



Minerals Regulatory Guidelines | MG13

Mineral exploration reporting guidelines for South Australia



Government of South Australia
Department of State Development

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Revision history

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1.0	25/07/12	Document transitioned into the Minerals Regulatory Guidelines series.
1.1	12/03/13	Link to further information on allowable expenditure added to Section 3.1.3.
1.2	06/11/13	Second page added to 'Summary report on mineral exploration' in the Appendix.
1.3	09/04/14	Requirements for submission of geological samples added.
1.4	10/02/15	Incorporates new contact information and references to the Department of State Development (formerly Department for Manufacturing, Innovation, Trade, Resources and Energy; October 2011 – July 2014) and updated link to latest version of the <i>Australian requirements for the submission of digital exploration data</i> (V 4.2).

Contents

Shortened forms	5
1 Introduction	6
2 General information and legislative requirements	6
2.1 Statutory requirements	6
2.2 Submission of reports and samples	6
2.2.1 Digital data	6
2.2.2 Geological samples	7
2.2.3 Submission/delivery of reports and notifications	7
2.3 Location coordinates and maps	8
2.3.1 Coordinate data	8
2.3.2 Maps and map references	8
2.4 Joint (combined) technical reporting	8
2.5 Data confidentiality and release of matter (section 77D of the Mining Act and regulation 88 of the Mining Regulations)	9
2.6 Open file data access	9
2.7 Copyright	9
2.8 Research reports	9
2.9 Notification of airborne surveys	10
2.10 Submission of samples	10
2.10.1 Core and cuttings	10
2.10.2 Thin and polished sections and paleontological specimens	10
2.11 Compliance/penalties	11
3 Six-monthly Summary report	11
3.1 Content and format	11
3.1.1 Licence details	11
3.1.2 Report	11
3.1.3 Expenditure	12
4 Technical reporting	12
4.1 Annual technical report	12
4.1.1 Open file release of reports and data	13
4.2 Partial surrender report	13
5 Technical report content and format	13
5.1 Front matter	13
5.1.1 Title page	13
5.1.2 Table of contents	14
5.1.3 Summary of all activities conducted	14
5.1.4 Exploration index map	14
5.1.5 Keywords	14
5.2 Body of report	15
5.2.1 Introduction, history and exploration rationale	15
5.2.2 Geology	15
5.2.3 Geophysics	15

5.2.3.1 Airborne surveys (excluding remote sensing)	15
5.2.3.2 Gravity surveys	16
5.2.3.3 Other geophysical surveys	17
5.2.4 Remote sensing data	17
5.2.5 Surface geochemistry	18
5.2.6 Drilling	19
5.2.6.1 Drillhole log data	20
5.2.6.2 Analytical results	20
5.2.6.3 Downhole geophysical survey results	21
5.2.6.4 Core photographs/images	21
5.2.6.5 Other tests	21
5.2.6.6 Maps	21
5.2.7 Other studies or work	21
5.2.8 Environment	22
5.2.9 Reporting on ore reserves and resources	22
5.2.11 Conclusion	22
5.2.12 References	23
5.3 End matter	23
5.3.1 Appendixes	23
5.3.2 Maps, plans, images and cross-sections	23
5.4 Report presentation	23
6 Resources	24
6.1 Legislation	24
6.1.1 South Australian legislation	24
6.1.2 Commonwealth legislation	24
6.2 Department of State Development	24
6.2.1 Web pages	24
6.2.2 Forms	24
6.2.3 Publications	24
6.2.4 Header generation software	25
6.3 Australasian Joint Ore Reserves Committee	25
6.4 Geological map symbols	25
6.5 Keywords	25
6.6 Writing	25
6.7 PDFs	25
7 Contacts	25
7.1 Department of State Development	25
7.2 Department of Environment, Water and Natural Resources	26
 APPENDIX	
Mineral exploration reporting forms	
Summary report on mineral exploration	27
Notification of an airborne survey on a mineral exploration licence	29

Shortened forms

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
ECR	exploration compliance report
EL	exploration licence (mineral)
EM	electromagnetic (geophysical survey)
GDA94	Geocentric Datum of Australia 1994
GPS	global positioning system
MGA	Map Grid of Australia (relative to GDA94)
PEPR	program for environment protection and rehabilitation
SARIG	South Australian Resources Information Geoserver
SI	International System of Units (international standard)

1 Introduction

These regulatory guidelines have been produced by the Department of State Development to assist licensees in the preparation and submission of statutory reports and samples for mineral exploration licences (ELs) in South Australia and to ensure integrity of data and compliance with Department of State Development policies pursuant to the *Mining Act 1971* and Mining Regulations 2011.

The statutory requirement for the submission of these reports and samples are in place so that exploration progress, in accordance with licence conditions, can be assessed, and the data obtained in the course of exploration can be effectively captured to ensure future availability to the exploration industry.

National uniform guidelines for both the structure of technical reports and the submission of this data in digital form have been developed for the Chief Government Geologists. This has evolved through consultation between industry groups, industry representatives and state government representatives with the common aim of improving the effectiveness and efficiency of data collection and storage, and thus data availability for future use. Your adherence to these guidelines will ensure 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 Department of State Development contact is encouraged to ensure that the requirements of these guidelines are effectively met (refer to Section 7).

Blue text throughout this document indicates a hyperlink is available.

This document will be revised on an as needs basis. Visit the Department of State Development Minerals website to access the latest version.

2 General information and legislative requirements

2.1 Statutory requirements

Under section 32 of the Mining Act, the holder of an EL is required to:

- (1) ... keep complete and detailed records of the surveys and other operations conducted in pursuance of the licence ...
- (2) ... furnish the Director of Mines with such information relating to the surveys and other operations conducted by him in pursuance of the licence, and such geological samples obtained by him in the course of those operations, as the Director may require.

Specific reporting requirements are set down as conditions under Schedule C of the EL document. These include a requirement that exploration reports, data and samples must be submitted in a manner and form acceptable to the Director of Mines, and it is the purpose of these guidelines to assist licence holders in producing and submitting reports of an acceptable format and standard.

2.2 Submission of reports and samples

2.2.1 Digital data

Digital copies (only) of 'Technical reports', 'Summary reports' and 'Notification of airborne survey' forms are required. Hard copies are no longer accepted.

A digital back-up copy of all digital information submitted to the Department of State Development should be kept by the licensee for the duration of the tenement and any subsequent tenements to cover the possibility

of information corruption during transfer to the Department of State Development, and to enable the compilation of future partial surrender reports, where required.

The digital report should comply with the requirements set out in these guidelines. Departmental contacts are available for advice (Section 7).

All reports must be submitted in English to the standards specified in the [Australian requirements for the submission of digital exploration data](#).

2.2.2 Geological samples

EL holders are required to offer geological samples (Section 2.10).

Under section 32(2) of the Mining Act, the holder of an EL holder is required to offer to the Director of Mines:

- any geological samples obtained during the course of exploration that the director may require
- all samples on completion of the program or on expiry of the tenement.

Samples are not to be discarded before being offered to the director (see [Submission of representative samples for mineral exploration drillholes](#), Minerals Regulatory Guidelines MG18, section 3).

Samples that are not accepted by the Department of State Development can be retained by the EL holder or disposed of in an appropriate manner. For further information contact the Exploration Regulation Team through Customer Services – phone +61 8 8463 3000, email <Resources.CustomerServices@sa.gov.au>.

2.2.3 Submission/delivery of reports and notifications

All reports, including the six-monthly **Summary report**, **Annual technical report** and **Notification of airborne survey** form, should be marked to the attention of the EL Reporting Officer, Mineral Resources Division, and submitted via email, post or courier.

Email

DSD.Exploration@sa.gov.au

Reports up to 5 MB can be sent. Greater than 5 MB should be submitted on digital media (e.g. CD, DVD, USB drive).

Mail

EL Reporting Officer
Mineral Resources Division
Department of State Development
GPO Box 320
Adelaide SA 5001

Hand deliver/courier

EL Reporting Officer
Mineral Resources Division
Department of State Development
c/- Level 7, 101 Grenfell Street
Adelaide SA 5001

2.3 Location coordinates and maps

On 1 January 2000 GDA94 (the Geocentric Datum of Australia 1994) was adopted by the Department of State Development and is the preferred spatial datum to which location coordinates should refer in submitted mineral exploration data.

The adoption of the GDA94 coordinate datum allows closer integration with international coordinate frameworks and navigational systems such as GPS. For grid-based map coordinates (i.e. eastings and northings), the MGA (Map Grid of Australia, relative to GDA94) replaces the previous AMG (Australian Map Grid, relative to AGD66/AGD84) system.

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

2.3.1 Coordinate data

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

- option 1: MGA in form easting, northing, zone, datum GDA94
- option 2: latitude/longitude in form DD MM SS.SSSS, datum GDA94.

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 GDA94, coordinates grids MGA.

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

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

2.4 Joint (combined) technical reporting

Where an exploration project is being conducted across adjoining licences, the licensee can apply to the Director of Mines (Attention: EL Reporting Officer) for joint reporting status for those licences. Such arrangements are encouraged by the Department of State Development as they reduce the number of reports to be completed by companies and reduce handling by the department.

Requests for joint annual reporting status should be submitted in writing to the Director of Mines (Attention: EL Reporting Officer), and provide the following information:

- list of tenements to be jointly reported displaying details of ownership of each tenement
- map showing the extent of the project area, boundaries of the licences covered, and relevant geoscientific and geographical information/justification to assist in assessment of the proposal
- proposed date for submission of reports (this should coincide with the anniversary of one of the licences within the reporting group)
- any **Technical reports** due or overdue on licences within the nominated group.

In considering requests for joint annual reporting, the department will take into account the exploration target or objective, the geographical distribution of the licences (i.e. contiguous licences), licence ownership, the history of reporting on the licences and the previous exploration and reporting performance of the explorer.

Where one licence or part of a licence from the group is surrendered or expires, partial surrender reporting requirements will apply (Sections 4.2 and 5).

Six-monthly **Summary reports** are not included in joint reporting arrangements and should be submitted as per normal requirements. Expenditure commitments for each licence must still be met unless a special arrangement has been reached with the Department of State Development.

2.5 Data confidentiality and release of matter (section 77D of the Mining Act and regulation 88 of the Mining Regulations)

The Director of Mines may release any report, information, sample or other material obtained from the holder or former holder of a tenement.

However, if the tenement is still current, the Director of Mines must not release matter under section 77D without the consent of the holder of a tenement (section 77D(3)). Matter may be released where:

- the licensee has agreed that reports, data or samples may be released
- the reports, data or samples deal with exploration conducted on areas that have ceased to be part of the licence or flow-on title
- information, drill cores or other material has been held by the department for a period of at least 5 years (regulation 88(3)(b)).

Tenement holders should note that the Department of State Development is an agency to which the *Freedom of Information Act 1991* applies.

2.6 Open file data access

Open file company data and reports are collected, managed and made available by the Department of State Development in a number of forms. The fastest and most convenient way to access these records is through SARIG, the South Australian Resources Information Geoserver. If reports are only available in hard copy format, a request can be forwarded to Customer Services, phone +61 8 8463 3000, email <Resources.CustomerServices@sa.gov.au> or via SARIG <www.statedevelopment.sa.gov.au/sarig>.

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 Department of State Development Drill Core Library at Glenside (see Section 6.2.2).

2.7 Copyright

On the release of data or data products to the public, users will be informed of their obligations under the Commonwealth *Copyright Act 1968*.

2.8 Research reports

Reports of any research sponsored by the licensee or operator of a licence (e.g. university thesis or confidential report from a research organisation) and attributed to exploration activity and expenditure for the licence, 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 licence, unless agreed otherwise with the licensee.

2.9 Notification of airborne surveys

The licensee/operator is required to provide written notification of any proposed airborne surveys (i.e. airborne geophysics, aerial photography, or remote sensing techniques) to the Department of State Development 14 days prior to undertaking this work. This notification should provide information such as the type of survey, area to be surveyed in relation to the licence area, flight line spacing and flight height.

A standard form – **Notification of an airborne survey on a mineral exploration licence** – should be emailed to the Mineral Resources Division, EL Reporting Officer at <DSD.Exploration@sa.gov.au>. The form is provided in the Appendix and also available from the Department of State Development Minerals website.

2.10 Submission of samples

Under section 32(2) of the Mining Act, the holder of an EL is required to offer to the Director of Mines:

- any geological samples obtained during the course of exploration that the director may require
- all samples on completion of the program or on expiry of the tenement.

Samples are not to be discarded before being offered to the director (see [Submission of representative samples for mineral exploration drillholes](#), Minerals Regulatory Guidelines MG18, section 3).

Samples that are not accepted by the Department of State Development can be retained by the EL holder or disposed of in an appropriate manner. For further information contact the Exploration Regulation Team through Customer Services – phone +61 8 8463 3000, email <Resources.CustomerServices@sa.gov.au>.

2.10.1 Core and cuttings

Generally, representative samples of core and cuttings will be required from exploration projects, and this will be advised in the letter of approval for a [Notice of use of declared equipment](#), Form 22.

Contact should be made with the Department of State Development Drill Core Library Manager prior to commencing the program to discuss these requirements – phone +61 8 8379 9574, email <DSD.CoreLibrary@sa.gov.au>.

Drilling samples should be collected and submitted in accordance with [Submission of representative samples for mineral exploration drillholes](#), Minerals Regulatory Guidelines MG18. More information can be found on the [Drill Core Library](#) page of the Department of State Development Minerals website.

If available, digital images or photographs (optional) of core should be submitted as part of the **Technical report** and be discussed under drilling (Section 5.2.6).

2.10.2 Thin and polished sections and paleontological specimens

The Department of State Development's Geological Survey of South Australia maintains collections of thin and polished sections and paleontological specimens. The submission of company samples for inclusion into these collections is optional, but samples should be offered to the department if no longer required. Contact the Geological Survey (phone +61 8 8204 1067, email <DSD.Minerals@sa.gov.au>).

2.11 Compliance/penalties

Failure to keep complete and detailed records of operations conducted in pursuance of the licence, or to correctly submit related information or samples (section 32 of the Mining Act) may result in a fine, or suspension or cancellation of the licence (section 33(1)).

Reports not meeting the required standards **will not be accepted**. This may jeopardise the grant of new licences and renewal of existing licences, which require that all reports be in good standing.

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, and ultimately in forfeiture of tenure.

If a report cannot be submitted within the timeframe as specified by licence conditions then a request for time extension (with justification) should be sought from the Department of State Development via the EL Reporting Officer <DSD.Exploration@sa.gov.au>.

3 Six-monthly Summary report

One copy of a **Summary report** must be submitted, together with a detailed expenditure statement, for each six-monthly period from the granting of a licence, **within 30 days of the end of the period**.

A standard form – ‘**Summary report on mineral exploration**’ – should be used for the submission of these reports. It is provided in the Appendix and is also available from the Department of State Development Minerals website.

A separate report must be lodged for each EL, and if no exploration was undertaken during the period a ‘**Nil report**’ must be submitted.

Joint reporting arrangements apply only to **Annual technical reports**. Where a joint reporting arrangement is in place, six-monthly **Summary reports** should be supplied as normal.

Forward six-monthly **Summary reports** to the EL Reporting Officer, Mineral Resources Division, <DSD.Exploration@sa.gov.au>.

3.1 Content and format

The six-monthly **Summary report** should contain information as specified in Sections 3.1.1 to 3.1.3.

3.1.1 Licence details

The EL number, the principal mineral sought, the name of the operator/manager, and a contact name and phone number must be included.

3.1.2 Report

The report should be a brief quantitative summary of exploration completed during the period. The amount and type of drilling (number and type of holes and metres drilled for each type of drilling), geochemistry, geophysics and mapping undertaken should be stated. A lengthy statement is not required as full details are to be provided in the **Technical report**.

If field activity was undertaken, an A4-size plan of the licence (e.g. as provided with Schedule A of the licence documents) should be attached, on which the general location and type of field activity carried out during the period are shown.

If no fieldwork was undertaken during the reporting period then a report must still be submitted stating this.

3.1.3 Expenditure

The total expenditure for the six-month report period and a detailed expenditure statement must be included. The total cumulative expenditure for the current licence is also required.

For information on allowable expenditure refer to Earth Resources Information Sheet M05, [Mineral exploration licences – general conditions, procedures and information](#).

4 Technical reporting

A **digital copy** of **Technical reports** must be submitted annually, or on the expiry, partial surrender or full surrender of a licence. Hard copies are no longer accepted.

Reports should be clearly labelled as either an '**Annual technical report**', '**Partial surrender report**' or '**Final technical report**'.

4.1 Annual technical report

The **Annual technical report**, including all results, studies and new technical data acquired annually, **must be submitted within 60 days** of each anniversary of the granting of a licence.

If this timeframe cannot be met then a request for time extension (with suitable justification) should be sought from the Department of State Development via the EL Reporting Officer, email <DSD.Exploration@sa.gov.au>.

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 in an email or a letter attached to an email, providing relevant information, including EL number and relevant reporting period. Email or letter needs to include company signature and/or logo.

On expiry or surrender of a licence, the **Final annual technical report** must contain a technical summary of all exploration work conducted throughout the term of the current licence and any former licences held under continuous tenure.

Where there remains a 'flow-on' tenement of smaller size, such as a mineral claim/mining lease or retention lease application, two reports will be required: a **Final annual technical report** for the area retained (to remain confidential); and a **Partial surrender report** for the areas not retained which will become open file. A single report can be submitted if the licensee is agreeable to all data being released to open file.

If a licence expires or is surrendered and has been part of joint (combined) reporting, a final technical report summarising and extracting all exploration data within the area of the expiring EL/former EL must be submitted within 60 days of expiry or surrender of a licence. As an alternative, the licensee may prefer to allow all previously submitted reports within that reporting group to be put on open file.

4.1.1 Open file release of reports and data

Annual technical reports, associated data or any other material that has been held by the department for a period of 5 years, will be released as open file.

4.2 Partial surrender report

If a licence is partially surrendered, a partial surrender report containing all technical data acquired by the licensee during current tenure, plus any preceding licence data not previously released for the area, must be submitted within 60 days of surrender. As an alternative, the licensee may prefer to allow all previously submitted reports to be put on open file.

If no technical work was undertaken during the reporting period, this needs to be stated in an email or a letter attached to an email, providing relevant information, including EL number and relevant reporting period.

5 Technical report content and format

A technical report should contain information of sufficient scope and detail to substantiate the expenditure claimed 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 appendices in the appropriate format (as per the [Australian requirements for the submission of digital exploration data](#)).

The required structure of a technical report is based on the national uniform guidelines developed for the Chief Government Geologists ([Australian requirements for the submission of digital exploration data](#)) and consists of three sections: front matter, body of report and end matter.

5.1 Front matter

The information specified under 'front matter' will be required to be included with the digital copy.

5.1.1 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 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).

5.1.2 Table of contents

The table of contents included at the start of the first volume should list:

- The contents of all volumes showing section headings.
- All figures, tables, plates, plans, maps and their sequential numbers and scales.
- All 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 should be listed with their name, file size and file type in the table of contents for the report.

Each subsequent volume to the first must have its own volume contents list.

5.1.3 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 5.1.4).

5.1.4 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 (MGA (GDA94) 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 of drilling (e.g. rotary air blast, reverse circulation, diamond drillhole)
 - 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.

5.1.5 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, minerals and petroleum thesaurus \(GeMPeT\)](#) can be used as a guide.

5.2 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 licence area
- a series of region or prospect-related sections in which all topics are covered.

5.2.1 Introduction, history and exploration rationale

Include:

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

5.2.2 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 5.3.2).
- Provide results and a summary of any mineralogy, petrology, paleontology or geochronology studies on surface or sub-surface (drilling) samples. Detailed descriptions should be appended to the report, with sample locations provided in a nationally recognised coordinate system (e.g. MGA (GDA94)), and shown on appropriate plans or drilling logs.
- Include results of any spectral analyses and interpretation conducted.

5.2.3 Geophysics

Describe the airborne and ground-based geophysical exploration (excluding downhole surveys which should be addressed under drilling, Section 5.2.6). Where appropriate the following should be included.

5.2.3.1 Airborne surveys (excluding remote sensing)

Within the text/appendixes of the report:

- Standard scale maps (as per Section 5.3.2) 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 (MGA (GDA94) is 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 (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.

5.2.3.2 Gravity surveys

- Located basic data (tabulated or as line profiles), including station number, latitude/longitude or MGA position (specify datum – GDA94 preferred), AHD elevation, observed gravity (specify datum) and terrain correction (if calculated).
- Processed data map(s) tied to a nationally recognised map grid (MGA(GDA94) is preferred) and at the same scales as other presented maps (e.g. geological map) to enable easy comparison.
- Standard scale maps (as per Section 5.3.2) 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 – GDA94 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).

5.2.3.3 Other geophysical surveys

Within the text/appendixes of the report include:

- Standard scale maps (as per Section 5.3.2) 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 (MGA (GDA94) is 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](#).

5.2.4 Remote sensing data

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

- Standard scale maps (as per Section 5.3.2) 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 MGA (GDA94) 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 MGA (GDA94).
- 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](#).

5.2.5 Surface geochemistry

Describe geochemical surveys undertaken (excluding drill assays which should be described under Section 5.2.6.2), 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 5.3.2) 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 MGA (GDA94), 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
 - 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) – for example, 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.

5.2.6 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, MGA location (specify datum – GDA94 preferred), zone if not the same for all holes, 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 5.2.2).
- 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 surrender reports, an indication of how and when the requirement for submission of samples to the Department of State Development Drill Core Library will be met.

5.2.6.1 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
 - MGA coordinates, including zone (or latitude/longitude) with datum clearly specified – GDA94 is preferred), and accuracy of coordinates
 - declination and azimuth if not vertical
 - collar elevation, indicating height datum
 - total depth.
- A geological log in full English text (preferred); 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. A copy of the summary table should be provided to the Department of Environment, Water and Natural Resources (Section 7.2) if this has been requested in the letter of approval for a [Notice of use of declared equipment](#), Form 22.

5.2.6.2 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
- laboratory report number
- hole number
- sample number
- sampled interval
- elements/compounds assayed
- laboratory method code with sample preparation and analytical method description as for surface samples
- units, detection limits.

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.

5.2.6.3 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.

5.2.6.4 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](#)).

5.2.6.5 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 5.2.2.

5.2.6.6 Maps

Maps must be provided as per Section 5.3.2 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.

5.2.7 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 MGA (GDA94).

5.2.8 Environment

The compilation and submission of an **Exploration compliance report** (ECR) will be requested as a condition of a [Notice of use of declared equipment](#), Form 22, or under the conditions of a program for environment protection and rehabilitation (PEPR) approval. This report is required to be submitted as a separate report (i.e. not included in the **Annual technical report**) and sent to:

Attention: Exploration Regulation Team
Mineral Resources Division
Department of State Development
GPO Box 320
Adelaide SA 5001

Or via email <DSD.Exploration@sa.gov.au>.

5.2.9 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).
- [Australian guidelines for estimating and reporting of inventory coal, coal resources and coal reserves](#) (Coalfields Geology Council of New South Wales and the Queensland Mining Council).

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.

5.2.11 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 or surrender of the tenement, give reasons for this.

5.2.12 References

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

5.3 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.

5.3.1 Appendixes

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

5.3.2 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, 1:5000, 1:2000, 1:1000 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 (MGA (GDA94) is preferred), or show any local grid lines indicating their relationship to a standard coordinate grid such as MGA (GDA94).
- 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. [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 5.1.4) should be used to show the relationship of all plans to each other.

5.4 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.

6 Resources

6.1 Legislation

6.1.1 South Australian legislation

www.legislation.sa.gov.au

South Australian Acts and Regulations are available for free download from the South Australian Legislation website.

Copies also are available at cost from Service SA, EDS Centre, 108 North Terrace, Adelaide SA 5000, phone 13 23 24.

6.1.2 Commonwealth legislation

www.comlaw.gov.au

Copies of Commonwealth Acts and Regulations are available for free download from the ComLaw website.

6.2 Department of State Development

www.minerals.statedevelopment.sa.gov.au

www.statedevelopment.sa.gov.au/sarig

The Department of State Development's publications are available for free download from both the Department of State Development Minerals website and SARIG, or can be obtained from Customer Services.

6.2.1 Web pages

- [Exploration Reporting](#) (Go to Licensing & Regulation, Exploration, Exploration Reporting)
- [Drill Core Library](#)

6.2.2 Forms

- [Summary report on mineral exploration](#) (a copy is provided in the Appendix)
- [Notification of an airborne survey on a mineral exploration licence](#) (a copy is provided in the Appendix)
- [Notice of use of declared equipment](#), Form 22
- [Request to inspect drillhole samples](#) (PDF)
- [Request to inspect drillhole samples](#) (Word)

6.2.3 Publications

- [Australian requirements for the submission of digital exploration data](#), V 4.2. (Commonwealth of Australia, prepared by the Government Geoscience Information Committee on instructions of the Chief Government Geologists' Committee, August 2013, available from the Geoscience Portal <<http://www.geoscience.gov.au/exploration.html>>).
- [Mineral exploration licences – general conditions, procedures and information](#), Earth Resources Information Sheet M05
- [Submission of representative samples for mineral exploration drillholes](#), Earth Resources Information Sheet M41.

6.2.4 Header generation software

Header generation software to facilitate the creation of geochemical, drilling and other point located data in the required templates:

- [Mineral reporting template software](#), V1.3.3 (.zip file).

6.3 Australasian Joint Ore Reserves Committee

www.jorc.org

The Australasian Joint Ore Reserves Committee (JORC) is sponsored by the Australian mining industry and its professional organisations.

- [The JORC Code: Australasian code for reporting of exploration results, mineral resources and ore reserves](#).
- [Australian guidelines for estimating and reporting of inventory coal, coal resources and coal reserves](#).

6.4 Geological map symbols

- [Symbols used on geological maps \(update\)](#), (Geoscience Australia, GeoCat 21883).

6.5 Keywords

- [The geoscience, minerals and petroleum thesaurus \(GeMPeT\)](#).

6.6 Writing

- [The Macquarie dictionary](#) or [The Australian Oxford dictionary](#).
- [Glossary of geology](#).
- [Style manual](#), 6th edn. (Commonwealth of Australia, revised by Snooks & Co., John Wiley Brisbane 2002).

6.7 PDFs

Invented by Adobe Systems, PDF (Portable Document Format) 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>.

7 Contacts

7.1 Department of State Development

General inquiries and assistance with SARIG

Customer Services

Level 7, 101 Grenfell Street, Adelaide SA

GPO Box 320, Adelaide SA 5001

Email Resources.CustomerServices@sa.gov.au

Phone +61 8 8463 3000

EL Reporting Officer

DSD.Exploration@sa.gov.au

Phone +61 8 8463 3060

Technical report data submission and open file release

Todd McKenzie

Todd.Mckenzie@sa.gov.au

Phone +61 8 8463 3282

Drill Core Library

23 Conyngham Street

Glenside, SA 5065

GPO Box 320, Adelaide SA 5001

DSD.CoreLibrary@sa.gov.au

Phone +61 8 8379 9574

Fax +61 8 8338 1925

Geological Survey of South Australia

DSD.Minerals@sa.gov.au

Phone +61 8 8204 1067

7.2 Department of Environment, Water and Natural Resources

www.environment.sa.gov.au

Water resources

Manager Resource Planning

Water Resources Branch

Phone +61 8 8463 6949



Government of South Australia
Department of State Development

Mineral Resources Division

SUMMARY REPORT ON MINERAL EXPLORATION

(Separate form for each licence)

Exploration licence no. _____

Operator/manager _____

For six months ending _____

Prepared by _____

Principal mineral sought during reporting period _____

Date _____

Telephone _____

(Nominate **ONE** only, e.g. Copper, Copper-Gold, Gypsum)

Fax _____

Email _____

SUMMARY OF OPERATIONS

- Summarise the type of exploration activities undertaken, including: number and type of samples; line kilometres and type of surveys; number of holes drilled and total metres (**provide drilling statistics in table below**); rehabilitation completed etc.
- Using the table on the following page, provide an itemised statement of exploration expenditure incurred during the period (allowable expenditure items are detailed in Earth Resources Information Sheet M05, *Mineral exploration licences – general conditions, procedures and information*, under 'Expenditure requirements')
- If field activities are undertaken, attach an A4-size map showing location and type of activities within the tenement area.

TABLE – Drilling statistics*

Cored		Open (RC)		Open (other)	
Number of holes	Total metres	Number of holes	Total metres	Number of holes	Total metres

* If more than one type of drilling occurred for a hole, please add the total metres for each type in the appropriate columns above. In such cases the 'number of holes' should be allocated to the drilling type column accounting for the majority of metres drilled.

EXPENDITURE

Expenditure for period

(Add detailed statement)

\$

Total expenditure for CURRENT LICENCE

\$

Group	Item	Detail	Cost
Management	Tenement mgt and reporting		\$
	Statutory fees		\$
Logistics	Food, accommodation and travel		\$
	Vehicle costs		\$
	Salaries	Employees	\$
		Consultants and contractors	\$
	Insurance	(pro-rata across all projects)	\$
Geological	Data review		\$
	Mapping	Geological, structural, etc	\$
	Geochemistry	Rock chip sampling	\$
		Soil/calcrete sampling	\$
		Biogeochemistry	\$
		Other:	\$
	Geophysics (Where applicable, please indicate if conducted by air or ground)	Magnetic (air/ground)	\$
		Radiometric (air/ground)	\$
		Gravity (air/ground)	\$
		Electromagnetic (air/ground)	\$
		Induced polarisation (air/ground)	\$
		Magnetotelluric (air/ground)	\$
		Seismic	\$
		Other:	\$
	Drilling	Auger	\$
		RAB	\$
		Air core	\$
		Sonic	\$
		Rotary mud	\$
		RC	\$
		Diamond	\$
		Other:	\$
	Remote sensing	Landsat	\$
		ASTER/multispectral	\$
		Aerial photography and DTM	\$
		Other:	\$
	Technical studies	Hydrogeology	\$
		Geotechnical	\$
		Petrology	\$
	Survey	Downhole (gyro/density/etc.)	\$
		Surface locations	\$
	Other	Trench/costean	\$
		Site preparation	\$
Rehabilitation		\$	
Sample assays		\$	
Land access	Native title negotiations		\$
	Aboriginal heritage survey		\$
	Environmental survey		\$
	Landowner negotiations		\$
	Compensation payments		\$
Project studies and research	Project development studies	Scoping study	\$
		Prefeasibility study	\$
		Feasibility study	\$
University research project		\$	
Other	(Please justify below)	Item:	\$
		Item:	\$
Subtotal			\$
Administration		10% of subtotal	\$
Total			\$



Government of South Australia
 Department of State Development

Mineral Resources Division

NOTIFICATION OF AN AIRBORNE SURVEY ON A MINERAL EXPLORATION LICENCE

TENURE INFORMATION

Tenement(s) _____

Operator _____

SURVEY INFORMATION

Type of survey: Magnetic Radiometric EM Gravity Remote sensing
 (tick appropriate) Other (specify): _____

Survey name _____

Contractor _____

Total line km _____

Line orientation _____

Flight line spacing _____

Flight height _____

Planned commencement date _____

Planned completion date _____

A map and GIS layer (e.g. shape file) showing the area to be surveyed in relation to the tenement boundaries and topographic features must accompany this form.

LANDOWNER NOTIFICATION

It is the responsibility of the licensee/operator to notify occupiers of the land prior to undertaking any low level airborne surveys.

Have the occupiers of the land to be surveyed been notified? YES NO

If 'no' give reason (e.g. not low level) _____

If 'yes' how were occupiers notified? _____

Notes:

- Detailed survey specifications should be provided on submission of the data with the **Annual technical report**.
- All airborne data must be submitted in line with requirements of Minerals Regulatory Guidelines MG13, Mineral exploration reporting guidelines for South Australia.**