Essential QGis operations in Roll

# Add a Point Layer

Adding a point layer may be needed to show the requested survey outline from a client (Area of interest), or a prospect outline from the geologist

1. **In QGis: Layer 🡪 Add delimited text layer**
2. Select filename
3. Optionally, give it a layer name that is different from the file name
4. Check File Format
5. Check Record and Field Options (For header lines etc.)
6. Define columns that represent X, Y and optionally Z values
7. Finally, select “Add”
8. Using Full Zoom (Ctrl+Shift+F) in QGis, you can now zoom to these points on the map

# Create a Line layer from Points (Vertices)

Once a point layer has been created, you can find them as a series of “small dots” in QGis. But these “dots” are hard to spot once you zoom out. It is therefore useful to turn these points into lines.

1. **In QGis: Processing 🡪 Toolbox will show (or hide) the Processing Toolbox**
2. **Processing Toolbox 🡪 Vector creation 🡪 Points to path**
3. Select Input layer
4. Create closed path (optionally)
5. Then, select “Run” to create a multi-line in order the points are listed

# Create a (filled) Polygon Layer from Lines

The lines are much better visible than points, but you cannot fill a line layer. To do so, you need to convert the lines to a polygon.

1. **In QGis: Processing 🡪 Toolbox will show (or hide) the Processing Toolbox**
2. **Processing Toolbox 🡪 Vector geometry 🡪 Lines to polygons**
3. Select Input layer
4. Then, select “Run” to create a filled polygon
5. Double-click the polygon to show the Layer Properties
6. Under “Symbology” adjust the Color to a meaningful color
7. Reduce Opacity to less than 100% to see features in underlying layers
8. You can also add an outline to the polygon. To do so:
   1. Add a Symbol Layer by pressing the green “Plus” Icon
   2. For symbol layer type select: “Outline: Simple Line” (Sits at the bottom of the list)
   3. Select appropriate color and Stroke width
   4. Select OK
9. Finally, in Layers Panel 🡪 context menu of the created layer 🡪 Make permanent
10. When an outline has been added to the polygon; you may delete the line layer. The line layer served its purpose (creating a polygon) and is no longer needed for the following steps, where we edit the exported src/rec/sps/rps data in QGis.

# Export src/rec and sps/rps data from Roll to QGIS

1. **In Roll: File 🡪 Export to QGis 🡪 Export Geometry 🡪 Export xxx Records to QGis**
2. **Alternatively: SPS import tab 🡪 Export to QGIS buttons for SPS and RPS records**
3. **Alternatively: Geometry tab 🡪 Export to QGIS buttons for SRC and REC records**
4. This will create in-memory (“scratch”) layers in QGIS with the exported data

# Make scratch src/rec and sps/rps layers permanent

To make the exported source and receiver data permanent, and available when you open the QGis project the next time, follow the steps below

1. in Layers Panel 🡪 context menu of the scratch layer 🡪 Rename layer
2. Use Ctrl+C to copy the layer name. Hit escape, and do not rename
3. in Layers Panel 🡪 context menu of the scratch layer 🡪Make Permanent
4. Alternatively 🡪 push the ‘scratch’ button on the right side of the layer’s name
5. Select ESRI Shapefile as file format
6. Select ellipses ( … ) next to filename 🡪 navigate to desired file location in the dialog
7. Paste the “filename” from clipboard in the dialog’s “File name” field
8. Select ok. The layer is now permanent, and will be restored if the project is opened again.

# Move src/rec and sps/rps points around in QGIS

To make changes to any of the layers you need to enable editing. To do so:

1. in Layers Panel 🡪 context menu of the layer with point data from Roll🡪 Toggle editing
2. A pencil icon will appear left of the layer name.
3. The pencil on the digitizing toolbar will also be highlighted.
4. In the digitizing toolbar select the Vertex tool for the current layer. This allows you to manipulate vertices on the active layer using one of the following methods:
   * Right click to lock on a feature
   * Click and drag to select vertices by rectangle
   * Alt+click to select vertices by polygon
   * Shift+click/drag to add vertices to selection
   * Ctrl+click/drag to remove vertices from selection
   * Shift+R to enable range selection

# Read src/rec and sps/rps points from QGIS back into Roll

Once changes have been made to point locations in QGis (*or when points have been made inactive, or have been deleted*) it can be useful to read these points back into Roll, to rerun analysis for Binning of Geometry data, or binning of imported SPS data. To lod modified point data back into Roll:

1. In Roll: Geometry tab 🡪 “Read from QGIS” buttons (for SRC and REC data separately)
2. In Roll: SPS import tab 🡪 “Read from QGIS” buttons (for SPS and RPS data separately)
3. In the layer dialog that pops up:
   1. Select the correct point layer from QGis, containing SPS/RPS and SRC/REC data
   2. Check that the CRS of the selected point layer matches that of the Roll project
   3. Decide whether (or not) to use a selection field code. Normally this is the “inuse” field.
   4. To see what fields are available in a point layer in QGis, you can:
      1. In Layers panel 🡪 Select the appropriate layer
      2. In context menu 🡪 Open Attribute Table (Shift+F6)
      3. Check column headers. These are normally:  
         ‘line’, ‘stake’, ‘index’, ‘code’, ‘depth’, ‘elev’ and’ inuse’
      4. Inuse = 0 is used to deselect a point for analysis in Roll

To update the analysis results in Roll:

1. In Roll’s processing menu 🡪 Binning from Geometry or Binning from Imported SPS

# Bulk edit src/rec/sps/rps points in QGIS

In Roll, survey geometry created is created using one or more rectangular blocks. In reality, a survey rarely consists of one or more rectangular shapes, but its outline is truncated according to the concession boundary, or impacted by features such as cities, lakes, etcetera. So, it will be necessary to cut (completely remove) or to switch off (mute) points in certain areas. In QGis this can be done by checking if points fall inside a polygon. There are two obvious solutions:

### Clipping: the easy way out

Clipping will remove all points outside a selected polygonal area. It is quick and easy, but won’t allow for points to be reinstated at a later stage; gone-is-gone. This can be cumbersome when the survey area is being finetuned over several iterations. Steps are straightforward:

1. Vector 🡪 Geoprocessing Tools 🡪 Clip …
2. Select Input layer: the layer containing SPS/RPS or SRC/REC points
3. Select Overlay layer: the layer with the boundary polygon
4. Select Run
5. The clipped point layer is now created as a scratch layer.

### Clipping: future proofing your edits

This approach first selects all points that lay inside a polygon, and is followed by turning the selection flag into a permanent attribute value (normally applied to “inuse”)

1. Vector 🡪 Research Tools 🡪 Select by Location …
2. Select features from: chose appropriate SPS/RPS or SRC/REC point layer
3. Where the features “are within” (and optionally “touch”)
4. Select the appropriate polygon layer
5. Create a new selection
6. Then, select “Run” to create a selection of points inside a polygon
7. These points will be highlighted in yellow and marked with a red cross
8. Now from the Attributes toolbar 🡪 Open Field Calculator
9. Alternatively: F6 to open Attribute Table, followed by Ctrl+I to Open Field Calculator
10. Uncheck “Only update xxx selected feature(s)”. We need to update all features, also those that have not been selected. If you forget to do so, only the already selected records will be altered, and in the unselected fields a NULL value will entered
11. Either (a) Create a new Field, with a 32 bit integer and default field length or (b) update an existing integer flag, such as the “inuse” field
12. In the Expression widget type the following:   
     **is\_selected()**

This function returns true (=1), when a point record has been selected, and false (=0) otherwise.

1. Press “OK” and let the operation run on all point records of the active layer.
2. Upon completion, check that everything went according to plan in the Attribute Table (F6)
3. Now the point layer is ready to be read back into Roll (See par above).