

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.

Cromarty Resources Pty Ltd (ACN 601 398 841)
C/- Hanson Porter Curzon
Level 6, 350 Collins Street
MELBOURNE VIC 3000

Your reference: EPML00773613

Our reference: 101/0009448; CR78215; STAT1173

14 September 2017

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

The notice to conduct or commission an environmental investigation is issued in respect of the activities of Cromarty Resources Pty Ltd, holder of environmental authority EPML00773613 for the Thalanga Project, situated on Mining Leases (ML) 1392, 1531, 10137, 10185 and 10186 (the premises).

A. Grounds

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

- The department is satisfied that an activity or proposed activity is causing, or is likely to cause environmental harm.

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

- Cromarty Resources Pty Ltd (Cromarty Resources) operate the Thalanga Project which occupies 5 mining tenements (ML1392, ML1531, ML10137, ML10185 and ML10186) situated approximately 65km west of Charters Towers in Queensland.
- The Thalanga Project is regulated by the department under environmental authority EPML00773613 (the EA), which authorises a number of activities to be conducted at the premises. These activities include environmentally relevant activities, 31(2b) Mineral Processing, 61(1) Waste Incineration and Thermal Treatment, 63(1a)(ii) Sewage Treatment, 64(4b) Water Treatment and 17 Mining copper ore.
- Condition F9-1 of the EA states that, 'Groundwater quality and level must be monitored at the locations and frequencies defined in Schedule F – Table 8 & Map 1 for parameters identified in Schedule F – Table 9. And Condition F9-4 of the EA states that 'Groundwater quality in compliance bores identified in Schedule F – Table 8, must not exceed contaminant release limits defined in Schedule F – Table 9.'

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- On 10 February 2017, Cromarty Resources submitted an Annual Groundwater Monitoring Report (the Report) to the department. Review of the Report identified ongoing exceedances of trigger level and contaminant limits defined in Schedule F – Table 9 (Groundwater contaminant and trigger limits) in groundwater monitoring bores over the previous 12 month reporting period from November 2015 to October 2016. Specifically, the Report detailed:
 - Exceedance of contaminant limits for:
 - Electrical conductivity (EC) at compliance bores C1, C2, W45B1, W45B2 and W45B3
 - Sulfate at compliance bore C1 and
 - Fluoride at compliance bores W45B1 and W45B4
 - Exceedances of trigger levels:
 - for arsenic in compliance monitoring bores W45B1, W45B2, W45B4 and C1
 - for cadmium in compliance monitoring bores C1 and W45B1
 - for copper in compliance monitoring bores C2, C1 and W45B1
 - for zinc in compliance monitoring bores W45B1, W45B2, W45B3 and W45B4
 - Elevated concentrations of arsenic, fluoride and zinc appear to be abundant in groundwater stored within proximity of West45 (W45B1, W45B2, W45B3 and W45B3). The West45 bores are situated in a strongly mineralized zone. Natural Resource Assessments Pty Ltd titled, 'Kagara North Queensland Water Management Plan (Rev. 1) 2011 states that, " *The elevated electrical conductivity, sulfate and metals concentrations in the impact bores are not unexpected given their proximity to mineralised ore bodies (pit impact bores) or to the TSF(TSF impact bores).*
- Following submission of the Report on 7 March 2017, Cromarty Resources submitted additional groundwater monitoring results for monitoring conducted in November 2016, December 2016, January 2017 and February 2017. Review of the monitoring results by the department identified that the exceedances of trigger and contaminant limits, as described above, are continuing.
- In response to the ongoing contaminant limit exceedances from November 2015 to January 2017, the department issued Cromarty Resources with two Formal Warnings for contravention of condition F9-4 of the EA on 14 November 2016 (WARN6832) and on 6 April 2017 (WARN7153).
- In correspondence received from Cromarty Resources dated 10 February 2017 and 28 February 2017, Cromarty Resources state that they believe elevated levels of contaminants in groundwater bores cannot be attributed to mining activities; rather the limits in the EA are inappropriate.
- Specifically, Cromarty Resources note that elevated levels of EC and Sulphate are reflective of background conditions, and that one off exceedances of fluoride is due to natural seasonal fluctuations. Further, Cromarty Resources state that all exceedances are considered to be within stable trends and historical values, which indicates there is no active contamination event or impact occurring.
- On 5 May 2017, Cromarty Resources submitted a 'Groundwater EA Amendment 2017 Technical Report' (the Technical Report) to the Minerals Assessment Centre of the department to provide supporting

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information and justification to amend the limits in the EA, based on site-specific groundwater limits for the Thalanga Project that capture background values.

- Review of the Technical Report by the Minerals Assessment Centre identified that there was not sufficient evidence to amend the groundwater limits in the EA as the department could not conclude from the information provided that exceedances result from natural groundwater mineralisation and not historical contamination. Specifically, it was identified that:
 - The department is not satisfied that the groundwater monitoring network at the Thalanga Project is suitable and adequate to detect potential impacts to groundwater.
 - It is not clear if the existing water management infrastructure at the Thalanga Project is effective in protecting groundwater resources from contamination.
 - There is no information provided in the Technical Report about the adequacy of the existing TSF seepage collection systems, and whether additional mitigation measures (shallow seepage detection bores) are required.
 - A number of 'reference' monitoring bores (V1), 'pit impact' monitoring bores (V2, V3, V4, V7b), 'TSF impact' groundwater monitoring bores (A3, TH5) and 'compliance' monitoring bores (W45B1) show results indicative of interconnection with mining infrastructure and have likely been impacted by mining activities, however the contamination source and pathways are not investigated or described.
 - The Technical Report does not describe if actions are being undertaken to address any identified seepage to prevent contaminants from migrating.
- The report by Natural Resource Assessments Pty Ltd titled, 'Kagara North Queensland Water Management Plan (Rev. 1) 2011' states that *'groundwater onsite is polluted as a direct consequence of mining activities, including the disposal of tailings into underground workings.... Groundwater aquifers beyond these known disturbances (ie off-site) remain unaffected as reported by investigations and monitoring undertaken by an independent hydrogeologist.'*
- Environmental harm as defined by section 14 of the *Environmental Protection Act 1994* (EP Act), is any adverse effect, or potential adverse effect (whether temporary or permanent and whatever magnitude, duration or frequency) on an environmental value.
- An environmental value, defined in section 9 of the EP Act, is a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety.
- The trigger limits prescribed in Schedule F – Table 9 of the EA reflect values in the *'Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, 2000'* (ANZECC) required to protect 95% of species in aquatic ecosystems of slightly to moderately disturbed waters.
- In the absence of local data, the ANZECC values provide a technically derived value to protect the environmental values of aquatic ecosystems. Any exceedance of the trigger limits therefore has the potential to negatively impact on the health of aquatic ecosystems.
- The contaminant limits prescribed in Schedule F – Table 9 of the EA are based on various Guideline Values, specifically:
 - For Electrical Conductivity, Fluoride, Molybdenum and Selenium the limits are based on the ANZECC guidelines (section 4) required to protect the environmental value of livestock drinking water quality for cattle production;

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- For Arsenic, Copper and Lead the limits are based on the ANZECC guidelines (section 5) required to protect the environmental value of recreational water quality and aesthetics; and
 - For Sulphate, Mercury and Zinc the limits are based on the *Australian Drinking Water Guidelines (2004)* required to protect the environmental values (health and aesthetic/taste) of human drinking water. Note that this guideline has since been replaced by the *Australian Drinking Water Guidelines (2011)* however values remain the same; and
 - For Cadmium the limit has been calculated based on site specific, local reference site data from groundwater monitoring bore A4, between 1996 and 2007 due to the default ANZECC guideline value being exceeded.
- The contaminant limits in the EA provide a technically derived value to protect the environmental values of background/reference water quality, water required for human consumption, cattle production and recreational water quality. Any exceedance of the contaminant limits is therefore considered to have the potential to negatively impact on the environmental values of ecological health, human health, livestock production and public amenity.
 - Furthermore the department is aware that local groundwater is accessed by the underlying land holder for stock watering purposes. Whilst groundwater monitoring bores at the Thalanga Project are not directly accessed for stock watering, the department is aware that the closest stock watering bore is located at the northeast boundary of the Thalanga Project's mining leases, as described in the document titled *Kagara North Queensland Water Management Plan (Rev. 1)*, dated 10 November 2011.
 - Chapter 4.3.3.5 of the ANZECC guidelines state that at levels exceeding 5,000mg/L of total dissolved solids (salinity), for drinking water of beef cattle production, 'a loss of production and a decline in animal condition could be expected'. The department is aware that compliance and reference groundwater monitoring bores at the Thalanga Project consistently record elevated levels of Electrical Conductivity greater than 5,000mg/L, with previous monitoring results recording results as high as 11,800uS/cm (equivalent to 6834mg/L Total Dissolved Solids (salinity)). The levels of contaminants observed at the Thalanga Project are therefore considered likely to cause environmental harm.
 - Following review of the Technical Report, the department is not satisfied that there is sufficient understanding of the extent of groundwater impact, or groundwater connectivity in the area with respect to the migration of contaminants. Further, the department is not satisfied that elevated levels of contaminants identified in groundwater monitoring bores at the Thalanga Project do not have the potential to migrate to, or impact on (now or in the future) the surrounding local groundwater resource.
 - In considering the information provided in the Technical Report, the Annual Groundwater Monitoring Report, and recent Notification, the department considers that there is the potential that environmental harm is being caused by the ongoing, consistently elevated levels of contaminants at the Thalanga Project which are in turn likely be caused by the mining activities.

B. Requirements

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

1. Identify the dominant underground **hydrogeological features** at the **Thalanga Project** and the **receiving environment**, and describe:

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- a) the characteristics of the **hydrogeological feature**, 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**
 - c) the waters contained in the **hydrogeological feature**, including its ionic composition
 - d) the movement of **groundwater** in the **hydrogeological feature** (direction and flow rate, at a minimum)
 - e) the interaction of **groundwater** contained in each **hydrogeological feature** with any other **hydrogeological feature**, including the degree of hydraulic connectivity and transmissivity
 - f) the interaction of any contaminated waters, with the water in the **hydrogeological feature**, including a comparison of the ionic compositions of the waters
 - g) the locations where water contained within the **hydrogeological feature** does or may potentially express at the surface
 - h) the spatial locations of environmental values within or dependant on the **hydrogeological feature**.
 - i) a conceptual model integrating items (a)–(h)
2. Identify the sources of all **contaminants** that are being, or have been released from the **Thalanga Project** which are likely impacting on **groundwater**. This investigation must include, but not be limited to, all dams, storages and ponds containing mine affected water at the **Thalanga Project**.
 3. Determine the types, concentrations and volumes of **contaminants** that are being or have been released from the **Thalanga Project**, which are currently impacting on, or have the potential to impact on **groundwater**.
 4. Identify and describe the pathways and mechanisms for the release and transport of **contaminants** to **groundwater**, due to activities conducted at the **Thalanga Project**.
 5. Determine the current lateral and vertical geographical extents of **contaminants** released to **groundwater**, due to activities conducted at the Thalanga Project, as well as rates, directions of movement, and attenuation of **contaminants** in **groundwater**. Undertake solute transport modelling to predict likely patterns of contaminant migration and impact.
 6. Undertake sensitive analysis of the solute transport model.
 7. Review the existing groundwater network to ensure monitoring bores have sufficient geographical coverage to detect and quantify the magnitude and extent of existing **groundwater contamination** caused by mining activities at the **Thalanga Project**. In designing the monitoring bore network, consideration should also be given to potential future impact areas.
 8. Assess impacts and potential impacts on **groundwater** and all **environmental values**. The assessment must include and consider:
 - a) A table of descriptive statistics for each groundwater monitoring bore at the **Thalanga Project** including; date range, count, mean, minimum, median and 80th and 95th percentiles and
 - b) Box plots for all groundwater monitoring bores at the **Thalanga Project** for each groundwater contaminant showing, the minimum, the median, 20th and 80th percentiles and maximum as well as the relevant water quality objectives for each **environmental value**.
 - c) Spatial trends in **groundwater contaminants** at the **Thalanga Project**.

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- d) Temporal trends in **groundwater contaminants** including time series plots for all groundwater monitoring bores at the Thalanga Project for all relevant contaminants.
- e) An assessment of **groundwater** quality against water quality objectives for all relevant contaminants and all **environmental values** with reference to graphical summaries which include water quality objectives for each **environmental value**.

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.

- 9. Identify **key indicators** which are detectable in all contaminated water that is being or has been released from the **Thalanga Project to groundwater**. Different **key indicators** may be nominated for different sources.
- 10. Identify all potential options and estimate corresponding implementation timeframes and costs for:
 - a) The prevention of further **contaminant** releases from the **Thalanga Project to groundwater**; and
 - b) Remedial measures to reduce **contaminant** concentrations in **groundwater** and ensure all **environmental values** are protected.
- 11. By **15 December, 2017**, provide a design document for the investigation, including an implementation schedule with milestones.
- 12. From **15 September, 2017**, provide progress reports on the progress of the environmental investigation with reference to the milestones in the implementation schedule at a frequency of once every six months.
- 13. Provide a Final Report to address all matters of this environmental investigation. The Final Report on the environmental investigation must address all relevant matters, and also include:
 - a) The methodology applied in conducting this investigation, including any assumptions relied upon and their justification.
 - b) A description of the conceptual model
 - c) A description of the solute transport model, including consideration of the confidence in the model with reference to assumptions, limitations and sensitivity analysis of the model.
 - d) The results of any studies, assessments or analyses that were carried out during this investigation
 - e) The outcomes and findings of the investigation, including justification for any conclusions and
 - f) The raw data for all graphical summaries with a clear indication of which data applies to each graph.
- 14. The requirements of this investigation must be completed by, or in accordance with advice from, a **suitably qualified person**.
- 15. The Final Report on the environmental investigation must be submitted to the department on or before **15 January, 2020**.

Definitions

The following definitions apply to the requirements of the EE:

Contaminant(s) - a contaminant can be

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- A gas, liquid or solid; or
- An odour; or
- An organism (whether alive or dead), including a virus; or
- Energy, including noise, heat, radioactivity and electromagnetic radiation; or
- A combination of contaminants.

Contamination means the release (whether by act or omission) of a contaminant into the environment.

Environmental value(s) in the context of water means environmental values defined in the Environmental Protection (Water) Policy 2009 and are applied to surface water and groundwater, being:

- for slightly disturbed waters—the biological integrity of an aquatic ecosystem that has effectively unmodified biological indicators, but slightly modified physical, chemical or other indicators;
- for moderately disturbed waters—the biological integrity of an aquatic ecosystem that is adversely affected by human activity to a relatively small but measurable degree;
- for waters that may be used for producing aquatic foods for human consumption—the suitability of the water for producing the foods for human consumption;
- for waters that may be used for agricultural purposes—the suitability of the water for agricultural purposes;
- for waters that may be used for recreation or aesthetic purposes, the suitability of the water for—
 - primary recreational use; or
 - secondary recreational use; or
- for waters that may be used for drinking water—the suitability of the water for supply as drinking water;
- for waters that may be used for industrial purposes—the suitability of the water for industrial use;
- the cultural and spiritual values of the water.

Groundwater means water in underground rock crevices and in the pores of geologic materials that make up the earth's crust. Groundwater includes sub surface flows or seepage.

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.

Key indicators means parameters, geochemical compositions/signatures or other identifiable characteristics of a body of water which are not present in the receiving environment and which can be used to identify the origin of a body of water, regardless of dilution or mixing with other waters.

Thalanga Project means any mine feature or mining activity on or conducted on Mining Lease (ML) 1392, 1531, 10137, 10185 and 10186. In the context of groundwater monitoring bores this also includes bores outside of Mining Lease (ML) 1392, 1531, 10137, 10185 and 10186, where they have been placed for the purpose of detecting potential impacts to groundwater as a result of mining activities.

Receiving environment means all groundwater, surface water, land, and sediments that are not disturbed areas authorised by the environmental authority.

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.

The environmental report must be submitted to the department on or before:

- **15 January 2020, two years and four months from issue date.**

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

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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](#)).

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.

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>.

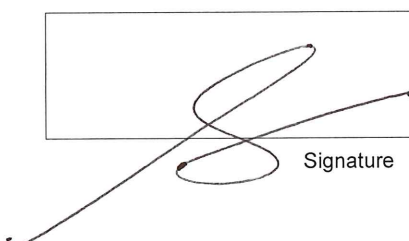
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D. Penalty

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.
2. The maximum penalty for a corporation is 1500 penalty units, totalling \$189,225.

Should you have any queries in relation to this notice, please contact Carly Greig, Senior Environmental Officer of the department on telephone number (07) 4722 5262 or email carly.greig@ehp.qld.gov.au.


Signature

Natalie Simpson

A/Manager, Compliance

Delegate of the Chief Executive

Department of Environment and Heritage Protection

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Date

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