Layer Data Grid

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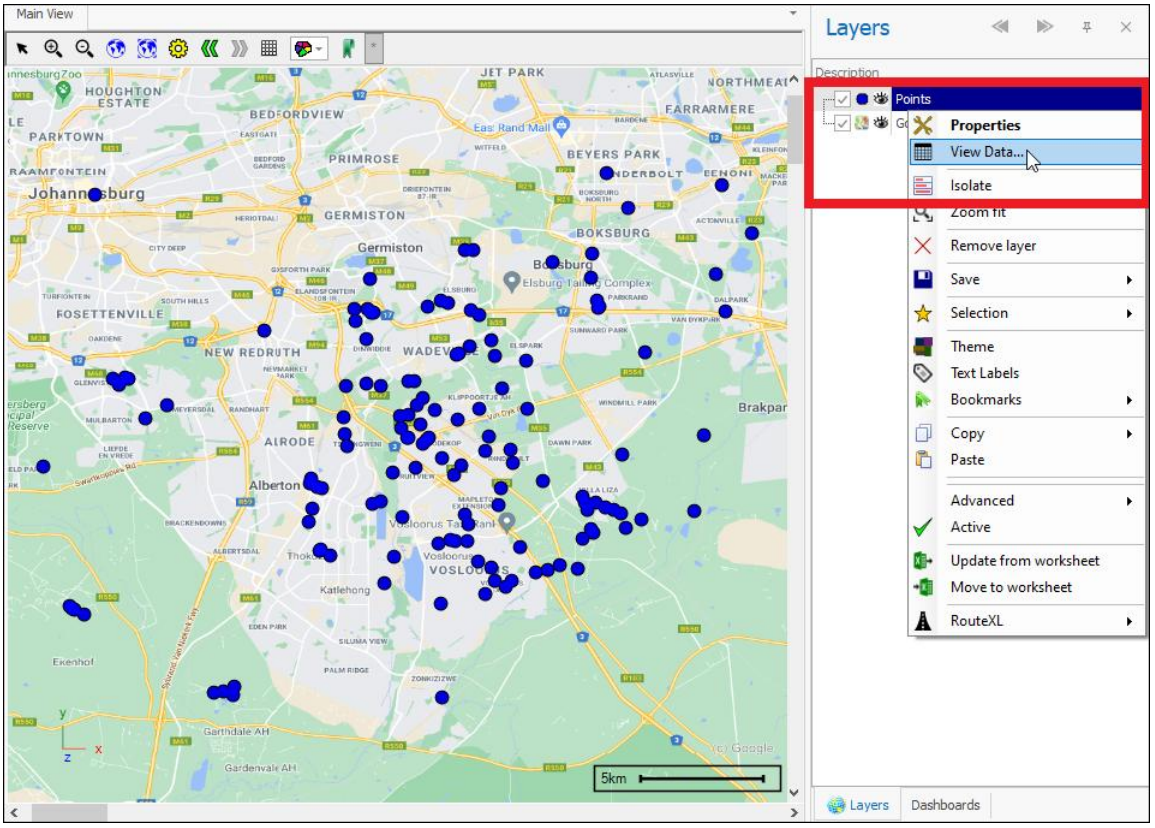
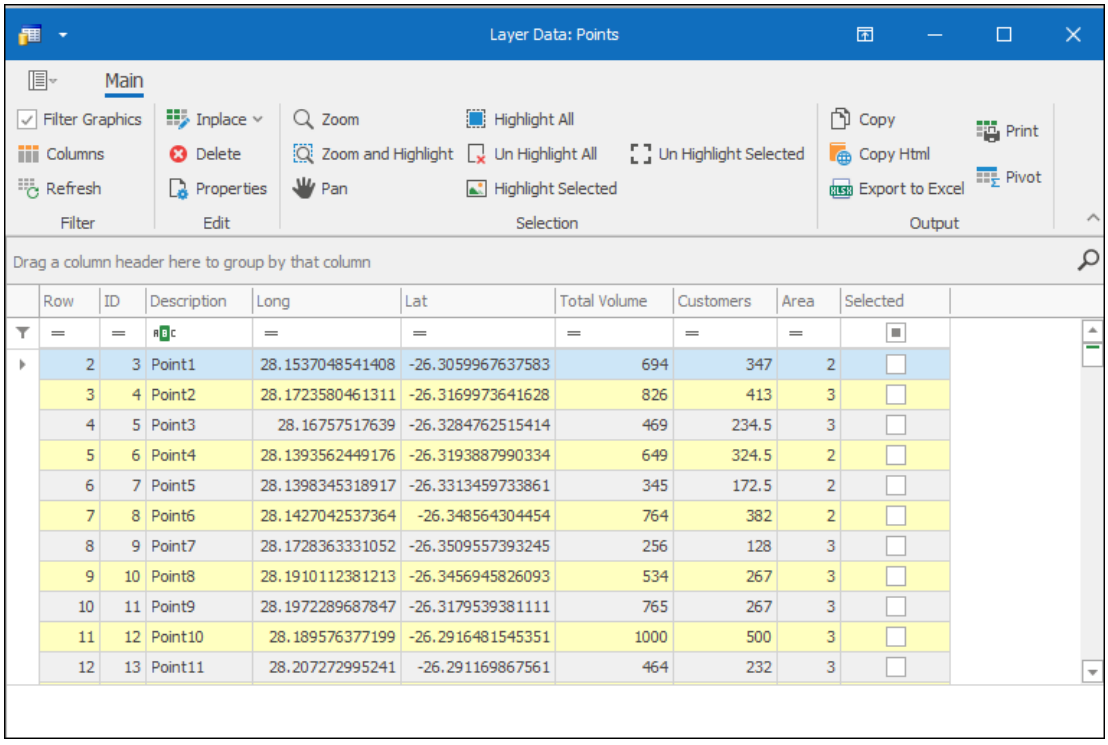
Intro

The **Layer Data Grid** is the data table connected with all layers in all our spatial products. It is accessed by right clicking on the layer and going to **View Data**:

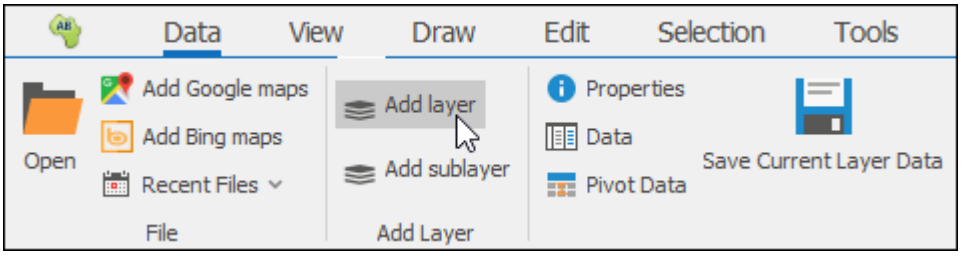


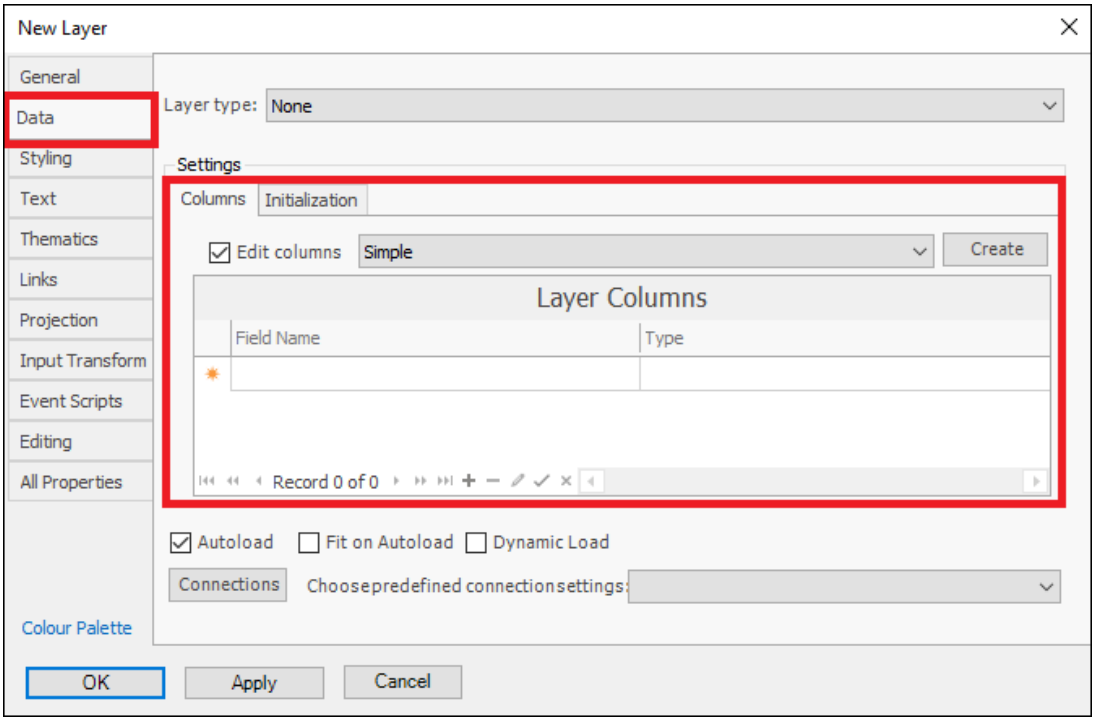


Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Selected
2	3	Point1	28.1537048541408	-26.3059967637583	694	347	2	
3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3	
4	5	Point3	28.16757517639	-26.3284762515414	469	234.5	3	
5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2	
6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2	
7	8	Point6	28.1427042537364	-26.348564304454	764	382	2	
8	9	Point7	28.1728363331052	-26.3509557393245	256	128	3	
9	10	Point8	28.1910112381213	-26.3456945826093	534	267	3	
10	11	Point9	28.1972289687847	-26.3179539381111	765	267	3	
11	12	Point10	28.189576377199	-26.2916481545351	1000	500	3	
12	13	Point11	28.207272995241	-26.291169867561	464	232	3	

This is a Layer Data Grid for my **Points** layer. Each row in this grid represents a single point, and as you can see there is an **ID**, **Description** and other data for each

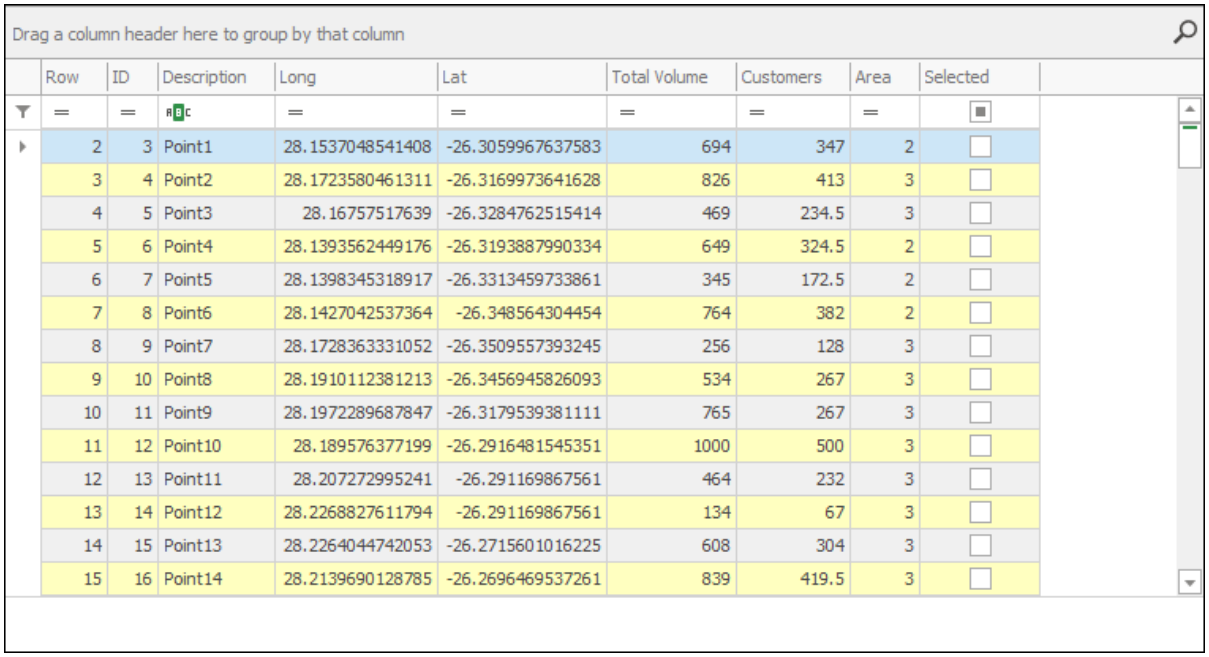
point. How the grid comes about for the layer depends on how the layer was created. In this case this layer was added from Excel and so all the data in my Excel worksheet will make up the grid for the layer. When creating an new empty layer however, you will specify what columns you want the data grid to be made up of, and this is done in the **Layer Properties** box , **Data** tab as gone over in the *Layer Properties Guide*:





We will start by taking up the features of the grid itself:

Grid



Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Selected
2	3	Point1	28.1537048541408	-26.3059967637583	694	347	2	
3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3	
4	5	Point3	28.16757517639	-26.3284762515414	469	234.5	3	
5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2	
6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2	
7	8	Point6	28.1427042537364	-26.348564304454	764	382	2	
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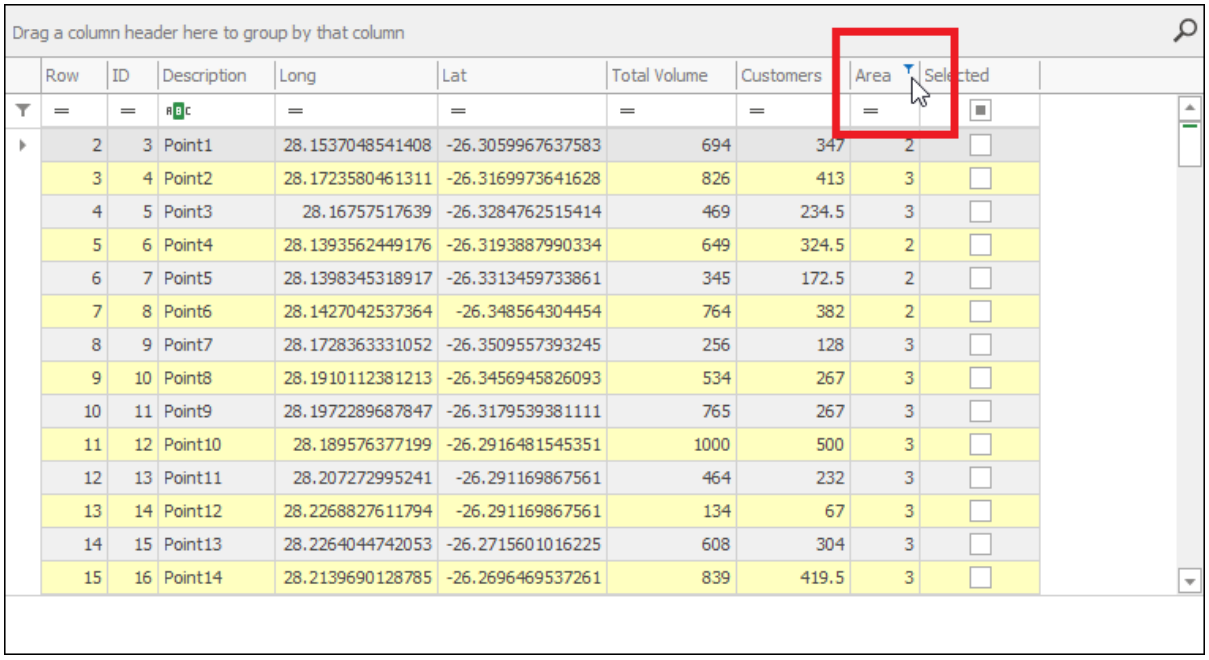
9	10	Point8	28.1910112381213	-26.3456945826093	534	267	3	
10	11	Point9	28.1972289687847	-26.3179539381111	765	267	3	
11	12	Point10	28.189576377199	-26.2916481545351	1000	500	3	
12	13	Point11	28.207272995241	-26.291169867561	464	232	3	
13	14	Point12	28.2268827611794	-26.291169867561	134	67	3	
14	15	Point13	28.2264044742053	-26.2715601016225	608	304	3	
15	16	Point14	28.2139690128785	-26.2696469537261	839	419.5	3	

Filtering

In this grid you can filter on items by clicking the filter icon in the right-hand corner of each column header, made visible by hovering on the header:



Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Selected
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3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3	
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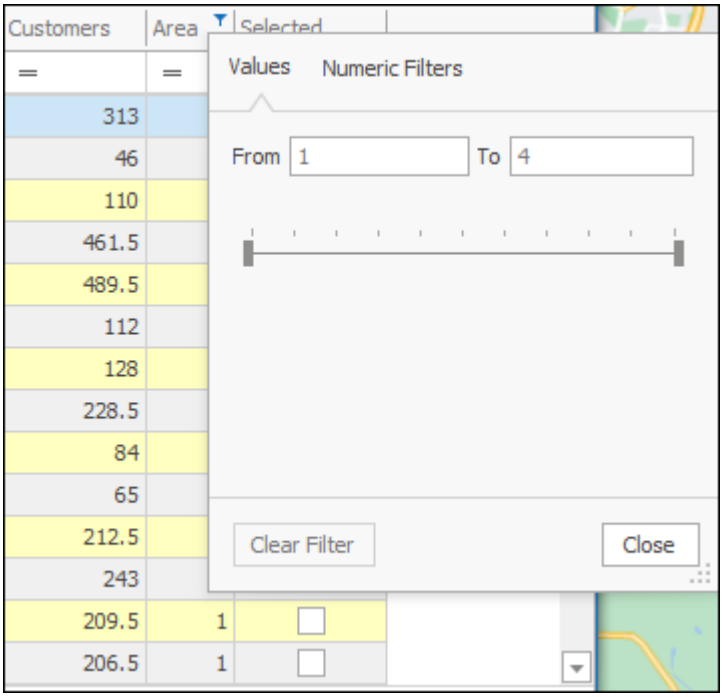
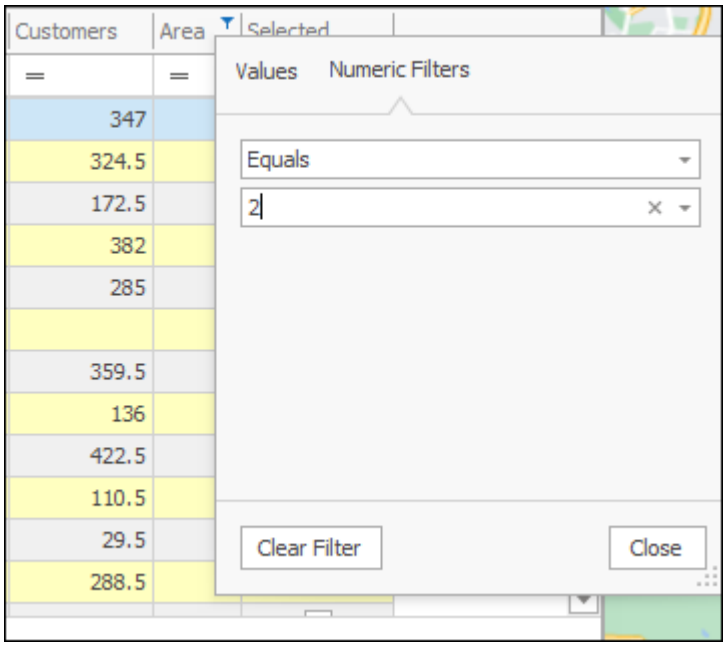
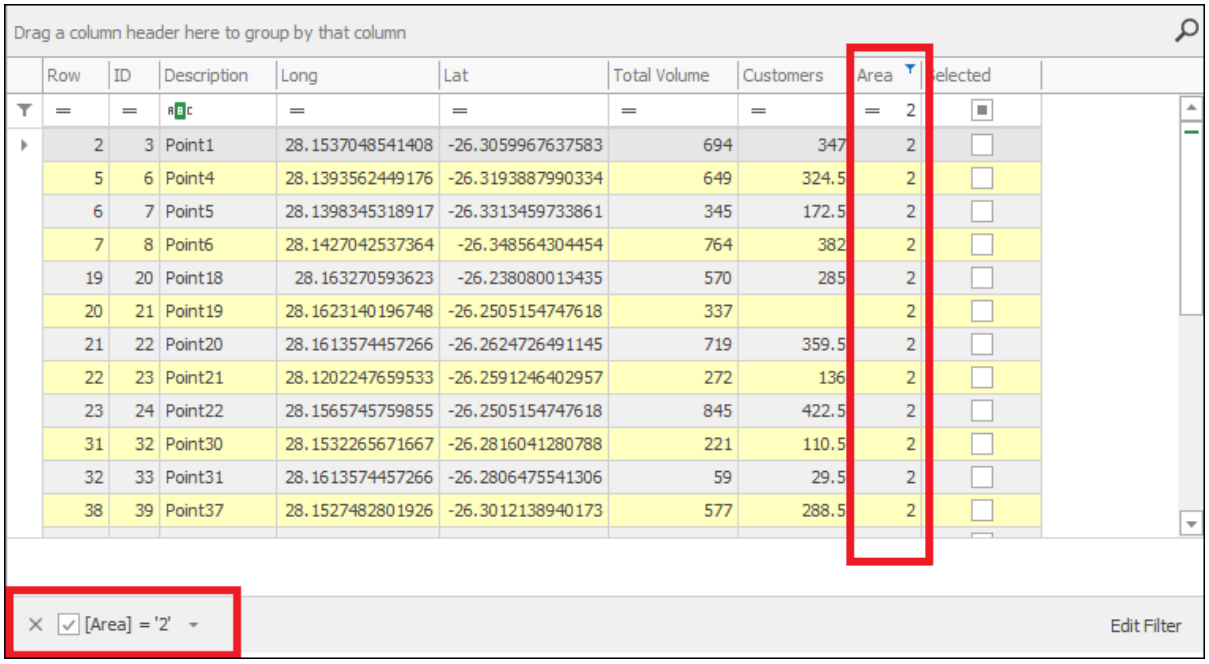
14	15	Point13	28.2264044742053	-26.2715601016225	608	304	3	
15	16	Point14	28.2139690128785	-26.2696469537261	839	419.5	3	



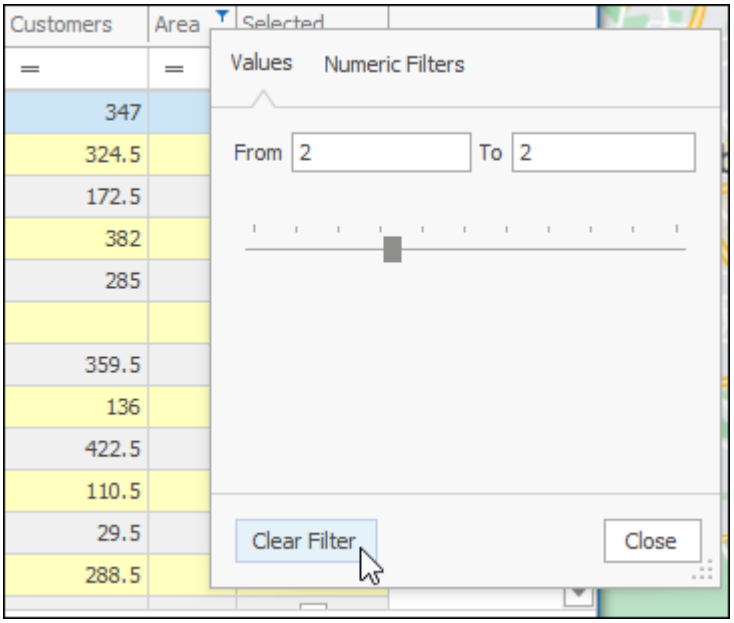
For number columns you have an option to filter by number range in the **Values** tab; you can type in the range or adjust the slider. You also have an option to filter by values equal to or greater than etc. in the **Numeric Filters** tab:

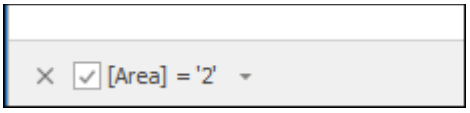


As you can see here, I am choosing to filter on all values equal to **2**. Click **Close** when done.

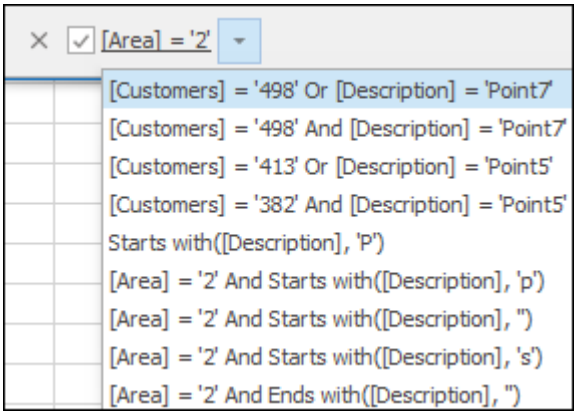


And you can see the filter is now active by the blue filter icon showing in the header and the checkbox in the bottom left corner. To clear the filter, click on the filter icon again and click **Clear Filter** or you can just uncheck the filter checkbox in the bottom left:

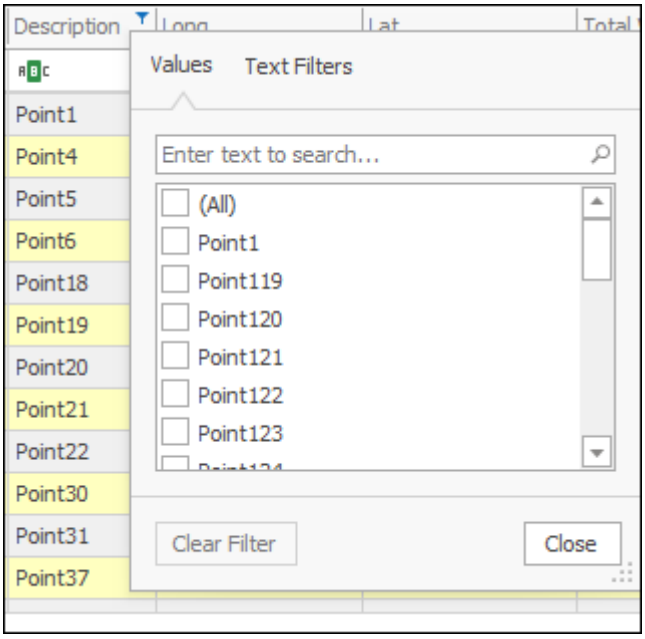


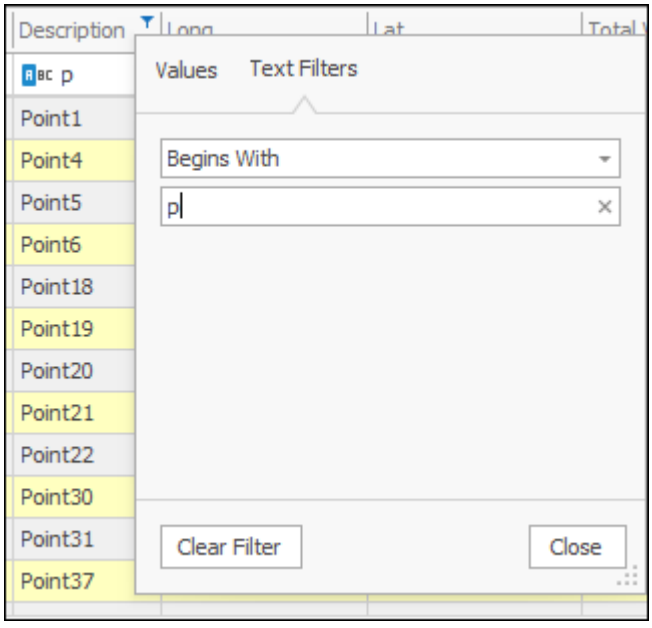


By dropping down on this bottom left box you can also get data on what values have not been included in the filtered values:

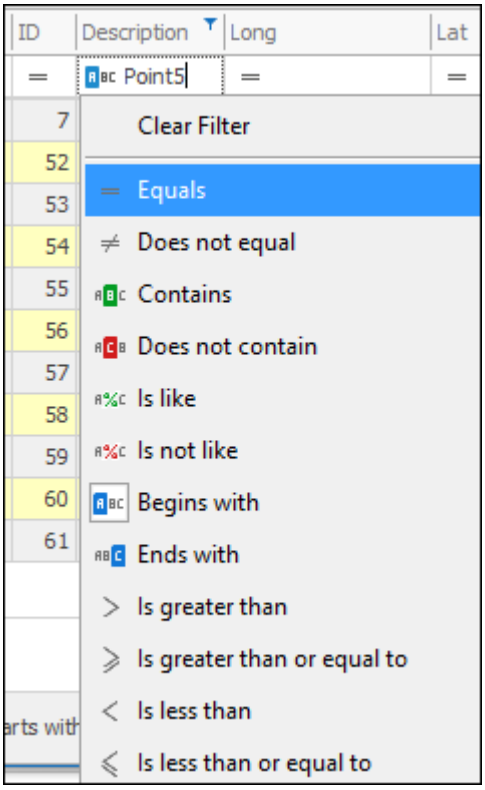


For text columns you have an option to filter on values in the **Values** tab or filter using specific parameters in the **Text Filters** tab:



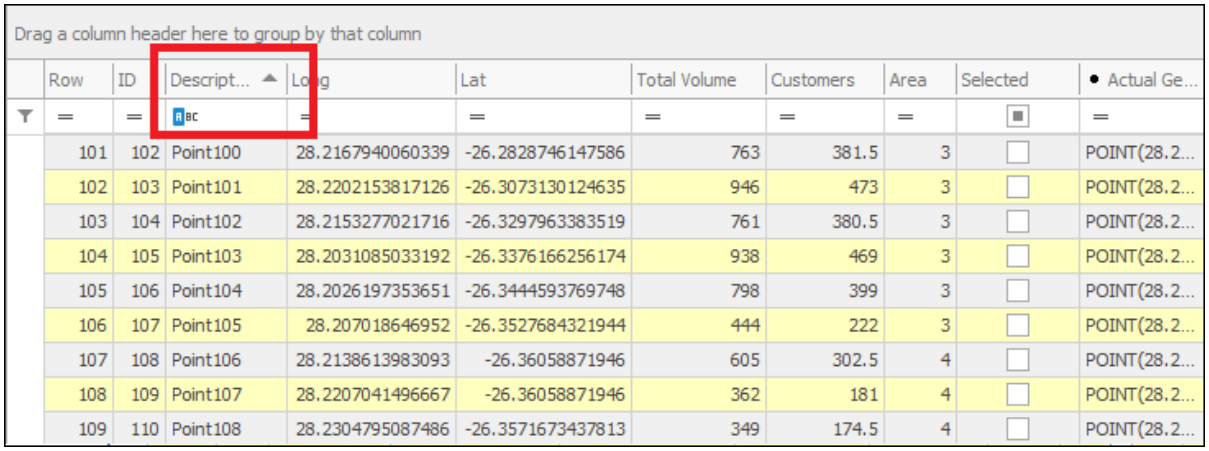


You can also filter on values by directly typing in the value you are looking for in the box below the header and even choosing the parameters by clicking on the = symbol (for number columns) or **ABC** symbol(for text columns):



Sorting

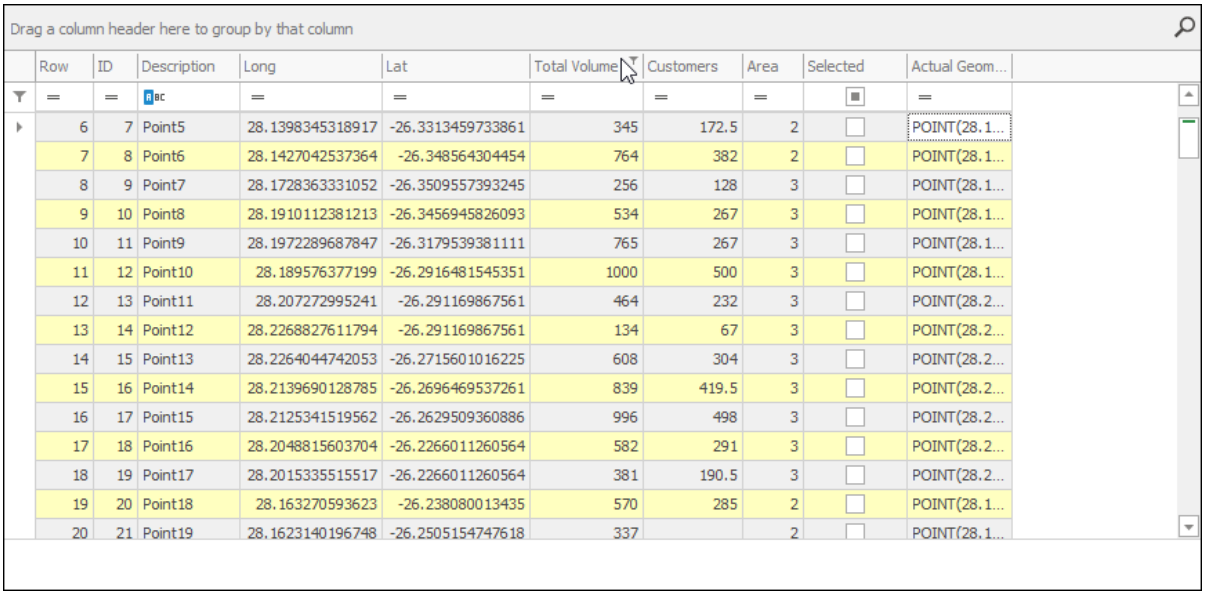
You can sort columns in ascending or descending order by clicking once on the column header for ascending and twice for descending. The sorting will be indicated by a downward arrow for descending or upward arrow for ascending:

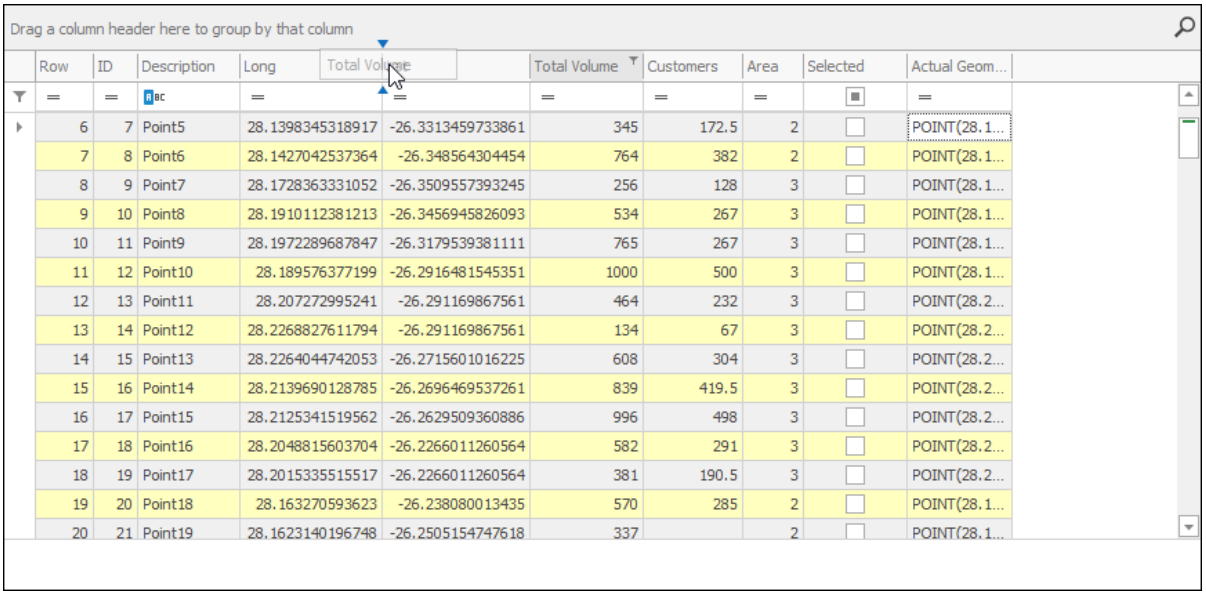


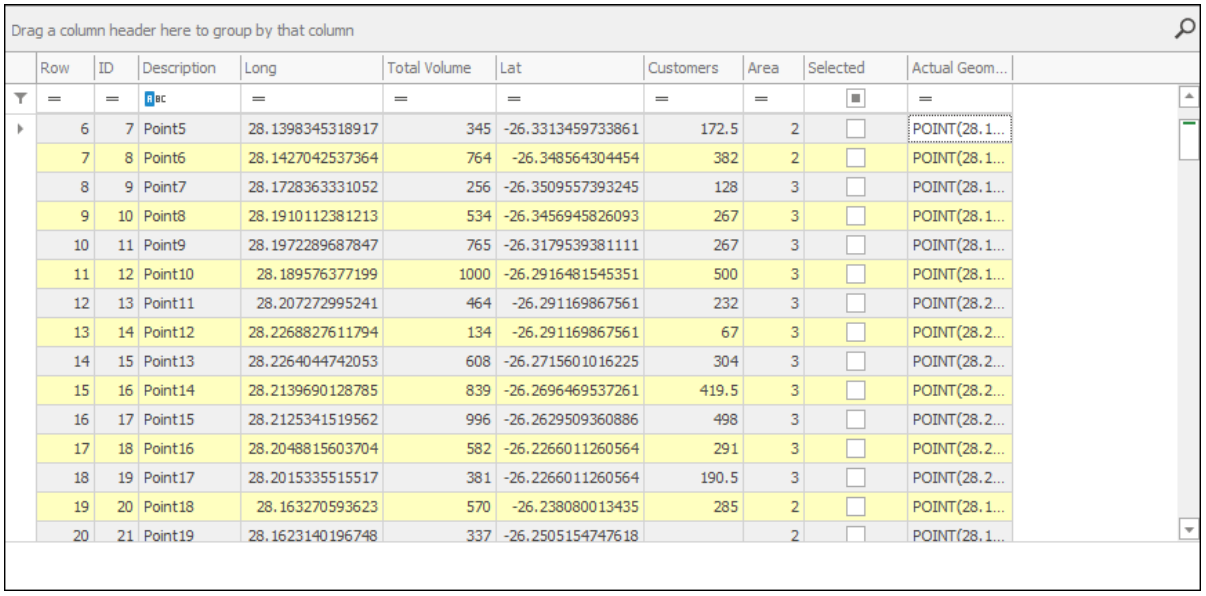
Row	ID	Descript...	Long	Lat	Total Volume	Customers	Area	Selected	Actual Ge...
101	102	Point100	28.2167940060339	-26.2828746147586	763	381.5	3		POINT(28.2...
102	103	Point101	28.2202153817126	-26.3073130124635	946	473	3		POINT(28.2...
103	104	Point102	28.2153277021716	-26.3297963383519	761	380.5	3		POINT(28.2...
104	105	Point103	28.2031085033192	-26.3376166256174	938	469	3		POINT(28.2...
105	106	Point104	28.2026197353651	-26.3444593769748	798	399	3		POINT(28.2...
106	107	Point105	28.207018646952	-26.3527684321944	444	222	3		POINT(28.2...
107	108	Point106	28.2138613983093	-26.36058871946	605	302.5	4		POINT(28.2...
108	109	Point107	28.2207041496667	-26.36058871946	362	181	4		POINT(28.2...
109	110	Point108	28.2304795087486	-26.3571673437813	349	174.5	4		POINT(28.2...

Moving Columns

To move columns around simply click on the column header and drag to the desired place; as you hover over where you want to place it you will see a pair of blue arrows indicating you can drop it there:

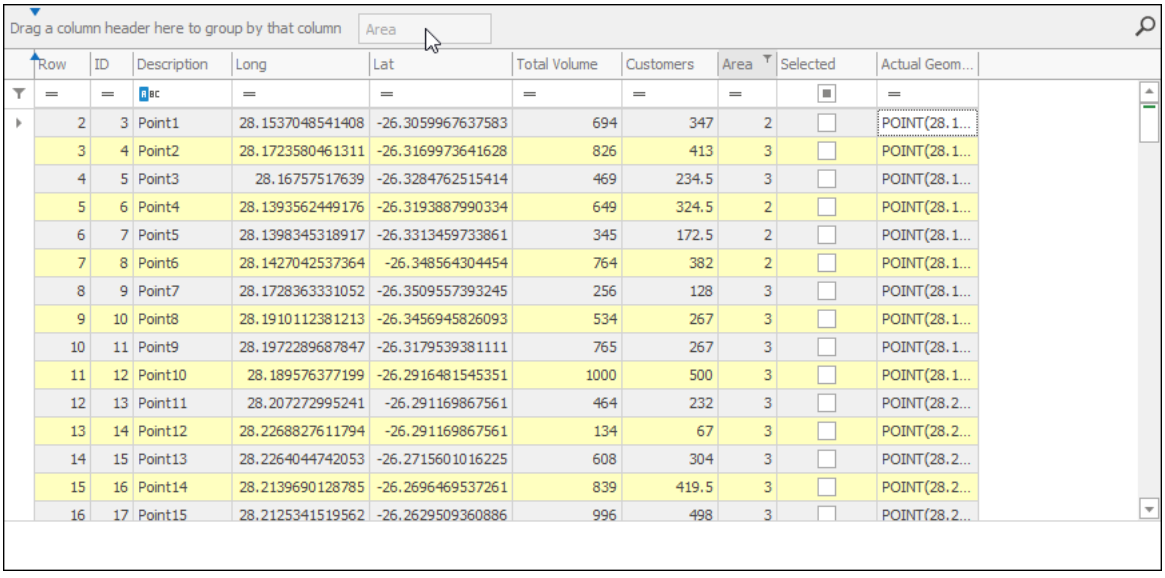


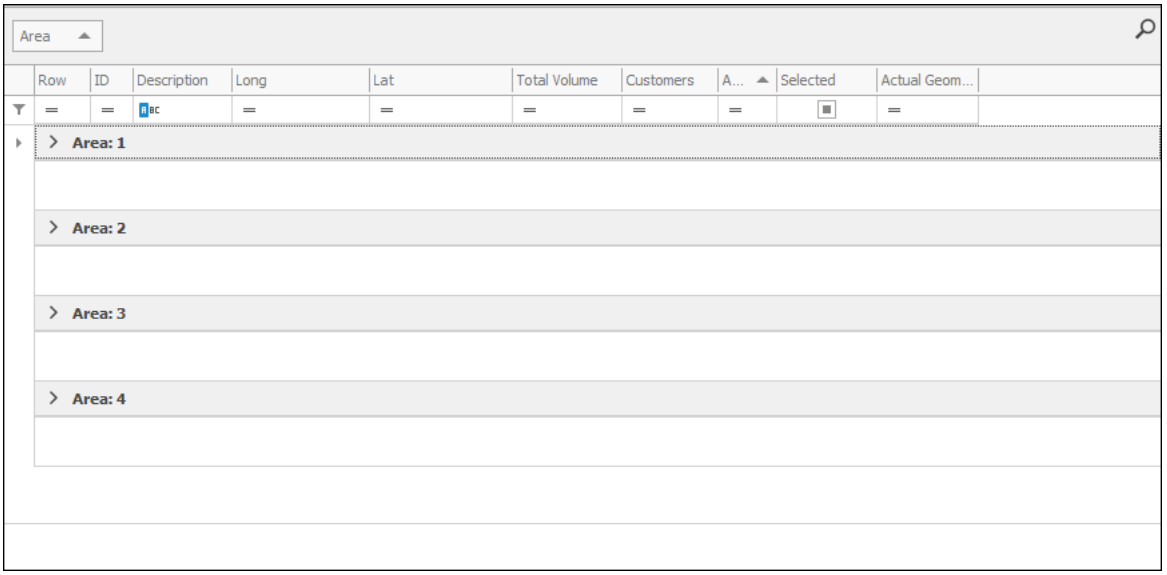




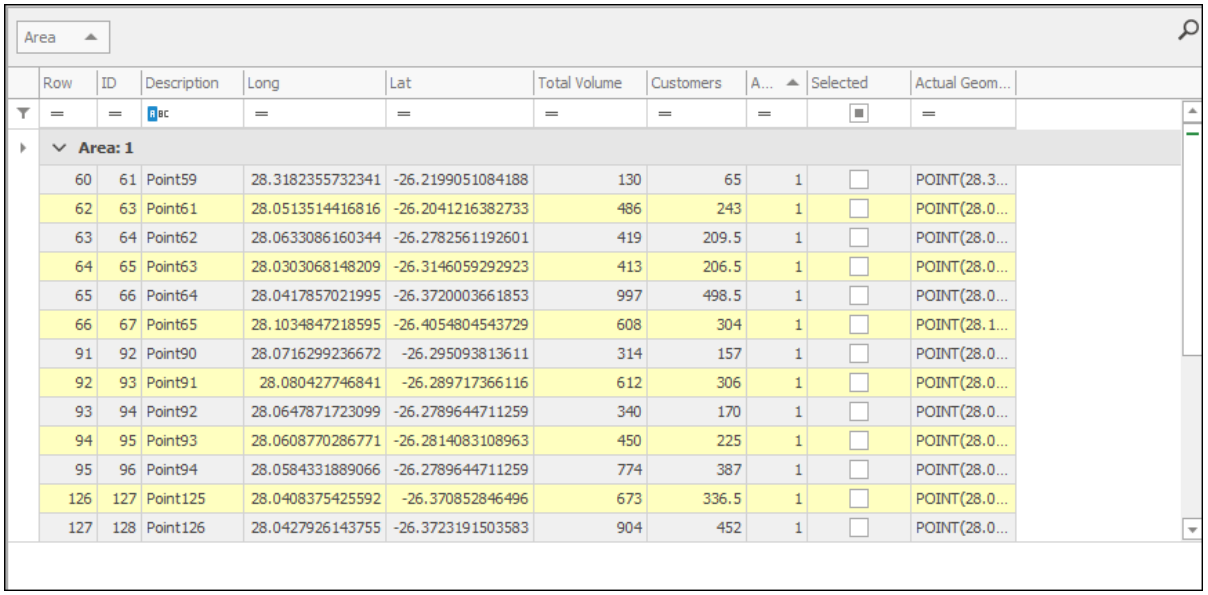
Grouping Columns

You can group your data by a certain column header by dragging it to the top area where it says:





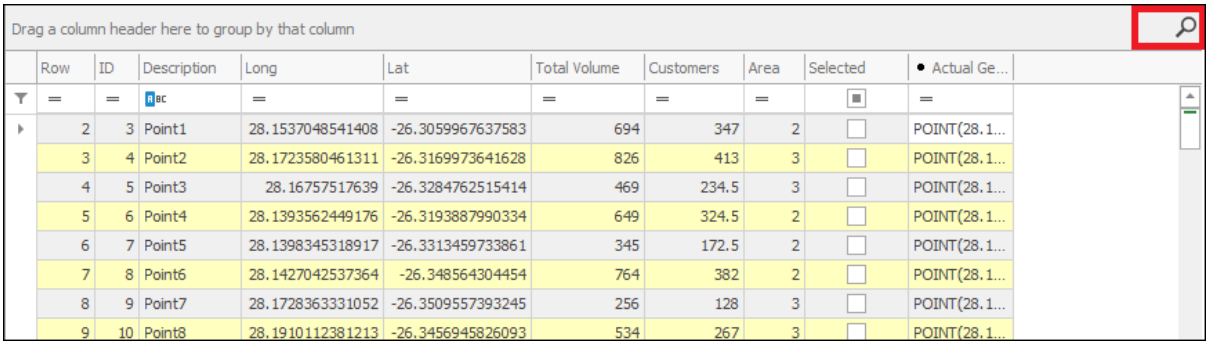
You can then dropdown on one of these groupings and see all items which fall under that category:



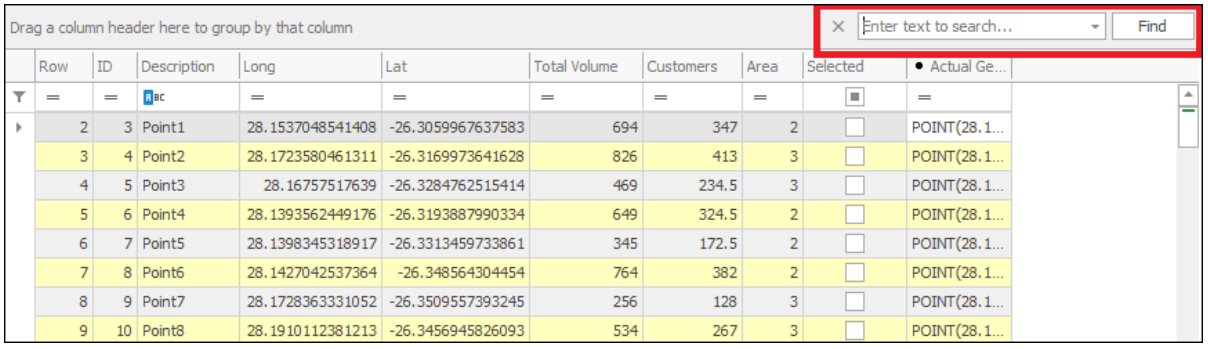
To ungroup simply drag the column header from the top area back to its original location.

Searching For Data

To search for data within your entire data grid, you can click on the magnifying glass in the far right of the grouping area, this will bring up a search bar where you can type in the value and then click **Find**:



Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Selected	Actual Ge...
2	3	Point1	28.1537048541408	-26.3059967637583	694	347	2		POINT(28.1...
3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3		POINT(28.1...
4	5	Point3	28.16757517639	-26.3284762515414	469	234.5	3		POINT(28.1...
5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2		POINT(28.1...
6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2		POINT(28.1...
7	8	Point6	28.1427042537364	-26.348564304454	764	382	2		POINT(28.1...
8	9	Point7	28.1728363331052	-26.3509557393245	256	128	3		POINT(28.1...
9	10	Point8	28.1910112381213	-26.3456945826093	534	267	3		POINT(28.1...



Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Selected	Actual Ge...
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5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2		POINT(28.1...
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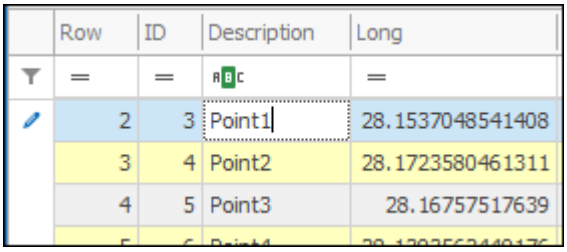
9	10	Point8	28.1910112381213	-26.3456945826093	534	267	3		POINT(28.1...

Editing Data

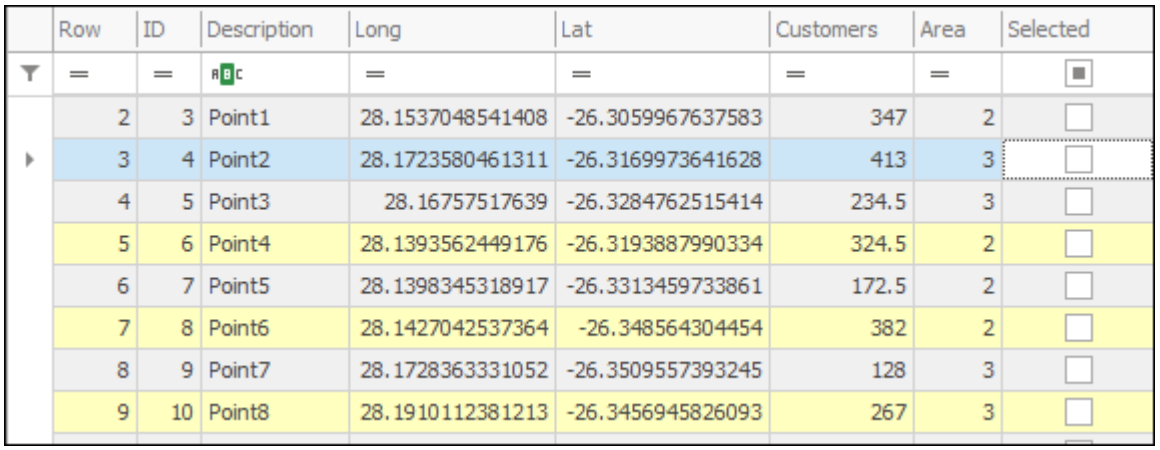
You can edit values in the grid by simply clicking in the appropriate point in the grid and then entering in the value (if it does not allow you to enter anything in it may be that the column is set as read-only and how to change this will be gone over). A little pencil icon will show on the left indicating that editing is now taking place:



	Row	ID	Description	Long
	=	=	=	=
	2	3	Point1	28.1537048541408
	3	4	Point2	28.1723580461311
	4	5	Point3	28.16757517639

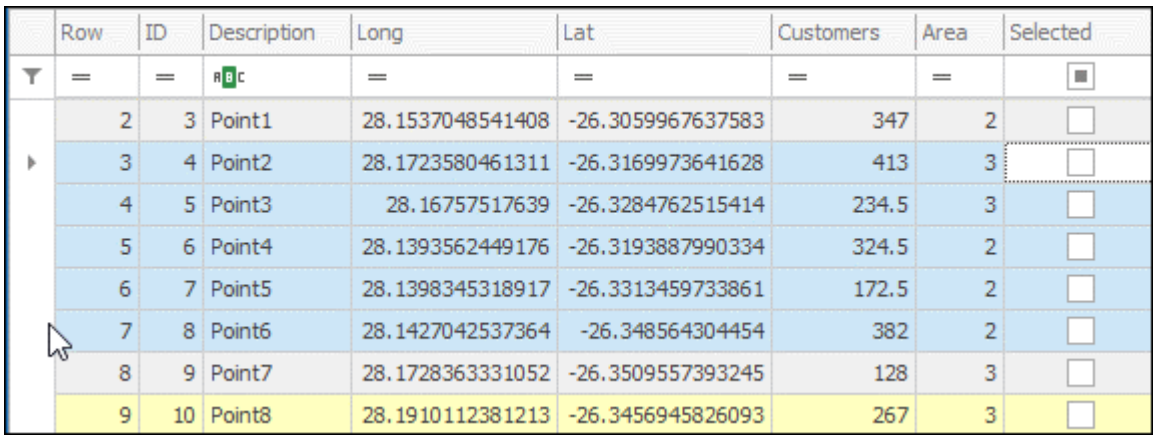
Selecting Rows

To select rows, click in the far-left blank area next to the appropriate row; selection is indicated by a little arrow:



	Row	ID	Description	Long	Lat	Customers	Area	Selected
	=	=	=	=	=	=	=	
	2	3	Point1	28.1537048541408	-26.3059967637583	347	2	
▸	3	4	Point2	28.1723580461311	-26.3169973641628	413	3	
	4	5	Point3	28.16757517639	-26.3284762515414	234.5	3	
	5	6	Point4	28.1393562449176	-26.3193887990334	324.5	2	
	6	7	Point5	28.1398345318917	-26.3313459733861	172.5	2	
	7	8	Point6	28.1427042537364	-26.348564304454	382	2	
	8	9	Point7	28.1728363331052	-26.3509557393245	128	3	
	9	10	Point8	28.1910112381213	-26.3456945826093	267	3	

To select more than one row simply click and drag:



	Row	ID	Description	Long	Lat	Customers	Area	Selected
	=	=	=	=	=	=	=	
	2	3	Point1	28.1537048541408	-26.3059967637583	347	2	
▸	3	4	Point2	28.1723580461311	-26.3169973641628	413	3	
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	5	6	Point4	28.1393562449176	-26.3193887990334	324.5	2	
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	7	8	Point6	28.1427042537364	-26.348564304454	382	2	
	8	9	Point7	28.1728363331052	-26.3509557393245	128	3	
	9	10	Point8	28.1910112381213	-26.3456945826093	267	3	

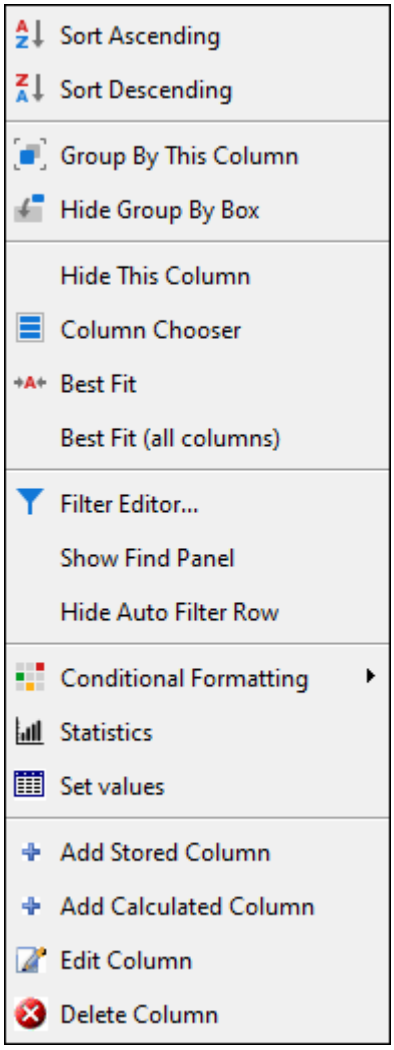
To select all rows, you can do a **ctrl A** just like in Excel.

Context Menus

Right clicking in the grid will bring up two different context menus depending on where you click. We will start by taking up the one that comes up when right clicking in one of the column headers or column header area:

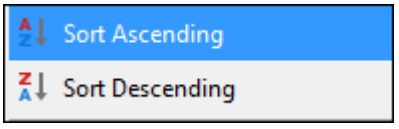
Column Header Area Context Menu

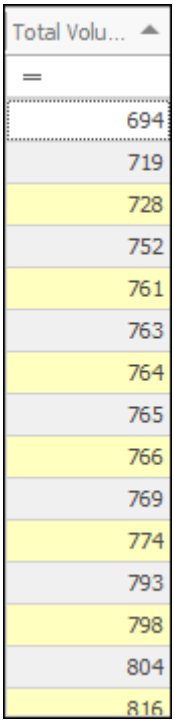
Right clicking in one of the column headers or the column header area will bring up the following context menu:



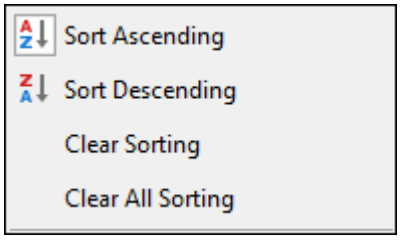
Sort Ascending/Sort Descending

You can sort columns in ascending or descending order by clicking on the **Sort Ascending** or **Sort Descending** buttons. The column header will then have an upward or downward arrow to indicate that the column is now sorted in ascending or descending order:



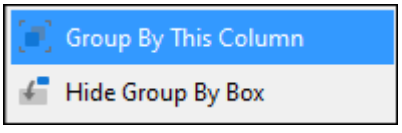


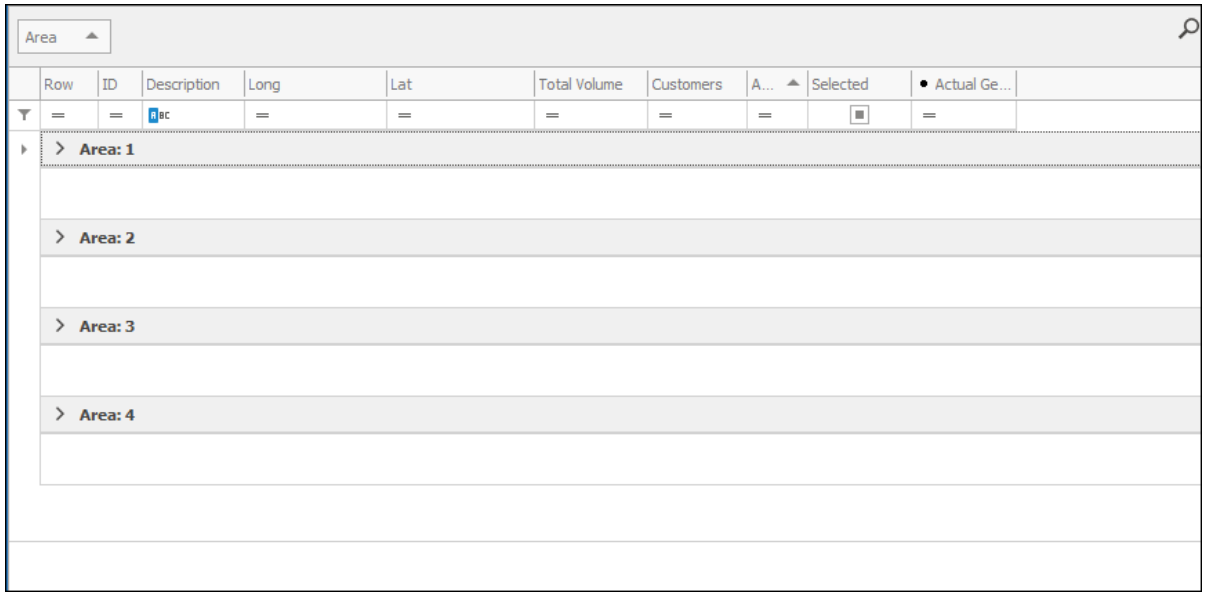
To clear sorting right click again and then click **Clear Sorting** to clear the sorting for just that column or **Clear All Sorting** to clear sorting for all columns:

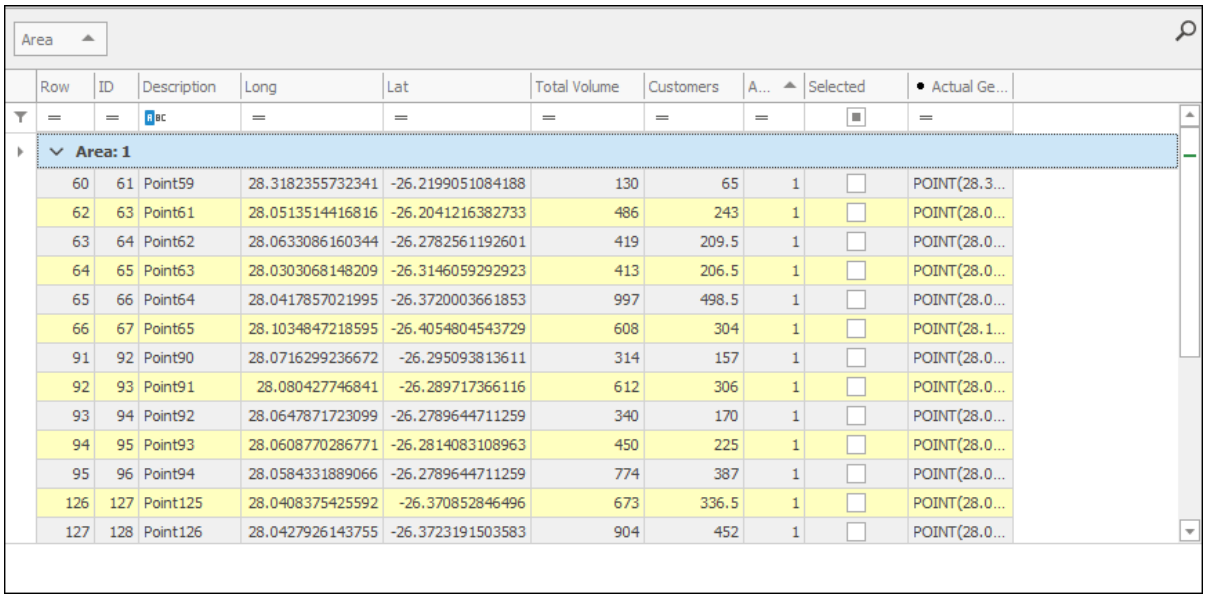


Group By This Column

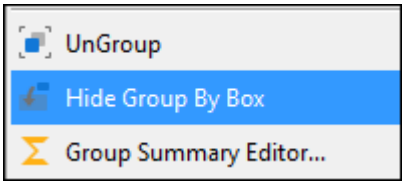
To group your data by a certain column, click **Group By This Column**, your data is then grouped and you can dropdown on one of the groupings to see all records that fall in that category:

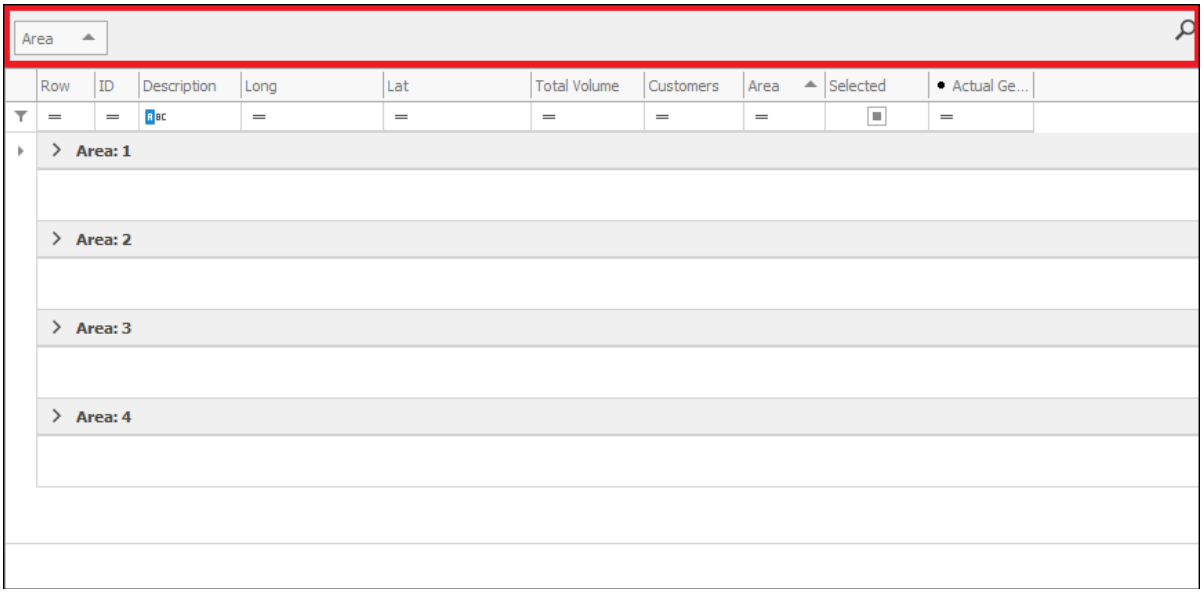


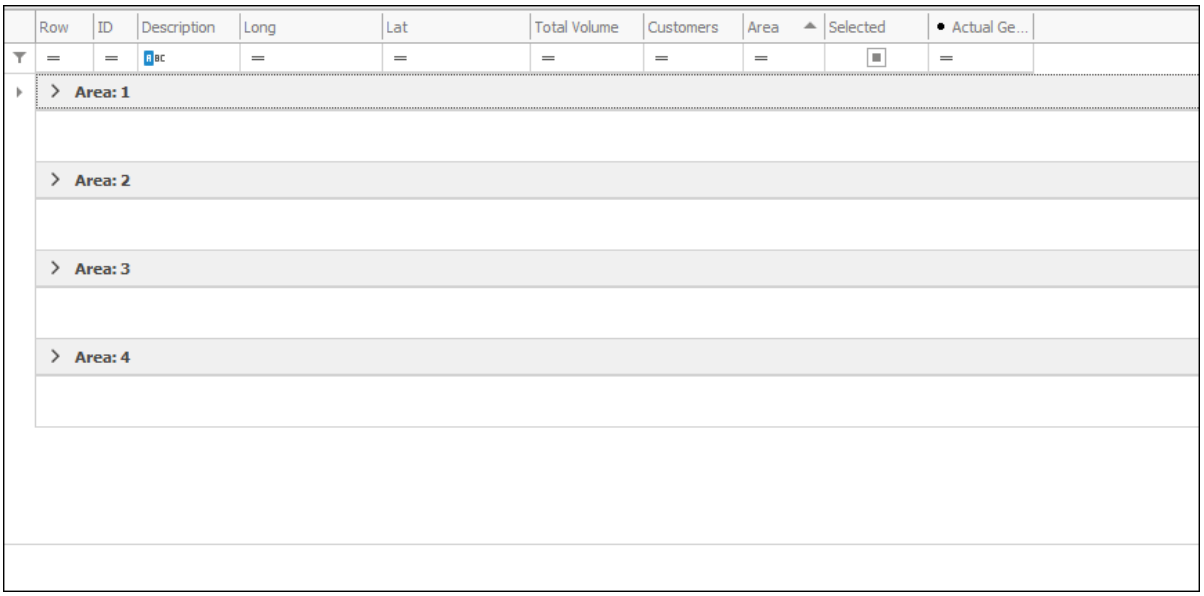




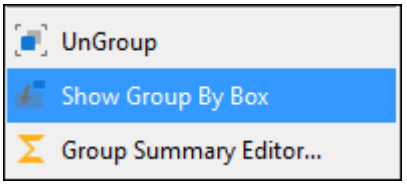
The **Hide Group By Box** button will hide the grouping area:



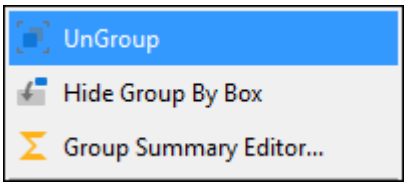


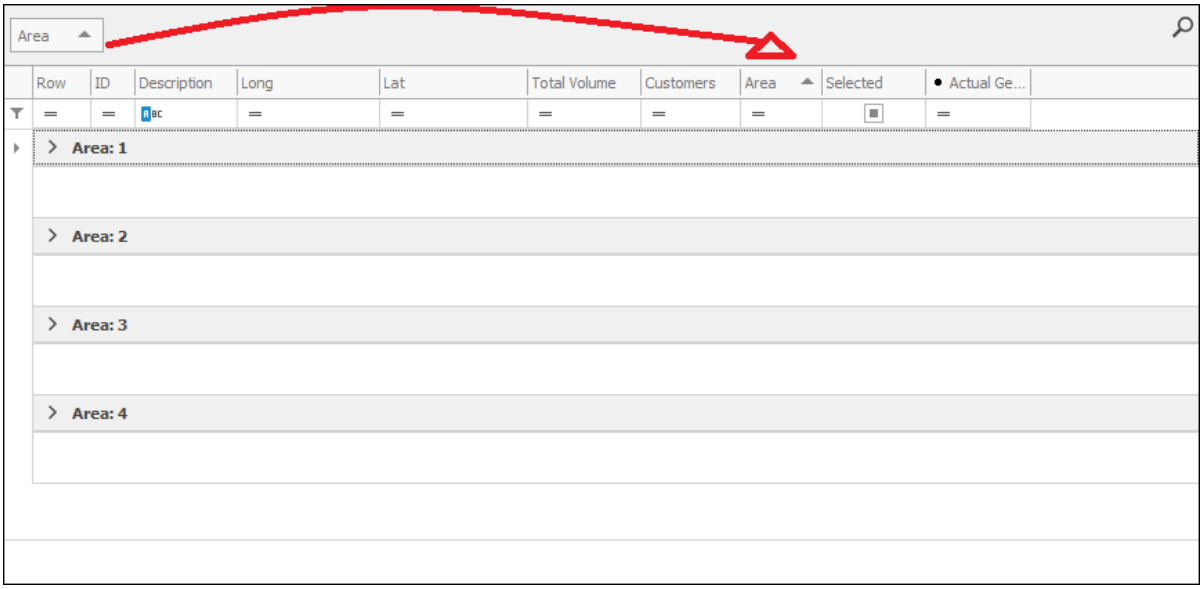


To unhide just right click again and click the **Show Group By Box**:

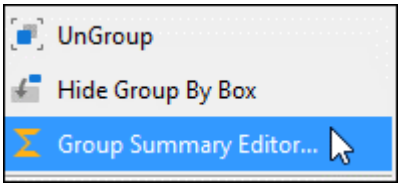


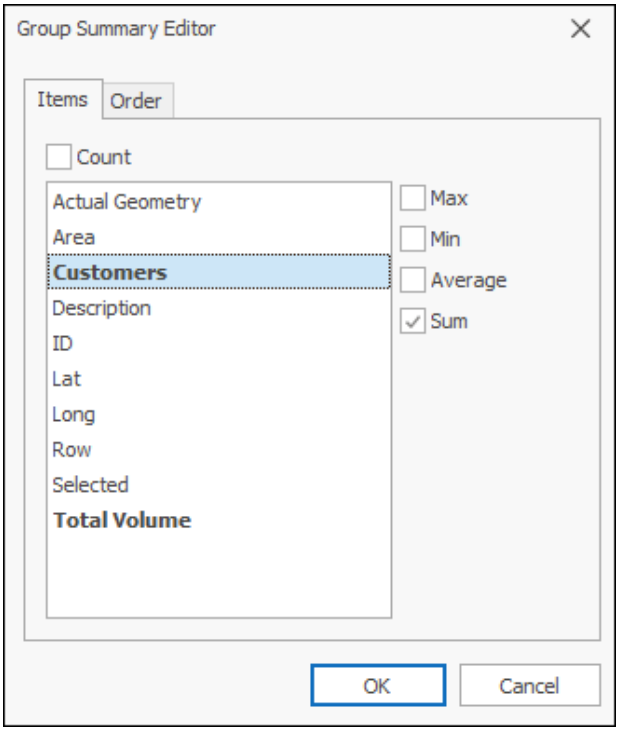
To ungroup you can right click again in the appropriate column header and click **Ungroup** (you can also just drag the column header out of the grouping area back to the grid and this will ungroup it too):

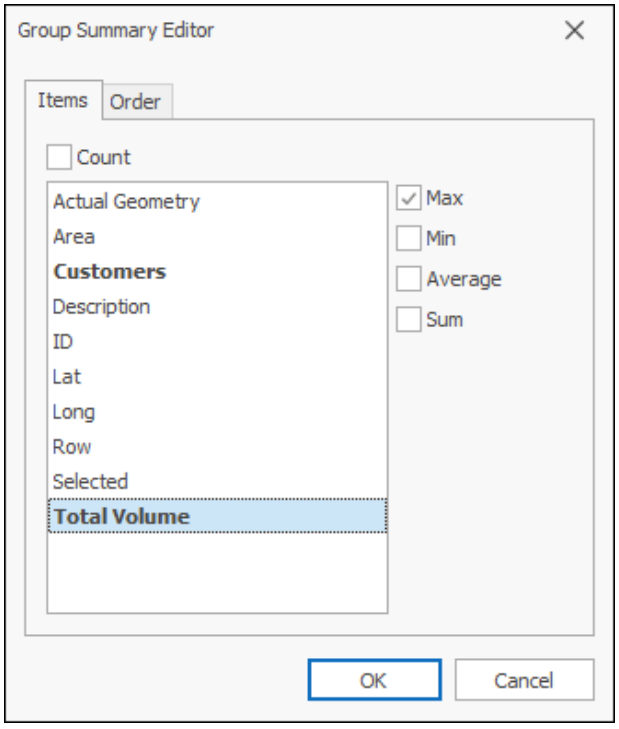


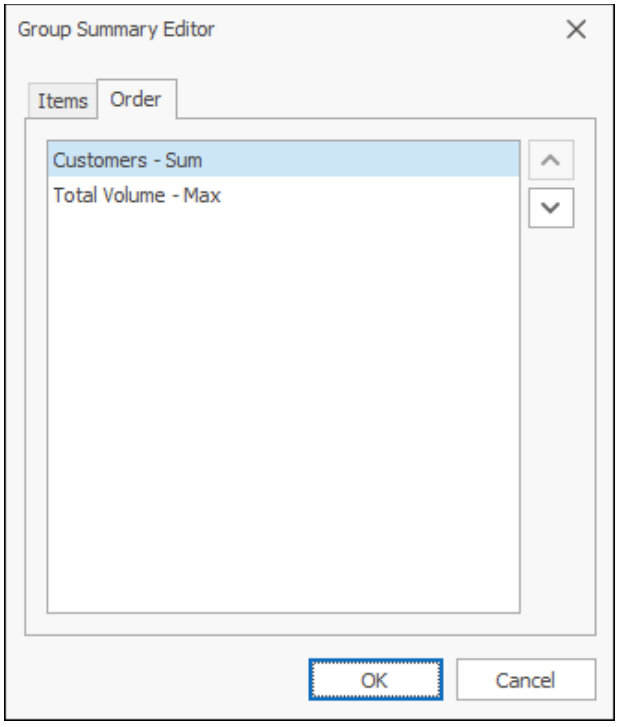


Group Summary Editor will bring up a dialogue where you can add some calculations to your grouping setup, here I chose to have the **Sum** of **Customers** shown and the **Max Total Volume**, you can choose the order in which they are shown in the **Order** tab:

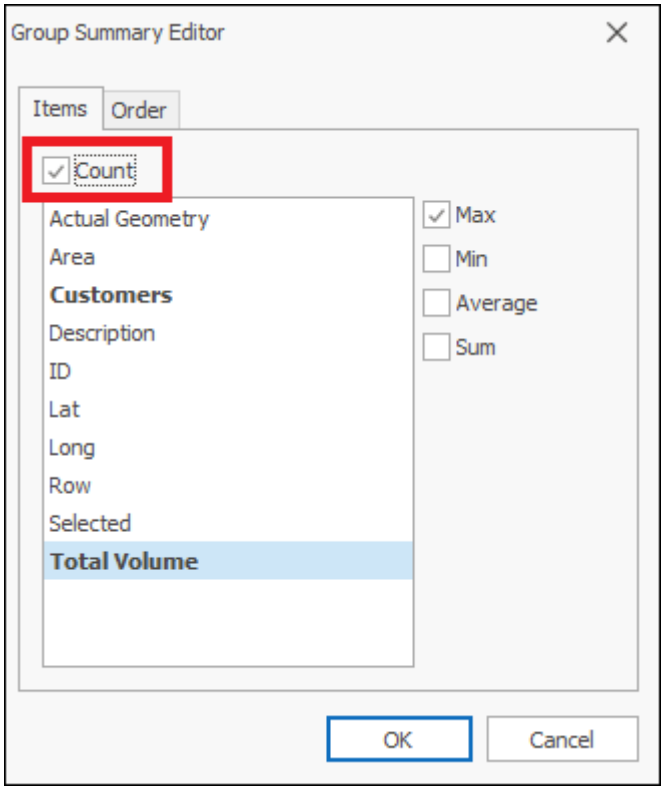

UnGroup
Hide Group By Box
Group Summary Editor...

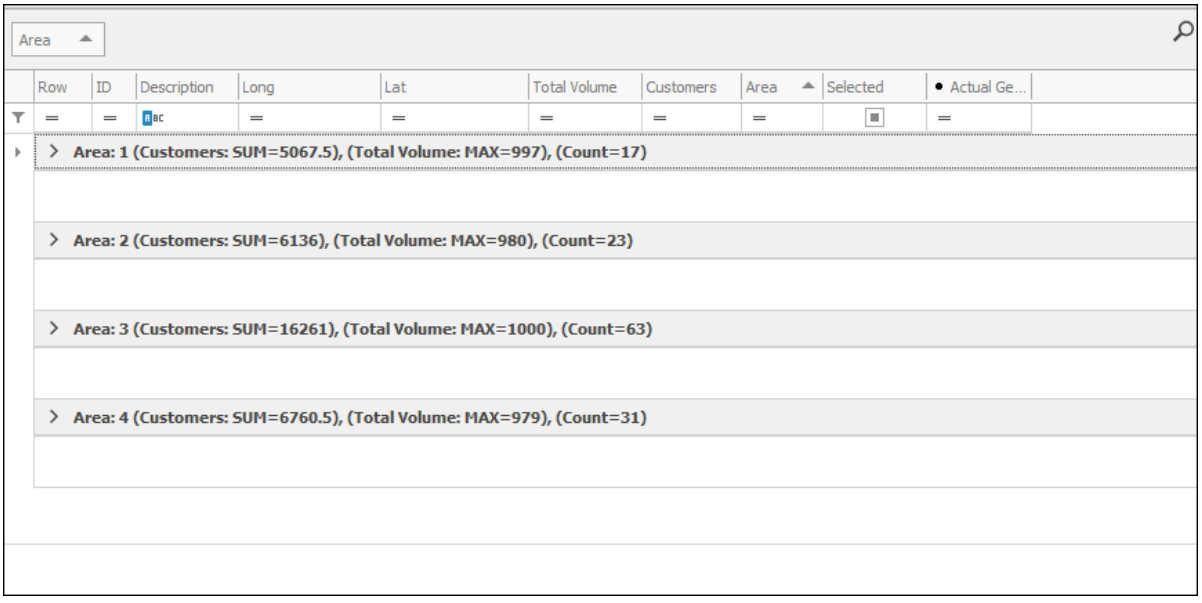

Group Summary Editor
Items
Order
Count
Actual Geometry
Area
Customers
Description
ID
Lat
Long
Row
Selected
Total Volume
Max
Min
Average
Sum
OK
Cancel





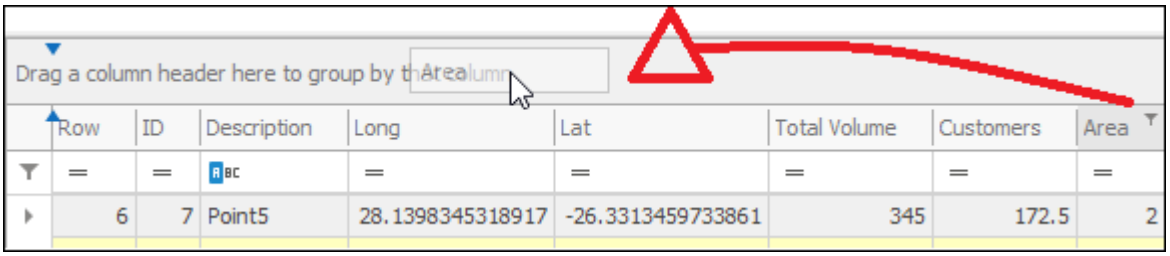
Ticking on **Count** will also include a count of the items:



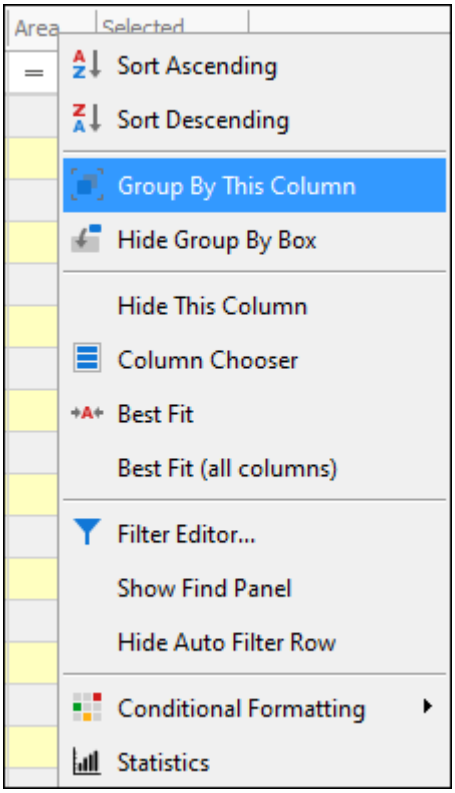


In grouping by columns, you are able to group by more than one column at once. You can start by grouping by one column and then all subsequent columns you

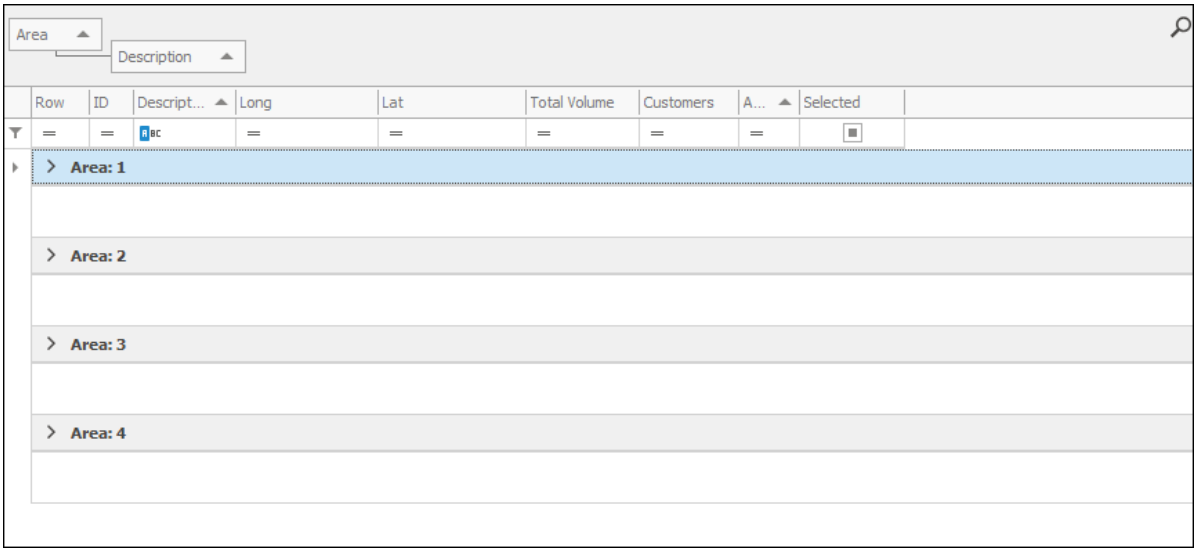
group will act as subgroupings, and as mentioned before, grouping can be done by either dragging and dropping column headers in the grouping area, or by right clicking on the column header and choosing **Group By This Column**:



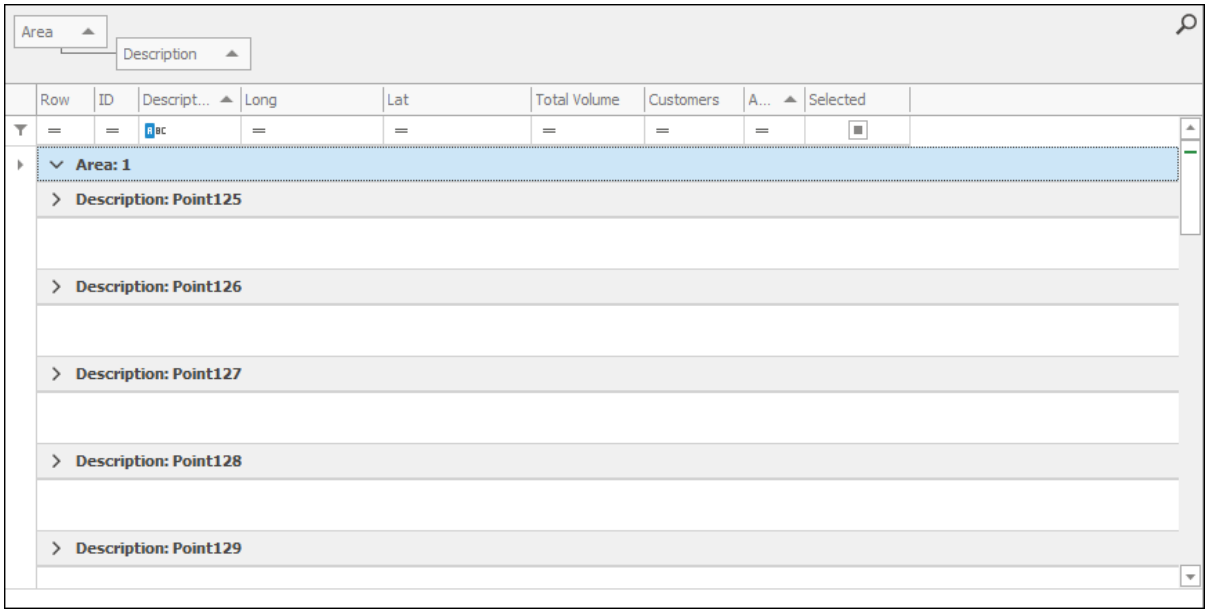
or



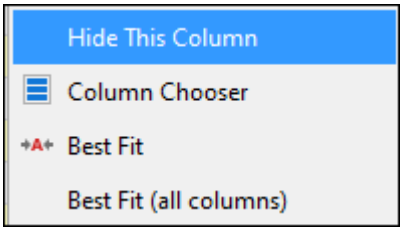
In this example I have grouped by two columns, the first being **Area** and the second being **Description**:



When I dropdown on **Area 1** you see the second grouping:

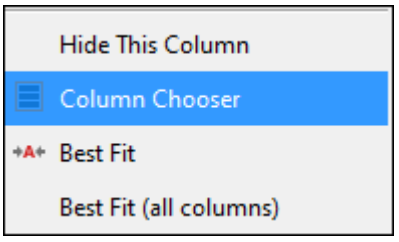


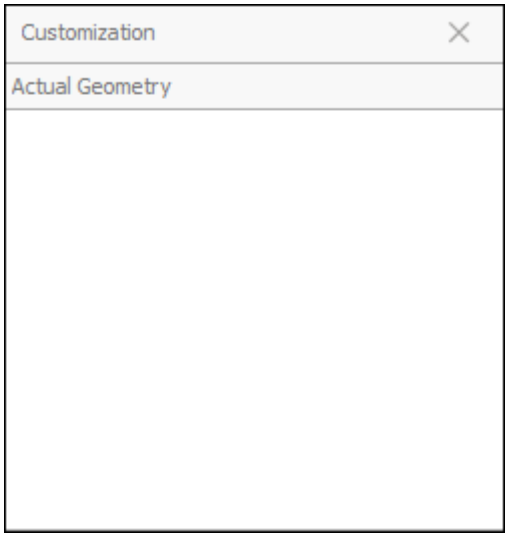
You can choose to hide columns by right clicking in the appropriate column header and selecting **Hide Column**:



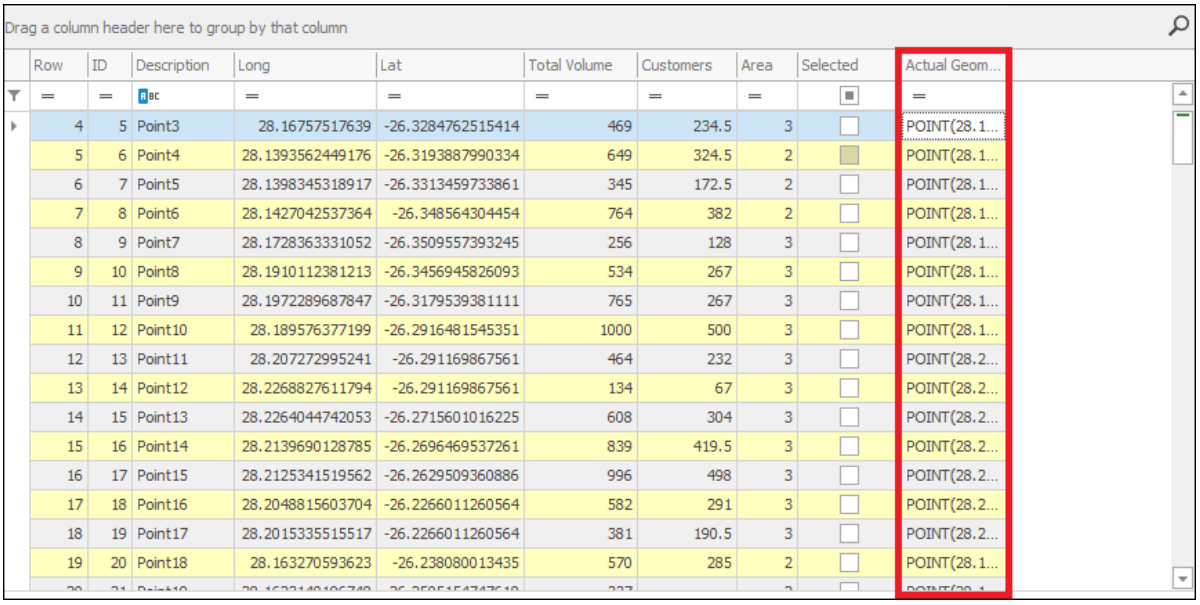
Column Chooser

Column Chooser will bring up a dialogue where you can choose which columns to have shown and which to have hidden by dragging and dropping columns into it that you want hidden, and double clicking on columns inside it to have them shown:



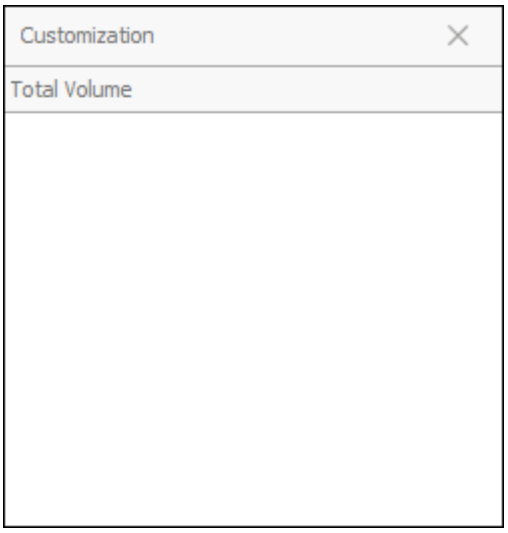


As you can see the **Actual Geometry** column is in this box which means it is hidden and if I want to show it, I double click on it and now it is part of my grid:

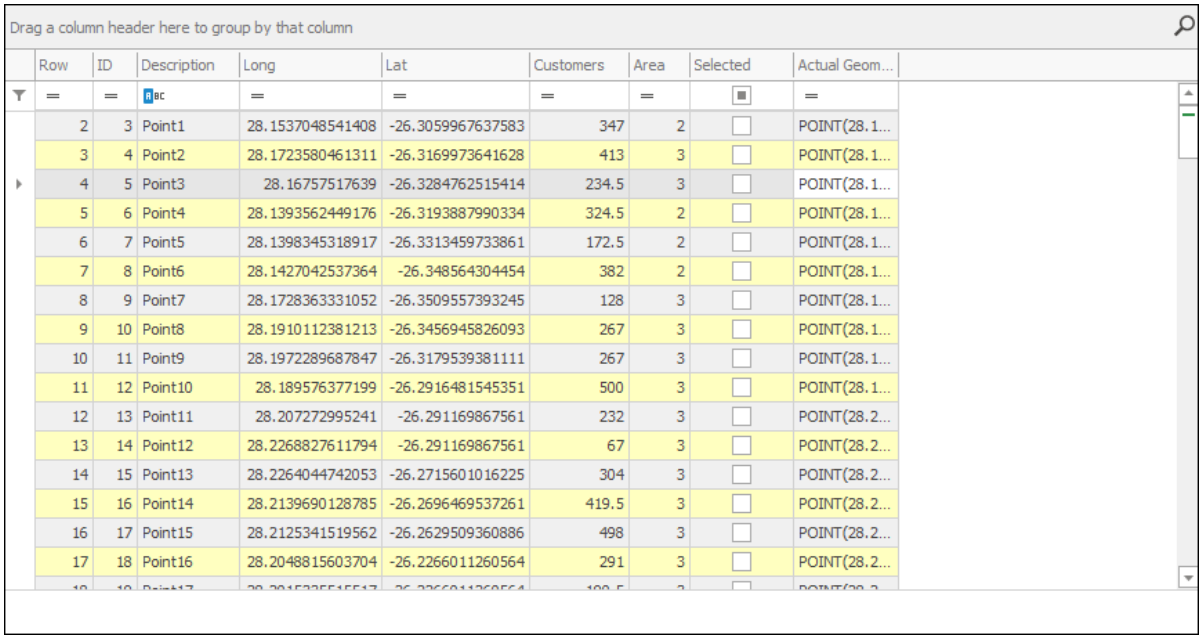


Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Selected	Actual Geom...
4	5	Point3	28.16757517639	-26.3284762515414	469	234.5	3		POINT(28.1...
5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2		POINT(28.1...
6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2		POINT(28.1...
7	8	Point6	28.1427042537364	-26.348564304454	764	382	2		POINT(28.1...
8	9	Point7	28.1728363331052	-26.3509557393245	256	128	3		POINT(28.1...
9	10	Point8	28.1910112381213	-26.3456945826093	534	267	3		POINT(28.1...
10	11	Point9	28.1972289687847	-26.3179539381111	765	267	3		POINT(28.1...
11	12	Point10	28.189576377199	-26.2916481545351	1000	500	3		POINT(28.1...
12	13	Point11	28.207272995241	-26.291169867561	464	232	3		POINT(28.2...
13	14	Point12	28.2268827611794	-26.291169867561	134	67	3		POINT(28.2...
14	15	Point13	28.2264044742053	-26.2715601016225	608	304	3		POINT(28.2...
15	16	Point14	28.2139690128785	-26.2696469537261	839	419.5	3		POINT(28.2...
16	17	Point15	28.2125341519562	-26.2629509360886	996	498	3		POINT(28.2...
17	18	Point16	28.2048815603704	-26.2266011260564	582	291	3		POINT(28.2...
18	19	Point17	28.2015335515517	-26.2266011260564	381	190.5	3		POINT(28.2...
19	20	Point18	28.163270593623	-26.238080013435	570	285	2		POINT(28.1...

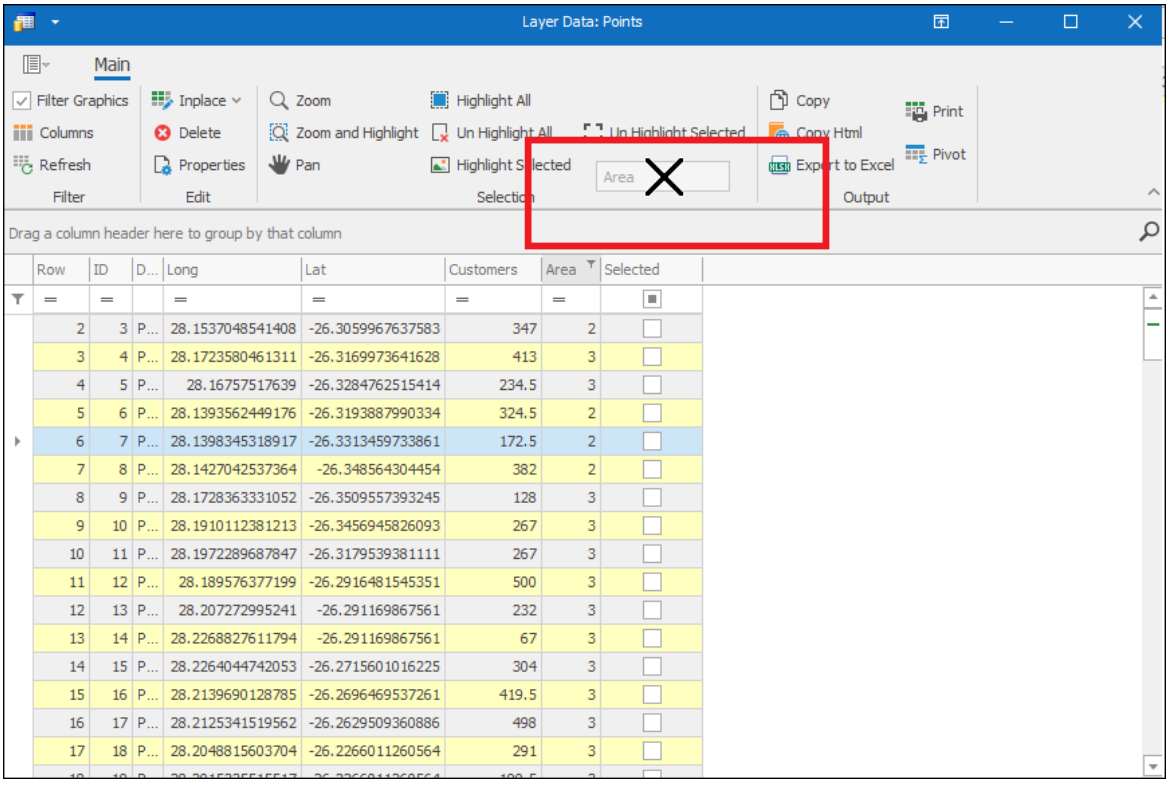
If I want to hide my **Total Volume** column I just drag it and drop it in this box:



And it is now no longer showing in my grid:

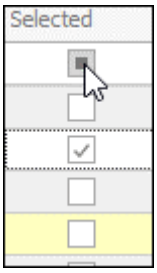


Another easy way to hide a column from your grid that you don't want showing is to simply drag it all the way to the ribbon area of the Layer Data Grid until a cross symbol shows and then just drop it:



The **Selected** column is a column that you can choose to have showing in the grid that will show you with a tick what is selected in the scene currently, you can then also filter by clicking in the box above to have only unselected items showing and click again to have only selected items showing:

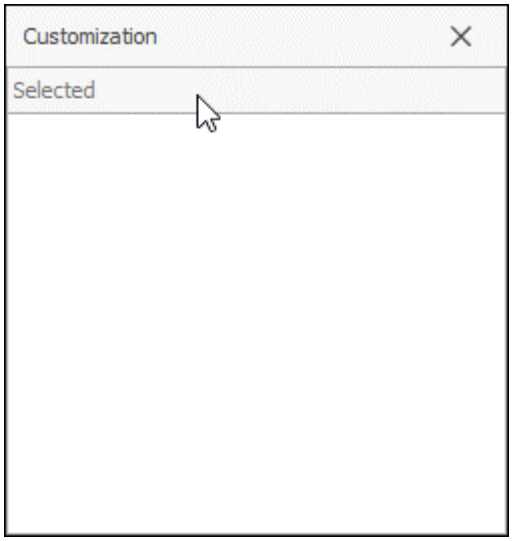
Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Actual Geom...	Selected
2	3	Point1	28.1537048541408	-26.3059967637583	694	348	2	POINT(28.1...	☐
3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3	POINT(28.1...	☑
4	5	Point3	28.16757517639	-26.3284762515414	470	234.5	3	POINT(28.1...	☐
5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2	POINT(28.1...	☐
6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2	POINT(28.1...	☐
7	8	Point6	28.1427042537364	-26.348564304454	764	382	2	POINT(28.1...	☐
8	9	Point7	28.1728363331052	-26.3509557393245	256	128	3	POINT(28.1...	☐
9	10	Point8	28.1910112381213	-26.3456945826093	534	267	3	POINT(28.1...	☐



Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Actual Geom...	Selected
2	3	Point1	28.1537048541408	-26.3059967637583	694	348	2	POINT(28.1...	☐
4	5	Point3	28.16757517639	-26.3284762515414	470	234.5	3	POINT(28.1...	☐
5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2	POINT(28.1...	☐
6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2	POINT(28.1...	☐
7	8	Point6	28.1427042537364	-26.348564304454	764	382	2	POINT(28.1...	☐
8	9	Point7	28.1728363331052	-26.3509557393245	256	128	3	POINT(28.1...	☐

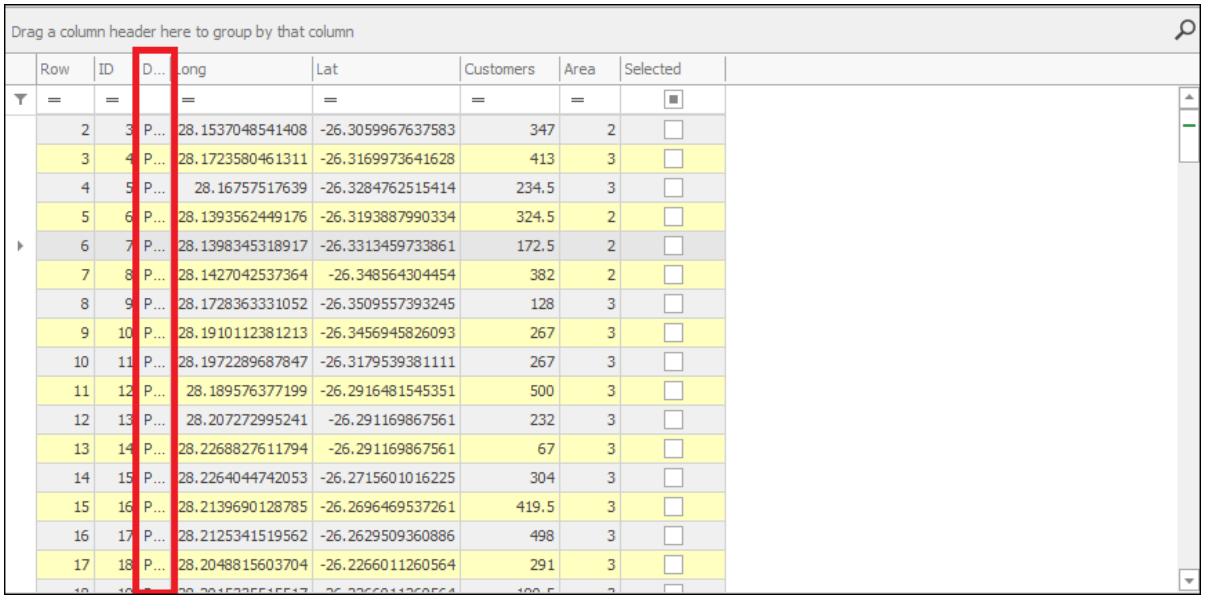
Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Actual Geom...	Selected
3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3	POINT(28.1...	☑

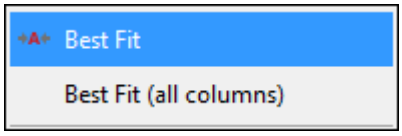
This column can be added via the **Column Chooser** box discussed above. Just double click on it here and it will show in your grid:

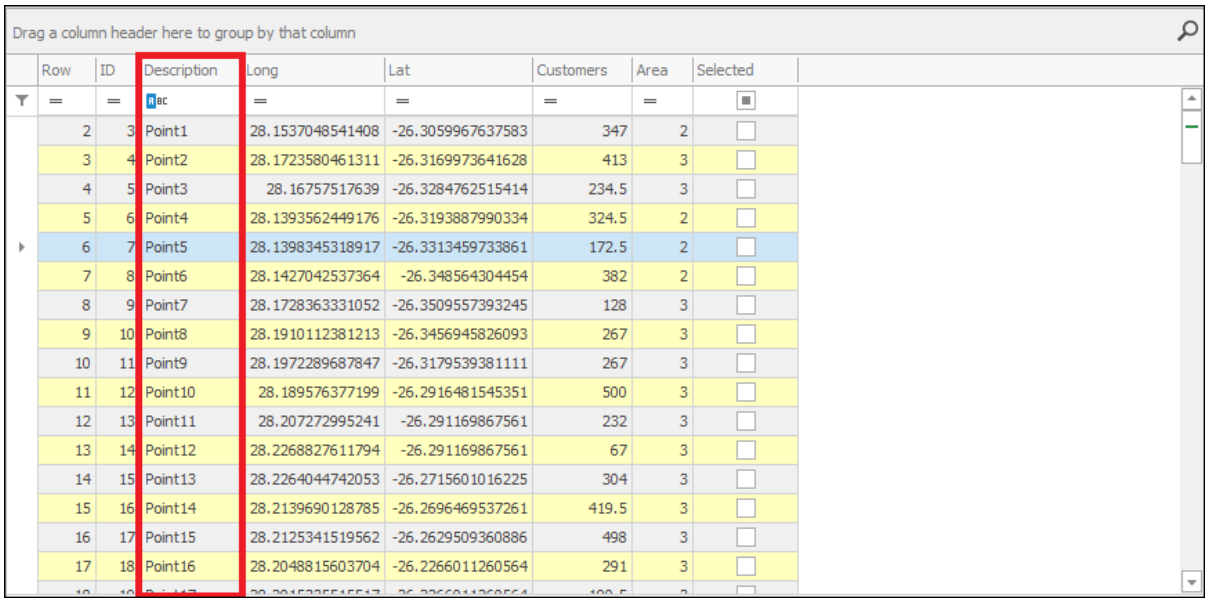


Best Fit

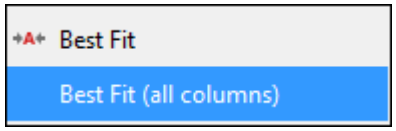
To optimally size columns right click in the appropriate column header and click **Best Fit**:





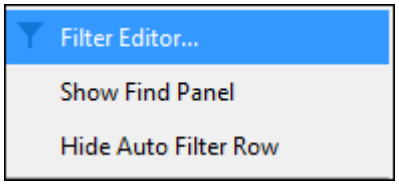


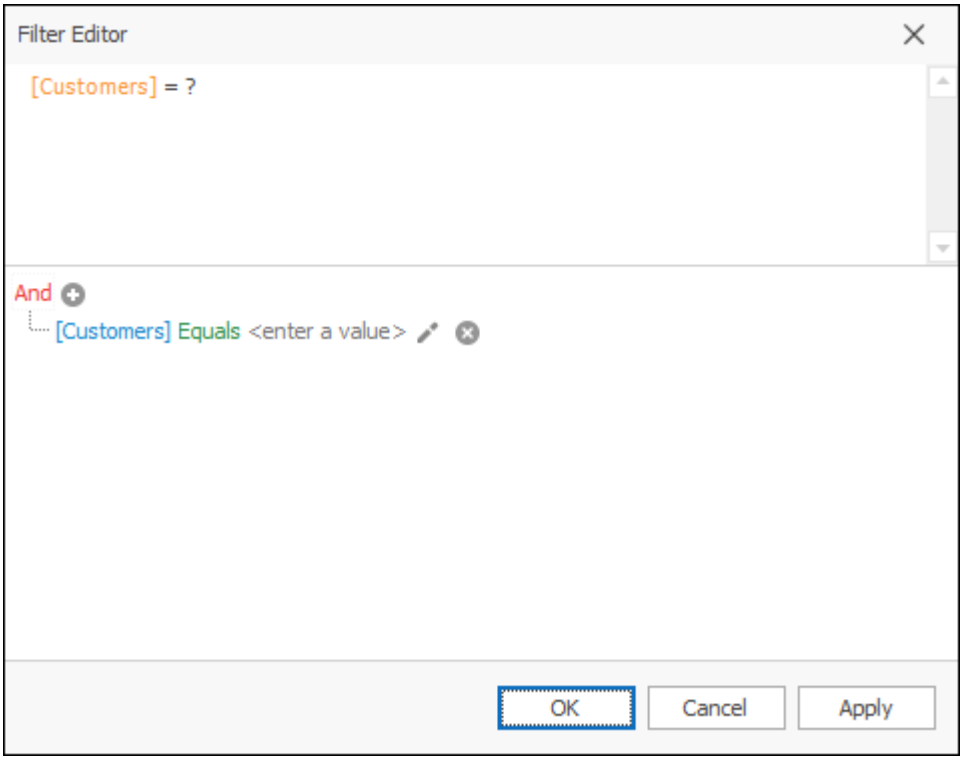
To do this for all columns click **Best Fit (all columns)**:



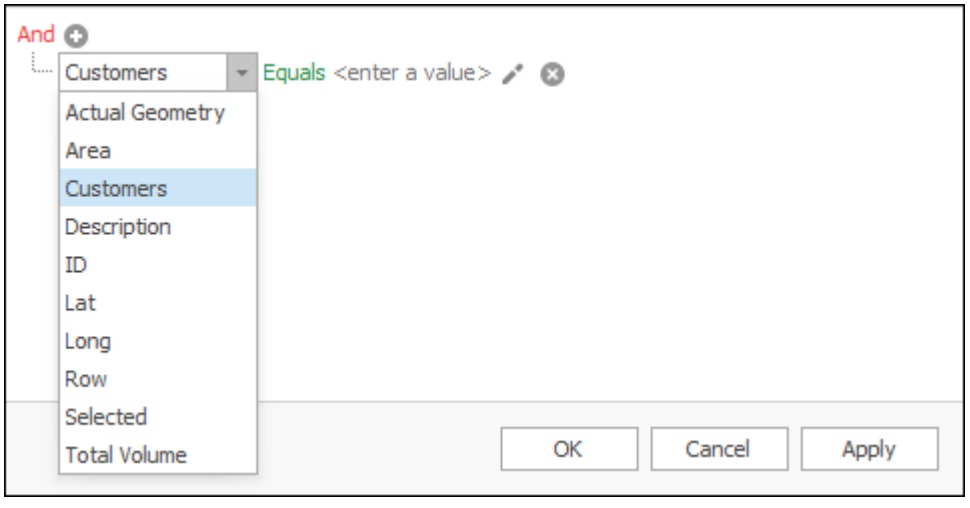
Filter Editor

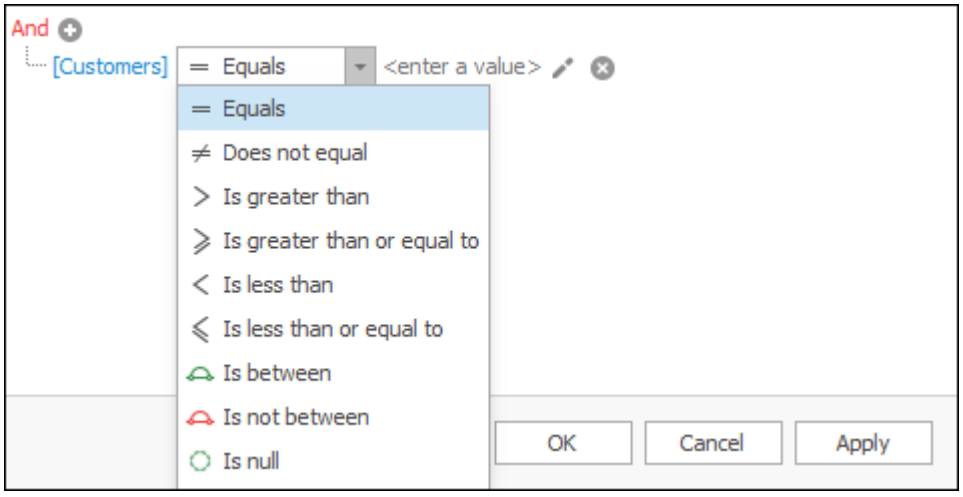
Filter Editor will bring up a dialogue where you can customize filters exactly as you want:

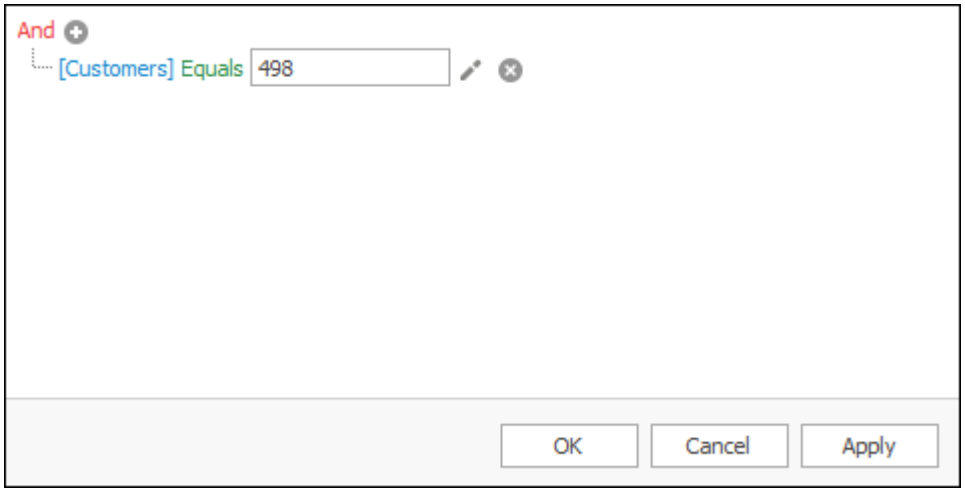




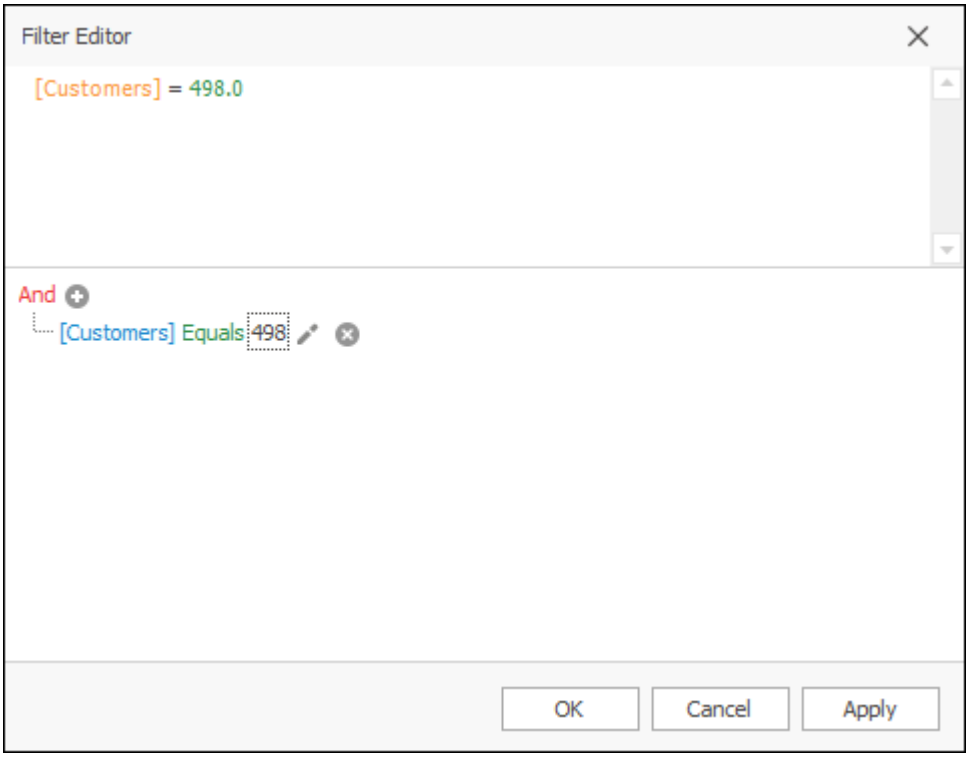
The top part shows the full expression for the filter you are specifying and the bottom part is where you specify the filter. Here (bottom part), click on any one of the elements to change them:



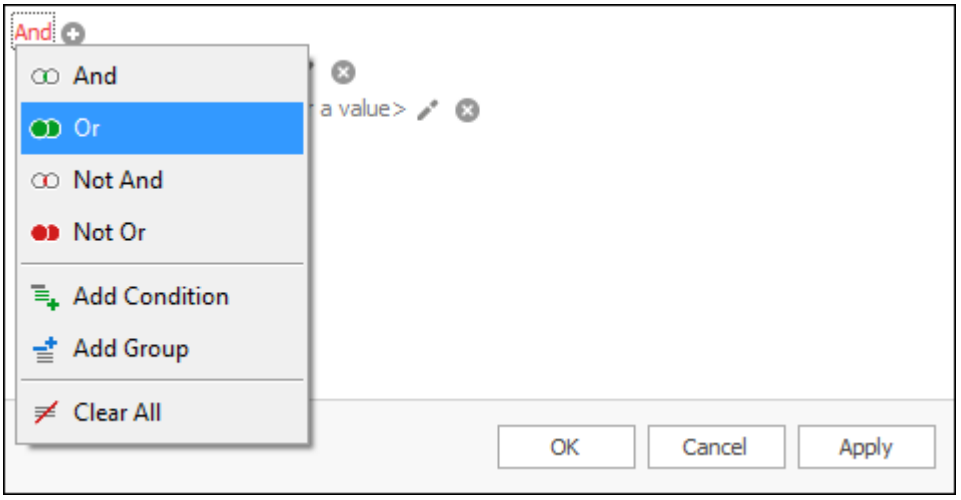


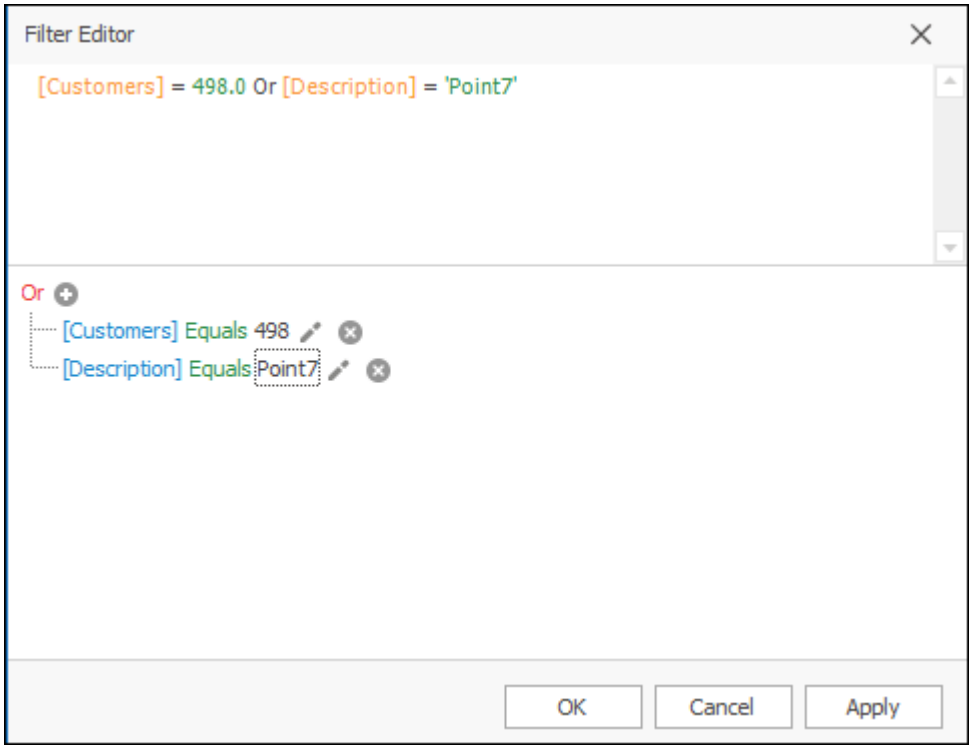


So, so far you can see I have made a filter which says **Customer** column is equal to 498:



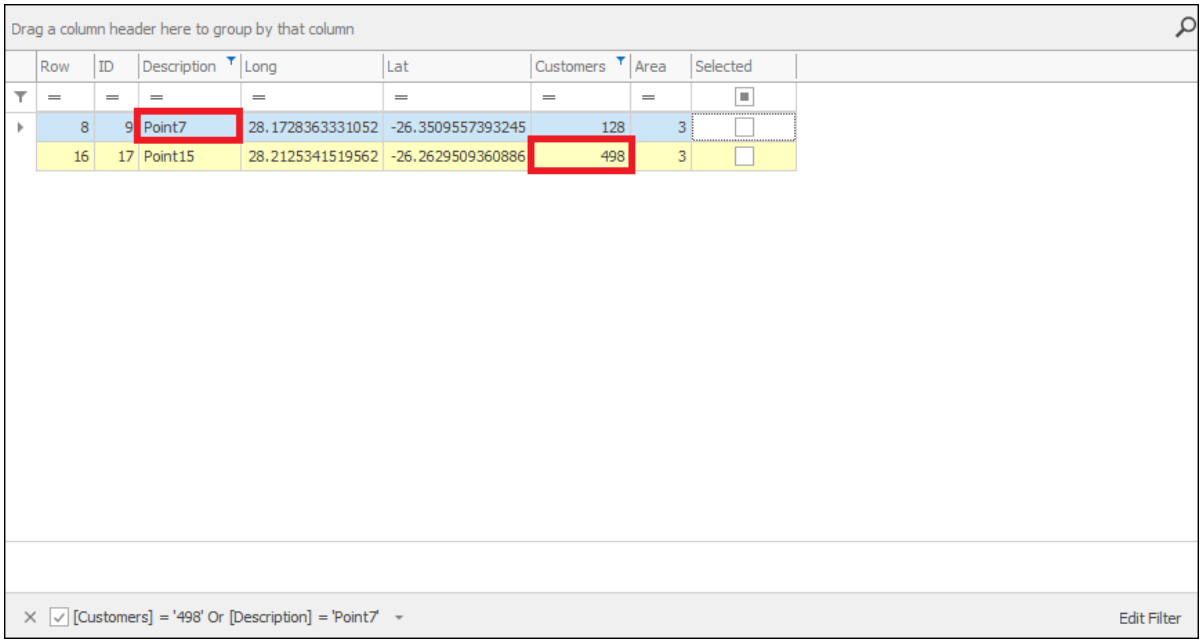
You can then add a new condition to this filter you are creating by clicking the plus symbol; if you want this to be an **And** condition then leave it as **And**, otherwise you can click on this and choose it to be any other type of condition. I will make it an **Or** condition:





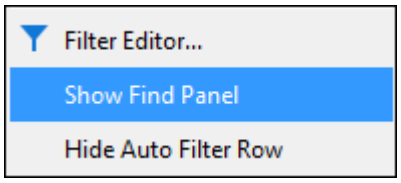
And now as you can see here, I have made a filter which says **Customers** equals 498 **Or Description** equals Point7. I can then click **OK** (or **Apply** if I want to first see how the filter looks without exiting the window yet):

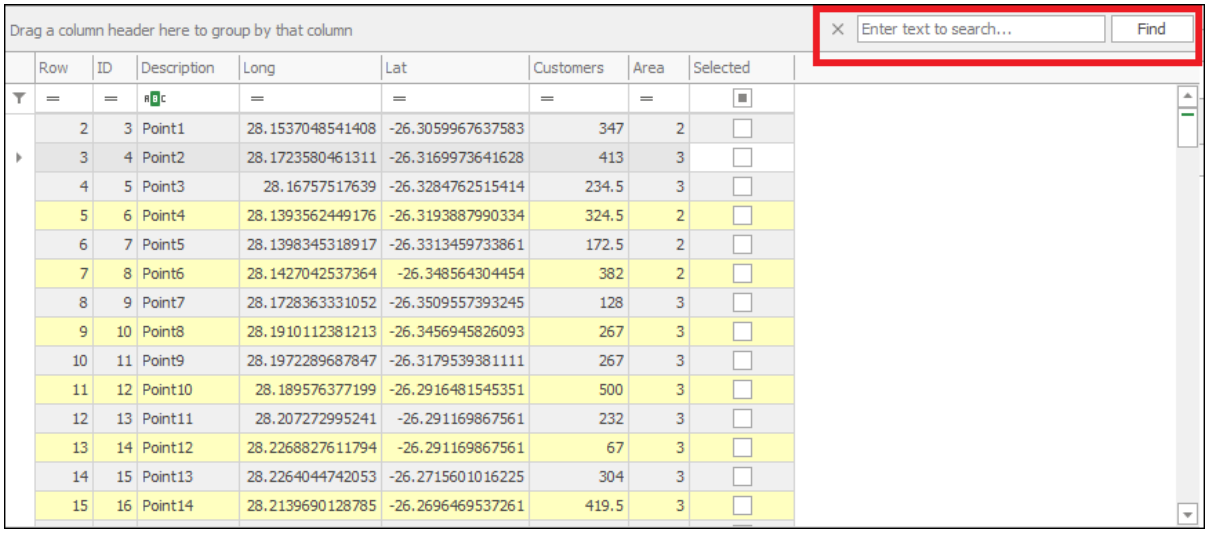
And this is the result of my customized filter:



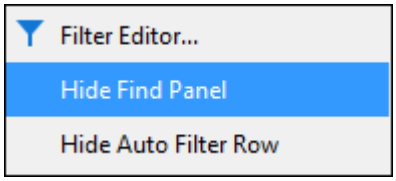
Show/Hide Find Panel

To show the Find Panel, which is where you can search the whole grid, select **Show Find Panel**:



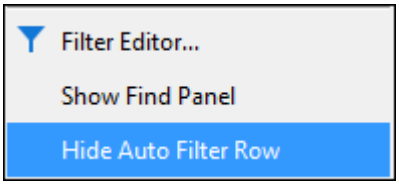


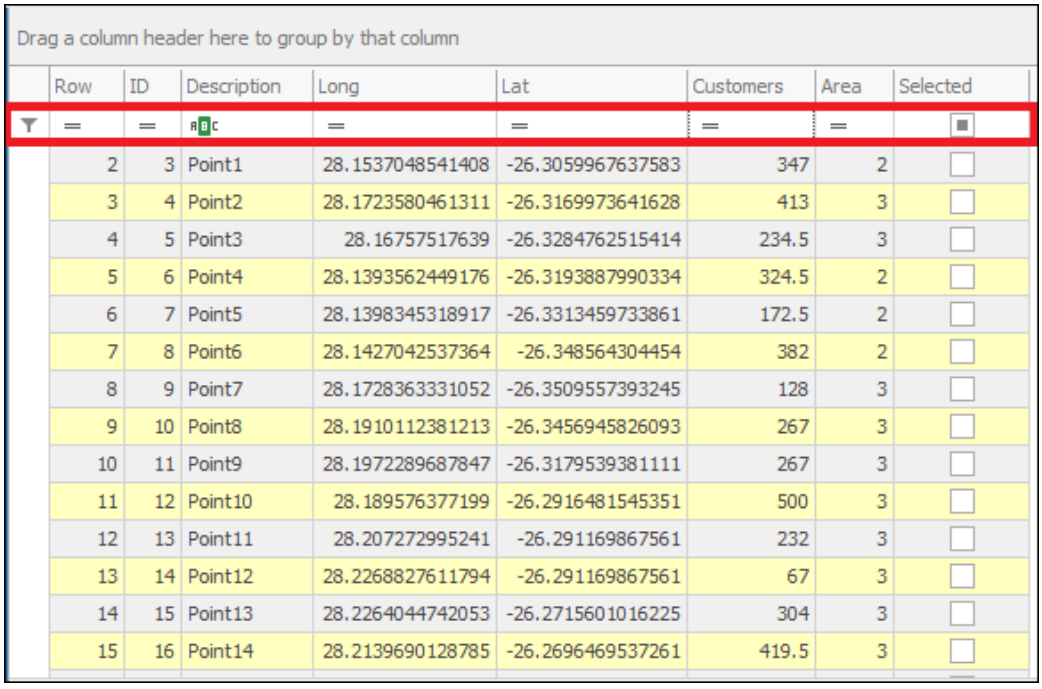
You can then right click again and select **Hide Find Panel** or simply click the **X** to hide it again:



Show/Hide Auto Filter Row

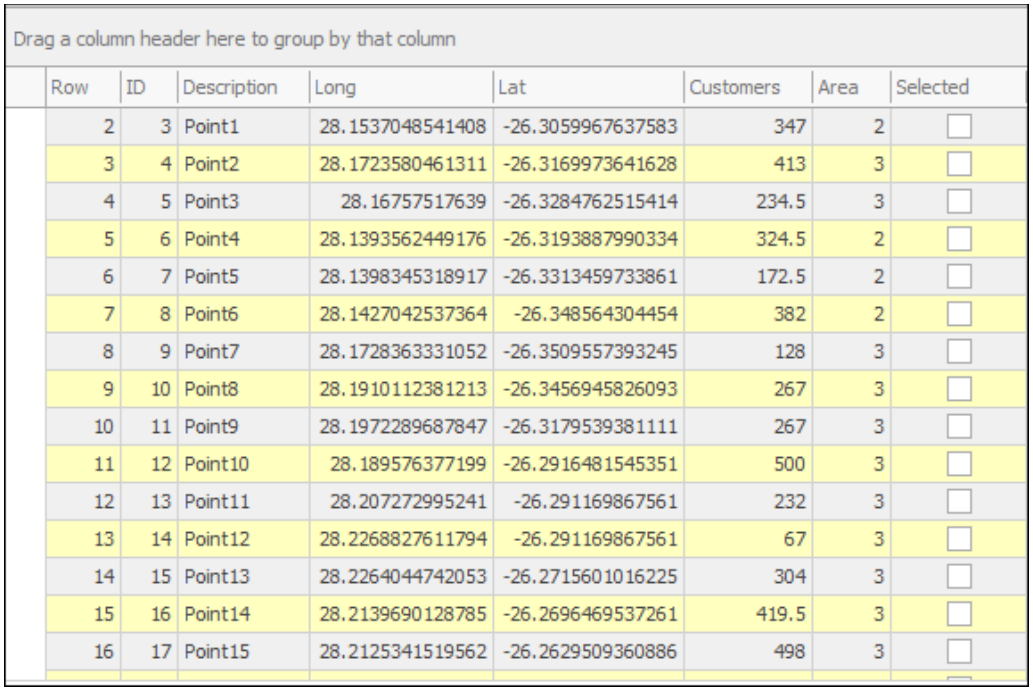
You can hide the auto filter row by selecting Hide **Auto Filter Row**:





Drag a column header here to group by that column

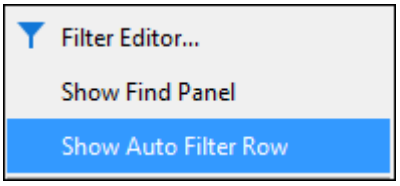
Row	ID	Description	Long	Lat	Customers	Area	Selected
2	3	Point1	28.1537048541408	-26.3059967637583	347	2	
3	4	Point2	28.1723580461311	-26.3169973641628	413	3	
4	5	Point3	28.16757517639	-26.3284762515414	234.5	3	
5	6	Point4	28.1393562449176	-26.3193887990334	324.5	2	
6	7	Point5	28.1398345318917	-26.3313459733861	172.5	2	
7	8	Point6	28.1427042537364	-26.348564304454	382	2	
8	9	Point7	28.1728363331052	-26.3509557393245	128	3	
9	10	Point8	28.1910112381213	-26.3456945826093	267	3	
10	11	Point9	28.1972289687847	-26.3179539381111	267	3	
11	12	Point10	28.189576377199	-26.2916481545351	500	3	
12	13	Point11	28.207272995241	-26.291169867561	232	3	
13	14	Point12	28.2268827611794	-26.291169867561	67	3	
14	15	Point13	28.2264044742053	-26.2715601016225	304	3	
15	16	Point14	28.2139690128785	-26.2696469537261	419.5	3	



Drag a column header here to group by that column

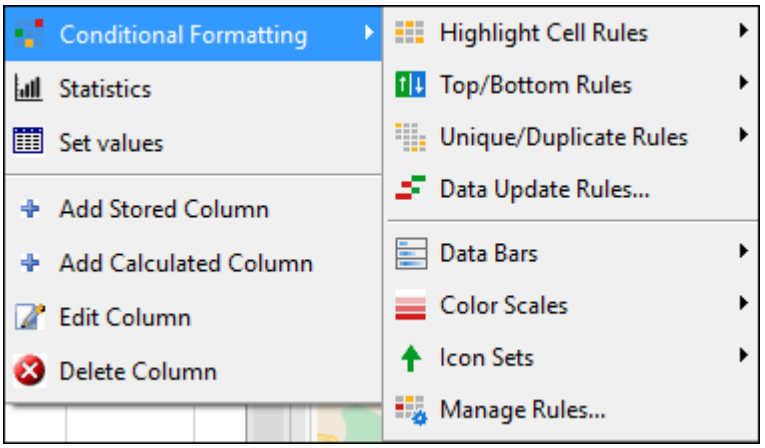
Row	ID	Description	Long	Lat	Customers	Area	Selected
2	3	Point1	28.1537048541408	-26.3059967637583	347	2	
3	4	Point2	28.1723580461311	-26.3169973641628	413	3	
4	5	Point3	28.16757517639	-26.3284762515414	234.5	3	
5	6	Point4	28.1393562449176	-26.3193887990334	324.5	2	
6	7	Point5	28.1398345318917	-26.3313459733861	172.5	2	
7	8	Point6	28.1427042537364	-26.348564304454	382	2	
8	9	Point7	28.1728363331052	-26.3509557393245	128	3	
9	10	Point8	28.1910112381213	-26.3456945826093	267	3	
10	11	Point9	28.1972289687847	-26.3179539381111	267	3	
11	12	Point10	28.189576377199	-26.2916481545351	500	3	
12	13	Point11	28.207272995241	-26.291169867561	232	3	
13	14	Point12	28.2268827611794	-26.291169867561	67	3	
14	15	Point13	28.2264044742053	-26.2715601016225	304	3	
15	16	Point14	28.2139690128785	-26.2696469537261	419.5	3	
16	17	Point15	28.2125341519562	-26.2629509360886	498	3	

To unhide, right click again and select **Show Auto Filter Row**:

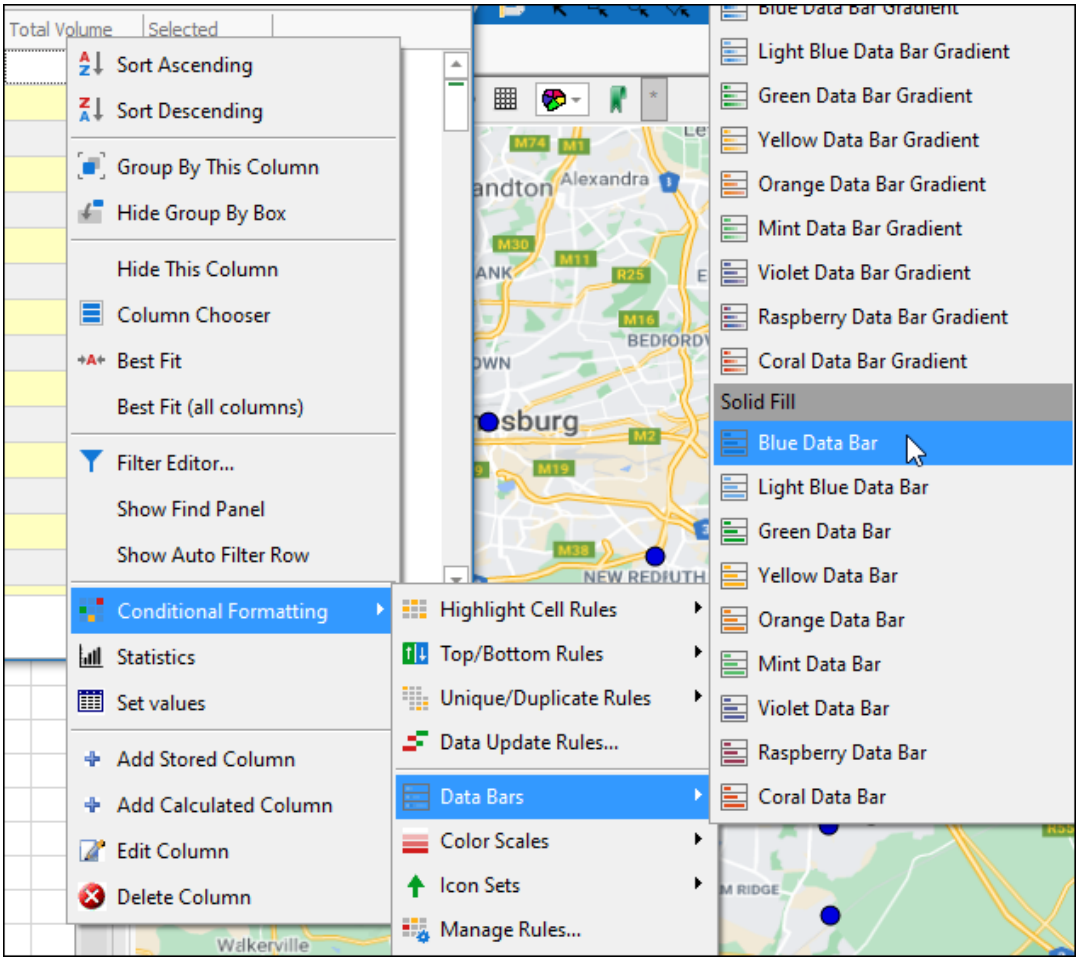


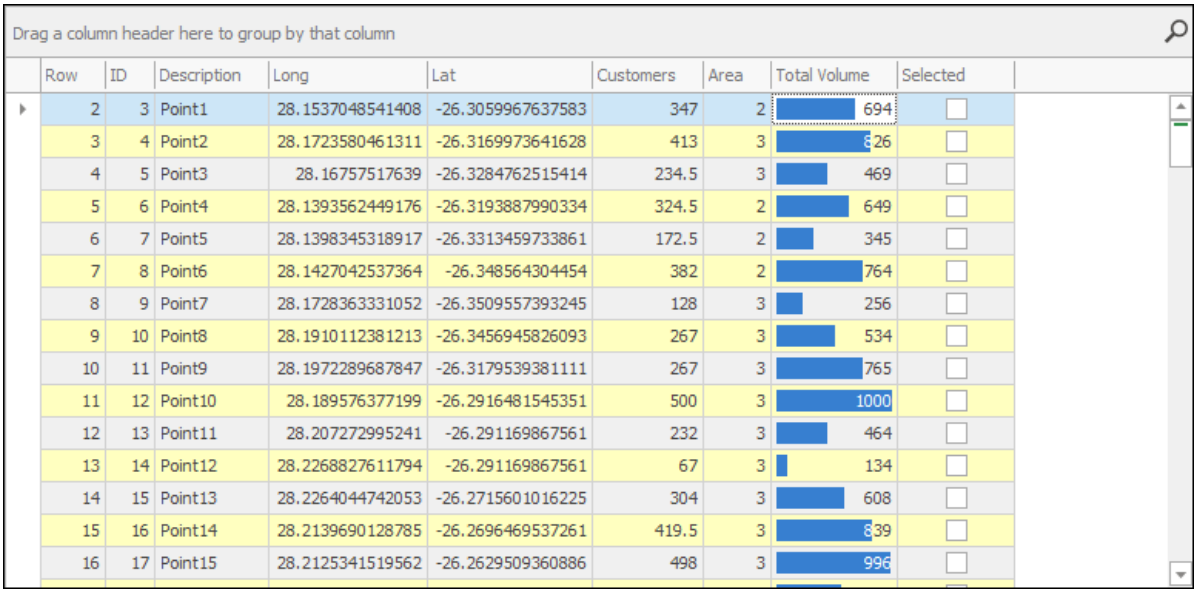
Conditional Formatting

With **Conditional Formatting** you can apply various formatting to your grid just like in Excel:

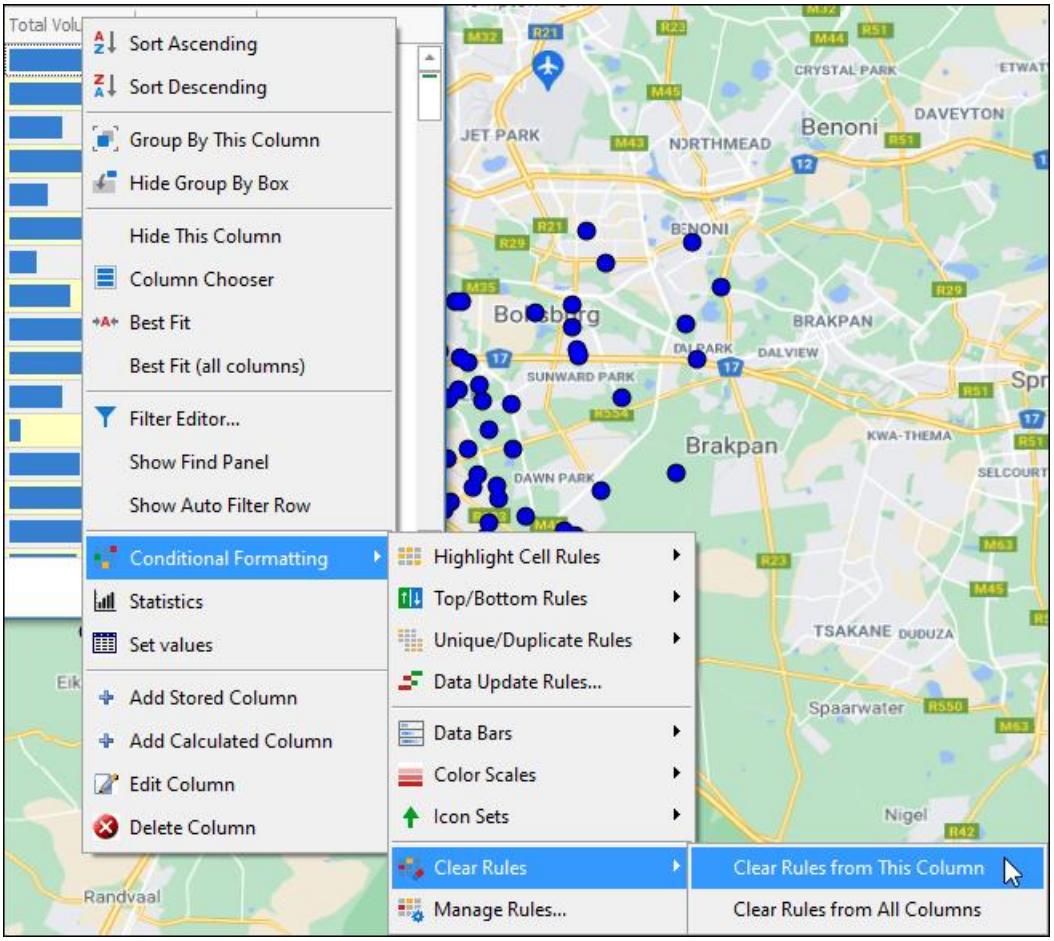


First right click in the column header of the column you would like to apply formatting to and then choose your desired formatting. As an example, here I will apply some **Data Bars** to my **Total Volume** column:


Total Volume
Selected
Sort Ascending
Sort Descending
Group By This Column
Hide Group By Box
Hide This Column
Column Chooser
Best Fit
Best Fit (all columns)
Filter Editor...
Show Find Panel
Show Auto Filter Row
Conditional Formatting
Statistics
Set values
Add Stored Column
Add Calculated Column
Edit Column
Delete Column
Highlight Cell Rules
Top/Bottom Rules
Unique/Duplicate Rules
Data Update Rules...
Data Bars
Color Scales
Icon Sets
Manage Rules...
Light Blue Data Bar Gradient
Green Data Bar Gradient
Yellow Data Bar Gradient
Orange Data Bar Gradient
Mint Data Bar Gradient
Violet Data Bar Gradient
Raspberry Data Bar Gradient
Coral Data Bar Gradient
Solid Fill
Blue Data Bar
Light Blue Data Bar
Green Data Bar
Yellow Data Bar
Orange Data Bar
Mint Data Bar
Violet Data Bar
Raspberry Data Bar
Coral Data Bar

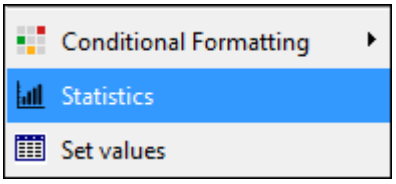

Drag a column header here to group by that column
Row
ID
Description
Long
Lat
Customers
Area
Total Volume
Selected
2 3 Point1 28.1537048541408 -26.3059967637583 347 2 694
3 4 Point2 28.1723580461311 -26.3169973641628 413 3 826
4 5 Point3 28.16757517639 -26.3284762515414 234.5 3 469
5 6 Point4 28.1393562449176 -26.3193887990334 324.5 2 649
6 7 Point5 28.1398345318917 -26.3313459733861 172.5 2 345
7 8 Point6 28.1427042537364 -26.348564304454 382 2 764
8 9 Point7 28.1728363331052 -26.3509557393245 128 3 256
9 10 Point8 28.1910112381213 -26.3456945826093 267 3 534
10 11 Point9 28.1972289687847 -26.3179539381111 267 3 765
11 12 Point10 28.189576377199 -26.2916481545351 500 3 1000
12 13 Point11 28.207272995241 -26.291169867561 232 3 464
13 14 Point12 28.2268827611794 -26.291169867561 67 3 134
14 15 Point13 28.2264044742053 -26.2715601016225 304 3 608
15 16 Point14 28.2139690128785 -26.2696469537261 419.5 3 839
16 17 Point15 28.2125341519562 -26.2629509360886 498 3 996

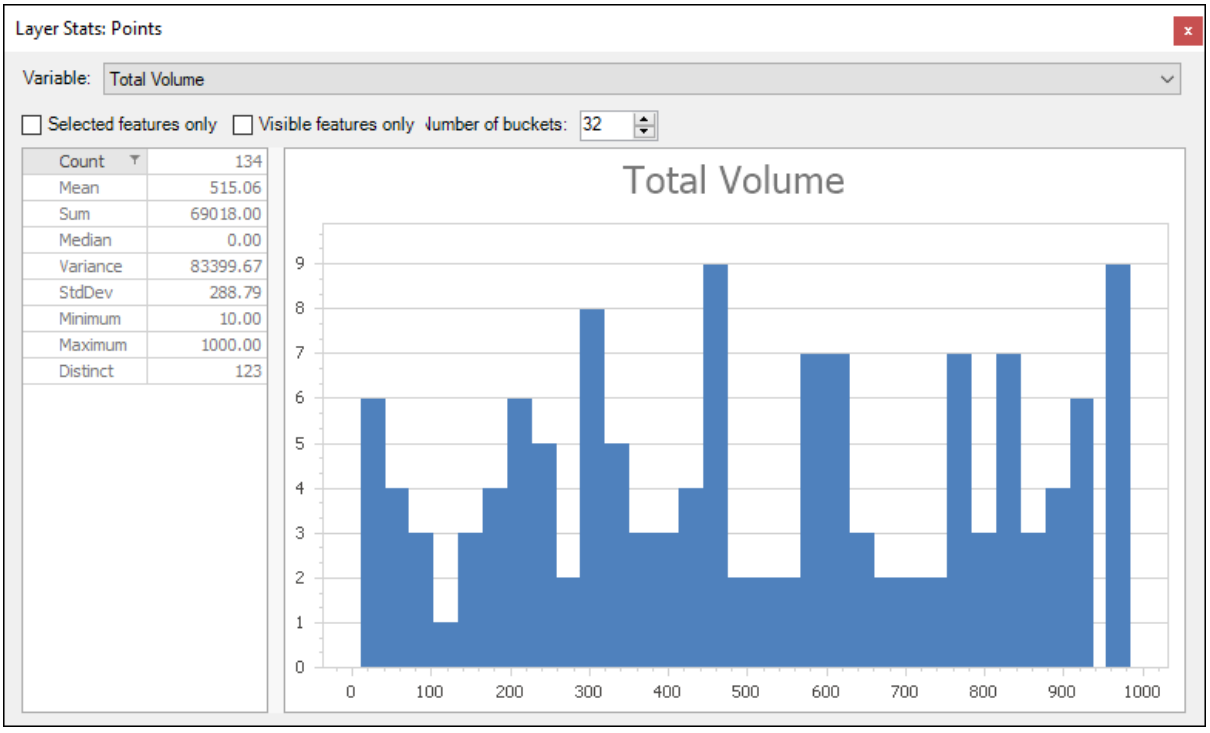
To clear any formatting once put, click **Clear Rules** and choose to clear formatting for just the column all for all columns:



Statistics

Statistics will take you to a dialogue with statistical data for that column. This tool is described fully in the *Compute Statistics for Layer* manual:





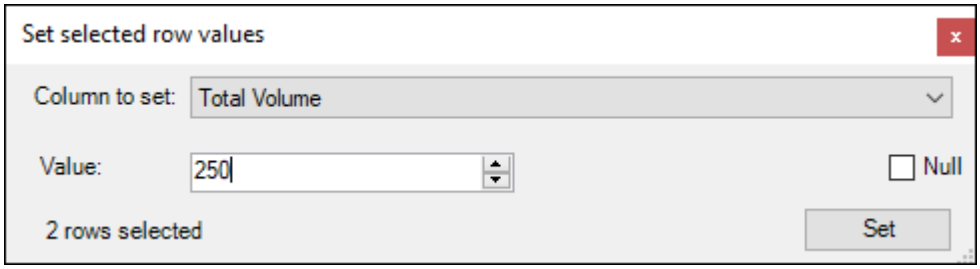
Set Values

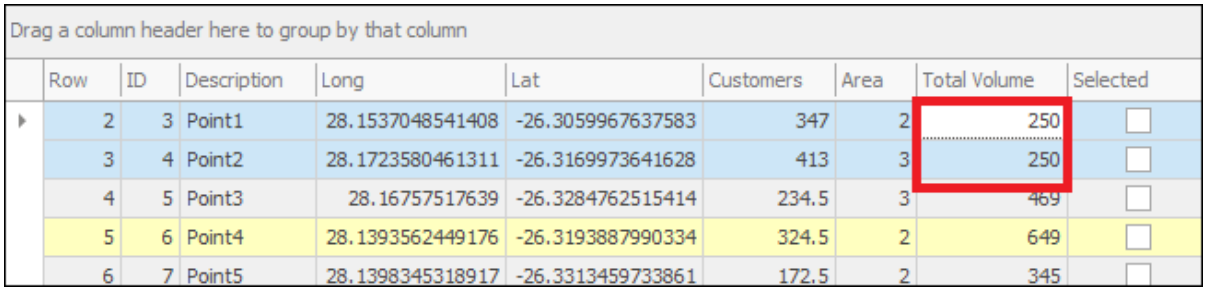
Set Values will bring up a dialogue where you can set values for a number of rows. First select the rows and then select **Set Values**. Choose the column you will be setting values for and then enter in the value you would like to set it to (the amount of rows you selected is shown in the bottom left of the dialogue as well).

If you would like to set the values to null have **Null** ticked on. Then click **OK** and your values will be set:

Drag a column header here to group by that column

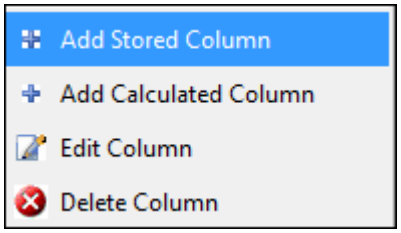
Row	ID	Description	Long	Lat	Customers	Area	Total Volume	Selected
2	3	Point1	28.1537048541408	-26.3059967637583	347	2	694	☐
3	4	Point2	28.1723580461311	-26.3169973641628	413	3	826	☐
4	5	Point3	28.16757517639	-26.3284762515414	234.5	3	469	☐
5	6	Point4	28.1393562449176	-26.3193887990334	324.5	2	649	☐
6	7	Point5	28.1398345318917	-26.3313459733861	172.5	2	345	☐



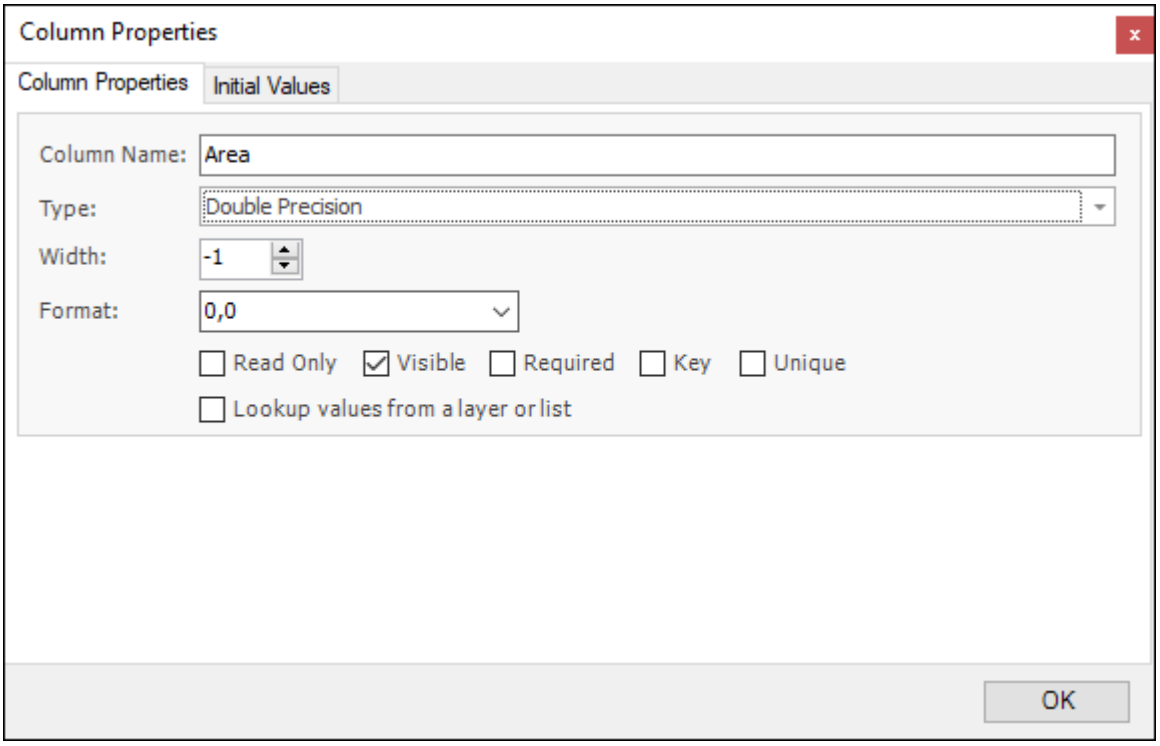


Add Stored Column

With **Add Stored Column** you are able to add a new column to your layer data grid. This will be a column that just holds values and doesn't change based on some calculation. Click on it and it will bring up the following dialogue:



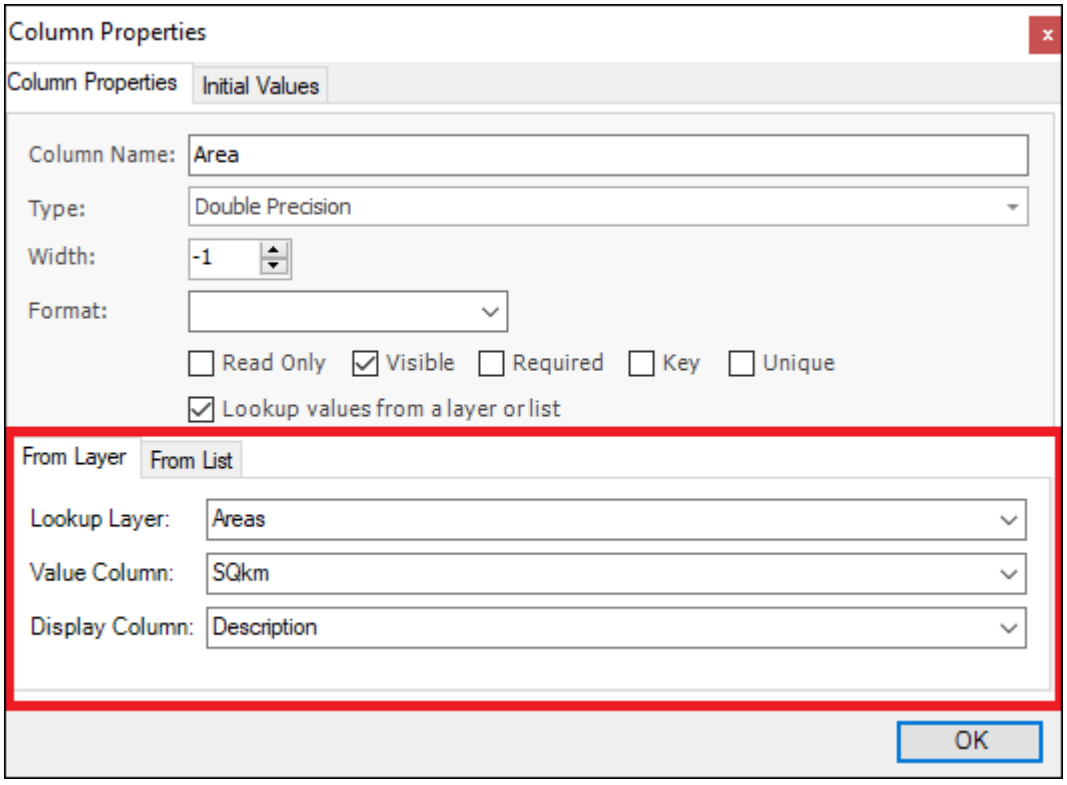
By **Column Name** enter in the name for the new column. Then enter in the **Type** of the column whether String, Integer etc. You can then specify its **Width** if you wish. You can then choose the **Format** of the values:



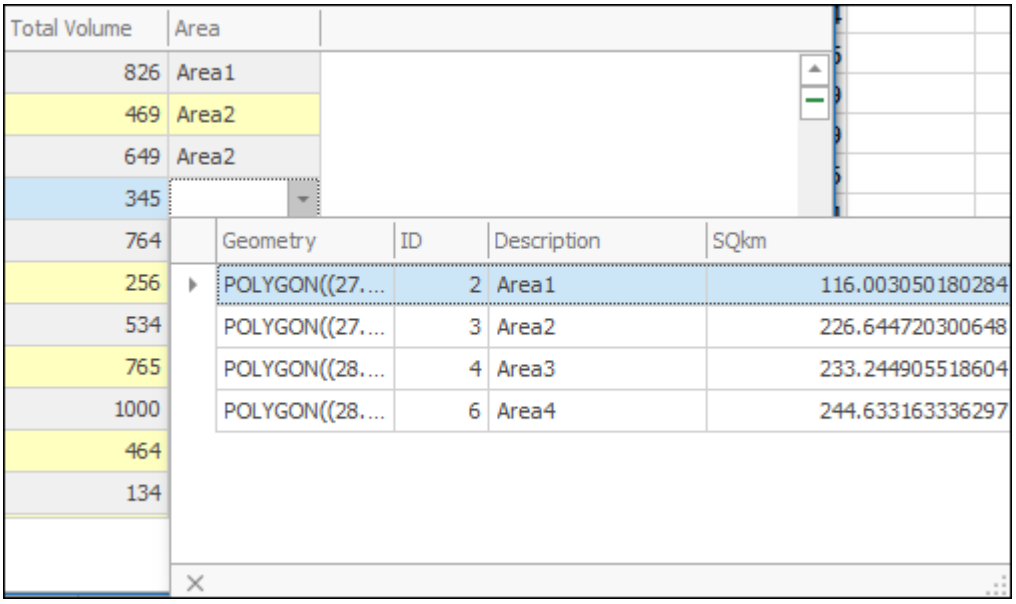
Now, you also have various options you can tick on or off regarding this new column. Tick on **Read Only** to make column read only; When **Visible** is ticked on it means the column will show, if it is off the column will be hidden; **Required** will require that a value be in this column for each record and will not allow nulls. **Key** will make the column a unique key column and **Unique** will make it so that no duplicate values will be allowed in the column:

Ticking on **Lookup values from a layer or list** will bring up a dialogue where you can specify a layer or list from which you can lookup values and which will appear as a lookup table in the Layer Data Grid. To lookup values from a layer first choose the layer, then choose the value to be looked up and then choose the value to display. In this example I am adding a stored column called **Area** and I'm choosing to lookup values from my **Areas** layer and the value I am choosing to

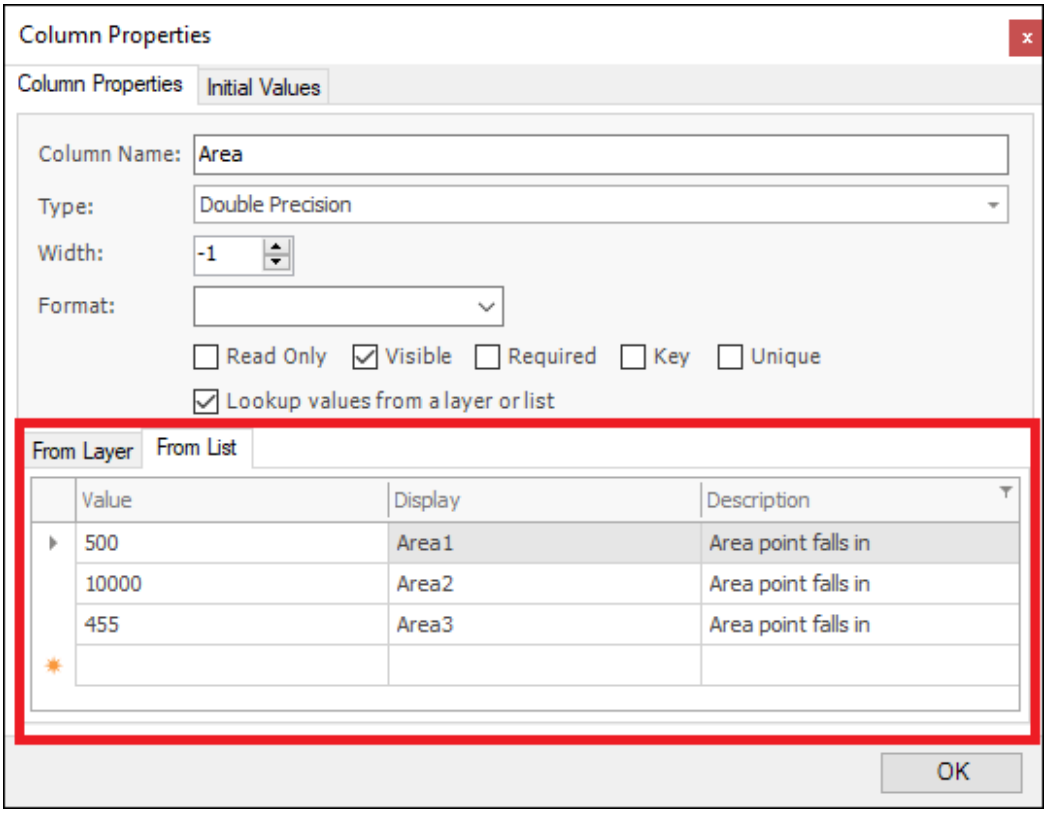
lookup is the **SQkm** of the area and the value that will display is the **Description** of the area:

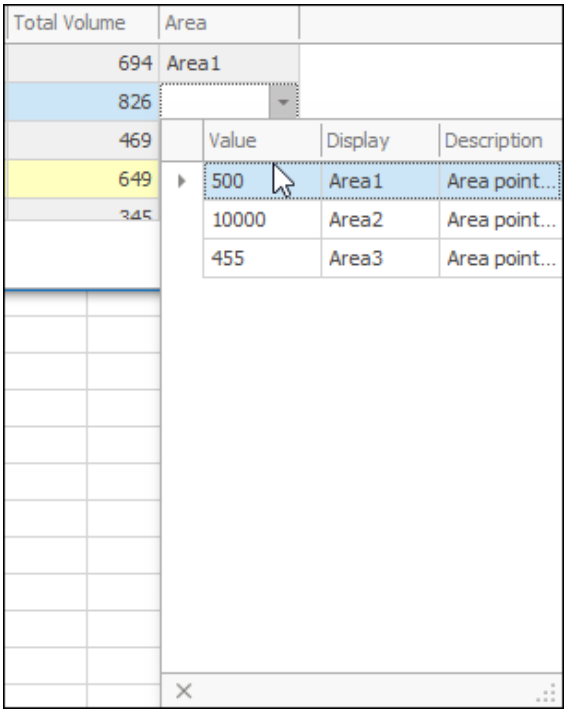


When I now want to enter in data in this column there is a lookup table for me to choose from:

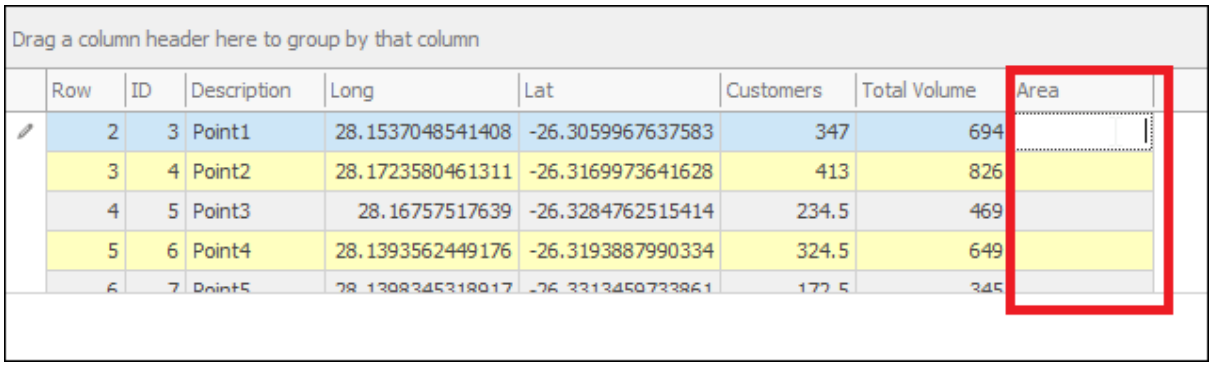


To lookup values from a list go to the **From List** tab and enter in the items in the list that will form a lookup table for you; the **Value** is the value the record will hold, the **Display** is what value will be displayed in the record and **Description** will just be in the lookup table as a description of the item:

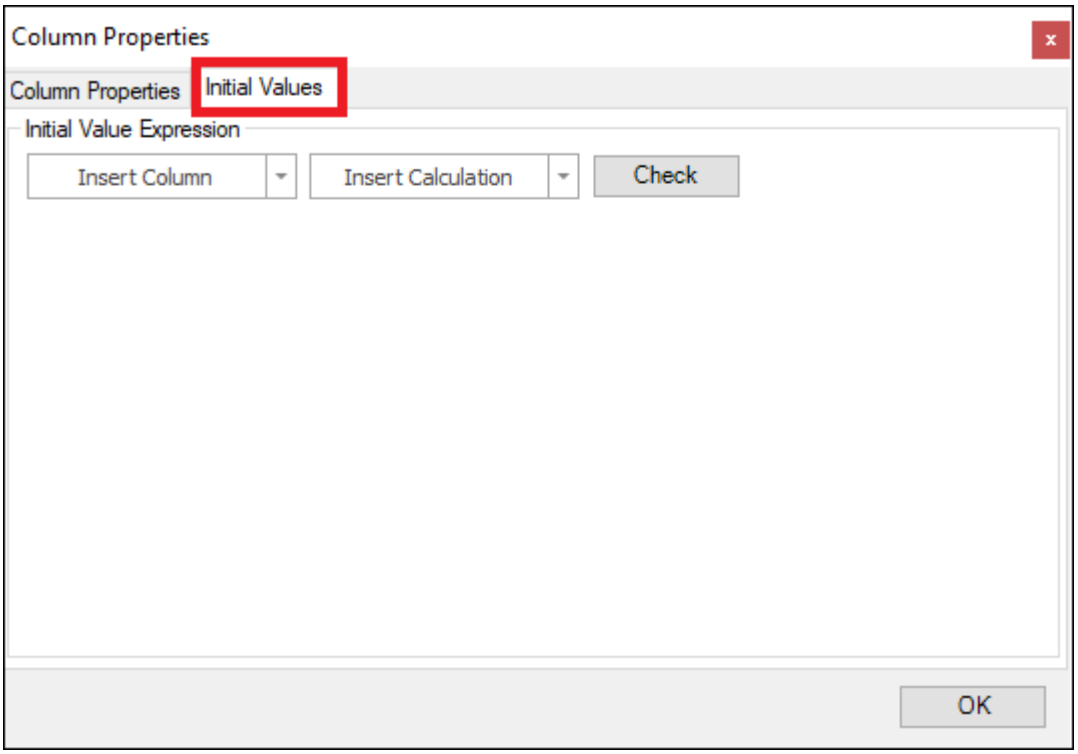

Column Properties
Column Properties
Initial Values
Column Name:
Area
Type:
Double Precision
Width:
-1
Format:
Read Only
Visible
Required
Key
Unique
Lookup values from a layer or list
From Layer
From List
Value
Display
Description
500
Area1
Area point falls in
10000
Area2
Area point falls in
455
Area3
Area point falls in
OK


Total Volume
Area
694
Area1
826
469
649
Value
Display
Description
500
Area1
Area point...
10000
Area2
Area point...
455
Area3
Area point...

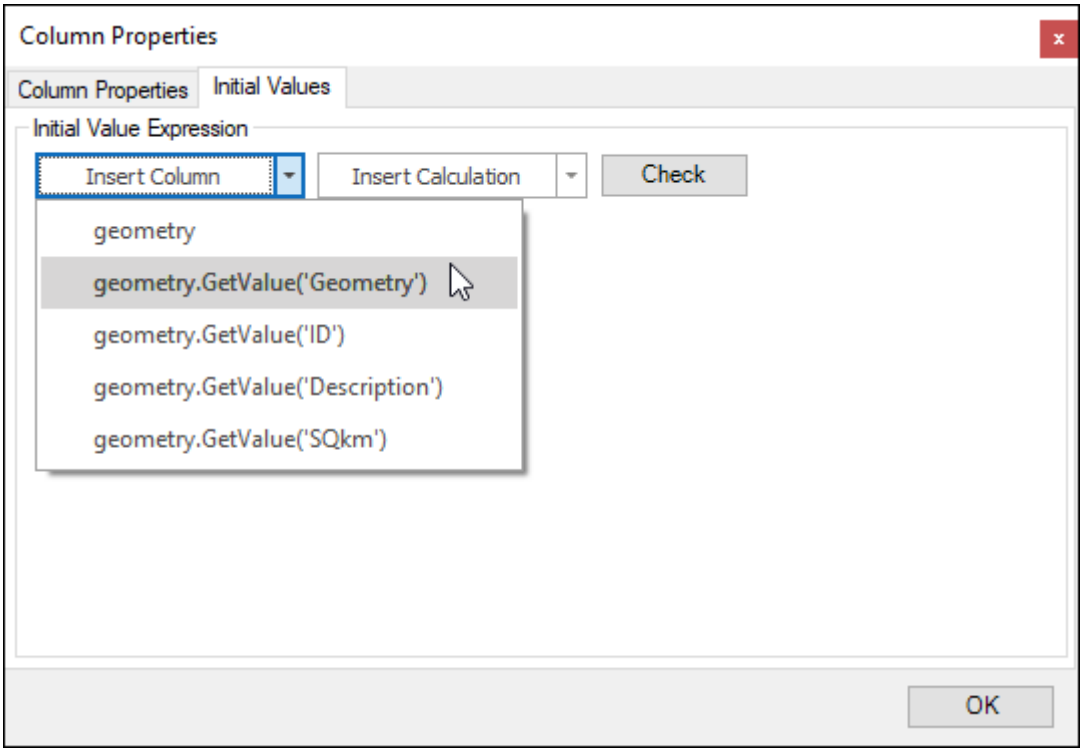
Once you have finished setting the new column's properties you can click **OK** and the column is added; you can then enter in values in this column by typing or inserting from a lookup table you have specified:

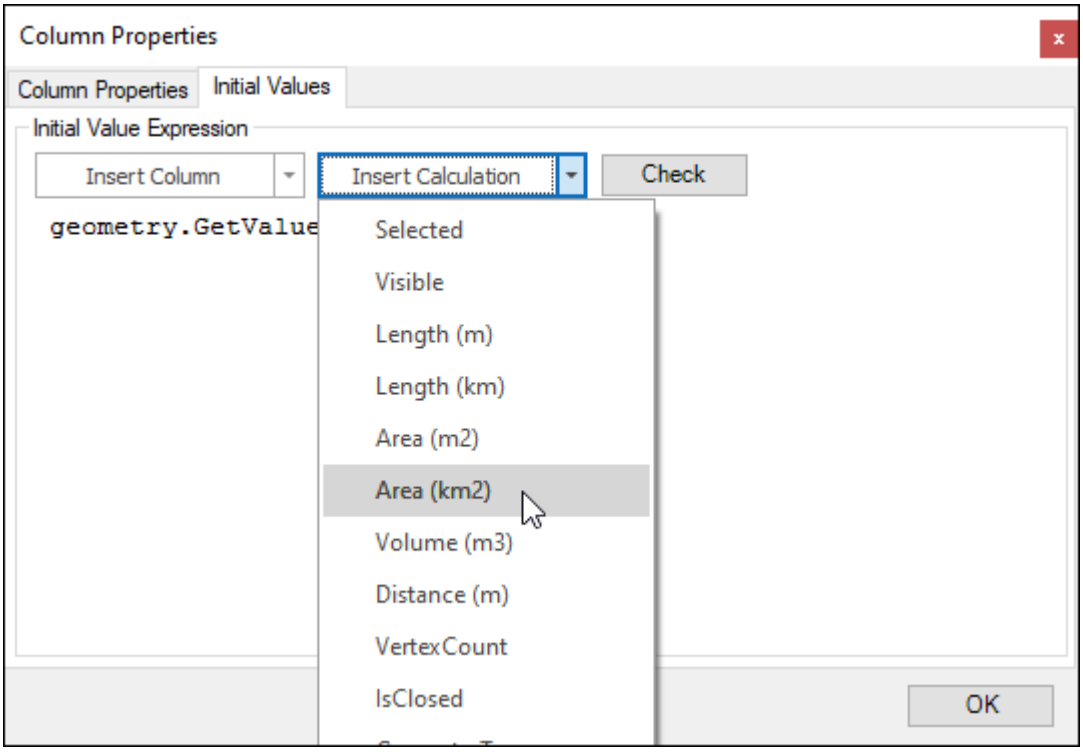


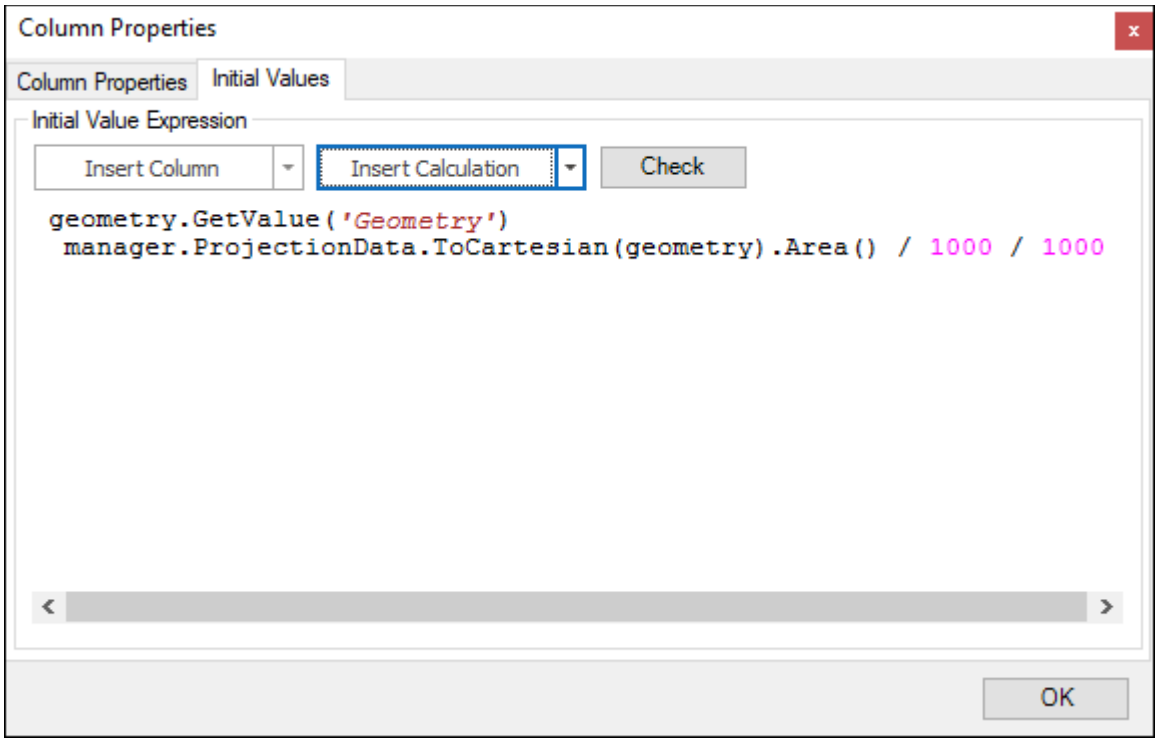
Now, when you are done specifying the properties of the new column and have clicked **OK**, the column will be added in your Layer Data Grid as an empty column that you can enter values into, however you are also able to initialize values for a new column in the **Initial Values** tab:



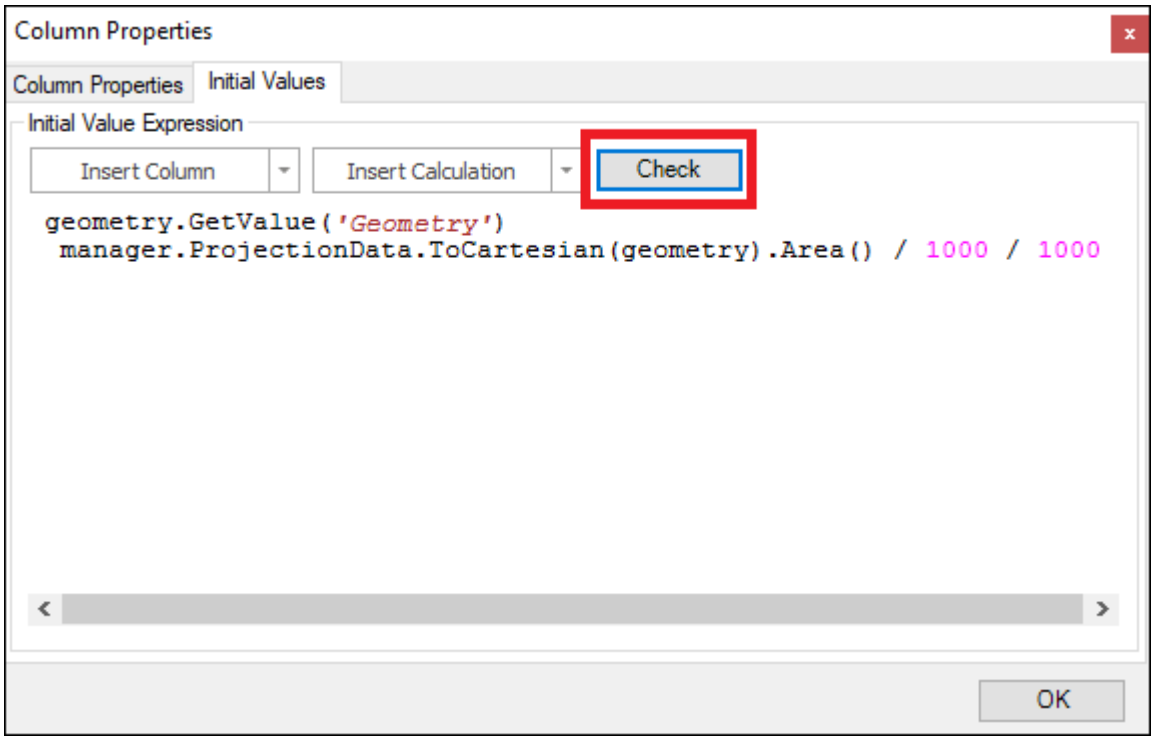
By dropping down on **Insert Column** you can choose a column from the **Layer Data Grid** to insert in the expression to get values from; by dropping down on **Insert Calculation** you can then choose a predefined calculation to insert into the expression:

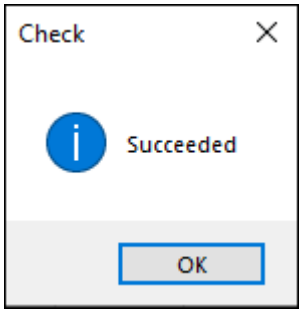



Column Properties
Column Properties
Initial Values
Initial Value Expression
Insert Column
Insert Calculation
Check
geometry.GetValue
Selected
Visible
Length (m)
Length (km)
Area (m2)
Area (km2)
Volume (m3)
Distance (m)
VertexCount
IsClosed
OK

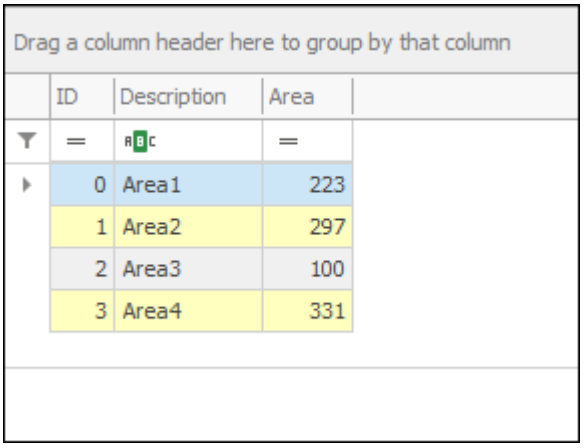

Column Properties
Column Properties
Initial Values
Initial Value Expression
Insert Column
Insert Calculation
Check
geometry.GetValue('Geometry')
manager.ProjectionData.ToCartesian(geometry).Area() / 1000 / 1000
OK

What I have said here is to get the geometries of the elements (which are polygons in this case) in this layer and then calculate the square kilometres of them. I can then click **Check** to see if this expression is correct and if so, it will let me know:

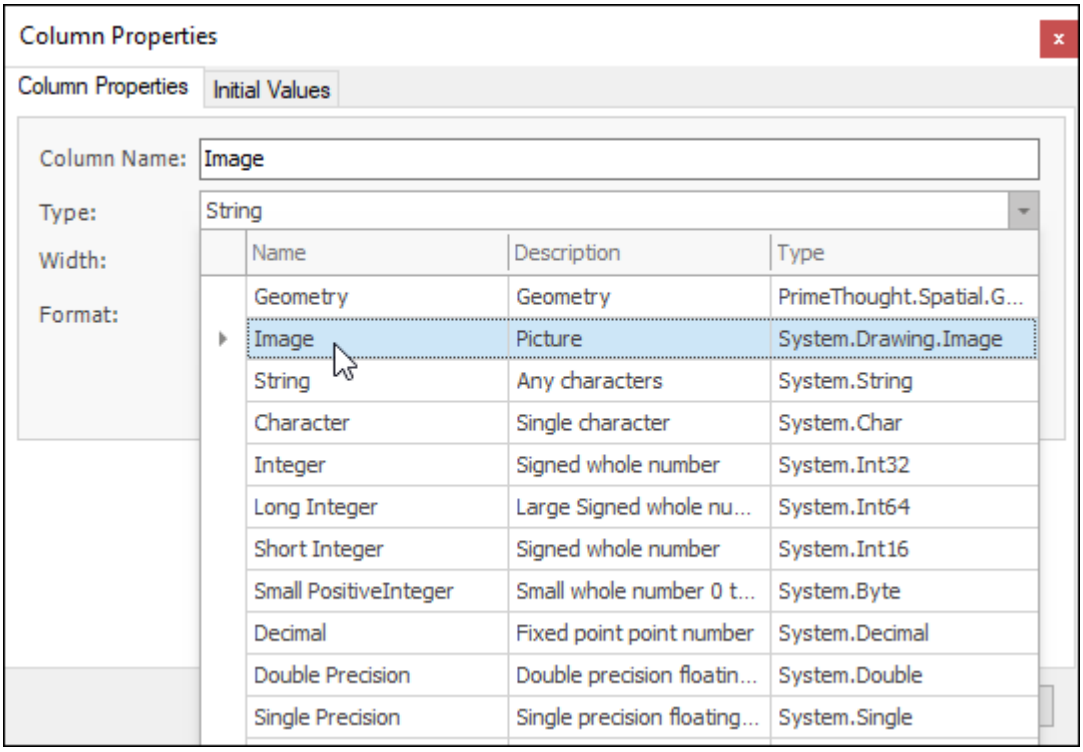


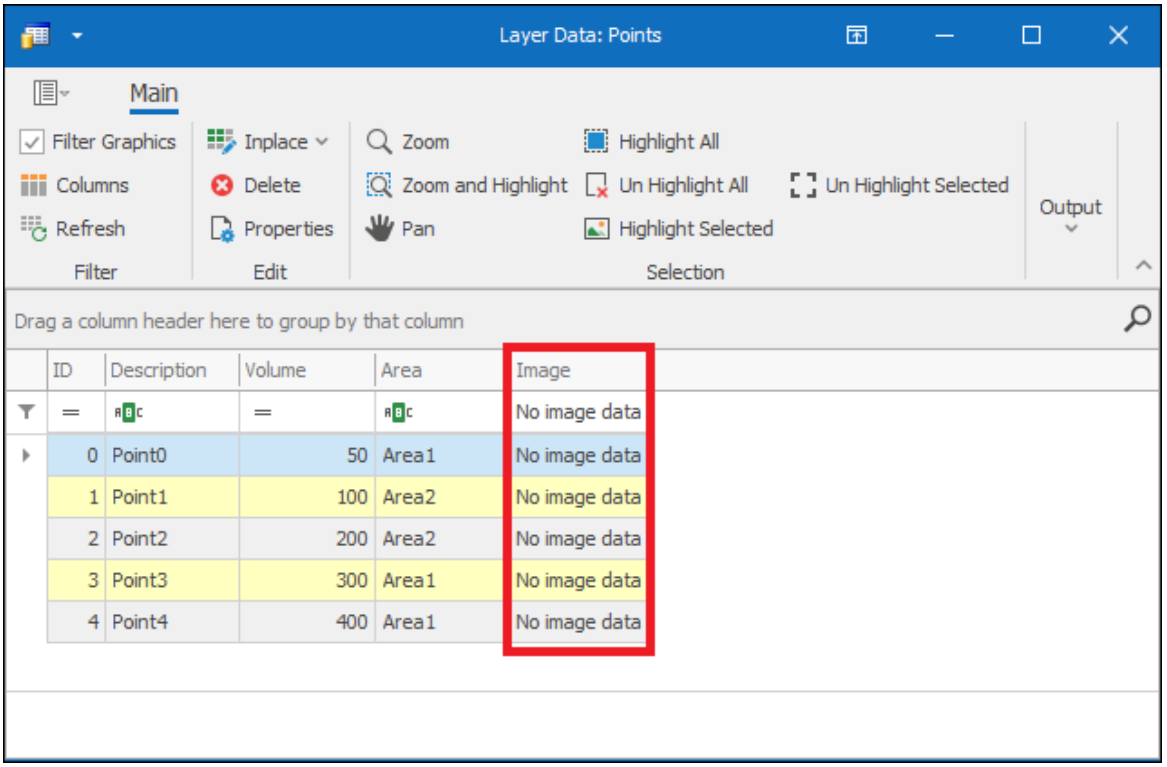


I can then click **OK** on this and the dialogue and you will see a column, which I have called **SQkm**, has been added with the initialized values of the square kilometres of the elements:

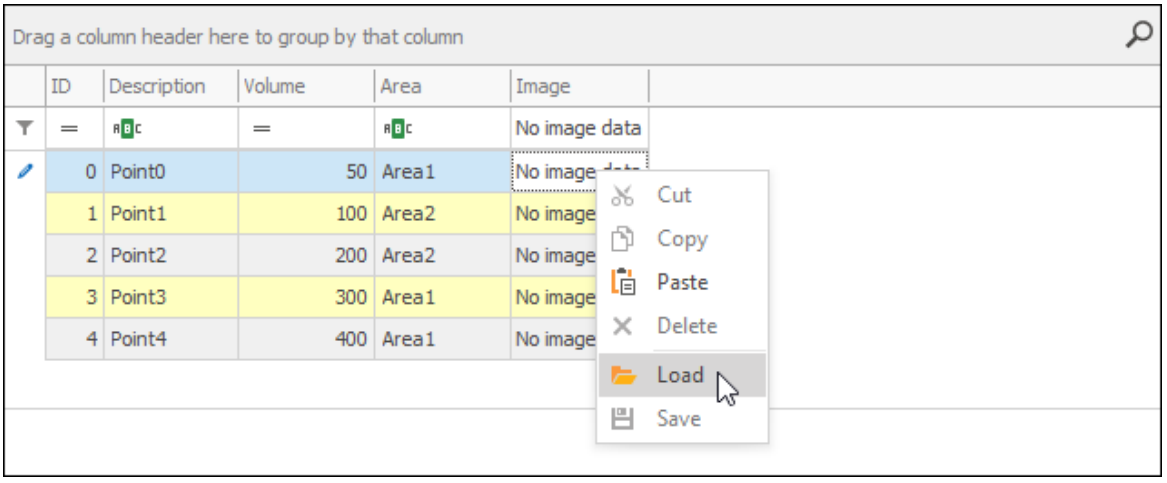


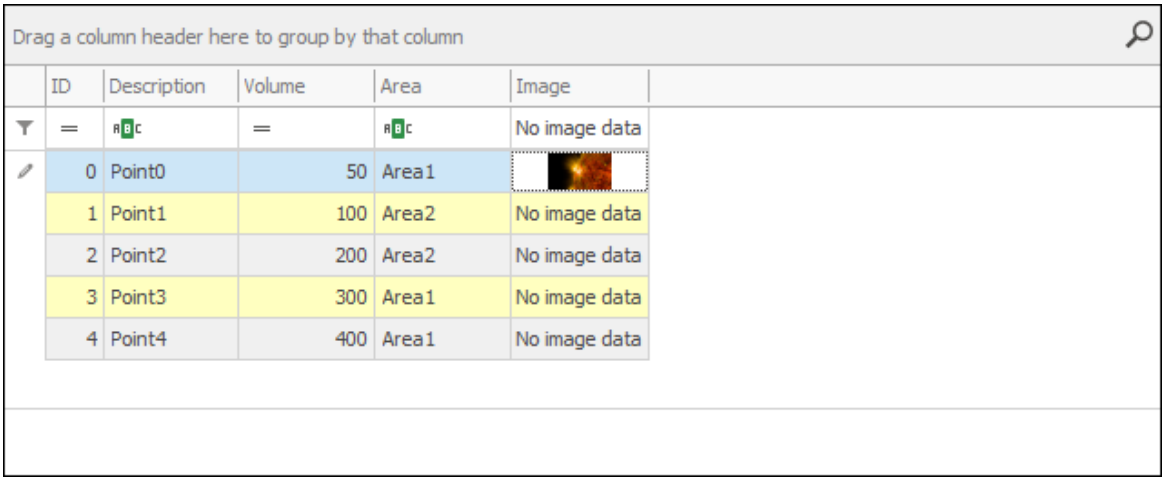
You can also add an **Image** type column when creating a stored column, this will allow you to store images for each record:





Click in one of the image fields and then right click to load an image:



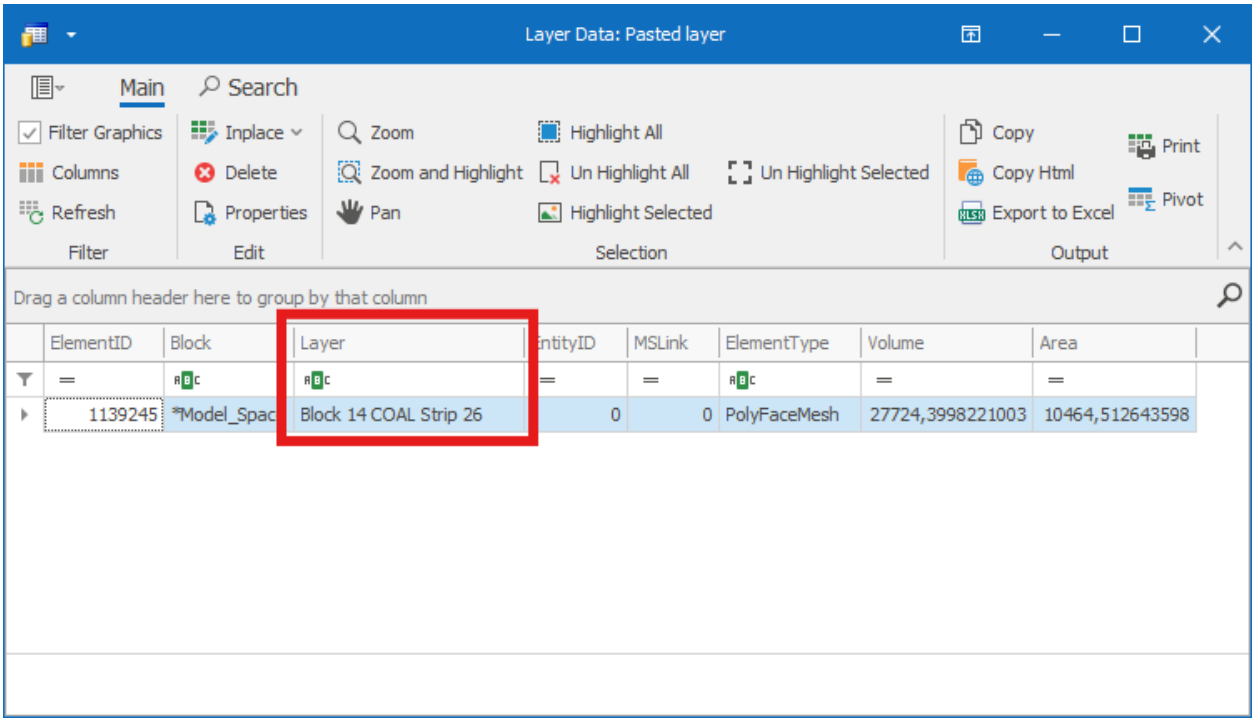


Extracting Data from Columns

As you saw in the Initial Values tab of the Add Stored Column box, we use a script to insert a calculation for a column. This is JavaScript. Full documentation and tutorials on the JavaScript language and how to use it for various calculations and actions can be found on the https://www.w3schools.com/ website.

One of the useful scripts you can use is for extracting out the various parts of a string of data within one column of your data so that they are split into separate columns.

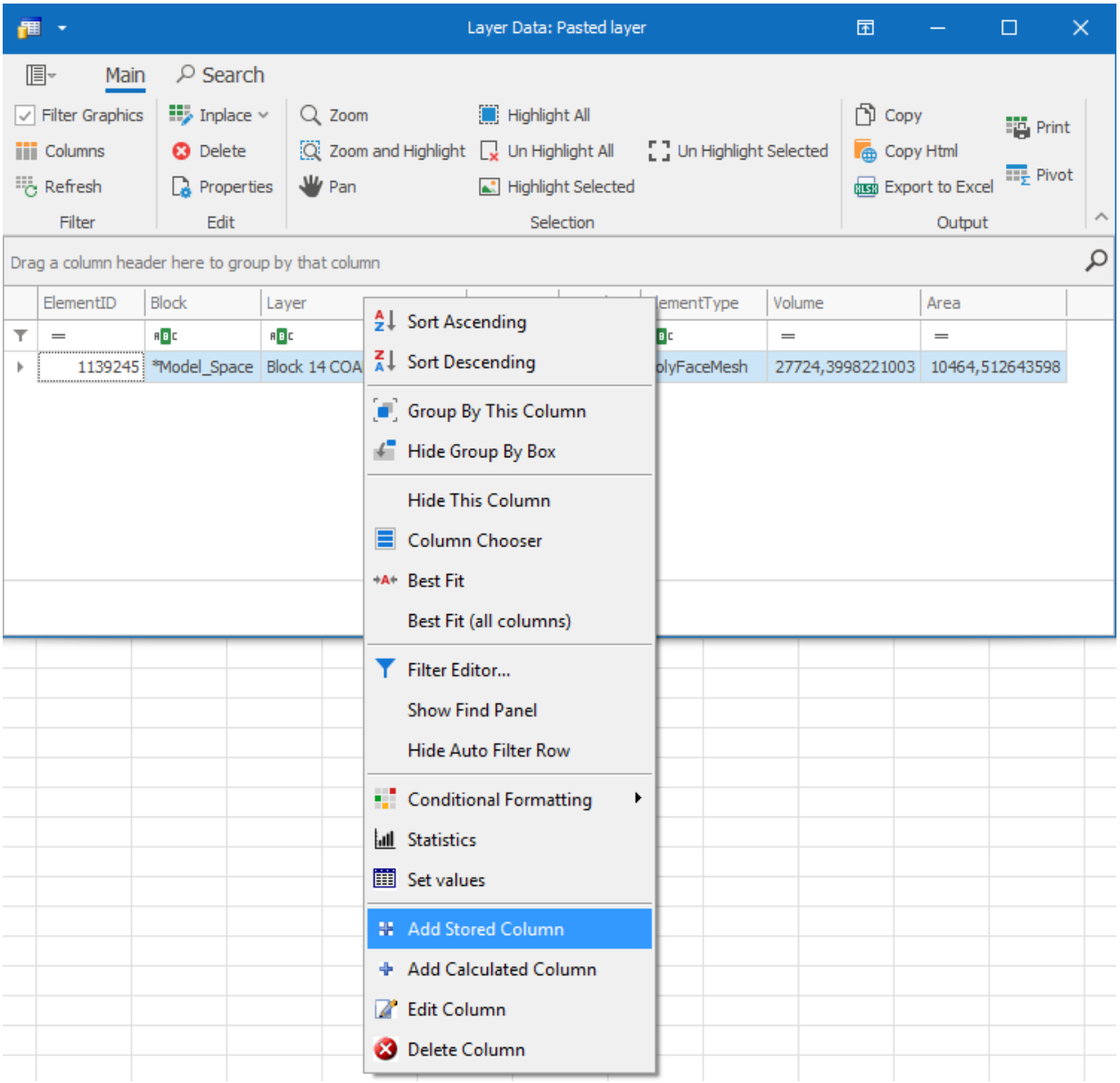
For example, in the field of Mining, a user may have a file with a design of the mining area. There may be a column in the attribute data of that file that specifies the mining block ID, the material type and the strip number all in one string in one column.



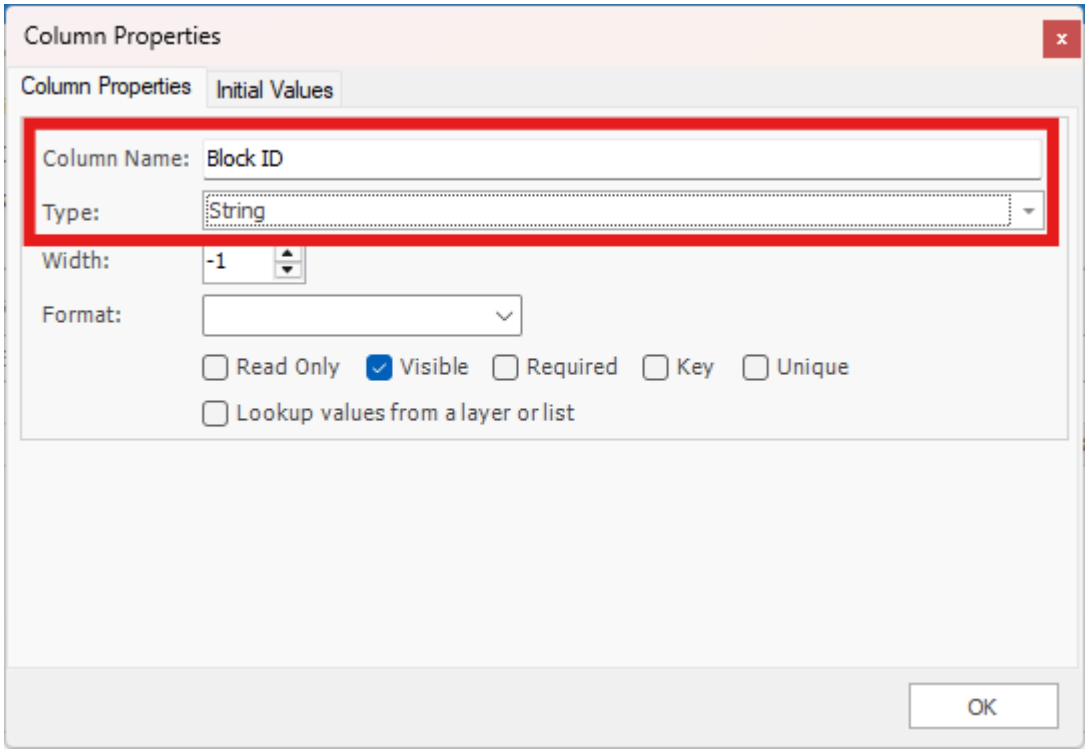
The user may want to split this data out so that they are in separate columns and he can then use these columns to filter his data by.

You can extract this data out in the following way.

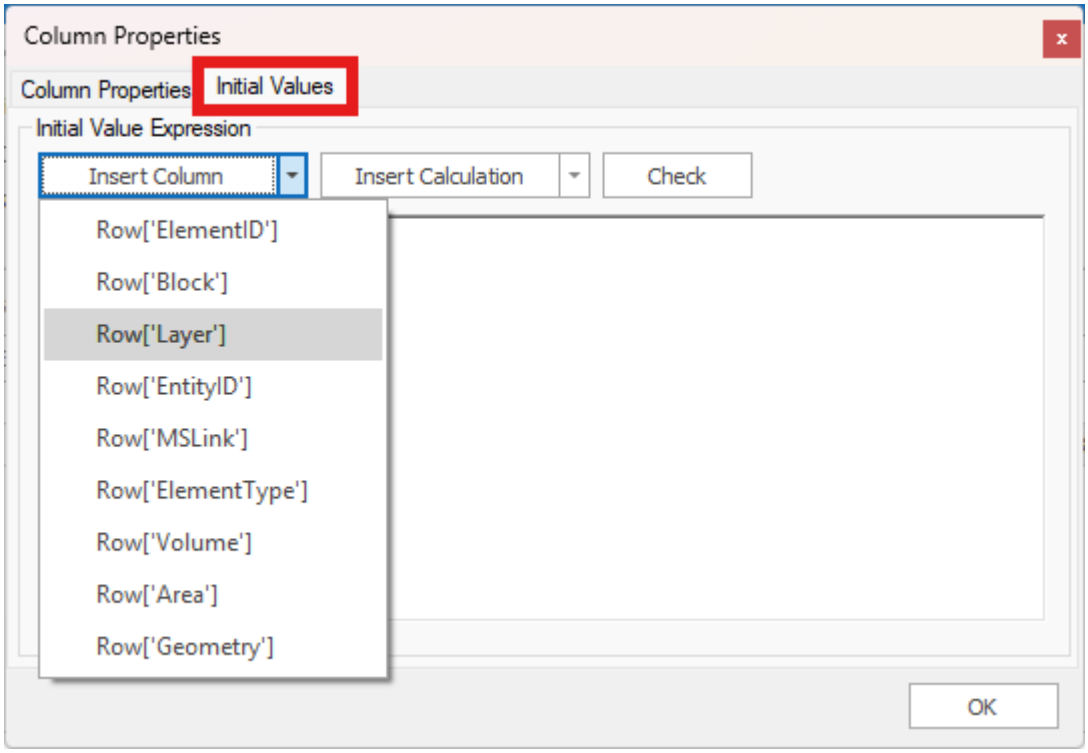
Right click in the column header area and select “Add Stored Column”:

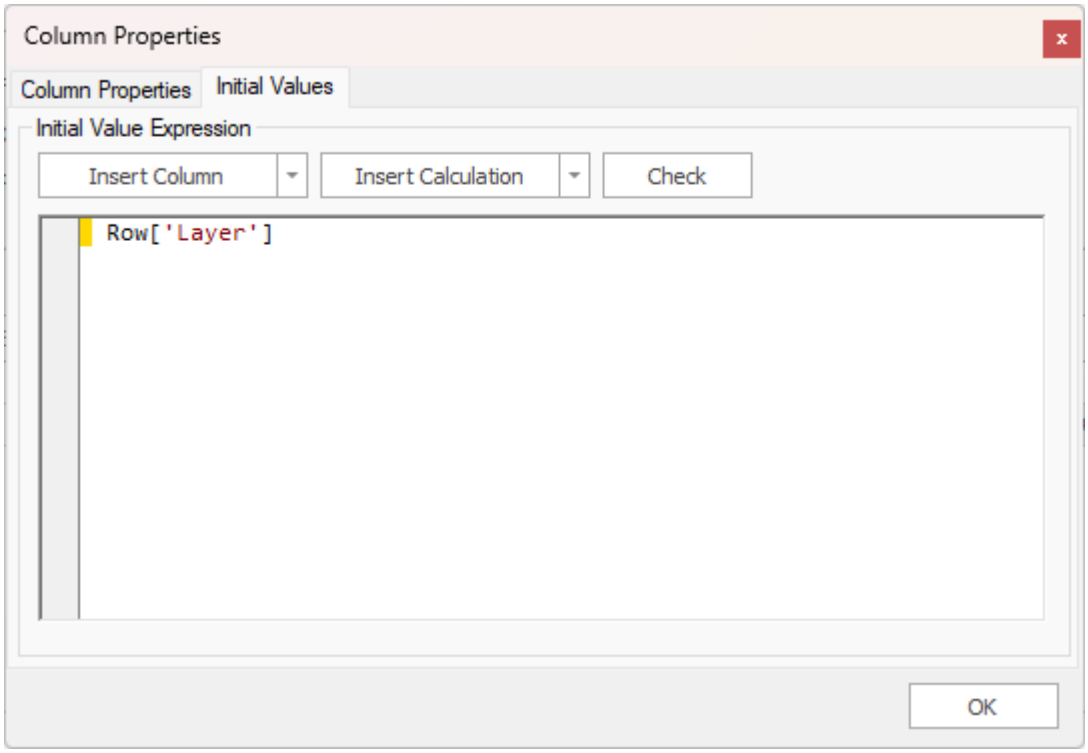


Give the column a name based on what information you will extract out from the existing column into this new column; in this example it is the Block ID.
Make the column of type String:



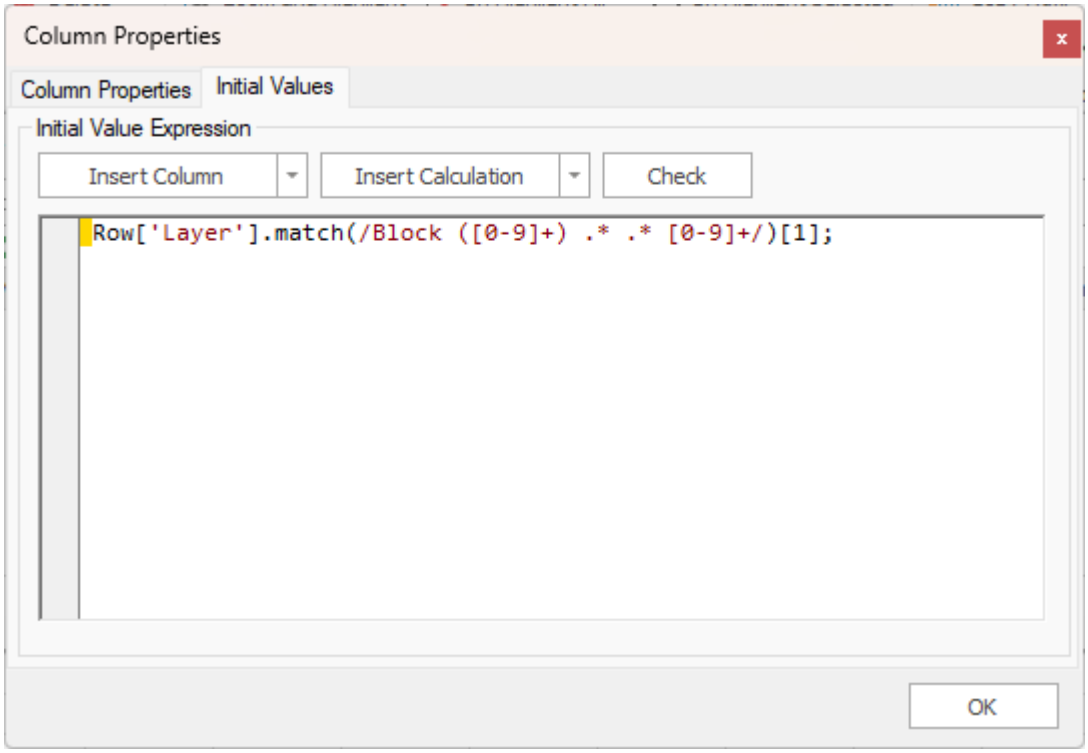
Go to the “Initial Values” tab, drop down on “Insert Column” and choose the column in your data that has the data you want to extract:





Then type in the following script after the layer name:

*Row['Layer'].match(/Block **([0-9]+)** .* .* [0-9]+/)[1];*

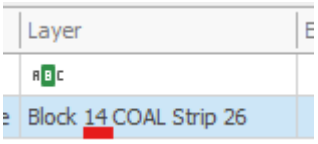


What this script uses is regular expression language which helps you match strings so that you can then capture or extract parts of it.

A simple explanation of this particular script follows:

- ***.match***: JavaScript function to do matching.
- ***(/Block ([0-9]+) .* .* [0-9]+/)[1]***: Everything between the **(**/ and /**)** is the total thing to look for and match. Everything between the nested **( )** is the part of the string to actually capture and extract.

  So in this example it is going to look for the word "***Block***" and then a space and then a number between ***[0-9]*** repeated however many times (indicated by the +). It is also going to capture and extract this part as indicated by the nested brackets here: ***([0-9]+)***. So this part is my block ID number that I will be extracting into my new column.

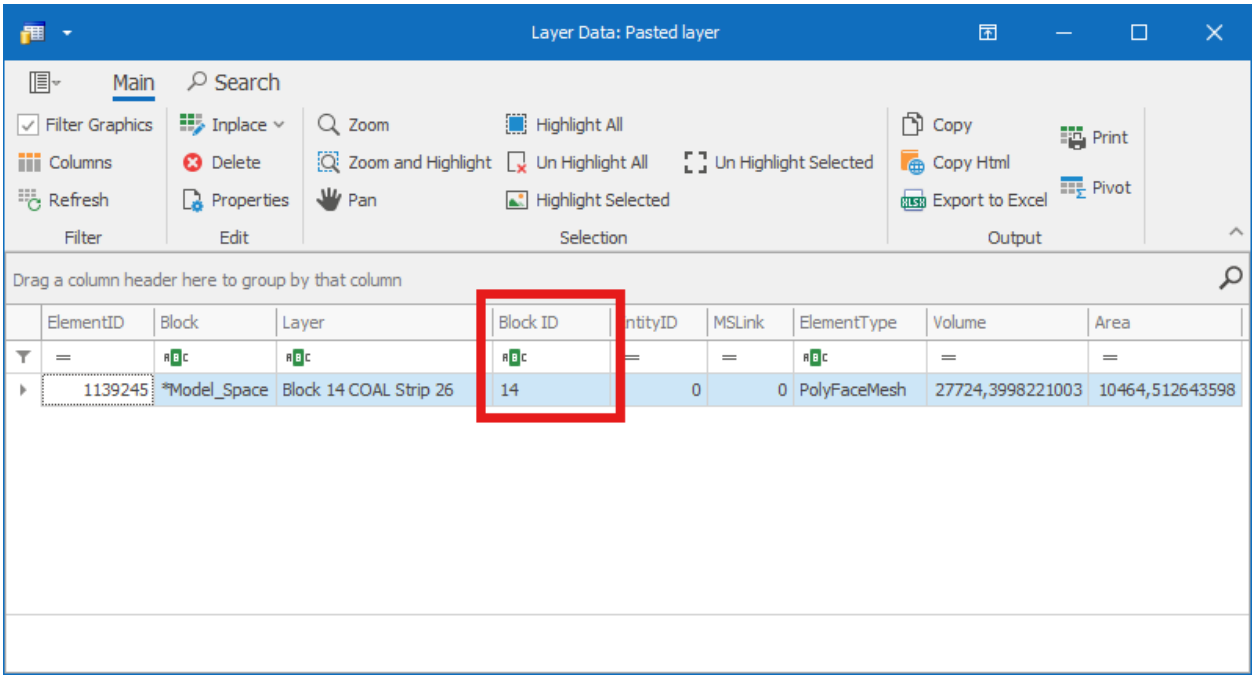


  The **.* .*** ***[0-9]***+ indicates the words "COAL" (First **.***), followed by a space, and "Strip" (Second **.***), also followed by a space. Finally, the ***[0-9]***+ indicates the strip number at the end of the original string, a number between ***[0-9]*** repeated however many times (indicated by the +).

  In regular expression language, the period character (.) matches any single character, and the asterisk (*) matches any number of characters.

- *[1]*: The [1] at the end of the whole script just indicates that it must return the second thing matched, which is the part in nested brackets( ), and not the rest of the match. In programming, 0 is the first thing in a list and 1 would be the second thing.

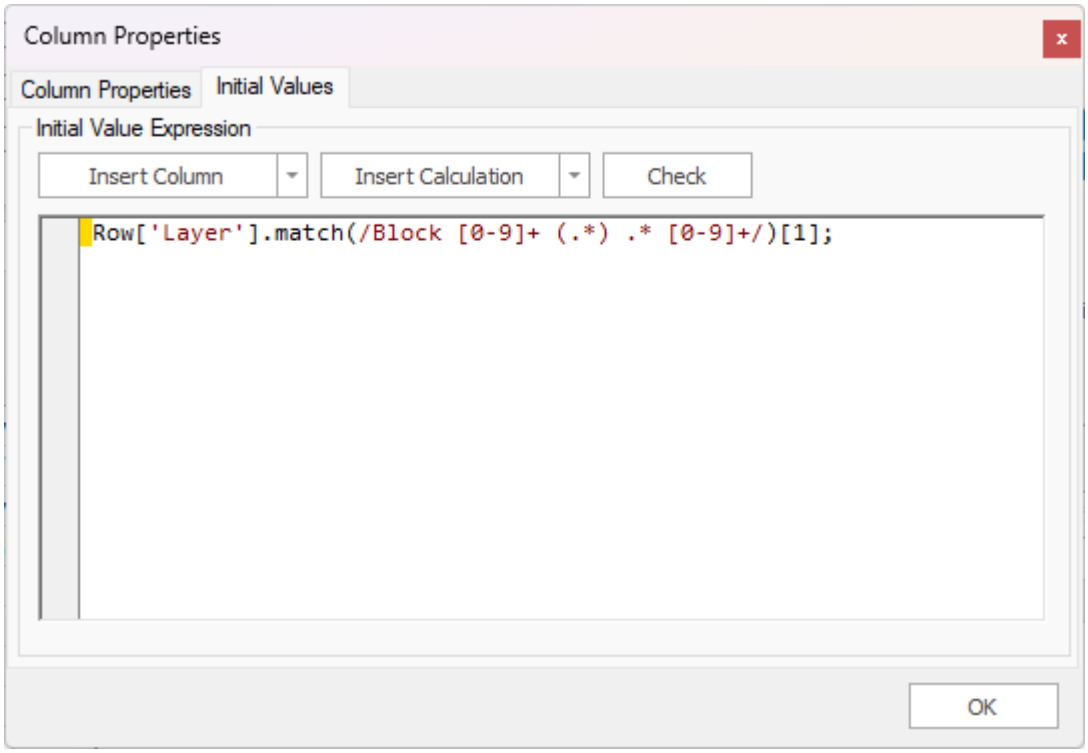
You can then click OK and your new column will be created:



Following this same script and logic I will extract the rest of the parts into their own columns such as the material type and strip number.

For the material type, which is COAL, I will add a new stored column (which I will call “Material”) following the steps above and use this script to capture and extract the material type this time:

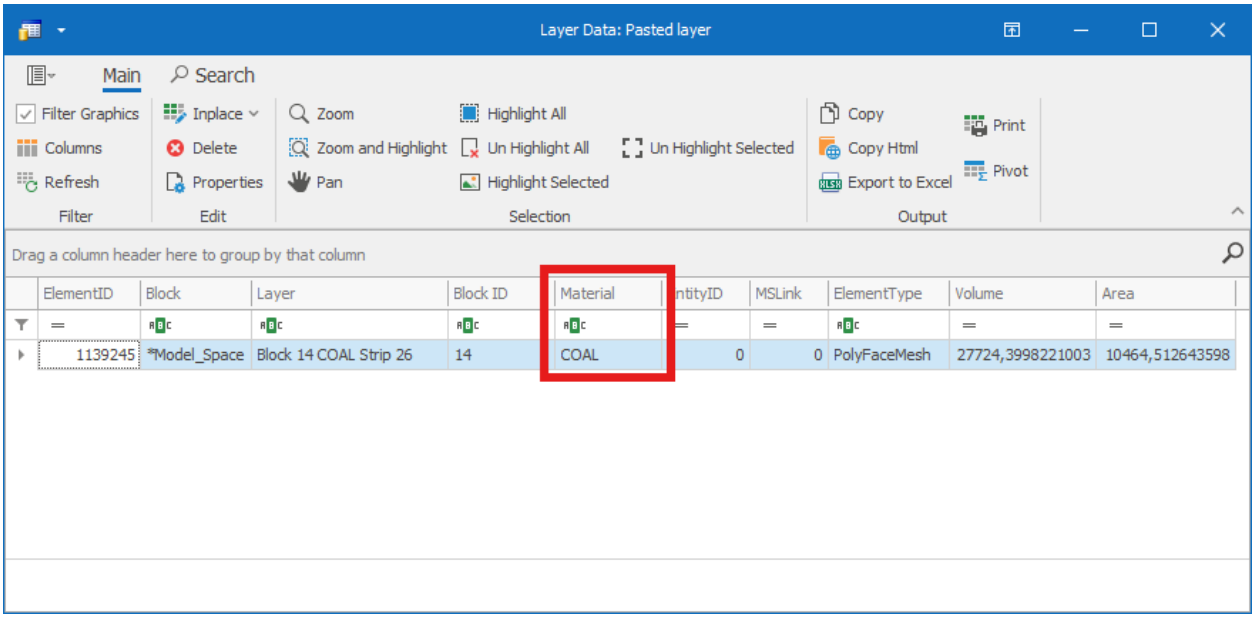
Row['Layer'].match(/Block [0-9]+ ***(.*)*** *.* [0-9]+/)[1];*



In this example, you can see my script is the same and the only difference is that I am choosing to capture a different part of the matched string, which is the material type, indicated by the first **.*** in nested brackets:

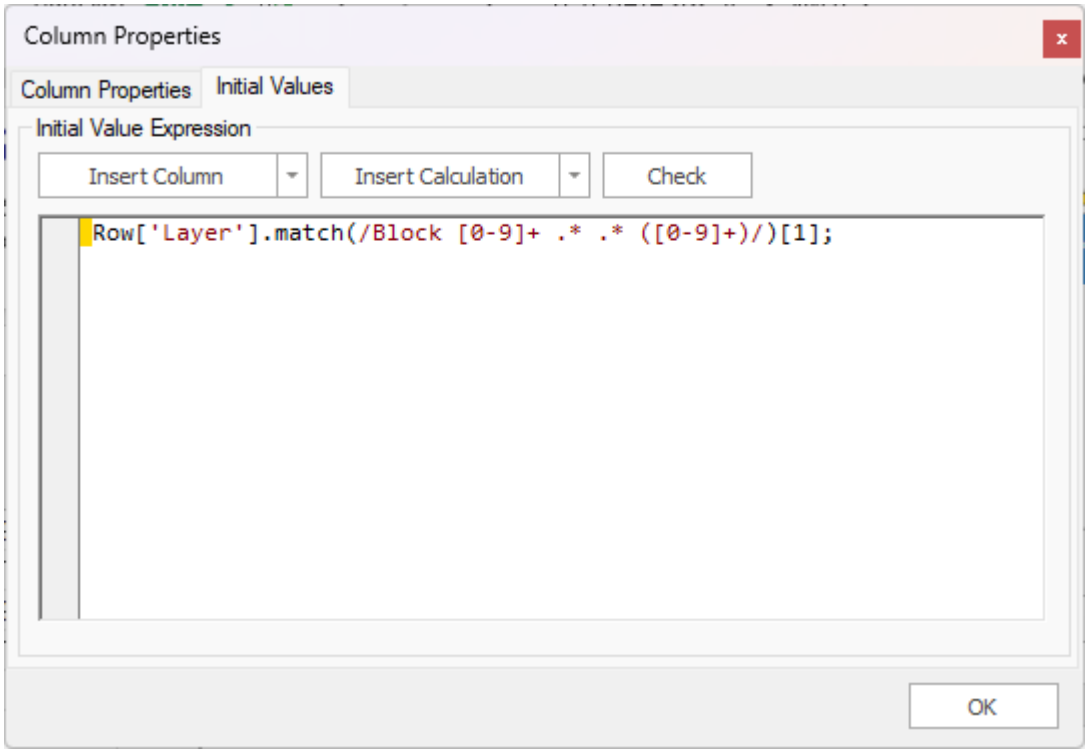
Row['Layer'].match(/Block [0-9]+ ***(.*)*** *.* [0-9]+/)[1];*

I can then click OK and my new column with the material type will be added:

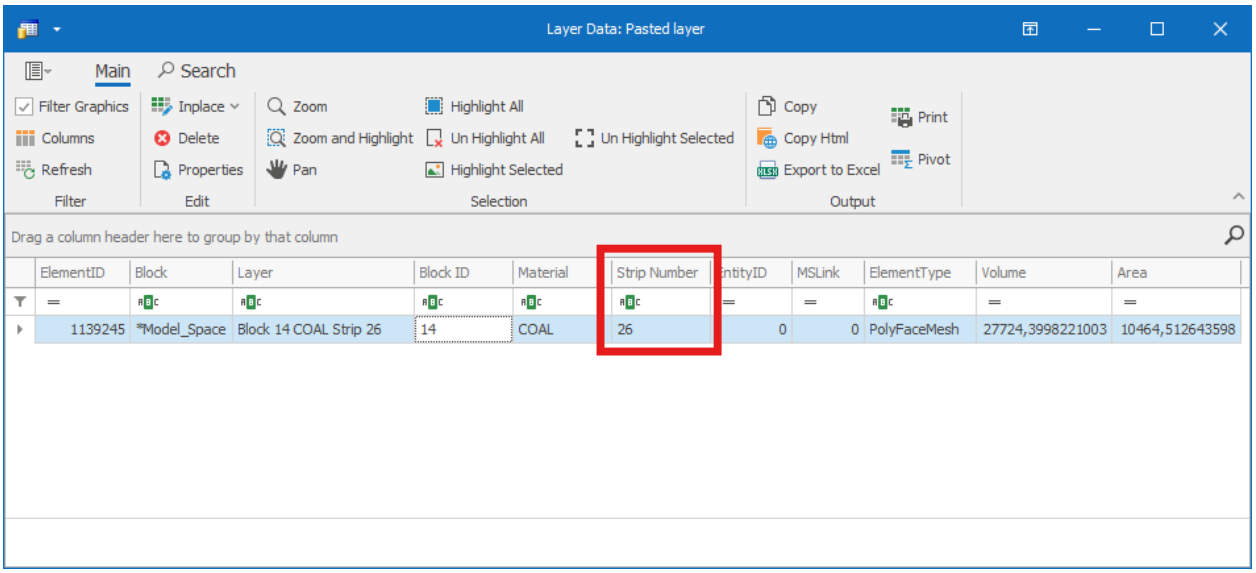


Finally, I will extract the strip number at the end and put it into a new column that I will call “Strip Number”. I will add a stored column as above and then I will use the following script this time, all the same except that I am capturing the final part of the original string, as indicated by where I put the nested brackets, which is the strip number:

Row['Layer'].match(/Block [0-9]+ . .* **([0-9]+)**/)[1];*



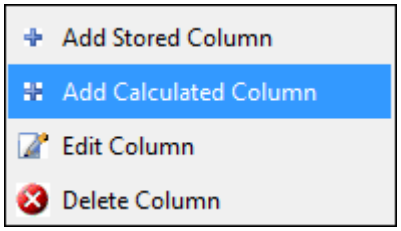
I then click OK and my new column is added with the Strip Number:

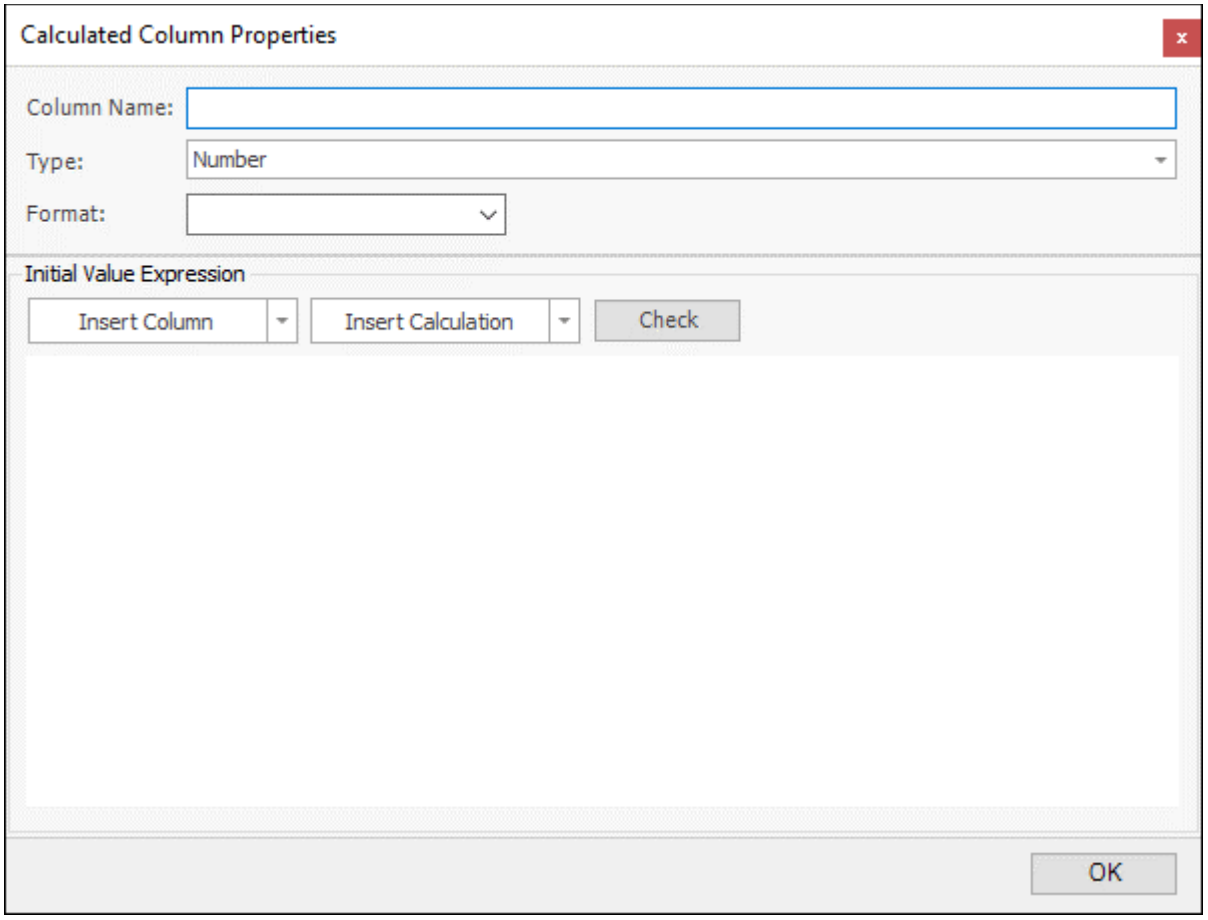


Further data on how to use regular expressions can be found online for example on the W3 Schools website: https://www.w3schools.com/js/js_regexp.asp.

Add Calculated Column

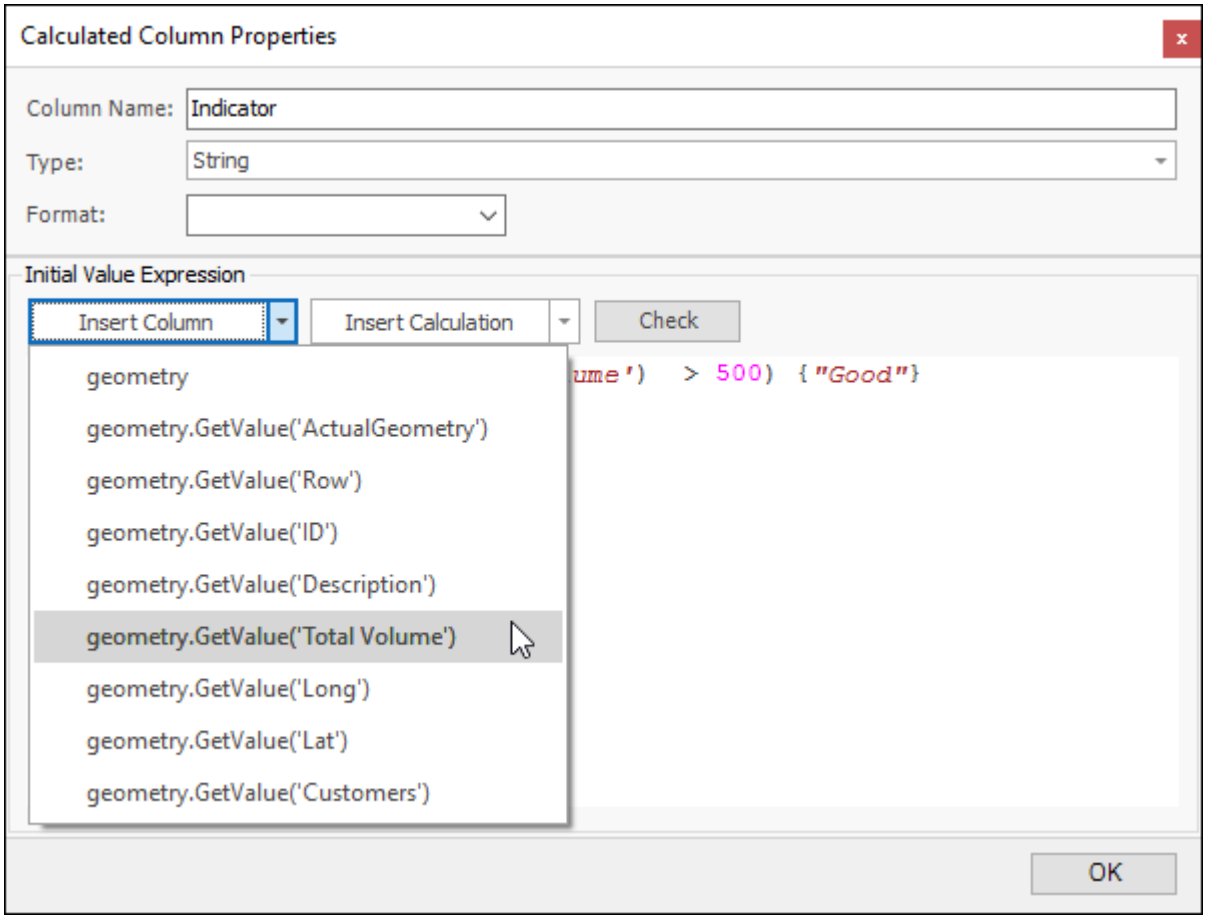
In the Layer Data Grid you are also able to add a **Calculated Column** which is a column that dynamically calculates values according to some calculation you have specified for it:

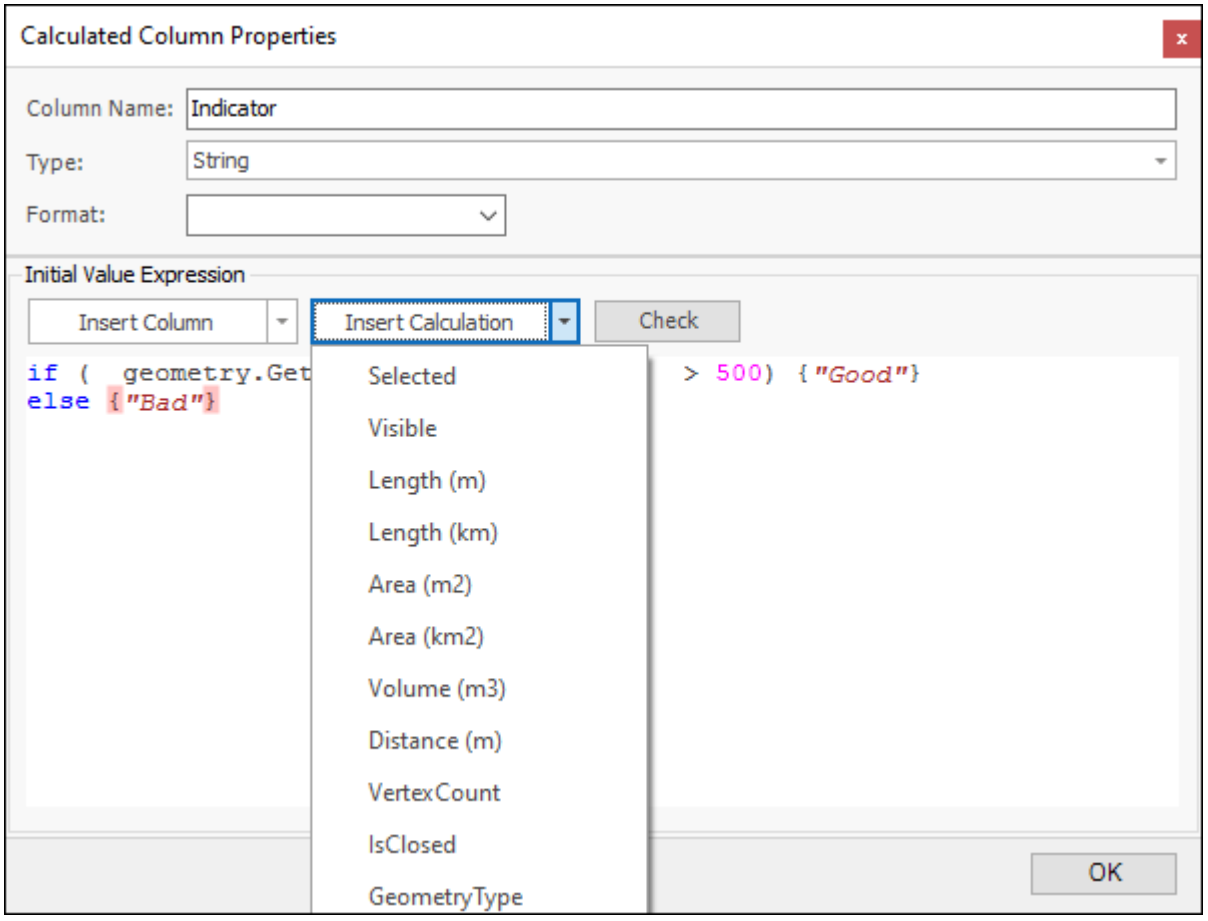




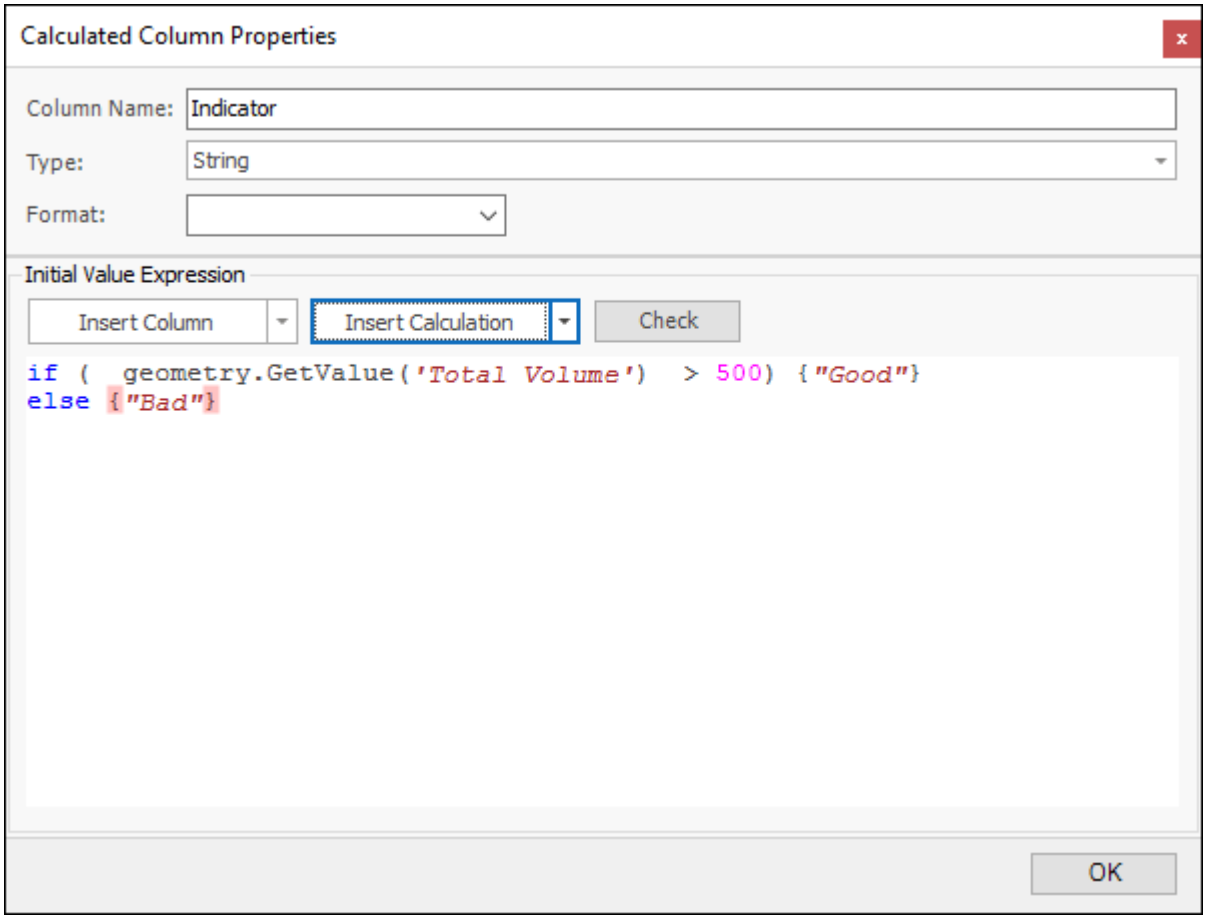
Type in the **Column Name**, **Type** and **Format** and then you can specify your expression below. Dropping down on **Insert Column** you can choose a column from the Layer Data Grid to insert in the expression to get values from, and dropping

down on **Insert Calculation** you can insert a predefined calculation into the expression, these expressions use JavaScript:

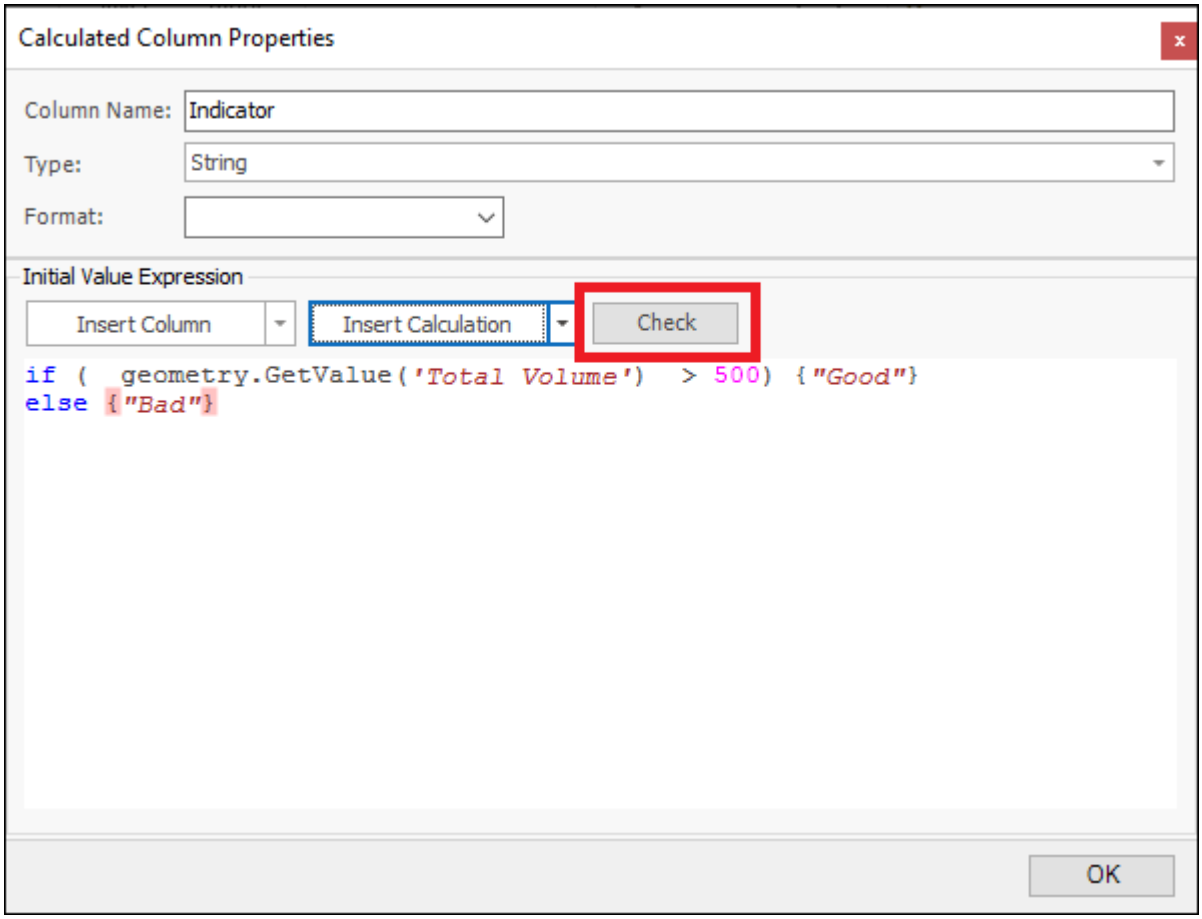


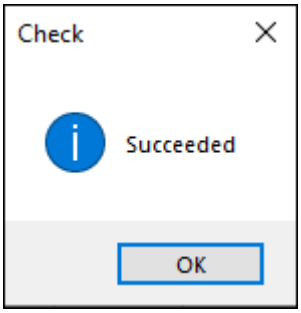


In this example you will see I have made a column called **Indicator** and the expression I have specified for it says if the value of the **Total Volume** column in my Layer Data Grid is greater than 500 then say “Good”, if not then say “Bad”:

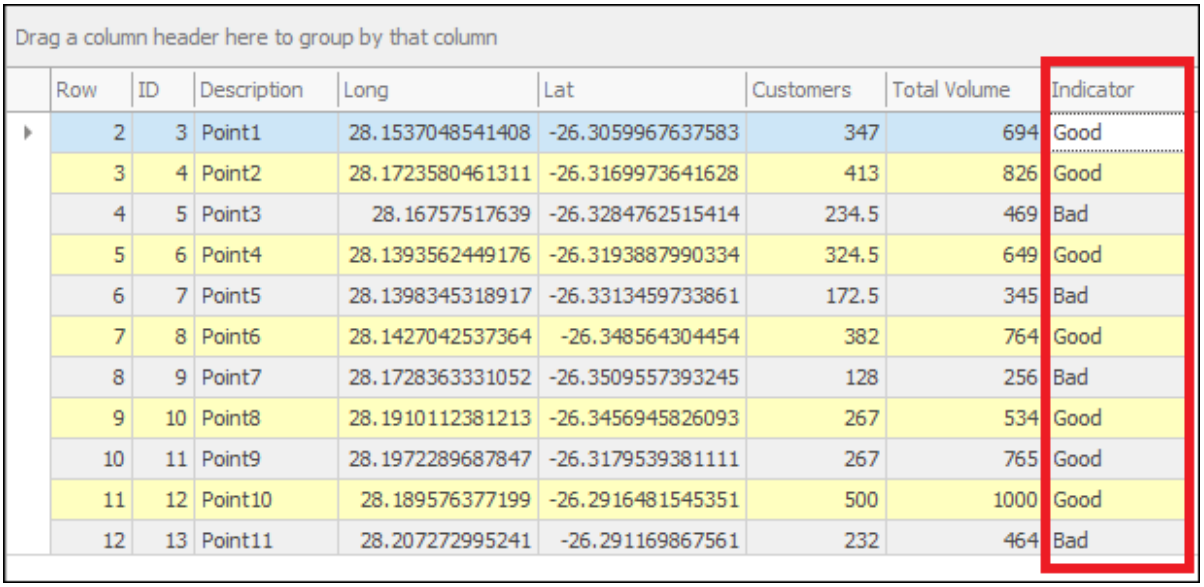


I can then click **Check** to see if this expression is correct and it will let me know:





I can then click **OK** on this and the dialogue and my calculated column has been added, any time the values in the **Total Volume** column are changed or any time a new row is added and a value for **Total Volume** is put this column will update accordingly:

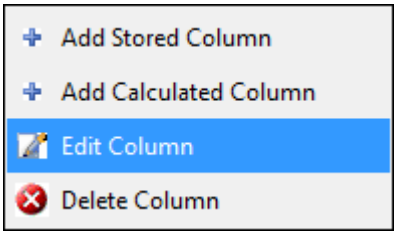


Drag a column header here to group by that column

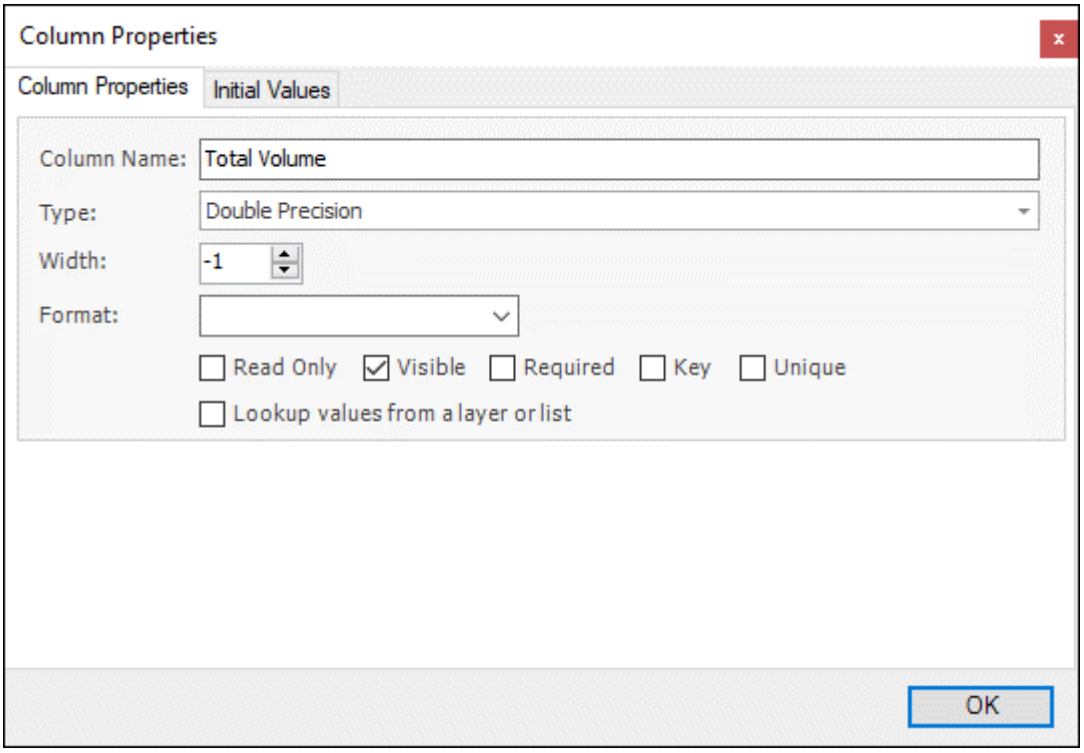
Row	ID	Description	Long	Lat	Customers	Total Volume	Indicator
2	3	Point1	28.1537048541408	-26.3059967637583	347	694	Good
3	4	Point2	28.1723580461311	-26.3169973641628	413	826	Good
4	5	Point3	28.16757517639	-26.3284762515414	234.5	469	Bad
5	6	Point4	28.1393562449176	-26.3193887990334	324.5	649	Good
6	7	Point5	28.1398345318917	-26.3313459733861	172.5	345	Bad
7	8	Point6	28.1427042537364	-26.348564304454	382	764	Good
8	9	Point7	28.1728363331052	-26.3509557393245	128	256	Bad
9	10	Point8	28.1910112381213	-26.3456945826093	267	534	Good
10	11	Point9	28.1972289687847	-26.3179539381111	267	765	Good
11	12	Point10	28.189576377199	-26.2916481545351	500	1000	Good
12	13	Point11	28.207272995241	-26.291169867561	232	464	Bad

Edit Column

Edit Column will bring up a dialogue where you can edit the columns properties whether it is a calculated or stored column. This dialogue is the same dialogue you see in adding a new stored or calculated column (see section on **Add Stored Column** and **Add Calculated Column** to see how this dialogue works):



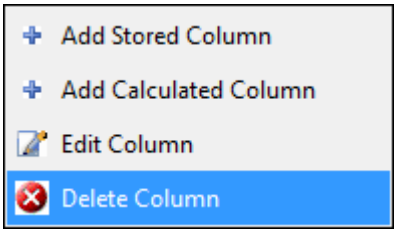
Total Volume
694
826
469
649
345
764
256
534
765
1000
464



As an example of editing, if a column was read only and I wanted to change this I could tick off **Read Only** here.

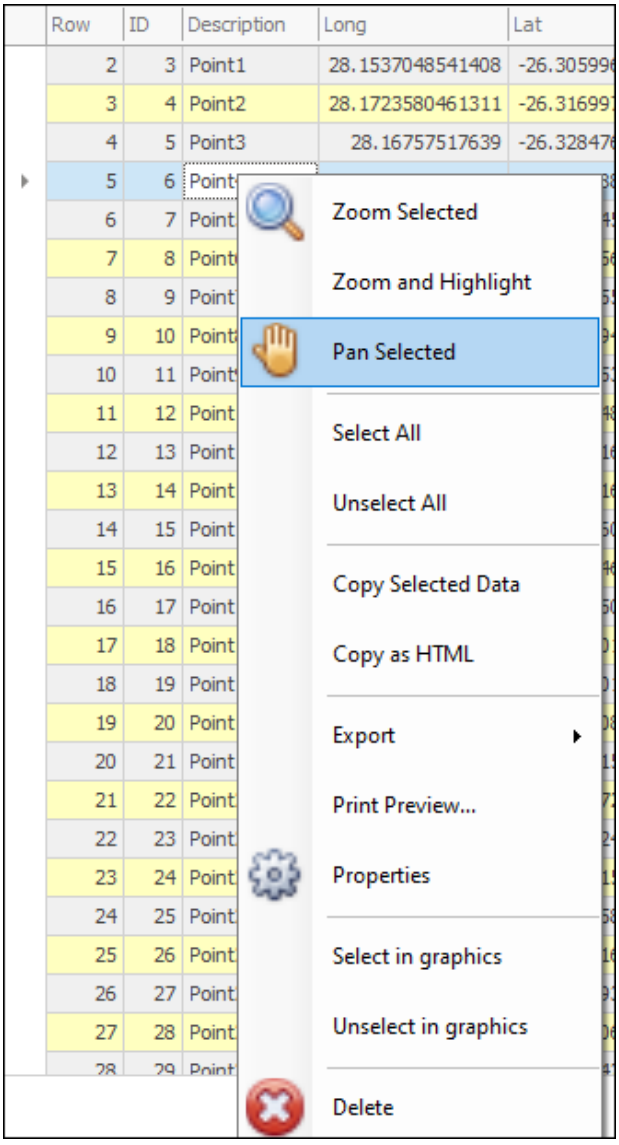
Delete Column

To delete any column in the Layer Data Grid, click **Delete Column** (Note: if your column is set as a key column, you will not be able to delete it, unless you tick off **Key** in the Edit Column dialogue):



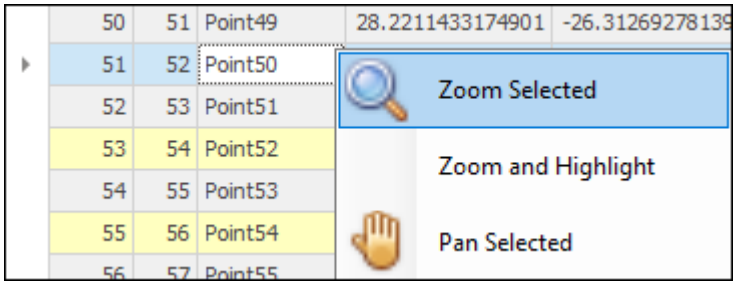
Grid Context Menu

Right clicking in the grid will bring up the following context menu:

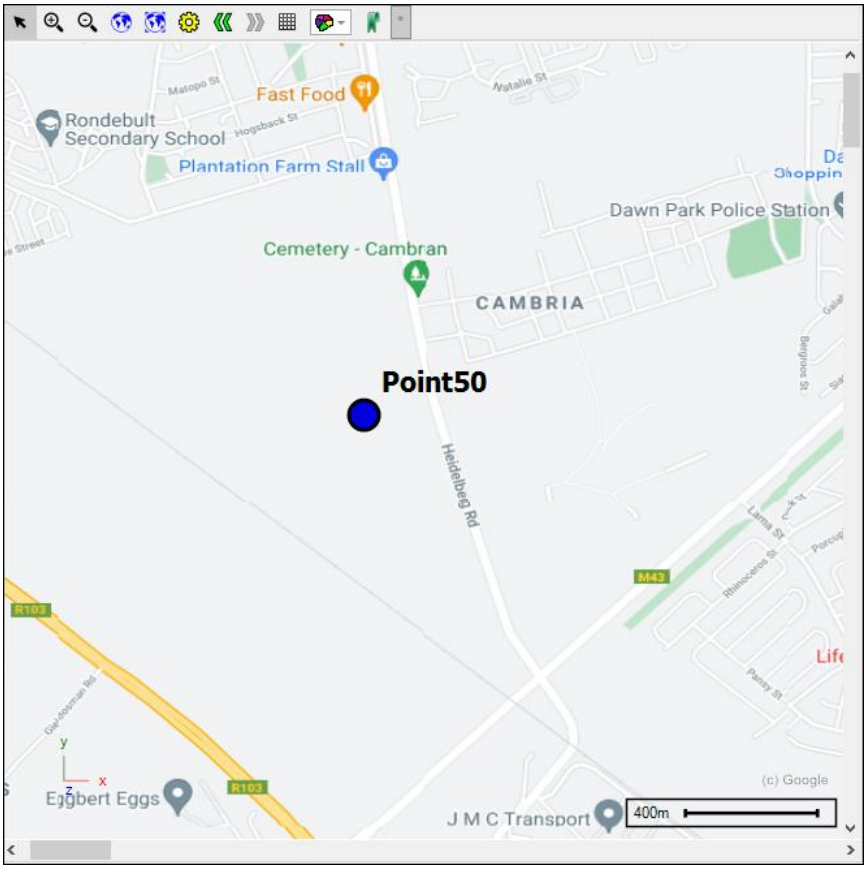


Zoom/Highlight/Pan Selected

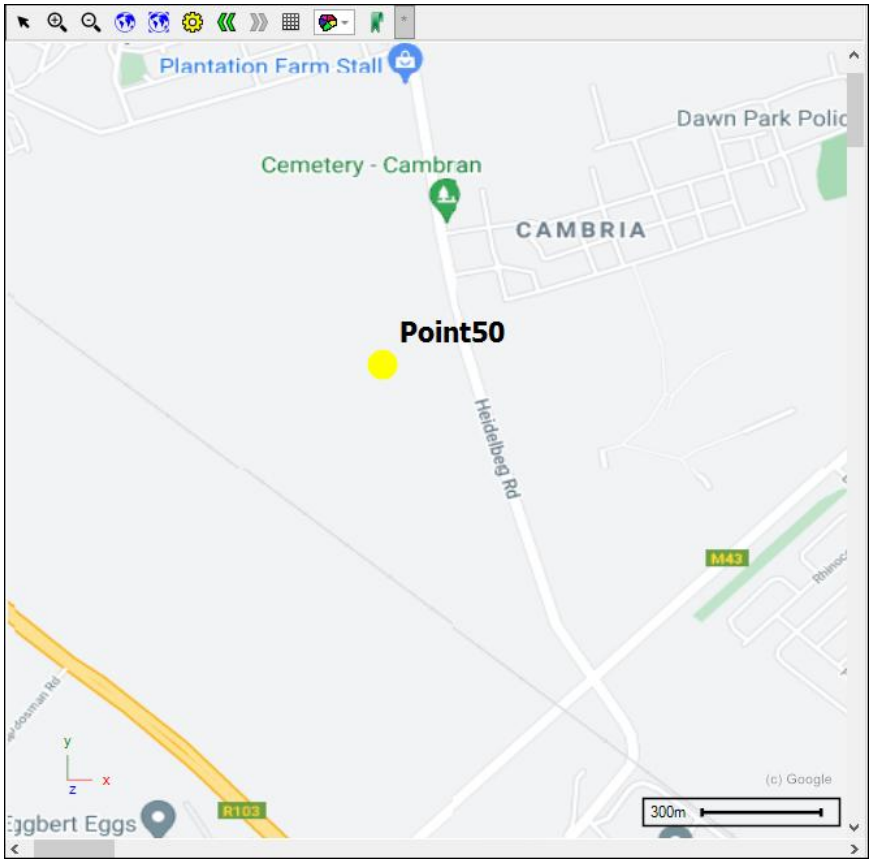
Zoom Selected will zoom to the selected row/s in your scene, **Zoom and Highlight** will zoom to and highlight the currently selected row/s in your scene and **Pan Selected** will pan to the currently selected row/s:



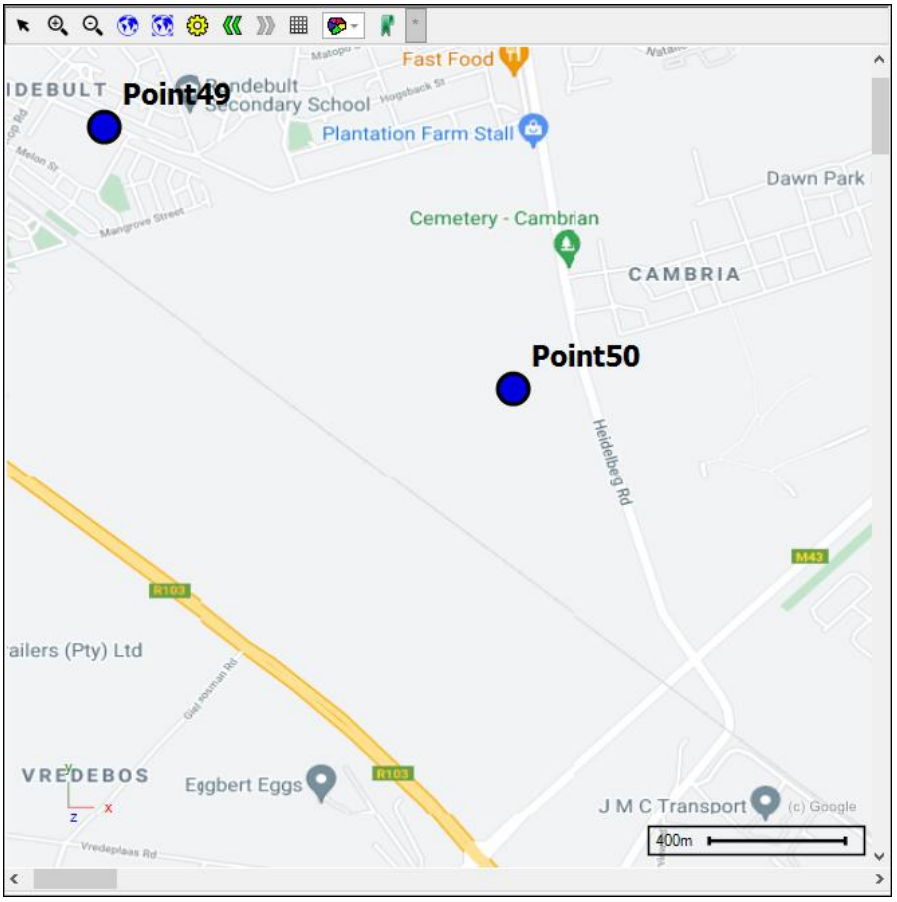
Zoom:



Zoom and Highlight:

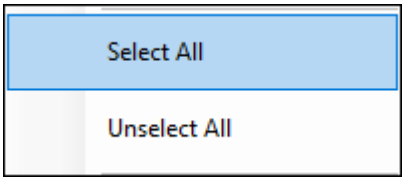

Plantation Farm Stall
Dawn Park Polic
Cemetery - Cambran
CAMBRIA
Point50
Heidelberg Rd
M43
R103
(c) Google
300m

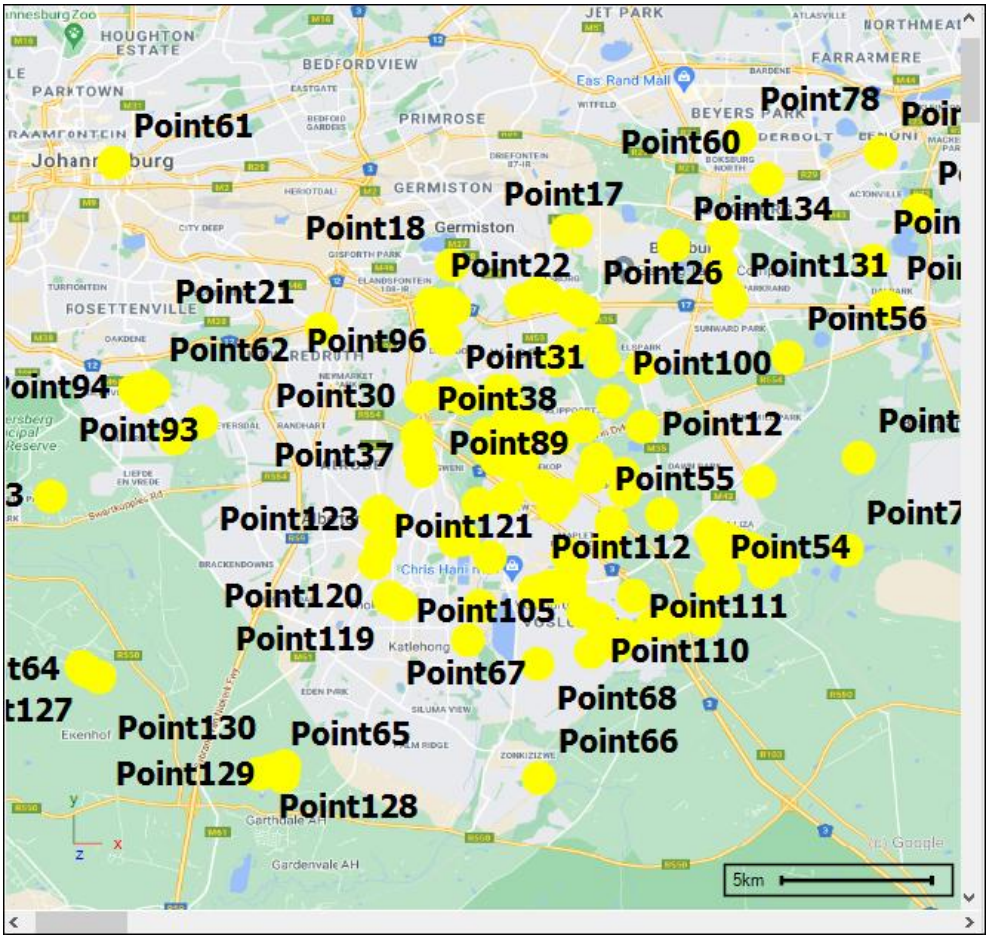
Pan:

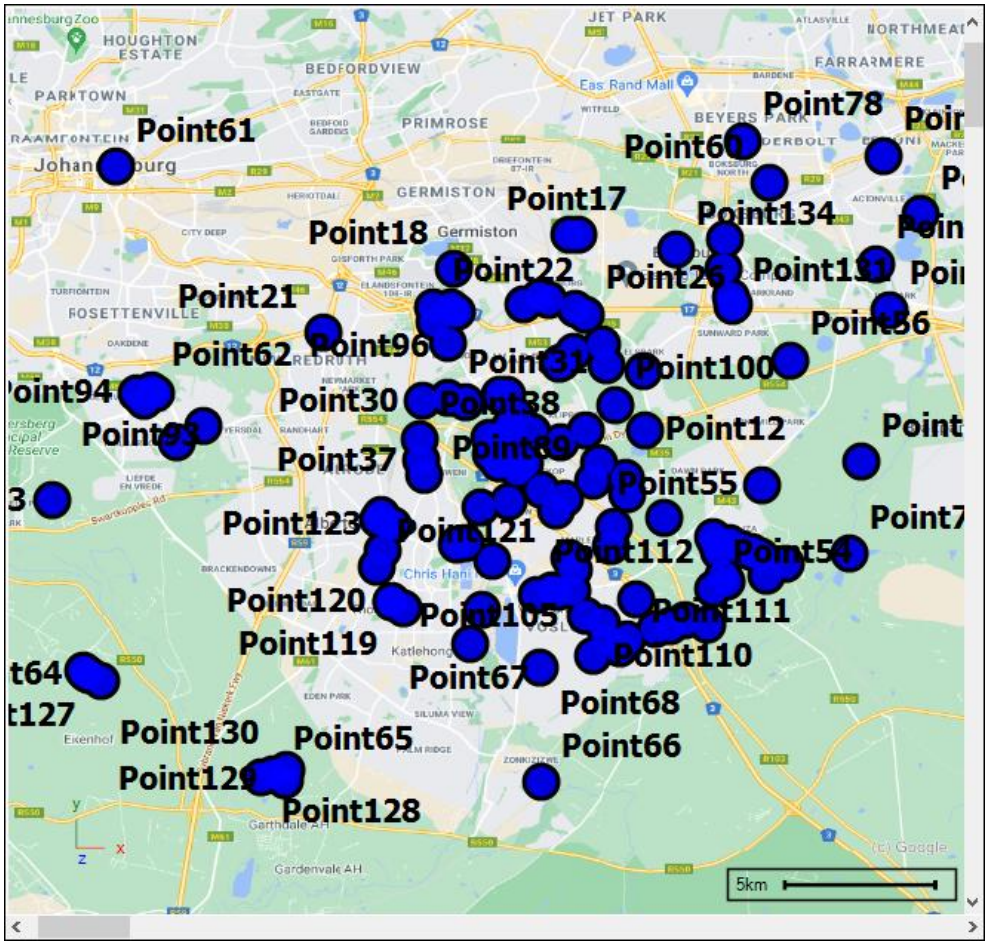


Select/Unselect All

Select All will select all the elements in the scene, and **Unselect All** will unselect all selected items in the scene:

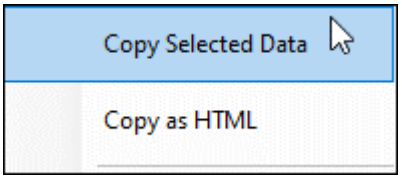


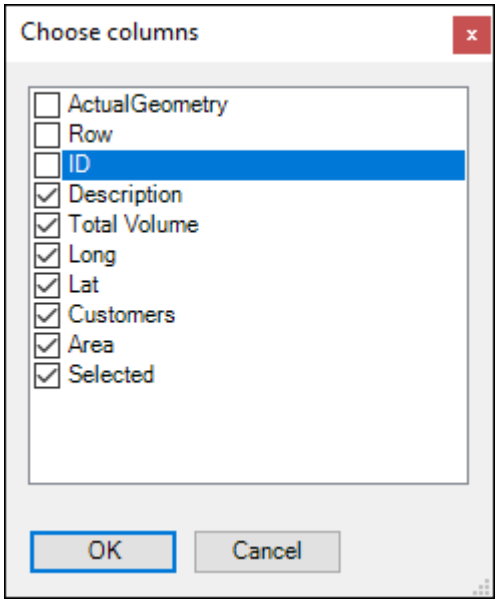

Point61
Point78
Point60
Point17
Point134
Point18
Germiston
Point22
Point26
Point131
Point21
Point56
Point62
Point96
Point31
Point100
Point94
Point30
Point38
Point93
Point12
Point37
Point89
Point55
Point123
Point121
Point112
Point54
Point120
Point105
Point111
Point119
Point110
Point67
Point68
Point130
Point65
Point66
Point129
Point128
5km

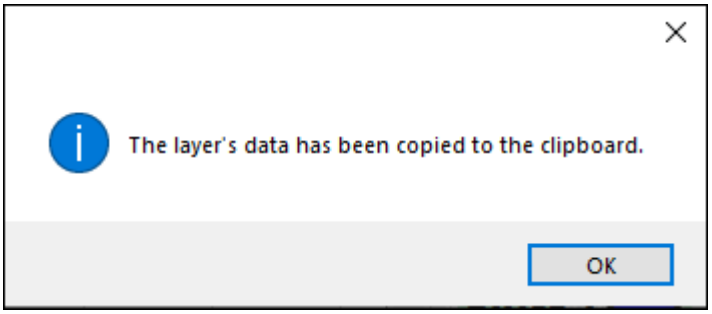


Copy Selected Data/Copy as HTML

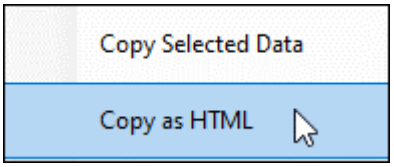
Copy Selected Data will copy the currently selected row/s to the clipboard, to select all rows you can use **ctrl A**. You will then be prompted to choose which columns you would like copied out, then click **OK** and your data has been copied to the clipboard and can be pasted elsewhere:





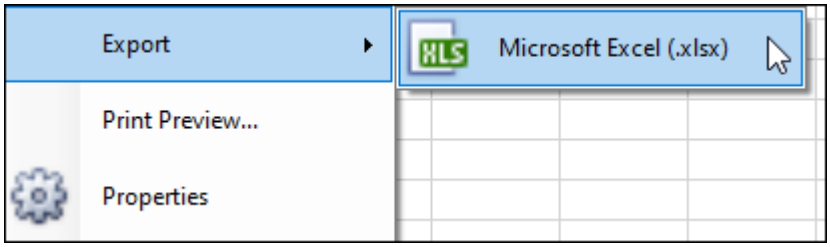


You can also copy out data as HTML by selecting **Copy as HTML**:



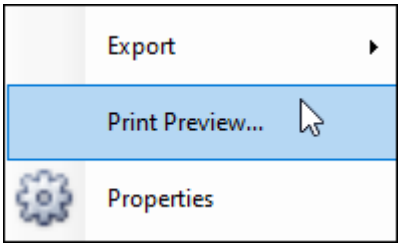
Export

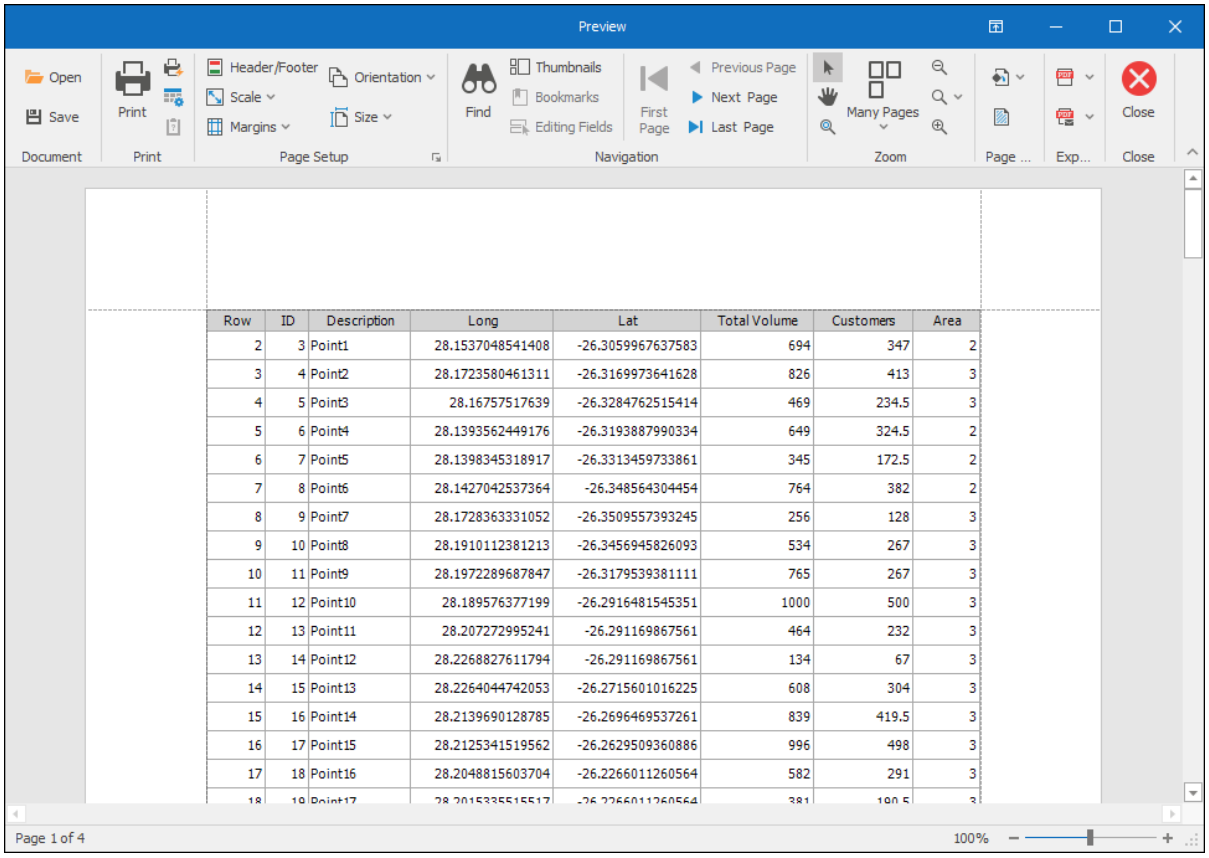
The Layer Data Grid can be exported to Excel with **Export** > **Microsoft Excel**:



Print Preview

You can see a print preview of your grid and edit and adjust this to your liking before printing:

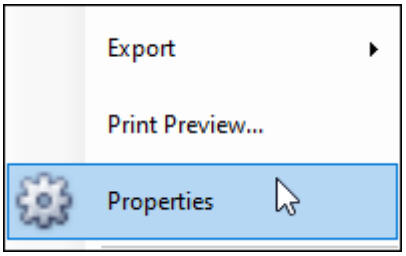




Row	ID	Description	Long	Lat	Total Volume	Customers	Area
2	3	Point1	28.1537048541408	-26.3059967637583	694	347	2
3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3
4	5	Point3	28.16757517639	-26.3284762515414	469	234.5	3
5	6	Point4	28.1393562449176	-26.3193887990334	649	324.5	2
6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2
7	8	Point6	28.1427042537364	-26.348564304454	764	382	2
8	9	Point7	28.1728363331052	-26.3509557393245	256	128	3
9	10	Point8	28.1910112381213	-26.3456945826093	534	267	3
10	11	Point9	28.1972289687847	-26.3179539381111	765	267	3
11	12	Point10	28.189576377199	-26.2916481545351	1000	500	3
12	13	Point11	28.207272995241	-26.291169867561	464	232	3
13	14	Point12	28.2268827611794	-26.291169867561	134	67	3
14	15	Point13	28.2264044742053	-26.2715601016225	608	304	3
15	16	Point14	28.2139690128785	-26.2696469537261	839	419.5	3
16	17	Point15	28.2125341519562	-26.2629509360886	996	498	3
17	18	Point16	28.2048815603704	-26.2266011260564	582	291	3

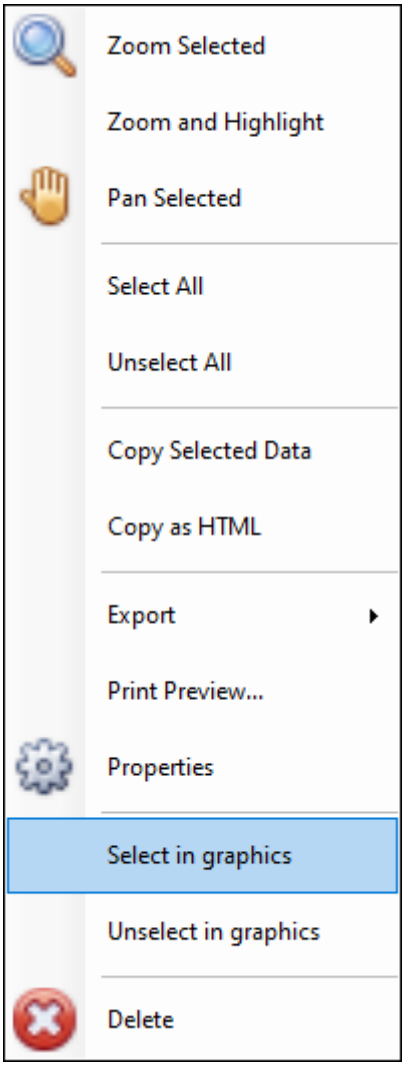
Properties

Properties will take you to the **Object Properties** box for the selected row where you can see various details about that record and do various things concerning it (this is the same Object Properties box that comes up when using the **Inspector** tool, see *SpatialXL Guide*, *Map Tools* section, *Inspector*):



Select/Unselect in Graphics

Select in graphics will select the currently selected row (or rows) in graphics and **Unselect in graphics** will unselect that element:



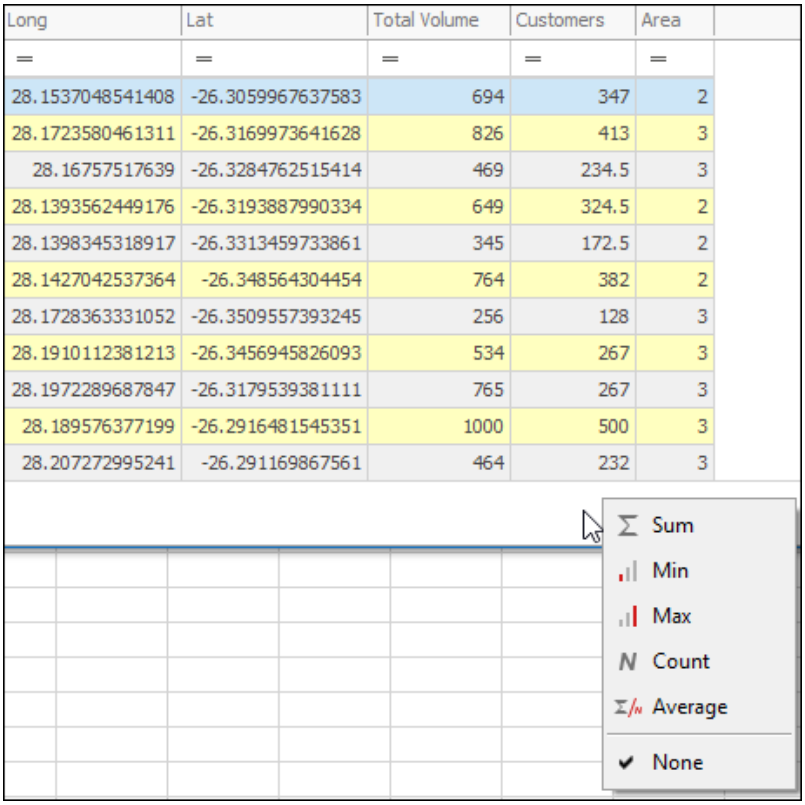
	2	3	Point1	28.1537048541408	-26.3059967637583	694	347	2
▸	3	4	Point2	28.1723580461311	-26.3169973641628	826	413	3
	4	5	Point3	28.16757517639	-26.3284762515414	469	234.5	3

Delete

Delete will delete the currently selected row.

Bottom Context Menu

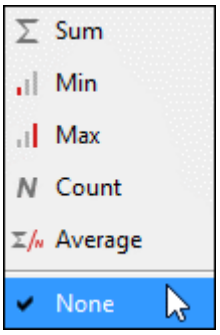
Right clicking in the bottom of the window below any column will bring up the following context menu where you can do various calculations for that column:



You can get the **Sum, Min**, **Max**, **Count** and **Average** of the values in that column by clicking on the desired one. In this example I got the sum of my Customers:

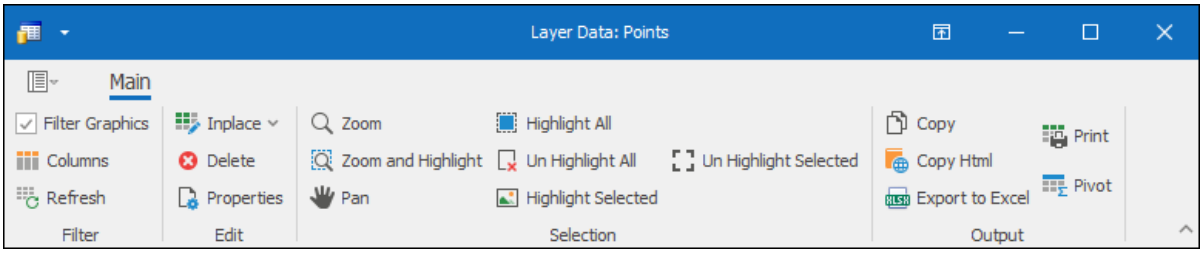
Total Volume	Customers
694	347
826	413
469	234.5
649	324.5
345	172.5
764	382
256	128
534	267
765	267
1000	500
464	232
	SUM=34225

To have no calculation showing just click on **None**:



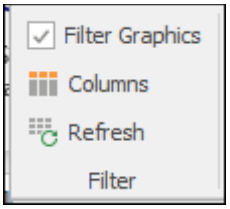
Ribbon

In the ribbon of the Layer Data Grid are various things you can do. We will take up each section of the ribbon:

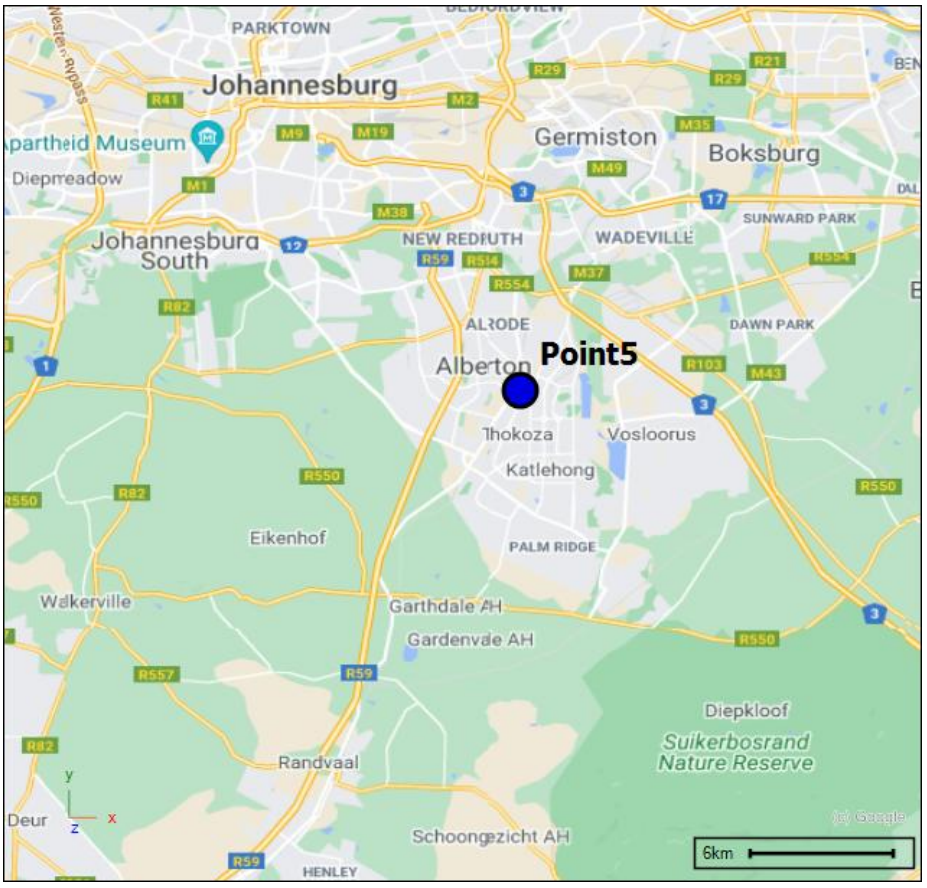


Filter

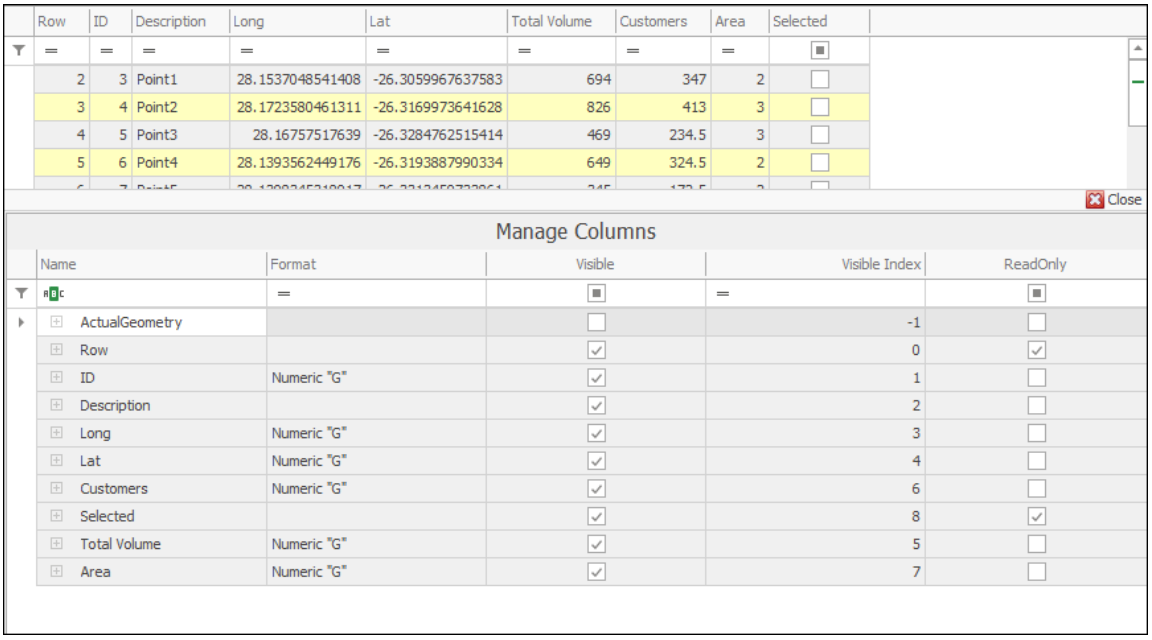
In the **Filter** section you have the option to **Filter Graphics** or not, this means that when you filter in the grid this will reflect in the graphics as well, this is ticked on by default:



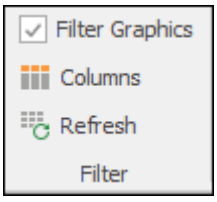
	Row	ID	Description	Long	Lat	Total Volume	Customers	Area	Selected
	=	=	= Point5	=	=	=	=	=	
	6	7	Point5	28.1398345318917	-26.3313459733861	345	172.5	2	



Clicking on **Columns** will bring up the **Manage Columns** dialogue where you can tick on or off what columns you would like to have showing or not and whether they are **Visible**. You can also see whether they are **Read Only**:

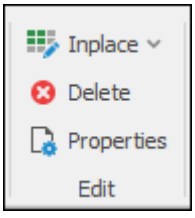


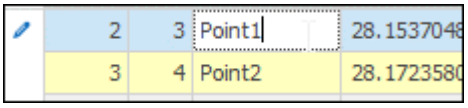
Refresh will refresh the grid if you have made any changes and this is needed:



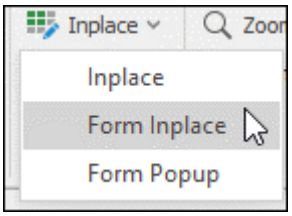
Edit

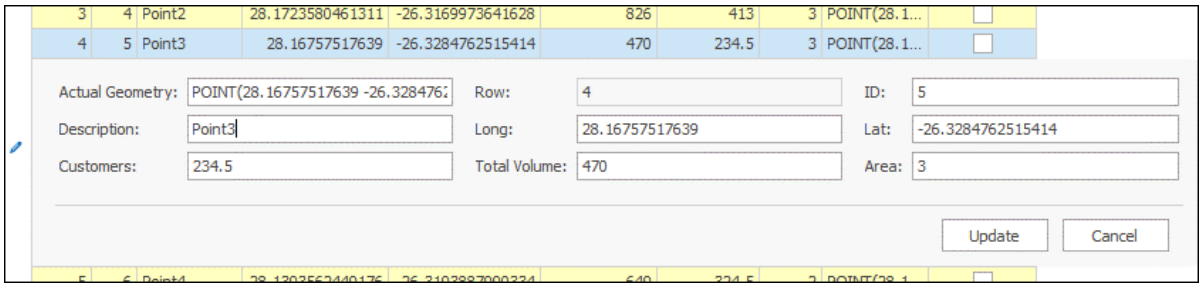
In the **Edit** section you can choose how you would like to edit the grid; **Inplace** will let you edit the grid in the grid itself:



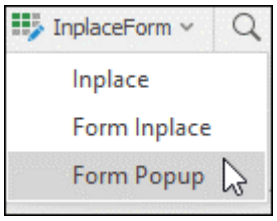


Form Inplace will bring up an edit form in the grid when you edit double click in the grid to edit:

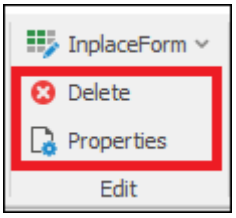


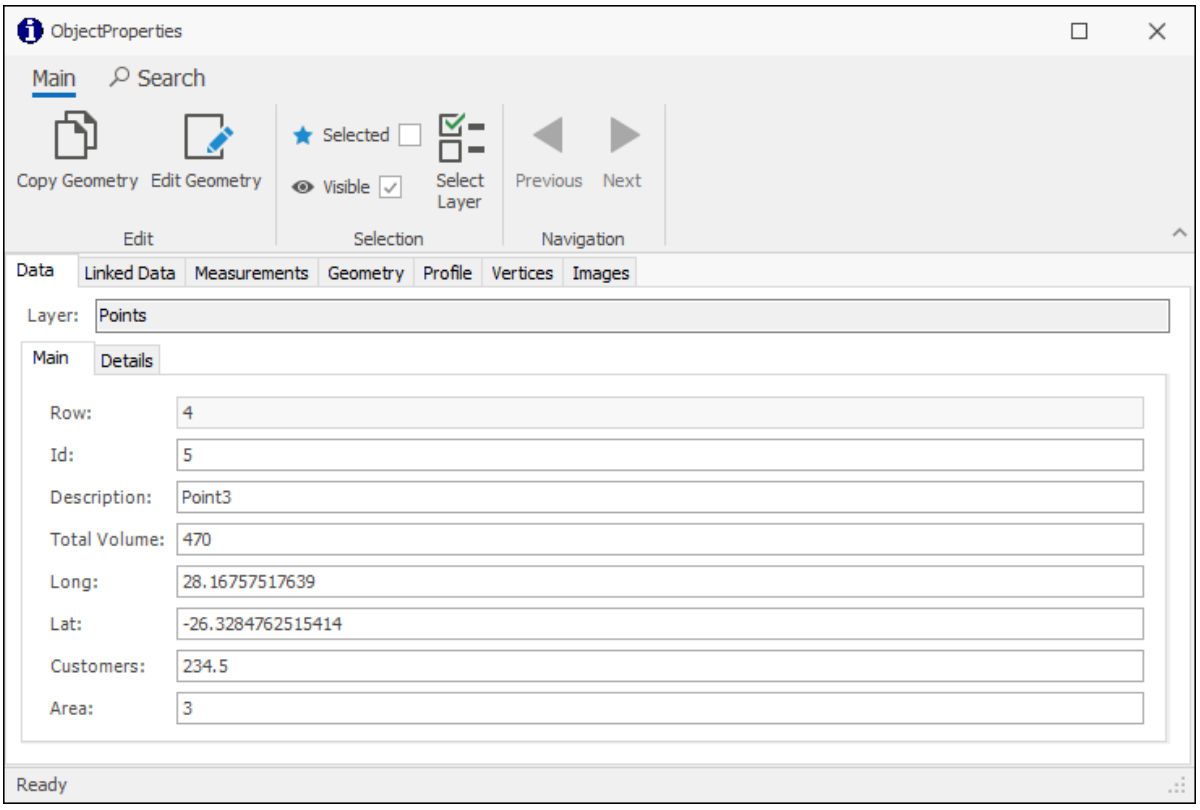


And **Form Popup** will bring up the edit form as a pop-up window:



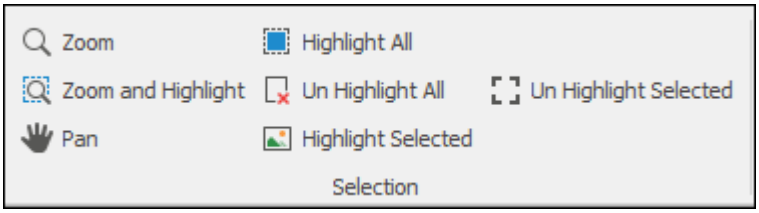
Delete will delete the selected column/s and **Properties** will take you to the **Object Properties** box for the selected row where you can see various details about that record and do various things concerning it (this is the same Object Properties box that comes up when using the **Inspector** tool, see *SpatialXL Guide*, *Map Tools* section, *Inspector*):



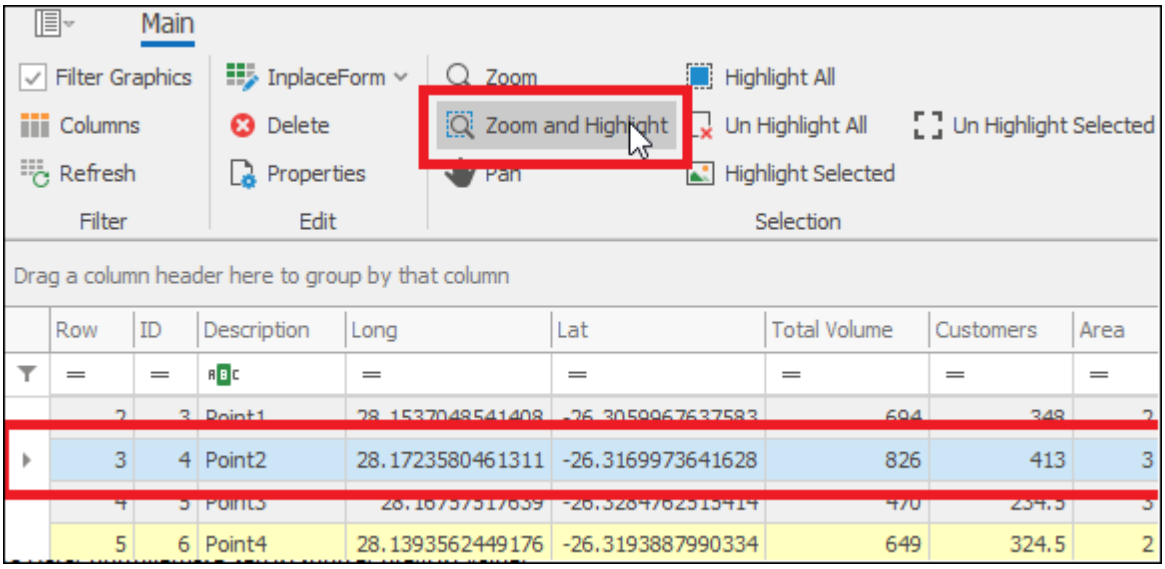


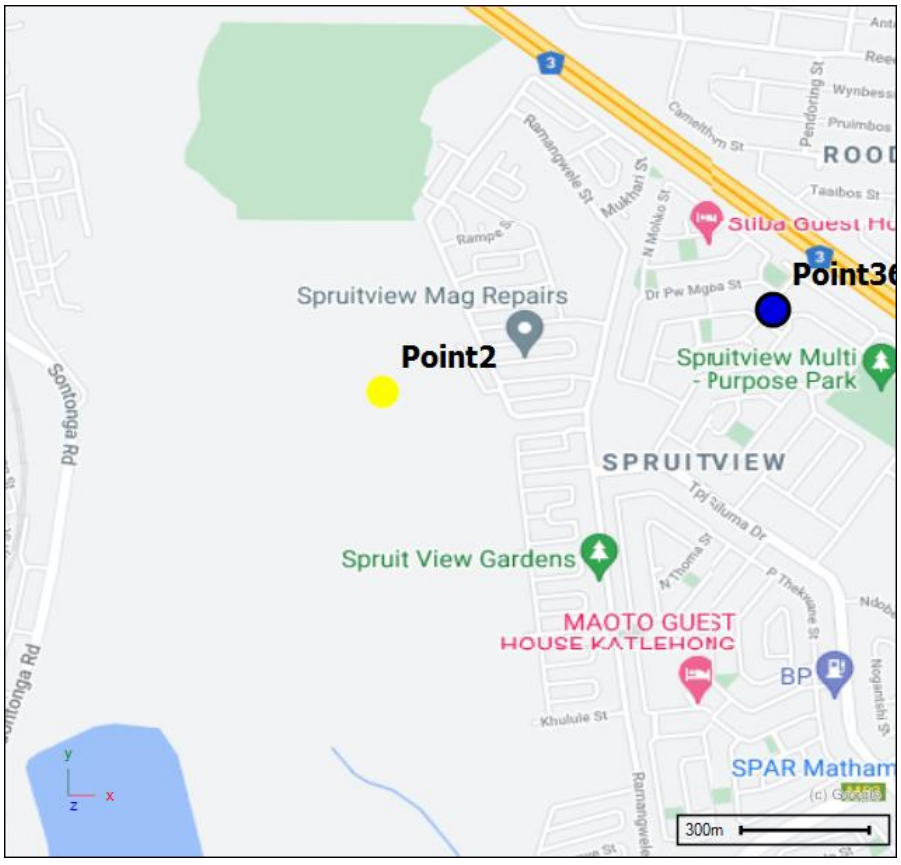
Selection

In the **Selection** section you can zoom, pan and select etc. a selected row or rows; the row/s will be zoomed/highlighted/panned to in the scene:



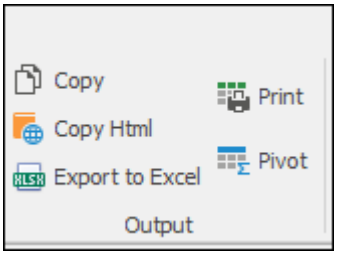
For example, I will **Zoom and Highlight** a row in my grid:

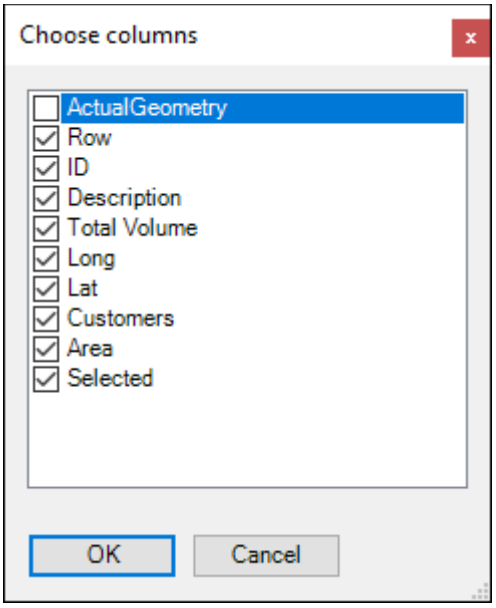


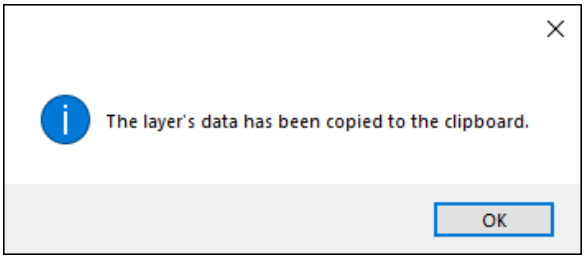


Output

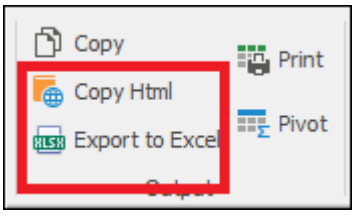
In the **Output** section you are able to **Copy** selected rows (to select all rows do **ctrl A**), a dialogue will then come up prompting you to choose which columns to copy out, then click **OK** and your data has been copied to clipboard:



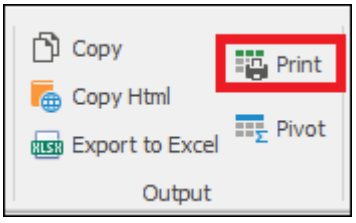


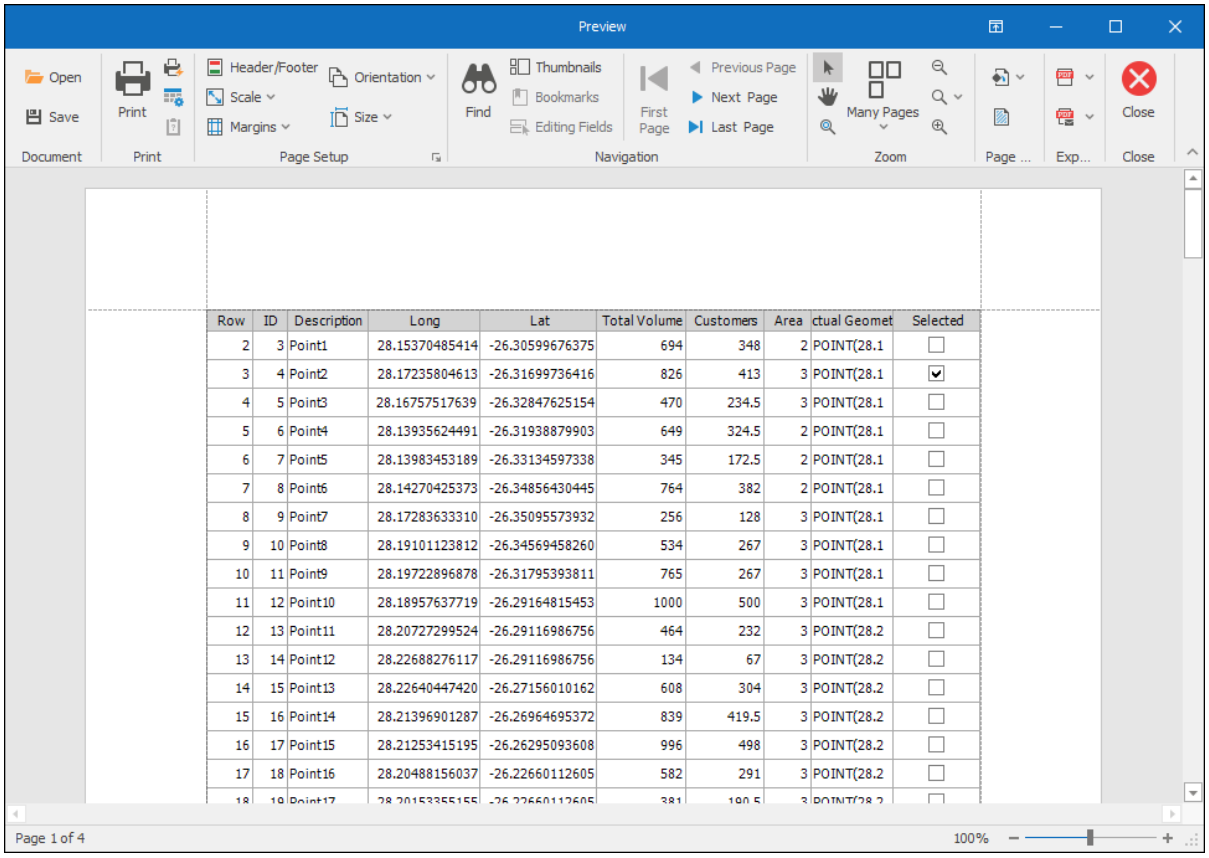


You can also copy out selected rows as HTML with **Copy Html**. The data grid can also be exported to Excel with **Export to Excel** which will export it to a new workbook:



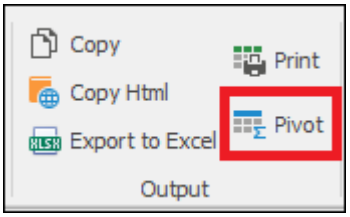
Print will bring up a print preview of your data grid where you can edit and do various things before printing it:

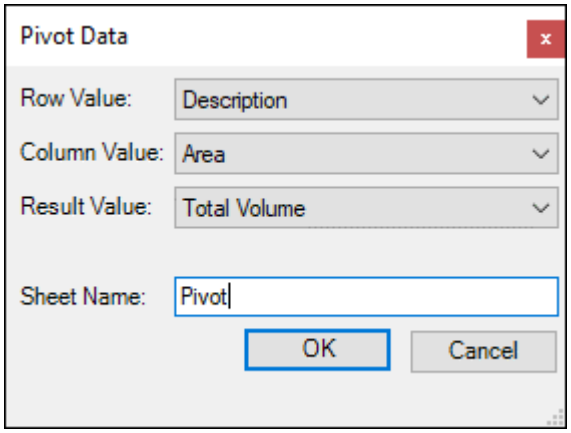




Row	ID	Description	Long	Lat	Total Volume	Customers	Area	ctual Geomet	Selected
2	3	Point1	28.15370485414	-26.30599676375	694	348	2	POINT(28.1	☐
3	4	Point2	28.17235804613	-26.31699736416	826	413	3	POINT(28.1	☑
4	5	Point3	28.16757517639	-26.32847625154	470	234.5	3	POINT(28.1	☐
5	6	Point4	28.13935624491	-26.31938879903	649	324.5	2	POINT(28.1	☐
6	7	Point5	28.13983453189	-26.33134597338	345	172.5	2	POINT(28.1	☐
7	8	Point6	28.14270425373	-26.34856430445	764	382	2	POINT(28.1	☐
8	9	Point7	28.17283633310	-26.35095573932	256	128	3	POINT(28.1	☐
9	10	Point8	28.19101123812	-26.34569458260	534	267	3	POINT(28.1	☐
10	11	Point9	28.19722896878	-26.31795393811	765	267	3	POINT(28.1	☐
11	12	Point10	28.18957637719	-26.29164815453	1000	500	3	POINT(28.1	☐
12	13	Point11	28.20727299524	-26.29116986756	464	232	3	POINT(28.2	☐
13	14	Point12	28.22688276117	-26.29116986756	134	67	3	POINT(28.2	☐
14	15	Point13	28.22640447420	-26.27156010162	608	304	3	POINT(28.2	☐
15	16	Point14	28.21396901287	-26.26964695372	839	419.5	3	POINT(28.2	☐
16	17	Point15	28.21253415195	-26.26295093608	996	498	3	POINT(28.2	☐
17	18	Point16	28.20488156037	-26.22660112605	582	291	3	POINT(28.2	☐

Pivot will create a pivot of your data grid for you in Excel in a new worksheet, it will first bring up a dialogue where you will specify the row and column values etc. of the pivot and the new worksheet name:





	A	B	C	D	E
1		4	3	2	1
2	Point1			694	
3	Point10		1000		
4	Point100		763		
5	Point101		946		
6	Point102		761		
7	Point103		938		
8	Point104		798		
9	Point105		444		
10	Point106	605			
11	Point107	362			
12	Point108	349			
13	Point109	186			
14	Point11		464		
15	Point110	292			
16	Point111	878			
17	Point112	161			
18	Point113	38			
19	Point114	44			
20	Point115	229			
21	Point116	817			
22	Point117	626			
23	Point118	235			
24	Point119			10	
25	Point12		134		
26	Point120			766	
27	Point121			648	
28	Point122			405	
29	Point123			392	
30	Point124			675	
31	Point125				673
32	Point126				904
33	Point127				856
34	Point128				728
35	Point129				911
36	Point13		608		
37	Point130				520
38	Point131		571		

Pivot | Points

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