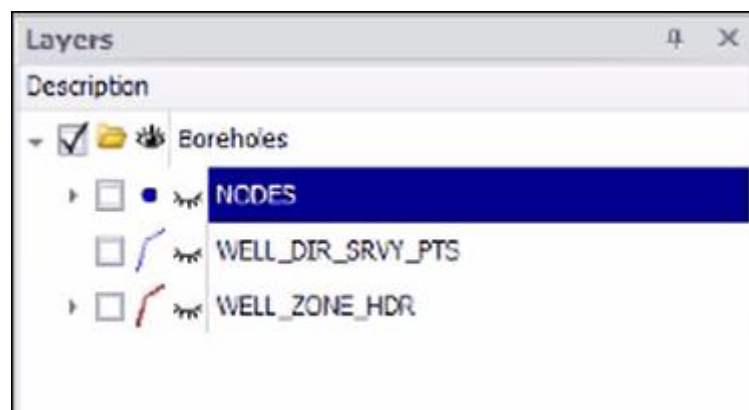
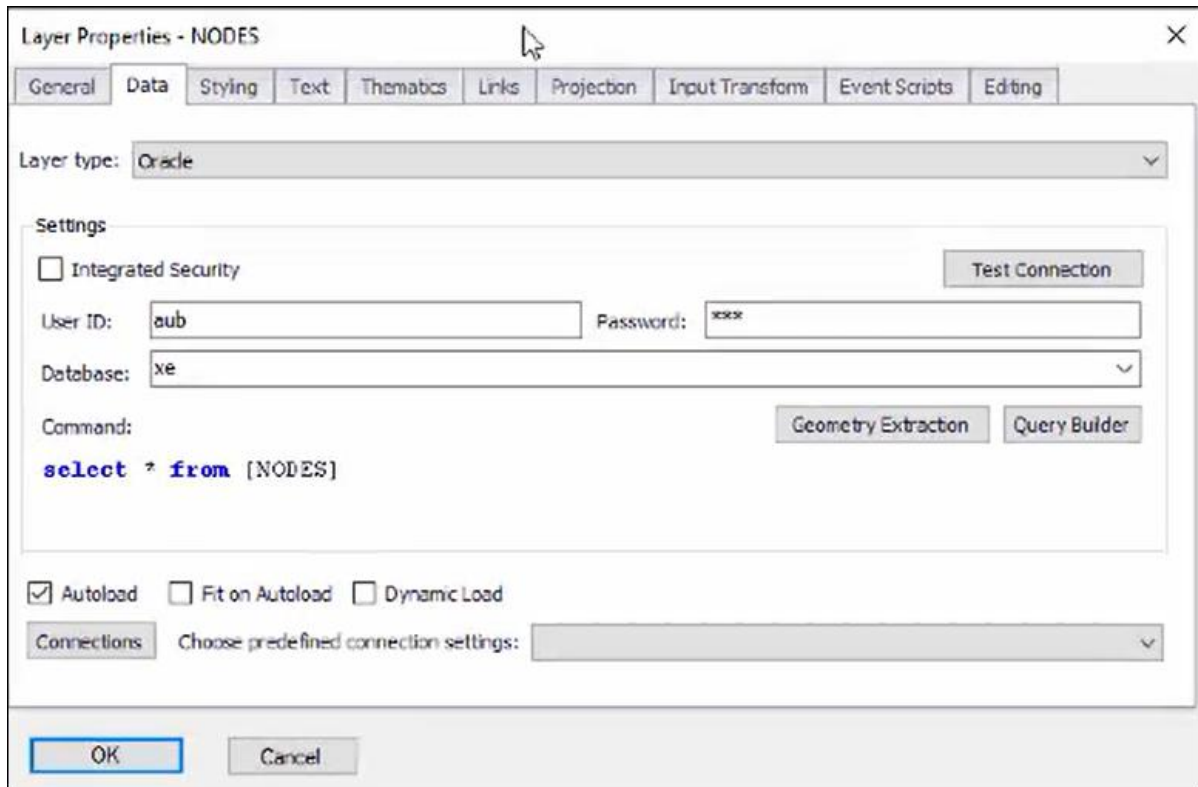




Borehole De-survey

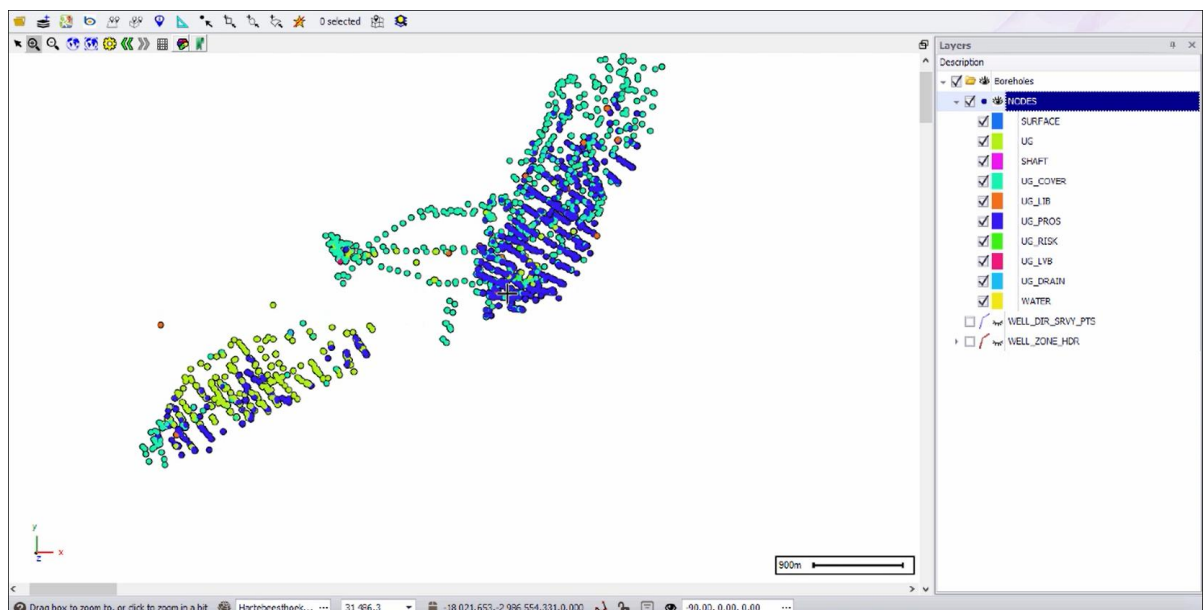
In all our spatial products you are able to do on-the-fly borehole de-surveys. You can load your boreholes from an Oracle or any other database (or add them as a layer from Excel itself in the case of SpatialXL). In this demonstration we will be pulling the data from an Oracle database. We are pulling the data from a **NODES** table which are the collars of the borehole, this has been added as a layer and if we go to the Layer Properties you will see the connection works like this:



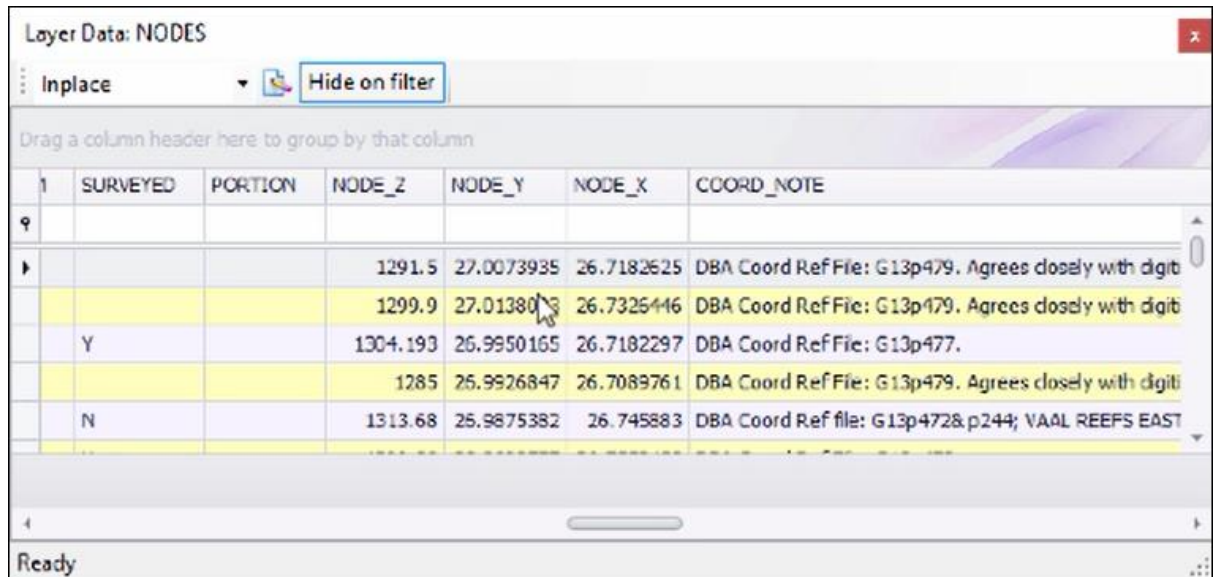


We have chosen the layer type as Oracle, put in our credentials for the database and then entered the query to select all from the **NODES** table in the database.

I will turn the **NODES** layer on now so we can see them in the scene, I have used the theming facility to theme these collars on whether they are surface, underground etc.:



I've used the feature of our spatial products where you can project on the fly. If you look in the layer data you will see the X,Y and Z columns which I'm using to place these collars are in geographical coordinates:



Layer Data: NODES

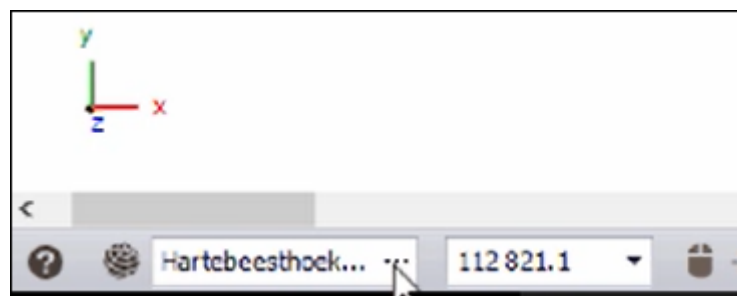
Inplace Hide on filter

Drag a column header here to group by that column

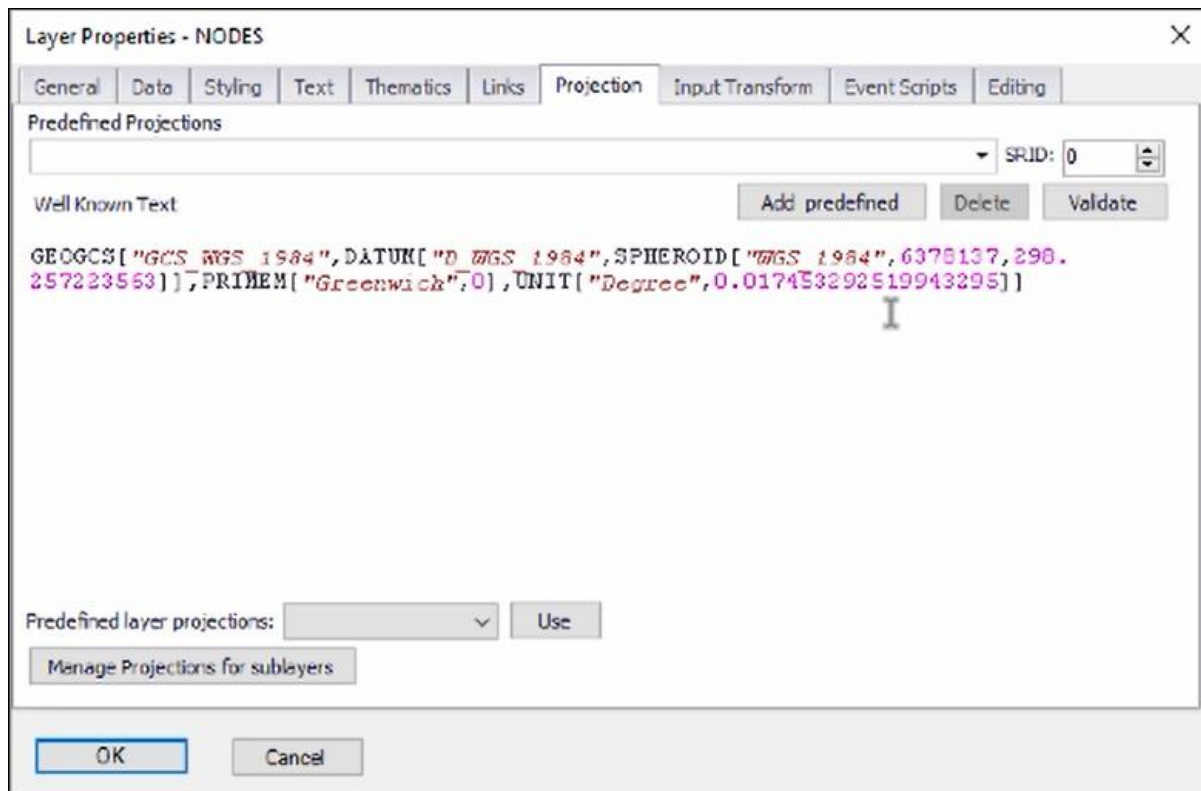
	SURVEYED	PORTION	NODE_Z	NODE_Y	NODE_X	COORD_NOTE
1						
9						
▶			1291.5	27.0073935	26.7182625	DBA Coord Ref File: G13p479. Agrees closely with digit
			1299.9	27.0138013	26.7325446	DBA Coord Ref File: G13p479. Agrees closely with digit
	Y		1304.193	26.9950165	26.7182297	DBA Coord Ref File: G13p477.
			1285	26.9926847	26.7089761	DBA Coord Ref File: G13p479. Agrees closely with digit
	N		1313.68	26.9875382	26.745883	DBA Coord Ref file: G13p472&p244; VAAL REEFS EAST

Ready

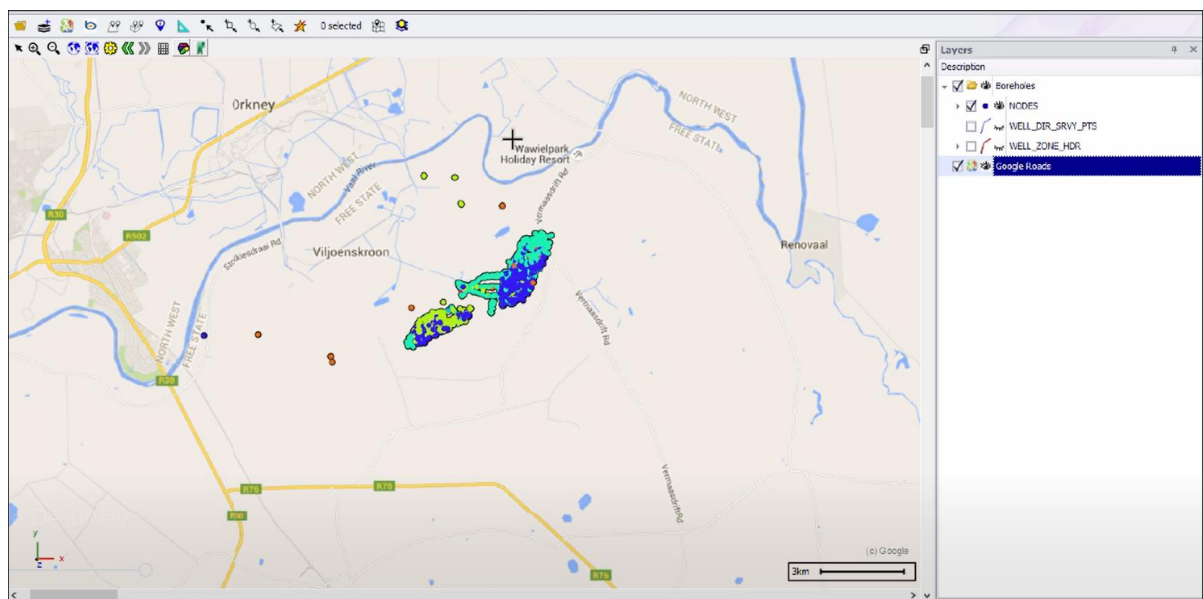
However, in our scene we are using the HartebeeshoekLO27 coordinates which is the true coordinates of the area:



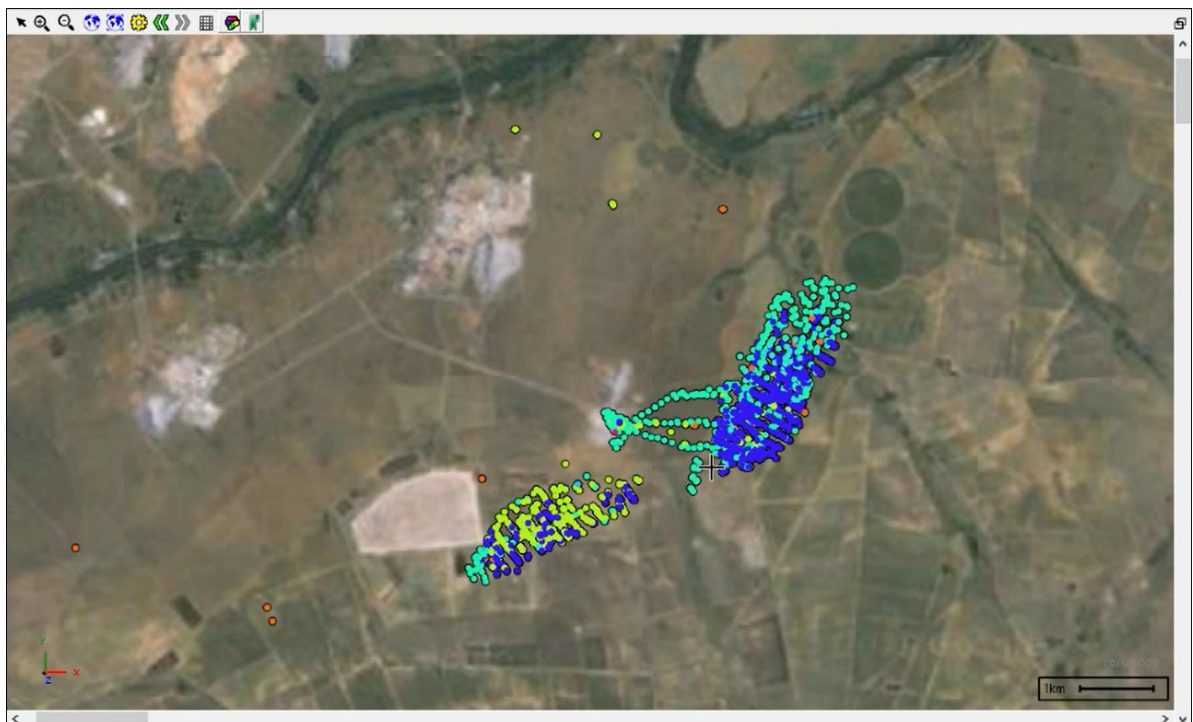
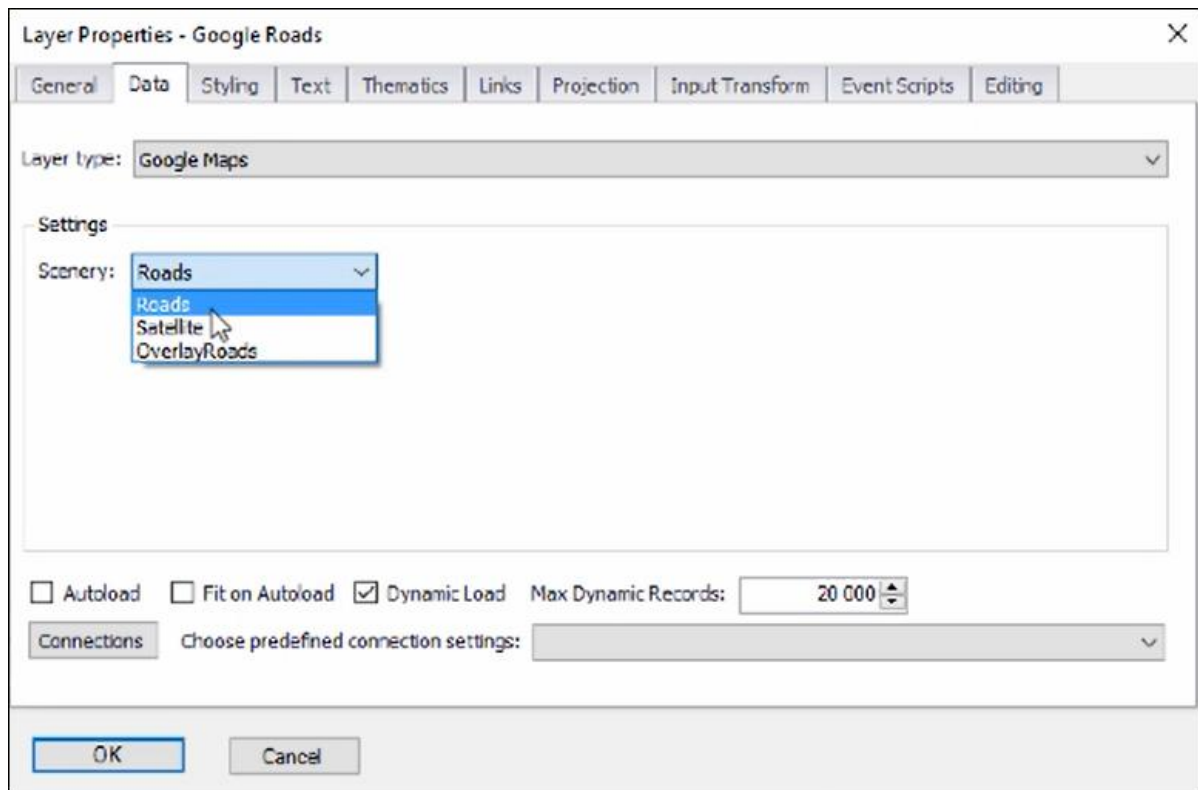
In the Layer Properties however I have specified that this **NODES** layer is in the geographic coordinate system, this is then projected on the fly to the scene projection:



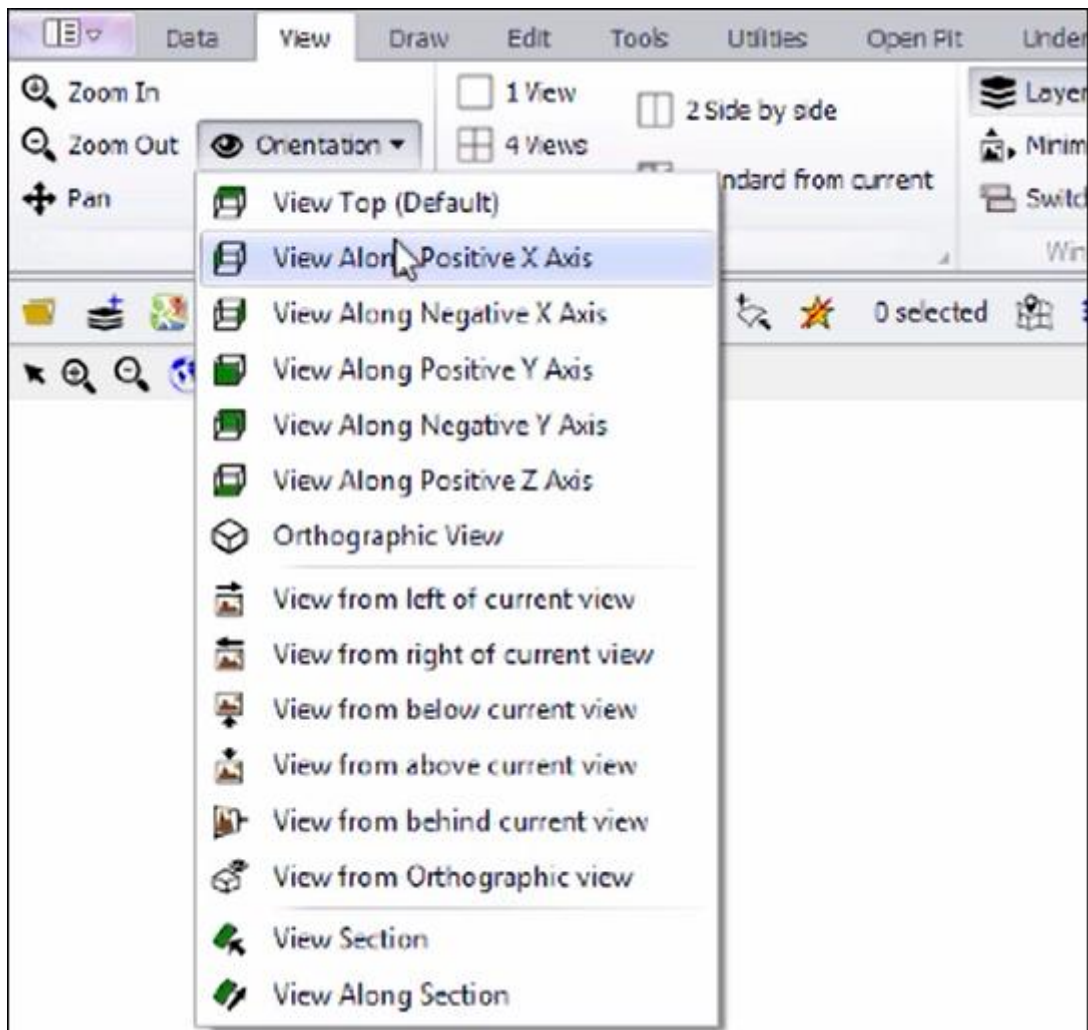
To get an idea of how our data looks we can turn on Google Maps to see where it fits, and here we can see that we are actually in the Vaal Reefs area in South Africa:

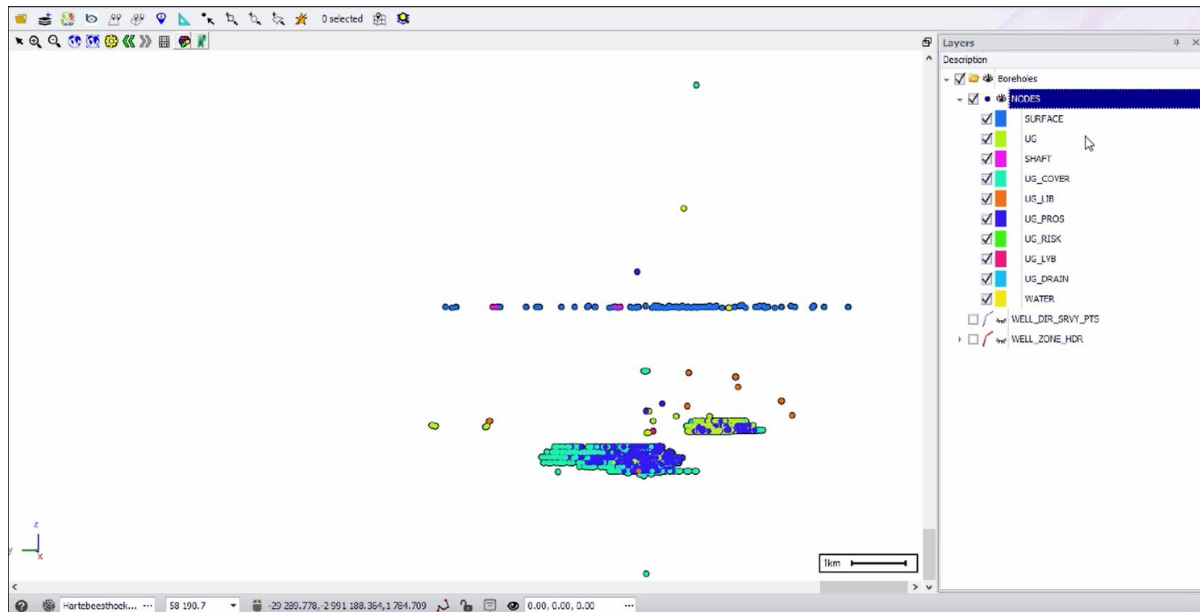


To get a better idea we can change the properties of our Google layer to satellite view instead:

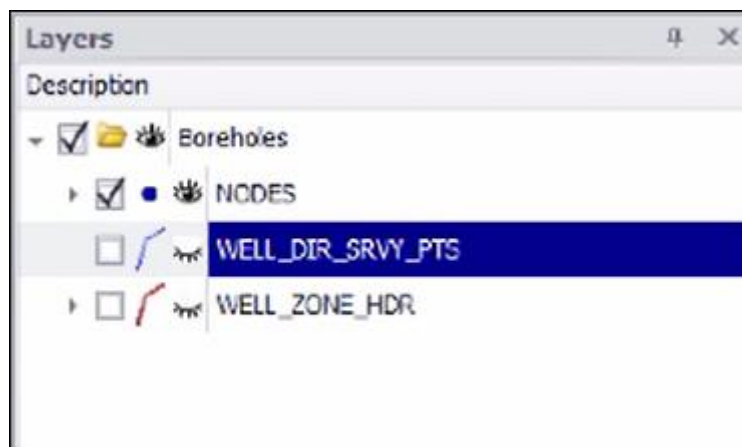


We will now be working underground to do the borehole de-survey operation so I will turn off my Google Maps and then I will get a side view of my data:





To do the borehole de-survey I then select the layer with the Oracle table that has the surveys in it, which is the **WELL_DIR_SRVY_PTS** (Well Direction Survey Points) layer, if we view its properties, we see it has the same connection, this time querying data from a different table:



Layer Properties - WELL_DIR_SRVY_PTS

General Data Styling Text Thematics Links Projection Input Transform Event Scripts Editing

Layer type: Oracle

Settings

☐ Integrated Security Test Connection

User ID: Password:

Database:

Command: Geometry Extraction Query Builder

```
select * from [WELL_DIR_SRVY_PTS]
```

☒ Autoload ☐ Fit on Autoload ☐ Dynamic Load

Connections Choose predefined connection settings:

OK Cancel

If we then view its data, we will see that it has all the survey values:

Layer Data: WELL_DIR_SRVY_PTS

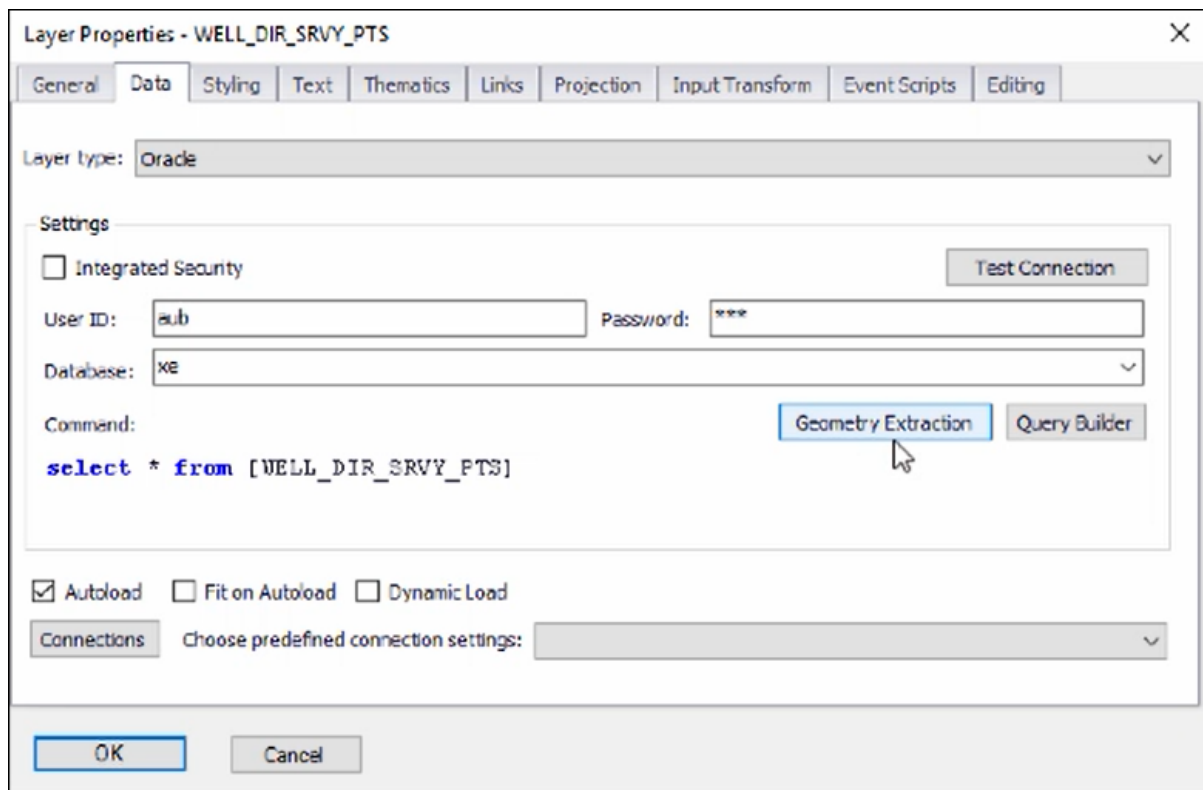
Inplace Hide on filter

Drag a column header here to group by that column

	WEDGE_NO	MD	DEVIATION_ANGLE	AZIMUTH	NOTE
		2121.41	17.5	335	
		2119	30.7	327.7	SURVEYED 07/05/87
		2113.79	27	327	
		2109.21	13.87	328	
		2103.12	10.5	317.1	
		2100	23.8	352	
		2094	30	326.7	SURVEYED 07/05/87
		2090.93	18	335.5	
		2075	9.8	333.7	
		2072.66	9.5	261.7	End of Original.
		2072	9.5	261.7	

Ready

Now what we need to do is tell our system that this is survey data, to do that we go into the Layer Properties and click on **Geometry Extraction**, here will specify how to extract the geometries in this layer:



As you can see, I've chosen the **Borehole De-survey** option, then I specified what is the collar layer and what is the unique ID to link on:

Geometry Creation Columns

Geometry Creation: Borehole De-survey

Borehole Desurvey

ID Column: NODE_ID

Depth Column: MD

Dip Column: DEVIATION_ANGLE

Dip value for horizontal: 90 ☒ Increase up

Direction Column: AZIMUTH

Direction value for eastwards: 0 ☐ Clockwise

Angular Units: Degrees

Collar Layer: NODES

ID Column: NODE_ID

OK Cancel

Then I specified the column in the survey data to link to the collar layer with:

Geometry Creation Columns

Geometry Creation: Borehole De-survey

Borehole Desurvey

ID Column: NODE_ID

Depth Column: MD

Dip Column: DEVIATION_ANGLE

Dip value for horizontal: 90 ☒ Increases up

Direction Column: AZIMUTH

Direction value for eastwards: 0 ☐ Clockwise

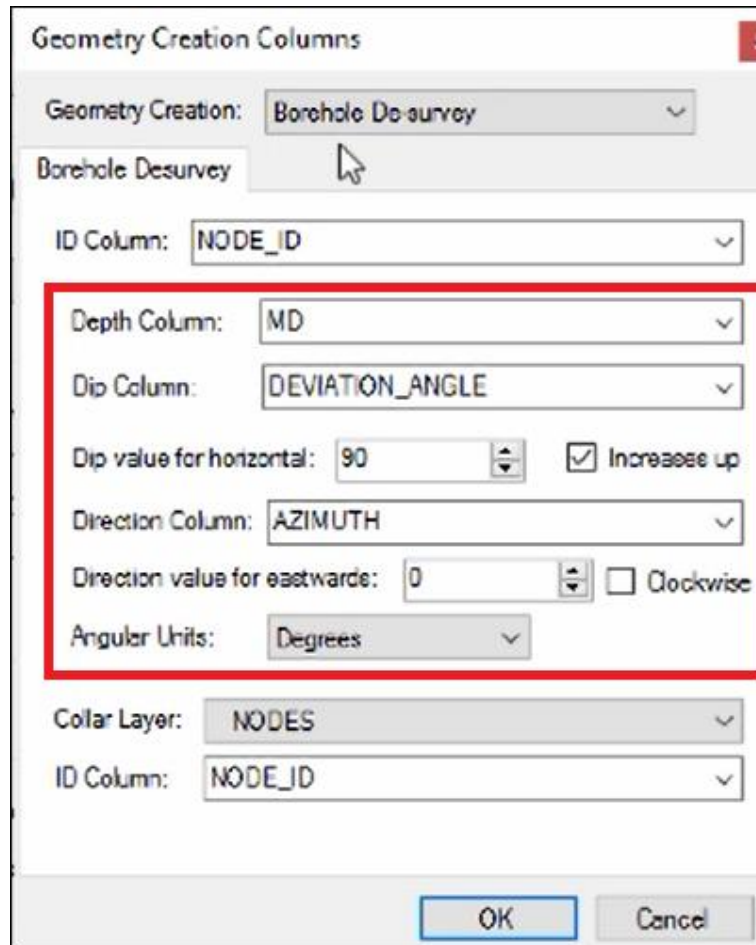
Angular Units: Degrees

Collar Layer: NODES

ID Column: NODE_ID

OK Cancel

Then I chose corresponding columns in my survey data for **Depth Column**, **Dip Column** and **Direction Column** and specified the other various details such as **Dip value for horizontal** etc.:



The dialog box is titled "Geometry Creation Columns". It contains several fields and checkboxes. A red rectangle highlights the following fields:

- Depth Column: MD
- Dip Column: DEVIATION_ANGLE
- Dip value for horizontal: 90
- Direction Column: AZIMUTH
- Direction value for eastwards: 0
- Angular Units: Degrees

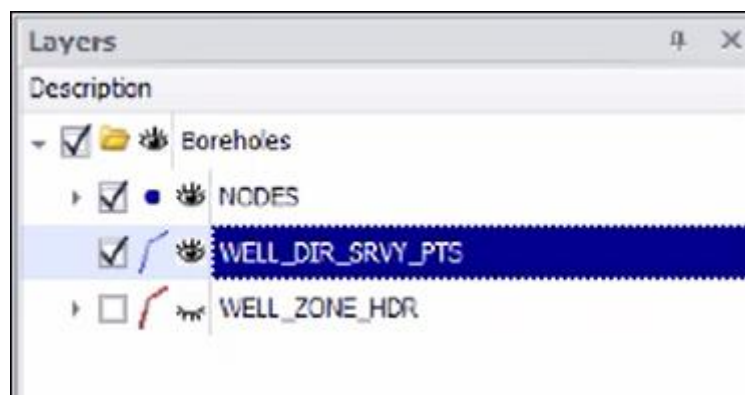
Other fields include:

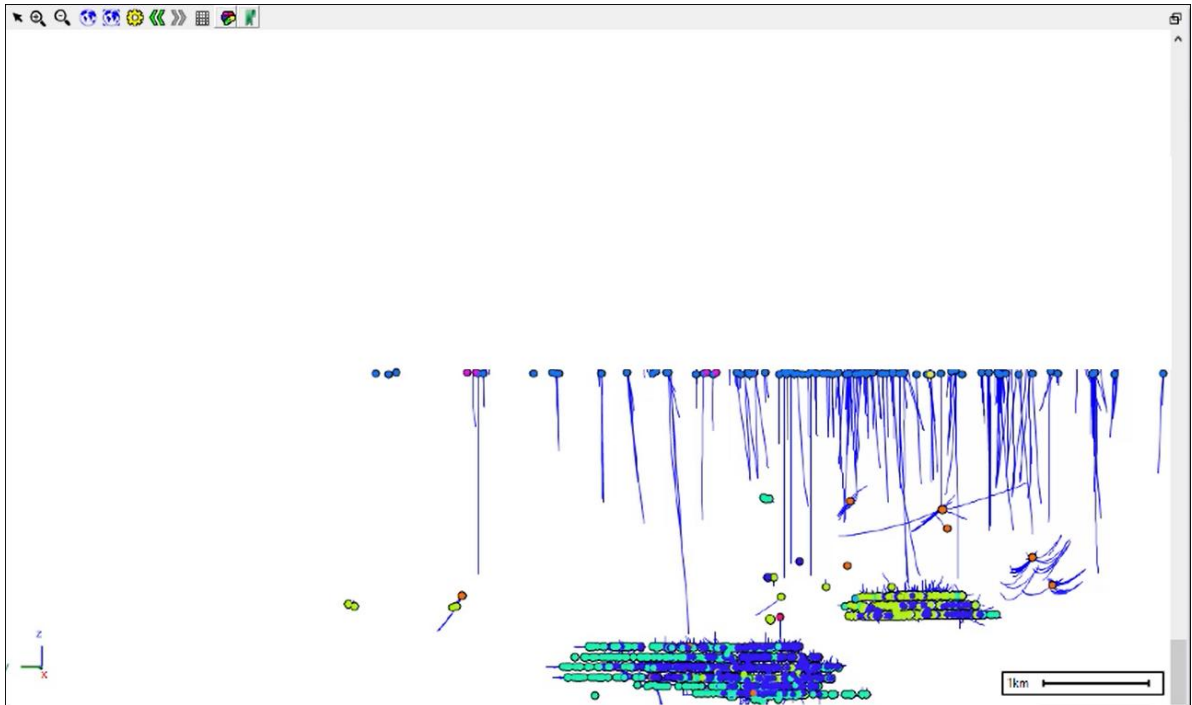
- Geometry Creation: Borehole De-survey
- ID Column: NODE_ID
- Collar Layer: NODES
- ID Column: NODE_ID

Checkboxes include "Increase up" (checked) and "Clockwise" (unchecked).

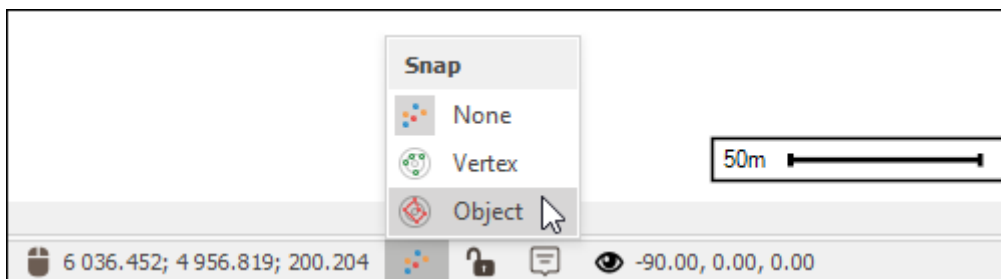
Buttons at the bottom: OK, Cancel.

Once you have specified your geometry extraction for your survey data and clicked **OK** on the Geometry Extraction dialogue and Layer Properties box, the boreholes will automatically de-survey. I will turn on the de-surveyed layer and you will see the boreholes:

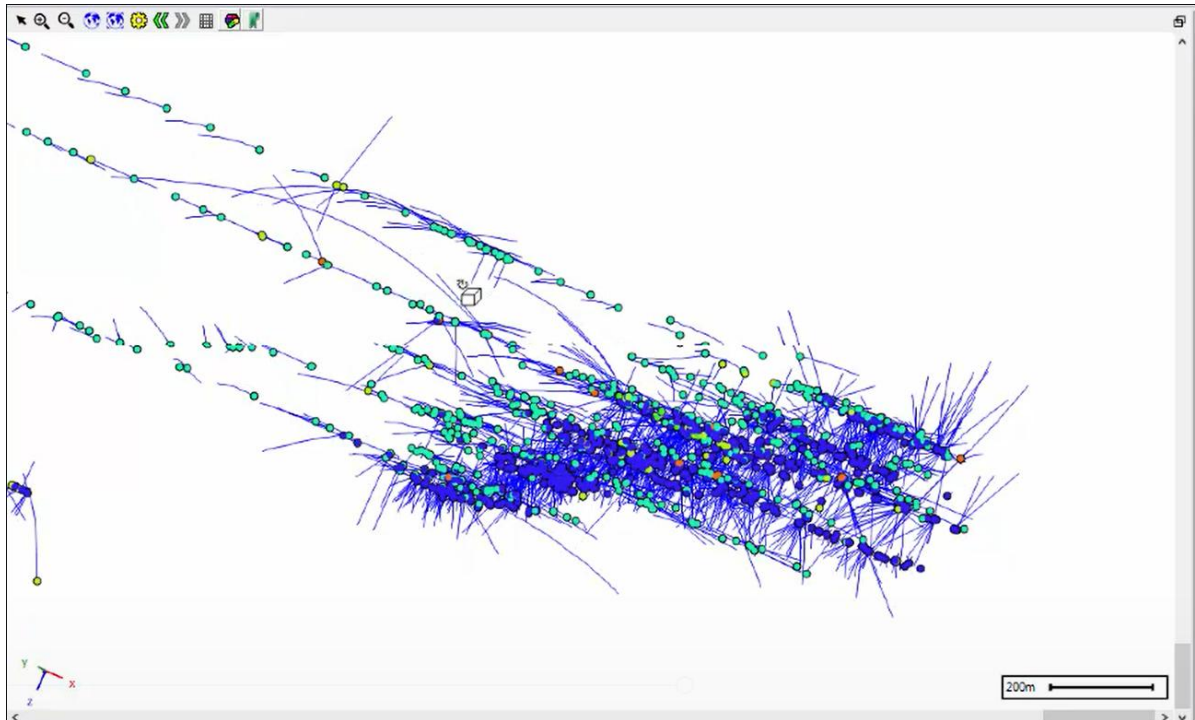




You can snap to one of them using one of the snapping tools and rotate about it to get an idea of how its looking:

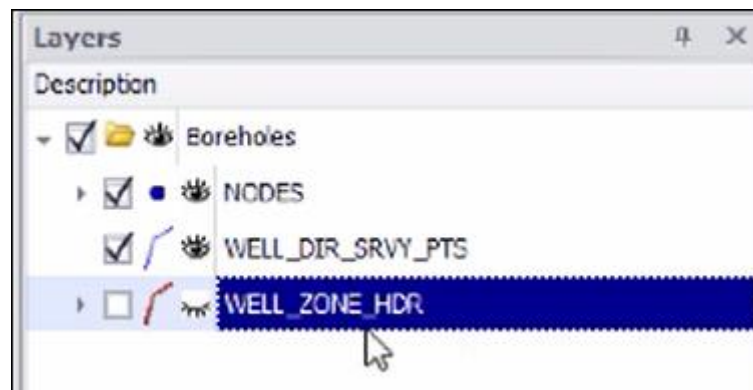


Snap to the desired point by clicking and then hold down ctrl while still holding down left click and drag to rotate:

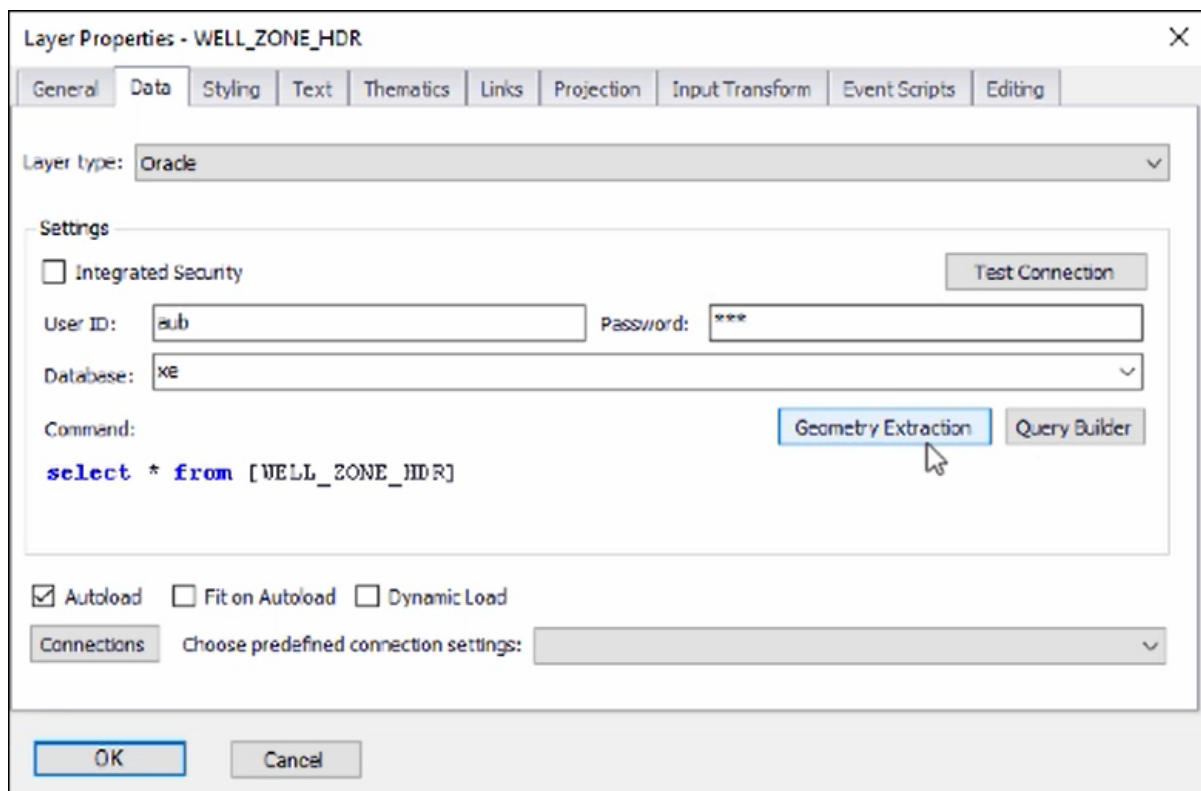


This is an on-the-fly de-survey so if you were to change any of the survey table data in Oracle, all you need to do is refresh the layer and you will get a new de-survey.

Now, what we can do next is to get the stratigraphy of these boreholes using the **WELL_ZONE_HDR** layer, this layer is pulling its data from an Oracle table as well:



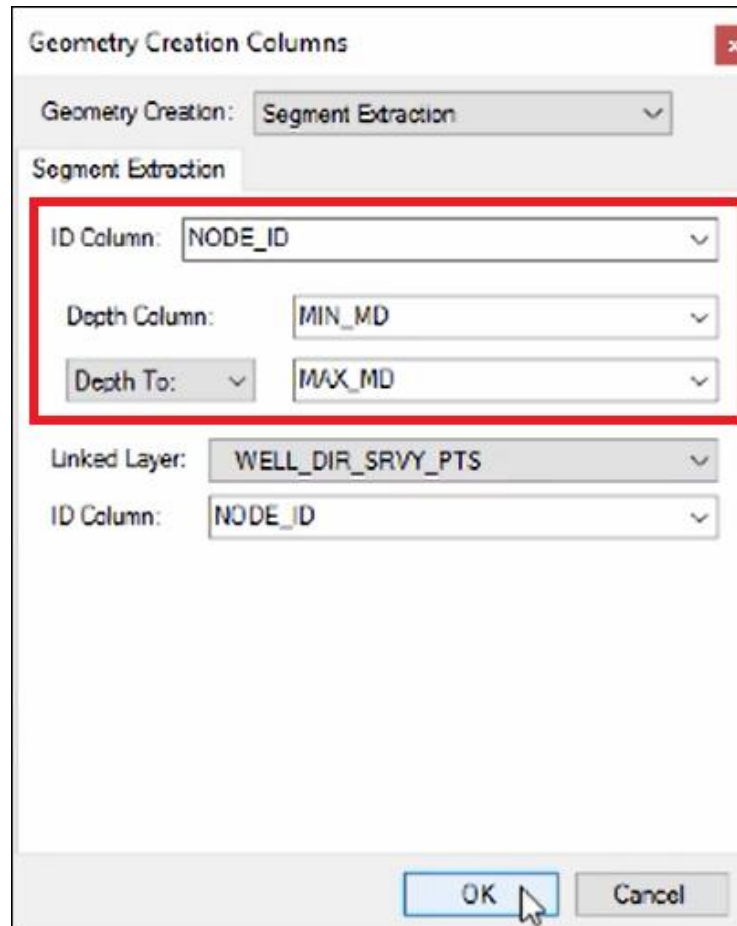
We need to tell the system how to get stratigraphy data out of this layer and so we go to **Geometry Extraction** in the Layer Properties of this layer:



This time we choose **Segment Extraction**. We then choose the layer its linked to and the unique ID column to link on, this is the layer that we are going to extract segments off of since it contains line segments:

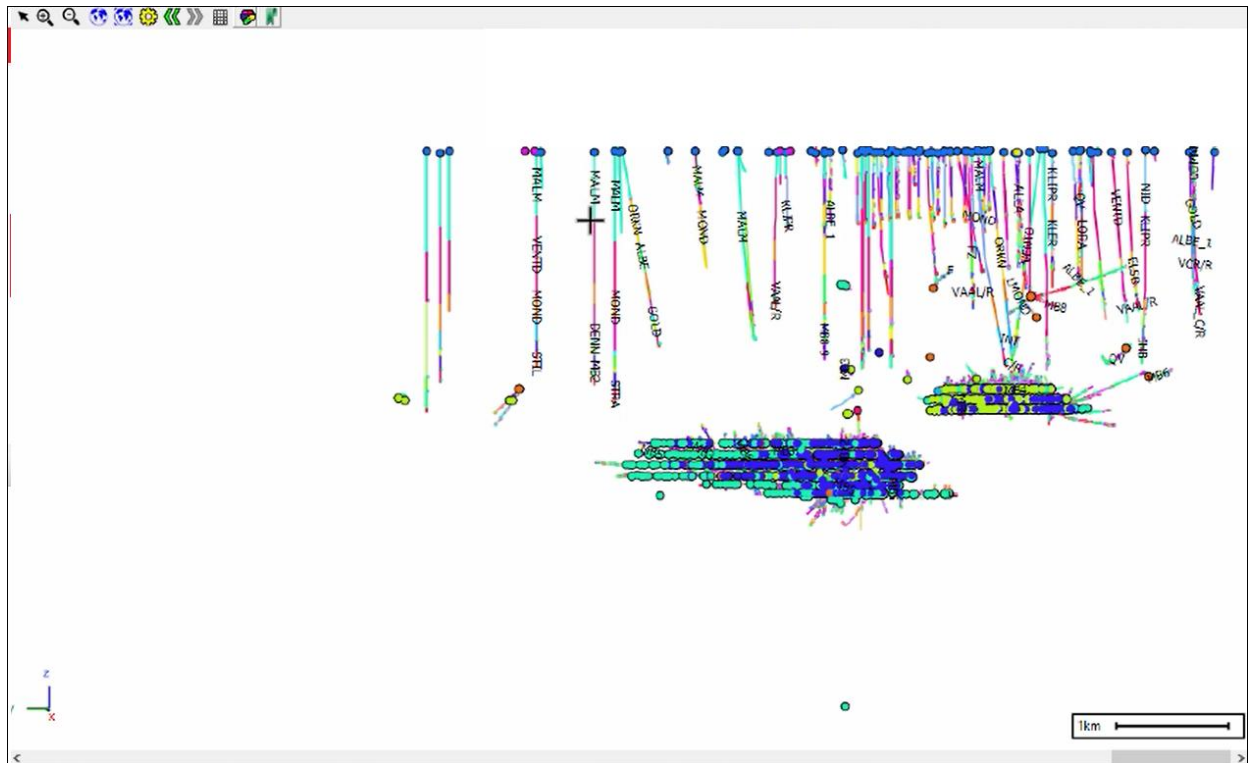
The screenshot shows a dialog box titled "Geometry Creation Columns". At the top, there is a dropdown menu labeled "Geometry Creation:" with "Segment Extraction" selected. Below this, the "Segment Extraction" section is active. It contains three dropdown menus: "ID Column:" with "NODE_ID", "Depth Column:" with "MIN_MD", and "Depth To:" with "MAX_MD". Below these, there is another section with a dropdown menu labeled "Linked Layer:" with "WELL_DIR_SRVY_PTS" selected, and an "ID Column:" dropdown with "NODE_ID". A red box highlights the "Geometry Creation:" dropdown, and another red box highlights the "Linked Layer:" and its "ID Column:". At the bottom right, there are "OK" and "Cancel" buttons. The "OK" button is highlighted with a blue box.

Then we choose the **ID Column** in the stratigraphy layer to link with, we also choose the corresponding columns for depth from and depth to:



Then we click **OK** on the Geometry Extraction dialogue and the Layer Properties box and the stratigraphy has been extracted on the fly off those surveyed points:

Borehole De-survey User Guide



I have the names of the different layers going along the boreholes as text labels. I can do some filters now by going to the layer data of the stratigraphy and filtering on **Layer Type** for example to only show **REEF** sections of the boreholes:

Layer Data: WELL_ZONE_HDR

Inplace

Drag a column header here to group by that column:

WELL_ZONE_ID	DEFNO	UWI	NODE_ID	STATUS	DATA_SOURCE	OWNER	STRAT_SCOPE_ID	LAYER_TYPE	LAYER_NAME	MTM_MD	LAST_UPDATE	MAX_MD	CONTACT	U_NAME	BASE_F
2	0	2492-0	2492	SEC	SUM_LOG	STRYDOM_PM	1	FM	RED	18	1995/04/18	664.2	U		
1	0	3103-0	3103	SEC	SUM_LOG	STRYDOM_PM	1	SUBGP	FM	18	1995/04/18	557.5	U		
4	0	2492-0	2492	SEC	SUM_LOG	STRYDOM_PM	1	FM	GP	18	1995/04/18	1584.1	NORM		
8	0	2492-0	2492	SEC	SUM_LOG	STRYDOM_PM	1	MEME	MEMB	18	1995/04/18	1923.6	NORM		
9	0	2492-0	2492	SEC	DUMMY	AAPS_DBA	1	MEME	NOISE	18	1995/04/18	1923.61	DUMMY		
10	0	2492-0	2492	SEC	DUMMY	AAPS_DBA	1	FM	REEF	18	1995/04/18	2009.23	DUMMY		
6	0	3249-0	3249	SEC	RAPID	AAPS_DBA	1	FM	SEQ	18	1995/04/18	1400	NORM		
7	0	3249-0	3249	SEC	RAPID	AAPS_DBA	1	FM	SUBGP	18	1995/04/18	1661.08	NORM		
10	0	3249-0	3249	SEC	RAPID	AAPS_DBA	1	MEME	SUBGP	18	1995/04/18	1875	DUMMY		
12	0	3249-0	3249	SEC	DUMMY	AAPS_DBA	1	SUBGP	ZONE	18	1995/04/18	1914.99	DUMMY		
14	0	3249-0	3249	SEC	DUMMY	AAPS_DBA	1	MEME	J-B	1875.01	1995/04/18	1915.01	DUMMY		
15	0	3249-0	3249	SEC	DUMMY	AAPS_DBA	1	FM	MB6	1915	1995/04/18	2052.71	DUMMY		
16	0	3249-0	3249	SEC	RAPID	AAPS_DBA	1	MEME	STIL	1915.01	1995/04/18	2052.72	NORM		
18	0	3249-0	3249	SEC	LIST	GEOVEN	1	FM	MB8-9	2052.94	1995/04/18	2200	END		
12	0	2492-0	2492	SEC	SUM_LOG	STRYDOM_PM	1	FM	COMM	2009.24	1995/04/18	2034.8	END		
3	0	2493-0	2493	SEC	SUM_LOG	STRYDOM_PM	1	FM	STIL	2009.24	1995/04/18	1473.4	NORM		
4	0	2493-0	2493	SEC	SUM_LOG	STRYDOM_PM	1	MEME	MOND	1295.4	1995/04/18	1766	NORM		
5	0	2493-0	2493	SEC	SUM_LOG	STRYDOM_PM	1	RED	GEQ	1473.4	1995/04/18	1817.8	NORM		
8	0	2493-0	2493	SEC	SUM_LOG	STRYDOM_PM	1	MEME	DENN	1766	1995/04/18	2103.1	NORM		

Ready



Support

T: +27871354351



support@primethought.biz - primethought.biz

Kyalami Estate, Midrand, Johannesburg,
1684, South Africa

