MapAble®

Visualize · Map · Collaborate

Manual: Queries and Reports

Version 2: April 2017

The information and instructions described below is subject to change and you should view our online manual that is periodically updated for up-to-date information (www.mapable.co.za/help).

Purpose of the module

This module will give an overview of the spatial queries and templates that can be used to create reports available in the MapAble workspace including practical applications.

Learning Objectives

After completing this module, you will achieve the following leaning objectives:

- Introduction into Queries and Reporting in MapAble.
- Why Do Reporting in Mapable?
- What Is a Query?
- What Is a Report?
- How to create a Report?
- Query Toolbox
- How to Create a Template?
- How to Run a Report?

Content

Why do reporting in MapAble?

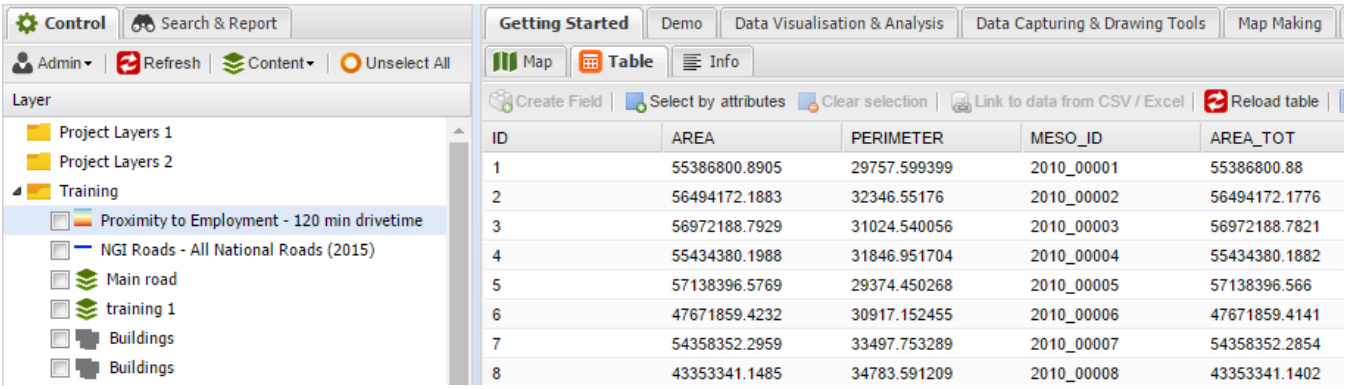
The reporting feature in MapAble makes basic and advanced analysis possible, where a selected area can be analysed in the context of other data layers. Once a report or set of queries has been produced in MapAble, quick analysis is possible on any applicable area.

What is a query?

A query is used to extract data from the database in a readable format according to the user's request. Queries form the basis of any report. Examples of questions that can be turned into queries:

- What is the size of the area?
- Are there any hospitals in the area?
- What is the nearest hospital?
- What % of the area is a nature reserve in the area?
- What is the total size of wetlands in the area?
- What is the total length of roads in the area?
- In what ward does this point fall? etc.

To answer these questions the data within MapAble need to be queried. The data that underlines all the information in MapAble is the Table of each layer.



The queries in MapAble essentially ask a question to the system related to a data layer/attribute.

MapAble users have 20 queries to one reports with it.

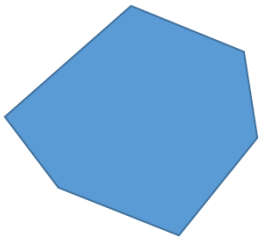
What is a report?

A report is a set of queries typically organised for a specific purpose i.e. demographic profile report for an area (with queries related to demographic info). Reports can be generated to just show the results (based on the queries or in a MS word Template).

The Spatial Analysis and Queries functions lets you create a Query List with a range of analytical procedures or queries. All the queries in the list, form the base inputs to a report that can be run from any similar type of spatial feature (e.g. polygon. line or point). An example may be a Demographic Profile of an area which executes a range of queries to describe the demographic characteristics from the various available layers.

Reports can be run on all the different types of vector files or layers including polygons (areas), polylines (lines) and points. It should be noted that the functionality and availability of queries depend on the type of report generated (e.g. vertical profile query can only be generated and run on a line feature).

Types of reports:



Polygon Report

Reporting on polygons/area

e.g. a new housing project sites or wards you need to report on.

Line Report

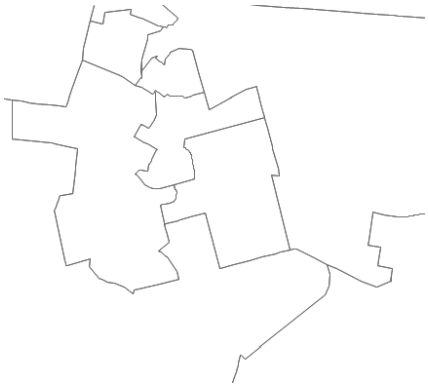
Reporting on lines

e.g. a new road project and surrounding areas.

Point Report

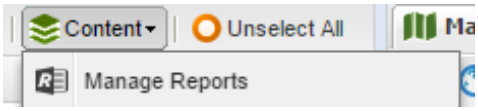
Reporting on points

e.g. a new school location and surrounding areas.

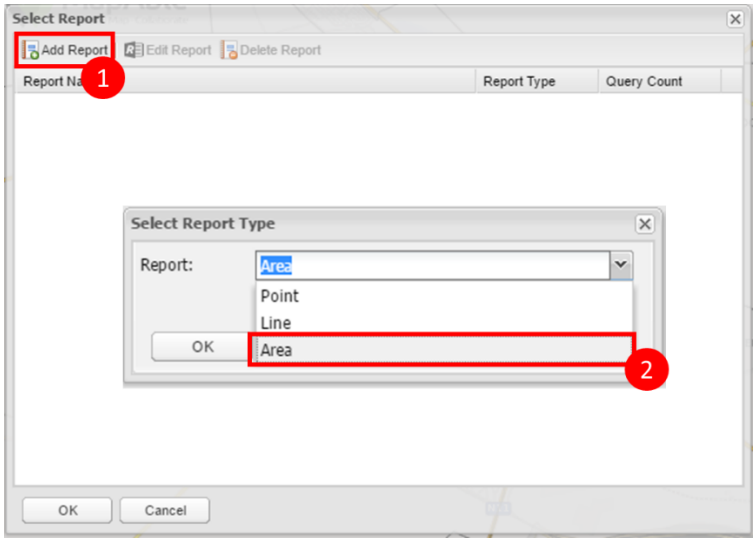


How to create a report:

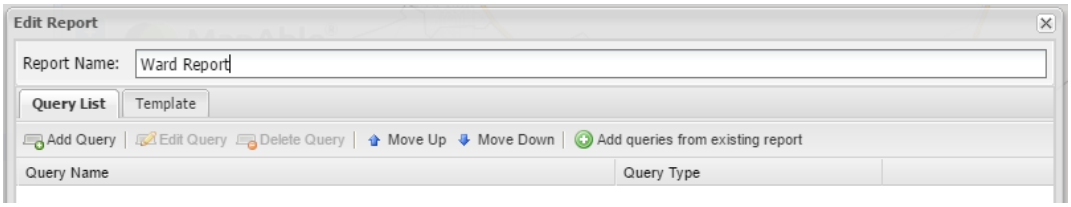
To create queries and build a report click on the on the Content dropdown list and select Manage Report button:



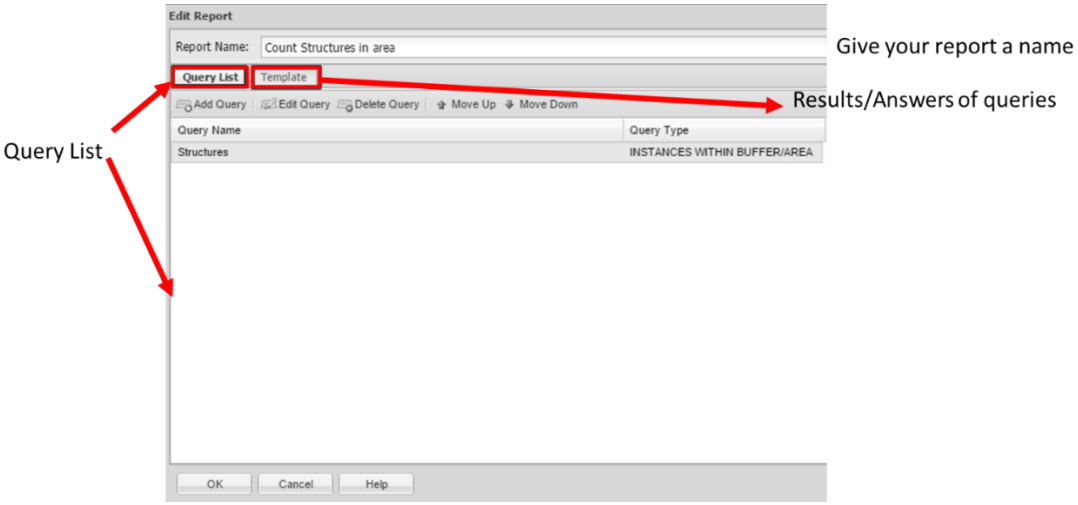
To create the Ward Profile Report first click on the Add Report button to create a new Report and select an Area report as a Ward is a polygon or an area which you want to report on:



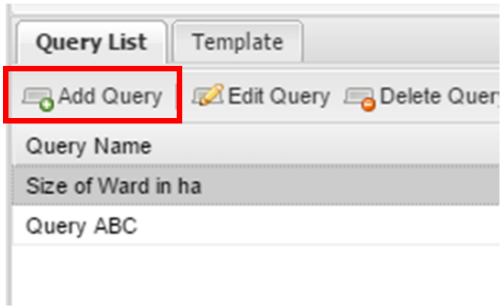
Once you create the report, an edit report box will be opened. Name the report:

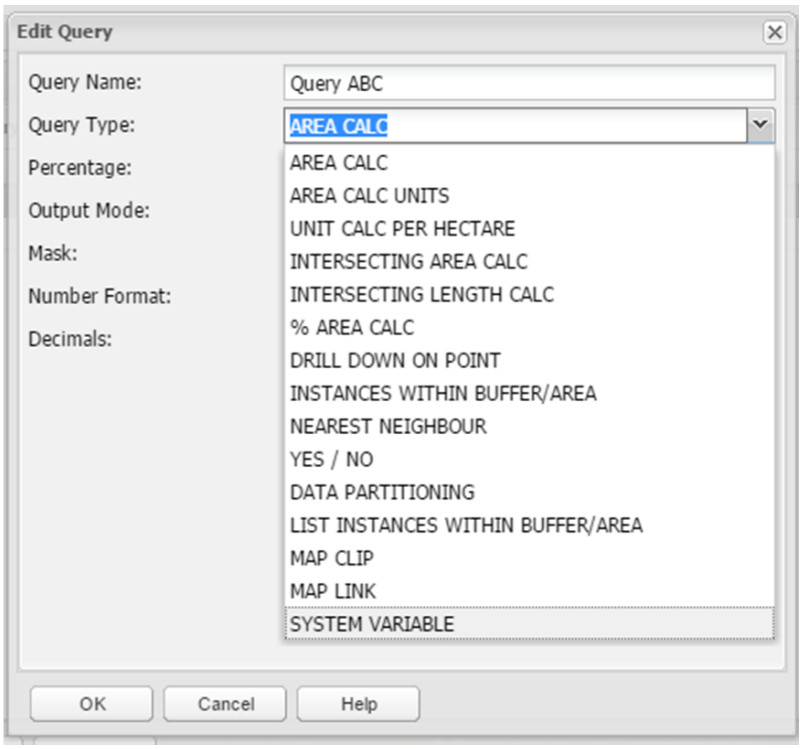


The next step is to populate the report with queries.



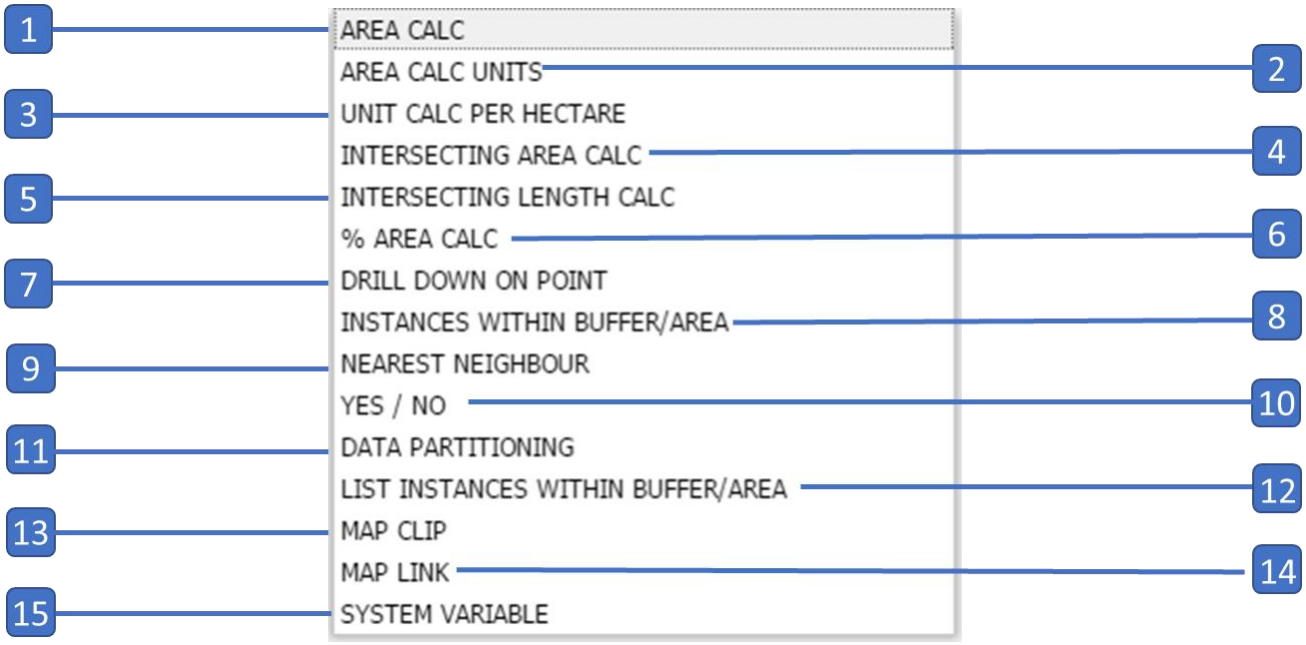
Click on the Add Query button which will open the Add Query box (or edit query once created and reopened). Give your query a unique name and select the type of query you require.





The types of queries are discussed in the section below.

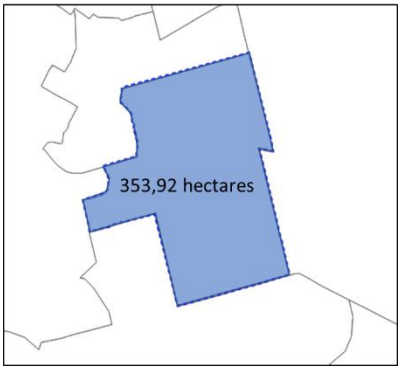
Query Toolbox



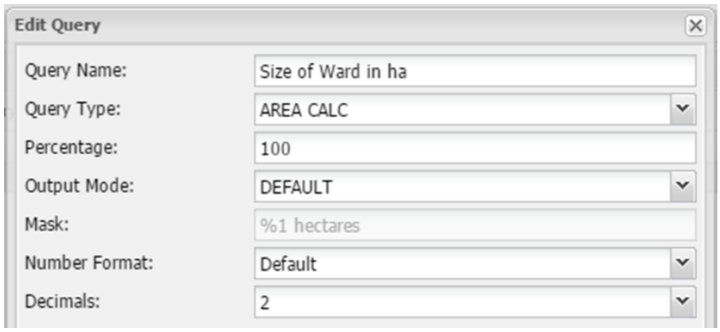
1. Area Calc

- Also known as: Area Calculation
- Area Calc is a simple calculation of the total area of the study area in hectares
- When to use: When the area of a land parcel needs to be calculated and reported on.
- Only applicable for reporting on areas.

What is the size of the area?



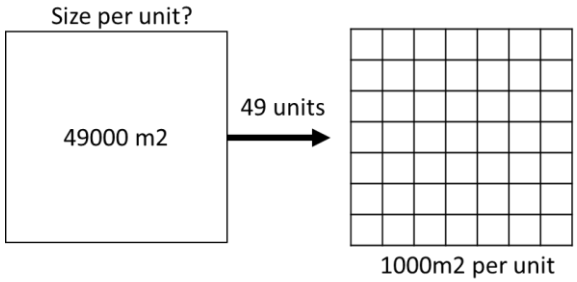
The query should be filled in the following manner:



Name of Query
Choose Area Calc Type
% - Calculate entire/portion of the area
Choose how the data/answer should be displayed
%1 = the value generated + how it is displayed
Choose the number format
Decimals you want e.g. 2 decimals = 4.12 hectares

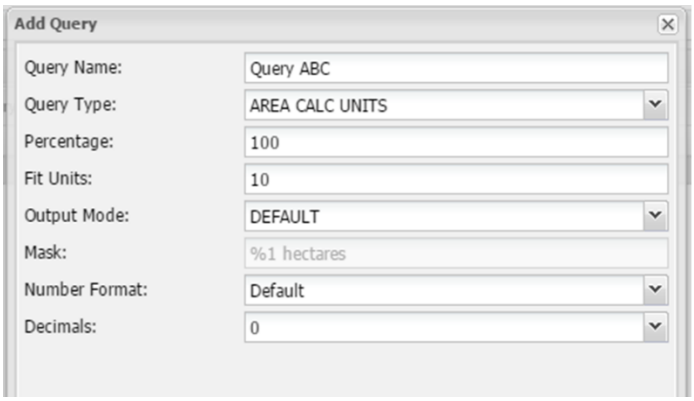
2. Area Calc Units

Also known as: Area Calculation per Equal Sized Units



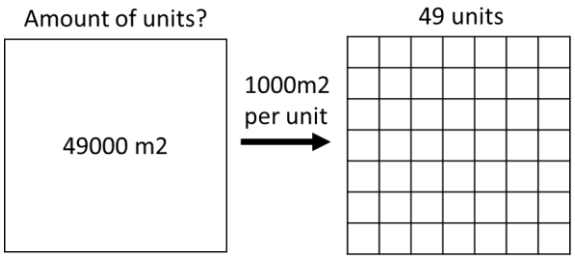
- This method assists you to calculate the average size of parts if it is to be split in a certain amount of parts. Yet again, you can do the calculation on only a certain percentage of the total study area as well.
- When to use: To calculate the average size of the area if it is to be split in a certain amount of equal size
- Only applicable for reporting on areas.

The query should be filled in the following manner:



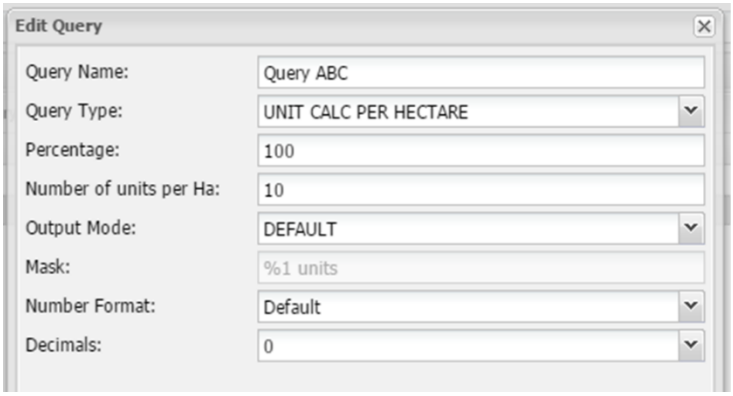
Name of Query
Choose between Area Calc Units
% - Calculate entire/portion of the area
How many units needs to be fit in the area
Choose how the data/answer should be displayed
%1 = the value generated + how it is displayed
Choose the number format
Decimals you want e.g. 2 decimals = 4.12 hectares per unit

3. Unit Calc per hectare



- Also known as: Unit Calculation per Hectare
- With this method, the user can calculate how many units will fit in the study area if it is to be of a certain size. The user can do the calculation on only a certain percentage of the total study area or the full area.
- When to use: To calculate how many units will fit in the study area if it is to be split by a certain unit per hectare ratio.
- Only applicable for reporting on areas.

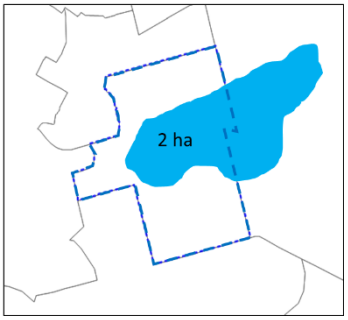
The query should be filled in the following manner:



Name of Query
Choose between Area Calc Units
% - Calculate entire/portion of the area
Number of units per ha
Choose how the data/answer should be displayed
%1 = the value generated + how it is displayed
Choose the number format

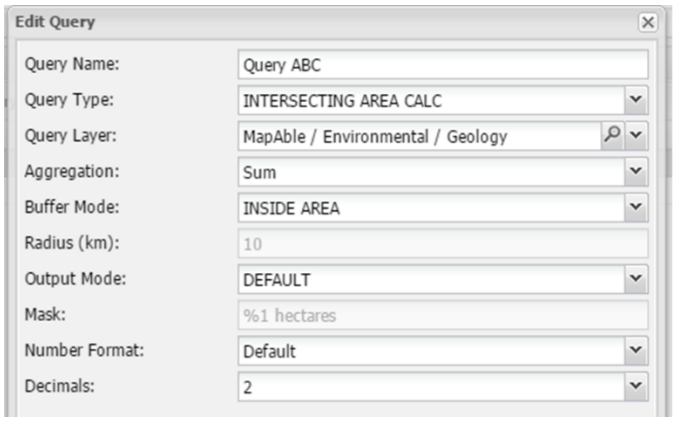
4. Intersecting Area Calc

What is the total size of wetlands in the area?



- Also known as: Intersecting area calculation
- With this method, the user can calculate how many units will fit in the study area if it is to be of a certain size. The user can do the calculation on only a certain percentage of the total study area or the full area.
- When to use: To calculate how many units will fit in the study area if it is to be split by a certain unit per hectare ratio.
- Applicable for all vector types (Polygon, Line and Points)

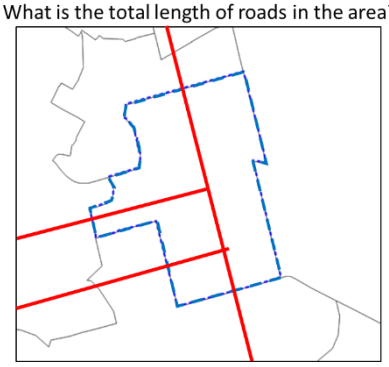
The query should be filled in the following manner:



Name of Query
Choose Intersecting area calc
Choose the intersecting layer you want to query
Choose between Sum or Average
Choose inside the area query/add a buffer area
Radius of the buffer if selected
Output mode
Output type preview
Choose the number format
Decimals you want e.g. 2 decimals = 4.12 hectares per unit

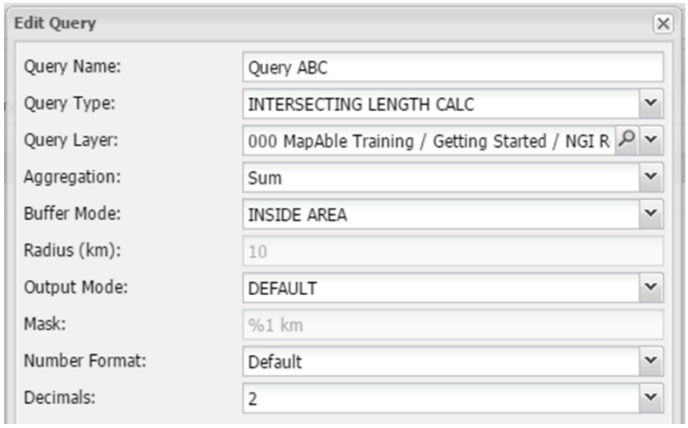
5. Intersecting length calc

What is the total length of roads in the area?



- Also known as: Intersecting length calculation
- The length calculation tool intersects the study area with a chosen theme and calculate the total length of each part of the chosen theme which intersects the study area.
- When to use: The length of different linear elements in the study area e.g. area intersecting with infrastructure: roads, electricity lines, sewage etc.
- Applicable for all vector types (Polygon, Line and Points)

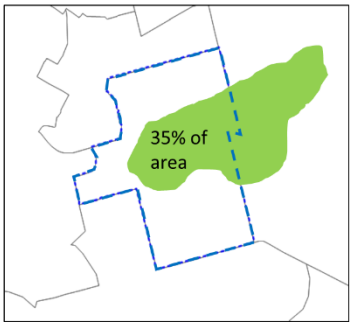
The query should be filled in the following manner:



Name of Query
Choose Intersecting length calc
Choose the intersecting layer you want to query
Choose between Sum or Average
Choose inside the area query/add a buffer area
Radius of the buffer if selected
Output mode
Output type preview
Choose the number format
Decimals you want e.g. 2 decimals = 4.12 hectares per unit

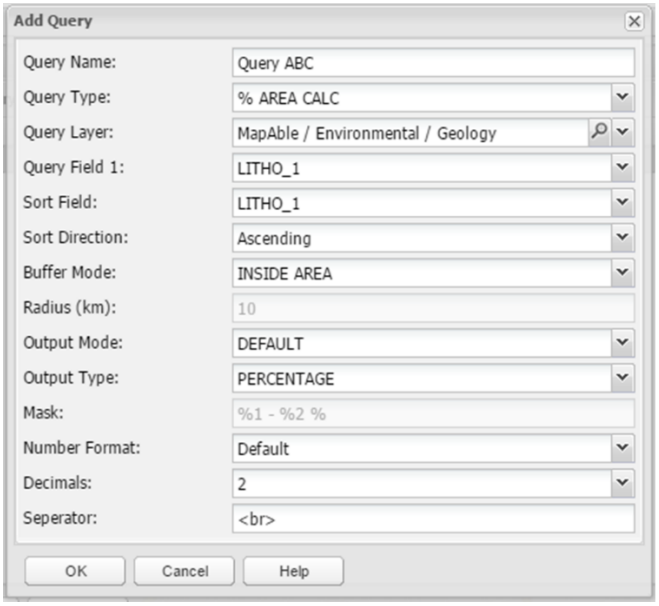
6. % Area Calc

What % of the area is a nature reserve in the area?



- Also known as: Calculate % Intersect area
- The percentage area calculation tool intersects the study area with a chosen theme and calculate the percentage of each part of the chosen theme which intersects the study area
- When to use: Percentage of different land use in the study area e.g. area intersecting with geology, waterbodies, wetlands.
- Only applicable for reporting on areas.

The query should be filled in the following manner:

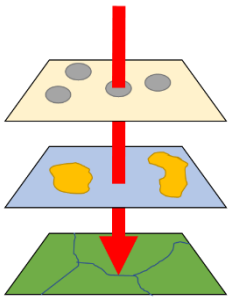


Name of Query
Choose between % Area Calc Type
Choose the intersecting layer you want to query
The attribute field of the queried layer
Choose how to sort the results
Sort direction Ascending or Decending
Choose inside the area query/add a buffer area
Radius of the buffer if selected
Output mode
Output type
Output type preview
Choose the number format
Decimals you want e.g. 2 decimals = 4.12 hectares per unit

 results below each other; comma (,) next to each other

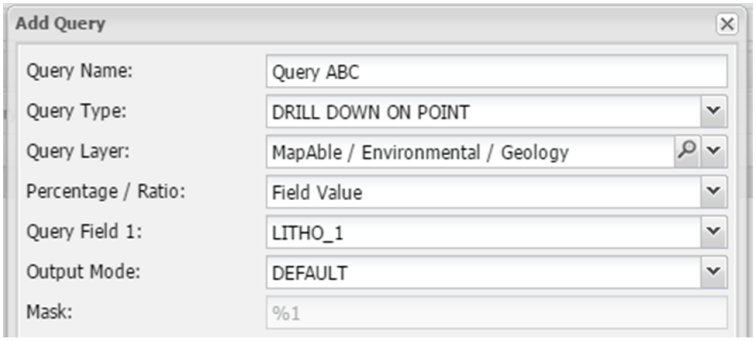
7. Drill down on point

In what ward does this point fall?



- Drill down on point is a simple overlay analysis based on the point of the centroid of the study area. If a polygon is used as the study area, the tool calculates the centroid of the polygon and establish the value of the specified layer at that specific point. It then reports on it.
- When to use: Whenever the user want to establish in which broader area the study area falls.
- Applicable for all vector types (Polygon, Line and Points)

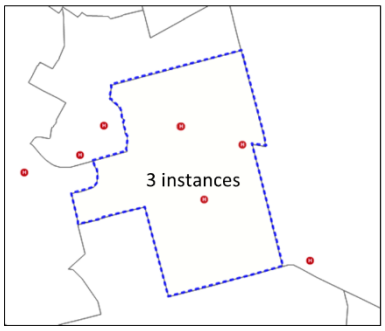
The query should be filled in the following manner:



Name of Query
Choose Drill down on point
Select layer you want to query
Field value/Percentage/Ratio
Which attribute field do you want to query
Output mode
%1 = the value generated + how it is displayed

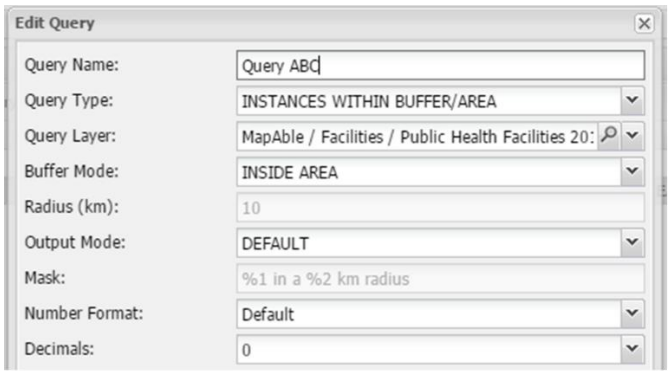
8. Instances within buffer/area

How many hospitals are there in the area?



- Also known as: Count instances within buffer area
- This tool calculates the number of instances of another layer that can be found within a specified distance from the study area.
- When to use: Calculating the incidences of any type of layer within distance. Typically, schools, hospitals, heritage sites etc.
- Applicable for all vector types (Polygon, Line and Points)

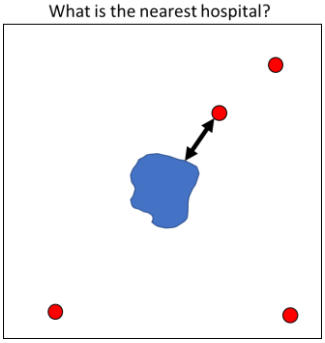
The query should be filled in the following manner:



Name of Query
Choose Instances within buffer/area
Select layer you want to query
Choose inside the area query/add a buffer area
Radius of the buffer if selected
Output mode
%1 = the value generated + how it is displayed
Choose the number format
Decimals you want e.g. 2 decimals = 4.12 hectares per unit

9. Nearest neighbour

What is the nearest hospital?



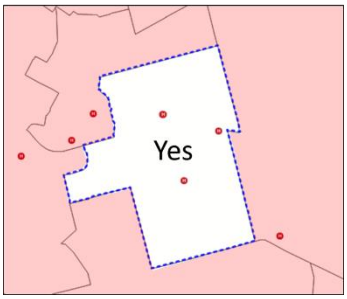
- The nearest neighbour calculation will determine the nearest instance of the specified layer. It will report on it by indicating the distance in kilometre and indicating the name.
- When to use: Typically used for public facilities like schools, hospitals, public transport stations.
- Applicable for all vector types (Polygon, Line and Points)

The query should be filled in the following manner:

Name of Query
Choose Nearest Neighbour
Select layer you want to query
Which attribute field do you want to query
Output mode
%1 = the value generated + how it is displayed

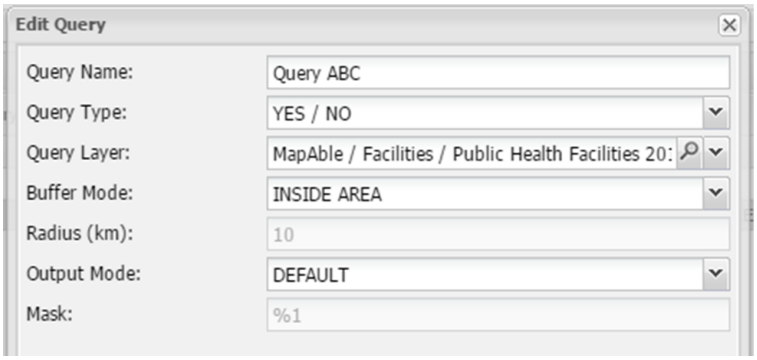
10. Yes/No

Are there any hospitals in the area?



- The nearest neighbour calculation will determine the nearest instance of the specified layer. It will report on it by indicating the distance in kilometre and indicating the name.
- When to use: Typically used for public facilities like schools, hospitals, public transport stations.
- Applicable for all vector types (Polygon, Line and Points)

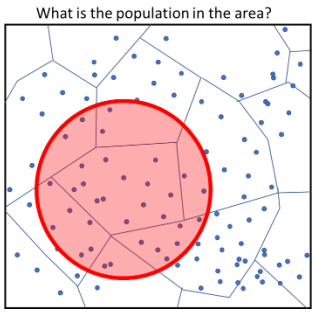
The query should be filled in the following manner:



Name of Query
Choose Yes/No query
Select layer you want to query
Choose inside the area query/add a buffer area
Radius of the buffer if selected
Output mode
%1 = the value generated + how it is displayed

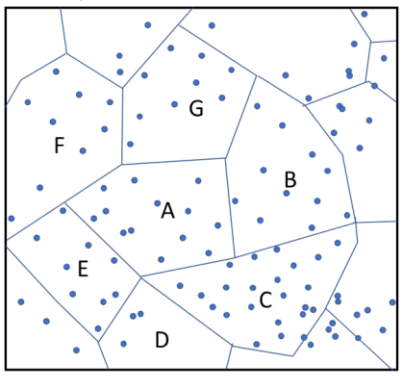
11. Data partitioning

- Data partitioning can be used to calculate demographic or other data proportionately based on another polygon theme. The proportions are based on the area of the intersecting themes.
- When to use: Demographics, census statistics.
- Applicable for all vector types (Polygon, Line and Points)



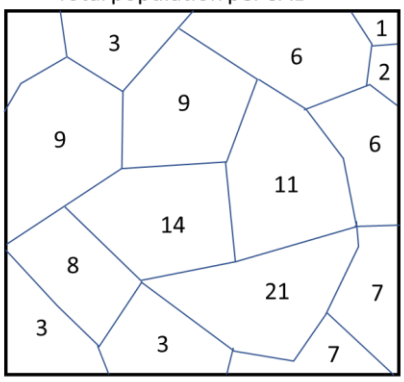
Data partitioning follows the following process:

Population within each SAL



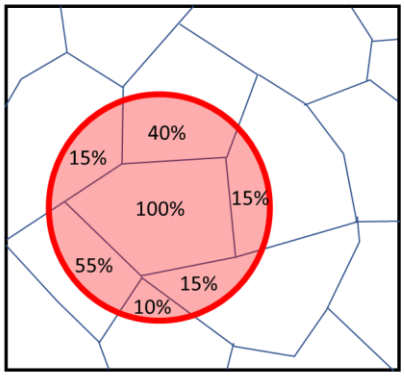
Data partitioning utilises a layer with a numerical value in this case population on Small Area Layer (Census 2011)

Total population per SAL



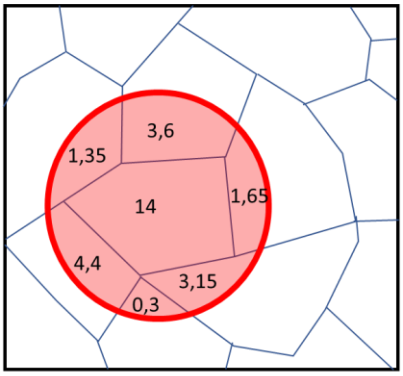
MapAble calculates the total population per SAL.

Area queried with % of area SAL intersecting



The intersecting area of the polygon queried is calculated as a % of each of the SAL.

Proportional population is worked out for polygon queried



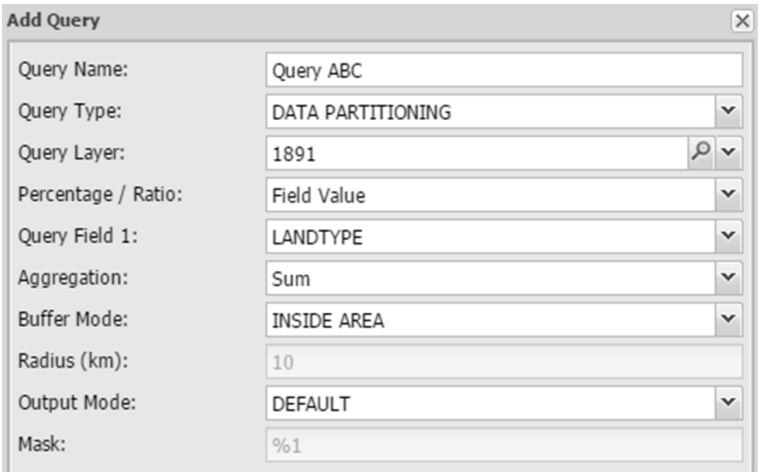
MapAble uses the percentage of the population in the SAL that is contained in the polygon queried.

SAL	Pop	% of Area	Pop in Area
A	14	100%	14
B	11	15%	1,65
C	21	15%	3,15
D	3	10%	0,3
E	8	55%	4,4
F	9	15%	1,35
G	9	40%	3,6

28,45 in the area

The total population is then calculated for the polygon queried

The query should be filled in the following manner:

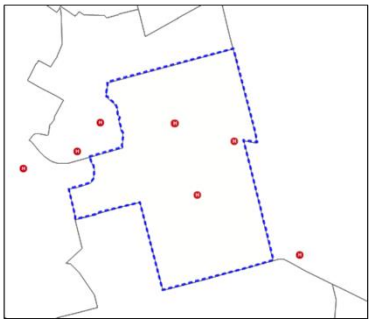


Name of Query
Choose Data Partitioning query
Select layer you want to query
Field Value/Percentage/Ratio
Select attribute field you want to query
Sum or Weighted Average
Choose inside the area query/add a buffer area
Radius of the buffer if selected
Output mode
%1 = the value generated + how it is displayed

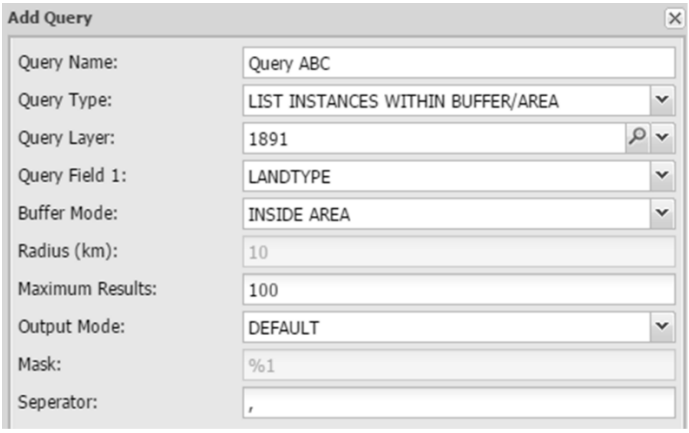
12. List instances within buffer/area

- This tool does the same as the Instances within buffer zone, except that it does not count them but list them. This is very handy if you need to know the names of the objects you are studying.
- When to use: Listing the incidences of any type of layer within a specific distance. Typically, schools, hospitals etc.
- Applicable for all vector types (Polygon, Line and Points).

What are the names of the hospitals in the area?



The query should be filled in the following manner:



Name of Query
Choose List instances within buffer/area query
Select layer you want to query
Field Value/Percentage/Ratio
Choose inside the area query/add a buffer area
Radius of the buffer if selected
Total amount of results you want listed
Output mode
%1 = the value generated + how it is displayed

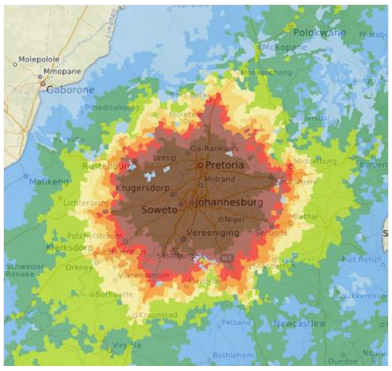
 results below each other; comma (,) next to each other

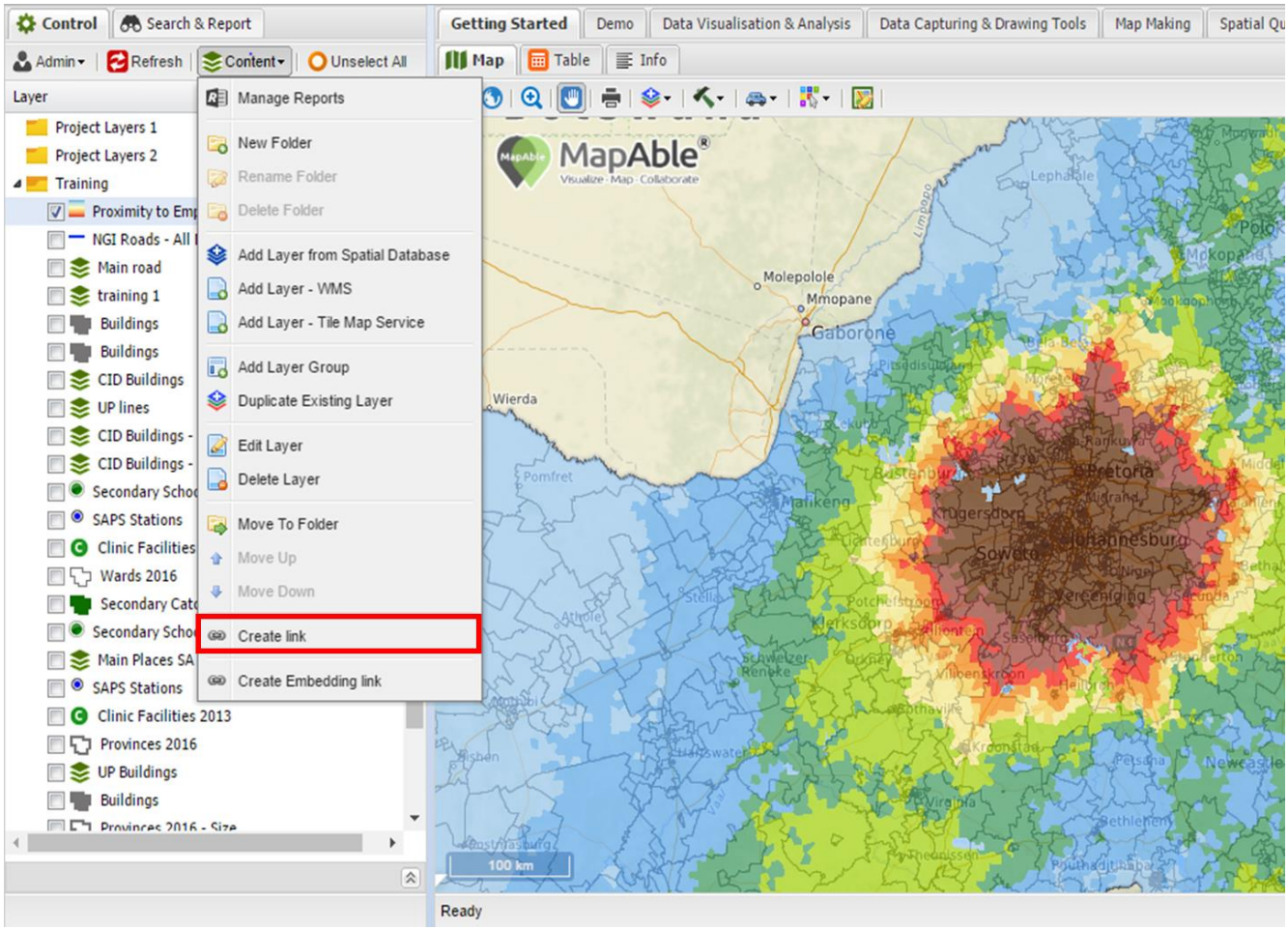
13. Map Clip

- A clip of the study area can be added to the report.
- When to use: When an overview map of the study area is required.
- Applicable for all vector types (Polygon, Line and Points).

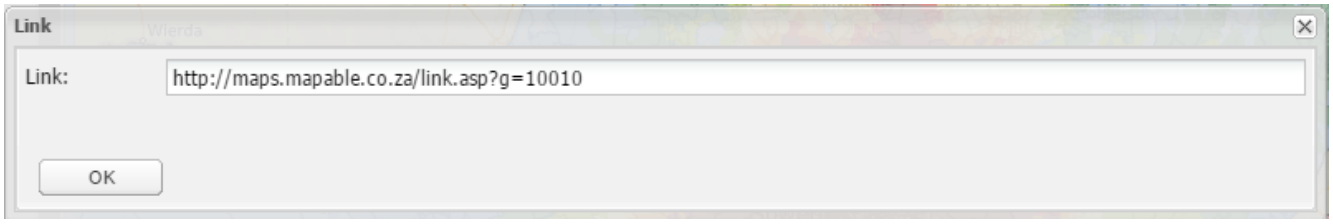
Process to create a map link in your template/report:
Set up the map you want in your document by selecting the appropriate layers in the list of layers and then opening the content dropdown list and selecting Create link.

Insert a map of the economic activity of Gauteng

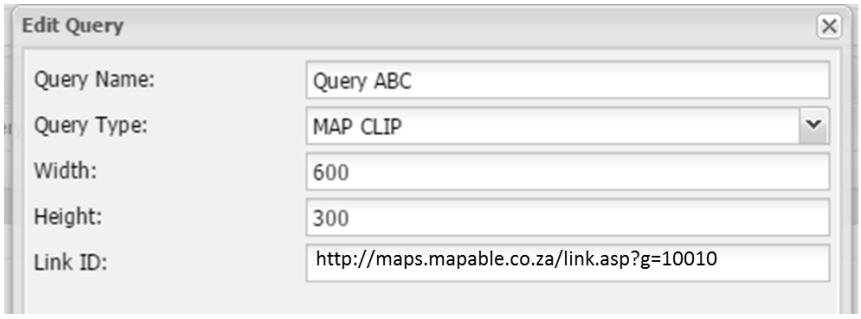




The following link will be created, copy the text as you will use it in the query.



The query should be filled in the following manner:



Name of Query
Choose Map Clip query
Pixel width of the profile
Pixel height of the profile
Insert map link you want to query

14. Map Link

The map link query creates a map link which you can use in your template to view the selected layers when the link was created:

Eg. http://maps.mapable.co.za/link.asp?g=10013

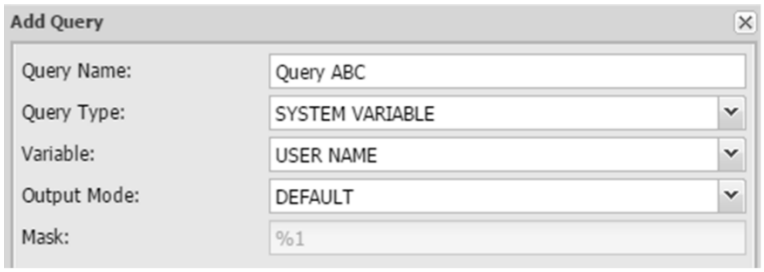
This link takes you to the view extent when the map was selected where you can view the map created online.

15. System Variable

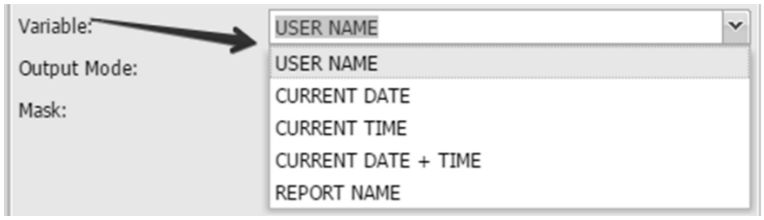
- Additional variables can be added to assist with administration and versioning of reports.
- When to use: Mostly for administrative purposes to keep record of authors and versioning of maps.
- Applicable for all vector types (Polygon, Line and Points).

This report was generated by: *Willem Badenhorst*
Date and time: *13 January 2015 02:15*

The query should be filled in the following manner:

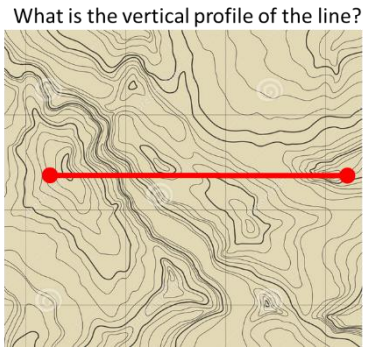


Name of Query
Choose System Variable query
System Variables
Output mode
%1 = the value generated + how it is displayed

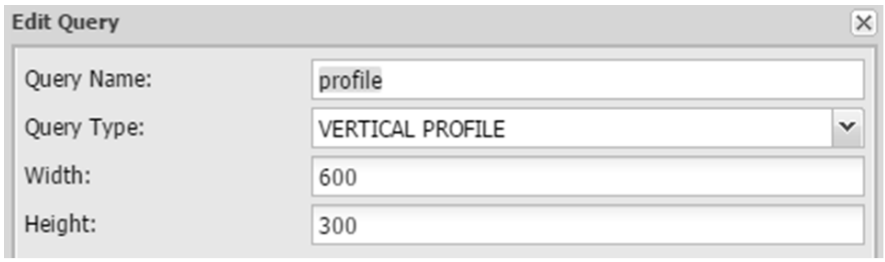


16. Verticle Profile

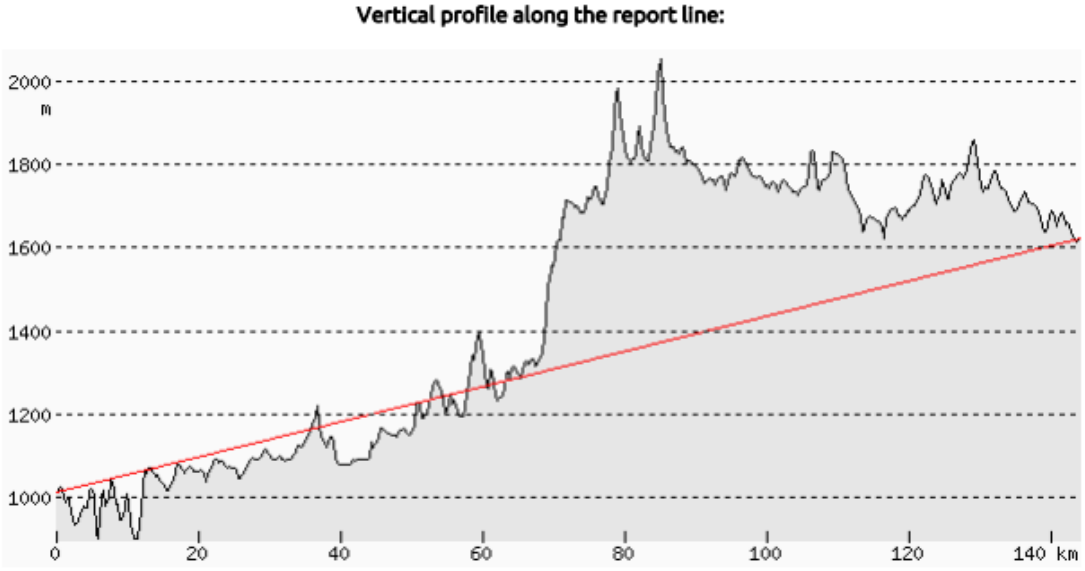
- The user can view a graph of the elevations of a path through the Elevation Profile tool. This function is only applicable if a line is chosen as the study area. The result is given in km distance and meter in height.
- When to use: When the elevation profile of a road or any other route needs to be shown in a graphic format.
- Only applicable for reports run on lines



The query should be filled in the following manner:

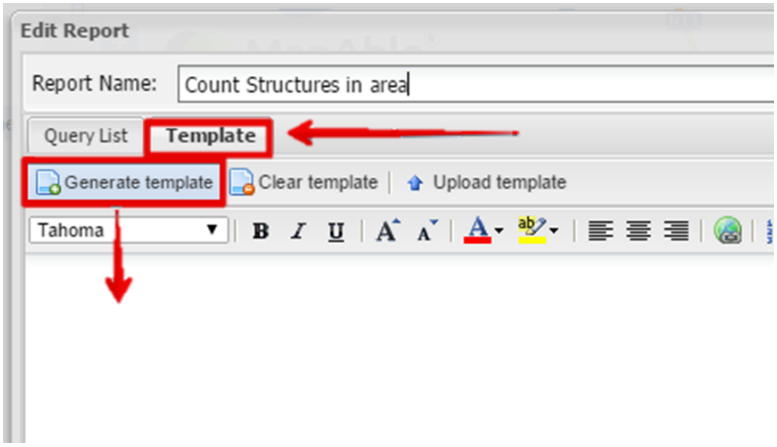


Name of Query
Choose Vertical profile query
Pixel width of the profile
Pixel height of the profile

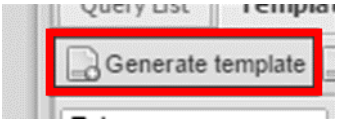


How to create a template

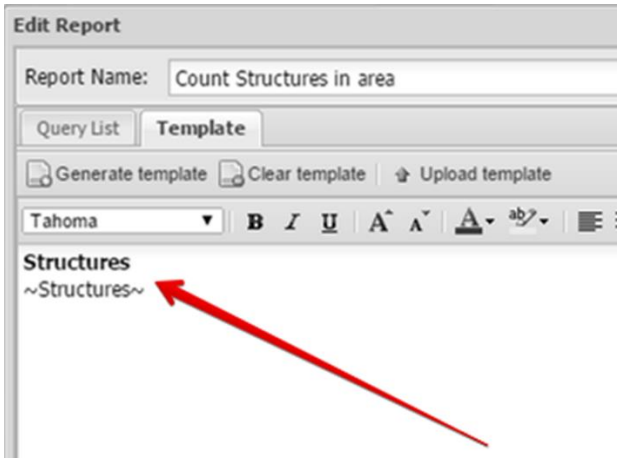
For any Spatial Report to be finalised, a template needs to be prepared. The first method is to create an Automatically Created Template:



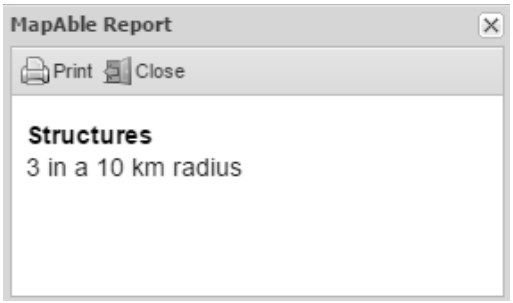
You can click on the Generate Template button to let MapAble automatically create a template based on the already prepared query list.



MapAble will create a very simple template based on all the queries related to the specific spatial report:

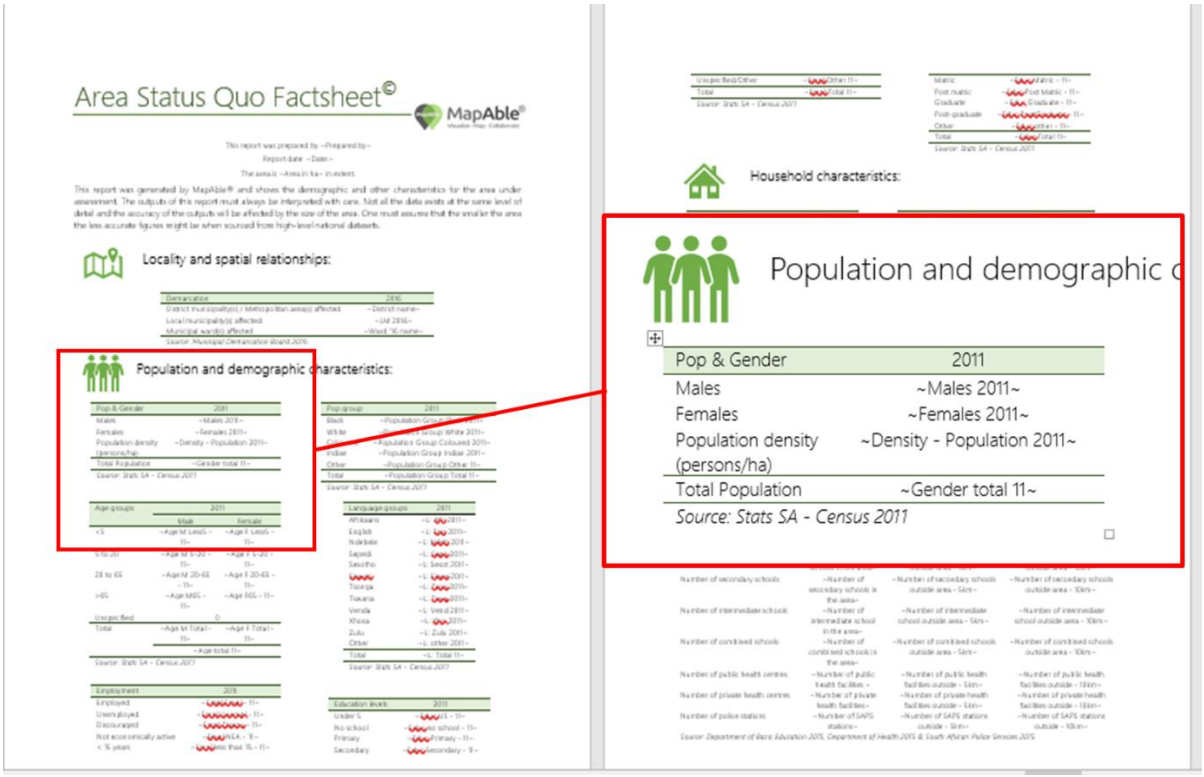


Once executed (once you run the report) the result will typically look like this:



At this stage, the whole process to create a spatial report is complete. But to have a custom query report with comments and logos etc., you can create a template in external software (such as MS Word) and import the files into MapAble.

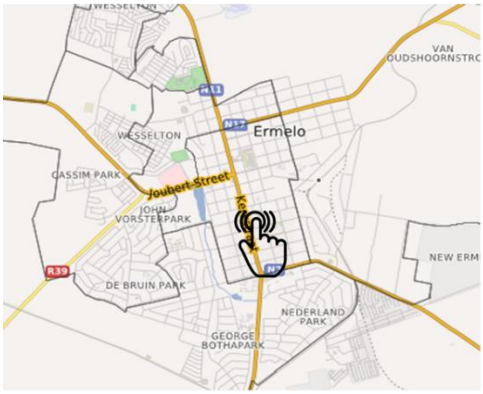
An example of a word template that uses the outputs (answers) of a report is illustrated below.



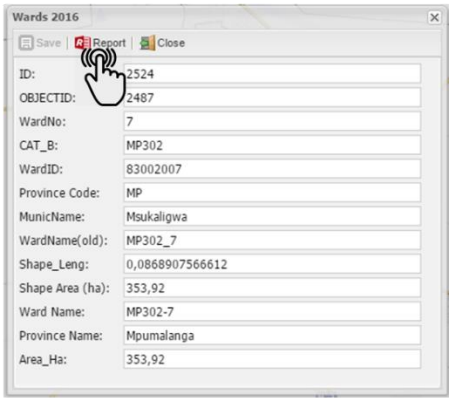
How to run a Report

You can run a report from a map feature (point/line/polygon – which matches the type of report you want to run) or on one of your drawings.

Click on the map feature (Ward):



Click on the run report button:

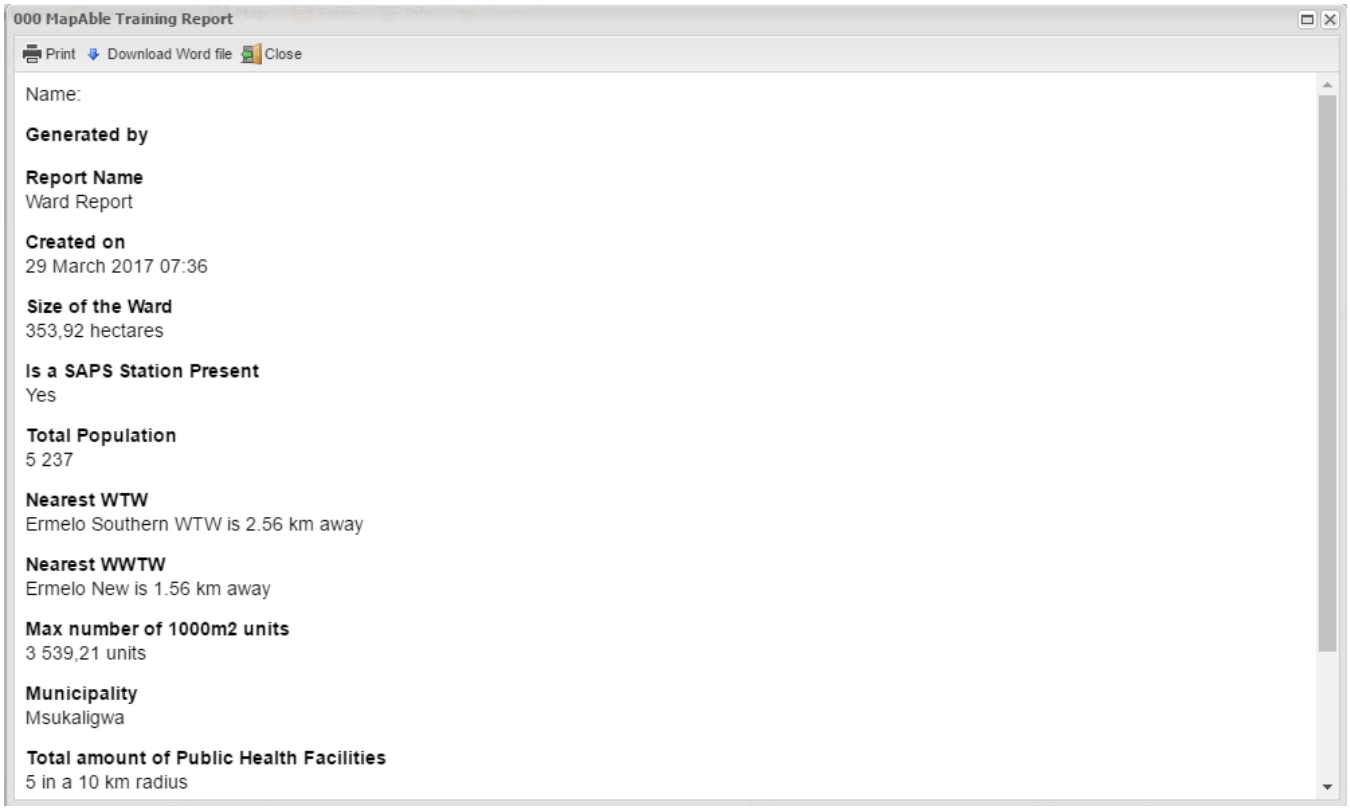


Select the report you want to run:

OR

Select drawing and click run report then select the report you want to run

An example of a system generated template is displayed below listing all the outputs from the queries contained in the report:



An extract from a Word template report is displayed below (the values in the table is populated by MapAble):

3 Household characteristics

Population numbers relate to the demand for community and or social facilities. Households, on the other hand, determine the demand for infrastructure and housing. Furthermore, many planning indicators are measured in terms of household sizes and densities.

3.1 Households, size and density

Households are usually assessed in the context of the total population. This gives rise to density ratios and household size. The total number of households is always an important factor in determining the overall demand for infrastructure services and housing. Household density is an important indicator for settlement efficiency and plays and important role in urban planning and development strategies. Household size has an impact on the extent of consumption of goods and services. One should note that housing support strategies have affected household formation to the extent that there are often different rates of change between households and population. The basic household profile for the assessment area is shown in the table below.

Table 7: Total households, size and density

	1996	2001	2011
Total households	103 137	127 249	181 455
Household density (households/ha)	0,05	0,18	0,25
Ave household size	4,60	4,19	3,62