EEP Data Deliverables

Exploration Enablement Program Report Data Format Requirements

The EEP Report must address all content points as listed in the Reporting Template available at (https://taadeen.sa/en/exploration-enablement-program).

The EEP Report must include data submitted in compliance with the file conventions, file types and formats set out in this document and Table 1.

1. File naming conventions

File names should conform to the following file naming convention:

Title id_YYYY_EIP_ ##_ {data type}.eee where:

- **Title id** is the license number; there is no space between the title type/prefix and the number e.g. EL12345.
- **YYYY** is a four-digit report date representing year in which the report is due (not the year of submission).
- **EEP** is representative of an Exploration Enablement Program Report
- **##** is a two-digit sequential integer for each file submitted as part of the report.
- **{data type}** either denotes the data type contained in the file corresponding to one of the abbreviations in Table 1 or for documents appended to the report, the appendix number e.g. appendix4,
- **.eee** is the file suffix as shown in Table 1.
- For example, the file FID9999_2024_04_drillcollars.txt would be the fourth file of the 2024 report for Exploration License 9999 and would contain tabular data in ASCII text format.

The Ministry will accept the report and data via:

- Email, if the total report and data do not to exceed 10 MB
- Portable hard drive, non-returnable
- USB flash drives, non-returnable
- 3592 tape cartridges for larger volume data sets, specifically seismic field data

All media must be compatible with Windows Operating System and must be supplied in a hard protective cover.

Files may be submitted in compressed form. Acceptable formats are ZIP, RAR and ECW. Self-extracting executable files are not acceptable because of potential problems with virus detection software.

All media must be individually labelled with the company name, title number(s), report type and period, and numbered if there are multiple media, for example 1/5. A list of all the files is to be included with the report.

2. File Compression

Files may be submitted in compressed form, but only in ZIP, RAR, or ECW formats. Self-extracting executable files are not permitted due to potential issues with virus detection software. File names mentioned in the report and templates must match the original (expanded) files. When compressed, files should expand into a single directory without subdirectories, and they should not be compressed into another compressed file.

It's important to note that compressed files should not be utilized to combine multiple PDF files; each should be submitted as separate components rather than joined within a compressed file.

3. Data formats and specifications

This section outlines the acceptable data formats for various types of information. A summary is provided in the table below, with detailed explanations following under corresponding headings.

3.1. Text Documents:

- Text documents should be text (not image) Portable Document Format (PDF) with thumbnails.
- Do not embed files within the PDF; keep all associated files separate.
- Allow copying from but not editing of the document.
- Individual PDF files should not exceed 10 MB.

3.2. Numerical and Tabular Data:

- Submitted in ASCII with a .txt suffix.
- Tab-delimited, **not** comma-delimited.
- Follow SI system or an accepted industry standard if SI is not applicable. Avoid mixed units.
- Ensure ASCII data includes headers with units of measure for each column in the analytic data.

3.3. Location Maps:

- All reports should feature a scaled location map displaying sample points or surveys in relation to title boundaries and eastings/northings.
- Maps to be presented as .JPEG, .PNG or .TIFF formats.
- Attach all map features as GIS layers in a file format that can be opened in MapInfo, ArcGIS, QGIS or similar GIS software such as .TAB or .SHP files.

3.4. Photographs in Reports:

- Use of outcrop and core photographs is encouraged.
- Stand-alone images can be in PDF, GEOTIFF, TIFF, JPEG (Q≥95), GIF, PNG, or EPS.
- Images should be reproducible at the original size with a minimum of 300 dpi.
- Must be Geo-Locatable, accompanied by datum and projection information.

Table 1: List of suitable formats for a range of data

Data Type	Description	Format	Parameter	Suffix
Tabular data*	Point locations, geochemistry, heavy mineral, diamond indicator and drilling data	Tab Delimited ASCII	Standard as described in Sections 4 and 5	**.txt**
Report text	Documents, figures etc. previously provided only in hardcopy	Adobe Acrobat PDF	See Section 3	**.pdf**
Maps, plans, figures and photographs not embodied in report text	Files of maps, plans, figures, core photographs, aerial photographs etc.	Adobe Acrobat PDF	See Section 6	**.pdf**
		GEOTIFF/TIFF (color)	Reproducible at 300 dpi, 24 bit	**.tif**
		JPEG	Q>95, reproducible at 300 dpi	**.jpg**
		GIF	8 bit	**.gif**
		PNG		**.png**
GIS data	Data in GIS format	MapInfo Tab		**.tab**
		ESRI Shape		**.shp**
Video clips	Fly-throughs etc.	MPEG		**.mpg**
		Avi		**.avi**
3D mine models and resource estimation	3D mine model data, resource / reserve models		See Section 13 and Section 14	
3D modelling	3D models	As appropriate to fulfil requirements in Section 13	See Section 13	**.dxf** **.txt**
		ASCII .dxf files		
Geophysics (other than seismic)	Raw and processed located data and gridded data. For example magnetics, radiometrics, EM, DTM and gravity data	ASEG GDF2		**.dfn** **.dat** **.des**
		ASEG GXF		**gxf**
		ER Mapper grid		**.grd, .ers**
		XML (including schema)		**.xml, .xsd**
Geophysical and other remotely sensed images	Images derived from geophysical / remote sensing surveys, e.g. TMI, Bouguer, radiometrics, Landsat 5 or 7	GEOTIFF/TIFF (color)	Reproducible at 300 dpi, 24 bit	**.tif**
		TIFF (greyscale)	Reproducible at 300 dpi, 8 bit	**.tif**

Data Type	Description	Format	Parameter	Suffix
		Compressed ER Mapper	Best quality (least loss)	**.ecw**
		JPEG	Quality as above 8 bit See Section 3	**.jpg**
		GIF		**.gif**
		PDF		**.pdf**
		PNG		**.png**
Geophysical Inversion and Numerical Modelling	Models	Points (DXF or ASCII)		**.dxf** **.txt**
		Images	See Section 3 See parameters above for Geophysical Images	**.pdf** **.tif** **.jpg** **.gif** **.png**
		Surfaces	.dxf	
		3D grids (UBC Grid or GoCAD Voxet)		
Seismic data	Raw and processed data	SEG Y, preferably Rev. 1		**.sgy**
		SEG D		**.sgd**
	Navigation data	UKOOA P1/90		**.uka**
	Processed sections	CGM+ format with metadata (line number, shotpoint number)	See parameters above for Geophysical Images	**.cgm**
		Images		**.tif, .jpg, .gif, .pdf,**
Petrophysical and geophysical log data	Raw and processed wireline and MWD data	DLIS and LIS LAS	As defined by latest Industry Standard	**.lis** **.las**
		Delimited ASCII (format must be explained)		**asc**
		WELLOGML (POSC standard)	Include schema	**.xml,** **.xsd**
	Log plots	Adobe Acrobat PDF	See Section 3. See parameters above for Geophysical Images 8 bit	**.pdf**
		TIFF (colour)		**.tif**
		TIFF (greyscale)		**.tif**
		JPEG		**.jpg**
		GIF		**.gif**
		PNG		**.png**
Processed down-hole velocity data		**SEG Y, preferably Rev. 1**		**.sgy**

4. Tabular data

Tabular data comprises point locations, geochemistry, diamond indicator observations, and drilling data. To submit this information, use TAB-delimited ASCII files with a .txt suffix.

It's essential to adhere to a "flat file" format for tabular data rather than a "relational" file system. This choice offers greater flexibility in formatting and minimizes the need for relational keys between files. However, for certain datasets, such as drill logs incorporating lithological, geochemical, structural, and other information, including authority/lookup tables, submission may involve a set of "linked" flat files. These should be appropriately documented to ensure clarity and understanding.

5. Metadata

All data must be accompanied by metadata; presented in a file header at the top of the file of related tabular data (preferred) or as a separate file.

Metadata should include:

- location of the data
- date the data were produced
- data the data were altered
- parameters controlling the data acquisition
- parameters controlling the data's alteration
- name of the company for whom the data was produced
- title(s) under which the data was produced
- activity which produced the data e.g. Drilling
- name of the contractor producing the data
- any translation parameters required for conversion of the data (especially location data)

6. Maps, plans, figures, images and photographs

Depending on the number involved and the file size, maps, plans, figures, photographs and other illustrations may be inserted into the appropriate places within the text document or may be grouped together in a separate section or appendix. Refer to Table 1 for formats and parameters.

All maps, plans, sections, figures, etc. must:

- have a metric scale bar
- have a coordinate grid clearly marked and a label within the bounds of the map or plan that includes the datum and where relevant, the UTM zone.
- have a north point (grid, true and magnetic north) or orientation of sections
- have a clear and comprehensive legend.
- distinguish between geological 'fact' and interpreted geology
- show the author, acknowledged sources and date of drafting.

TIFF (.tif) is recommended for black and white and JPEG (.jpg) for greyscale or colour including photographs, but not for images containing text or line work.

Sufficient information should be provided to allow spatial registration of images (geophysical surveys, satellite, multispectral scanner and orthoimagery) where appropriate.

7. GIS data

Currently, there is no international standard for data in GIS format, but most common software is able to read the common proprietary formats. GIS data formats accepted are ESRI shape files (SHP) and MapInfo tab files (TAB).

Where practical the symbology of the GIS displayed data should be provided (e.g. an ESRI layer file (LYR) or legend file (AVI) or MapInfo workspace file (WOR).

8. Geophysical data other than seismic

These data encompass magnetic, gravity, radiometric, and electromagnetic surveys, including TEM, SIROTEM, and airborne EM. For both raw and processed located data, adherence to standards is required, with gridded data in ER Mapper format.

It's important to note that the submission of images alone does not excuse companies from providing the located geophysical data from which these images were derived.

In the case of airborne EM surveys, as much of the following located information as is pertinent to the type of survey conducted shall be supplied, in addition to the operational data (such as line number, sample position, terrain clearance etc) normally supplied for airborne surveys.

Additionally, companies must furnish supplementary data sufficient to facilitate inversion of the data to the extent implied by the conducted survey type:

- Raw EM data for each recorded component, if supplied by the survey contractor
- Levelled, windowed and processed EM data for each recorded sample and component
- All channels of information computed from the processed EM data e.g. half-space apparent conductivities, layered earth apparent conductivities
- Ancillary data such as those recorded by 50Hz monitors and spherics monitors
- Tx-Rx vertical and horizontal separation tabulated with accompanying diagram, or Tx and Rx positions, for each sample if recorded dynamically
- All parameters relevant to Tx and Rx moment and all orientation data
- If a B-field sensor is used, all relevant sensitivity information
- Tx current details and, if available, for each sample recorded dynamically
- All reference or real-time waveforms recorded and suitable for calibration purposes
- All calibration data relevant to the flight lines supplied
- Full metadata including frequencies, waveform and duty cycle, window times, centres and widths, measurement units and details of any amplitude normalization
- Full metadata about the EM data processing including a list defining the processing sequence employed and a quantitative description of each processing stage in the sequence sufficient that its effect on the data may be determined for future reference. Such descriptions may include references to published papers explaining the algorithms used
- Any other recorded parameters relevant to the current processed or interpretive outputs or useful for the further processing or inversion of the data.

Much of the reference information required will be in the operations report which should be lodged with the data. It is required that gridded data be submitted in either ASEG GXF or ER Mapper gridded data format.

The data format specifications may be waivered for ground geophysical surveys of less than 1000 data points and/or over an area of less one square kilometre. Permission must be granted in advance.

9. Seismic data

International standards exist for seismic data and compliance with the following formats is required:

Raw and processed data - SEG Y (preferably Rev. 1) or SEG D, with file names including the survey name and line number where appropriate.

Navigation data - as a complete IOGP P1/90 file.

Processed sections - CGM+ files complete with metadata, with the line number included within the file name. Images of processed sections may use geophysical image formats specified in Table 1.

10. Petrophysical and downhole geophysical data

Raw and processed wireline (eg gamma or resistivity logs) and MWD data must be provided as DLIS, LIS, LAS or delimited ASCII files.

Log plots are to be provided as either PDF, TIFF, JPEG, GIF or PNG files. Processed down hole velocity data should be provided in SEG Y (preferably Rev.1) format, with the well/hole name as part of the file name.

11. Spectral and alteration logs

Files generated by spectral and/or alteration logging hardware or display and interpretation software may be submitted in their native formats. However, it's crucial that these proprietary files are accompanied by a generic ASCII equivalent.

For instance, PIMA™ FOS files should be supplemented with one or more .txt and/or .emf files, and if required, .jpg files containing the same data. These ASCII equivalents ensure accessibility without the need for specialist software.

12. Aerial hyperspectral data

Hyperspectral data submissions should consist of reflectance-level data accompanied by all relevant geocorrection files. In this format, the data retains the full 125/128 bands, minimizing disk space usage and ensuring potential reprocessing in the future. Reflectance data should be submitted as .bil files, complete with .hdr header files, and corresponding geo-correction details provided in .img and .glt files.

Data older than 2004 may lack the .glt files or be at radiance level rather than reflectance. Additionally, for comprehensive presentations, mineral maps must be included. All images must be georeferenced to provide accurate spatial context.

13. Computer modelling

13.1. 3D Model Objects

Complete data sets, along with the necessary associated files, must be provided to regenerate the models. This includes regional and mine-scale 3D model objects, encompassing points, lines, surfaces, and volumes. Refer to Table 1 for the specified formats.

Model files should include:

- details of software and version used
- model extents in GDA94 (MGA or latitude/longitude)
- local grid transformation data if local grid is used
- model points, lines and surfaces as ASCII .dxf files (or as ASCII point sets or ASCII line strings for point and line objects)

13.2. Geophysical inversion

Please provide both the inputs to and results from geophysical inversion modelling, accompanied by a detailed description of the modelling process. Additionally, include a comprehensive explanation of the model's scope and purpose.

Model files should include:

- a description of the aim and scope of the inversion project
- details of software and version used
- model extents in national projection or latitude/longitude)
- a description of the input datasets and constraints (eg using drill data)
- a description of the modelling parameters (eg susceptibility, density, dimensions of body) used (control file)

Model outputs either as:

- points (DXF or ASCII)
- images – calculated, observed, residual
- surfaces (DXF and/or file type described in Section 13.10.1)
- 3D grids (UBC Grid sus, bin and mesh files or GoCAD Voxet)

Include a brief description of model convergence and confidence level (Is the model a good fit for the data?).

13.3. Numerical simulation

Describe the model scope and purpose. Supply inputs, to and results from, numerical simulation modelling.

Refer to Table 1 for formats.

Model files should include:

- a description of the aim and scope of the numerical simulation
- details of software and version used
- model extents in national projection or latitude/longitude
- a description of the input datasets and constraints
- a description of the simulation parameters used (control file)
- Model outputs in DXF, VRML, VTK, GoCAD or other appropriate format

14. Resource / Reserve modelling and estimation

Provide the data used to produce the Mineral Resource / Reserve estimations including:

- details of software and version used
- rock density estimate or measurement data
- boreholes involved (collars, assays and down hole survey files)
- additional grade information (eg bulk sampling data)
- all relevant model points, lines and surfaces as ASCII .dxf files (or as ASCII point sets or ASCII line strings for point and line objects)
- assumptions made (eg cut-off grade, overburden etc)
- domain models

15. Appendix 1

File formats for sample records.

Table 15-1 Summary of Literature Study (Exploration History)

Reference	Year of Publish	Author	Nature of Work	Specific Location	Summary of Work Done

Table 15-2 List of Map and Data Digitized

Reference	Year of Publish	Map Type	Data Type	Specific Location	Summary of Digitization

Table 15-3 Topographic Survey Data

Tenement_ID	Survey_point_ID	X_Easting metres	Y_Northing metres	Z_Elevation metres	UTM_Zone	Survey_Type	Instrument	Survey_date
Abcd_001	numeric					Control Point	DGPS	
Abcd_001	numeric					Control Point	DGPS	
Abcd_001	numeric					Road	Total Station	
Abcd_001	numeric					Fence	Total Station	
Abcd_001	numeric					Topo	Total Station	

Table 15-4 Summary of Samples

Tenement_ID	Sample_Type	No of Samples Collected	No of Samples Analyzed	Laboratory Name
Abcd_001	Stream			
Abcd_001	Soil			
Abcd_001	Rock-chip			
Abcd_001	Channel			

Table 15-5 Surface Sample Location Coordinates

Tenement_ID	Observation_ID	X_Long	Y_Lat	Z_Elevation metres	Sample_Description	Sample_Type	Sample_ID
Abcd_001	S_001					Soil/stream	numeric
Abcd_001	S_002					Soil/stream	numeric
Abcd_001	R_001					Rock chip	numeric
Abcd_001	R_002					Rock chip	numeric
Abcd_001	CH_001					Channel	numeric
Abcd_001	CH_001					Channel	numeric

Table 15-6 Surface Sample Assay Results

Tenement_ID	Sample_ID	X_Long	Y_Lat	Z_Elevation metres	Laboratory	Element 1 Unit Method	Element 2 Unit Method	Element 3 Unit Method	etc. Unit Method
Abcd_001	numeric								
Abcd_001	numeric								
Abcd_001	numeric								
Abcd_001	numeric								
Abcd_001	numeric								

	Survey Type	Flight Type	Survey Specification	Total Area Covered (sq.km)
Airborne Geophysical Survey	*Magnetic* *Electro-Magnetic* *Radiometry* *Gravimetry*	*Fixed Wing* *Rotary Wing*	*Flight Height (m)* *Line Spacing (m)* *Equipment Specification*	*Magnetic* *Electro-Magnetic* *Radiometry* *Gravimetry*

Table 15-7 Coverage area line coordinates

Tenement ID	Location Name	Survey Type	Line_ ID	Start_ X_Long	Start_ Y_Lat	End_ X_Long	End_ Y_Lat	Datum
								WGS84
								WGS84
								WGS84
								WGS84

Table 15-8 Details of Ground Geophysical Survey

	Magnetic	Resistivity	EM	IP	Other Methods
Ground Based Geophysical Surveys	*Equipment Specification*	*Equipment Specification*	*Equipment Specification*	*Equipment Specification*	*Equipment Specification*
	Points per line *Total no of Lines* *Total Line Length (km)*	*Points per line* *Total no of Lines* *Total Line Length (km)*	*Points per line* *Total no of Lines* *Total Line Length (km)*	*Points per line* *Total no of Lines* *Total Line Length (km)*	*Points per line* *Total no of Lines* *Total Line Length (km)*

Table 15-9 Coverage area point and line coordinates

Tenement ID	Location Name	Survey Type	Point ID	X_ Long	Y_ Lat	Line_ ID	Start_ X_Long	Start_ Y_Lat	End_ X_Long	End_ Y_Lat	Line Length km	Datum
												WGS84
												WGS84
												WGS84
												WGS84

Table 15-10 Excavation (Pit, Trench) Summary

Bedrock Geochemical Sampling by Pitting	No of Pits	Average Spacing (m)	Average Depth (m)	Average Width (m)	Average Length (m)	Total Excavated Volume (cum)	Total Sampled Volume (cum)	Total No. of Samples	Total Working Days
Bedrock Geochemical Sampling by Trenching	No of Trenches	Average Spacing (m)	Average Depth (m)	Average Width (m)	Average Length (m)	Total Excavated Length (m)	Total Sampled Length (m)	Total No. of Samples	Total Working Days

Table 15-11 Pit, Trench ID, Location Coordinates and Sample Logs

Sl. No.	Pit/ Trench ID	X_ Long	Y_ Lat	Z_ Elevation metres	Date	Location	Azimuth	Channel width (m)		Sampled width	Sample Description	Sample ID	Laboratory
								From	To	Total			

Table 15-12 Pit, Trench Assay Results

Pit/Trench ID	Sample ID	X_ Long	Y_ Lat	Z_ Elevation	Laboratory	Element 1	Element 2	Element 3	etc.
				metres		Unit	Unit	Unit	Unit
						Method	Method	Method	Method

Table 15-13 Drilling Summary-1

EL ID	Hole Type	Hole Number Range	Hole/Core Size	No of Holes	Total Metres
	DTH/RAB/Auger	RAB 001-500	60-200 mm	500	1500
	AC	AC 001-200	35-55 mm	200	3000
	RC	RC 001-050	85-145 mm	50	5000
	Diamond	DD 001-010	PQ, HQ, NQ, BQ	10	2000
Grand Total				760	11500

Table 15-14 Drilling Summary-2

DTH/RAB/Auger Drilling	No of drill-holes	Average Depth (m)	Average Spacing (m)	Total drilled metres	Total sampled metres	Total No. of Samples

Air Core Drilling	No of drill-holes	Average Depth (m)	Average Spacing (m)	Total drilled metres	Total sampled metres	Total No. of Samples

RC Drilling	No of drill-holes	Average Depth (m)	Average Spacing (m)	Total drilled metres	Total sampled metres	Total No. of Samples

Diamond Core Drilling	No of drill-holes	Average Depth (m)	Average Spacing (m)	Total drilled metres	Total sampled metres	Total No. of Samples

Table 15-15 Drillhole Collar Coordinates

Tenement ID	Hole ID	X_Long	Y_Lat	Z_Elevation (m)	Surveyed	Drill Type	Start Date	End Date	Final Depth (m)	Inclination	Azimuth
					GPS	Air Core					
					GPS	Air Core					
					DGPS	RC					
					DGPS	RC					
					DGPS	DD					
					DGPS	DD					

Table 15-16 Drill-Sampling Summary

Assaying Drilled Samples	Drill-Sampling Type	No of Samples Assayed	Methodology XRF ICP-MS/OES/AAS Fire Assay	Major Elements Analysed	Name of Laboratory
	DTH/RAB/Auger Cuttings				
	Air Core Chips & Cuttings				
	RC Chips & Cuttings				
	Diamond Core				

Table 15-17 Drill-sample Assay Results

| Tenement ID | Drill-hole ID | Sampled Distance (m) | | Sampled Width | Sample Description | Sample ID | Laboratory | Element 1 | Element 2 | Element 3 | etc. |
| | | From | To | Total | | | | Unit | Unit | Unit | Unit |
								Method	Method	Method	Method

Table 15-18 List of Core Photographs to be submitted as Attachment

Tenement ID	Site Name	BHID	Box No	From (m)	To (m)	Core photograph with ID
						Provide core photograph of each drill-hole in separate folder inside a folder with Site name; name each photo with BHID and depth

Note: For core photography please read SGS guideline

Table 15-19 Significant Intercepts

Hole No	Hole Dip	Hole Azimuth	X_Long	Y_Lat	From (m)	Significant intersections Cut-offs: 0.5 g/t Au, 5 g/t Ag, 0.1% Cu, 0.2% Pb, 0.2% Zn, 0.1% Sb, 0.4% Ni, Cr, V and 0.2 % W	Total depth (m)	Comments
RC001	-60	180			138	3 m @ 2.4 g/t Au	210	Reef intersected 135-145 m
DD002	-55	200			121	4 m @ 1.1 g/t Au	215	Reef intersected 120-130 m

Table 15-20 List of Drillhole Collar Photographs to be submitted as Attachment

Tenement ID	Site Name	BHID	X_Long	Y_Lat	Z_Elevation (m)	Drillhole Collar photograph with ID
						Provide collar photograph of each drill-hole in separate folder inside a folder with Site name; name each photo with BHID