




There are two points worth mentioning as you complete this guided exercise.

1.  indicates an action you need to take.
2.  Pro Tip highlights tips to get the most out of Surfer.

 Let's get started!

1. Download and extract the ZIP file containing the data used for this guide - [Navigating Surfer Sample Data.zip](#).

The files must be extracted from the ZIP after download to make them available to Surfer.

2. If you haven't already, please download and install Surfer.

A download link is provided in the email with subject line: *[Surfer Trial] - Welcome friend, let's get you started!* or you can download the software from our [Software Downloads](#) page.

3. Open Surfer by double clicking the Surfer icon on your desktop or by selecting it from the list of installed programs in the Windows Start menu.


Note :

Surfer can be set to use comma or period as the decimal separator. You can change the setting by following the instructions below.

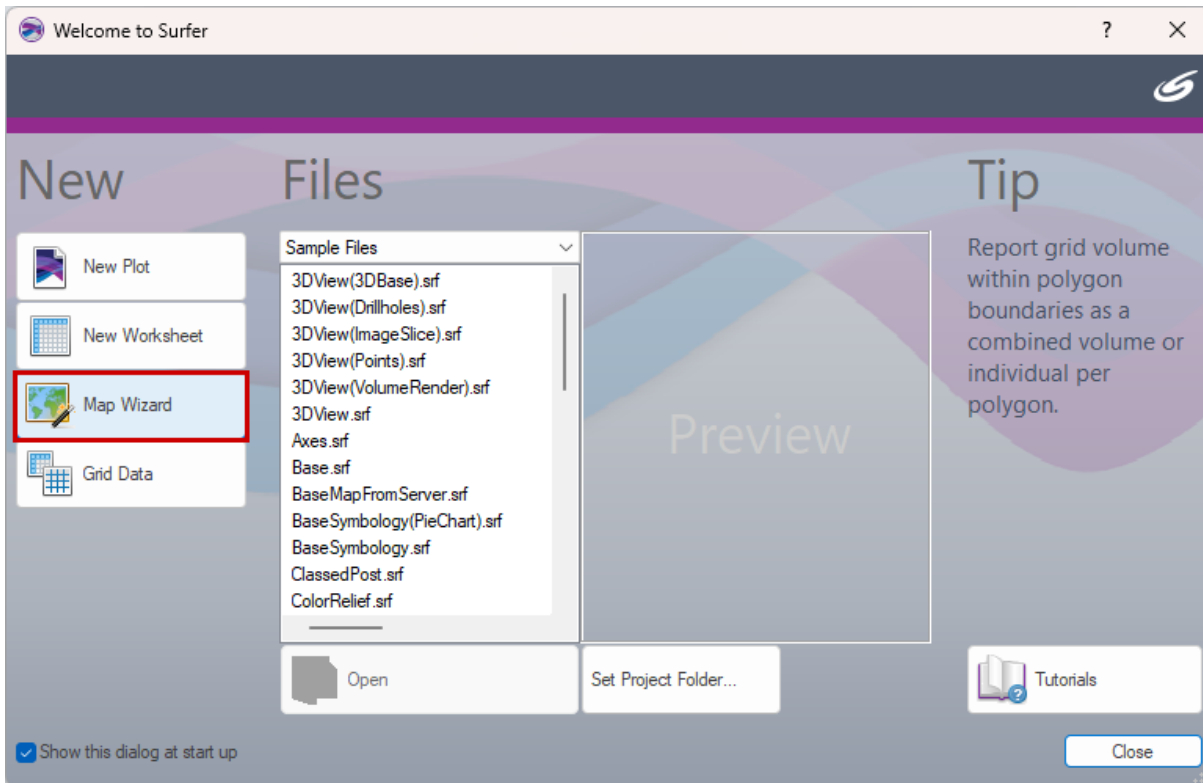
1. Click **File | Options**.
2. In the pane on the left, click **User Interface**.
3. In the pane on the right, scroll to the bottom and set the Decimal separator to Period (or Comma).
4. Click **OK** and the decimal separators will be converted throughout the program.

## Creating a Map

Surfer's Map Wizard makes it easier than ever to go from data to map in only a few minutes. The wizard can be used to create new maps, as we're doing in this exercise, and to add map layers to existing maps.

 To create a map using the Wizard

1. Open Surfer if it is not already open.
2. Click *Map Wizard* in the **Welcome to Surfer** window.



## Map Wizard - Select Your Data

The **Select Your Data** page of the map wizard makes it easy to select data from the *Sample files* directory, your *Project files* directory or a list of *Recent files* by clicking the appropriate option from the dropdown. You can also browse all files on your computer to select the desired input dataset.

➔ In this exercise, we'll use the browse option to select the downloaded dataset:

3. Click *Browse* and select the downloaded *Well\_measurements.xlsx*
4. Click *OK* in the **XLSX Import Options** dialog.
5. In the *Select Data Columns* section, set the data columns to
  - X = *Column C: Longitude*
  - Y = *Column B: Latitude*
  - Z = *Column F: Water-level elevation, in feet*

📢 **Pro Tip:** When using Latitude/Longitude coordinates remember Latitude is always the Y variable and Longitude is always the X variable to avoid future headaches!

6. Click *Next*.

Map Wizard - Select Your Data

Select File

G: \My Drive\Test Files\Su

Citation for database.txt  
Well\_measurements.csv  
Well\_measurements.grd  
**Well\_measurements.xlsx**

Data Preview

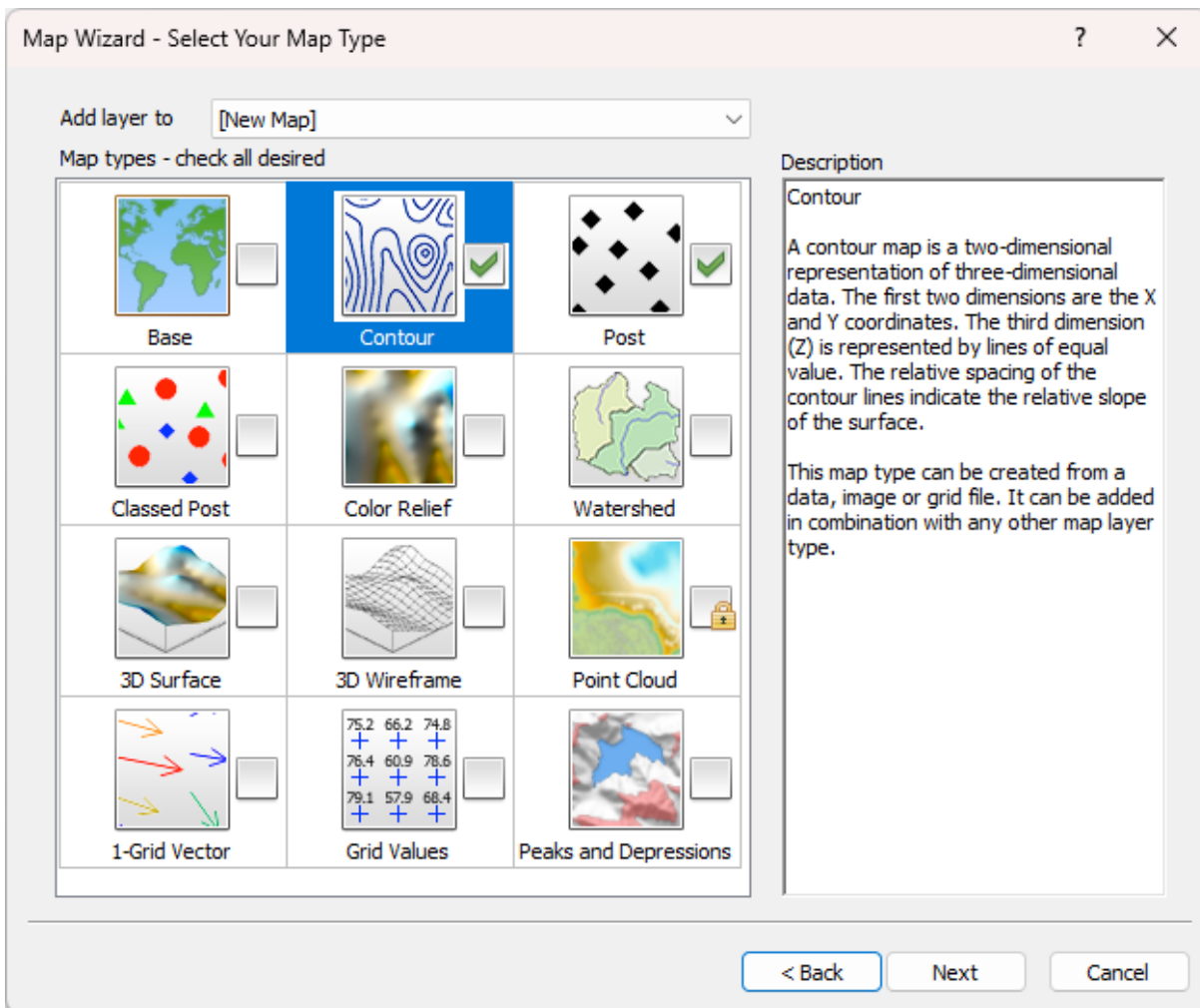
Show preview

	A	B	C
1	OWRD well lo...	Latitude	Longitude
2	GRAN0000800	44.030417	-118.93786
3	HARN0000008	43.87566	-119.27279
4	HARN0000106	43.627696	-119.01189
5	HARN0000143	43.621728	-118.95571
6	HARN0000198	43.638919	-118.73474
7	HARN0000219	43.628142	-118.63255

Select Data Columns

Coordinate	Column
X	Column C: Longitude
Y	Column B: Latitude
Z	Column F: Water-level elevation, in feet

## Map Wizard - Select Your Map Type



The **Select Your Map Type** page of the map wizard displays all available map types along with a description when each map type is selected. If a lock is displayed next to the map, that map type cannot be created with the selected file type.

➔ In this exercise we are going to create a contour map of the water level elevations with a post layer displaying the well locations.

7. Check *Contour* and *Post* boxes in the list of available map types
8. Click *Next*.

🗨️ **Pro Tip:** To add layers to an existing map, click [New Map] in the Add layer to field and select your Map at the top of the Select Your Map Type page.

### Map Wizard - Select Gridding Parameters

Map Wizard - Select Gridding Parameters

Your XYZ data is irregularly spaced. Surfer needs to interpolate the data onto a regularly spaced grid and save the results to a grid file, which is used to generate the selected map type. Select the interpolation parameters below to create the grid file.

Simple gridding parameters  Show preview

Gridding method  
Kriging

Output Grid Geometry

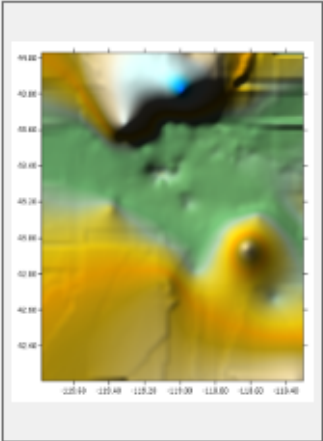
Copy geometry from: <None>

	Minimum	Maximum	Spacing	# of Nodes
X	-119.778665	-118.302632	0.018450412500	81
Y	42.20581	44.030417	0.018430373737	100

Assign NoData outside convex hull of data

Output grid file  
G:\My Drive\Test Files\Surfer\1 Tutorial data\New Getting Started Guide\W


Advanced gridding parameters



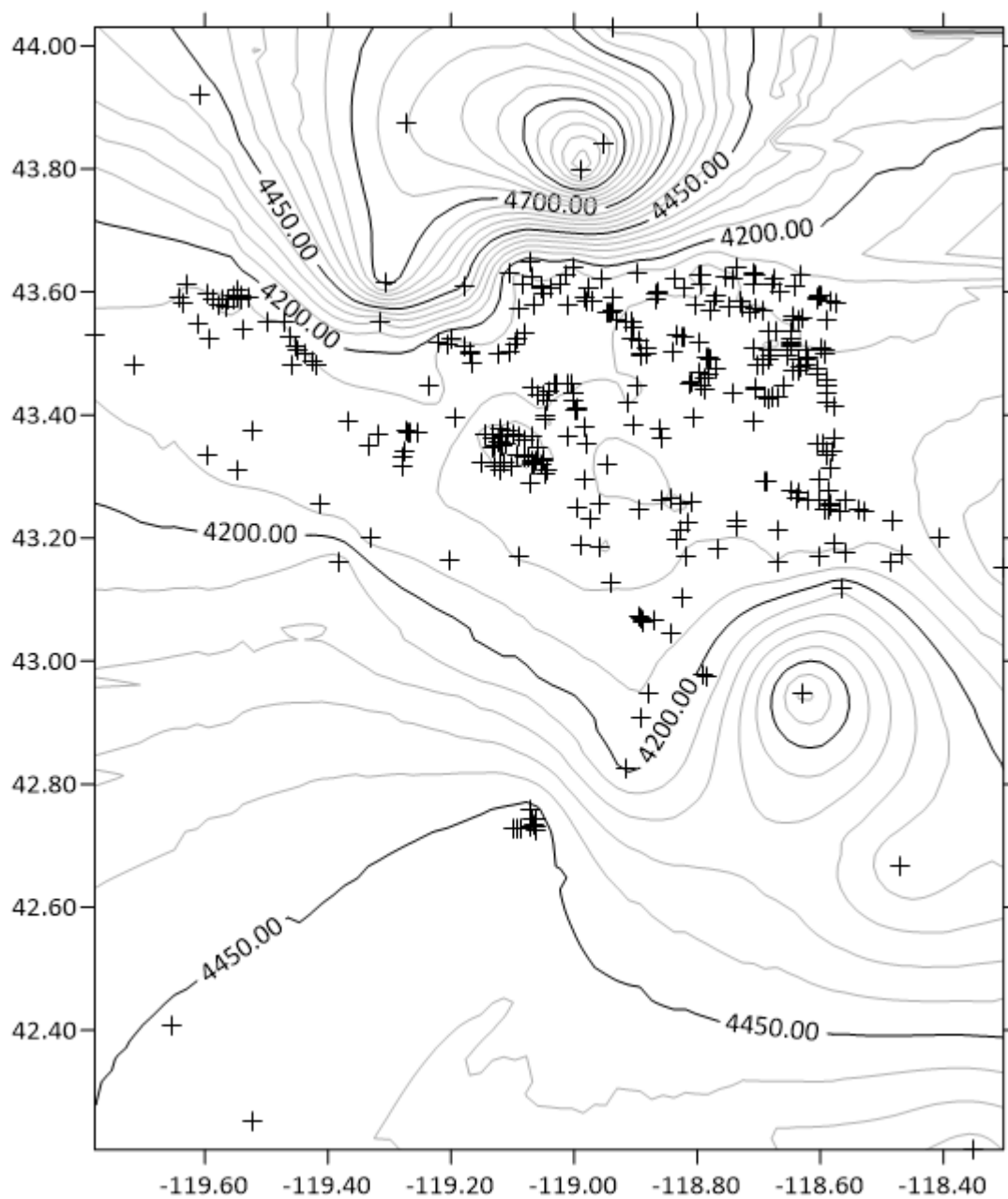
The **Select Gridding Parameters** page of the map wizard is displayed if one of the selected map types requires a grid file, and a grid file was not selected as the input file type.

On this page you can adjust the simple gridding parameters to create a grid based on default search and filter settings, or you can choose to apply advanced gridding parameters using the **Grid Data** dialog.

Surfer's **Grid Data** dialog gives you full control of how your data is interpolated to create a surface grid.

 In this exercise, we will use the default gridding parameters

9. Verify your *Gridding method* is set to *Kriging* and click *Finish* to create the map.

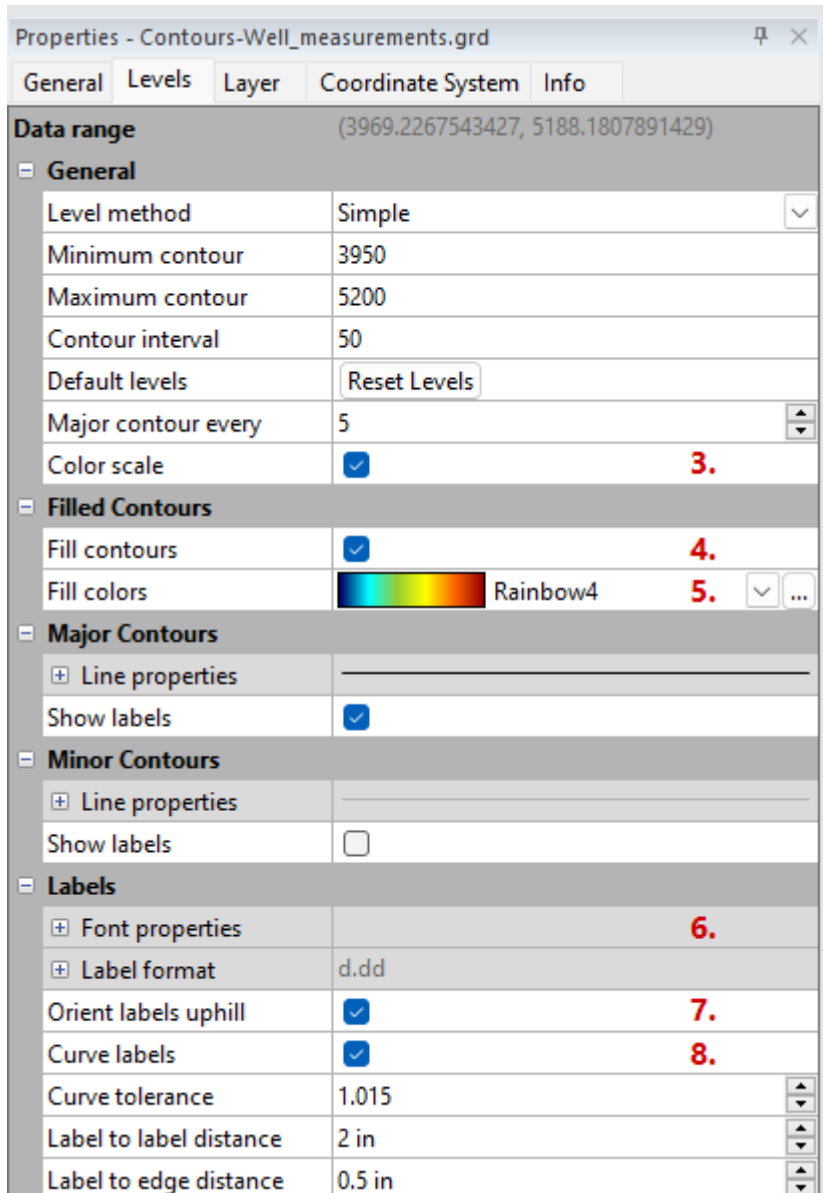


Now that we have a map of the groundwater elevations, let's make it tell a story by adding some color and context...

## Customizing Your Map

Time to go from unremarkable to stunning!

We now have a map with contour and post layers but they do not stand out. To make a compelling presentation with this map we need to customize it so that it is visually appealing and clear what the contours and post map symbols represent.




### Contour Layer Customizations

The **Properties** window is used to customize every aspect of your map from the way each layer is displayed to the text formatting for custom labels.

→ In this exercise, we are going to fill the contours with a rainbow fill pattern and add a color scale to inform the viewer what elevation is associated with each color.


1. Click the *Contours* layer in the **Contents** window to select it.
2. Click the **Levels** tab in the **Properties** window.
3. Check the box next to *Color scale*.
4. Check the box next to *Fill contours*.

5. Click on *GrayScale* in the *Fill colors* field and select *Rainbow4*.

 **Pro tip:** You can customize or create your own color schemes with the **Colormap Editor** by clicking the ellipses (...) next to the *Fill colors* dropdown.

6. In the *Labels* section click the + next to *Font properties* to expand the options and check the box next to *Bold*.
7. Check the box next to *Orient labels uphill*.
8. Check the box next to *Curve labels*.

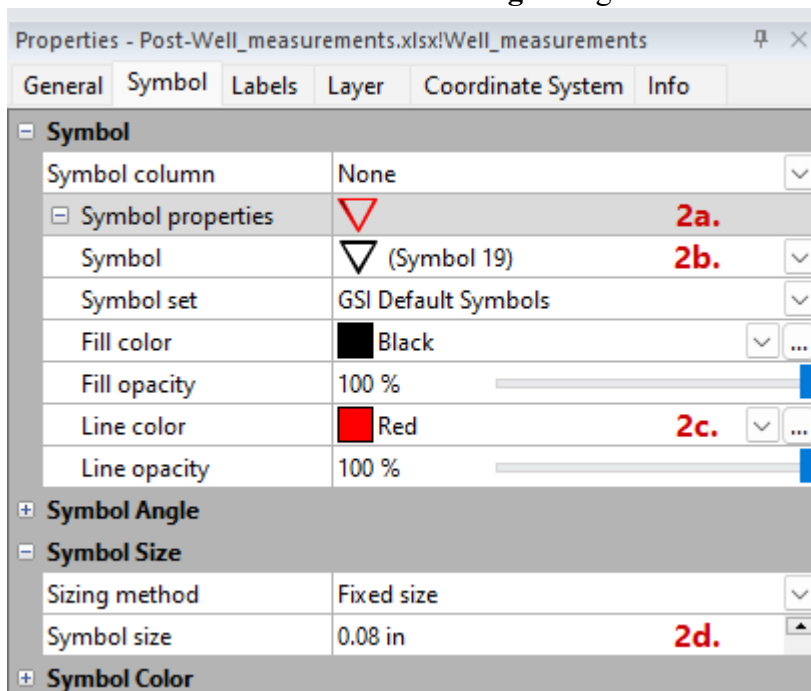
## Post Layer Customizations

 The post layer symbols are barely discernible as is so let's adjust the symbol properties and add labels to enable well identification.

1. Click the *Post* layer in the **Contents** window to select it.
2. On the **Symbol** tab in the **Properties** window:
  - a. Expand *Symbol properties*.
  - b. Click in the *Symbol* field and select *Symbol 19* (*open triangle pointing down*).
  - c. Change the *Line color* to *Red*.
  - d. Change the *Symbol size* to *0.08*.
3. On the **Labels** tab in the **Properties** window:
  - a. Click in the *Worksheet column* field and select *Column G: Well ID short*
  - b. Click the + next to *Font properties* and decrease the *Size (points)* to 4

The density of these well locations resulted in our labels overlapping and being impossible to read in places. Let's fix that using the disperse labels tool.

4. Click **Map Tools | Edit Layer | Disperse Labels**
5. In the **Disperse Overlapped Labels** dialog, change the *Maximum dispersion distance* to *0.5* and click *OK*.
6. Click *OK* in the **Surfer warning** dialog.





Properties - Post-Well\_measurements.xlsx!Well\_measurements

General Symbol Labels Layer Coordinate System Info

**Label Sets**

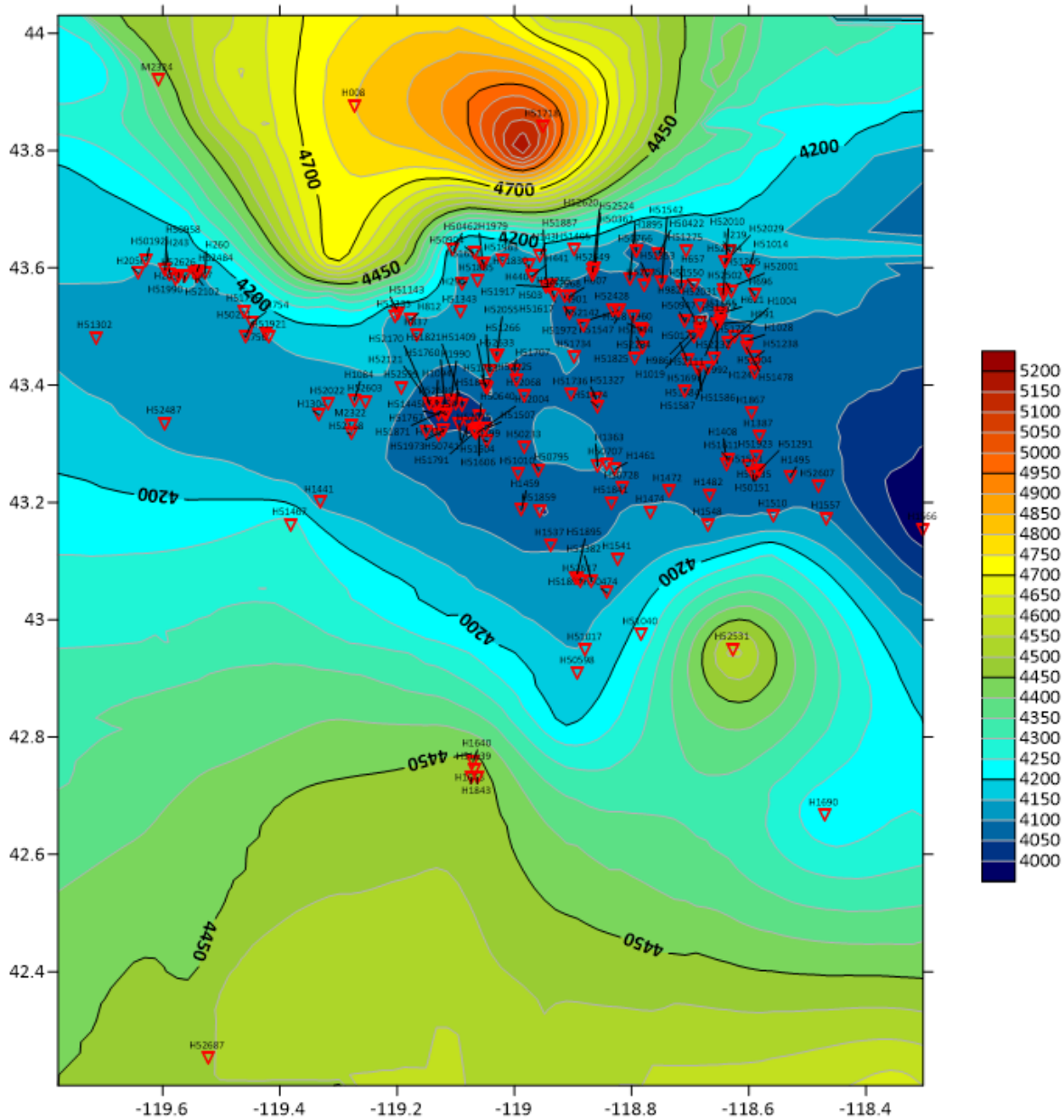
Label set	Set 1
Add label set	Add
Remove label set	Remove

**Label Set 1**

Worksheet column	Column G: Well ID short	<b>3a.</b>
Position relative to symbol	Above	
Angle (degrees)	0	
+ Font properties		<b>3b.</b>
+ Label format	d.dd	

+ General

+ Leader Lines



Now that our map is visually appealing, it's time to add finishing touches.

### Adding Finishing Touches

It's now time to make our beautiful map easy to understand for all audiences.

A map isn't truly finished until it is clear to a viewer what the map and each of its components represent.

Depending on the type of information being presented this could involve adding legends, north arrows, scale bars, graticules, and numerous other features to your map.

To finish our exercise, we'll add a legend and title to the map.

Properties - Legend

General Layers Info

**Frame**

Type	Square	<b>3a.</b>
Margin	0.1 in	
+ Line properties	_____	
+ Fill properties	None	

**Title**

Title text	Well Sampling Locations	<b>3b.</b>
+ Font properties		

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Properties - Legend

General Layers Info

+ **General**

**Layers in Legend**

Layer to edit	Post-Well_measurements.xlsx!Well_mea...
Edit layer list	Edit List...

**Post Layer - Post-Well\_measurements.xlsx!Well\_measurements**

Template	\symbol	<b>4.</b>
Symbol size method	Same as plot	
Custom size	0.2 in	
Sample spacing	0 in	

+ **Samples**

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Properties - Top Axis

General Ticks Labels Scaling Grid Lines Info

+ **Axis**

**Title**

Title text	<b>7.</b>	Harney Basin, OR Groundwater Elevatio...
Offset along axis	0 in	
Offset from axis	0 in	
Angle (degrees)	0	
- Font properties		
Font	Calibri	
Size (points)	18	<b>8.</b>
Foreground color	Black	
Foreground opacity	100 %	
Background color	White	
Background opacity	0 %	
Bold	<input checked="" type="checkbox"/>	<b>9.</b>
Italic	<input type="checkbox"/>	
Strikeout	<input type="checkbox"/>	
Underline	<input type="checkbox"/>	



## Map Legend & Titles

→ Add a map legend:

1. Click **Map Tools | Add to Map | Legend**
2. Click on the *Legend* in the **Contents** window to select it.
3. On the **General** tab in the **Properties** window,
  - a. Click *None* in the *Type* field and select *Square*
  - b. Enter *Well Sampling Locations* in the *Title text* field
4. On the **Layers** tab, delete *\value* from the *Template* field.
5. Click and drag the legend so that it sits above the color scale

→ Add a map title:

6. Click *Top Axis* in the **Contents** window to select it.
7. On the **General** page in the **Properties** window, enter *Harney Basin, OR Groundwater Elevation Contour* in the *Title text* field.

 **Pro Tip:** Click the Text Editor () icon to open a dialog that makes it easy to add specialized formatting including special characters and mathematical equations to your titles.

8. Expand *Font properties* and increase the *Size (points)* to *18*
  9. Check the box next to *Bold*.
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