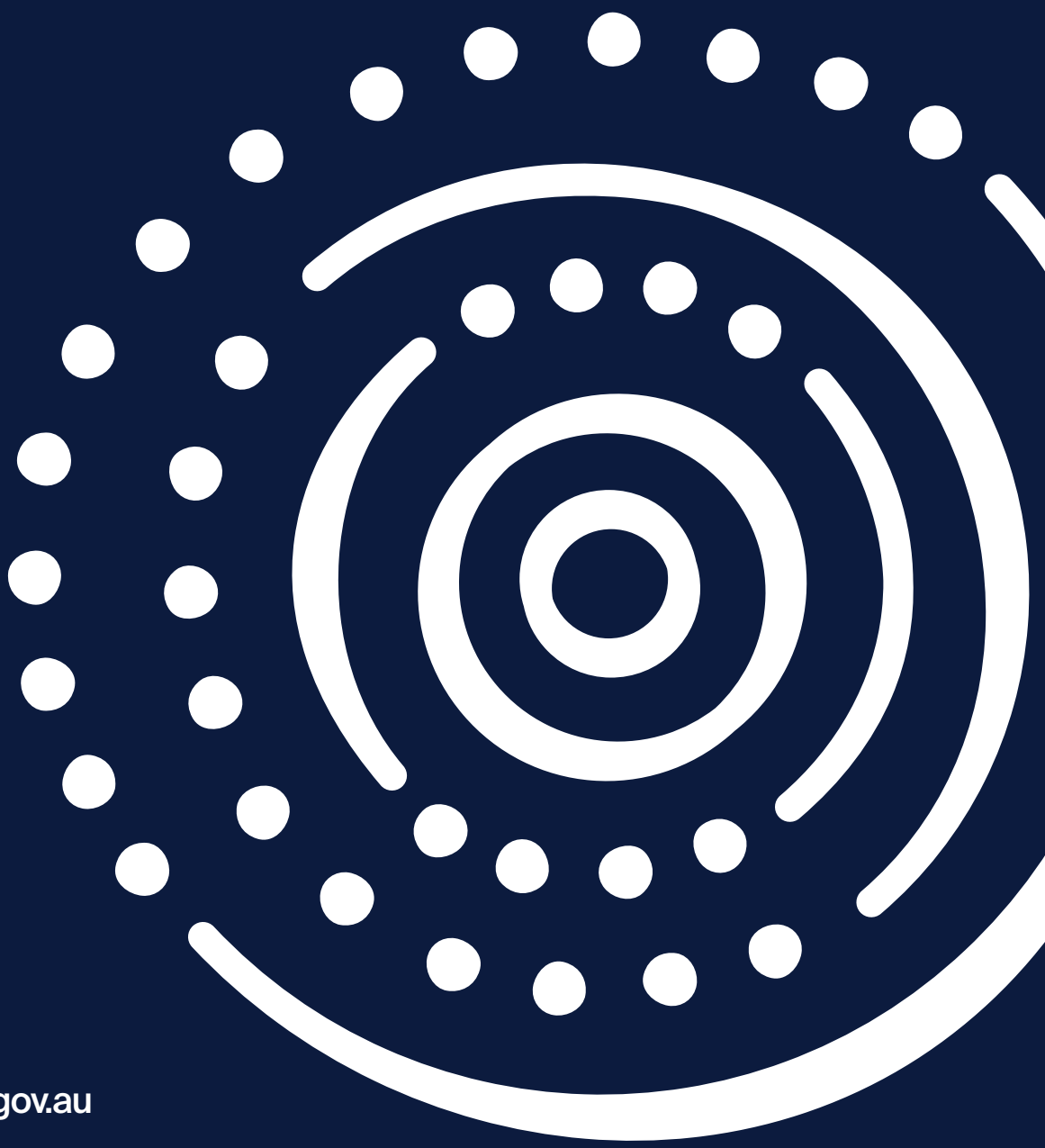
Government of South Australia

Department for Energy and Mining

Minerals Regulatory Guidelines

MG13

Mineral exploration reporting



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Minerals Regulatory Guidelines MG13

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Revision history

Date	Comment
July 2012	Transitioned into the Minerals Regulatory Guidelines series.
March 2013	Added link to further information on allowable expenditure.
November 2013	Expanded summary report on mineral exploration.
April 2014	Added requirements for submission of geological samples.
February 2015	Updated links.
May 2016	Updated links.
May 2017	New requirement for an annual expenditure report (replaces 6-monthly summary report).
March 2018	Ability to make maps in SARIG added; updates to technical reporting and partial surrenders.
August 2019	Migration to GDA2020; update to submission/delivery of reports and notifications; new phone nos.
August 2022	Updated to comply with Mining Regulations 2020.
July 2023	Updated for a change to the information transfer platform.

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Contents

Shortened forms

AA summary	annual activity summary (for exploration licences)
AEA	amalgamated expenditure arrangement
AHD	Australian height datum (geodetic datum for altitude measurement in Australia)
AMG	Australian Map Grid (relative to AGD66/AGD84)
ASCII	American Standard Code for Information Interchange (international standard)
ASEG	Australian Society of Exploration Geophysicists
DEM	Department for Energy and Mining
Director	Director of Mines (as specified in the *Mining Act 1971* and Mining Regulations 2020)
GDA2020	Geocentric Datum of Australia 2020
GDA94	Geocentric Datum of Australia 1994
GPS	global positioning system
MGA2020	Map Grid of Australia (relative to GDA2020)
SARIG	South Australian Resources Information Gateway
SI	International System of Units (international standard)

1 Introduction

These guidelines assist tenement holders to:

- prepare and submit exploration reports and geological samples
- ensure integrity of data and compliance with the requirements under the *Mining Act 1971* and Mining Regulations 2020.

The requirement for the submission of these reports and geological samples is in place so that exploration progress can be assessed and the exploration data obtained can be effectively captured to ensure its future availability.

Geological samples are collected and stored by the Department for Energy and Mining (DEM) as an invaluable geoscientific reference collection. Sample selection criteria, quantities, labelling and accompanying information required are set out in Minerals Regulatory Guidelines MG18, *Drill core and geological sample submission*.

National guidelines for both the structure of technical reports and the submission of this data in digital form have been developed for the Australian Chief Government Geologists' Committee. The guide – *Australian requirements for the submission of digital exploration data –* evolved through consultation between industry groups, industry representatives and state government representatives. The aim is to improve the effectiveness and efficiency of data collection and storage, and thus data availability for future use. Your adherence to these guidelines ensures that the results of exploration are fully and clearly recorded for the benefit of future explorers and researchers.

Liaison between company staff and the relevant DEM contact (Section 6) is encouraged to ensure that the requirements of these guidelines are effectively met.

This report is periodically updated. Check the DEM website for current guidelines.

2 General information and legislative requirements

2.1 Tenement holder requirements

Under section 15AJ of the Mining Act, a tenement holder must:

(1) … compile or create designated material relating to the tenement in accordance with any requirements prescribed by the regulations.

(2) … keep all designated material in a form, in a place and for a period as prescribed by the regulations.

Specific reporting requirements are set down under regulation 78. These include a requirement that technical exploration reports, data and geological samples must be submitted in a manner and form determined by the Minister, and it is the purpose of these guidelines to assist tenement holders in producing and submitting reports and geological samples of an acceptable format and standard.

2.2 Submission of reports

2.2.1 Digital data and online submission

Submission requirements and confidentiality periods for each report type are summarised in Table 1. Reports are no longer accepted as printed copy or digitally via CD, DVD or USB devices.

Table 1 *Mineral exploration reporting requirements*

Report type	Reporting format	Due date	Mode of submission	Confidentiality period
Annual technical report (and associated data)	As specified in Section 3.1	Within 2 months following the end of each reporting period	Email to DEM.Exploration@sa.gov.au or transfer via OneDrive (Section 2.2.2)	5 years after the report was lodged
Annual activity summary	As specified in Section 3.1.1	Within 2 months following the end of each reporting period	Online template on the SA.GOV.AU website – Annual activity summary	Ongoing confidential status
Partial surrender report (and associated data)	As specified in Section 3.3	Within 2 months following the date of the partial surrender	Email to DEM.Exploration@sa.gov.au or transfer via OneDrive (Section 2.2.2)	Open file immediately on surrender/relinquishment
Final technical report	As specified in Section 3.2	Within 2 months following the date of the expiry/surrender or within 3 months following the date of the cancellation/forfeiture	Email to DEM.Exploration@sa.gov.au or transfer via OneDrive (Section 2.2.2)	Open file immediately on expiry, full surrender, cancellation or forfeiture
Notification of an airborne survey	As specified in Section 2.8	14 days **before** the airborne survey is due to be carried out	Online template on the SA.GOV.AU website – Notification of an airborne survey on a mineral tenement	Notification remains ongoing confidential status (Confidential period is 5 years for the survey data submitted with technical report)

A digital backup copy of all information submitted to DEM must be kept by the tenement holder for 7 years to cover the possibility of information corruption during transfer to DEM, and to enable the compilation of future partial surrender reports, where required.

All reports must be submitted in full English text.

2.2.2 OneDrive

OneDrive is the preferred platform for transferring information too large to be emailed (>20MB). It allows individual folders to be shared with individual users. Email DEM.Exploration@sa.gov.au to request a OneDrive File Sharing folder.

2.2.3 *Submission of geological samples*

Under regulation 16(4), geological samples – drill core, drill cuttings and other representative samples – must be kept for the term of the relevant tenement and for 7 years after the tenement expiry, surrender, cancellation or forfeiture, or provided to the Director.

Geological sample submissions must comply with the requirements set out in Minerals Regulatory Guidelines *MG18, Drill core and geological sample submission*. A drill core sample submission agreement form is provided within the guideline and must be approved before samples can be submitted.

DEM contacts are available for advice (Section 6).

2.3 Location coordinates and maps

On 12 August 2019, GDA2020 (the Geocentric Datum of Australia 2020) was adopted and is the preferred spatial datum to which location coordinates should refer in submitted mineral exploration data.

The adoption of the GDA2020 coordinate datum allows closer alignment with global navigational satellite systems such as GPS. For grid-based map coordinates (i.e. eastings and northings), the MGA2020 (Map Grid of Australia, relative to GDA2020) replaces the previous MGA (Map Grid of Australia, relative to GDA94) system.

To avoid confusion and ensure the effective transfer and future use of all maps and coordinate data submitted to DEM, it is **essential** that the information in Sections 2.3.1 and 2.3.2 be clearly and explicitly specified.

Note that the South Australian Resources Information Gateway (SARIG) can be used to create and print a map showing a tenement boundary polygon.

2.3.1 *Coordinate data*

All coordinate information must include coordinate system (e.g. latitude/longitude or MGA2020 with appropriate zone), datum, accuracy (e.g. 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500 m) and method of determination of the coordinates which are provided (e.g. GPS, hand-held; GPS, differential; scaled or digitised from map). The following options are preferred:

- MGA2020 – easting, northing, zone, datum GDA2020
- latitude/longitude – DD MM SS.SSSS, datum GDA2020.

2.3.2 *Maps and map references*

The map projection, coordinate system of any grids or graticules, and datum should be clearly shown on all maps and be clearly specified for all map references used. The following is preferred:

- Universal Transverse Mercator projection, datum GDA2020, coordinates grid MGA2020.

The wrong use of a datum could result in displaced positions of in excess of 200 m.

Data or maps presented without the required coordinate reference information will not be considered as meeting the reporting requirements.

2.4 Joint (combined) reporting

Where an exploration project is being conducted across adjoining exploration licences and mineral tenements, the tenement holder can apply to the Director for joint reporting status for those tenements. Such

arrangements are encouraged as they reduce the number of reports to be completed by companies and reduce handling by DEM.

Requests for joint reporting status must be emailed to DEM.Exploration@sa.gov.au (Attention: Exploration Data Team) using the application for combined/joint reporting form (Appendix A). The application must be accompanied by the relevant information as detailed on the form.

In considering requests for joint reporting status, the exploration target or objective, the geographical distribution of the tenements (i.e. contiguous licences/mineral tenements), tenement ownership, the history of reporting and the previous exploration and reporting performance of the explorer will be taken into account.

Where one tenement or part of a tenement from the group is surrendered or expires, final/partial surrender reporting requirements will apply (Sections 3.2 and 3.3).

If there is a current amalgamated expenditure arrangement (AEA) approved over the same group of tenements which joint reporting status has been requested, it is recommended the nominated reporting date and name of project correspond with the expiry date and project name of the AEA.

On approval, joint reporting status will apply to submission of joint annual technical reports and joint compliance reports in lieu of individual reports.

Requests to include additional tenements into granted groups must be made using the application for combined/joint reporting form and will be considered in the same way as new applications.

Annual activity summaries are not included in joint reporting arrangements and should be submitted as per normal requirements.

2.5 Data confidentiality and release of matter (section 15AL of the Mining Act and regulation 17 of the Mining Regulations)

Subject to section 15AL (1) of the Mining Act, the Minister or Director may release any prescribed material – e.g. report and associated data obtained from the holder or former holder of a tenement.

However, if the tenement is still current, the Director must not release material under section 15AL without the consent of the holder of a tenement (reg 17(e)). Under regulation 17 material may be released where:

- report and associated data have been held for a period of at least 5 years
- the expiry, cancellation or forfeiture of the tenement
- the reports and data dealing with exploration conducted on areas that have ceased to be part of the tenement
- the tenement holder has agreed that reports and data may be released.

Note that the *Freedom of Information Act 1991* applies to material held for the purposes of the Mining Act.

2.6 Open file data access

Open file company data and reports are collected, managed and made available in digital format. The fastest and most convenient way to access these records is through SARIG. For assistance email DEM.CustomerServices@sa.gov.au or phone +61 8 8463 3000.

SARIG allows you to search all open file records and download digital reports directly to your computer. You can also search drillhole records and organise core viewings at the South Australia Drill Core Reference Library at Tonsley.

2.7 Technical data, studies and reports

Regulation 16(9) requires technical data, studies and reports sponsored by the tenement holder or operator of a tenement (e.g. university thesis or confidential report from a research organisation) and attributed to exploration activity and expenditure for the tenement, must be submitted in their complete form. Such reports should be referenced in and included with, the annual technical report. These reports will be subject to the same confidentiality restrictions as other reports submitted for the tenement, unless agreed otherwise with the tenement holder.

2.8 Notification of airborne surveys

Regulation 80 requires the tenement holder to provide notification of any proposed airborne surveys. Use the online template on the SA.GOV.AU website – Notification of an airborne survey on a mineral tenement.

See Appendix B for further details.

2.9 Compliance/penalties

Failure to keep complete and detailed records of operations conducted on a tenement, or to correctly submit related information or samples to the standards required by section 15AJ of the Mining Act may result in an administrative penalty.

Regulation 78(3) of the Mining Regulations lists the administrative penalty per instance of noncompliance as $5,000.

Noncompliance in relation to the Mining Act and Mining Regulations (including breaches of exploration reporting requirements) will be taken into account when considering the grant or renewal of an exploration licence, and the scoring of competitive applications in the exploration release areas process.

In the case of joint reporting arrangements, failure to submit reports in the correct form or within the specified time could result in the loss of joint reporting privileges.

If a report cannot be submitted within the timeframe as specified by the Regulations, then a request for time extension (with justification) should be emailed to DEM.Exploration@sa.gov.au.

3 Technical exploration reporting

Technical reports must be submitted annually, or on the expiry, full surrender, cancellation, forfeiture or partial surrender of an exploration licence and any other mineral tenement where the tenement holder carries out exploration operations.

Reports should be clearly titled as either an ‘Annual technical report’, ‘Partial surrender report’ or ‘Final technical report’.

3.1 Annual technical report

The annual technical report contains two parts:

- Annual technical report – includes all results, studies and new technical data acquired within the reporting period.
- Annual activity summary (exploration licence only) – includes brief summary of exploration activities and associated expenditure.

Each part must be submitted separately within 2 months following the end of each reporting period.

If this timeframe cannot be met, then a request for time extension (with justification) should be emailed to DEM.Exploration@sa.gov.au prior to the due date of the report(s).

For surveys in progress at the time of submission of an annual technical report, it is sufficient to indicate the progress of the work and to submit the full results in a subsequent report when the survey has been completed.

If **no technical work was undertaken** during the reporting period, this needs to be stated by the tenement holder in an email, or a letter attached to an email, providing relevant information, including tenement number and reporting period. Email or letter needs to include company signature or signature of relevant authorised person and/or company logo.

3.1.1 Annual activity summary

A separate annual activity summary (AA summary) must be submitted for each exploration licence, reporting on the 12-month period ending on the anniversary of the day the licence was granted.

Online submission is required using the template on the SA.GOV.AU website.

If no technical work was undertaken during the reporting period an AA summary must still be submitted stating this.

Joint reporting arrangements apply only to **technical reports** and **compliance reports**. Where a joint reporting arrangement is in place, AA summaries should be submitted as per normal requirements.

The AA summary required for an exploration licence is not a component of exploration expenditure regulation. It is part of the annual technical report that itemises expenditure for each year's activities, for use in conjunction with exploration operations and data reporting.

Exploration expenditure and operations within a commitment period are monitored and regulated through an expenditure return. AA summaries for the expenditure commitment period can be used as supporting documentation in the expenditure return to list detailed expenditure. The differences between the AA summary and the exploration licence expenditure return are shown in Table 2.

***Table 2** Annual activity summary and exploration licence expenditure return reporting requirements*

Item	Submission frequency	Description	Confidentiality
Annual activity summary	Annually	Component of the annual technical report. Itemised activities and costings to reconcile with the annual technical report and for departmental statistical purposes.	All information to remain confidential.
Expenditure return*	2 yearly	Expenditure and operations for the completed and forward commitment periods for purposes of exploration expenditure regulation.	Only summary costs for the completed period published on the Mining Register. Forward period details remain confidential.

* For information on allowable expenditure refer to Minerals Regulatory Guidelines MG33, Mineral exploration licences.

3.2 Final technical report

On expiry, surrender, cancellation or forfeiture of an exploration licence or mineral tenement, the **final technical report** must contain a technical summary of exploration work conducted from the date of the previously submitted annual technical report to the expiry, surrender, cancellation or forfeiture date. All previously submitted annual technical reports will be released as open file and made available via SARIG.

If the tenement has been part of joint (combined) reporting, a final technical report summarising and extracting all exploration data within the area of the expired, surrendered, cancelled or forfeited tenement/former tenement must be submitted within 2 months following the expiry or surrender date and within 3 months following cancellation or forfeiture date. As an alternative, the tenement holder may prefer to allow all previously submitted joint annual technical reports within that reporting group to be released to open file.

3.3 Partial surrender report

If a tenement holder voluntarily surrenders part of an exploration licence or is required to relinquish part of a licence, a partial surrender report must be submitted within 2 months of the surrender date. The report needs to summarise all exploration activities and contain all technical data acquired by the tenement holder during current tenure, plus any preceding tenement data not previously released for the surrendered area. As an alternative, the tenement holder may prefer to allow all previously submitted technical reports to be put on open file.

If no technical work was undertaken over the surrendered area during the reporting period, this needs to be stated by the tenement holder in an email, or a letter attached to an email, providing relevant information, including tenement number and relevant reporting period. Email or letter needs to include company signature or signature of relevant authorised person and/or company logo.

3.4 Open file release of reports and data

Annual technical reports, associated data or any other associated material that has been held by DEM for a period of 5 years will be released as open file. See Section 2.5 for further details.

4 Technical report content and format

A technical report should contain information of sufficient scope and detail to substantiate the expenditure reported and the activities undertaken within the reporting period.

This should include complete and consistent records of all geoscientific activities undertaken, the information obtained and the technical results and geological interpretation of exploration during the reporting period.

The report should include data and any consultant or laboratory reports as digital appendixes in the appropriate format (as per the *Australian requirements for the submission of digital exploration data*).

The required structure of a technical report consists of 3 sections – front matter, body of report and end matter – and are detailed below.

4.1 Front matter

4.1.1 Title page

The title page should include:

- type of report (annual, partial surrender, final)
- reporting period (period covered by the report)
- tenement number(s)
- name of tenement(s)/project or joint/combined reporting group
- name of tenement holder(s)
- name of operator
- author of report (and company name if not the operator)
- date of report
- company internal report reference number (if applicable).

4.1.2 Table of contents

The table of contents should list all:

- section headings
- figures, tables, photos, plans, maps, figures and their sequential numbers and scales.
- appendixes (with meaningful titling, including sub-appendixes if any). If an appendix contains a collation of basic data (e.g. drillhole logs), then a summary of the contents of the appendix must be included at its start.
- digital files submitted with the report including name, file size and file type.

4.1.3 Summary of all activities conducted

The summary of activities should include:

- A brief outline of target(s) sought and work carried out.
- A table listing the activities by tenement and the key results. The table should contain details such as the scale of geological mapping; type of sampling, number of samples and elements analysed; type of geophysical survey and number of line kilometres; and type of drilling and number of holes and metres drilled.

All areas of exploration activities in the summary should be shown on the exploration index map (Section 4.1.4).

4.1.4 Exploration index map

An index map (or maps) at an appropriate standard scale should be included to show the areas where the different exploration activities have been carried out during the reporting period.

The exploration index map(s) should show a standard map grid (MGA2020 (GDA2020) preferred) and major landmarks (e.g. towns, roads, topographic features), plus the following types of activities as polygons:

- boundaries of tenements (with tenement numbers) covered by the report
- boundaries of areas covered by:
  - survey grids (it is not necessary to show individual grid lines)
  - geological mapping (specify the scales used)
  - drilling programs (specify type – rotary air blast, reverse circulation, diamond etc.)
  - geochemical surveys (specify type – soil (A, B, C horizon), stream sediment, rock chip etc.)
  - airborne/ground geophysical surveys (specify type – magnetic, gravity, electromagnetic etc.)
  - aerial photography, satellite imagery or airborne remote sensing imagery.
- position of identified mineral resources or pre-resource mineralisation.

4.1.5 Keywords

Relevant bibliographic indexing keywords, such as map sheet names, location names, commodity sought, exploration methods, geological units targeted, prospect name, geological province, geological age and any other relevant earth science and related terms, should be provided to identify the main points of the reports and so assist any future computer searches. The *Geoscience, mineral and petroleum thesaurus (GeMPeT)* can be used as a guide.

4.2 Body of report

The body of the report should be structured using the headings given below, and may be in the form of either:

- a series of topic-related sections (e.g. geology, geophysics), each of which contains relevant information for all locations or prospects within the tenement area
- a series of region or prospect-related sections in which all topics are covered.

4.2.1 Introduction, history and exploration rationale

Include:

- summary of the tenure details (i.e. tenement number(s), grant date(s), term(s), project name, operator/joint venture status)
- general description of the location including a simple map showing the location of the tenement(s)
- results of literature searches
- a brief summary of the exploration/mining history of the area
- exploration targets, objectives and rationale.

4.2.2 Geology

- Describe the regional setting and the results of geological mapping.
- Report on models of structural interpretation and/or mineralisation.
- Include appropriate geological maps and cross-sections (as per Section 4.3.2).
- Provide results and a summary of any mineralogy, petrology, paleontology or geochronology studies on surface or subsurface (drilling) samples. Detailed descriptions should be appended to the report, with

sample locations provided in a nationally recognised coordinate system (e.g. MGA2020 (GDA2020)) and shown on appropriate plans or drilling logs.

- Include results of any spectral analyses and interpretation conducted.

4.2.3 Geophysics

Describe the airborne and ground-based geophysical exploration (excluding downhole surveys which should be addressed under drilling, Section 4.2.6). Where appropriate, the following should be included.

4.2.3.1 Airborne surveys (excluding remote sensing)

Within the text/appendixes of the report include:

- Standard scale maps (as per Section 4.3.2) showing survey locations and flight lines, together with any cultural features which may affect results (e.g. power lines).
- Processed data map(s) tied to a nationally recognised map grid (MGA2020 (GDA2020) preferred) and at the same scales as other presented maps (e.g. geological map) to enable easy comparison.
- Details of data processing techniques used.
- Interpretations of results – discussions of what constitutes an anomaly, and the relation of anomalies to geochemistry, geology and drilling results.
- Separate reports on the results and interpretations of surveys as an appendix.
- Specifications of surveys and instruments (as below) so that another operator can extend or reinterpret the survey:
  - survey specifications – survey type, date, contractor, parameters recorded, instruments used, line orientation, line and tie spacing and, where applicable, mean terrain clearance and aircraft type
  - instrument specifications – instrument type, design, power, units of measurement (preferably SI), order of accuracy and mode of recording data (i.e. analog or digital)
  - other information – conversion factors for units outside the SI system, data on terrain conditions, nature of the ground, quality of electrical contacts, and extent of drifts (to aid in any extension or reinterpretation of the survey).
- Survey company logistics report detailing data acquisition operations and processing.
- All drift/diurnal/tie corrections applied, and calibration constants and null values defined.
- Calibration parameters and procedures, and any quality control data.

As digital files accompanying the report (as per the *Australian requirements for the submission of digital exploration data*) include:

- field data (Australian Society of Exploration Geophysicists, ASEG, GDF2 format or fixed column ASCII with a header)
- gridded data (ER Mapper format)
- final located data (ASEG GDF2 format or fixed column ASCII with a header)
- survey company logistics report detailing data acquisition operations and processing
- 256 channel radiometrics data where acquired.

Airborne surveys that cover more than one tenement are to be submitted as one complete survey (including original raw data as received from the survey company, and survey company logistics report). Attach a covering letter stating **all tenement numbers the survey covers**.

4.2.3.2 Gravity surveys

Within the text/appendixes of the report include:

- Located basic data (tabulated or as line profiles), including station number, latitude/longitude or MGA2020 position (specify datum – GDA2020 preferred), AHD elevation, observed gravity (specify datum) and terrain correction (if calculated).
- Processed data map(s) tied to a nationally recognised map grid (MGA2020 (GDA2020) preferred) and at the same scales as other presented maps (e.g. geological map) to enable easy comparison.
- Standard scale maps (as per Section 4.3.2) showing survey location, gravity station position and base station position.
- Survey company logistics report detailing data acquisition operations and processing.
- Base station information – details of base stations established/used should include:
  - name (e.g. isogal station)
  - location (i.e. latitude/longitude or easting/northing; specify datum – GDA2020 preferred)
  - observed gravity value used to tie into national gravity network (specify datum)
  - method of tie to control (i.e. 'ABABA')
  - description of locality, including sketch map and description of monumentation (photos are often useful).
- If a floating grid, i.e. not tied into the national network, then provide:
  - base station assumed gravity value
  - description of locality, including sketch map and description of monumentation (photos are often useful).

4.2.3.3 Other geophysical surveys – including those conducted using a drone platform

Within the text/appendixes of the report include:

- Standard scale maps (as per Section 4.3.2) showing survey locations, traverse lines and/or stations, together with any cultural features which may affect results.
- Processed data map(s) tied to a nationally recognised map grid (MGA2020 (GDA2020) preferred) and at the same scales as other presented maps (e.g. geological map) to enable easy comparison.
- Details of data processing techniques used.
- Interpretations of results – discussions of what constitutes an anomaly, and the relation of anomalies to geochemistry, geology and drilling results.
- Separate reports on the results and interpretations of surveys as an appendix.
- Specifications of surveys and instruments (as below) so that another operator can extend or reinterpret the survey:
  - survey specifications – survey type, date, contractor, parameters recorded, instruments used, line orientation, line and tie spacing, and station spacing
  - instrument specifications – instrument type, design, power, units of measurement (preferably SI), order of accuracy and mode of recording data (i.e. analog or digital)
  - other information – conversion factors for units outside the SI system, data on terrain conditions, nature of the ground, quality of electrical contacts, and extent of drifts (to aid in any extension or reinterpretation of the survey).
- Survey company logistics report detailing data acquisition operations and processing.
- All corrections applied, and calibration constants and null values defined.
- Calibration parameters and procedures, and any quality control data.

As digital files accompanying the report (as per the *Australian requirements for the submission of digital exploration data*):

- field data (ASEG GDF2 format or fixed column ASCII with a header)
- gridded data (ER Mapper format)
- final located data (ASEG GDF2 format or fixed column ASCII with a header).

All geophysical survey data (including airborne surveys) should be submitted with the **annual technical report**. Digital data must conform with requirements as outlined by the *Australian requirements for the submission of digital exploration data*.

4.2.4 Remote sensing data

Describe the remote sensing survey, including the following where applicable:

- Standard scale maps (as per Section 4.3.2) showing survey locations and flight lines.
- Specifications of surveys and instruments (as below) so that another operator can extend or reinterpret the survey:
  - survey specifications – survey type, date, contractor, parameters recorded, instruments used, line orientation, line spacing and, where applicable, mean terrain clearance and aircraft type
  - instrument specifications – instrument type, design, power, units of measurement (preferably SI), order of accuracy and mode of recording data (i.e. analog or digital)
  - other information – conversion factors for units outside the SI system, data on terrain conditions and nature of the ground
  - raw data with associated calibration data – calibration parameters and procedures, and any quality control data.
- Processed data tied to MGA2020 (GDA2020) and at the same scales as other presented maps (e.g. geological map) to enable easy comparison.
- Survey company logistics report detailing data acquisition operations and processing.
- Details of data processing techniques used.
- Written reports on the results and interpretations of surveys.
- Interpretations of results – discussions of what constitutes an anomaly, and the relation of anomalies to geochemistry, geology and drilling results.
- Flight diagrams and specifications of aerial photography should be supplied (i.e. scale, black and white or colour, contractor, date flown etc.), as well as the location and ownership of prints and negatives.
- Results and specifications from other remote sensing surveys (e.g. Landsat, airborne multispectral scanner (Geoscan), spot, radar) must be reported in text of the report, together with the storage location and ownership of any digital data.
- Where available, a digital copy of the raw and processed data should be submitted as an image data file (see *Australian requirements for the submission of digital exploration data* for acceptable formats). Otherwise images produced may be submitted within the report as appropriately labelled 35 mm slides or colour photographs, with a description of each scene and the process used to produce each image.
- If the data is protected by copyright laws which prevent the inclusion of contour maps or image prints, then a detailed interpretation plan must be submitted.
- Images must have some means of locating the data on the ground – ideally these should be referenced to MGA2020 (GDA2020).
- Where appropriate, the individual bands included in each image and their colour allocation should be identified. A brief description of the process used to develop the image should also be provided (if not proprietary).

Remote sensing survey data should be submitted with the **annual technical report**. This data must conform with requirements as outlined by the *Australian requirements for the submission of digital exploration data*.

4.2.5 Surface geochemistry

Describe geochemical surveys undertaken (excluding drill assays which should be described under Section 4.2.6.2), their results, and their relationship to other components of the exploration program. Geochemical surveys must be described in sufficient detail to allow them to be reproduced or reinterpreted.

The following information should be provided:

- A map of the surveyed area (as per Section 4.3.2) showing:
  - sample locations with sample number and type (rock chip, soil, stream sediment etc.)
  - relevant geographic features (including drainage lines and topographic contours, or the general gradient along traverses)
  - relevant geological features, if appropriate
  - a standard coordinate grid such as MGA2020 (GDA2020), with datum and projection clearly specified.
- Field sampling procedures nominating sample type (e.g. rock chip, soil, stream sediment, calcrete, water, gossan or mineralisation, costean, bulk, air, vegetation), material sampled, sample weight, sampled depth (soil horizon, if applicable) and method of collection.
- Where important, a description of sample preparation, such as size fraction analysed, and any concentration of samples (e.g. heavy mineral separation, fraction, panned concentrate).
- Details of analytical procedures including:
  - name of the analytical laboratory
  - elements, oxides, isotopes etc. analysed
  - laboratory methods/codes, including description of sample preparation, digestion and determination
  - units for each analyte analysed (e.g. ppb, ppm, %)
  - analytical methods with detection limits and accuracy.
- Full assay results in tabular form (refer to *Australian requirements for the submission of digital exploration data* for the required digital format).
- Processed data (optional) – e.g. contour plans, preferably for each of the elements analysed, with individual values and sample numbers plotted. Include interpretations of the results, showing any anomalies encountered and their relationship to geology and geophysical anomalies, where appropriate.
- A description of methods used for processing and interpretation of data to determine anomalies, particularly if advanced data processing or statistical methods have been used.
- Results of geochemical/mineralogical exploration (e.g. for diamonds, heavy mineral sands) should be reported as above but also include the following information:
  - mineralogy
  - grain size analyses
  - analysis of indicator minerals and/or other minerals
  - results of bulk sampling.
- Storage location and the possibility of access to the samples at conclusion of the exploration program.

4.2.6 Drilling

Discussion of drilling programs should include, in the text of the report:

- A statement of the purpose and targets of the program, including project/program/prospect names.
- A summary of the drilling, describing the type of drilling, number of holes, total metres drilled, hole and line spacing if grid based, method and accuracy of hole location, drilling contractor, rig type, duration of the program, method of sample (for record purposes) and assay, storage of record samples, and a statement on the nature of completion/abandonment of drillholes.
- A summary table of hole header information, showing hole name, drilling method if not the same for all holes, MGA2020 location (specify datum – GDA2020 preferred), zone, depth, declination and azimuth if not vertical, completion date and sample number range.
- A statement of geochemical testing carried out, including laboratory, elements/compounds assayed, methods, detection limits and, if appropriate, regarding significant results.
- A statement of other tests carried out on the samples such as petrology, paleontology, mineralogy, geochronology, grain size analysis and petrophysical. Results and interpretation of petrology, paleontology, mineralogy and geochronology should be discussed under Section 4.2.2).
- A statement of any downhole surveys carried out, indicating the nature of the survey and the contractor and, if appropriate, a discussion of the results of the surveys.
- A summary of any photographs or digital images of core submitted.
- For full surrender or partial surrender reports, an indication of how and when the requirement for submission of samples to the South Australia Drill Core Reference Library will be met.

4.2.6.1 Drillhole log data

Drillhole log data should be included in digital form (as per the *Australian requirements for the submission of digital exploration data*) and as logs in an appendix to the report showing:

- Header information including:
  - company name
  - tenement number
  - project name
  - hole name
  - drilling contractor
  - rig type
  - drilling method(s)
  - commencement and completion dates
  - MGA2020 coordinates, including zone (or latitude/longitude) with datum clearly specified (GDA2020 preferred) and accuracy of coordinates
  - declination and azimuth if not vertical
  - collar elevation, indicating height datum changes
  - total depth.
- A geological log in full English text in digital format; where codes are used, a full and complete code descriptor must be included. Logs should detail the lithology and mineralogy of each interval, and include a summary stratigraphic interpretation (i.e. probable formation or age names).
- Sample recovery, if pertinent (e.g. diamond core).
- Sampled intervals and sample numbers.
- Analytical results.

- Petrophysical results when tests were made on samples, including magnetic susceptibility, scintillometer counts, density etc.
- Details of downhole directional surveys, including instrument type.
- Where drilling methods permit, groundwater information on depth water first cut, depth of any samples taken, standing water level and an estimate of the flow rate (L/s) should be recorded on the logs and in a summary table.

4.2.6.2 Analytical results

Analytical results should be included in digital form (as per the *Australian requirements for the submission of digital exploration data*) and as a fully detailed table in an appendix to the report showing:

- Laboratory name(s)
- laboratory report number/batch number(s)
- all drillholes analysed
- tenement number(s) for each drillhole/samples
- sample number
- sampled interval
- elements/compounds assayed
- laboratory methods code with sample preparation and analytical method description as for surface samples
- units, detection limits for each analyte.

Copies of laboratory reports are acceptable provided they have been annotated to show hole and sample details or a separate table is provided showing these details.

4.2.6.3 Downhole geophysical survey results

Downhole geophysical survey results should be included in digital form (as per the *Australian requirements for the submission of digital exploration data*) and as an appendix of the report including:

- A statement describing the type of logs run, the name of the contractor, a description of the techniques and equipment used, and the dates and duration of the surveys if not concurrent with the drilling.
- A copy of each log with detailed header information, including hole name, prospect name, tenement number, date logged, relevant operating parameters and, if possible, a geological interpretation.
- A discussion of the results of the geophysical surveys in so far as they relate to the objectives and targets of the drilling program.

4.2.6.4 Core photographs/images

Core photographs/images – where available in digital form these should be included in the digital report (as per the *Australian requirements for the submission of digital exploration data*).

4.2.6.5 Other tests

Other tests undertaken on drilling samples should be reported in detail in appendixes. It is preferable that petrological and mineralogical investigation of samples be presented as full copies of the consultant's report(s), including any discussion and/or interpretation, and annotation or an accompanying table referencing the sample to the appropriate drillhole. Discussions of the results of mineralogical, petrological and paleontological work (in relation to the geological understanding of the area) should be included under Section 4.2.2.

4.2.6.6 Maps

Maps must be provided as per Section 4.3.2 and show:

- Individual drillhole locations identified by drillhole name, without confusion due to overwrite. Maps should be at a scale or scales appropriate to show this.
- The location and orientation of any drillhole sections.

4.2.7 Other studies or work

Any other studies or work, such as metallurgical and mineral processing studies, mining feasibility studies, and hydrogeological studies, should be reported and summarised in the text under this heading. Where separate consultant reports or study reports have been produced these can be added as appendixes to the main technical report.

Where a survey grid has been established as a location control for exploration activities on the ground, a grid plan should be included. The plan should show the grid orientation, the grid origin, and its relationship to a nationally recognised grid such as MGA2020 (GDA2020).

4.2.8 Environment

The submission of an exploration compliance report, in accordance with regulation 77 of the Mining Regulations, will be requested once a program for environment protection and rehabilitation (PEPR) has been approved. This report is required to be submitted as a separate report (i.e. not included in the annual technical report). See Minerals Regulatory Guidelines MG22, *Mineral exploration PEPRs and compliance* for further details.

4.2.9 Reporting on ore reserves and resources

Statements of any resources or reserves identified must be reported.

Statements must be reported in accordance with most recent version of:

- *The JORC code: Australasian code for reporting of exploration results, mineral resources and ore reserves* (Australasian Joint Ore Reserves Committee, JORC).

If pre-resource mineralisation, identified mineral resources or ore reserves were identified during the reporting period, then full details of these should be reported as a separate appendix or volume including:

- plans and sections showing significant results and ore blocks and ore outlines
- summary table of significant results
- description of the method(s) used for calculating ore reserves.

Later annual updates and revisions of resource or reserve estimates should be provided only in summary form, based on the recommendations of the *JORC code* on the reporting of mineral resources and ore reserves.

Reporting of pre-resource mineralisation or identified resources in the category of inferred mineral resources may be prepared by a qualified geoscientist who need not be a ‘competent person’ as specified in the code.

4.2.10 Conclusion

Summarise the main results and conclusions drawn from the work completed over the reporting period. Reference to summarised geological interpretations such as maps and drillhole cross-sections (showing significant results) would be useful.

In the case of expiry, surrender, cancellation or forfeiture of the exploration licence or mineral tenement, give reasons for this.

4.2.11 References

References to other reports used in compiling the technical report should be listed.

4.3 End matter

The end matter of the report should include items separate from the main body of the report such as maps, plans, images, sections and appendixes.

All appendixes and attachments should have a separate title/contents page.

4.3.1 Appendixes

Appendixes may contain a variety of information, including consultant studies and reports, and various tabular data such as drill logs and assay results.

4.3.2 Maps, plans, images and cross-sections

Maps, plans, figures, images and sections should:

- Be at a standard metric map series scale, i.e. 1:250,000, 1:100,000, 1:50,000, 1:25,000, 1:10,000, 1:5,000, 1:2,000, 1:1,000 or 1:500.
- Use metric measurements throughout.
- Show a graphic bar scale to allow for digital image manipulation.
- Have a north point (grid, true and magnetic north).
- Be clearly annotated and labelled, including tenement boundaries and number(s), author, plan/figure number, date of drafting and date of any revisions.
- Show a standard coordinate grid with datum and projection clearly specified as per Section 2.3 (MGA2020 (GDA2020) preferred), or show any local grid lines indicating their relationship to a standard coordinate grid such as MGA2020 (GDA2020).
- Show sufficient base information to relate the map to standard topographic maps (e.g. homesteads, mine workings, prospects, bores, roads, peaks, names of streams, datum points, drill sites).
- Clearly distinguish between ‘fact’ and interpretation (e.g. for geological maps).
- Geological maps be presented as line drawings with graphical and/or alphabetical symbols for rock units. Make use of an abbreviations index in the report where a complicated system of abbreviations is used.
- Have a clear and comprehensive legend. Geoscience Australia’s *Symbols used on geological maps* provides a useful standard.
- Acknowledge sources of information shown which are not the result of original work.

Plans and maps compiled from aerial photographs should state full details, i.e. photo number, run number, survey number, date etc.

The exploration index map (Section 4.1.4) should be used to show the relationship of all plans to each other.

4.4 Report presentation

Reports should be presented in digital format and such that each page, plan, or other separate sheet shows the tenement number and date of the report.

5 Resources

5.1 Legislation

- *Mining Act 1971*
- Mining Regulations 2020.

5.2 DEM website

- Exploration reporting
- Forms, legislation and guidance
- Drill core reference library including:
  - Accessing samples.

5.3 Other publications

- *Australian requirements for the submission of digital exploration data* (Government Geoscience Information Committee)
- *The JORC Code: Australasian code for reporting of exploration results, mineral resources and ore reserves* (Australasian Joint Ore Reserves Committee)
- *Symbols used on geological maps*, (Geoscience Australia)
- *Geoscience, mineral and petroleum thesaurus (GeMPeT)* (Geological Survey of Western Australia).

5.4 Writing

- *Macquarie dictionary* or *Australian Oxford dictionary*
- *Glossary of geology*
- Australian Government *Style manual* [online resource].

5.5 PDFs

Invented by Adobe Systems, PDF is the global standard for capturing and reviewing rich information from almost any application on any computer system and sharing it with virtually anyone, anywhere. There are a number of free web based services that will convert documents to PDF (e.g. <www.freepdfconvert.com/>) or software can be purchased from Adobe <www.adobe.com>.

6 Contacts

6.1 Department for Energy and Mining

General inquiries and assistance with SARIG

Customer Services

Level 4, 11 Waymouth Street, Adelaide SA

GPO Box 320, Adelaide SA 5001

Email DEM.CustomerServices@sa.gov.au

Phone +61 8 8463 3000

Exploration reporting
General reporting enquiries
DEM.Exploration@sa.gov.au
Phone +61 8 8429 2587

Technical report data submission and open file release
Exploration data manager
DEM.Exploration@sa.gov.au
Phone +61 8 8429 2491

South Australia Drill Core Reference Library
5 Tonsley Boulevard
Clovelly Park, SA 5042
GPO Box 320, Adelaide SA 5001
DEM.CoreLibrary@sa.gov.au
Phone +61 8 8429 0578

Geological Survey of South Australia
DEM.Minerals@sa.gov.au
Phone +61 8 8429 2570

6.2 Department for Environment and Water

www.environment.sa.gov.au
Water resources
Manager Resource Planning
Water Resources Branch
Phone +61 8 8463 6949

Appendixes

A: Application for combined or joint reporting

Attached Word file.

B: Notification of an airborne survey

Attached Word file.

ACKNOWLEDGEMENT OF COUNTRY

As guests here on Kaurna land, the Department for Energy and Mining (DEM) acknowledges everything this department does impacts on Aboriginal country, the sea, the sky, its people, and the spiritual and cultural connections which have existed since the first sunrise. Our responsibility is to share our collective knowledge, recognise a difficult history, respect the relationships made over time, and create a stronger future.
We are ready to walk, learn and work together.

FURTHER INFORMATION

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SOUTH AUSTRALIA

Government of South Australia
Department for Energy and Mining

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