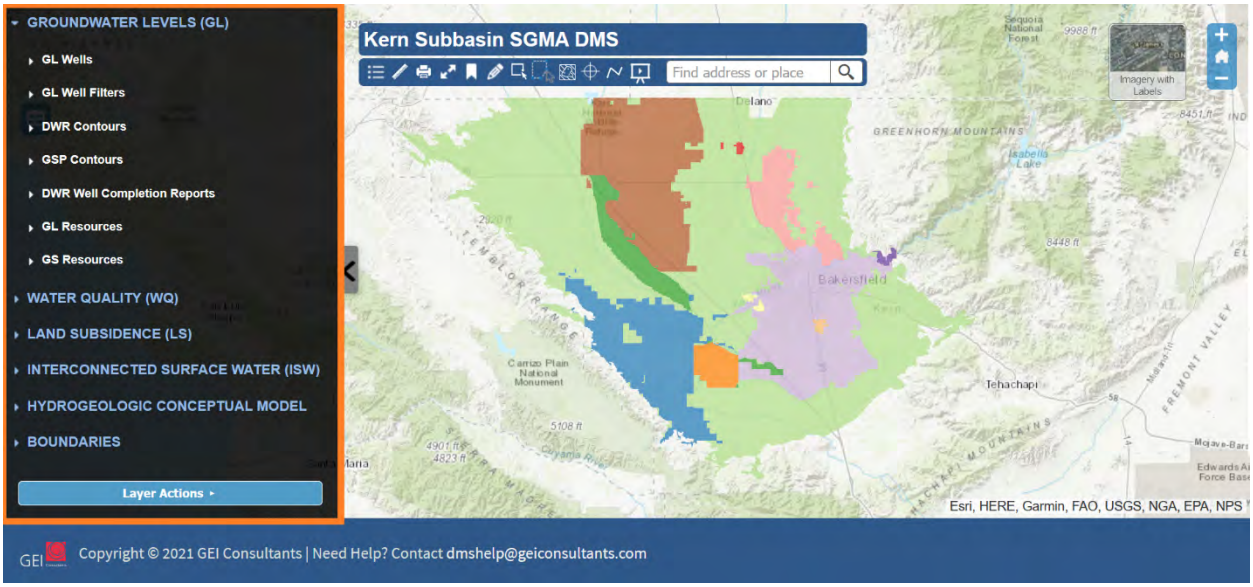
This section describes how to use the map viewer to display data and how to use the map tools. The primary purpose of the map viewer is to VIEW data – not to import new data or create reports. Login credentials are needed to perform actions such as importing, editing and reporting.

2.1 Viewing Data on the Map

To view DMS data on a geographical map, follow the steps below.

1. As a guest, the DMS map viewer will automatically appear (**Figure 2**).
2. Use the left-side navigation panel (highlighted, **Figure 4**) to choose a data type you want to see on the map.

Figure 2. Map Viewer Modules



The navigation panel contains a long list of data. For ease-of-use, data is grouped and shown or hidden by category. **Table 1** lists the data categories. A full description of the data within each category is provided in **Appendix A**.

Table 1. Left Navigation Panel Labels

Label	Description	Stored in DMS?
GROUNDWATER LEVELS (GL)		
GL Wells	Wells with water level data stored in the DMS	✓
GL Well Filters	Filter data to fit within a given time span	
DWR Contours	Display historical water depth, water level elevation, or water level change contours	
GSP Contours	Display historical water depth and water elevation contours used in the GSP	

Label	Description	Stored in DMS?
DWR Well Completion Reports	Index of records from DWR Online System for Well Completion Reports (OSWCR)	
GL Resources	Groundwater level measurements provided by DWR or USGS that are not stored in the DMS but are available for viewing.	
GS Resources	Links to C2VSim data.	
WATER QUALITY (WQ)		
WQ Wells	Wells with water quality data stored in the DMS	✓
WQ Stations	Stations with water quality data stored in the DMS	✓
WQ Filters	Filter by date or constituent	
WQ Resources	Link to Groundwater Ambient Monitoring & Assessment (GAMA) Program Online Tools	
LAND SUBSIDENCE (LS)		
LS Stations	Stations with land subsidence data stored in the DMS	✓
LS Resources	Extensometer data from DWR and USGS; InSAR data from NASA JPL and TRE Altamira	
INTERCONNECTED SURFACE WATER (ISW)		
ISW Wells	Wells with ISW data stored in the DMS	✓
ISW Resources	California Data Exchange Center (CDEC) and Natural Communities Commonly Associated with Groundwater (NCCAG) data	
HYDROGEOLOGIC CONCEPTUAL MODEL		
Soil and Recharge Map	UC Davis Soil Agricultural Groundwater Banking Index (SAGBI)	
Geologic Map	California Geological Survey (CGS) Geologic Map – 750k Generalized	
Geologic Map – Quaternary	CGS Geologic Map – Quaternary age and older	
USGS – Corcoran	United States Geological Survey Corcoran Clay data including depth, thickness, and extent	
Recharge Basins	Local recharge basins as of July 8, 2019	
Faults	CGS Fault Activity Map of California	
BOUNDARIES		
Boundaries	GIS layers such as counties, water agencies, etc.	⭘

✓*Data stored in DMS database* ⭘ *Some data stored in DMS, other from outside sources.*

2.1.1 Changing the Map Background

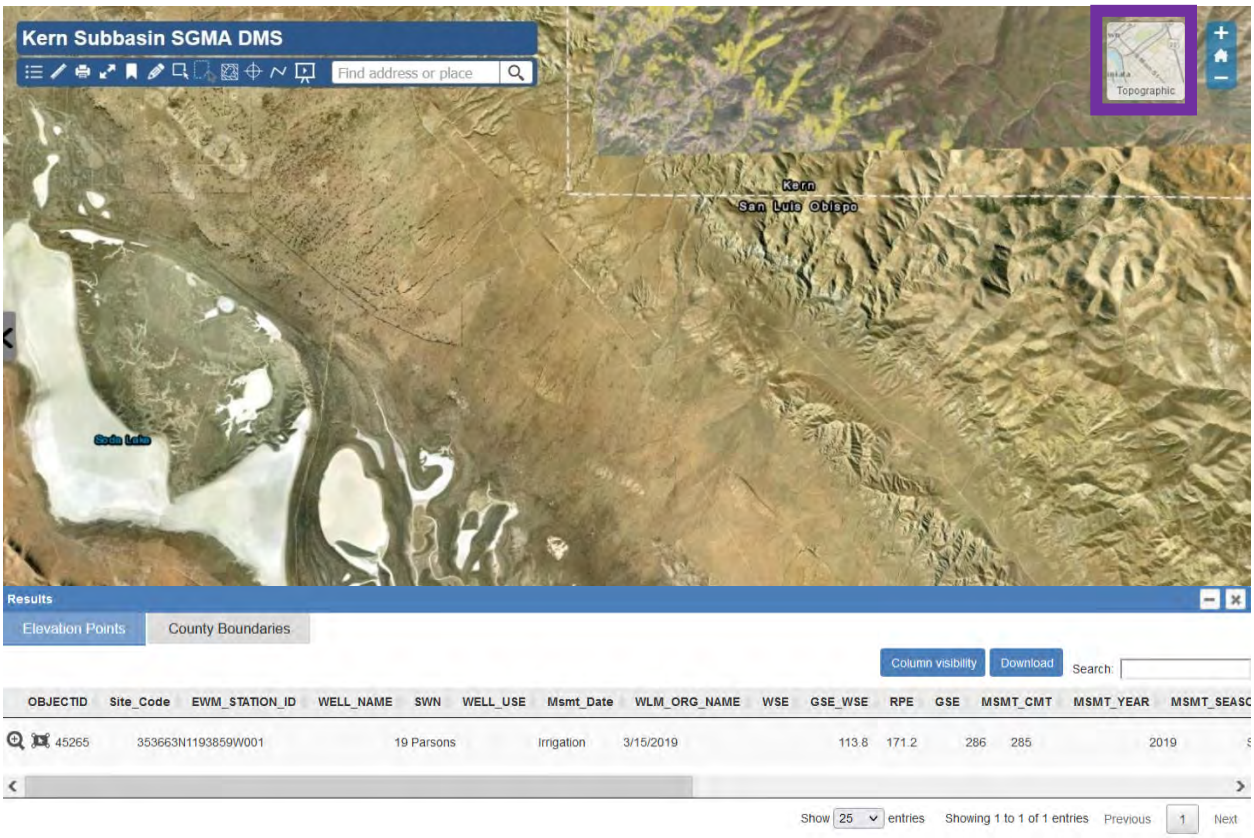
By default, the DMS Map Viewer displays a topographic map in the background.

To change the map background to a satellite image:

1. Click the image in the upper right corner of the screen labelled Imagery with Labels.
   A satellite image appears in the background (**Figure 3**).

2. To toggle back to topographic view, click the image in the upper right corner again.

Figure 3. Satellite Image Background Map



2.1.2 *Viewing Groundwater Level Data*

To view groundwater level data on the map, follow the steps below.

1. On the left navigation panel under the Groundwater Levels heading, click the ► (arrow) to expand the heading of the groundwater level data type you want to see. Descriptions of the available groundwater level data types are provided on **Table 2**.

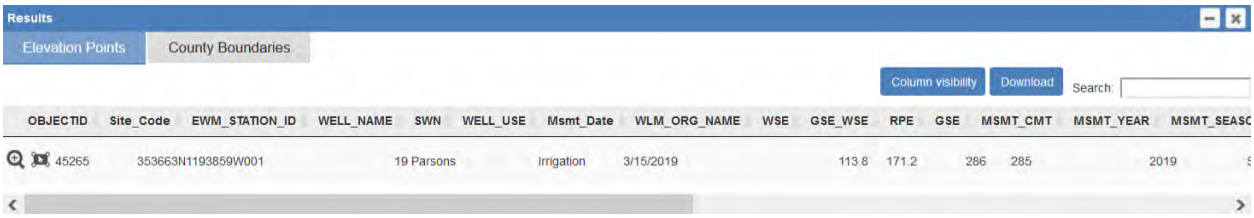
Table 2. Groundwater Level Data Types

Groundwater Level (GL)	Description
GL Wells	Well locations that are stored in the DMS and have groundwater level data
GL Well Filters	Filters the GL Wells currently displayed on the map by year
DWR Contours	Contours from the DWR Enterprise Water Management database
DWR Well Completion Reports	Points with well completion reports
GL Resources	Wells associated with outside agencies that have groundwater level measurements (ties directly to outside source, such as DWR)
GS Resources	Links to C2VSim data.

2. Click the ☐ (check box) next to the data type you want to see.
   Data of the type you checked appear.

3. If you want to view data associated with **a single well**:
    a. On the map, hover over the well symbol for the well you want to view.
    A preview window with the well name and a thumbnail-sized hydrograph appears.
    b. Click the well name.
    The well information window, including hydrograph and time-series data, appears.
4. If you want to view data for **multiple wells on a single hydrograph**:
    a. Follow the instructions through Step 3 above.
    b. In the upper-right corner of the well information window on the satellite image, click a second well (current well is marked with a red flag). *The information for the second well is added to the hydrograph and the second well location is marked with a ◆ (diamond).*
    c. Repeat Step 4b to add additional wells to the hydrograph or click any ◆ (diamond) to remove the associated well from the hydrograph.
5. If you want to view data associated with a non-well **object**:
    a. On the map, click the object you wish to view.
    A results table appears at the bottom of the map window.
    b. Click on the tab labelled with the data you wish to view. For example, if you clicked on a groundwater level contour – elevation points, click on the tab labelled Elevation Points. Refer to **Figure 4**.

Figure 4. Elevation Points Tab



2.1.3 *Viewing Groundwater Quality Data*

To view groundwater quality data on the map, follow the steps below.

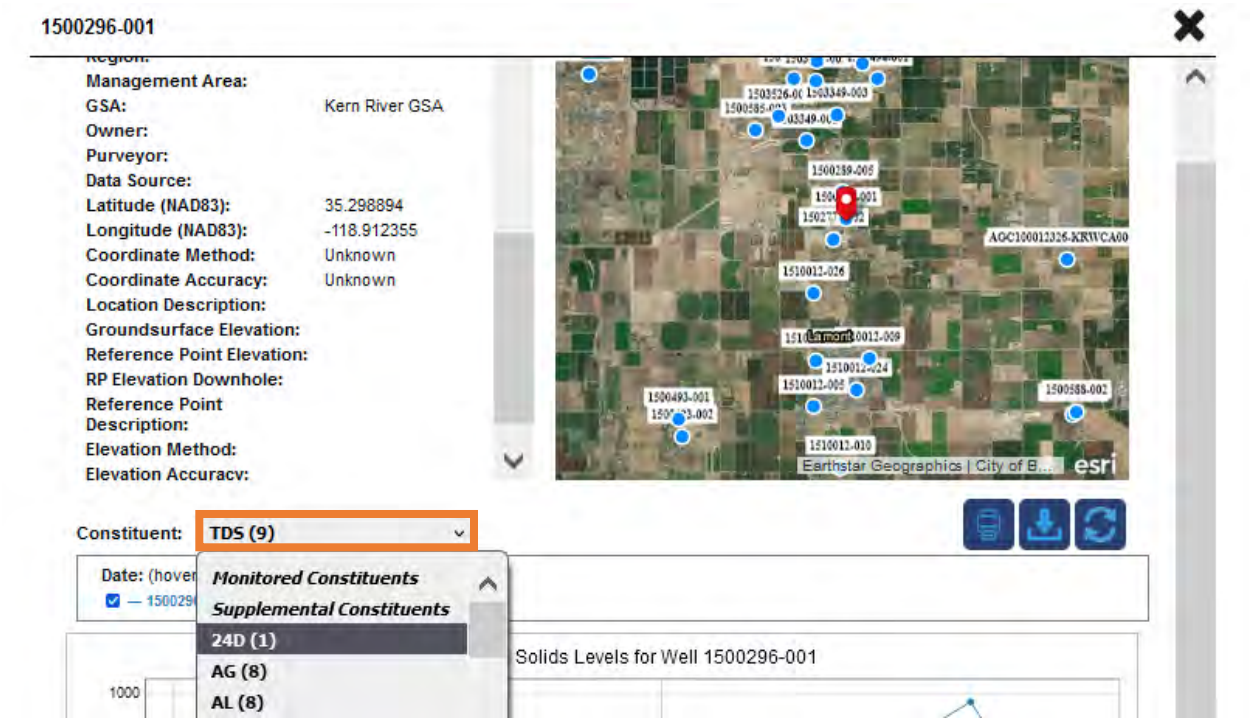
1. On the left navigation panel under the Water Quality heading, click the ► (arrow) to expand the heading of the groundwater quality data type you want to see. Descriptions of the available groundwater quality data types are provided in **Table 3**.

Table 3. Groundwater Quality Data Types

Groundwater Quality (WQ)	Description
WQ Wells	Well locations that are stored in the DMS and have groundwater quality data
WQ Stations	Non-well station locations that are stored in the DMS and have groundwater quality data
WQ Filters	Filter the WQ wells and/or stations currently displayed on the map by constituent and/or year.
WQ Resources	Link to the national Water Quality Portal

2. Click the ☐ (check box) next to the data type you want to see. *Wells and/or stations with data of the type you checked appear.*
3. If you want to view water quality data associated with **a single well or station**:
    a. On the map, hover over the symbol for the well or station you want to view. *A preview of the well or station name and a small total dissolved solids (TDS) graph appear.*
    b. Click the well or station name. *The well or site information window, including TDS graph and time-series data, appears* (**Figure 5**).
    c. To view a water quality constituent other than TDS, click the drop-down menu next to the Constituent label (highlighted, **Figure 5**).

Figure 5. Water Quality Monitoring Well Information Window



2.1.4 Viewing Land Subsidence Data

To view land subsidence data on the map, follow the steps below.

1. On the left navigation panel under the Land Subsidence heading, click the ► (arrow) to expand the heading of the data type you want to see. Descriptions of the available data types are provided in Table 4.

Table 4. Land Subsidence Data Types

Land Subsidence Data Type	Description
LS Stations	Stations, such as extensometers, that are stored in the DMS and have land subsidence data
LS Resources	Land subsidence data associated with outside agencies (ties directly to outside source) including DWR and USGS extensometers and InSAR data processed by TRE Altamira, Inc. and NASA

2. Click the ☐ (check box) next to the data type you want to see. *Wells and/or stations with data of the type you checked appear.*
3. If you want to view data associated with a station, click the station location marker.

2.1.5 Viewing Interconnected Surface Water Data

NOTE: There are no identified interconnected surface waters in the Kern Subbasin. To view interconnected surface water data on the map, follow the steps below.

1. On the left navigation panel under the Interconnected Surface Water heading, click the ► (arrow) to expand the heading of the data type you want to see. Descriptions of the available data types are provided on Table 5.

Table 5. Interconnected Surface Water Data Types

Interconnected Surface Water (ISW)	Description
ISW Wells	Wells/stations with interconnected surface water data
ISW Resources	ISW data associated with outside agencies (ties directly to outside source) including CDEC stations NCCAG layers

2. Click the ☐ (check box) next to the data type you want to see. *Wells and/or stations with data of the type you checked appear.*
3. If you want to view data associated with a station, click the station location marker.

2.1.6 Viewing Hydrogeologic Conceptual Model Data

Data displayed under the Hydrogeologic Conceptual Model heading is for reference only. These data are not stored in the DMS and cannot be modified. Instead, they are tied directly to outside sources, such as USGS, and are available for display only. Descriptions of the available data are provided on Table 6.

Table 6. Hydrogeologic Conceptual Model Data Types

Hydrogeologic Conceptual Model	Description
Soil and Recharge Map	SAGBI and Soil Survey Geographic Database (SSURGO) datasets
Geologic Map	Geologic Map of California published by CGS
Geologic Map – Quaternary	Geologic Compilation of Quaternary Surficial Deposits published by CGS
USGS – Corcoran	USGS Corcoran Clay data including depth, thickness, extent
Recharge Basins	Local recharge basins as of July 8, 2019
Faults	Fault Activity Map of California published by CGS

2.1.7 Viewing Boundaries

The Map Viewer displays area boundaries and other GIS layers relevant to water management. To view boundaries/layers on the map, follow the steps below.

1. On the left navigation panel click the ► (arrow) to expand the Boundaries heading. Descriptions of the available boundaries are provided on Table 7.
2. Click the ☐ (check box) next to the boundary or layer you want to see. *The selected layer appears on the map. Note: layers with a lot of data may take longer to load.*

Table 7. Map Boundaries

Boundary	Description
County Boundaries	Full detailed California county dataset with all coding (islands, inlets, etc.)
Canals and Aqueducts	Minor canal features from DWR, USBR, and various public water agencies
Tribal Trust Boundary	Administrative boundaries of all realty tracts (parcels) within California Indian Trust lands, as administered by the Bureau of Indian Affairs.
Disadvantaged Communities Block Groups	Blocks are the smallest geographic areas for which the U.S. Census Bureau publishes data from the decennial census.
Disadvantaged Communities Places	Boundaries as delineated as part of the Census Bureau's Participant Statistical Areas Program (PSAP) for the 2010 Census.
Disadvantaged Communities Tracts	Geographic and cartographic information from the U.S. Census Bureau's Master Address File.
Water Agencies	Boundaries of all public water agencies in California including public water systems, agricultural water districts, urban water districts, Federal and State water contractors, wholesalers, retailers, and other public or private utilities.
CASGEM Groundwater Basins Prioritization – 2019	Boundaries of 515 groundwater basins and subbasins with 2019 prioritization as defined by DWR.
Bulletin 118 Groundwater Basins – 2016	Boundaries of 515 groundwater basins and subbasins as defined by DWR in Bulletin 118, 2016.
State Parks	California State Parks Enterprise Geographic Information Systems.
State Refuges	State refuge boundaries as of 2020.
CDFW Owned and Operated Lands and Conservation Easements	Lands and conservation easements owned and operated by the California Department of Fish and Wildlife as of January 11, 2021.
California Protected Areas Database (CPAD) Holdings	Lands that are owned in fee and protected for open space purposes by over 1,000 public agencies or non-profit organizations.
California Conservation Easement Database (CCED)	Lands protected under conservation easements.

Boundary	Description
Regional Water Quality Control Board Boundaries	Jurisdictional boundaries of the nine Regional Water Quality Control Boards.
Federal Lands	U.S. Federal land classified by its active Federal surface managing agency.
Township and Range Section Lines	Compiled by the Bureau of Land Management (BLM), National Operations Center (NOC), OC-530.
GSA Boundaries	Boundaries submitted to the DWR SGMA Portal as part of the Groundwater Sustainability Agency (GSA) formation process.
Individual Kern GSA Boundaries	These are the boundaries for the GSAs in the Kern Subbasin.
Kern Subbasin Water Districts	These are the boundaries for the Water Districts in the Kern Subbasin.

2.2 Selecting and Exporting Data from the Map

Using the Map Viewer to export data is best suited for when you use the map's tools to display a specific combination of wells and stations and want to export the well or station data. This method is not well-suited for advanced filtering or exports of entire tables or time-series data.

IMPORTANT! In this DMS, you may only export well and site information from the map viewer and NOT the associated time-series data (such as water levels or water quality).

2.2.1 Selecting Data on the Map

The map viewer provides a set of tools to select data points displayed on the map. These tools are located in the map toolbar (**Figure 6**). **Table 8** describes the tools and their functions. The tools are labelled 1 through 13, from left to right.

Figure 6. Map Toolbar

Table 8. Map Tool Descriptions

#	Tool	Description
1	Legends	Selection of GSA boundaries
2	Measure	Measure of area, distance, and location
3	Print	Print current view of DMS map
4	Full screen	Expand map to full screen viewing
5	Bookmark	Bookmark locations with specified map parameters
6	Drawing	Label, create, or draw on map to measure points or identify map locations
7	Select	Allows user to select which tool they want to use
8	Edit	Enable a setting to edit or remove text labels
10	Point Elevation	Click on to retrieve latitude, longitude, and point elevation on a selected map location
11	Elevation Profile	Draw a line on map to get elevation along line
12	Application Tour	Activate DMS data viewer application tour
13	Address Search	Search for specific address within DMS data viewer

2.2.2 Exporting Data from the Map

To export a full dataset from the map viewer, do the following:

1. Click a well or station. *The Results table appears.*
2. In the upper right portion of the Results table, click the Download button.
   A drop-down menu appears.
3. In the drop-down menu under **Full Dataset**, select how you would like to receive the data. You may choose from the following:
   a. Spreadsheet
   b. KML
   c. Shapefile

   A Save As window appears.
4. Choose the location where you would like to save the exported data, then click Save.
   The file is saved to your chosen location.

To export selected well or station data from the map viewer, do the following:

1. Use the Map Tools to select the wells and/or stations you would like to export.
   The Results table appears.
2. In the upper right portion of the Results table, click the Download button.
   A drop-down menu appears.
3. In the drop-down menu under **Filtered Dataset**, select how you would like to receive the data. You may choose from the following:
   - Spreadsheet
   - KML
   - Shapefile

   A Save As window appears.
4. Choose the location where you would like to save the exported data, then click Save.
   The file is saved to your chosen location.

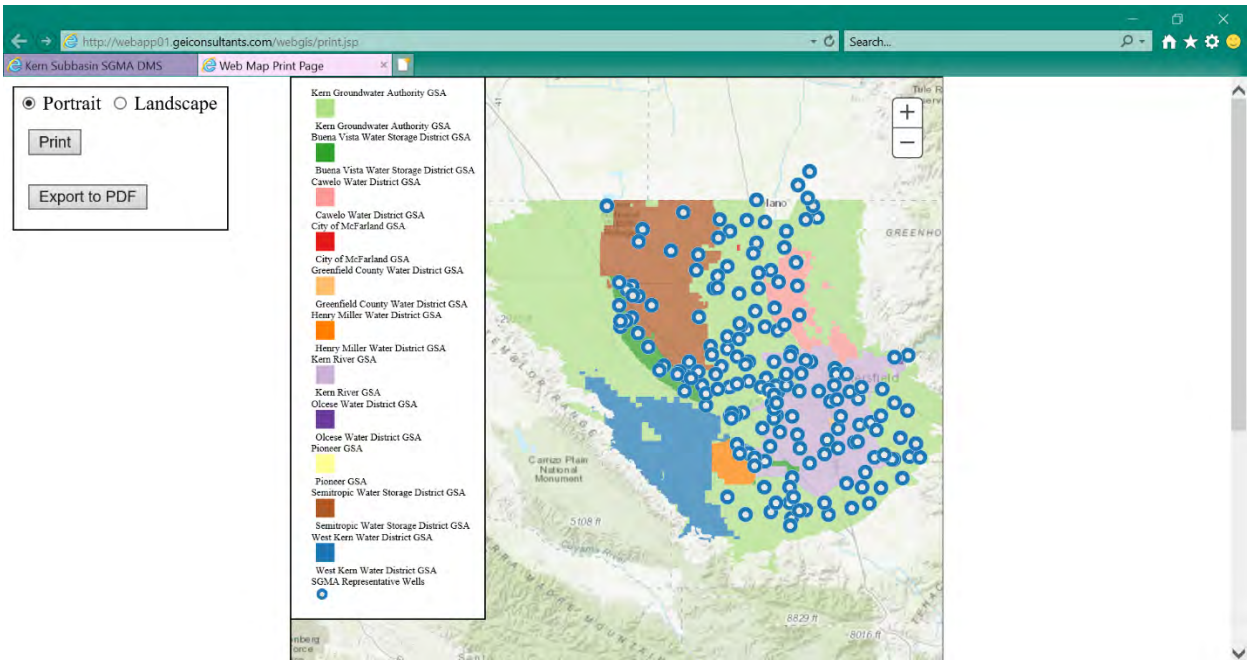
2.3 Creating Map Figures

To create a figure from the map viewer to use in a report or other document, follow the steps below:

1. Use the left navigation panel to turn on the data you want to show on the figure (be sure to also turn off data you do not wish to show).
2. On the Map Toolbar (**Figure 7**), click the Print icon. The Web Map Print page (**Figure 8**) appears.
3. Populate the fields along the bottom (portrait orientation) or right side (landscape orientation) as desired (enter a date, name the figure, upload a logo, etc.).
4. If you want to print directly from your web browser to a printer on your network, click Print.
5. If you want to save the figure as a PDF, click Export to PDF.

Figure 7. Print Icon on the Map Toolbar

Figure 8. Web Map Print Page



APPENDIX A
Map Viewer Data Categories and Contents

Kern County Subbasin Data Management System (DMS)

Label	Description	Stored in DMS?
GROUNDWATER LEVELS (GL)		
GL Wells		
GL Representative Monitoring Network	Sites tracking the SGMA groundwater levels sustainability indicator. These sites have minimum thresholds and measurable objectives assigned in a Kern County Subbasin Groundwater Sustainability Plan (GSP).	✓
GL Non-Representative Wells	Groundwater levels at sites that are not a part of the Representative Monitoring Network for groundwater levels for any Kern County Subbasin GSP.	✓
GL Well Filters	Filter the wells currently displayed on the map by year.	
DWR Contours	Historical water depth and water elevation contours provided by DWR.	
DWR Well Completion Reports	Points with well completion reports for wells with known construction information.	
GL Resources	Groundwater level measurements provided by DWR or USGS that are not stored in the DMS but are available for viewing.	
WATER QUALITY (WQ)		
WQ Wells		
WQ Representative Monitoring Network Wells	Wells tracking the SGMA groundwater quality sustainability indicator. These wells and stations have minimum thresholds and measurable objectives assigned in a Kern County Subbasin Groundwater Sustainability Plan (GSP).	✓
WQ Non-Representative Monitoring Network Wells	Groundwater quality data at wells that are not a part of the Representative Monitoring Network for groundwater quality for any Kern County Subbasin GSP.	✓
WQ Stations		
WQ Representative Monitoring Network Stations	Stations tracking the SGMA groundwater quality sustainability indicator. These wells and stations have minimum thresholds and measurable objectives assigned in a Kern County Subbasin Groundwater Sustainability Plan (GSP).	✓
WQ Non-Representative Monitoring Network Stations	Groundwater quality data at stations that are not a part of the Representative Monitoring Network for groundwater quality for any Kern County Subbasin GSP.	✓
WQ Filters	Filter the wells and/or stations currently displayed on the map by constituent tracked and/or year.	
WQ Resources	Link to the national Water Quality Portal	

Label	Description	Stored in DMS?
LAND SUBSIDENCE (LS)		
LS Stations		
LS Representative Monitoring Network Stations	Stations tracking the SGMA land subsidence sustainability indicator. These stations have minimum thresholds and measurable objectives assigned in a Kern County Subbasin GSP.	✓
LS Non-Representative Stations	Groundwater quality data at wells that are not a part of the Representative Monitoring Network for groundwater quality for any Kern County Subbasin GSP.	✓
LS Resources		
DWR Extensometers	DWR monitored borehole extensometers	
USGS Extensometers	USGS monitored extensometers	
TRE Altamira InSAR Dataset	Measurements of vertical ground surface displacement	
NASA JPL InSAR Dataset	Measurements of vertical ground surface displacement	
UNAVCO CGPS Site	UNAVCO Continuous Global Positioning System (CGPS) Stations	
INTERCONNECTED SURFACE WATER (ISW)		
ISW Wells		
ISW Representative Monitoring Network Wells	Wells tracking the SGMA interconnected surface water sustainability indicator. These stations have minimum thresholds and measurable objectives assigned in a Kern County Subbasin GSP.	✓
ISW Resources		
Precipitation & Stream Gage Stations		
Precipitation Stations		
Stream Gage Stations		
California Data Exchange Center (CDEC)	River flow, river stage, reservoir, snow, rain, and air temperature data from DWR CDEC	
Natural Communities Commonly Associated with Groundwater (NCCAG)	A compilation of 48 publicly available State and federal agency datasets that map vegetation, wetlands, springs, and seeps in California (hosted by DWR).	
SEAWATER INTRUSION		
Seawater Intrusion Monitoring Network		
Monitored Seawater Intrusion Stations	Stations with SMC for seawater intrusion	✓
Monitored Seawater Intrusion Wells	Wells with SMC for seawater intrusion	✓
Supplemental Seawater Intrusion Data		
Supplemental Seawater Intrusion Stations	Stations with seawater intrusion data but no SMC	✓
Supplemental Seawater Intrusion Wells	Wells with seawater intrusion data but no SMC	✓
HYDROGEOLOGIC CONCEPTUAL MODEL		
Soil and Recharge Map		
UC Davis SAGBI	Soil Agricultural Groundwater Banking Index (SAGBI) developed and maintained by the California Soil Resource Lab at UC Davis and UC-ANR.	

Label	Description	Stored in DMS?
Soil Survey Geographic Database	The Soil Survey Geographic Database (SSURGO) dataset is a compilation of soils information collected over the last century by the Natural Resources Conservation Service (NRCS).	
Geologic Map		
CGS Geologic Map – 750k Generalized	Geologic Map of California published by Department of Conservation, California Geological Survey	
Geologic Map – Quaternary	Geologic Compilation of Quaternary Surficial Deposits published by the Department of Conservation, California Geological Survey (DOC/CGS), with funding from DWR	
Faults	Fault Activity Map of California published by Department of Conservation, California Geological Survey	
BOUNDARIES		
County Boundaries		
Canals and Aqueducts		
Tribal Trust Boundary		
Disadvantaged Communities Block Groups		
Disadvantaged Communities Places		
Disadvantaged Communities Tracts		
Water Agencies		
CASGEM Groundwater Basins Prioritization – 2019		
Bulletin 118 Groundwater Basins – 2016		
State Parks		
State Refuges		
CDFW Owned and Operated Lands and Conservation Easements		
California Protected Areas Database (CPAD) Holdings		
California Conservation Easement Database (CCED)		
Regional Water Quality Control Board Boundaries		
Federal Lands		
GSA Boundaries		