

# QGIS User Manual for home users

---

## INTRODUCTION

1. The new (2017) map system for the Matienzo Caves Project is based on a widely-used free-ware programme, QGIS.
2. The purpose is allow Matienzo cavers to research information and plan speleological projects, and to disseminate up-to-date information about the cave systems and other sites.
3. Two monitors are a definite advantage but not essential.
4. The downloadable sets of information which are opened in the QGIS programme allows investigation of speleological sites known to the Matienzo Caves Project. Satellite photos, digital terrain model, cave passage centre lines and widths and site positions are shown on a map with surface details, geological details and contours as separate layers. Aerial videos and 360° panoramas are linked to the map.
5. QGIS also allows data to be filtered so that we can view unexplored holes, draughting sites, etc.
6. Altitudes of cave passages can also be determined to compare with surface altitude.
7. The fuller MCP-QGIS system, used during expeditions and for updating information, additionally allows input of cave grid references through an Excel spreadsheet.
8. Updated information will be disseminated every few months.

## INSTALLATION

1. **The QGIS programme can be downloaded** from the QGIS web site: [www.qgis.org/](http://www.qgis.org/)  
At the time of writing, QGIS version 3.xx is offered for download from the front page. Version 2.18.16 is hidden on the "Download Now" page. The link is found on the Index of Downloads page as [https://qgis.org/downloads/QGIS-OSGeo4W-2.18.16-1-Setup-x86\\_64.exe](https://qgis.org/downloads/QGIS-OSGeo4W-2.18.16-1-Setup-x86_64.exe) and this link is found on the MCP-QGIS website page. Version 3 should not (yet) be used. Version 3 will eventually take over, no doubt.
  - 1.1. The programme (*QGIS Desktop*) can be started from the folder of QGIS shortcuts installed on the desktop or by typing "QGIS" into the "Search programs and files" bar from the Start menu.
  - 1.2. Double-left-clicking on the configuration icon, eg *MCP-200428.qgs* downloaded from the Matienzo website (see below) will start up QGIS with the Matienzo Caves Project data.
  - 1.3. To get maximum functionality for exploring the Matienzo data, a number of plugins should be installed.
    - 1.3.1. More detail about using plugins is shown in the *Plugins* section on page 4.
    - 1.3.2. However, in order to having a working "Experimental" group, the *Memory Layer Saver* plugin must be installed.
2. The **Matienzo Caves Project map data** can be downloaded from the MCP web site (<http://www.matienzocaves.org.uk/MCP-QGIS/index.htm>). The complete, latest version is also available to Matienzo regulars from Juan by sending a 32Gb memory stick + s.a.e. This may be better for those with a slow / unreliable Internet connection.
  - 2.1. **First time users**
    - 2.1.1. First time users: On your C: drive create a folder named *MCP-QGIS*. This is the container for all Matienzo data: *static*, *updated* and *AerialVideosLocal* folders and other files.
    - 2.1.2. First time users will need to download the *static.zip* file (1.68Gb), *updates.zip* file (8.3Gb), *AerialVideosLocal.zip* (8.2Gb) and the *MCP-QGIS-yymmdd.zip* file
    - 2.1.3. Unzip *static.zip* and move the unzipped *static* folder into the *MCP-QGIS* folder.
    - 2.1.4. Note that the required *static* folder (with files) may be sitting inside a *static* folder if the path for unzipping has not been correctly altered. *Static.zip* should be extracted to C:\MCP-QGIS
    - 2.1.5. Unzip the *updates.zip* file and move the *updates* folder into the *MCP-QGIS* folder.
    - 2.1.6. Note that the required *updates* folder (with files) may be sitting inside an *updates* folder if the path for unzipping has not been correctly altered. *updates.zip* should be extracted to C:\MCP-QGIS
    - 2.1.7. Unzip the *AerialVideosLocal.zip* file and move the *AerialVideosLocal* folder into the *MCP-QGIS* folder.
    - 2.1.8. Note that the required *AerialVideosLocal* folder (with files) may be sitting inside an *AerialVideosFolder* folder if the path for unzipping has not been correctly altered. *AerialVideosLocal.zip* should be extracted to C:\MCP-QGIS
    - 2.1.9. Unzip the *MCP-QGIS-yymmdd.zip* file to extract the three files (*MCP-yymmdd.qgs*, *MCP-yymmdd.qgs.mldata* and *QGIS\_UserManual-RemoteUser.pdf*) into the *MCP-QGIS* folder.
    - 2.1.10. At the end of the download process, the C:\MCP-QGIS folder should contain *static*, *updates* and *AerialVideosLocal* folders, plus one pdf plus one *qgs* file plus the corresponding *mldata* file.

- 2.2. **Incremental updates for other users.** This download contains new or updated files and/or folders for inclusion in the C:\MCP-QGIS\ folder
  - 2.2.1. Download and unzip the *MCP-QGIS-updates* folder. This folder can be renamed MCP-QGIS and dragged into the C:\ folder where it should merge with existing MCP-QGIS folder. Replace old files with the new ones if requested.
  - 2.2.2. Alternatively, copy the contents of the *MCP-QGIS-updates* folder and paste into C:/MCP-QGIS.
  - 2.2.3. If you want to, delete any old configuration file, eg *MCP-170707.qgs*.
- 2.3. At the end of the download process, the C:\MCP-QGIS folder should contain *static* and *updates* folders along with one or more *qgs* files plus the corresponding *.mldata* file(s).
- 2.4. A copy of this updated User Manual is found within the *MCP-QGIS* folder
3. From time-to time, any data update should start at 2.2 above.

**START**

1. Double click on the QGIS configuration file icon, eg *MCP-200428.qgs* to start the programme and load in the map. The map is loaded in the same state as when it was last saved. First time start up is likely to be slow - perhaps 2 to 3 minutes on a slow machine.
  - 1.1. When QGIS is first started, a window sometimes appears asking to refresh outdated searches. Click *Yes* then the *Refresh* and *Close* buttons.
  - 1.2. The title and acknowledgements are removed by removing the tick in the *Prelims* group box.
  - 1.3. If the sites or other objects don't appear when expected, press the *refresh* icon.

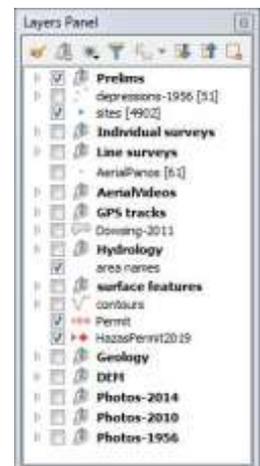


**USING THE QGIS MAP**

INTRODUCTION

1. Many of the programme icons around the left and top remain unused for day-to-day use. The application is highly competent; current use and investigation of the Matienzo data barely scratches the capability of the programme.
  - 1.1. The useful icons include three in the centre of the top icon bar
 

These are the *screen refresh*, *identify features* and *run feature action* icons.
  - 1.2. and a fourth to the right: the *Map Tips* icon.
2. Zoom in and out and panning (dragging) are controlled by the mouse centre wheel.
3. If the *Layers Panel* is not seen, selecting *View / Layers / Layers Panel* from the top menu bar will make it visible.
4. The *Layers Panel* should look something like the screen shot on the right.
5. Layers can be switched on (visible) and off by clicking in the tick (or cross) box.
6. Some layers have sub-layers - eg, the *Line surveys* layer can show just the *centre line* or the *passages* or both together. Click on a triangle-pointer to open up the layer or grouped layers.
7. Layers higher in the *Layers Panel* cover lower layers. The *Digital Elevation Model (DEM)* layer will smother the photos. However, the *Line surveys/passages* layer is semi-transparent, allowing lower layers (if visible) to be seen.
8. Nothing is locked within the application or data, so feel free to explore and experiment. Nothing is permanent until saved and a fresh version of the *.qgs* file can always be downloaded. You may want to experiment with a copy of the original *.qgs* file.



WORKING WITH LAYERS FROM THE LAYERS PANEL

1. The following descriptions are not necessarily in the order showing on the Layers Panel: each layer can be dragged up or down to aid visibility.
2. If the Layers Panel disappears, it can be brought back through the *View / Panels / Layers Panel*.
3. Prelims The map title, version and acknowledgements. Switch this off!
4. Sites
  - 4.1. This layer shows the entrance positions of thousands of sites from the MCP database.



- 4.2. At different zoom-in scales (middle mouse wheel), the blue dot entrance position is accompanied by nothing, a site number or a number plus name.
- 4.3. The **Sites layer (in the Layer panel) must be selected** (highlighted) to carry out any data procedure with these sites. The *Map Tips* icon must be depressed.
  - 4.3.1. To display some **primary data** for a site, hover over a blue point. 
  - 4.3.2. To view a **web site description** (from where photos, surveys, etc can be shown), the *Run feature action* icon must be depressed then left-click a blue point. (Internet connection required and the *Action* must be set up correctly. See Appendix 3). 
  - 4.3.3. The *Sites* layer can be **filtered to show sub-sets** of the data, eg sites which are unexplored, draughting, sinks, dive sites, have archaeological interest, etc. The number of sites shown in the filtered *Sites* layer is shown in the *Layers Panel*.
    - 4.3.3.1. In the *Layers Panel*, right-click over the *Sites* layer and left click *Filter...* (Or *ctrl-F*)
    - 4.3.3.2. A *Query Builder* window appears which can be resized as shown.
    - 4.3.3.3. Details of the fields are shown in Appendix 1.
    - 4.3.3.4. A simple example. To show unexplored sites on the map, left-click once on the *explored* field; click the *Sample* button to show possible values (NULL, ! (still going), d (dig), u (unexplored)) in the *Values* pane. Build up the query expression by double left-click on *explored*; click the "=" operator then double left-click the "u" value. Click the *Test* button to show the filter query works then click the *OK* button to show just the unexplored sites on the map.
    - 4.3.3.5. If draughting, unexplored sites are required then the filter expression can be built up to show "*explored*" = 'u' AND "*draught*" = '1'
    - 4.3.3.6. To remove the filter expression, left-click the *Clear* then *OK* buttons at the base of the *Query Builder* window.
    - 4.3.3.7. Different layers can be filtered at the same time, eg showing *Sites* which have an entrance altitude between 210 and 230m with only the 220m *Contour* line shown.

5. Depressions

- 5.1. Starting at Easter 2019, a number of depressions have been marked (over the *Photos-1956* layer) as a separate layer to ease investigation in, what are now, areas thick with trees and undergrowth.
- 5.2. Red diamonds show the position of depressions that have not been investigated. Green diamonds show the position of depressions that have been investigated. If caves are found, a cave site number will be given.
- 5.3. When this *depressions* layer is displayed over the modern *2014-photos* layer, it becomes obvious that this feature may prevent pure random wanderings in the jungle. (The information can be downloaded into *OruxMaps*.)

6. Permit

- 6.1. A patterned, faint, red line shows the 2014 - 2018 permit area; the west and east boundary for the additional 2019 Hazas de Cesto area is shown as red crosses on the *HazasPermit2019* layer. The N-624 is the northern boundary. Note that the withdrawal of permission to explore on Vizmaya at Hoznayo is not shown on this QGIS map. The addition to the 2020 permit area is (probably) around Villanueva up to the motorway.

7. Hydrology

- 7.1. This layer currently shows the results of water traces with sub-layers *Resurgences-TracedTo* and *traceDetails*.
- 7.2. The trace lines are coloured green for fluorescein, cyan for optical brightener and clear for an unknown agent.
- 7.3. With *traceDetails* selected (and the *Map Tips* icon depressed), hovering over a trace line will bring up a small detail panel.
- 7.4. The code number on each trace line is the same as the code used in the MCP web site water tracing page: <http://www.matienzocaves.org.uk/science/index-water-tracing.htm> where further details can be seen.

8. Line surveys

- 8.1. This layer is made up of two sub-layers, *centre line* (containing the all.3d survex dxf export) and *passages* which can be shown separately, together, or not at all.
- 8.2. Position information can be displayed for any cave centre line survey segment.
  - 8.2.1. Select the *centre line* layer; click on the Information icon at the



top of the window.

8.2.2. Click on a *centre line* segment near to the station (vertex) of interest. An *Identify Results* window displays the data relating to the segment.

8.2.3. Altitude information for a station is "Closest vertex z".

#### 9. Surface features

9.1. This layer has vegetation outlines, buildings, roads, streams, etc organised in a number of sub-layers. The layer (or sub-layer) visibility might be turned off when viewing *photos* or the *DEM* layers.

#### 10. AerialPanos

10.1. The panoramas are viewed in *PanGazer*, an application installed in the *PanGazer* folder and automatically downloaded through the update folder. Further details are found in *Appendix 4*.

10.2. The places where panoramas have been taken by drone are shown as pale blue circles with a centre cross. (When zoomed in, a date and code are also shown.)

10.3. With the *AerialPanos* layer selected and the *MapTips* icon depressed, hovering over a centre cross brings up some information about the panorama.

10.4. With the *AerialPanos* layer selected and the *Action icon* depressed, a left-click on the centre cross will start up *PanGazer* with the appropriate panorama.

#### 11. AerialVideos

11.1. At a small scale, say 1:2500, the path of the camera drone shows as a transparent grey line with an "H" ("home") to show the start and finish point. When zoomed in further, the video code is displayed.

11.2. The complete path of the drone is displayed with red chevrons showing the flight direction.

11.3. The videos do not necessarily document the whole flight. The camera may not have been filming all the time and certain parts of the downloaded video may not have been used. Also, not all video has been taken looking straight down.

11.4. As an example, have the flight over Torca de la Vera Negra (site 0036), on the screen at a scale of about 1:1500. The video code is 0825-SVega.

11.4.1. Open up the *AerialVideos* group to show the 3 layers. Select *KMLs-merged path* and select the down arrow on the *Action icon*. The "Local video" is for Office use in Spain. Choose "YouTube video" then click once anywhere on the grey line.

11.4.2. *YouTube* should start in your browser. The *0825-SVega* flight then flies out over the *Vera Negra* shaft entrance, following the path. Two screens are obviously much better to view both map with documented holes and video at the same time.

11.4.2.1. Having the *Photos* layer displayed may make it easier to follow the route.

11.4.3. With the *KMLs-merged home* layer selected and the *Action icon* depressed, left-clicking in the centre of the orange home circle will start up *Google Earth* and load in the appropriate flight path kml file. This allows the altitudes of paths to be displayed.

11.4.3.1. *Google Earth (Pro)* must be installed for this feature to work. If the Matienzo Google Earth file is also installed, eg *MATIENZO CAVES 180601.kmz*, then entrances and cave centre lines can be switched on/off, etc

#### 12. GPS tracks

12.1. Starting at Easter 2019, some tracks from GPS devices have been downloaded into QGIS. These can be given different styles and may be particularly useful when trying to retrace steps through a "jungle".

#### 13. Dowsing-2011

13.1. This layer shows on the map the dowsing reactions obtained by John Wilcock on a three-day visit in 2011.

13.2. *Positive reactions*, *No reactions* and *Presumed connections* are shown within the layer.

13.3. With the layer selected and the *Map Tips* icon depressed, information about each segment is displayed when the cross indicator is hovered over a segment.

13.3.1. These information panels also have a link to an overview of the three-day visit.

#### 14. Area names

14.1. Shows area names with scaled-based visibility.

#### 15. Contours

15.1. Each contour is labelled out to 1:5000 scale and not labelled in the smaller scale views. When zoomed out, only the heavier 25m lines are shown.

15.2. Heavier lines are used for the contours at 25m, 50m, 75m, etc - which can be switched off.

15.3. Lines encircling a depression are highlighted in blue. Again, this feature can be switched off.

#### 16. DEM

16.1. The *Digital Elevation Model* layer highlights the landscape and depressions. It may be useful to turn (some) other layers off when viewing this layer.

17. Photos

- 17.1. Satellite orthophotos of the area. There are three photo layers imported from the Cantabria maps site: satellite photos *2010*, *2014* and *Photos-1956* layer which displays aerial photos taken in 1956-57. These are proving particularly useful viewing the land surface (eg for depressions) before eucalyptus plantations were in vogue.
- 17.2. It may be clearer to turn (some) other layers off when viewing one of these photo layers.

18. Geology

- 18.1. This group of layers and other resources have been imported from the Cantabrian government [mapas.cantabria.es](http://mapas.cantabria.es) site and the geology terms translated to English. (Please report errors / poor translations!).
- 18.1.1. The information has been imported as 6 sheets. The facies colours and patterns used between the sheets are not consistent in all instances and it is possible that the same beds are reported (slightly?) differently across the beds. For example, bottom right on sheet 35\_4, limestone (code 1) changes to dolomite (code 6) at the sheet 59\_2 boundary.
- 18.2. The *Geology* group layers are arranged in a particular order to allow faults, contacts, etc to lie over the *Lithology* layer.
- 18.3. Some layers contain map artefacts and have been bracketed, ie (Pointer lines) and (Fill lines).
- 18.4. Remember that, to view more information about each layer, the *Map Tips* icon must be depressed and the relevant layer selected.
- 18.5. The **Lithology** layer provides rock and deposits information.
- 18.5.1. Hover over any colour to show a panel with rock information, possibly formation information, and possibly a name. The period/epoch etc information is then shown along with a link to a simplified geological column. The bottom section has the sheet number, a rock unit number and link to the legend for that sheet. Two of the sheets (35\_3 and 35\_4) also have a link to more information (in Spanish) about the geology.
- 18.5.2. The *Lithology* layer can be made transparent to view the lower *Photos* and *DEM* layers through the geology information.
- 18.6. The **Contacts and Faults** layer differentiates 19 line styles to show various types of fault, rock contacts (including unconformities), etc. *Sheet borders* and *Political limits* are also shown.
- 18.6.1. With the *Contacts and Faults* layer chosen, hovering over a contact or fault line will bring up an information panel.
- 18.7. The **Folding** layer differentiates different types of folds.
- 18.7.1. With the *Folding* layer chosen, hovering over a fold line will bring up an information panel.
- 18.8. The **Mobile formations** layer shows information about mass movements and deposits, eg landslides and colluvium.
- 18.8.1. With the *Mobile formations* layer chosen, hovering over a deposit will bring up an information panel.
- 18.9. The **Ores / minerals** layer shows minimal information about these deposits.
- 18.9.1. With the *Ores / minerals* layer chosen, hovering over a black dot will bring up an information panel.
- 18.10. The **Dip** group has 2 layers: *Strata and dips* and *Dip value*. The Dip value is displayed on the map next to a dip symbol.
- 18.10.1. The *Strata and dips* layers differentiates sub-horizontal beds, inverted strata and others
- 18.10.2. With the *Strata and dips* layer selected, hovering over a dip symbol on the map will bring up an information box.
- 18.10.2.1. Note that another displayed figure will either be "0" or an integer that is either the dip direction or the strike! This is easily sorted looking at the symbol. The data confusion is probably due to different cartographers using different conventions.
- 18.11. The **Layer traces** layer has freehand lines that appear to pick out features on aerial photos. (see section 12.5.2)
- 18.12. The **Lithology codes** layer shows the numbers allocated by the cartographer to the various facies. They differ from sheet to sheet. Further information can be gleaned from the legends that are available from *Lithology layer*.

SCALE BAR, GRID, COPYRIGHT AND COMPASS ROSE

1. These map decorations can be altered and switched on/off from the *View / Decorations* menu.
- 1.1. The Scale bar is currently set up to appear at the top right of the map.
- 1.2. The Grid (dotted lines) currently has a 500m interval with annotations shown at the bottom and the right hand side of the map.

- 1.3. The Compass rose is shown at the top left. Both the rose and the grid rotate when the map is rotated. (The rotation control is at the base of the map.)
- 1.4. The map version information label is shown at the bottom left of the map.

### PLUGINS

1. Plugins can be installed from the *Plugins / Manage and install* plugins menu
2. Plugins found useful for extracting information from the map include *Quick Finder*, *StreetView*, *Elevations*, *Memory Layer Saver* and *Install Survex*.
3. The plugin *Quick Finder* is set up to quickly show entrances with a yellow ring when searched for (by number or (part) name) in the search bar.
  - 3.1. For example, typing "Hoyuca" into the search bar will bring up 4 possible entrances to click on.
  - 3.2. Site numbers must be 4 digits, eg "0081".
4. The plugin *go2streetview* opens up *Google Street View* photographs when a short line is dragged over a road.
  - 4.1. With the *surface features* layer visible, click on the *go2streetview* icon then drag a short line along a road.
  - 4.2. As long as the road has been traversed by the Google car, a photo appears with the view.
  - 4.3. Dragging the picture or zooming in or out is reflected in the blue icon on the map.
5. The plugin *Elevation Viewer* is started by clicking on the *EleView* icon.
  - 5.1. In the *Elevation Viewer* window, the *Elevation Layer* should be "contours" and the *Elevation Attribute* "COTA\_0002".
  - 5.2. The *Projection* should be correct from the project settings.
  - 5.3. Left-click the *Point 1 Capture* button and select a contour as the left hand point on the section.
  - 5.4. Left-click the *Point 2 Capture* button and select a contour as the right hand point on the section.
  - 5.5. Click the *Show Elevation* button.
6. The *Survex Import* plugin is found at <https://github.com/patrickbwarren/qgis-survex-import>. Instructions for downloading, installation and use are well documented.
7. The *Memory Layer Saver* plugin must be installed to bring back and save layers initially held as memory layers. Currently, these are some of the "experimental" layers

### STYLES

1. Each layer is given its own style and this can be altered for points, lines and polygons.
2. The details of altering styles is beyond this introduction but obviously well documented in QGIS literature.
3. Styles can be shown by double-left-clicking over the layer name in the Layer Panel.
  - 3.1. For example, the data in the sites layer is currently shown as a simple marker. Clicking on Simple marker shows that it has a size of 6 pixels.
  - 3.2. This style can be altered and applied.
  - 3.3. To apply a saved style, the Style button at the bottom left of the window accesses a *Load style* option. A possible style for the points would be *Waypoints-new-01.qml*. This style is used during expeditions to highlight new sites.
  - 3.4. Labels can also be applied to markers and it is possible to change markers and labels depending on various attributes (eg digs, resurgences, etc could have different markers) and the zoom setting.
  - 3.5. As an example, use is made of database information to differentiate sites. Untick the *sites* layer. Within the *Experimental* layer, left-click *site types* then open up the layer to show the various data to highlight. Hovering in the middle of a map icon shows primary data, left-clicking the icon (with the run feature icon depressed) will show the website description.
4. Many hours can be spent exploring all the current layers and styles, playing with settings and learning what is possible (beyond the current Matienzo map).

### OTHER LAYERS

1. Further layers have been added to provide illustrations for the *Matienzo Caves Project: 2010-2019* book.
  - 1.1. See Larger cave names; areas-common; 60BookTopTenPlus; altitude colours.
  - 1.2. Current X-coded sites, those found out of the current permit area, are also shown.

### PRINT OUTS

1. A screen shot of the current window can be taken with *Project / Save as image* - a number of formats are available.
  - 1.1. The resultant file can be printed using any method.
  - 1.2. This procedure should be OK for most expedition requirements.

- 1.3. The scale, grid, compass rose and attribution notice can be turned off or altered in *View / Decorations*.
2. A screen shot can be taken using the *Windows Snipping Tool*, then printed out.
  - 2.1. The scale, grid, compass rose and attribution notice can be turned off or altered in *View / Decorations*.
3. The *Print Composer Manager* is of use but beyond the scope of this introductory paper.

#### ACKNOWLEDGEMENTS

1. Realizado a partir de datos del Gobierno de Cantabria disponibles de forma gratuita en <http://mapas.cantabria.es>
2. Cave data and site positions produced by participants in the *Matienzo Caves Project*.
3. Map designed by Juan Corrin.

#### CONCLUSION

Please let me know of errors or omissions which will come to light when sites are filtered. Suggestions for improvements and ideas for Python routines would be welcome!

*Juan Corrin 2017-2019; 3/5/2020*

---

## Appendix 1

### SITES LAYER: FIELDS, THEIR VALUES AND NOTES FOR FILTERING

Field	Values	Notes
cavet	0001 to nnnn	The site number/code
name	varies	The name by which the site is usually known, starting with the first significant word
Alt1, Alt2, Alt3	varies	Alternative names, if any.
area	varies	The area in which the site lies. This doesn't necessarily agree with the names in the <i>area names</i> layer.
E6, N7	varies	The 6-figure easting and 7-figure northing values for the grid reference (ETRS89 or WGS84).
alt	varies	The altitude of the site.
prec	1, 5, 10, 20, 30, 50, 100	A code for the accuracy in placing the entrance on the map. A "1" doesn't mean accurate to 1 metre, rather "as accurate as possible" probably using a GPS.
GPS/Adj	M, A, G, P	See <a href="http://www.matienzocaves.org.uk/surveying-help/SiteCoordinatesAccuracy.pdf">http://www.matienzocaves.org.uk/surveying-help/SiteCoordinatesAccuracy.pdf</a>
length	varies	Traverse length in metres.
depth	varies	Depth in metres.
explored	!, ?, d, u	In order: "still going"; "unknown status"; "dig"; "unexplored".
ArchBio	A, A?, AB, B	In order: "Archaeological significance"; "possible archaeological significance"; AB "Both archaeological and biological significance", "biological significance".
sink	Drought, flood, normal, unknown	"drought": water sinks in drought conditions; "flood": water only sinks in flood conditions; "normal": water sinks in normal conditions; "unknown": unknown sinking conditions.
resurgence	Drought, flood, normal, unknown	"drought": water resurgences in drought conditions; "flood": water only resurges in flood conditions; "normal": water resurges in normal conditions; "unknown": unknown resurging conditions.
cave streams	yes, >1	The site has an underground stream or more than one.
draught	0, 1	"0": No draught; "1": the site draughts.
dive	Completed, dive potential	
address-3d	varies	The file name of the Survex 3d file.

## Appendix 2

### UPDATE INFORMATION FOR VERSION 190606

The Updates folder now contains 1956/57 aerial photos. A depressions layer has been added.

### UPDATE INFORMATION FOR VERSION 190306

Current users have the extra step of downloading a new photos-2014 folder into the static folder.

### UPDATE INFORMATION FOR VERSION 181213

The complete *updates* folder additionally contains the *PanGazer v1.12* application (see *Appendix 4*), all the aerial panorama photos (60) and data for correctly displaying the aerial video paths. The videos are viewed through *YouTube*.

### UPDATE INFORMATION FOR VERSION 181315

The *updates* folder additionally contains the *PanGazer* application (see *Appendix 4*), all the aerial panorama photos (47) and data for correctly displaying the aerial video paths. The videos are viewed through *YouTube*.

### UPDATE INFORMATION FOR VERSION 180619

The *Geology* group has been added with files stored in the *static* folder. So it is probably best to "start again". That is delete the contents of the C:\MCP-QGIS folder and bring in completely new contents as if it were the first time of downloading.

### UPDATE INFORMATION FOR VERSION 180602

*Sites* and *Cave surveys* layers updated with Easter 2018 info. *Hydrology* layer updated  
Styles have been moved from the *static* to the *update* folder, so it is probably best to "start again". That is delete the contents of the C:\MCP-QGIS folder and bring in completely new contents as if it were the first time of downloading.

## Appendix 3

### CHANGING LEFT-CLICK ON SITE MARKER ACTION

1. If a left-click over a blue sites marker (with sites highlighted and the Run feature action icon depressed) doesn't bring up the site description from the website, the script for the action will need altering.
2. To show the script: double-left click on the *sites* layer in the *Layers Panel* and choose the *Actions* icon in the left hand panel. A line in the Action field shows that the Chrome browser is to be loaded from the location:

C:\Program Files (x86)\Google\Chrome\Application\chrome.exe

then a phrase to load in the correct site description from the web site.

3. If you use Internet Explorer instead of Chrome then the first part of the action should (probably) be altered to  
C:\Program Files (x86)\Internet Explorer\iexplore.exe

**Appendix 4**

PANGAZER

1. The *PanGazer v1.12* application is downloaded in the *updates / PanGazer* folder and runs from there. There is no installation process. The application starts up and loads the appropriate panorama when a cross in the blue circle is left-clicked.
2. The application is well documented, either from the Help menu or from here: <http://speleotrove.com/pangazer/>
3. As well as the usual zoom and drag, *PanGazer* features include multiple views, addition of compass points and a link to *Google Maps* to show where the panorama was taken.
4. The panoramas in the *updates/panos* folder can be viewed outside of the map - just drag the jpg file and drop it into the PanGazer window. A shortcut can also be created for the *Pangazer64.exe* on the desktop.

IMPROVEMENTS AND EXTRA FACILITIES

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_
5. \_\_\_\_\_  
\_\_\_\_\_