Notice

Environmental Protection Act 1994

Environmental Evaluation

Notice to conduct or commission an environmental evaluation

This notice to conduct or commission an environmental evaluation is issued by the administering authority pursuant to section 326B of the Environmental Protection Act 1994.

Mt Rawdon Operations Pty Ltd
Level 30, 175 Liverpool Street
SYDNEY NSW 2000

Your reference: EPML00712113

Our reference: STAT1264; EPML00712113

18 May 2018

Take notice: that under the *Environmental Protection Act 1994* (the Act) a notice to conduct or commission an environmental investigation is issued to Mt Rawdon Operations Pty Ltd (you) by the administering authority. The administering authority is the Chief Executive of the Department of Environment and Science (the department).

The notice to conduct or commission an environmental investigation is issued in respect of the activities of Mt Rawdon Operations Pty Ltd at Mt Rawdon Mine on land described as Mining Leases (ML)1192, ML1203, ML1204, ML1206, ML1210, ML1231, ML1259, ML50119, and ML100059 situated at Swindon Road, Mt Perry (the premises).

A. Grounds

The notice to conduct or commission an environmental investigation is issued on the following grounds:

1. The department is satisfied that an activity is causing, or is likely to cause, environmental harm (as per section 326B(1)(b) of the *Environmental Protection Act 1994* (EP Act)).

The facts and circumstances forming the basis for these grounds are:

1. Mount Rawdon Operations Pty Ltd operate a gold mine and conduct mineral processing (the activity) under Environmental Authority (EA) EPML00712113.
2. Following an EA amendment on 22 September 2017, existing and new bores proposed to be installed by you were classified as Operational Management Bores, Investigation Bores, and Compliance Bores in the EA for monitoring groundwater impacts from the activity.
3. The amended EA (22 September 2017), set lower limits for the majority of contaminants relating to groundwater quality. These lower limits were set based on the monitoring data available at the time and some limits were based on a limited monitoring data set. Additional monitoring data is required for some bores to identify appropriate limits.
4. You and the department have engaged extensively in relation to site operations and the complexities of groundwater at the premises and have jointly agreed on this Environmental Evaluation.
5. The activity produces waste products (tailings, waste rock, and waste water) that are stored in waste rock dumps (WRD), a tailings storage facility (TSF), and dams.

6. These waste product storages contain contaminants in concentrations that if released to the receiving environment have the potential to cause environmental harm.
7. The monitoring bore types were determined following assessment of the modelled seepage management area undertaken by you in July 2017.
8. Operational Management Bores were included in the EA to monitor the groundwater quality within the operational zone.
9. Investigation Bores were included in the EA to monitor the groundwater between the Operational Management Bores and the Compliance Bores to understand the changes to groundwater quality with distance from the operations and assess the effectiveness of the seepage management infrastructure. Investigation bores have contaminant limits that apply.
10. Groundwater monitoring data for particular investigation bores indicate an increasing trend of sulphate concentrations.
11. Increasing trends of sulphate in groundwater investigation bores indicate that the seepage mitigation measures installed by you are potentially not effective in arresting and reversing seepage movement from the TSF and the WRD's, or the groundwater may be taking longer than anticipated to respond to the installed mitigation measures.
12. Compliance Bores were included in the EA to monitor groundwater close to the ML boundary to monitor potential impacts from the activity. Compliance bores have contaminant limits that were determined from the available groundwater quality data. Increasing trends indicate that further investigation is required to fully understand the groundwater and potential impacts from the activity.
13. Groundwater monitoring data for particular compliance bores indicates that EC is greater in these bores than the other compliance monitoring bores and the concentration of sulphate is similar to bores previously identified as impacted.
14. Cyanide is used in the processing of gold ore as part of the activity and is present at elevated levels within the tailings that are deposited in the Tailings Storage Facility (TSF). The department considers that cyanide is very unlikely to occur naturally in groundwater and cyanide is not present in any background groundwater quality results.
15. Total cyanide and Weak Acid Dissociable (WAD) cyanide has been detected above the Limit of Reporting (LOR) in a groundwater monitoring bore outside of the modelled seepage extents.
16. The presence of cyanide and the elevated EC and sulphate concentration in the bore outside of the modelled seepage extents suggest that further investigation is required to fully understand the groundwater and potential impacts from the activity.
17. Environmental values that may be impacted by the elevated contaminants are identified and declared under the *Environmental Protection (Water) Policy 2009* (EPP Water).
18. Increasing concentrations of contaminants not attributable to natural variation, cause a deterioration in water quality and result in the management intent for water in the EPP (Water) not being met.
19. Although not identified at the premises, groundwater is known to contain communities of organisms specially adapted to the chemical and physical environments associated with groundwater. Groundwater is also known to interact with surface water aquatic ecosystems and support the ecological health of these ecosystems during periods of low or nil flow in the stream.
20. Any deterioration in the groundwater quality has the potential to have an adverse effect on the groundwater as an environmental value.
21. Deterioration of the groundwater quality from the current natural variation has the potential to:
    a. have an adverse effect on the groundwater's ability to support and maintain a balanced, integrative, adaptive community of organisms; and

b. adversely affect the scientific, social or other significance of the groundwater to the present generation and future generations.

22. Groundwater underlying the premises and the interactions between groundwater and the activities; geology; and surrounding land uses are complex. There remains some uncertainty regarding the mechanisms and processes that are influencing groundwater quality in the area.
23. Processes and infrastructure to manage potential impacts of the operations to groundwater systems have been established, and there is a need to better understand the efficacy of these measures.
24. Numerous studies and investigations have previously been undertaken at the premises regarding relevant factors such as: the potential sources; geology; soils; hydrogeological features and processes; groundwater movement; and groundwater quality. There is a need to coordinate the information arising from these works and fill remaining gaps in groundwater knowledge.
25. The department considers that relevant grounds exist for requiring an environmental investigation, as per section 326B(1)(b) of the EP Act.

B. Requirements

The report on the environmental investigation must address the following relevant matters:

Stage 1: Characterisation of groundwater resources and identification of contaminant sources

1. Identify the dominant underground **hydrogeological system(s)** relevant to the premises, incorporating all available data from **groundwater** monitoring bores, and determine:

    a) the characteristics of each **hydrogeological feature** within the **hydrogeological system(s)**, including, but not limited to: soil and rock types, porosity, permeability, hydraulic conductivity, transmissivity, stratigraphy, and fault and fracture propensity;

    b) any geological barriers which are overlaying or underlying the **hydrogeological feature(s)**;

    c) the waters contained in the **hydrogeological feature(s)**, including its ionic composition;

    d) the movement of **groundwater** in the **hydrogeological feature(s)** (direction and flow rate, at a minimum);

    e) the interaction of **groundwater** contained in each **hydrogeological feature** with any other underground **hydrogeological feature**;

    f) the interaction of any **contaminated waters**, with the water in the **hydrogeological system(s)**, including a comparison of the ionic compositions of the **contaminated waters** with the water is the **hydrogeological system(s)**;

    g) the locations where water contained within the **hydrogeological system(s)** does or may potentially express at the surface;

    h) the spatial locations of environmental values within or dependant on the **hydrogeological system(s)**; authorised release points; monitoring points (surface and groundwater); previous known **contamination** event(s) locations; and current and historical mining related infrastructure/storage locations.

2. Develop a conceptual hydrogeological flow model integrating items (a)–(h) from Requirement 1. The conceptual hydrogeological flow model must be diagrammatically presented and define: the assumptions relied upon; and the uncertainties and exclusions.

3. Identify the sources of all **contaminants** that are being, or have been, released from **the premises**, which are likely to have impacted, or are currently impacting, on **receiving waters**. Sources of **contamination** to be considered should include as a minimum:
    a) current and historical knowledge including events, exceedances and incidents such as releases;
    b) on-site water management infrastructures (including dams, storages and ponds), and/or diffuse mine-related sources; and
    c) any possible mine-related source of contamination to groundwater which is relevant to this investigation.
4. By 18 November 2019, submit to the department the information outlined in requirements 1, 2 and 3 that demonstrates Stage 1 has been completed.

Stage 2: Mapping potential contaminant migration, assessment of various options for remediation and selection of appropriate options

5. Identify and describe the pathways and mechanisms for the release and transport of **contaminants** to **groundwater**, due to activities conducted at **the premises**.
6. Determine the current horizontal and vertical hydrogeographical extents of **contaminants** released to **groundwater** due to activities conducted at **the premises**, as well as rates and directions of movement of **contaminants** in **groundwater** through undertaking transient solute transport modelling using appropriate contaminants.
7. Predict likely future extent of current contaminant migration and impact using the transient solute transport modelling outlined in Requirement 6.
8. Undertake calibration and sensitivity analysis of the transient solute transport model.
9. Submit to the department the calibrated transient solute transport model, including: a summary of the findings; visual representation of the current and future horizontal and vertical hydrogeographical extents of contaminants; assumptions relied upon; and uncertainties and exclusions.
10. Determine, and install any additional monitoring bores with sufficient geographical coverage to assist in quantifying the magnitude and extent of existing **groundwater contamination** caused by mining activities at **the premises**.
11. Determine, and install any additional monitoring bores with sufficient geographical coverage to assist in quantifying the magnitude and extent of modelled likely future extent **groundwater contamination** caused by mining activities at **the premises**.
12. Assess impacts and potential impacts to **groundwater** and **surface waters**. The assessment must include:
    a) descriptive water quality statistics for each groundwater monitoring bore at **the premises** including date range, count, mean, minimum, median and 80th and 95th percentiles (and 5th and 20th percentiles for pH);
    b) box plots for all groundwater monitoring bores at **the premises** for each identified groundwater contaminant showing the minimum, the median, 20th and 80th percentiles, and the maximum;
    c) spatial trends in **groundwater contaminants** at **the premises**;
    d) temporal trends in **groundwater contaminants** including time series plots for all groundwater monitoring bores at the **premises** for all contaminants; and

Note: the method for assessing groundwater quality must be consistent with the guideline: *Using monitoring data to assess groundwater quality and potential environmental impacts. Version 1.* Department of Science, Information Technology and Innovation (DSITI) 2017, Queensland Government, Brisbane or a later version.

13. Identify appropriate **groundwater limits** that will provide for verification of the current and predicted horizontal and vertical hydrogeographical extents of **contaminants** released to **groundwater** due to activities conducted at **the premises.**
14. Identify all potential options and estimate corresponding implementation timeframes and costs for:
    a) the prevention of further **contaminant** releases from **the premises** to **groundwaters**; and
    b) remedial measures to reduce contaminant concentrations in groundwaters.
15. Nominate the preferred options from Requirement 14.
16. By 18 May 2020, submit to the department the information outlined in requirements 5 to 15 including an implementation schedule for the preferred options in Requirement 15 that demonstrates that Stage 2 has been completed.

Stage 3:Final reporting

17. Provide to the department a final report on the environmental investigation, the final report must include:
    a) the methodology applied in conducting this investigation, including any assumptions relied upon and their justification;
    b) a description of the conceptual groundwater flow model, including a visual representation;
    c) a description of the solute transport model, including: sources of uncertainty; calibration and sensitivity analysis; and a visual representation;
    d) graphical presentation of data analysis conducted in Requirement 12;
    e) the results of any studies, assessments or analyses that were carried out during this investigation;
    f) outcomes, findings and conclusions which are scientifically supported by the investigation results and are provided with clear explanations and justifications for any assumptions made; and
    g) the electronic raw data used for all data analysis, modelling, and graphical summaries with a clear indication of where the data was used.
18. The requirements of this investigation must be completed by, or in accordance with advice from, a **suitably qualified person**.
19. The final report on the environmental investigation must be submitted to the department on or before 18 November 2020.

Definitions

Aquifer means zones within the underlying geology of an area that are saturated with groundwater

conceptual hydrogeological model means a descriptive representation of a groundwater system that incorporates an interpretation of the geological and hydrological conditions

Groundwater means water stored underground in rock crevices and in the pores of geologic materials that make up the earth's crust; water that may supply springs and wells.

Hydrogeological feature(s) means a connected geological unit, sharing hydraulic characteristics and dynamics which is distinct from other geological units and stores water or acts as a transport pathway for water. A hydrological feature can be an aquifer and include transport pathways to and from the aquifer.

Suitably qualified person means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

As the recipient of this notice, you are also required to provide a statutory declaration in the form attached, to accompany the environmental report submitted to the department. The suitably qualified person who prepares the environmental report must also provide a statutory declaration in the form attached to accompany the environmental report submitted to the department.

You can view an electronic version of the statutory declaration for a recipient using the following search term (ESR/2016/1997).[1]

An electronic version of the statutory declaration for a suitably qualified person form is available using the search term (ESR/2016/2266).

Take notice:

1. the requirements of the notice to conduct or commission an environmental investigation take effect immediately upon service of this notice;
2. this notice remains in force until further notice from the department; and
3. you are responsible for meeting the costs of conducting or commissioning the environmental evaluation, preparing the environmental report and providing any further information as requested by the department.

C. Reviews and appeals

The provisions regarding reviews of decisions and appeals are found in sections 519 to 539 of the Act.

A person who is dissatisfied with certain decisions of the department, may be able to apply to have the department review that original decision.

Generally, a request to have a decision reviewed must be made:

- within 10 business days of the decision being notified to the person;
- be supported by enough information to enable the department to decide the application for review; and
- be made using the application for review of an original decision form (ESR/2015/1573).

[1] This is the publication number. The publication number can be used as a search term to find the latest version of a publication at <www.ehp.qld.gov.au>.

Where an application has been made for a decision to be reviewed, the applicant may also apply to the relevant court for a stay of the decision to secure the effectiveness of the review.

Once the original decision has been reviewed, a person who is dissatisfied with the review decision may be able to appeal against that decision to the relevant court within 22 business days after receiving notice of the review decision.

A person whose interests are or would be adversely affected by a decision of the department may also be able to request a statement of reasons for a decision or a statutory order review under the *Judicial Review Act 1991*.

For further information about reviews and appeals see the:

1. Information sheet - internal review and appeal to the Planning and Environment Court (ESR/2015/1572).
2. Information sheet - internal review and appeal to the Land Court (ESR/2015/1742).

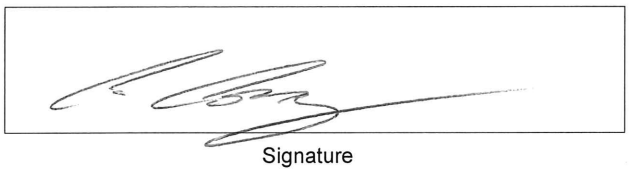
You may have other legal rights or obligations and should seek your own legal advice.

D. Penalty

Failure to comply with a notice to conduct or commission an environmental evaluation is an offence.

1. The maximum penalty for an individual is 300 penalty units, totalling $37,845.00.
2. The maximum penalty for a corporation is 1500 penalty units, totalling $189,225.00.

Should you have any queries in relation to this notice, please contact Luke Johnston of the department on telephone number 07 4222 5354.



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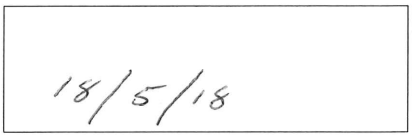

Date

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Environmental Protection Act 1994

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