

Queensland Floods Commission of Inquiry

CROWN LAW—(DERM – Rob Lawrence)
Response to Req #1720609 – Mt Oxide Mine)
#1737341 File 540093/1
Volume 1 of 1 ORIGINAL

Statement of Robert Anthony Lawrence (Mt. Oxide Mine)

September 2011
Vol 1

QFCI

Date:

9/11/11 Jm
942

Exhibit Number:

QUEENSLAND FLOODS
COMMISSION OF INQUIRY

STATEMENT OF ROBERT (ROB) ANTHONY LAWRENCE

WITH RESPECT TO THE MT OXIDE MINE (ABANDONED)

I, **ROBERT (ROB) ANTHONY LAWRENCE** of c/- 5B Sheridan Street, Cairns in the State of Queensland, Regional Manager, Environmental Services, Department of Environment and Resource Management (DERM), make oath and states as follows:-

Requirement from Queensland Floods Commission of Inquiry

1. I have seen a copy of a letter dated 9 September 2011, which is attachment **RAL-01**, from the Commissioner, Queensland Floods Commission of Inquiry to me requiring a written statement under oath or affirmation, and which details the topics my statement should cover.

Role

2. I am currently Regional Manager Environmental Services, North Region, Regional Service Delivery Division, Operations and Environmental Regulator Business Group, DERM. I am based in Cairns, but my work covers the whole North Region. Attachment **RAL-02** is a map showing the regions.
3. From 1 Oct 2010 to present my roles were as follows:
 - a. From 1 October 2010 Regional Manager, Mining and Industry, North Region
 - b. On or around 4 April 2011 the role changed to Regional Manager, Environmental Services, North Region due to some internal realignment.
 - c. Reporting arrangements for a and b above are directly to the Regional Services Director, North Region, Regional Service Delivery Division, DERM.
 - d. I was on leave from DERM from 24 December 2010 until 28 January 2011 and 4 July 2011 until 11 July 2011.
 - e. I acted in the position of Regional Services Director from 8 August 2011 until 19 August 2011.

Item 1: Department of Environment and Resource Management (DERM) activities in respect of the mine's flood preparedness in advance of the 2010/2011 wet season, including whether any particular activities were undertaken as a response to the forecast of an above-average rainfall wet season.

4. The Mount Oxide Mine is an abandoned mine administered under the Abandoned Mine Land Program (AMLPL) managed by the Department of Employment, Economic Development and Innovation (DEEDI) – Mines. The AMLPL is not administered by DERM.
5. DEEDI provided a brief history and status of the abandoned Mt Oxide mine to DERM in June 2010 (**RAL-MO01-01** attached DEEDI history of site). That document identifies that the Mt Oxide mine;
 - a. Is located 158km by road north of Mount Isa;
 - b. Copper was mined whilst the mine was in operation;
 - c. The mine operated from around the 1920's until 1984.
 - d. The leases were surrendered in 1999;
 - e. The responsibility for the site rests with the AMLPL.
6. My employment was with the former Environmental Protection Agency (EPA) one of DERM's predecessor departments. My involvement in the environmental regulation of mining has been from 2001 when the environmental regulation of mining was moved to the *Environmental Protection Act 1994* and administered by the former EPA.
7. I am advised that prior to 2001, environmental regulation of mining was administered by the Department of Mines and Energy, a predecessor department to DEEDI.
8. DERM has a pre wet season inspection program focusing on mining operations regulated by DERM. This program aims to inspect the larger level 1 mines with a particular focus on water management prior to the wet season. In addition the North region has a Mine Discharge Response Plan which provides a framework for incident management in relation to mine discharges as well as information for responding to a discharge such as, site access and land holder contact details. The plan is updated each year prior to the wet season (**RAL-MO01-02** Mine Discharge response Plan with relevant page for Mt Oxide).
9. An Exploration Permit Mineral (EPM 10313) has been granted over land which includes the Mount Oxide abandoned mine (**RAL-MO01-03** map showing EPM 10313). DERM regulates the environmental aspects of the exploration activities undertaken on the EPM through an EA issued under the provisions of the *Environmental Protection Act 1994*. The conditions of the EA require the holder to also comply with the conditions in the Code of Environmental Compliance for Exploration and Mineral Development Projects (Attachment **RAL-MO01-04** and **RAL-MO01-05** Copies of EA and Code).
10. The EA allows for exploration to occur over the EPM. The holder of the EA is not responsible for the historical disturbance of the Mt Oxide abandoned mine.
11. DERM officers carried out a compliance inspection of the EA which regulates the environmental aspects of the exploration activities prior to the 2010/2011 wet season (Attachment **RAL-MO01-06** DERM post inspection letter) but that inspection did not specifically focus on the Mt Oxide abandoned mine as that is the responsibility of DEEDI.

12. The management of the Mount Oxide abandoned mine is the responsibility of the AMLP by DEEDI. DEEDI are responsible for any flood preparations prior to the 2010/2011 wet season.

Item 2: the water management sections of the environmental authority applicable at the mine during the 2010/2011 wet season, including:

- a) Any concerns held by him or the Department of Environment and Resource Management (DERM) regarding its terms and the ability of the mine operator to comply with it
 - b) Any terms that the mine operator has indicated it is unable to comply with, or breached
 - c) Any terms that had to be amended from the Fitzroy model conditions because the model terms were unsuitable for this mine site
 - d) Any terms that he or DERM consider do not adequately promote environmental protection and dam safety.
13. As previously stated in paragraph 5 above, the Mount Oxide mine has not operated since the 1980s and the mining lease was surrendered in the late 1990s. The environmental regulation of mining was incorporated into the *Environmental Protection Act 1994* in 2001. As a result there is no EA for the Mount Oxide abandoned mine.

Item 3: any transitional environmental program (TEP) issued or refused or any emergency direction (ED) given or considered regarding either mine during the period 1 October 2010 to 30 July 2011 related to water management, and for each, the following:

- a) Information received from the mine operator
- b) Any relevant dam safety issues
- c) Relevant correspondence with the mine operator and other stakeholders
- d) Whether and, if so, how DERM consulted with stakeholders
- e) What considerations DERM took into account in making the decision
- f) Whether, and if so, how DERM balanced environmental considerations and economic consequences of mines being non-operational
- g) Whether, and if so how, DERM took account of downstream effects, including cumulative effects
- h) The terms of the TEP issued or ED given
- i) What actions were taken by DERM to advise emergency management personnel, including local and regional disaster management groups and local residents downstream of the dam about the TEP and any discharges or effects
- j) Reasons for the decision given to the mine operator
- k) Any breaches of the TEP or ED by the mine operator and DERM's response

14. I have conducted a search of DERM records and there were no TEP's issued or refused by DERM in relation to water management at the Mount Oxide abandoned mine during the period of 1 October 2010 to 30 July 2011.
15. I have conducted a search of DERM records and no ED was given in relation to water management at the Mount Oxide abandoned mine during the period of 1 October 2010 to 30 July 2011.

Item 4: the effects on the environment, drinking water quality and public health downstream of each of the mine sites (as far as the Great Barrier Reef Marine Park) as a result of discharges of water from the mine during the period 1 October 2010 to 30 July 2011.

16. DERM officers have been to the Mt Oxide abandoned mine on numerous occasions including when the creeks in the area are running. I am advised by DERM officers that water discharged from the Mt Oxide abandoned mine flows to Cave Creek immediately downstream of the abandoned mine. Cave Creek is an ephemeral creek and has ecosystem and stock water values. The creek water is not used for human consumption or recreation. Cave Creek flows to Gunpowder Creek which runs into the Leichardt River which flows to the Gulf of Carpentaria. It therefore does not discharge to the Great Barrier Reef Marine Park.
17. DERM officers undertook sampling of water and sediment in Cave Creek downstream of the Mt Oxide abandoned mine in March 2011 (Attachment RAL-MO04-01 Sample results March 2011). DERM officers have reviewed the results of the samples and advised as follows;
 - a. In relation to the effects on the receiving environment, the water quality immediately downstream of the release exceeded the Australian and New Zealand Environment Conservation Council (2000) (ANZECC 2000) water quality guideline trigger values for the protection of ecosystems specifically for metals. In addition sediment samples also exceed the ANZECC 2000 interim sediment quality guidelines.
 - b. In relation to the effects on drinking water and public health, it should be noted that Cave Creek is not used for this purpose, however the sample results indicate that the water in Cave Creek exceeded the Australian Drinking Water Guidelines, specifically for heavy metals. I am advised that the water samples taken from Cave Creek in March 2011 did not exceed the recommended recreational water quality for primary contact.
 - c. The sample results indicate that the water quality in Cave Creek exceeded the ANZECC 2000 livestock drinking water guideline values specifically for heavy metals.

18. DERM officers discussed the sample results with DEEDI and copies of sample results were provided to the landholder. DERM officers have also provided advice to the landowner on the interpretation of the results (RAL-MO04-02).

Item 5: any actions taken by DERM in response to any effect of discharges from the mine falling into 4, above, during the period 1 October 2010 and 30 July 2011.

19. As previously stated in paragraph 4 above, the Mt Oxide abandoned mine is managed by DEEDI under that department's AMLP. DEEDI is responsible for managing the abandoned mine and any actions arising from discharge of contaminated water from the mine.
20. DERM officers discussed the sample results with DEEDI and provided copies of the results to the landowner of Chidna Station on which the abandoned mine is located.
21. DEEDI has established an expert panel to review and provide advice on the management of the Mt Oxide abandoned mine. DERM has provided technical experts to support the expert panel (Attachment RAL-MO05-01 Last minutes of Expert Panel meeting).
22. The Director-General of DERM wrote to the Director-General of DEEDI on 8 August 2010 (Attachment RAL-MO05-02 Brief and DG Letter) and again on 15 September 2011 (Attachment RAL-MO05-03 Brief and DG Letter) in relation to the discharges from the Mt Oxide abandoned mine. The Director-General of DEEDI wrote back to DERM on 8 September 2010 outlining DEEDI's proposed management of the environmental issues on site (Attachment RAL-MO05-04 DG DEEDI letter). DERM is currently awaiting a response from DEEDI in relation to DERM's letter of 15 September 2011.

Item 6: reports of visible blue precipitate downstream, including an account of DERM knowledge of the precipitate, the area affected by it, its cause and effects, and response actions taken by DERM.

23. Since 2009 DERM officers have inspected the site numerous times and taken samples for analysis. The blue precipitation occurs in Cave Creek immediately downstream of the Mt Oxide abandoned mine. I have been advised by DERM officers that the cause of the blue precipitation in Cave Creek is due to the discharge of low pH (Acidic) water containing heavy metals including copper from the abandoned mine site after rainfall. The low pH water then flows downstream into Cave Creek where it meets clean storm water. The mixing of waters increases the pH which results in heavy metals, particularly copper, dropping out of solution leaving a blue precipitate on the surface of sediments in Cave Creek. A photograph taken by DERM officers during an inspection of Cave Creek on 16 March 2009 is attached. (Attachment RAL-MO06-01 PHOTO).
24. I have been advised by DERM officers that the most extensive contamination event occurred during the 2008/2009 wet season when Cave Creek was

significantly impacted by the blue precipitates. Subsequent wet seasons have also resulted in blue precipitates in Cave Creek though they have not been as extensive as the 2008/2009 wet season. The extent of the blue precipitates has only been observed by DERM immediately downstream of the abandoned mine in Cave Creek.

25. DERM has continued to liaise with the landholder directly affected by the release of contaminated water from the abandoned mine and has established a single point of contact for the landowner for all issues regarding the Mount Oxide abandoned mine. Copies of sample results that DERM officers have taken since 2009 (Attachment **RAL-MO06-02 to RAL-MO06-12 and RAL-MO04-01 & RAL-MO04-02** All sample results) have been provided to both the landowner and DEEDI. DERM officers have also provided advice to the landowner in interpretation of the results.
26. DERM has made available technical experts to attend the expert panel meetings convened by DEEDI to provide advice and recommendations on how best to manage the abandoned mine. DERM has also made staff available to attend stakeholder information sessions facilitated by DEEDI to update stakeholders on proposed actions planned to occur at the abandoned mine.
27. As outlined in paragraph 22 above and attachments **RAL-MO05-02, RAL-MO05-03 and RAL-MO05-04**, the Director-General, DERM and the Director-General, DEEDI have been corresponding regarding the issue.

Item 7: any ongoing concerns regarding uncontrolled or controlled discharges from Mt Oxide Mine (abandoned), including the quality of discharges

28. DERM has concerns regarding uncontrolled release of poor quality water from the abandoned mine and will continue to participate in the expert panel process being run by DEEDI to assist in identifying appropriate management strategies for the abandoned mine.

Item 8: details of any remediation works planned and the intended outcome of those works

29. The management and remediation works at the Mount Oxide abandoned mine is the responsibility of the AMLP administered by DEEDI. Therefore, any remediation works under AMLP would be planned and carried out by DEEDI.

Item 9: details of any flood preparedness activities planned to precede the 2011/2012 wet season

30. The management of the Mount Oxide abandoned mine is the responsibility of the AMLP administered by DEEDI. DEEDI are responsible for any flood preparations prior to the 2011/2012 wet season.

31. DERM will continue with its pre wet season inspection program focusing on mining operations regulated by DERM. In addition, the North region has a Mine Discharge Response Plan, refer to attachment **RAL-MO01-02** above which is updated each year prior to the wet season. DERM is currently reviewing the Mine Discharge Response Plan in advance of the upcoming wet season.
32. DERM will maintain contact with the local landowner, liaise closely with DEEDI and will continue to monitor any discharge from the abandoned mine.

Item 10: details of how the new Fitzroy Model Conditions negotiated during 2011, or any other discussions with DERM, will resolve any issue raised above in 1, 2, 3, or 4

And

Item 11: an explanation as to whether the new Fitzroy Model Conditions negotiated during 2011 are advantageous or disadvantageous to the mine operator in the management of water at the mine, the downstream environment and safety issues.

33. I was not involved in the development of the Fitzroy model conditions however I understand that they were developed specifically for coal mining operations in Central Queensland. These conditions have not been applied to operational or abandoned metalliferous mines in North Queensland (of which Mt Oxide is one). I am not able to comment specifically on the details of the Fitzroy model conditions as these conditions are outside my area of expertise and were developed by DERM specialists.
34. The Mt Oxide mine is an abandoned mine, has no environmental authority and is managed by DEEDI under their abandoned mine land program.

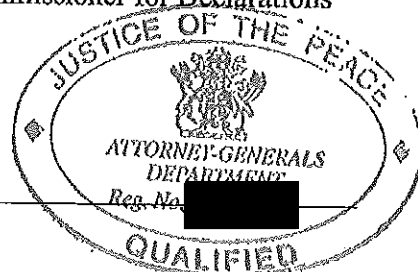
I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867*.

Signed .

Robert Anthony Lawrence

Taken and declared before me, at Cairns this 27th day of September 2011

Solicitor/Barrister/Justice of the
Peace/Commissioner for Declarations



Our ref: Doc 1705864

9 September 2011

[REDACTED]
Assistant Crown Solicitor
Crown Law - Department of Justice and Attorney-General
GPO Box 5221
BRISBANE QLD 4001

Dear [REDACTED]

Department of Environment and Resources & Department of Employment, Economic Development and Innovation - Mining Dams

Please find enclosed a Requirement to Provide Statement to the Commission addressed to the following:

1. Mr Andrew Brier, General Manager, Strategic Implementation, Coal & CSG Operations, Regional Service Delivery, Operations and Environmental Regulator, directed to the regulation by the Department of Environment and Resource Management of Ensham Coal Mine and the Moranbah North Coal Mine.
2. Mr Rob Lawrence, Director, Environmental Services (North Region), Regional Service Delivery, Operations and Environmental Regulator, directed to the regulation by the Department of Environment and Resource Management of Mt Oxide Mine.
3. Mr Oskar Kadletz, Abandoned Mine Coordinator in the Department of Employment, Economic Development and Innovation, directed to the State regulations of discharges during floods at Mt Oxide Mine.

Please note that this further requirement for Mr Kadletz is additional to requirement number 1702565 dated 8 September, and that one statement covering topics from both requirements may be provided if convenient. Both requirements are returnable by 5 pm, Friday 16 September 2011.

The material from Mr Brier and Mr Lawrence is returnable to the Commission no later than 5 pm, Monday 26 September 2011.

If you require further information or assistance, please contact [REDACTED] on telephone [REDACTED]

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Queensland 4001 Australia
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Facsimile **+61 7 3405 9750**
www.floodcommission.qld.gov.au
ABN 82 696 762 534

We thank you for your assistance.

Yours sincerely



 Jane Moynihan
Executive Director

Our ref: Doc 1694638

9 September 2011

Mr Andrew Brier
General Manager, Strategic Implementation, Coal & CSG Operations,
Regional Service Delivery, Operations and Environmental Regulator
Department of Environment and Resource Management
Level 13, 400 George Street
BRISBANE QLD 4001

REQUIREMENT TO PROVIDE STATEMENT TO COMMISSION OF INQUIRY

I, Justice Catherine E Holmes, Commissioner of Inquiry, pursuant to section 5(1)(d) of the *Commissions of Inquiry Act 1950* (Qld), require Mr Andrew Brier of the Department of Environment and Resource Management to provide a written statement, under oath or affirmation, to the Queensland Floods Commission of Inquiry, in which the said Mr Brier gives an account of the following topics.

With respect to the Ensham Coal Mine and the Moranbah North Coal Mine:

1. Department of Environment and Resource Management's activities in respect of each mine's flood preparedness in advance of the 2010/2011 wet season, including whether any particular activities were undertaken as a response to the forecast of an above-average rainfall wet season
2. the water management sections of the environmental authority applicable at the mine during the 2010/2011 wet season, including:
 - a. any concerns held by him or the Department of Environment and Resource Management (DERM) regarding its terms and the ability of the mine operator to comply with it
 - b. any terms that the mine operator has indicated it is unable to comply with, or breached
 - c. any terms that had to be amended from the Fitzroy model conditions because the model terms were unsuitable for this mine site
 - d. any terms that he or DERM consider do not adequately promote environmental protection and dam safety
3. any transitional environmental program (TEP) issued or refused or any emergency direction (ED) given or considered regarding either mine during the period 1 October 2010 to 30 July 2011 related to water management, and for each, the following:
 - a. information received from the mine operator

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- b. any relevant dam safety issues
 - c. relevant correspondence with the mine operator and other stakeholders
 - d. whether and, if so how, DERM consulted with stakeholders
 - e. what considerations DERM took into account in making the decision
 - f. whether, and if so how, DERM balanced environmental considerations and economic consequences of mines being non-operational
 - g. whether, and if so how, DERM took account of downstream effects, including cumulative effects
 - h. the terms of the TEP issued or ED given
 - i. what actions were taken by DERM to advise emergency management personnel, including local and regional disaster management groups and local residents downstream of the dam about the TEP and any discharges or effects
 - j. reasons for the decision given to the mine operator
 - k. any breaches of the TEP or ED by the mine operator and DERM's response
4. the effects on the environment, drinking water quality and public health downstream of each of the mine sites (as far as the Great Barrier Reef Marine Park) as a result of discharges of water under a TEP or ED
 5. details of how the new Fitzroy Model Conditions negotiated during 2011, or any other discussions with DERM, will resolve any issue raised above in 1, 2, 3, or 4
 6. an explanation as to whether the new Fitzroy Model Conditions negotiated during 2011 are advantageous or disadvantageous to the mine operator in the management of water at the mine, the downstream environment and safety issues

With respect to the Ensham Coal Mine only:

7. an account of DERM's activities and decisions to assist Ensham to de-water the mine pits after the 2008 flooding affecting that mine
8. the rationale for prohibiting the discharge of excess water from the 2008 flood which remained in the mine pit through to 2010
9. the positive and negative effects on the environment of the discharge of water from the 2008 flood out of the Ensham mine site in 2010/2011

Mr Brier should attach to his statement:

- the water management sections of the environmental authority in force during the 2010/2011 wet season for the mines
- all relevant TEP or ED documentation, including internal working documents, assessment report, policy documents used, expert reports, notes of any conference, meeting or teleconference, reasons given to mine operators, notice of decision, correspondence with the mine operator and other stakeholders
- any new environmental authority issued in response to the 2011 amendments to the Fitzroy Model Conditions

- any internal reports regarding the Ensham Coal Mine de-watering between 2008 and 2011

In addressing these matters, Mr Brier is to:

- provide all information in his possession and identify the source or sources of that information;
- make commentary and provide opinions he is qualified to give as to the appropriateness of particular actions or decisions and the basis of that commentary or opinion.

Mr Brier may also address other topics relevant to the Terms of Reference of the Commission in the statement, if he wishes.

The statement is to be provided to the Queensland Floods Commission of Inquiry by 5 pm, Monday 26 September 2011.

The statement can be provided by post, email or by arranging delivery to the Commission by emailing info@floodcommission.qld.gov.au.



Commissioner
Justice C E Holmes

Our ref: Doc 1705885

9 September 2011

Mr Rob Lawrence

Director, Environmental Services (North Region), Regional Service Delivery, Operations and Environmental Regulator

Department of Environment and Resource Management

Level 13, 400 George Street

BRISBANE QLD 4001

REQUIREMENT TO PROVIDE STATEMENT TO COMMISSION OF INQUIRY

I, Justice Catherine E Holmes, Commissioner of Inquiry, pursuant to section 5(1)(d) of the *Commissions of Inquiry Act 1950* (Qld), require Mr Rob Lawrence of the Department of Environment and Resource Management to provide a written statement, under oath or affirmation, to the Queensland Floods Commission of Inquiry, in which the said Mr Lawrence gives an account of the following topics.

With respect to the Mt Oxide Mine (abandoned)

1. Department of Environment and Resource Management (DERM) activities in respect of the mine's flood preparedness in advance of the 2010/2011 wet season, including whether any particular activities were undertaken as a response to the forecast of an above-average rainfall wet season
2. the water management sections of the environmental authority applicable at the mine during the 2010/2011 wet season, including:
 - a. any concerns held by him or the Department of Environment and Resource Management (DERM) regarding its terms and the ability of the mine operator to comply with it
 - b. any terms that the mine operator has indicated it is unable to comply with, or breached
 - c. any terms that had to be amended from the Fitzroy model conditions because the model terms were unsuitable for this mine site
 - d. any terms that he or DERM consider do not adequately promote environmental protection and dam safety
3. any transitional environmental program (TEP) issued or refused or any emergency direction (ED) given or considered regarding either mine during the period 1 October 2010 to 30 July 2011 related to water management, and for each, the following:
 - a. information received from the mine operator

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- b. any relevant dam safety issues
 - c. relevant correspondence with the mine operator and other stakeholders
 - d. whether and, if so, how DERM consulted with stakeholders
 - e. what considerations DERM took into account in making the decision
 - f. whether, and if so, how DERM balanced environmental considerations and economic consequences of mines being non-operational
 - g. whether, and if so how, DERM took account of downstream effects, including cumulative effects
 - h. the terms of the TEP issued or ED given
 - i. what actions were taken by DERM to advise emergency management personnel, including local and regional disaster management groups and local residents downstream of the dam about the TEP and any discharges or effects
 - j. reasons for the decision given to the mine operator
 - k. any breaches of the TEP or ED by the mine operator and DERM's response
4. the effects on the environment, drinking water quality and public health downstream of each of the mine sites (as far as the Great Barrier Reef Marine Park) as a result of discharges of water from the mine during the period 1 October 2010 to 30 July 2011
 5. any actions taken by DERM in response to any effect of discharges from the mine falling into 4, above, during the period 1 October 2010 to 30 July 2011
 6. reports of visible blue precipitate downstream, including an account of DERM knowledge of the precipitate, the area affected by it, its cause and effects, and response actions taken by DERM
 7. any ongoing concerns regarding uncontrolled or controlled discharges from Mt Oxide Mine (abandoned), including the quality of discharges
 8. details of any remediation works planned and the intended outcome of those works
 9. details of any flood preparedness activities planned to precede the 2011/2012 wet season
 10. details of how the new Fitzroy Model Conditions negotiated during 2011, or any other discussions with DERM, will resolve any issue raised above in 1, 2, 3, or 4
 11. an explanation as to whether the new Fitzroy Model Conditions negotiated during 2011 are advantageous or disadvantageous to the mine operator in the management of water at the mine, the downstream environment and safety issues

Mr Lawrence should attach to his statement:

- the water management sections of the environmental authority in force during the 2010/2011 wet season for the mines
- all relevant TEP or ED documentation, including internal working documents, assessment report, policy documents used, expert reports, notes of any conference,

meeting or teleconference, reasons given to mine operators, notice of decision, correspondence with the mine operator and other stakeholders

- any new environmental authority issued in response to the 2011 amendments to the Fitzroy Model Conditions
- any internal reports regarding the Ensham Coal Mine de-watering between 2008 and 2011

In addressing these matters, Mr Lawrence is to:

- provide all information in his possession and identify the source or sources of that information;
- make commentary and provide opinions he is qualified to give as to the appropriateness of particular actions or decisions and the basis of that commentary or opinion.

Mr Lawrence may also address other topics relevant to the Terms of Reference of the Commission in the statement, if he wishes.

The statement is to be provided to the Queensland Floods Commission of Inquiry by 5 pm, Monday 26 September 2011.

The statement can be provided by post, email or by arranging delivery to the Commission by emailing info@floodcommission.qld.gov.au.



Commissioner
Justice C E Holmes

Our ref: Doc 1710243

9 September 2011

Mr Oskar Kadletz
Abandoned Mines Coordinator
Department of Employment, Economic Development and Innovation
PO Box 15168
City East QLD 4002

REQUIREMENT TO PROVIDE STATEMENT TO COMMISSION OF INQUIRY

I, Justice Catherine E Holmes, Commissioner of Inquiry, pursuant to section 5(1)(d) of the *Commissions of Inquiry Act 1950* (Qld), require Mr Oskar Kadletz to provide a written statement, under oath or affirmation, to the Queensland Floods Commission of Inquiry, in which the said Mr Kadletz provides details of:

1. any ongoing concerns regarding uncontrolled or controlled discharges from Mt Oxide Mine (abandoned), including the quality of discharges
2. any remediation works planned and the intended outcome of those works
3. any flood preparedness activities planned to precede the 2011/2012 wet season

The statement is to be provided to the Queensland Floods Commission of Inquiry by 5 pm, Friday 16 September 2011.

The statement can be provided by post, email or by arranging delivery to the Commission by emailing info@floodcommission.qld.gov.au.



Commissioner
Justice C E Holmes



WEIPA

MAREEBA

ATHERTON

CAIRNS

INNISFAIL

SOUTH JOHNSTONE

INGHAM

TOWNSVILLE

AYR

MOUNT ISA

CLONCURRY

HUGHENDEN

DEPARTMENT OF EMPLOYMENT, ECONOMIC
DEVELOPMENT AND INNOVATION



Mount Oxide History and Status

For

Expert Panel

Department of Employment, Economic Development and Innovation
Mines and Energy
Level 1, 187 Stanley Street
Townsville, QLD, 4810
Australia

Aim

This summary provides background information for the Mount Oxide Expert Panel.

Location

Mount Oxide abandoned mine site is located 158 km by road north of Mount Isa (see Figure 1). Take the Western Metals' Mt Gordon/Gunpowder turn-off on the Barkly Highway 44km out from Mt Isa towards Camooweal. Progress through the Mt Gordon security check a further 82 km out. Turn right at the small Mt Oxide sign along a further 3.8 km. Follow the track across Gunpowder Creek. (If creek is flowing strongly reroute to Mt Gordon administration office for alternate route through Mt Gordon Operations area.) Turn right towards Mt Oxide. Continue a further 6.5 km past the old airstrip on the right.

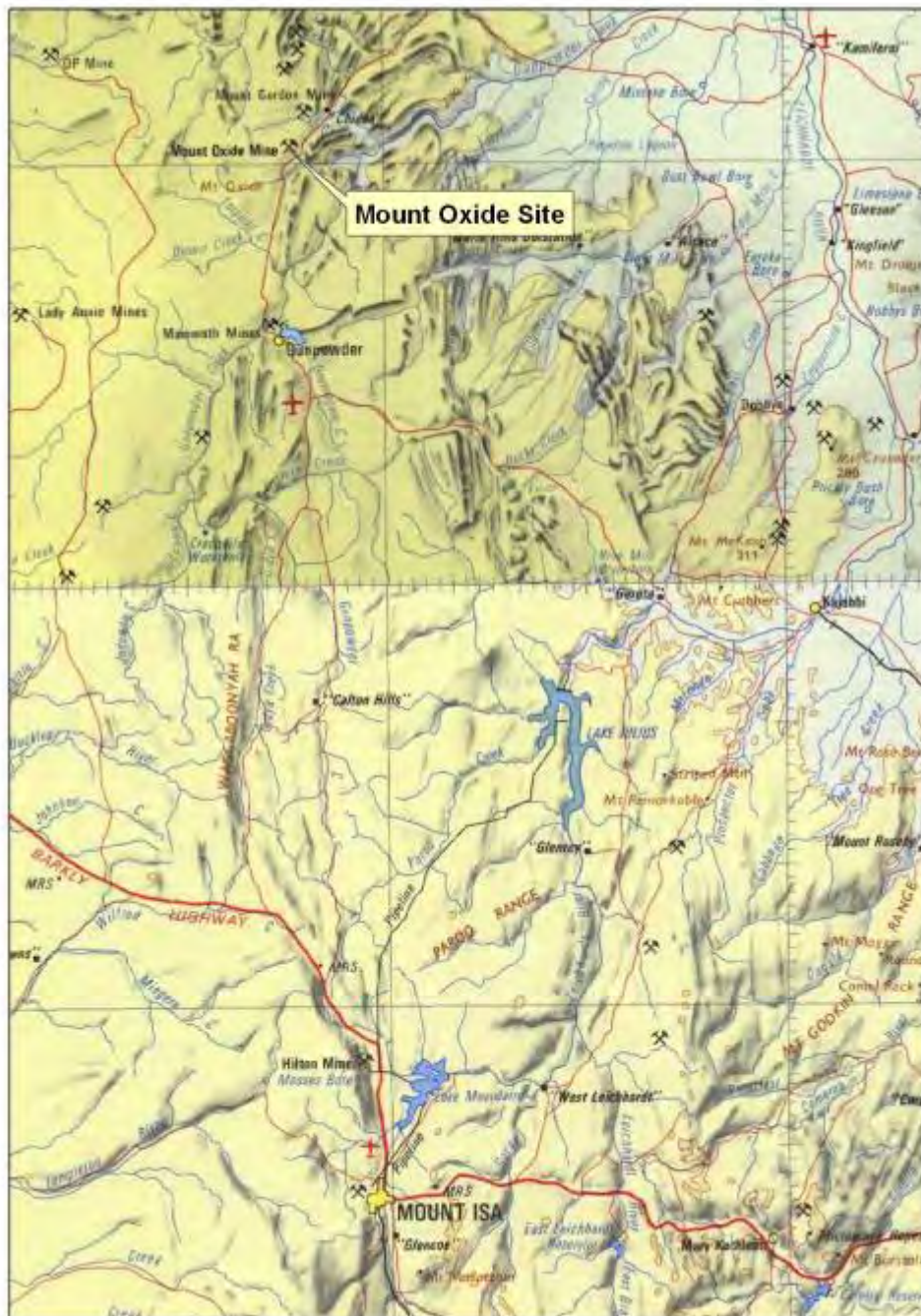


Figure 1: Location of Mount Oxide Site

Site Mining History

- Deposit discovered by Ernest Henry in 1882.
- Little production took place until the 1920's. 1927 – 1943 and 1955 – 1960 underground mining of high grade ore (80,000 t of ore @ 15.9% Cu).
- 1967 – 1971 Open Cut mining of lower grade ore by Fraebairn Pty Limited.
- 1969 – Mt Oxide leases purchased by Surveys and Mining Ltd (VAM Ltd).
- 1970 – 1971; 355,000 t of ore averaging 2.5% Cu were treated at Mammoth.
- Early 1970's; VAM Ltd collapsed. Mammoth and Mt Oxide mines acquired by a JV led by Consolidated Gold Fields Australia Limited (Renison) with the Mitsubishi group as associates.
- December 1971; open cut mining ceased at Mt Oxide.
- 1978 – 1984; leaching and precipitation activities occurred
- 1990; Renison transferred Mt Oxide tenements to Tremelling Pty Limited which subsequently changed its name to Gunpowder Copper Limited. GCL was a wholly owned subsidiary of Adelaide Brighton Limited (formerly Adelaide Brighton Cement Limited).
- Mid 1996; Aberfoyle Resources Ltd acquired Gunpowder Copper Limited's interests, excluding the Mt Oxide leases retained by the Adelaide Brighton group.
- Aberfoyle Resources Limited changed its name on 8/10/98 to Western Metals Resources Limited which changed its name to Western Metals Copper Limited on 18/7/2000.
- Surrender application for MLs 5406, 5408, 5409, 5411, 5422, 5423, 5425, 5458, 5547 and 5558 was lodged on 26 Sept 1996.
- Surrender of MLs 5406, 5422, 5423, 5425, 5458 and 5558 was accepted 30/8/99. MLs 5408, 5409, 5411 and 5547 expired before the surrenders were accepted.
- Sept 1999; Security of \$49,000 called in to provide for site rehabilitation.
- The operators of the site who caused the historic mining disturbances no longer exist as corporate entities.
- There is no remaining financial assurance or other funding source to address the issues remaining at the site.

Exploration History

In 1949, Broken Hill South Ltd took out the first Exploration Permit to cover the oxidised copper deposits at Mount Oxide. Early exploration was slow and difficult because of poor access, rugged topography and extreme surface weathering. Enterprise Exploration Company mapped an area from Mount Oxide to Mammoth and later covered out reconnaissance over a larger area. The Mount Oxide area has subsequently been investigated by several companies. In 1980 Anaconda Australia Incorporated undertook detailed rock chip sampling of carbonaceous shales of the Gunpowder Creek Formation in the Mount Oxide Syncline, with negative results. In the 1980s Aberfoyle Resources Ltd took out several permits in the Mount Oxide/Mammoth area and exploration led to the delineation of additional copper resources at Mammoth and Esperanza.

Perilya Mines NL was granted EPs 6085 and 6086 in October 1989 which cover copper occurrences at Mount Oxide, Chidna and Big Oxide. Perilya is currently undertaking a resource definition drilling to better understand the mineralisation at Mount Oxide. Current published resource at Mount Oxide is 17.9Mt at 1.3% Cu with cobalt credits.

Perilya have stated that they expect to be in a position to determine their future direction for Mount Oxide by end 2010. They are currently undertaking a significant drilling program on the site to better define resources for future mining feasibility studies.

Mount Oxide Abandoned Mine Site Attributes

Mount Oxide Mine is classed as an abandoned mine site as there is no current mining lease or Environmental Authority in place. Mines and Energy is considered to have responsibility for the site as it manages the State's Abandoned Mine Land Program.

The Mount Oxide site (see Figure 2) comprises a number of man made mining related features that are summarised below.

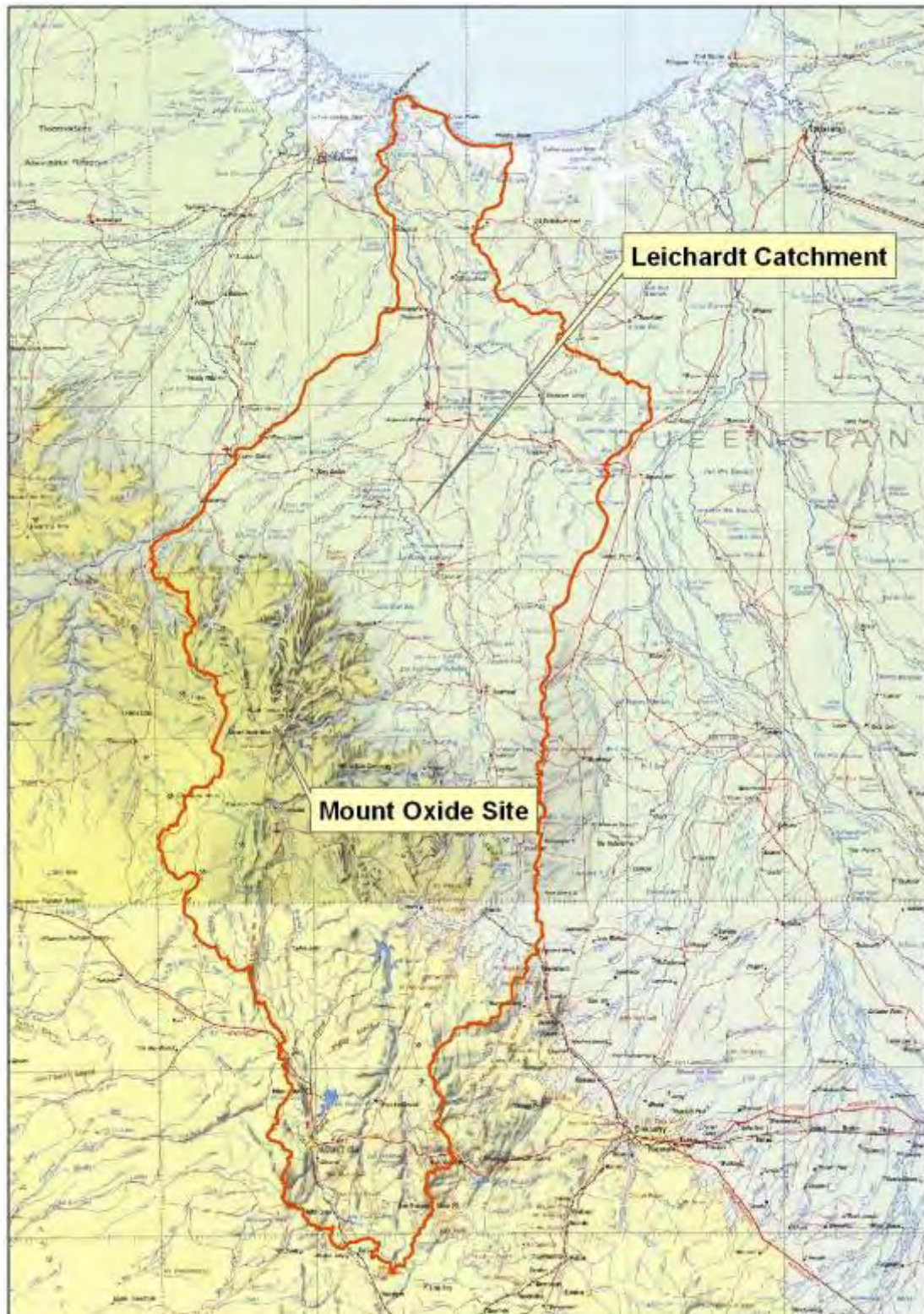
- Disturbed areas relating to legacy disturbance have been estimated to be captured within a 48ha area..
- The mine pit area has unstable eroding benches to the west - includes carbonaceous slates.
- To the east/south east is a large multi lobed overburden dump. The dump appears to be largely inert with the exception of a mineralised area in the north east.
- To the west/north west of the pit are mullock heaps. Some of these are badly eroding and include erosion towards a sedimentation trap located high above the void, as well as erosion down the drainage slope.
- A smaller overburden dump, of apparently inert material, dams a valley to the south west of the void. Severe erosion is occurring, with movement of materials downstream.
- The old heap leach area is located to the south of the void. Bunding has been breached and erosion of the leach pad into the creek system is occurring. Some of the piping and collection system remain in situ.
- A number of ore dumps occur further south of this area along the access route.
- Scrap iron dumps (for copper precipitation) occur at a number of sites – including, south and north of the leach pad, north east of the void, and south west of the void.
- Cementation (copper precipitation) tanks and associated infrastructure occur to the north east of the void, to the south east and to the west.
- Asbestos water piping and pump footings occur to the north east of the void where they lead from a small dam near the caves to a water tank on the treed ridge above the void; similar piping and footings occur in the valley to the west of the south west dump.
- Miscellaneous drums, piping, old machinery, general waste and evidence of human habitation are found on parts of the disturbed areas.
- A number of small water holding structures and sedimentation traps are found on the site.



Figure 2: Site Photo

Site Drainage

Tributaries of Caves Creek drain the site. These lead to Gunpowder Creek as part of the Leichardt River catchment.



The area of disturbance can be divided into a number of sub-catchments that report to different tributaries of Caves Creek. (see Attachment 1 for further details) The sub-catchments, their respective areas and off site release points are to be detailed in the near future. Acquisition of detailed aerial photography and construction of digital terrain model for site is currently being undertaken.

Site Issues:

Issues associated with the Mount Oxide legacy site are:

- Acid mine drainage;
- Sediment dispersion;
- Downstream contamination;
- Mineralised pit water;
- Erodible landforms;
- Quantities of mineralised waste;
- Scrap iron;
- Access to sealing materials and growth media;
- Cultural issues have been identified;
- Wet weather access

Copper in solution and copper precipitates are, at times, detected initially in the Caves Creek tributary some hundreds of metres downstream of the heap leach pad area. Downstream, copper is quickly precipitated (basic copper carbonate and basic copper sulphate), and also forms frothy efflorescences in flowing waters. Within several kilometres water quality has returned to livestock quality parameters – but this may be influenced by the flow regimes operating in the various tributaries at the time of sampling.

The northern arm of Caves Creek below the eastern waste rock dump receives mineralised discharges from one lobe of this dump adjacent to the inadequately small sedimentation pond. This creek stretch has sometimes been described as having a greenish flow and reflects higher iron levels, as evidenced by iron staining of the creek bed, and test results. Mineralisation/salting is entering the creek via sedimentation pond overflow as well as probably seeping through the natural landform immediately to the north of the pond, as indicated by salting. This arm of the creek joins with the flow below the leach pad at the Chidna road crossing immediately upstream of the wheelwright's platform.

Erosion of materials placed in and adjacent to upstream tributaries of Caves Creek is also a potential issue. This applies to the southwest dump and the heap leach pad and associated bunding. The upstream tributaries enter steep gorge country and drain considerable areas. The movement of materials down these creek systems indicates that flows are large and have the power to erode rock dumps, and indicates that the present positioning of these structures is not satisfactory. Valley erosion issues apply to the western waste rock dumps, while rilling and erosion of the eastern rock dumps need to be assessed in relation to final landform stability and design.

Water Quality

Water quality has been assessed sporadically until post 2009 when systematic monitoring was undertaken. The majority of earlier sampling has not been systematic and is considered snapshot data of water quality at the time of sampling and is more qualitative than quantitative in its functionality.

The sampling can be divided into different time frames by the entities collecting the data.

Surface Water

- Pre 1999 – mining leases current sampling by Company and Government officers.

(See Attachment 2 for example data)

- 1999-2003 – post ML cancelation – sample collection by Government officers

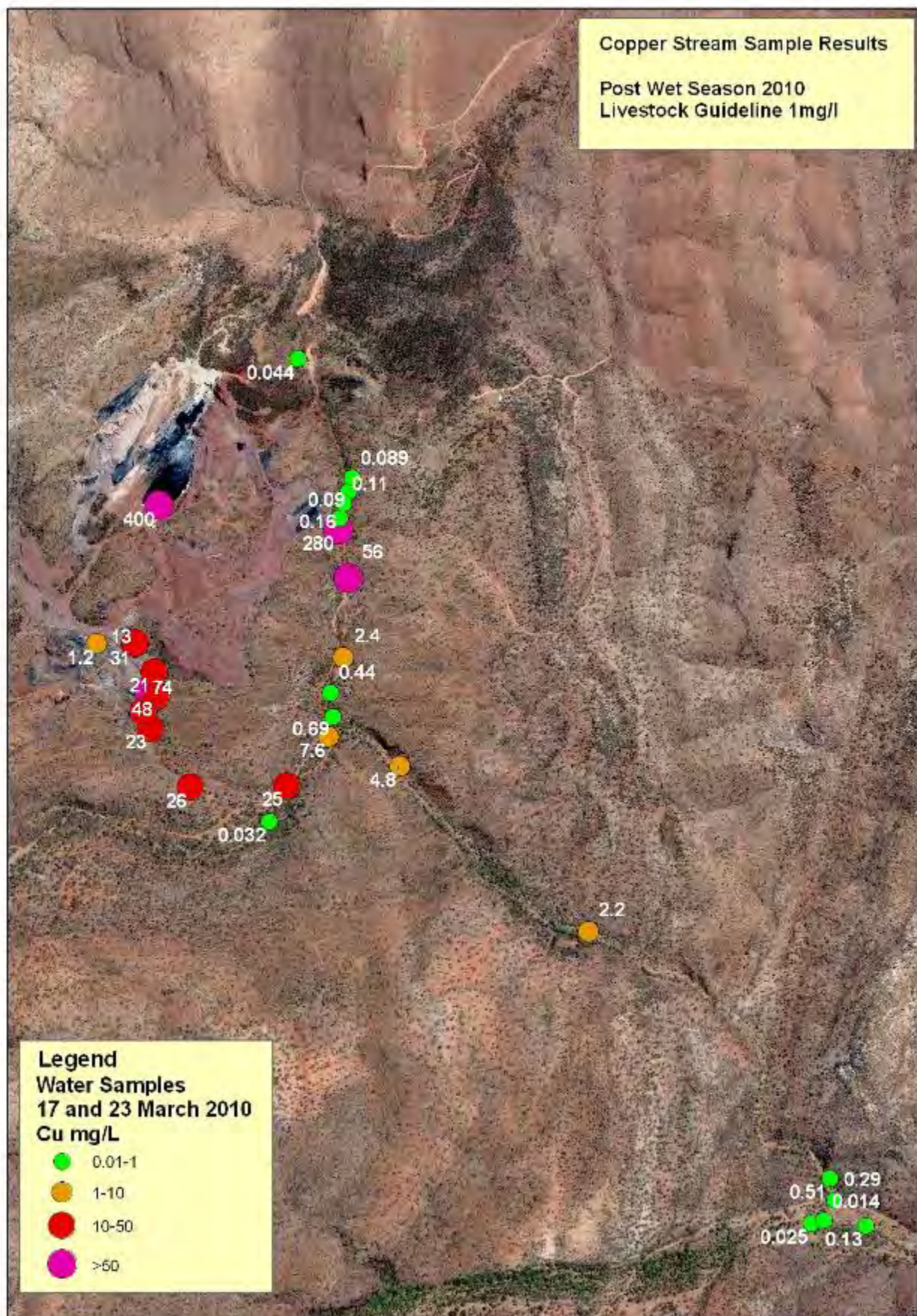
(See Attachment 3 and 4 for example data)

- 2003-2009 – minimal sample collection
- 2009-present – DEEDI and DERM sample collections

(See Attachment 2 for Sample Data summary)

Water quality samples have been collected as a snapshot type sample from a range of sample locations and water flow regimes.

Representative water sample results for Copper is shown below for samples collected on 17 and 23 March 2010.



Sample locations are shown below and analytical data for samples collected on these dates is presented in Appendix 1





2009 Site works

A summary of the site works completed can be divided into:

MOP1 - Stream Cleanup

Contractors were engaged to remove copper contamination from caves creek using machinery. The works undertaken in this phase of work have effectively removed approximately 75% of the total copper-rich precipitate in Caves Creek using both a low impact washing process and direct picking up of dried precipitate from the surface. All material removed from the creek has been placed adjacent to the open pit in an area isolated from the creek systems.

Final clean-up of the creek lines was undertaken in November 2009 when a vacuum truck was used to remove the remaining material from Caves Creek

MOP 2 - Earthworks

The Phase 2 remediation included:

- Earth works to reshape mineralised heap leach pads to minimise the risk of future rain events causing discharge into the creek.
- Removal of contaminated material from creek adjacent to mineralised rock dumps.;
- Re-establishment of a clean creek flow path to ensure rapid movement of water through the site;
- Installation of sump systems to collect contaminated seepage at the source for return to the mine pit if necessary;

These works were undertaken by a contractor with the Scope of works shown as Attachment 3 and the on ground results of the earthworks shown in Figures 4 and 5.



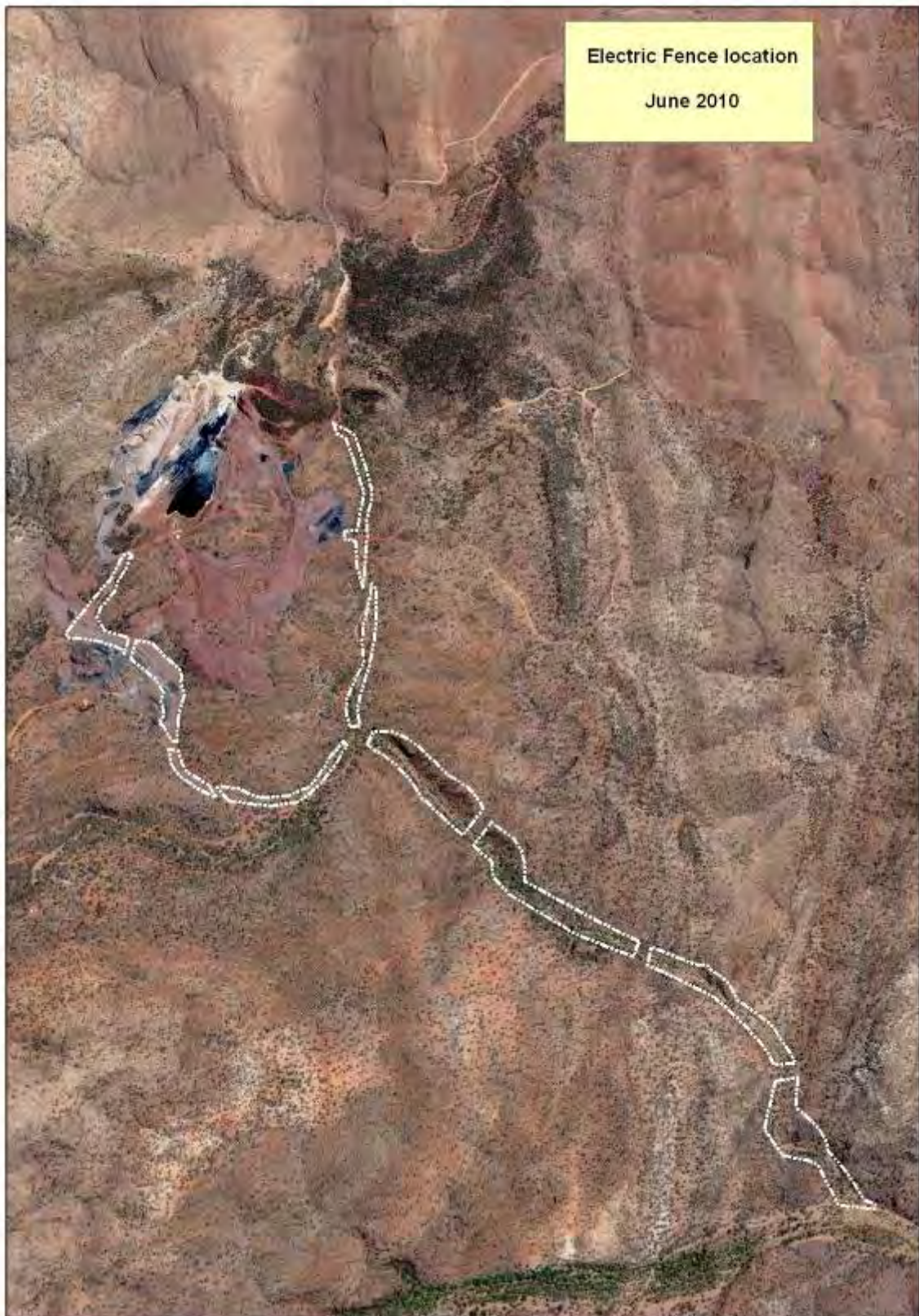
Figure 4 – MOP2 earthworks results



Figure 5 MOP2 Detail

2010 Site works

After the 2009/10 wet season, the reoccurrence of the contamination downstream determined that the electric fence was required to be re-established. The location of the current fence is shown below.



The identified works required for the site after the 2010 wet season is detailed below.
This work was accounted for in the initial budget

The aims of the works under the Phase 3 Site Works (MOP3) program are to maintain and upgrade works completed under the MOP2 Rehabilitation Works conducted in late 2009.

Based on the site risks, the works required include:

- Removal of contaminated material from catch dams and silt traps constructed under the MOP2 works
- Increase functionality of water flow lines within the MOP2 works areas.
- Increase volumes of catch dams previously constructed.
- Undertake repairs and modifications of previous works completed.

A and scope of works and estimated cost breakdown for these works is given in Attachment 4.

MINE DISCHARGE RESPONSE PLAN

Regional Service Delivery

North Region



**Department of Environment
And Resource Management**

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MINE DISCHARGE RESPONSE PLAN

Regional Services - North Region - DERM

SITUATION

The Department of Environment and Resource Management administers the *Environmental Protection Act 1994* and has a responsibility to address environmental issues associated with that legislation.

The North Region encompasses a broad range of industrial operations that include heavy industry and large mining operations each of which can be located in or near populated areas or in the more remote areas of the state. The conduct of the mining operations may result in environmental issues that require urgent actions by departmental staff.

Seasonal factors such as excessive rainfall often place a higher risk on the potentiality of mine releases / discharges.

Mine discharge situations may occur at any time and therefore a plan is required to ensure a 24 hour response capability by this division.

To determine whether the response to a contamination event triggers this plan, the criteria for a Mine Contamination Event (MCE) are outlined in **Action 4** in execution.

The criteria under the MCE will determine whether this Mine Discharge Response Plan is activated. If activated the response to the MCE will be in accordance with Mine Discharge Response Plan.

Area of operation:

The area of the North Region includes the Mount Isa, Cairns, and Townsville Districts which incorporates Cape York, North Queensland Coastline, Gulf Areas and North West Queensland – **Appendix A**.

Staffing:

Regional Services Division has staff based at Townsville, Cairns and Mt Isa. A full contact list including each person's role / expertise is attached as **Appendix B**

Own Resources:

The primary response staff are:

- Regional Manager, Regional Services, North Region
- Manager (Mining)
- 3 Team Leaders (Mining) across Townsville, Cairns, and Mount Isa
- An On Call Environmental Officer/ Project Officer is available to provide initial response to calls 24 hours a day. On call roster is attached as **Appendix C**.
- A list of emergency contacts for internal departmental teams as well as key external stakeholders is also detailed in **Appendix C**.
- The Mining and Heavy Industry team have staff in Townsville, Cairns and Mount Isa available to respond to incidents

MISSION

To ensure a professional, consistent and timely initial response by the Department of Environment and Resource Management to major contamination events resulting from mines in North Queensland.

EXECUTION

The response to any situation of reported mine contamination event / discharge shall be executed as outlined hereunder.

This document sets out the roles and responsibilities when responding to a contamination event. These roles may be altered based on operational requirements. Additionally, several roles may be undertaken by a single officer.

Action 1: Initial information/ First notification (Duty of Receiving Officer)

- Obtain particulars of informant:-
 - Name
 - Contact details (phone, address)
 - Determine role of informant (employee/ manager/ witness etc)
- Obtain all available information about environmental issue from informant:-
 - Refer to prompt sheet – **Appendix D.**
 - What other agencies / stakeholders have been alerted
- Obtain from the informant details of other:-
 - Witnesses
 - Persons involved
 - Assistance available (human and physical resources)
 - On site expertise that is present
 - Action that has taken place since the incident to rectify/ address the matter

Action 2: Information / Communications search (Duty of Receiving Officer)

Confirm initial information along with the following where practicable:-

- Other Government agencies involved
- Company / persons directly involved (operators)
- Witnesses (to confirm their observations, involvement and details)

Note: If situation has the potential for immediate serious harm, and on scene resources and urgent actions can avoid or reduce the harm, take immediate reasonable steps to implement those actions. – Advise manager as soon as practicable of actions.

Action 3: Notify Management of Mine Discharge (Duty of Receiving Officer)

- Brief the Team Leader (Mining), Manager (Mining) and Regional Manager on situation (Management Team)

Action 4: Assess information against criteria for Mine Contamination Event (MCE) (Duty of Management Team)

Determine whether the incident meets the criteria for an MCE considering the information from:-

- The information received from the initial informant
- The additional information from other agencies and witnesses
- The records, files and local knowledge within the Department

Note: While an event may not initially meet the criteria to activate this plan, as further information becomes available, it may be appropriate to revisit the MCE. The plan may be activated at any time.

Mine Contamination Event Criteria (MCE Criteria)

For a contamination event to trigger a response under this plan, the event must meet the following criteria:

1. Originate from an active or abandoned mining activity; and
2. Have an actual or potential impact footprint outside of the mine's boundaries; and
3. There is actual or potential risk to human health, property, livestock, an environmental value, or a community value; and
4. Response to the event under the Department's Standard Operating Procedures is not sufficient to manage the event.

When considering the applicability of MCE criteria 4, the following may trigger the criteria:

- a) The scale of the impact is excessive; or
- b) The concentration of the contamination is high; or
- c) The event involves hazardous substances or dangerous goods; or
- d) Contamination events have occurred across several mines requiring a coordinated approach; or
- e) The receiving environment is highly sensitive.

Action 5: Activation of Mine Discharge Response Plan
(Duty of Regional Manager)

- Regional Manager may immediately or at any time in the response to the incident, activate the Mine Discharge Response Plan if the MCE criteria is met

Mine CRP Activation Procedures

1. Regional Manager to be briefed on situation.
2. Regional Manager to determine incident should be dealt with under Mine Discharge Response Plan
3. Regional Manager to Activate Response Plan
4. Regional Manager to advise Regional Service Director in writing (e.g. email) of Mine Discharge Response Plan Activation
5. Regional Manager to meet with Management Team (Mining Team Leaders and Mining Manager) to form Incident Management Team (IMT).

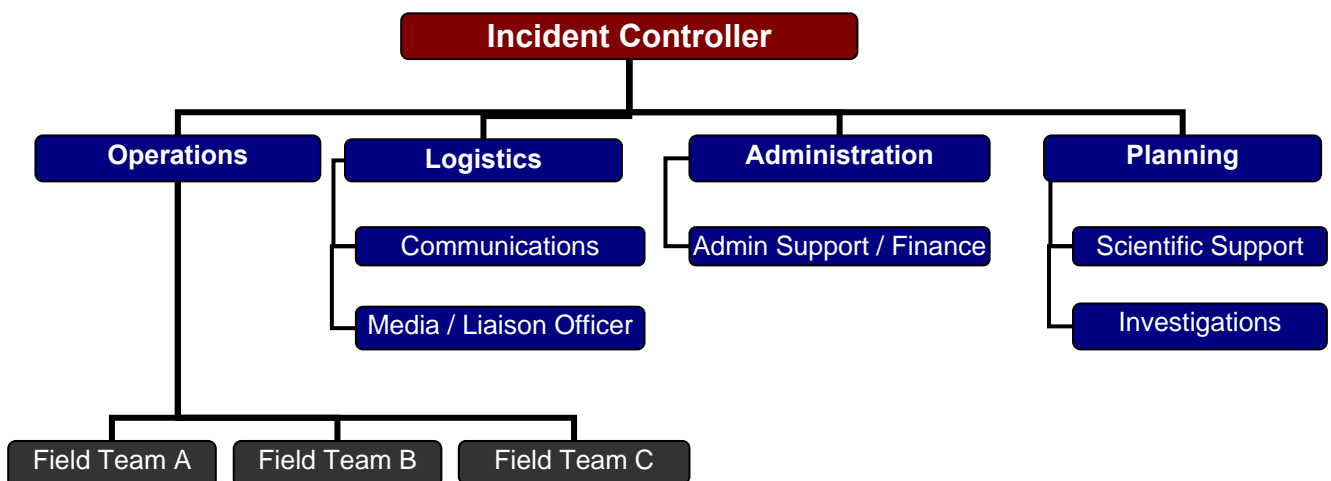
Action 6: Form Incident Management Team (Duty of Regional Manager)

1. Upon activation of the Mine Discharge Response Plan, the Regional Manager will then appoint an incident controller (which can be any staff member including the Regional Manager).
2. The Incident Controller will then form an Incident Management Team (IMT) in consultation with the Regional Manager.

Note: the IMT may consist of as many or as few staff as required by the Incident Controller, largely dependant on the scale and nature of the MCE. Additionally, one officer may conduct more than one functional role.

The IMT (shown in blue) may consist of any officers, but it is recommended that Team Leaders and/or Managers are involved in the IMT.

Incident Management Team Structural Command



Action 7: Develop Action Plan (Duty of Incident Management Team)

- IMT to develop Action Plan
- Action Plan may include Sampling Plan
- IMT to appoint Field Team(s) as required
- Action Plan to be carried out / reviewed / amended in accordance with structural command.
- Refer to Action Plan Template – **Appendix H**

Action 8: Implementation of the plan (Duty of all Personnel)

The Field Team(s) shall be responsible for the implementation of the plan on site and report to Operations Commander.

This responsibility will include:-

PRIOR TO TRAVEL:-

- Liaising with IMT on required actions and briefing rest of field response team
- Organising response kit / field equipment (Refer to check list **Appendix E**)
- Organizing flights / transport to and from the site for staff and equipment. (In conjunction with Administration and Logistics teams in IMT)
- Organizing accommodation where required (In conjunction with Administration and Logistics teams in IMT)

ON SITE:-

- Evaluate the situation – determine the extent of the issue
- Brief on ground staff – allocate specific duties
- Ensure Staff Safety (WPH&S)
- Provide regular Sit Reps to Manager - as previously arranged – **Appendix I**
- Exercising of provisions under the *Environmental Protection Act 1994* – refer to **Appendix F** – Field guide.
- Record Keeping – notes/records/ photographs/ logs. (running sheet – **Appendix G**)
- Sampling - **Appendix J** - Sampling point guides

Action 9: Review of Action Plan and Situation Report

(Duty of Incident Management Team)

- IMT to review Situation Reports provided by Field Team(s) to determine if Action Plan is achieving prescribed outcomes.
- IMT to amend Action Plan if planned outcomes are not achieved
- If outcomes not achieved – IMT to refer back to Action 7.
- If outcomes are achieved, IMT to continue to Action 10.

Action 10: Deactivation (Duty of Incident Management Team)

- Regional Manager may deactivate the plan if:
 - (a) The incident no longer meets the 4 MCE criteria; or
 - (b) The initial response phase to the incident is completed.

Mine Discharge Response Plan Deactivation Procedures

1. Regional Manager to be briefed on implementation of action plan and success of response
2. Regional Manager to assess whether the goals of the action plan were achieved and whether the Department's immediate response has concluded.
3. Regional Manager to Deactivate Response Plan
4. Regional Manager to advise Regional Service Director in writing (e.g. email) of Mine Discharge Response Plan Deactivation
6. Team Leader (Mining) advised on Deactivation and to coordinate remaining response and investigations as per standard Departmental procedures.

Action 11: Demobilisation and Debrief

- Field Team(s) to liaise with Operations of demobilisation from the field
- Operations to liaise with logistics and administration on:
 - re-stocking used equipment;
 - sending samples to lab;
 - cleaning and calibration of equipment.
- Incident Controller to hold a debrief within 5 working days of the Mine Discharge Response Plan being deactivated. The debrief should address:
 - Success of initial response;
 - Identification of further actions / response required (e.g. Med-Long term response plans / remediation plans);
 - Identification of responsible officer(s) / team(s) for management of the response / incident following the deactivation of the Mine Discharge Response Plan.
 - Nomination of officer(s) / team(s) responsible for ensuring that the actions under the Mine Discharge Response Plan are appropriately documented.

ADMINISTRATION AND LOGISTICS

Administration -

Staffing:

The selection of staffing to respond to a matter shall be the responsibility of the Incident Controller and IMT. The approval to recall staff back to duty will lie with the Regional Manager.

Expenditure approvals:

All expenditure must be approved by the Regional Manager prior to purchase unless circumstances exist that would make the approval unreasonable at the time.

Travel:

All travel must be approved by the Manager or Regional Manager prior to commencement unless circumstances exist that would make the approval unreasonable at the time. In that case the Team leader may provide initial approval.

Equipment and vehicle use:

All users must hold the relevant qualifications, training and approvals to operate the equipment and vehicles used by them.

Flights/ Air Travel:

All flights must be approved by the Manager or Regional Manager prior to commencement. Refer to Logistics Section for arrangement details.

Work Hours:

Work hours shall be conducted in line with the award and response needs. Weekend work and work after 6pm and before 6am will be with the approval of the Regional Manager.

On Call staff:

An on-call officer shall be available to respond to phone calls 24 hours a day as per existing on-call regional arrangements.

Logistics

Vehicles:

Remote Area 4WD vehicles are available in Cairns, Townsville and Mount Isa. Cairns and Townsville have available an on call vehicle with remote field equipment for response. Mount Isa has 2 vehicles equipped with remote area field equipment and mining safety equipment. Sargents (1800 077 353) hire vehicles with mine site equipment in case Departmental vehicles are unavailable.

Air Travel:

- Domestic Travel is to be arranged through the Travel Management System during Business Hours on 1300 729 912 and After Hours on 1300 474 287
- Other flights (Helicopter) to be arranged by the Travel Management System

Remote operations:

Remote travel requires the possession and use of equipment designed to support this type of operation – Car Kits and Field Kits are to be utilised.

Field Equipment:

Field equipment and safety equipment is available for use, located at Cairns, Townsville and Mt Isa offices. Each office must prepare and maintain field equipment ready for use during the wet season.

Sampling Equipment:

Sampling equipment is located at Cairns, Townville and Mt Isa Offices.

* It is the responsibility of the Team Leader (Mining) to ensure that their office have equipped vehicles, safety kits, and mine discharge response kits available and up to date prior to the wet season.

COMMAND AND COMMUNICATIONS

Command

INCIDENT CONTROLLER

- Overall Incident Command and lead the IMT
- Approve action plans
- Primary Decision Maker

OPERATIONS

- Responsible for carrying out approved action plans
- Brief Incident Controller
- Coordinate actions of Field Team(s)

Field Teams

- Responsible for carrying out action plan on ground
- Brief Operations
- Sampling and evidence collection as detailed in action plan
- Provide situation reports on regular basis

LOGISTICS

- Responsible for providing logistical support to carry out action plan
- Brief Incident Controller
- Coordinate transport, food, equipment and accommodation for Field Team(s)
- Responsible for communication systems between Field Team(s), Incident Management Team and other stakeholders
- Notification of incident to appropriate stakeholders and government departments
- Coordinate Media responses

Communications

- Establish lines of communication between field teams, mining operators, IMT, stakeholders and within the Department
- Record and track communications and develop / track briefings

Media / Liaison

- Engage with stakeholders external to the IMT and provide briefings to stakeholders
- Operate as a single point of contact for all incoming enquires from external stakeholders
- Liaise with Media Unit on development of media releases and response to media enquires
- Brief Regional Services Director

ADMINISTRATION

- Brief Incident Controller
- Track expenditures
- Provide support to operations, logistics and planning
- Track staff movements and administer call-in safety procedures

Admin Support / Finance

- Support administration and IMT through provision of documents, record keeping etc.
- Track expenditures and liaise with finance department as appropriate.

PLANNING

- Responsible for development of action plan
- Brief Incident Controller
- Coordinate support from sciences, investigations, litigation as required
- Arrange mobilisation / demobilisation of Field Team(s)

Scientific Support

- Provide scientific advice on the nature of the incident, sampling plan development or remediation

Investigations

- Provide advice on powers of officers, or how to ensure evidence collection is appropriate in the event of offences being investigated under the *Environmental Protection Act 1994*.

Communications

Primary communications:-

Telephone: - Use of telephone for the receipt and relay of information will be the primary means of communication between the parties where face to face capability does not exist. A full list of phone numbers is provided on **Appendix B**.

Secondary Communications:-

Email and Fax: - Shall be used as Secondary means of communications only and a response from the receiver should be requested to ensure receipt of information. A list of email addresses and Fax numbers are listed in **Appendix B**.

Satellite Telephones:-

Sat Phones may be the only source of communications in remote areas. The Field Response Coordinator will ensure the serviceable operation of the phone prior to departure. Ensure the contact number is advised on the Response Plan. Sat Phone Numbers also listed on **Appendix B**.

Reporting Requirements - Field Operations

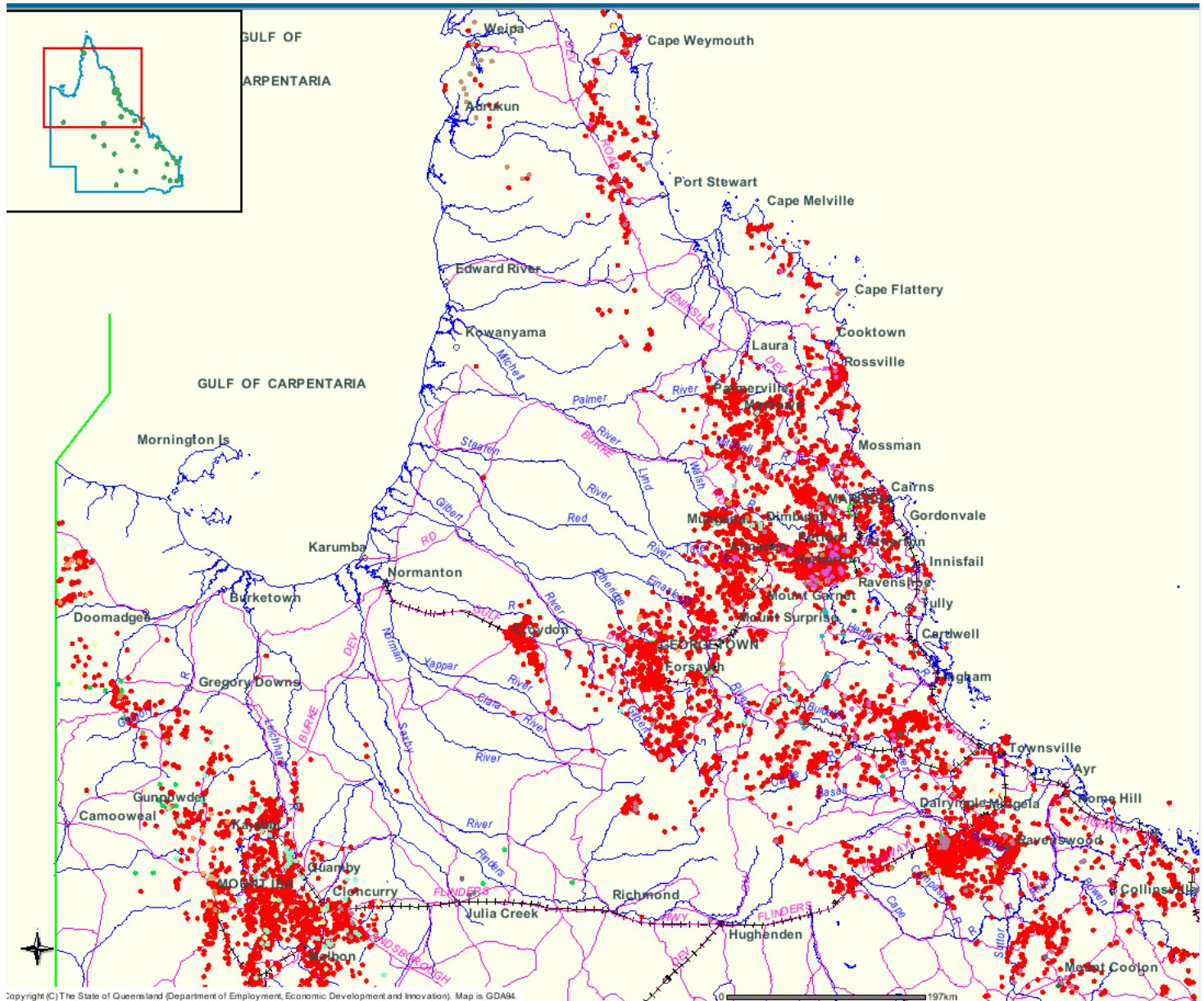
Reporting times, Sit Reps and protocols will be adhered to whilst conducting the field response. The reporting times will be as per policy and incorporated as part of the Response Plan. The Field Team(s) will ensure reporting times and procedures are adhered to.

APPENDIX A - MAPS

REGIONAL MAP



MAP OF MINES IN NORTH QUEENSLAND



APPENDIX B – EMERGENCY CONTACT LIST

The following information has been edited to remove confidential and personal contact information. In the event of a Mine Discharge, Contact the Department of Environment and Resource Management's 24 hour pollution hotline on **1300 130 372**.

Key Discharge Stakeholder Contacts

The following information has been edited to remove confidential and personal contact information. In the event of a Mine Discharge, Contact the Department of Environment and Resource Management's 24 hour pollution hotline on **1300 130 372**.

Additional Internal and External Contacts

Table 1.1: DERM – Pollution Hotline

CONTACT	POSITION	NUMBER
Pollution Hotline	(24 hours)	1300 130 372

Table 1.2: DERM - Regional Service Delivery (Environmental Services)

CONTACT	POSITION	OFFICE	MOBILE
NORTH REGION			
CENTRAL WEST REGION			
SOUTH WEST REGION			
SOUTH EAST REGION - NORTH			
SOUTH EAST REGION - SOUTH			

Table 1.3: DERM – Incident Response Unit

CONTACT	POSITION	OFFICE	MOBILE	SATELLITE PHONE
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Table 1.4: DERM – State Incident Response Network (SIRN)

CONTACT	POSITION	OFFICE	MOBILE	HOME
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Table 1.5: DERM – Specialist Areas (Environment)

CONTACT	POSITION	OFFICE	MOBILE
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Table 1.7: DERM – Environment and Natural Resource Regulation

CONTACT	POSITION	OFFICE	MOBILE
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Table 1.8: DERM – Regional Service Directors

CONTACT	POSITION	OFFICE	MOBILE
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Table 1.9: DERM – Technical Operations

CONTACT	POSITION	OFFICE	MOBILE
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Table 1.10: DERM – Environment and Resource Sciences

CONTACT	POSITION	OFFICE	MOBILE
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Table 1.11: DERM – General Contacts (Environment)

CONTACT	POSITION	OFFICE	MOBILE
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Table 1.12: DERM – QPWS Division

CONTACT	POSITION	OFFICE	MOBILE
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Table 2.1: State Government Contacts - General

AGENCY	SECTION/ISSUE (state Govt – General)	B/H	A/H
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Table 2.2: Authorities

AGENCY	SECTION/ISSUE (Qld Authorities)	B/H	A/H
PORT AUTHORITIES			
Brisbane			3258 4601
Bundaberg			4159 4233
Gladstone			4976 1333
Mackay			4955 5107
Townsville			4781 1684
Cairns			4051 2558
PORTS CORP QLD			
WATER AUTHORITIES			
SEQ Water	(QLD Bulk Water Assn)	3229 3399	-
NQ Water		4759 4759	-

Table 3: Federal Government Contacts

AGENCY	SECTION/ISSUE (Federal Govt)	B/H	A/H
AMSA			
Australian Maritime Safety Authority	Major oil spills and shipping emergencies		1800 641 792
GREAT BARRIER REEF MARINE PARK AUTHORITY			
AQIS			
AQIS	Australian Quarantine and Inspection Service		1800 020 504
FEDERAL POLICE			
AIRCRAFT			
Air Services Australia	Aircraft noise enquiries		1300 301 120
CASA	Civil Aviation Safety Authority	131 757	131 757
WEATHER			
Bureau of Meteorology	Queensland Regional Office (Brisbane 24hrs)		3239 8700
	Field Meteorology Office – Cairns	4035 9777	--
	Field Meteorology Office – Charleville	4654 1033	--
	Field Meteorology Office – Longreach	4658 1783	--
	Field Meteorology Office – Mackay	4955 1355	--
	Field Meteorology Office – Mount Isa	4743 3382	--
	Field Meteorology Office – Rockhampton	4922 3597	--
	Field Meteorology Office – Townsville (RAAF)	4779 5999	--
	Field Meteorology Office – Weipa	4069 7059	--
	DoT / MSQ Maritime weather service Qld / Marine / SEQ		1300 360 426 / 427 / 428

Table 4: Local Government Contacts

Table 5: Interstate Environmental Science Coordinators (ESCs)

STATE	ESC	B/H	A/H
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Table 6: Other Contacts

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AGENCY	SECTION/ISSUE	B/H	A/H
LABORATORIES			
ELECTRICITY			
Energex		131 253	131 253
CAR BREAKDOWN			
RACQ		131 111	131 111
TELECOMMUNICATIONS			
Optus	Directory Assistance Service	124 937	124 937
REGULATED WASTE TRANSPORTERS			
REGULATED WASTE DISPOSAL			
PETROLEUM COMPANIES			
HIRE COMPANIES			
QLD GOVERNMENT - CHARTERING AIRCRAFT POLICY			
HELICOPTERS			
CHARTER PLANES			

APPENDIX C – ON CALL ROSTER

Wet Season On-Call Officers and Availability (Dec 2010 - Apr 2011)

Week Beginning	On-Call Officer (CNS)	On-Call Officer (TVS)	Officers Unavailable / On Leave		
			Cairns	Townsville	Mount Isa
3/12/2010					
10/12/2010					
17/12/2010					
24/12/2010					
7/01/2011					
14/01/2011					
21/01/2011					
28/01/2011					
4/02/2011					
11/02/2011					
18/02/2011					
25/02/2011					
4/03/2011					
11/03/2011					
18/03/2011					
25/03/2011					
1/04/2011					
8/04/2011					

APPENDIX D – RESPONSE NOTIFICATION PROMPT SHEET

Date, Time and Location of discharge	
Name, position, and contact number of the person notifying of the incident	
What is the cause of the discharge (if known)?	
Is the discharge ongoing?	
Can we access the discharge site, mine site and receiving environment?	
What is the company involved? Who is the appropriate contact person and his/her details?	
What actions have the mine taken to date?	
Are there any Safety Hazards?	
What is the quantity of material discharged?	
What type of material was discharged (e.g. oil, sewage, concentrate, stormwater)?	
What Creeks / Rivers / Watercourses have been affected or have potential to be affected?	
Is there any drinking, recreational or livestock water points downstream?	
What are the environmental values of the receiving environment? Are there any sensitive downstream values?	
Who are the potentially impacted landholders or stakeholders?	
Has these landholders / stakeholders been notified? What are their contact details?	
What immediate actions are proposed by the mine?	

APPENDIX E – INITIAL RESPONSE KIT

Minimum Personal Protective Equipment

- Hard Hat
- High Visibility Vest
- Steel Cap Boots
- Qld Government Long Sleeve Shirt and Trousers

Minimum Safety Equipment

- UHF Radios
- Satellite Phone
- Emergency Beacon
- 4WD vehicle
- GPS
- Fresh Water
- Batteries
- Orange Flashing Light
- Torch
- Camera
- Pens
- Official Notebook
- Paper / Maps

Basic Sampling Equipment Kit

- Sampling Pole
- TPS / YSI (in-situ field measurements)
- pH strips
- Minimum 1L of Distilled Water
- 10 x sediment jars
- 10 x metal analysis bottles (water quality)
- 10 x standard physical unpreserved bottles (water quality)
- 2 x oil / grease / hydrocarbon bottles
- 2 x Ammonia / Nitrogen / phosphorous bottles (sewage)
- 1 x box gloves
- 20 x syringes
- 1 x box of 0.45 µm syringe filters

APPENDIX F - COMPLIANCE ACTIVITY FIELD GUIDE

Preface: This field guide is formulated to provide basic information to field officers in relation to assessing activities for compliance and to provide information on procedures to follow when making inquiries or investigation into suspected non-compliance.

This guide relates to the provisions of the *Environmental Protection Act 1994*. Field Officers must be familiar of the provisions of the *Environmental Protection Act 1994* (the 'Act') so that they can carry out their duties effectively and lawfully.

Whilst the enforceable provisions of the Act for the mining activities are primarily focused on Chapter 5 of the *Environmental Protection Act 1994* the field staff will be designated as Authorised Persons under the Act and therefore knowledge of their obligations and the provisions of the Act is crucial.

Topics covered by this guide:

- Part 1. Authorised Persons - Section 445 *Environmental Protection Act 1994***
- Part 2. Powers of Authorised Persons - Chapter 9**
- Part 3. Offences that relate to the powers of Authorised Persons**
- Part 4. Records and Record Keeping requirements**
- Part 5. Exhibit Handling- Sect's 461-462**
- Part 6. Interviewing/ Witness Statements**
- Part 7. Field Equipment – Types and Use**
- Part 8. Flow Charts - Compliance Management Guide/ Compliance Actions**

PART 1 AUTHORISED PERSONS

All field staff will be required to be appointed as an Authorised Person under the provisions of Section 445 of the *Environmental Protection Act 1994*. To exercise any of the powers under the legislation the person must be an Authorised Person in possession of an Identity Card.

PART 2. POWERS OF AUTHORISED PERSONS

Chapter 9 of the *Environmental Protection Act 1994*, Investigation and Enforcement.

This chapter outlines the general powers of authorised persons and all field staff should be familiar with the contents of that chapter of the legislation.

Section 449 *Production of identity card.*

(1) An authorised person may exercise a power in relation to someone else only if the authorised person—

- (a) first produces his or her identity card for the person's inspection; or*
- (b) has his or her identity card displayed so that it is clearly visible to the person.*

(2) If, for any reason, it is not practicable to comply with subsection (1), the authorised person must produce the identity card for inspection by the person at the first reasonable opportunity.

Section 452 *Entry of place—general*

(1) An authorised person may enter a place if—

- (a) its occupier consents to the entry and, if the entry is for exercising a power under chapter 7, part 5B or 8, its owner consents; or*
- (b) it is a public place and the entry is made when the place is open to the public; or*
- (ca) it is a place to which an Agricultural ERA, a registration certificate, a development approval subject to a development condition or a code of environmental compliance relates and the entry is made when—*
 - (i) the chapter 4 activity to which the certificate, approval or code relates is being carried out; or*
 - (ii) the place is open for conduct of business; or*
 - (iii) the place is otherwise open for entry; or*

Note: In relation to the Environmental Services staff it is expected that entry to places will be primarily conducted as outlined in Section 452(1)(a) with the owner / occupier having knowledge of the visit and providing consent for the visit.

Where consent is given, consideration should be given to obtaining confirmation of that consent either in writing from the owner/ occupier or by corroboration of such consent. Section 485 refers to content of consent form.

Section 455 *Entry of land for access*

(1) This section applies if—

- (a) an authorised person may enter land (the **primary land**) under section 452 or 454; and*
- (b) it is necessary or desirable to cross other land (the **access land**) to enter the primary land.*

Note: This section provides for the access across other property to obtain entry into the primary land. There is provision for such access with consent of the occupier and this would be the preferred method. The section further outlines the actions required if that consent is not obtained.

Sections 456 and 457 relate to the **authority to apply for Warrants** and how applications may be made. It should be noted that any application and subsequent entry via the execution of a Warrant should only be done with the approval of the Manager of the Reef Unit and under the control of staff from the Regional Investigation Unit.

Section 458 *Order to enter land to conduct investigation or conduct work*

This section states that an authorised person may apply to a magistrate for an order to enter land to carry out work on the land to secure compliance with an accredited ERMP. Application for any order under this section should only be done with the approval of the Manager of the Reef Unit.

Section 459 Entry or boarding of vehicles

- (1) An authorised person may enter or board a vehicle if the authorised person has reasonable grounds for suspecting—*
(a) the vehicle is being, or has been, used in the commission of an offence against this Act; or
(b) the vehicle, or a thing in or on the vehicle, may provide evidence of the commission of an offence against this Act; or
(2) If the vehicle is moving or about to move, the authorised person may signal the person in control of the vehicle to stop the vehicle or not to move it.
(3) To enable the vehicle to be entered or boarded, the authorised person may—
(a) act with necessary and reasonable help and force; and
(b) require the person in control of the vehicle to give reasonable help to the authorised person.

Section 471 creates the offence for failing to comply with a signal under section 459(2) to stop or not to move a vehicle.

Note: The power outlined in Section 459(2) and (3) should be carried out with care taking into account the options available to achieve the same outcome. Consider the assistance of Police where the vehicle is not on the occupiers/ owners property or on a roadway and the need exists to stop the vehicle.

Section 460 General powers for places and vehicles

This section provides broad powers to Authorised Persons who lawfully enters a place or boards a vehicle to conduct their duties.

Authorised Persons should be familiar with the content of this section as the powers apply to all entries and boarding's and are not confined only to enforcement actions

Section 461 Power to seize evidence

This Section applies to the power to seize evidence where lawful entry has been gained with the intent of seizing evidence to a place either with warrant or by occupiers consent.

Any entry done with the intent of seizing evidence should be carried out as per this section and with the assistance of an investigator and/or supervisor where practicable.

Approval for such entry and seizure should, where practicable, be approved by the manager of the Reef Unit.

Section 462 Procedure after seizure of evidence

Outlines the requirement that an authorised person must give a receipt for a thing seized to the person from whom it was seized.

The section also outlines the procedure and associated requirements for dealing with the receipt and seized property. Subsections 5 to 7 relates to the retention of the seized material/ item and the return of it to the owner.

Any material or item seized should be dealt with as an exhibit. Refer to Compliance Investigations Manual Chapter 8 which refers to Exhibit Management.

Section 464 Power to require name and address

- (1) *An authorised person may require a person to state the person's name and address if the authorised person—*
- (a) *finds the person committing an offence against this Act; or*
 - (b) *finds the person in circumstances that lead, or has information that leads, the authorised person to suspect on reasonable grounds that the person has committed an offence against this Act.*
- (2) *When making the requirement, the authorised person must warn the person that it is an offence against this Act to fail to state the person's name and address, unless the person has a reasonable excuse.*
- (3) *The authorised person may require the person to give evidence of the correctness of the person's name or address if the authorised person suspects on reasonable grounds that the name or address given is false.*

Section 475 creates the offence for failing to comply with name and address requirement.

Section 465 Power to require answers to questions

- (1) *This section applies if an authorised person suspects, on reasonable grounds, that—*
- (a) *an offence against this Act has happened; and*
 - (b) *a person may be able to give information about the offence.*
- (2) *The authorised person may require the person to answer a question about the offence.*
- (3) *When making the requirement, the authorised person must warn the person it is an offence to fail to comply with the requirement, unless the person has a reasonable excuse.*

Section 476 creates the offence for failure to comply with requirement under Section 465.

Section 466 Power to require production of documents

- (1) *An authorised person may require a person to produce to the authorised person for inspection a document required to be held or kept under this Act or a development condition of a development approval.*
- (2) *The authorised person may keep a produced document to take an extract from, or make a copy of, the document.*
- (3) *The authorised person must return the document to the person as soon as practicable after taking the extract or making the copy.*

PART 3. OFFENCES THAT RELATE TO THE POWERS OF AUTHORISED PERSONS

Part 5 of the *Environmental Protection Act 1994* deals with multiple offences that relate to the compliance powers of Authorised Persons. Appropriate offences are outlined hereunder.

Note: The provisions mentioned in this guide are limited and referral to the Act should occur and assistance sought where suspicion of non compliance occurs.

Section 471 Failure to comply with signal

This section provides an offence for failing to obey a signal under section 459(2) to stop or not to move a vehicle, unless the person has a reasonable excuse for not obeying the signal. Defences apply (E.g. safety, first opportunity)

Section 475 Failure to give name and address etc.

This section relates to where a person is required by an authorised person under section 464(1) to state the person's name or address or is required by an authorised person under section 464(3) to give evidence of the correctness of a name fails to comply with the requirement, unless the person has a reasonable excuse for not complying with it.

Subsection (3) states; *The person does not commit an offence against this section if—*

(a) the authorised person required the person to state the person's name and address on suspicion of the person having committed an offence against this Act; and

(b) the person is not proved to have committed the offence.

476 Failure to answer questions

This section applies if an authorised person requires a person under section 465 to answer a question, the person must comply with the requirement unless the person has a reasonable excuse for not complying with it.

Reasonable excuse – “might tend to incriminate the person”.

No offence committed if the information sought by the authorised person is not in fact relevant to the offence.

477 Failure to produce document

This section creates the offence for a person who was required under section 466 to produce a document and failed to comply with the requirement, unless the person had a reasonable excuse for not complying with it.

482 Obstruction of authorised persons

This section creates the offence for a person who obstructs an authorised person in the exercise of a power under this chapter, unless the person has a reasonable excuse for obstructing the authorised person. In this section **authorised person** includes a person who is—

(a) acting under an authorised person's direction under section 363K; or

(b) authorised by an authorised person to take action under section 467(2)(b); or

(c) helping an authorised person under this chapter.

PART 4 RECORDS and RECORD KEEPING

Environmental Services staff are required to keep accurate records to ensure monitoring of progress against Service Delivery requirements is achievable and the content is of a standard that would pass judicial review.

Records are for two purposes;

- Compliance Monitoring and Service Delivery
- Compliance Enforcement

Compliance Monitoring and Service Delivery

Records for this purpose will be kept for;

- Statistics
- Performance delivery
- Service delivery
- Enforcement/ compliance actions

Records for this purpose will be by way of ;

- Diary Entries
- Field Inspection reports
- Ecotrack data entry

Compliance Enforcement

Records for this purpose will be kept for;

- Statistics
- Compliance History
- Investigation process
- Court Proceedings
- Evidence

Records for this purpose will be by way of;

- Diary entries
- Official Note Book entries
- Field Inspection reports
- Ecotrack data entry

PART 5 EXHIBIT HANDLING – (Including Sections 461 and 462(EPA))
(Includes extracts from Departmental Compliance Investigation Manual)

Introduction

Failure to control an exhibit lawfully may result in the exclusion of the exhibits as evidence and jeopardize the final outcome of the prosecution case, and subsequent repercussions to the investigator personally.

Continuity of Evidence

Continuity of possession is required to ensure any material that may be used as evidence is kept in a manner that ensures originality. This includes the need to keep the material secure, ensure no alterations are made and to have a record of the place kept and in whose possession it has been. The Compliance Investigation Manual Chapter 8 refers to Exhibit Management.

Property Receipt

If a thing is taken or seized, a property receipt must immediately be given to the person in control of the thing (normally the owner or custodian of the thing). If it is impossible to immediately give the person a property receipt then it must be given as soon as practicable after the seizure or the receipt may be left at the place of seizure in a conspicuous and reasonably secure place.

The following information must also be completed on the property receipt:

- name and address of the person from whom the property was seized or taken.
- Authorised Officer's name – name of the investigator's taking or seizing the property;
- the location the exhibit was taken from – this also includes a description of the location within the property from where it was seized or taken.
- a brief description of the exhibit including any serial number and/or identification marks;
- comment on its condition and value (if known) at the time of seizure;
- date and time taken; and
- CIRaM number (If known).

The property receipt is to have the following distribution:

- Investigator's brief/ Reef Unit File - Original
- Person from whom thing taken or seized - Copy 1
- Attached to the thing - Copy 2
- Remaining in book - Copy 3

Exhibit Registers

The Exhibit Register is an official and auditable document in which all physical exhibits (other than original documents) that cannot be satisfactorily controlled by the investigator are to be entered. It records all ingress and egress of exhibits at property point, and identifies the custodian of the exhibit should it be removed from the property point for analysis or further investigation purposes. Each exhibit must be labelled securely so that the label will not become detached in packing or handling. Details of the exhibit must be recorded in an exhibit register so its whereabouts can be tracked. The exhibit itself should be appropriately secured.

PART 6 INTERVIEWING/ WITNESS STATEMENTS

(Includes extracts from Departmental Compliance Investigation Manual)

Interviews

Whilst the following information primarily relates to interviews associated with suspected offences, the day to day field inquiries may wish to adopt the general standard so that progression to enforcement actions is supported by previous field records and practices.

Chapter 9 of the Compliance Investigation Manual provides detail for Interviewing.

A Record of Interview with a suspected offender should be conducted using electronic recording devices (Video/ Audio). Where practicable assistance should be sought from supervisors and/or investigators prior to conducting this type of interview.

Interviews should be conducted in a courteous and sensitive manner with an emphasis on portraying a professional image of the investigator and the Department.

Location

The location chosen to conduct an interview may set the tone for an interview. Whilst it is best practice to conduct any interview in a private area free from distractions and interruptions, it is recognised that some interviewees may request or insist on the interview occurring at a location set by themselves (e.g. in their home or at their workplace)

For any interview consider interference factors including interjection by other persons, machinery or electronic noises and comfort.

Witness Statements

As part of day to day field operation staff will become involved with potential witnesses and also be witnesses to offences.

As a result field staff should be familiar with the process of taking or making a statement to a standard that is suitable for production in a criminal proceeding. Seek assistance from a supervisor or investigator if necessary.

Chapter 9 of the Compliance Investigation Manual provides detail for Statement taking and making

A statement may be made:

In an Official Notebook

Handwritten on paper

Typewritten (Most preferred for court)

Electronic Recording (Audio/ Video)

If requested to obtain or make a formal statement the following should occur:

- Seek advice from the Supervisor/ Manager
- Gather all known facts relevant to the incident,
- Understand the elements to be proved regarding the offences alleged to have been committed,
- Identify the best venue to interview the witness,
- Identify what information the witness may be able to provide and remember the 'who, what, where, when and how' questions that underpin an interview
- Preliminary inquiries with the witness will determine what the person knows about the incident.
- Evaluate this information to determine if it is relevant to the investigation.
- Record the information formally as a statement.

Guide to Validating Witness' Observations

A witness' observations may be critical in describing an offence or proving a particular element of an offence. To assist in assessing a witness' observations the ADVOKATE acronym is valuable:

A - Amount of time the witness observed the incident or offender

D - Distance between the offence and witness

V - Visibility including atmospheric conditions, lighting etc

O - Obstructions to the witness' line of sight

K - Knowledge with regard to the witness having previously known the offender

A - Any special reason for the witness to remember the incident or offender

T - Time lapse between the incident and when the witness made their statement

E - Errors or discrepancies

PART 7 FIELD EQUIPMENT

To ensure continuity of evidence and quality of evidence it is necessary to have personalised field equipment.

Equipment to be carried

Camera- Digital
Voice Recorder- digital
Diary
Official Note Book
Field forms
Receipt Book.
Bags and Containers

Note: Personal issue allows users to maintain the equipment to a high standard and also provides a high standard of knowledge of use.

Procedures when working with field equipment.

Note: All records made and kept by this department may be subject to audit, public access or production in court.

Camera.

For evidence purposes the person who takes the photo should be the person who downloads the photo and subsequently prints the photo or copies the photo to another medium. The person who takes the photo must be the person who produces the photo (exhibit) to a court.

Voice Recorder

For evidence purposes the person who makes the recording should be the person who downloads the recording and subsequently copies the recording to another medium.

The person who makes the recording must be the person who produces the recording (exhibit) to a court.

Diary

To be used for day to day compliance monitoring and management. Records should briefly include;

- Dates and times (in and out)
- Place visited
- Persons Spoken to
- Outline of matters discussed
- Observations including positive matters
- Non Compliance activities

Note: This record may be subpoenaed for court or be required to be produced under RTI legislation. Avoid opinion or derogatory statements.

Official Note Book

To record any official information regarding compliance activities. Records should include;

- Dates, times
- Place
- Details of suspects and witnesses
- Observations of suspected non compliance
- Corroborators endorsements
- Witness statements
- Details of actions taken.

Note: These notes are primarily made with consideration that they may be produced in a court proceeding. Notes should be factual and should not include irrelevant information and opinion.

Field Forms

To be completed for every field inspection in relation to Level A and B inspections. These are notes made at the time and should be signed by the person making the entries and adoption sought by initial from the property occupier/ owner.

Receipt Book

Section 462 *Environmental Protection Act 1994- Procedure after seizure of evidence*

Outlines the requirement that an authorised person must give a receipt for a thing seized to the person from whom it was seized.

Where property / documents are voluntarily provided by the owner/ occupier in relation to monitoring day to day compliance, consideration should be given to making a record in the Official Note Book and have the owner/ occupier acknowledge the supply and return of the items in that book. A receipt may be issued from the Receipt Book and an acknowledgement (Indemnity Receipt) of the items return should be kept in that book or other place of record.

Bags and Containers

- Preservation of all items and material taken into the possession of DERM staff is required to ensure;
- The item is identifiable.
- The item can be returned to the owner in the condition that it was taken.
- The item is maintained in its condition for court purposes.
- The item is not contaminated – when taken for further tests/ examination.
- The item is properly identified without the need to mark the actual item.

Examples of use:

- Plastic envelopes to preserve documents- can be marked with details
- Plastic Bags to preserve items from external contamination- identified and sealed
- Plastic bags and containers suitable to hold soil/chemicals for further testing. (Of a kind that does not affect the contents) – Can be identified and sealed.
- Boxes/ Larger Containers- To house large items or to maintain all items in one location.

APPENDIX G – FIELD TEAM RUNNING SHEET

DERM Officer Name: _____

Role: _____

Mine / Incident Description: _____

Date	Time	Action	Next Action

APPENDIX H – ACTION PLAN TEMPLATE

Mine Discharge Incident

Date

Incident Controller

Operations Officer

Field Team

**Safety Assessment
Completed**

☐

Details

Field Response Required

☐

Details

**Remote Area Trip sheet
Supplied**

☐

Travel Arrangements

☐

Details

Accommodation Required

☐

Details

**Risk to Drinking,
recreational or livestock
water**

☐

Details

**Immediate Preventative
Actions Required**

☐

Details

**Immediate Enforcement
Action**

☐

Details

**Evidence Collection /
Sampling Plan**

☐

Details

Notification to Stakeholders

☐

Details

Remediation Required

☐

Details

Notification to Investigators

☐

Details

Details of Action Plan

[illegible]

SAMPLING PLAN

Ecosystems potentially impacted ☐

Take Filtered Samples

Livestock drinking water potentially impacted ☐

Take unfiltered Samples

Gold Mine with Cyanide present ☐

Do NOT use Nitric Acid as preservative

Sediment Sampling ☐

Consider taking composite mixed samples

Sampling Checklist

Water Sampling Metals Unfiltered	Water Sampling Metals Filtered	Water Sampling General	Water Sampling – Specific analyte	Sediment Samples (Grab samples)	Sediment Samples (Composite samples)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sampling Locations

Sample ID	Location Details	Site Justification
Reference Sites		
Point Source Release Sites / Discharge Points		
Impacted Sites		

Details of Sampling Plan / Map

Cost Analysis

SAMPLE DESCRIPTION	COST PER SAMPLE (A\$)	NUMBER OF SAMPLES FOR ANALYSIS	TOTAL COST (A\$)
Water Quality – Field Filtered			
Metals 8			
Water Quality - Unfiltered			
Sulphate			
Cyanide			
Oils and Hydrocarbons			
Sediment Quality			
Metals 8			
Particle Size Distribution			
Other			
TOTAL COST (A\$)			

Justification and Recommendations

APPROVALS

Recommended By: *Endorse* *d By:* *Appro* *ved By:*

	Operations	Incident Controller

APPENDIX I – SITUATION REPORT

Mine Discharge Incident

Date

Time

Field Response Coordinator

Sit Rep To:

Current Environmental Risk

☐

N/A

☐

Low

☐

Medium

☐

High

Details

Actions Taken to Date

Proposed Actions

Recommendation:

Operations Officer:

Signed:

Date:

Comment and Recommendation:

Incident Controller:

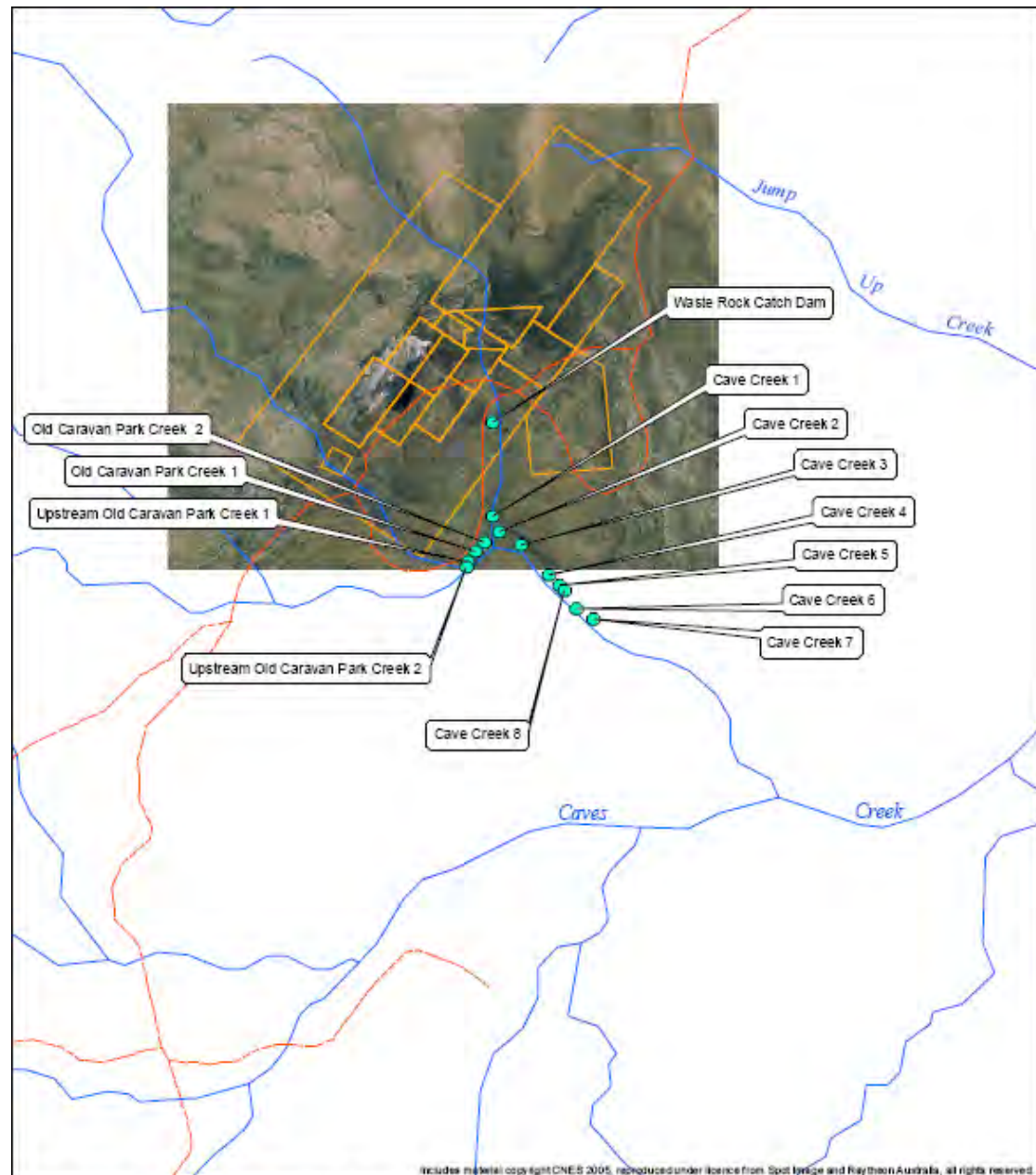
Signed:

Date:

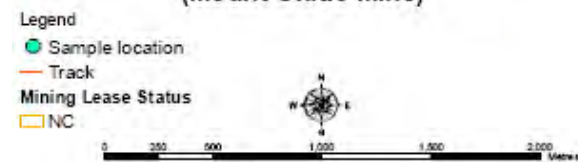
APPENDIX J – MINE SITE RESPONSE SHEETS

MOUNT OXIDE

Site Water Monitoring Points & Local Drainage



Water Quality and Sediment Sample Locations (Mount Oxide Mine)



(Note: Historical sampling program 2009 – only 4 sites selected for ongoing monitoring – see table over page)

MINE CONTACTS

Mount Oxide

Ph: [REDACTED] Mob: [REDACTED]
E: [REDACTED]

Mine Site Address:

Approximately 142km North West of Mount Isa along the heading up to Birla Mount Gordon mine
EPM10313

Registered Business Address:

Hetherington Exploration &
Mining Title Services Pty Ltd
Suite 41, Northpoint 231, North Quay
BRISBANE QLD 4001

gunpowder road

Landowners

Vernon Spreadbrough (Brussey) Chidna Station

Ph: [REDACTED]
E: [REDACTED]

Address:

WATER QUALITY & SEDIMENT SAMPLING LOCATIONS (GDA94)

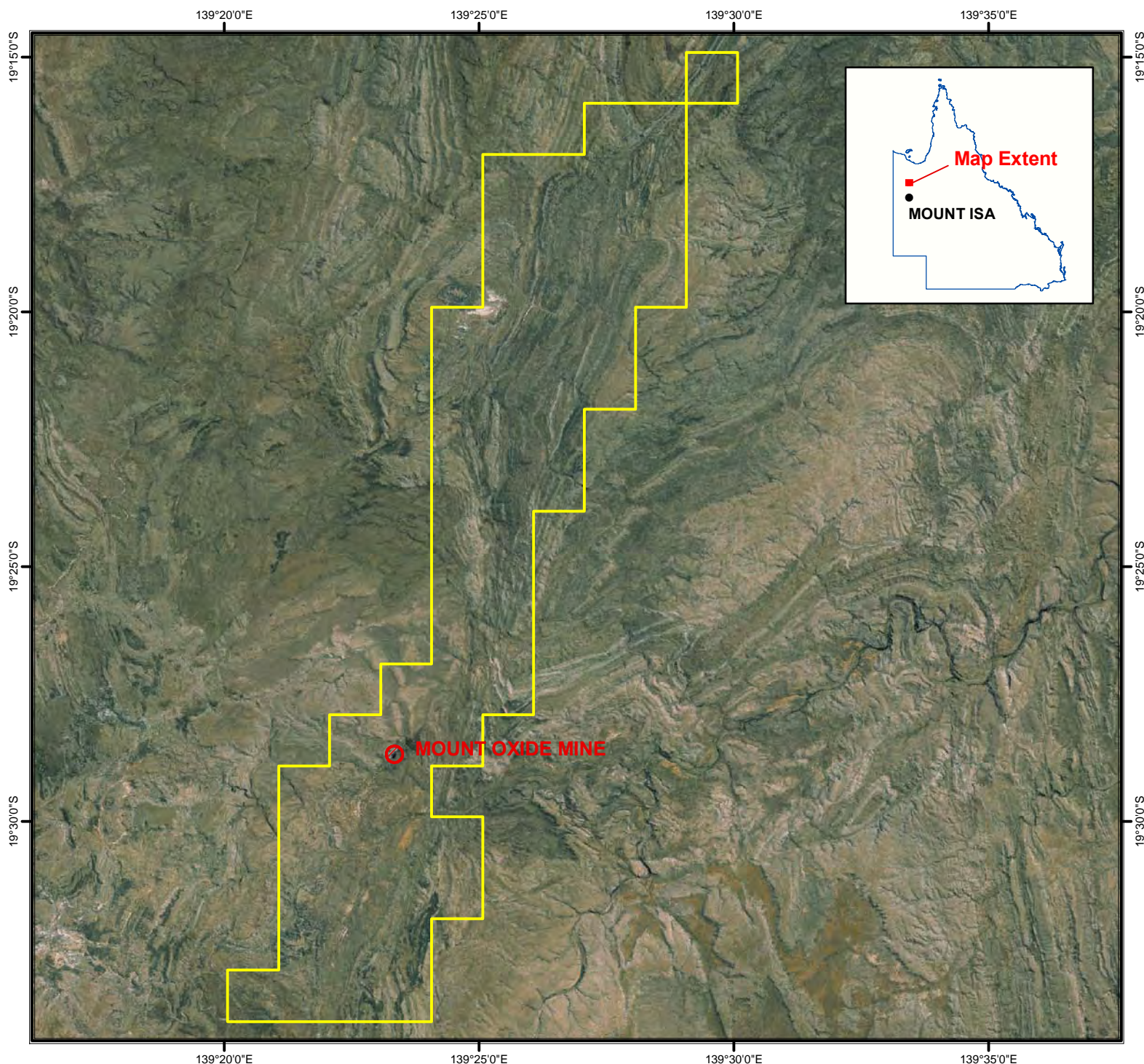
(GDA94 comparable with WGS84 on handheld GPS)

Monitoring point	Lat	Long	Monitoring point	Lat	Long
Receiving Waters			Reference Sites		
Cave Creek 2	S19.48460	139.39320	Upstream Old Caravan Park Creek 1	S19.48593	139.39183
Cave Creek 5	S19.48700	139.39589	Licensed Release Points		
On Site Storage			None specified in EA with exception of sewage effluent discharge point		
	Waste Rock Catch Dam		S19.47972	139.39291	

Note: No monitoring locations specified in EA, however monitoring of surrounding creeks required.
Contaminants first enter Cave Crk, which flows into Gunpowder River.

The Mt Oxide site is an historical, surrendered mine site managed by DEEDI Mines & Energy. The old waste rock dump to the SE of the main pit potentially emits AMD contaminated runoff to Cave Creek following significant rain events.

EPM 10313 - Mine extent



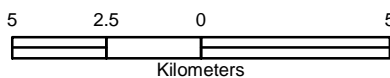
LEGEND

- EPM10313
- Extent of mine (approximate)
- State Borders

Data Sources:
 © The State of Queensland (Department of Environment and Resource Management)
 - EPM10313 (2011)

© CNES
 - Spot 10 Satellite Image (2006)

ACCURACY STATEMENT
 Due to varying sources and scale of data, spatial locations may not coincide when overlaid



MAP PRODUCTION
 Spatial Information Services North, Department of Environment and Resource Management, Cairns, Queensland (20 September, 2011)

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 (Department of Environment and Resource Management)

Version: 110920_MtOxideExtent_SO

DISCLAIMER

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19 DEC 2008

RP40114189

**Environmental Authority (Exploration or Mineral Development) Non Code
Compliant Level 1 Mining Project
Permit¹ Number: MIN100748608**

Section 193 — Environmental Protection Act 1994

Takes Effect From: 19 December 2008

Details

Permit Holder(s)	Name	Address
Principal Holder	Mount Oxide Pty Ltd	C/- Suite 41, Level 7, 231 North Quay Brisbane QLD 4000

Activity(s)	Location(s)
Exploration Permit Mineral	EPM10313

The anniversary date of the environmental authority is 23 May.

The environmental authority is subject to the attached conditions of approval.

Rob Lawrence
Delegate
Environmental Protection Agency
19- DEC-2008

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Environmental Protection Agency and the Queensland Parks and Wildlife Service

Environmental Authority (Exploration or Mineral Development) Non Code
Compliant Level 1 Mining Project
Permit¹ Number: MIN100748608

CONDITIONS OF ENVIRONMENTAL AUTHORITY

General Permit Condition

Agency Interest: General

- G1 The Environmental Authority does not take effect until the grant of the tenure to the Environmental Authority holder, or until each Environmental Authority holder has become a holder, under the Mineral Resources Act 1989, of each of the relevant mining tenements.
- G2 The conditions of this Environmental Authority are in force until a surrender of the authority is accepted pursuant to the Environmental Protection Act 1994. The conditions apply unless an amendment is approved pursuant to the Environmental Protection Act 1994.
- G3 The Environmental Authority holder is to give the administering authority a financial assurance in the amount and form and at a time required by the administering authority.
- G4 The Environmental Authority holder must comply with each of the Standard Environmental Conditions contained in the Code of Environmental Compliance for Exploration and Mineral Development Projects.

Agency Interest: Air

- A1 The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activity must not cause a nuisance at any nuisance sensitive or commercial place.
- A2 The release of dust and or particulate matter resulting from the activity must not cause a nuisance at any nuisance sensitive or commercial place.

Agency Interest: Land

- L1 A minimum area of 7,000 square meters of land, excluding any necessary buffer zones, must be utilised for the irrigation of treated effluent at a maximum rate of 3mm/day.
- L2 The holder of the Environmental Authority must ensure that contaminated wastewater, and mine waste is contained to the drill pad in Cave Creek.
- L3 The holder of the Environmental Authority must use existing tracks where reasonable and practicable.
- L4 Regular harvesting of the land irrigation area is to be conducted as required with clippings disposed of outside the land application area.
- L5 Notwithstanding Condition 27 of the Code of Environmental Compliance for Exploration and Mineral Development Projects, the holder of this Environmental Authority is authorised to carry out exploration activities in one location in Cave Creek as shown in the attached Map 1.
- L6 Disturbance to the riparian vegetation along Cave Creek must be limited during exploration activities

**Environmental Authority (Exploration or Mineral Development) Non Code
Compliant Level 1 Mining Project
Permit¹ Number: MIN100748608**

where reasonable and practicable.

- L7 Drilling must only occur at the location defined in Map 1 during the dry season between the months of May and October.

Important Note:

The relevant Code of Environmental Compliance imposes certain restrictions on mining activities within or adjacent to Category A, B or C Environmentally Sensitive Areas, watercourses, wetlands and lakes. Ensure that the relevant provisions of the Code are complied with.
The holder of the Environmental Authority must use existing tracks where reasonable and practicable.

Agency Interest: Waste

- W1 All regulated waste removed of the site must be removed by a person who holds a current approval to transport such waste under the provisions of the *Environmental Protection Act 1994*.

Agency Interest: Water

- W1 All effluent released from the treatment plant must be monitored at the frequency and for the parameters specified in the Table 1:

Table 1- Sewage effluent targets and monitoring frequency.

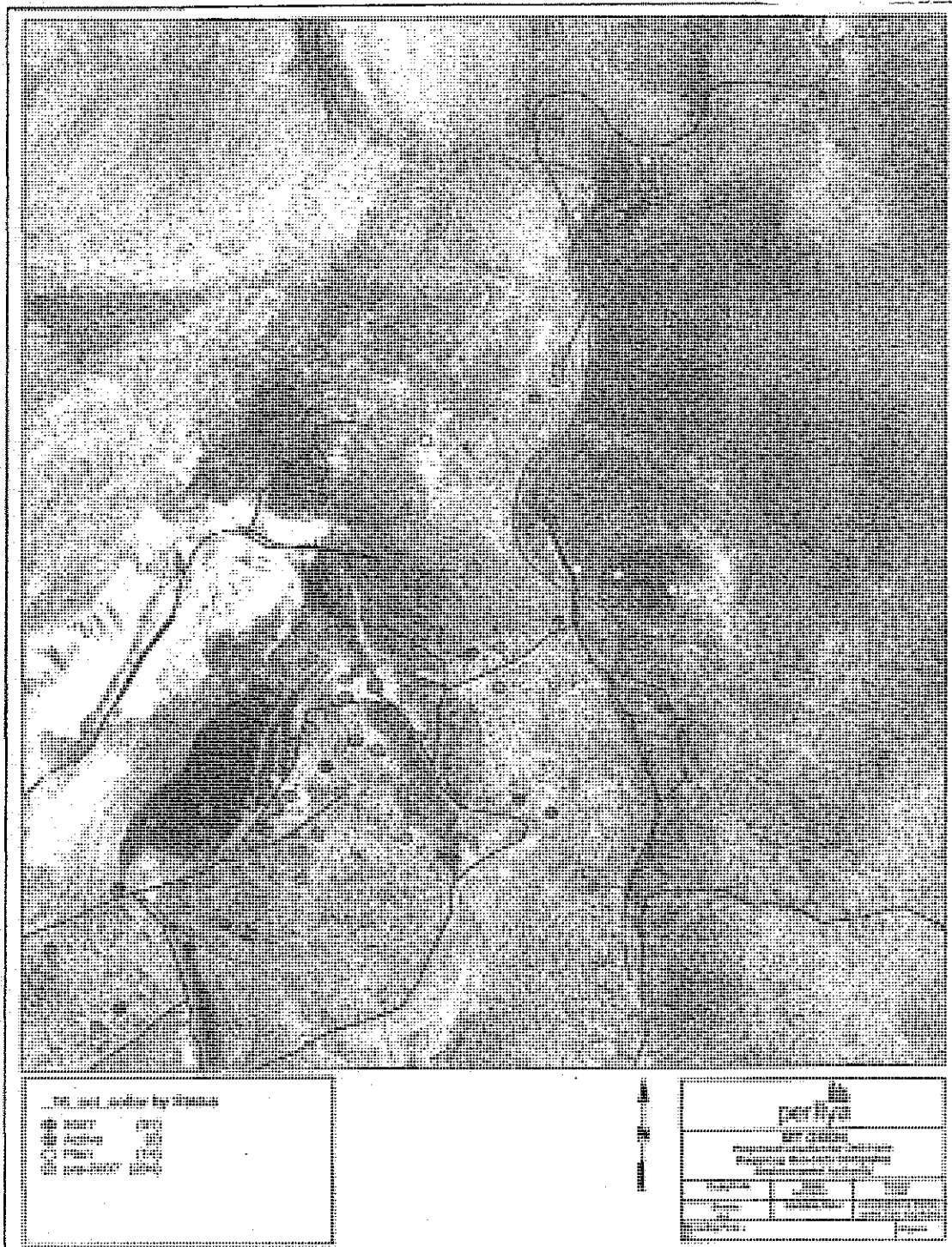
Quality Characteristics	Units	Limit	Limit Type	Monitoring frequency
pH	Ph Units	6 - 8.5	Minimum to maximum	Monthly
5-Day Biochemical Oxygen Demand	Mg/L	<20	80 th percentile ¹	Monthly
Total Suspended Solids (TSS)	Mg/L	<30	80 th percentile ¹	Monthly
Free Chlorine Residual	Mg/L	<2.0	Maximum	Monthly
E coli	Units/100ml	<100	Maximum	Monthly
Total Nitrogen	Mg/L	10	Maximum	Monthly
Total Phosphorus	Mg/L	5	Maximum	Monthly

¹ The 80th percentile must be determined based on no more than ten (10) consecutive samples.

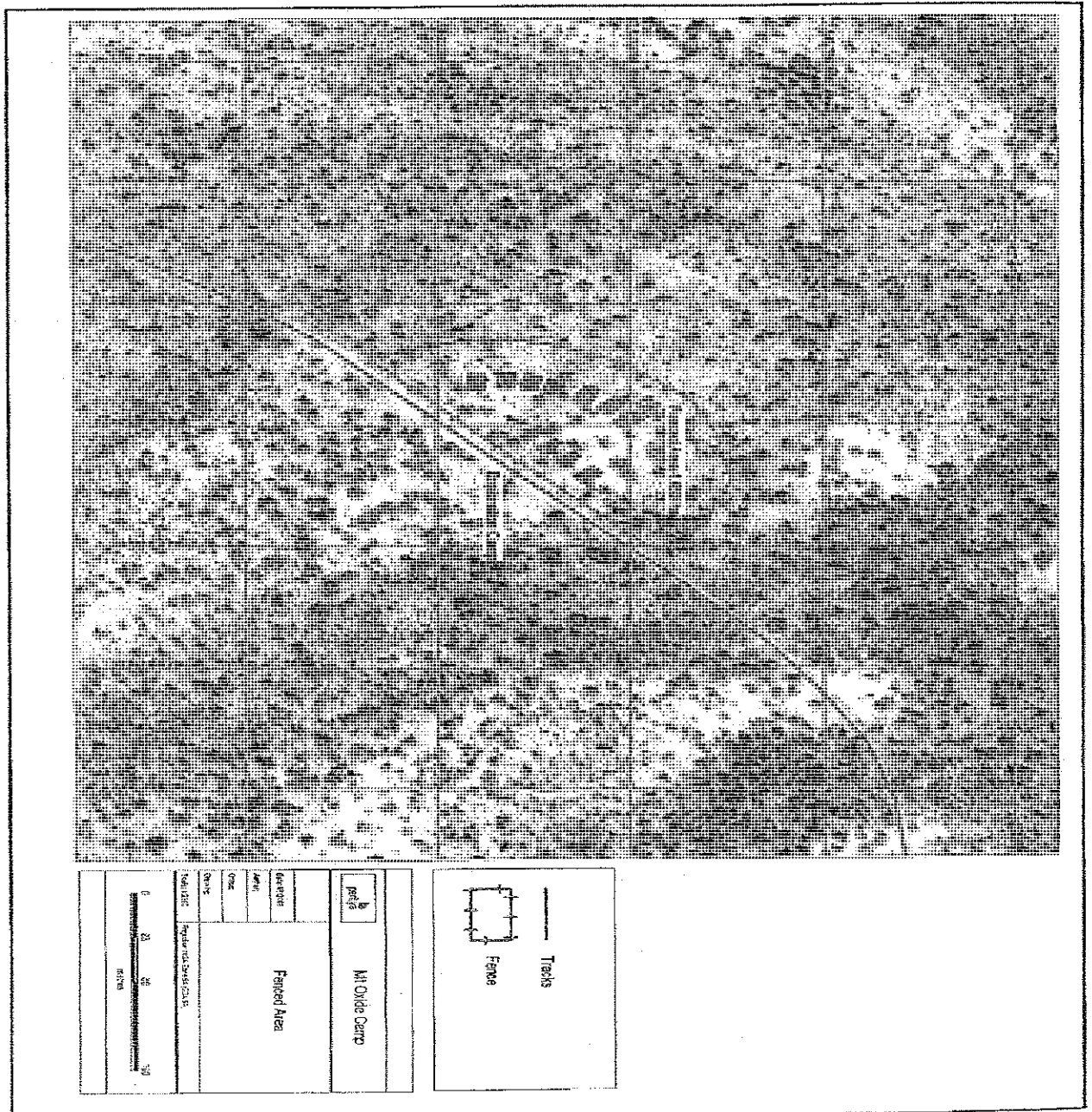
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- W2 Subject to Condition W1, release of treated effluent is permitted via irrigation to the fenced designated area identified in Map 2. Alternatively, such effluent can be used for dust suppression on roads located within EPM 10313.
- W3 Record, compile and keep all monitoring results required by this approval and present this information to the administering authority when requested. The irrigation of effluent must be carried out in a manner such that:
- a) vegetation is not damaged;
 - b) soil erosion and soil structure damage is avoided;
 - c) there is no surface ponding of effluent;
 - d) percolation of effluent beyond the plant root zone is minimised;
 - e) the capacity of the land to assimilate nitrogen, phosphorus, salts, organic matter as measured by oxygen demand and water is not exceeded; and
 - f) the quality of ground water is not adversely affected.
- W4 Notices must be prominently displayed on areas undergoing effluent irrigation, warning the public that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition.
- W5 When conditions prevent the irrigation of treated effluent to land (such as during rain events), alternative measures must be taken to store/dispose of effluent (such as wet weather storage or tankering off site).
- W6 The operator of the ERA must record the following details for all complaints received in relation to the ERA and provide this information to the administering authority on request:
- a) time, date, name and contact details of the complainant;
 - b) reasons for the complaint;
 - c) any investigations undertaken;
 - d) conclusions formed; and
 - e) any actions taken.
- W7 The Environmental Authority Holder must investigate the soil geology of the irrigation area at the Mount Oxide camp including but not limited to the absorption capacity of the soil for nitrogen and phosphorus. The report into the investigation of the soil geology must be submitted to the administering authority before the 11 June 2008.
- W8 Based on the investigation report of the soil geology into the irrigation area at the Mount oxide camp, the administering authority may amend the environmental authority to further protect environmental values.

MAP 1



Environmental Authority (Exploration or Mineral Development) Non Code
Compliant Level 1 Mining Project
Permit¹ Number: MIN100748608





**Queensland
Government**

- **Environmental
Protection Agency**
- **Department of
Mines and Energy**

CODE OF ENVIRONMENTAL COMPLIANCE
for
EXPLORATION AND MINERAL
DEVELOPMENT PROJECTS

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1.0 INTRODUCTION

Note: The key terms and/or phrases used in this Code are *highlighted in italics* followed by an (*). They are defined in Section 4.

Mineral exploration activities are authorised by Exploration Permits and Mineral Development Licences issued under the *Mineral Resources Act 1989*. An Exploration Permit allows the holder to take action to determine the existence, quality and quantity of minerals by:

- prospecting;
- using instruments, vehicles, vessels, machinery and equipment and techniques appropriate to determine the existence of any mineral;
- sampling and testing of material to determine its mineral bearing capacity or properties of mineralisation; and
- carrying out other operations the Minister approves.

A Mineral Development Licence entitles the holder to carry out:

- geological, geophysical and geochemical programs and other work reasonably necessary to evaluate the potential for development of any mineral occurrence that has possible economic potential;
- mining feasibility studies;
- metallurgical testing;
- environmental studies;
- marketing studies;
- engineering and design studies; and
- other activities the Minister considers appropriate.

The regulation of environmental management for an Exploration Permit or a Mineral Development Licence is via an *Environmental Authority** issued under the *Environmental Protection Act 1994*. An exploration or mineral development project that is considered to present a low risk of causing *Serious Environmental Harm** under the *Environmental Protection Act 1994* will be assessed as a *Standard Mining Activity**. A standard mining activity is an *Environmentally Relevant Activity** under the *Environmental Protection Regulation 1998* and will therefore require an environmental authority.

This Code of Environmental Compliance has been developed for standard mining activities that include an Exploration or a Mineral Development activity that, to the satisfaction of the administering authority, complies with all relevant criteria listed in schedule 1A of the *Environmental Protection Regulation 1998*.

About this Code

The Code of Environmental Compliance:

- provides the criteria used to determine the level of environmental management required for exploration or mineral development projects (see section 2);
- sets the environmental performance requirements as *Standard Environmental Conditions*^{*}, which will be the compliance requirements of an environmental authority issued for standard exploration and mineral development projects (see section 3);
- provides advisory notes on how to achieve compliance with the standard environmental conditions. These are not compliance requirements and are contained in the boxes associated with the relevant standard environmental condition; and
- provides definitions of terms used in this code (see section 4);
- provides references to Technical Guidelines for information on best practice environmental management (see section 5).

Additional Conditions

The holder of the environmental authority may apply for additional conditions at any time. The request must be made on the *Approved Form*^{*} and the applicant must supply enough information to allow the *Administering Authority*^{*} to decide whether or not to impose the additional condition/s.

The administering authority may set additional conditions on the environmental authority. The administering authority may only set additional conditions as long as the exploration or mineral development project remains a standard mining activity. In deciding whether to set an additional condition, the administering authority must comply with any relevant *Environmental Protection Policy*^{*} and consider the *Standard Criteria*^{*}.

If an application for an additional condition is granted, the additional condition will override the relevant criteria (see section 2) or standard environmental condition (see section 3) and the activity will remain a standard mining activity in accordance with section 151 of the *Environmental Protection Act 1994*.

Compliance Requirement

The compliance requirements of a standard environmental authority issued under the *Environmental Protection Act 1994* for a standard mining activity are the standard environmental conditions in this code, plus any additional conditions. Failure to comply with the standard environmental conditions, or any additional conditions, is a breach of the environmental authority and the holder is liable to various compliance enforcement actions under the *Environmental Protection Act 1994*. Refer to section 430 of the *Environmental Protection Act 1994* - 'offence to contravene condition of environmental authority'.

Public Notification

Following assessment of the application for an environmental authority for a standard exploration or mineral development project, the application and the decision on the level of assessment will be publicly notified, but will not be subject to objection. The explorer will continue to notify land owners of entry to land as required under the *Mineral Resources Act 1989*.

For More Information on this Code

Contact the District Manager at the Environmental Protection Agency or the Mining Registrar at the Department of Mines and Energy at the following locations.

Environmental Protection Agency

EPA Advisory Service - 1800 501087
Brisbane and Toowoomba - (07) 3224 6161
Maryborough and
Rockhampton - (07) 4936 0511
Mackay and Emerald - (07) 4982 4555
Townsville - (07) 4722 5350
Mt Isa - (07) 4744 7888
Cairns - (07) 4046 6730

Department of Mines And Energy

Brisbane (Spring Hill) - (07) 3227 1972
Quilpie – (07) 4656 1266
Emerald - (07) 4982 4011
Winton – (07) 4657 1727
Mt Isa – (07) 4747 2103
Mareeba – (07) 4092 4211
Charters Towers - (07) 4787 1266
Townsville – (07) 4760 7406
Georgetown – (07) 4062 1204
Rockhampton – (07) 4938 4440

2.0 CRITERIA FOR DETERMINING THE LEVEL OF ASSESSMENT

The following criteria found in schedule 1A of the *Environmental Protection Regulation 1998*, are used to determine the level of assessment required for an application for an environmental authority for a standard exploration or mineral development project.

- (1) the mining activities do not, or will not, cause more than 10 ha of any land to be *Significantly Disturbed** at any one time;
- (2) no more than 5000 m² are disturbed at any campsite at any one time;
- (3) no more than 20 m³ of any substance is extracted from each kilometre of any riverine area in any one year;
- (4) the mining activities are not, or will not be, carried out in a category A or B *Environmentally Sensitive Area**;
- (5) the mining activities do not include a level 1 environmentally relevant activity.

If an application for an environmental authority does not meet the assessment level criteria, it could be approved as a standard mining activity provided the environmental impact is no greater than the environmental impact of activities allowed under an environmental authority of the same type that does meet the criteria. For example, an application for a standard mining activity proposing a significant disturbance of greater than 10ha, could be granted a standard environmental authority as long as the applicant can demonstrate that the significant disturbance will have no greater environmental impact than a project that can operate within the 10ha limit.

3.0 STANDARD ENVIRONMENTAL CONDITIONS

3.1 GENERAL CONDITIONS

Financial Assurance

Condition 1

The holder of a new *Environmental Authority must submit the required amount of *Financial Assurance** to the administering authority prior to carrying out any activities on the mining tenement. If the activities being carried out by the holder of the environmental authority are altered so as to cause a change in the category of total area of disturbance shown in Form 3, Schedule of Rehabilitation Costs, the holder of the environmental authority must submit an application to amend their financial assurance to the administering authority. If an application is lodged to transfer the environmental authority to another person or company, the proposed transferee must submit the required financial assurance prior to the transfer taking effect.**

Note 1 - Financial assurance must be calculated in accordance with Form 3, Schedule of Rehabilitation Costs.

Note 2 - Section 364 of the *Environmental Protection Act 1994* requires that the holder of the environmental authority gives the administering authority a financial assurance in a form acceptable to the administering authority. When necessary, the holder of the environmental authority must submit an application to amend their financial assurance under section 366 of the *Environmental Protection Act 1994*. The holder of the environmental authority must lodge a single financial assurance with the District Mining Registrar, Department of Mines and Energy. The financial assurance will consist of two components:

- (i) An amount to cover the potential costs of rehabilitation of areas disturbed by mining activities (ie. Environmental Protection Agency component); and
- (ii) An amount to cover the potential costs of restoring property improvements disturbed by mining activities and the failure of the tenure holder to pay rents and royalties (ie. Department of Mines and Energy component).

Land Disturbance

Condition 2

The holder of the environmental authority must ensure that the area and duration of disturbance to land and vegetation is minimised. Not more than 1000m² can be disturbed at any one location, excluding campsites.

Note 3 – To minimise the area and duration of disturbance to land and vegetation the following measures or similar measures can be used:

- avoid disturbing large and/or mature trees;
- select specific trees to be cleared and avoid causing damage to surrounding vegetation;
- where practical leave the rootstock intact to promote regeneration and regrowth.

Note 4 – Before carrying out activities on the tenement refer to the Technical Guideline ‘Good Relations with Landowners’ and the Department of Mines and Energy Code of Conduct, ‘Procedure for Sound Landholder/Explorer Relations’.

Air Quality

Condition 3

The holder of the environmental authority must not cause an *Unreasonable Release of dust.**

Note 5 – To prevent causing an unreasonable release of dust the following measures or similar measures can be used:

- altering work practices to avoid or minimise the generation of dust;
- scheduling activities for times when they will have least impact;
- spraying water on roads and tracks;
- revegetating disturbed areas as soon as practicable;
- leaving or creating wind breaks or screening; and
- installing pollution control equipment (e.g. fitting bag filters or a cyclone to dust generating equipment).

Noise Emissions

Condition 4

The holder of the environmental authority must not cause *Unreasonable Noise at a *Noise Sensitive Place**.**

Note 6 - To prevent causing unreasonable noise at a noise sensitive place the following measures or similar measures can be used:

- construct and maintain noise barriers and enclosures around noisy equipment or along the noise transmission path;
- implement noise reduction measures at noise sensitive places;
- provide and maintain low noise equipment;
- carry out routine maintenance on fans to minimise bearing noise; and
- repair or replace defective mufflers of vehicles and plant with suitable effective mufflers;
limit the hours of operation of the project to between the hours of 7am to 6pm Monday to Saturday.

Note 7 - If aircraft are being used for mining activities operate them so as to minimise disturbance to livestock (eg. helicopters).

Erosion And Sediment Control

Condition 5

The holder of the environmental authority must design, install and maintain adequate banks and/or diversion drains to minimise the potential for storm water runoff to enter disturbed areas.

Condition 6

The holder of the environmental authority must design, install and maintain adequate erosion and sediment controls wherever necessary to prevent erosion of disturbed areas and sedimentation of any *Watercourse, *Waterway**, *Wetland** or *Lake**.**

Note 8 - When designing and constructing sediment ponds refer to the “Engineering Guidelines for Queensland Construction Sites” Soil Erosion and Sediment Control.

Note 9 – Regularly clean out sediment traps, ponds and drains and maintain them in effective working order, until erosion stability has been achieved in disturbed areas.

Note 10 – The capacity of sediment traps, ponds, drains and banks should not be reduced below 70% of their design capacity.

Topsoil and Overburden Management

Condition 7

The holder of the environmental authority must ensure that *Topsoil is removed and stockpiled prior to carrying out any mining activity. Prevent or minimise the mixing and erosion of topsoil and *Overburden** stockpiles.**

Note 11 - To separate topsoil and overburden and to prevent or minimise the erosion of these stockpiles the following measures or similar measures can be used:

- identify topsoil and overburden layers before stripping topsoil;
- store topsoil and overburden in separate stockpiles;
- install silt fences or bunding around the stockpiles;
- where practical reuse topsoil stockpiles within 12 months;
- establish and maintain a temporary cover crop on stockpiles; and
- limit the height of topsoil stockpiles to 2 metres.

Hazardous Contaminants

Condition 8

The holder of the environmental authority must plan and conduct activities on site to prevent any potential or actual release of a *Hazardous Contaminant.**

Note 12 - Section 442 of the *Environmental Protection Act 1994* makes it an offence to release a prescribed contaminant. A prescribed contaminant is a contaminant prescribed by an Environmental Protection Policy.

Note 13 - Section 443 of the *Environmental Protection Act 1994* makes it an offence to cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Condition 9

The holder of the environmental authority must ensure that spills of hazardous contaminants are cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, sweeping or otherwise releasing such contaminants to any watercourse, waterway, groundwater, wetland or lake.

Note 14 - If a mining tenement becomes *Significantly Disturbed Land** because it is contaminated land, it ceases to be significantly disturbed land if a *Suitability Statement** is issued for the land. Refer to section 384 of the *Environmental Protection Act 1994*.

Note 15 - A *Site Management Plan** approved under part 413 of the *Environmental Protection Act 1994* may be required by the administering authority for sites recorded on the *Environmental Management Register** or *Contaminated Land Register**. Such sites may include acid producing overburden stockpiles and tailings dams containing acid producing wastes.

Condition 10

The holder of the environmental authority must, where practical, separate acid producing waste rock from benign waste rock.

Condition 11

The holder of the environmental authority must dispose of acid producing waste rock in an excavation or pit and backfill as soon as practical. Backfill the excavation or pit containing acid producing waste rock with benign, low permeability material and seal the excavation or pit with a compacted capping layer at least 1m thick.

Note 16 - The owner or occupier of a mining tenement must notify the administering authority if they become aware that a *Notifiable Activity** listed in schedule 3 of the *Environmental Protection Act 1994*, is being carried out on the land within 30 days, by giving notice to the administering authority in the approved form. For example, an exploration or mineral development project that generates waste materials that contain hazardous contaminants, must notify the administering authority that this activity is being carried out. Refer to section 371 of the *Environmental Protection Act 1994*.

Note 17 - For detailed information on the management of acid mine waste material refer to the “Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland”, Part B, ‘Assessment and Management of Acid Drainage’ and the ‘Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland’.

Nature Conservation

Condition 12

The holder of the environmental authority must prevent the spread of *Declared Plants by ensuring that all vehicles and machinery are adequately cleaned before taking the vehicles and machinery out of a *Declared Plant Area**.**

Note 18 - Sections 23 (b) and 29 (b) of the *Mineral Resources Regulation 1990* requires that - every precaution be taken to ensure there is no dispersal of parthenium weed or the seed of any other declared plant within the meaning of the *Rural Lands Protection Act 1985* as a result of mining activities or as a result of access to the area of the mining tenement.

Note 19 – The Department of Natural Resources provide Pest Facts sheets for declared plants in Queensland and clean down procedures for vehicles and machinery working in declared plant areas. For advice on declared plant areas contact the Department of Mines and Energy, the Department of Natural Resources or your Local Shire Council.

Condition 13

The holder of the environmental authority must not carry out activities in a category A or B Environmentally Sensitive Area. Activities involving machinery must not be carried out within 1km of a category A environmentally sensitive area or within 500m of category B environmentally sensitive area. Prior to carrying out activities in a category C environmentally sensitive area, consult with the relevant administering authority and the Environmental Protection Agency. If it is determined through the consultation that additional conditions are necessary, the holder must comply with those conditions.

Note 20 – Refer to Appendix A - Environmentally sensitive Areas.

Condition 14

The holder of the environmental authority must not carry out activities within 100m of a *Historical, Archaeological or Ethnographic* site.

Note 21 – With regard to cultural heritage issues refer to the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987* and the *Queensland Heritage Act 1992*. Prior to carrying out any activities on the mining tenement, the holder of the environmental authority should consult with the administering authority if a site has the potential to be designated as a historical, archaeological or ethnographic site.

Other Level 2 Environmentally Relevant Activities

Condition 15

The holder of the environmental authority must not carry out the following Level 2 Environmentally Relevant Activities (ERA) on the mining tenement:

- ERA (7) Chemical Storage - storage of chemicals (other than crude oil, natural gas and petroleum products) including ozone depleting substances, gases or dangerous goods under the dangerous goods code in containers with a design storage volume of more than 10m³ but less than 1000m³;
- ERA (76) Incinerating waste – operation of a waste incineration facility for incinerating -
 - (a) vegetation;
 - (b) clean paper or cardboard;
- ERA (77) Battery Recycling - operation of a facility for receiving and recycling or reprocessing any kind of battery; and
- ERA (80) Tyre Recycling - operation of a facility for receiving and commercially recycling or reprocessing tyres (other than retreading tyres).

3.2 ACTIVITY BASED CONDITIONS

Roads And Tracks

Condition 16

The holder of the environmental authority must consult with the *Landowner prior to establishing any new roads and tracks.**

Note 22 - Refer to the Technical Guidelines when planning and constructing all new roads and tracks.

Note 23 - Repair all damage to existing private roads and tracks resulting from mining activities, so that they are as trafficable as they were prior to any damage.

Condition 17

When constructing new roads and tracks, the holder of the environmental authority must ensure that the area and duration of disturbance to land, vegetation and watercourses is minimised.

Note 24 - When planning and constructing new roads and tracks the following measures or similar measures can be used to minimise the area and duration of disturbance of land, vegetation and watercourses:

- wherever possible use or upgrade existing roads and tracks;
- construct roads and tracks along natural grades;
- minimise the width of roads and tracks;
- minimise the number of crossings in riverine areas;
- construct crossings in riverine areas in a stable section of the bed;
- avoid constructing roads or tracks that run straight down the bank to the crossing;
- do not disadvantage other users of existing public roads & tracks;
- construct a bed level causeway, a culvert or a bridge where natural bed conditions within a watercourse will not carry the intended traffic load or where crossing of the bed will generate a significant increase in turbidity;
- minimise the number of cuts and fills in riverine areas;
- position cuts and fills in riverine areas to minimise risk of erosion from subsequent flood events;
- position crossings to prevent flow being directed towards the banks and provide erosion resistance to the bed and banks downstream of a crossing for a distance equal to the width of the normal flow channel;
- do not create any downstream or upstream drops at the lip of culverts or causeways;
- regularly clean out culverts, bridges and causeways to prevent flow being impeded or redirected; and
- construct in-stream crossings outside of main fish migration periods.

Campsites

Condition 18

The holder of the environmental authority must consult with the landowner prior to establishing any *Campsites*.

Condition 19

When establishing a campsite, the holder of the environmental authority must ensure that the area and duration of disturbance to land, vegetation and watercourses is minimised.

Note 25 - When establishing and maintaining campsites the following measures or similar measures can be used to minimise the area and duration of disturbance to land, vegetation and watercourses:

- locate campsites at least 100m from any riverine areas;
- only disturb the minimum area necessary for the safe functioning of the campsite;
- install an appropriate human waste disposal facility (e.g. portable self contained toilets, pit toilets, septic tanks);
- use absorption trenches, transpiration beds or spray irrigation to dispose of grey water; and
- locate all disposal areas at least 100m distance from any watercourse, waterway, groundwater recharge area, wetland or lake.

Note 26 – With regard to the on site management of water refer to the Environmental Protection (Water) Policy 1997.

Waste Management

Condition 20

The holder of the environmental authority must not directly or indirectly release waste from the project area to any watercourse, waterway, groundwater, wetland or lake.

Note 27 - When managing waste materials the following strategy should be adopted:

- avoid creating excess waste;
- reuse waste materials;
- recycle waste;
- create and utilise energy from waste;
- treat waste; and
- dispose of waste (e.g. provide rubbish containers on site).

Note 28 - Where practicable take all *General Waste** to a *Licensed General Waste Disposal Facility**.

Condition 21

The holder of the environmental authority must not dispose of more than 50 tonnes of *General Waste on the mining tenement per year.**

Note 29 - The holder of the environmental authority may bury up to 50 tonnes of general waste on the mining tenement per year. When burying general waste the following measures or similar measures should be used:

- locate the waste pit so as to ensure that the waste will not contaminate any watercourse, waterway, groundwater, wetland or lake;
- divert stormwater runoff from entering the pit;
- crush drums and other containers to reduce the volume of waste;
- make the pit safe and protect it from scavengers;
- backfill the pit when the level of rubbish in the pit is not less than 1m below the surface; and
- sufficiently overfill the pit to allow for settlement.

Note 30 – The holder of the environmental authority may dispose of limited regulated waste to a licensed general waste disposal facility provided the annual volume of limited regulated waste does not exceed 10% of the annual volume of general waste (e.g. tyres).

Service, Maintenance and Storage Areas

Condition 22

The holder of the environmental authority must not directly or indirectly release fuels, oils, lubricants or other contaminants to any watercourse, waterway, groundwater, wetland or lake.

Note 31 - To prevent the direct or indirect release of fuels, lubricants or other contaminants to any watercourse, waterway, groundwater, wetland or lake the following measures or similar measures can be used:

- maintain all refuelling equipment in good working order;
- use groundsheets or drip trays to capture spillage during maintenance of machinery and vehicles;
- locate all fuel storages within an impermeable bund;
- ensure all liquid containment, including fuel tank bunds and process water ponds, have a volume at least equal to the design volume plus an additional 10% of that volume; and
- where practical, undertake all refuelling and routine maintenance of vehicles within designated service areas.

Condition 23

The holder of the environmental authority must ensure that all chemical, fuel and oil storage facilities less than 10 000L on a mining tenement, must be designed and operated in accordance with Australian Standard 1940 – ‘The storage and handling of flammable and combustible liquids’, Section 2, Minor Storage.

Condition 24

The holder of the environmental authority must ensure that:

- (1) all chemical, fuel and oil storage facilities of more than 10 000 L on a mining tenement, must be banded to contain at least one hundred percent of the volume of the largest container, plus twenty-five percent of the storage capacity of the largest container up to a maximum of 10,000 L, together with ten percent of the storage capacity beyond 10, 000 L; and**
- (2) the facility must be operated and maintained in accordance with the Australian Standard 1940 – “The Storage and Handling of flammable and combustible liquids”.**

Drilling, Excavating and Sampling

Condition 25

The holder of the environmental authority must ensure:

- all marker pegs are marked with contrasting colour so as to be clearly visible;**
- all marker pegs are removed from the tenement at the completion of exploration activities;**
- all permanent markers (example, concrete plugs or steel plates) are installed at ground level and made safe.**

Condition 26

When drilling, excavating or sampling, the holder of the environmental authority must ensure that the area and duration of disturbance to land and vegetation is minimised.

Note 32 - When drilling, excavating or sampling the following measures or similar measures can be used to minimise the area and duration of disturbance to land and vegetation:

- consider seasonal influences, such as rainfall before excavating or establishing a drill site;
- construct drill pads no larger than necessary to safely accommodate the drilling rigs and ancillary equipment;
- use excavators or backhoes wherever possible in preference to bulldozers; and
- use drilling fluids and other process fluids which are non-toxic.

Note 33 - Prior to working in riverine areas refer to the “Technical Guidelines for the Environmental Management of Mining and Exploration in Queensland”, Part B, “Exploration and Mining in Watercourses”.

Note 34 - Install and maintain adequate warning signs, fences and rock bunds to exclude people, livestock and native animals from excavations and shafts.

Note 35 - Provide safe access to water for livestock and native animals by:

- providing hard surfaces around water storage areas; and
- fencing off any soft areas around the edge of water storage areas.

Condition 27

The holder of the environmental authority must not drill, excavate or clear vegetation:

- **in standing waters, wetlands or lakes; or**
- **on the sloped banks or within 3m of the top of the bank or 5m of the toe of the bank; or**
- **within, or on the levee banks of the normal flow channel.**

Note 36 - For representative diagrams that define the different landform elements that make up a watercourse refer to Figure 1 - Cross Section Through a Watercourse and Figure 2 – Plan View of a Watercourse.

Condition 28

The holder of the environmental authority must not directly or indirectly release wastewater to any watercourse, waterway, groundwater, wetland or lake.

Note 37 - To prevent the direct or indirect release of waste water to any watercourse, waterway or groundwater, wetland or lake the following measures or similar measures can be used:

- where practical recycle all waste water (e.g. recycle waste water for drilling water);
- use waste water for dust suppression;
- discharge waste water onto benign overburden or waste rock heaps for absorption; and
- discharge wastewater to an evaporation pond.

Note 38 - With regard to the on site management of water refer to the Environmental Protection (Water) Policy 1997.

Exploration drill holes

Condition 29

The holder of the environmental authority must decommission all non-artesian drill holes, apart from those still required for monitoring purposes as soon as practical, but no later than 6 months after the hole was drilled by undertaking the following actions:

- **where practical dispose of all unused drill chips to the hole or to a sump pit and;**
- **cap the hole at a depth that is appropriate for the previous land use of the area (unless the land owner stipulates a future use which requires the cap to be placed deeper); and**
- **backfill the hole above the cap with soil or material similar to the surrounding soil or material.**

Note 39 - The following depths are considered as appropriate for capping:

- surface level in rock outcrops; and
- at least 1 metre below the surface on land used for cropping; and
- at least 300 mm below the surface on other land.

Condition 30

The holder of the environmental authority must isolate non-artesian aquifers where a drill hole intersects more than one water bearing strata by casing or plugging the hole as soon as practical after the hole is no longer required, but no later than 2 months after the hole was drilled, apart from those holes that are still required for monitoring purposes if:

- the flow difference between aquifers exceeds 500 L/hour; and**
- the difference in electrical conductivity of water is greater than 10% of the lower value.**

Condition 31

Conditions 29 and 30 do not apply to a non-artesian exploration drill hole if:

- the land owner and the explorer have agreed that it should be left for conversion to a water bore; and**
- the landowner gives a written undertaking to accept responsibility for the hole; and**
- the details of the agreement and the drill hole (such as its GPS location and the drill logs showing the water bearing strata and flow rates) are provided to the Department of Natural Resources within 30 days of the land owner giving the undertaking; and**
- the hole is temporarily capped so as to prevent possible ingress of surface waters and associated sediments and pollutants.**

Note 40 - Drill holes that are to be converted to a water bore must be done so by a licensed water bore driller.

Condition 32

The holder of the environmental authority must ensure that exploration drill holes that strike artesian flows of water that exceeds 500 L/hour for seven days must be either:

- (1) decommissioned as soon as practical, but no later than 1 month after the hole was drilled, apart from holes that are still required for monitoring or evaluation purposes. Refer to Report No. SW4 – “Minimum Construction Requirements for Water Bores in Australia”, (ARMCANZ 1997); or**
- (2) capped to allow for future conversion into a controlled artesian bore by a licensed water bore driller; or**
- (3) converted into a controlled artesian bore by a licensed water bore driller, provided that:**
 - (a) the land owner has undertaken in writing to accept responsibility for the drill hole; and**
 - (b) the explorer provides details of the agreement and the drill hole to the Department of Natural Resources within 30 days of obtaining the landowner’s agreement.**

Note 41 - Provisions apply under the *Water Act 2000* with respect to the utilisation of ground water from boreholes in Proclaimed Areas (which include all Artesian Basin areas) and the rehabilitation of boreholes.

Condition 33

The holder of the environmental authority must ensure that exploration drill holes that are to be retained for future mineral resource evaluation purposes are cased and capped. Holes to be retained for more than three years must be capped with steel casing and appropriately identified.

Gridlines and Geophysical Surveys

Condition 34

The holder of the environmental authority must plan and determine the final position of gridlines and geophysical lines in consultation with the landowner.

Condition 35

When constructing gridlines and geophysical lines, the holder of the environmental authority must ensure that the area and duration of disturbance to land and vegetation is minimised.

Note 42 - When constructing gridlines and geophysical lines the following measures or similar measures can be used to ensure that the area and duration of disturbance to land and vegetation is minimised:

- conduct surveying of gridlines on foot;
- use existing gates, tracks, roads and seismic lines;
- before deciding on the location of new seismic lines, record the location of all underground or surface pipelines, cables, power lines, etc. and avoid these areas;
- in planning for drilling and sampling activities, where possible, ensure the activities occur at least 100m from riverine areas;
- construct seismic lines that do not exceed the width necessary to safely undertake the survey;
- use Global Positioning Systems (GPS), or other techniques, to reduce the need for line of sight clearing;
- maintain buffer widths of at least 25m between all disturbed areas;
- minimise the use of bulldozers and excavators when cutting gridlines and/or seismic lines; and
- notify landowners at least 24 hours prior to detonating seismic explosives.

Monitoring, Reporting and Emergency Response Procedures

Condition 36

The holder of the environmental authority must record and notify the administering authority of any emergency or incident which demonstrates non-compliance with the Standard Environmental Conditions.

Note 43 - A notification of any emergency or incident which demonstrates non-compliance to the standard environmental conditions can not be used in evidence in any further action taken by the administering authority as a result of the notification.

Note 44 - To demonstrate ongoing compliance with the standard environmental conditions, the holder complete Form 1, 'Monitoring and Record Keeping Summary' and establish programs to monitor project activities and maintain monitoring records for review by the administering authority.

Note 45 - To demonstrate compliance complete Form 2, 'Emergency Response Table'. Provide and maintain appropriate emergency response equipment and inform all operational personnel, contractors and visitors of emergency procedures.

Note 46 - Observe the provisions and regulations under the *Fire and Rescue Authority Act 1990* and the *Mines Regulation Act 1985*.

Rehabilitation

Condition 37

In *Riverine Areas, the holder of the environmental authority must complete the *Rehabilitation Processes** on all areas disturbed by mining activities, apart from those areas currently being utilised for mining activities, as soon as practical and prior to the onset of the wet season.**

Note 47 - Condition 37 is to ensure that there is adequate erosion protection in riverine areas prior to the onset of the wet season. In Queensland the wet season is generally considered to be from November to April each year.

Condition 38

For all other areas on the mining tenement, the holder of the environmental authority must complete the rehabilitation processes on all areas disturbed by mining activities, apart from those areas currently being utilised for mining activities, as soon as practical and at least within six months of the completion of works in those areas.

Note 48 – Where practical undertake progressive rehabilitation wherever possible.

Condition 39

The holder of the environmental authority must backfill all excavations, drill holes or sampling sites as soon as practical following the completion of exploration activities.

Condition 40

Condition 39 does not apply to any excavations, drill holes or sampling sites that are to remain after the completion of exploration activities, by agreement with the land owner.

Condition 41

The holder of the environmental authority must rehabilitate areas disturbed by mining activities to a stable landform similar to that of surrounding undisturbed areas.

Note 49 - When rehabilitating disturbed areas refer to the “Technical Guidelines for the Environmental Management of Mining and Exploration in Queensland”, Part D, ‘Geo-technical Slope Stability’.

Condition 42

The holder of the environmental authority must spread seeds or plant species that will promote vegetation of a similar species and *Density of Cover to that of the surrounding undisturbed areas or vegetation that is appropriate for providing erosion control and stabilisation of the disturbed areas.**

Note 50 - To revegetate disturbed areas the following measures or similar measures can be used:

- for areas which have become compacted during the project, break up the soil surface to a depth that is suitable for establishing vegetation; and
- spread stockpiled topsoil over disturbed areas to a depth that is suitable as a rooting medium for the revegetation process; and
- provide suitable nutrient conditions for planting by using fertiliser if necessary; and
- collect and store native seeds to be used in rehabilitation.

Note 51 - When revegetating disturbed areas, the holder of the environmental authority should plant native species endemic to the area and location in the landscape (e.g. if clearing has occurred in a riverine area, revegetate the disturbed area using local riverine species).

Note 52 - Vegetation used to provide erosion protection and stabilise disturbed areas in the short term should be comprised of sterile, short-lived species (e.g. a cover crop). However, the long term aim of revegetating any disturbed area is to establish a stable vegetation community that is similar to that of the surrounding undisturbed areas or endemic species.

Note 53 - The environmental authority holder is not liable for rehabilitating disturbed areas that existed prior to the grant of the tenure unless those areas are disturbed during the term of the tenure.

Condition 43

For any *Mine Infrastructure to remain after all mining activities have ceased, the holder of the environmental authority must obtain the written agreement of the land owner stating they will take over responsibility for that infrastructure.**

Condition 44

The holder of the environmental authority must complete rehabilitation of disturbed areas to the satisfaction of the administering authority.

Note 54 - Condition 44 is a requirement of the *Environmental Protection Act 1994*. The environmental authority holder must submit a *Final Rehabilitation Report* (FRR) and an *Environmental Audit Statement* (EAS) prior to the cancellation or expiry of the mining tenement. The surrender of the environmental authority will not be granted until the administering authority has accepted the FRR and the EAS.

4.0 DEFINITIONS

Administering authority - Means -

- (a) for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the *Environmental Protection Act 1994*; or
- (b) for all other matters - the Chief Executive of the Environmental Protection Agency; or
- (c) another State Government Department, Authority, Storage Operator, Board or Trust, who's role is to administer provisions under other enacted legislation (e.g. Department of Natural Resources who licence referable dams under the Water Act 2000).

Annual exceedence probability (AEP) - For a given rainfall event the AEP is the probability that the event will be exceeded within a one year period. The AEP is usually expressed as a one in 'n' (years) or a percentage.

Approved form - Means a form approved by the administering authority.

Archaeological site - A site that has physical evidence of the past, which has the potential to increase our knowledge of earlier human occupation, activities and events.

Artesian drill hole - An exploration drill hole from which water freely flows at a rate of greater than 500 L/hour for at least 7 days after being drilled.

Banks - The feature which confines major flows within a watercourse. They are steeper than a terrace and are generally of a slope greater than 1:1 on outer bends. Refer to Figure 1 – Cross Section through a Watercourse.

Bund - (a) An earth mound or similar structure (e.g. a concrete block wall), whether impervious or not, constructed to contain spilled material (e.g. petrol, diesel, oil etc); or
(b) a structure to prevent or reduce soil erosion.

Campsite - The area encompassing any dwelling, amenities (e.g. toilet block, power generator), sewage or general waste disposal facility and includes the office area and vehicle parking areas associated with a temporary or permanent mining camp.

Contaminant - The *Environmental Protection Act 1994* defines, under Section 11, a contaminant as:

- (a) a gas, liquid or solid; or
- (b) an odour; or
- (c) an organism (whether alive or dead), including a virus; or
- (d) energy, including noise, heat, radioactivity and electromagnetic radiation; or
- (e) a combination of contaminants.

Contamination - Section 10 of the *Environmental Protection Act 1994* defines contamination of the environment as the release (whether by act or omission) of a contaminant into the environment.

Contaminated land - Schedule 3 of the *Environmental Protection Act 1994* defines contaminated land as land contaminated by a hazardous contaminant. (See below for a definition of hazardous contaminant.)

Contaminated land register - Means the register kept by the administering authority under section 541 of the *Environmental Protection Act 1994*.

Contour banks - Are mounds of earth constructed along the contours of the land to reduce the amount and velocity of run-off down the slope.

Costeaning - The digging of a trench or pit across the seam or ore body for exposing, sampling and mapping of the ore body.

Culvert - A covered channel, or a pipe of large diameter conveying water below ground level. Also applies to a tunnel through which water is pumped or permitted to flow.

Declared plant area - Areas designated by the Department of Natural Resources or Local Government as areas infested with plants declared under section 69 of the *Rural Lands Protection Act 1985* (section 70 (3) lists the categories of declared plants).

Declared plant - A plant that has been declared under the *Rural Lands Protection Act 1985*.

Density of cover - In reference to trees and/or shrubs, it means the number of trees or shrubs in a specified area (e.g. 50 trees per square kilometre). With reference to understorey plant species (e.g. grasses and forbs), it means the percentage of surface area covered by a particular species.

Designated service area - Is a nominated site, selected and managed to minimise contamination of land or water, where the majority of services or maintenance of machinery or plant is to be conducted.

Disturbed - Any area that has had its natural state altered by the action or interference of carrying out an activity associated with the exploration project.

Environment - Section 8 of the *Environmental Protection Act 1994* defines the environment as:

- (a) ecosystems and their constituent parts, including people and communities; and
- (b) all natural and physical resources; and
- (c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and
- (d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).

Environmental audit statement - Verifies the accuracy of the final rehabilitation report and identifies any residual financial assurance requirements.

Environmental authority - Means a licence or approval issued by the administering authority under the *Environmental Protection Act 1994*.

Environmental management register - Means the register kept by the administering authority under section 541 of the *Environmental Protection Act 1994*.

Environmental nuisance - Section 15 of the *Environmental Protection Act 1994* defines environmental nuisance as “unreasonable interference or likely interference with an environmental value” caused by:

- (a) noise, dust, odour, light; or
- (b) an unhealthy, offensive or unsightly condition because of contamination; or
- (c) another way prescribed by regulation. (e.g. unreasonable noise or dust emissions)”

Environmental protection policy - Means an environmental protection policy approved under chapter 2 of the *Environmental Protection Act 1994*.

Environmental relevant activity - Means an activity prescribed by regulation as an environmental relevant activity.

Environmentally sensitive areas - Refers to locations, however large or small, that have environmental values that contribute to maintaining biological diversity and integrity, have intrinsic or attributed scientific, historical or cultural heritage value, or are important in providing amenity, harmony or sense of community. Refer to Appendix A.

Environmental value - Section 9 of the *Environmental Protection Act 1994* defines an environmental value as:

- (a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
- (b) another quality of the environment identified and declared to be an environmental value under an Environmental Protection Policy or Regulation (e.g. water suitable for swimming in or drinking)

Ethnographic site - An archaeological site of particular importance to the study of a cultural group.

Final rehabilitation report - Means a final rehabilitation report prepared under chapter 5, part 10, division 2, subdivision 2 of the *Environmental Protection Act 1994*. The report assesses the extent to which the standard environmental conditions and any additional conditions of the environmental authority have been met.

Financial assurance - Means a security deposit, either cash or a bank guarantee, that is held by the administering authority to cover the potential:

- (a) costs to rehabilitate areas disturbed by mining activities; and
- (b) costs to restore property improvements disturbed by mining activities; and
- (c) failure of the tenure holder to pay rents and royalties.

Flood flow channel - For a representative drawing of a flood flow channel refer to Figure 1- ‘Cross Section Through a Watercourse’ and Figure 2 – ‘Plan View of a Watercourse’.

General waste - Schedule 9 of the *Environmental Protection Regulation 1998* defines general waste as “means waste other than regulated waste”. Waste rock, overburden and the contents of tailings dams are not included in the definition of general waste for the purposes of these conditions.

Guidelines for livestock drinking water - Recommended water quality guidelines for livestock drinking water. Refer to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 1992.

Hazardous contaminant - Schedule 3 of the *Environmental Protection Act 1994* defines a hazardous contaminant as “a contaminant that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause serious or material environmental harm because of:

- (a) its quantity, concentration, acute or chronic toxic effects, carcinogenicity, teratogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity, flammability; or
- (b) its physical, chemical or infectious characteristics (e.g.: spills of mercury, cyanide, petrol, diesel or oil)”.

Historical site - A site containing objects from the past that allows the study of the way people lived and worked at that place in the past.

Infrastructure - Project infrastructure includes roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, pipelines, powerlines, airstrips, helipads etc, which are constructed or installed specifically for the project.

Lake - A natural or artificial body of water, either permanent or intermittent.

Landowner - Schedule 3 of the *Environmental Protection Act 1994* defines the owner of the land as –

1. The “**owner**” of land is—

- (a) for freehold land—the person recorded in the freehold land register as the person entitled to the fee simple interest in the land; or
- (b) for land held under a lease, licence or permit under an Act—the person who holds the lease, licence or permit; or
- (c) for trust land under the *Land Act 1994*—the trustees of the land; or
- (d) for Aboriginal land under the *Aboriginal Land Act 1991*—the persons to whom the land has been transferred or granted; or
- (e) for Torres Strait Islander land under the *Torres Strait Islander Land Act 1991*—the persons to whom the land has been transferred or granted; or
- (f) for land for which there is a native title holder under the Commonwealth Native Title Act—each registered native title party in relation to the land.

2. Also, a mortgagee of land is the owner of the land if—

- (a) the mortgagee is acting as a mortgagee in possession of the land and has the exclusive management and control of the land; or
- (b) the mortgagee, or a person appointed by the mortgagee, is in possession of the land and has the exclusive management and control of the land.

Licensed general waste disposal facility - A site authorised by the administering authority to receive general waste or limited regulated waste (e.g. a rubbish dump).

Limited regulated waste - Schedule 9 of the *Environmental Protection Regulation 1998*, defines limited regulated waste. The only limited regulated wastes relevant to mining projects are asbestos and tyres.

Material environmental harm - Section 16 of the *Environmental Protection Act 1994* defines material environmental harm as:

- (1) material environmental harm is environmental harm (other than environmental nuisance)-
 - (a) that is not trivial or negligible in nature, extent or context; or
 - (b) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount but less than the maximum amount; or
 - (c) that results in costs of more than the threshold amount but less than the maximum amount being incurred in taking appropriate action to -
 - i. prevent or minimise the harm; and
 - ii. rehabilitate or restore the environment to its condition before the harm.

In this section -

“maximum amount” means the threshold amount for serious environmental harm.

“threshold amount” means \$5 000 or, if a greater amount is prescribed by regulation, the greater amount.

Mine - Section 6A of the *Mineral Resources Act 1989*, defines mining as –

- (1) **“Mine”** means to carry on an operation with a view to, or for the purpose of -
 - (a) winning mineral from a place where it occurs; or
 - (b) extracting mineral from its natural state; or
 - (c) disposing of mineral in connection with, or waste substances resulting from, the winning or extraction.
- (2) For subsection (2), extracting includes the physical, chemical, electrical, magnetic or other way of separation of a mineral.
- (3) Extracting includes, for example, crushing, grinding, concentrating, screening, washing, jigging, tabling, electro winning, solvent extraction electro winning (SX-EW), heap leaching, flotation, fluidised bedding, carbon-in-leach (CIL) and carbon-in-pulp (CIP) processing.
- (4) However, extracting does not include -
 - (a) a process in a smelter, refinery or anywhere else by which mineral is changed to another substance; or
 - (b) testing or assaying small quantities of mineral in teaching institutions or laboratories, other than laboratories situated on a mining lease; or
 - (c) an activity, prescribed under a regulation, that is not directly associated with winning mineral from a place where it occurs.
- (5) For subsection (1)(c), includes the disposal of tailings and waste rock.
- (6) A regulation under subsection (4)(c) may prescribe an activity by reference to the quantities of minerals extracted or to any other specified circumstances.

Native vegetation - Vegetation that occurs naturally in a certain area.

Noise sensitive place - Means any of the following places –

- (a) a dwelling;
- (b) a library, childcare centre, kindergarten, school, college, university or other educational institution;
- (c) a hospital, surgery or other medical institution;
- (d) a protected area or an area identified under a conservation plan as a critical habitat or an area of major interest, under the *Nature Conservation Act 1992*;
- (e) a marine park under the *Marine Parks Act 1982*; and
- (f) a park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment).

Normal flow channel - For a representative drawing of a normal flood flow channel of a water course refer to Figure 1- ‘Cross Section Through a Watercourse’ and Figure 2 - ‘Plan View of a Watercourse’.

Notifiable activity - Means an activity in schedule 2 of the *Environmental Protection Act 1994*.

Outer bends - For a representative drawing of an outer bend of a watercourse refer to Figure 1– “Cross Section Through a Watercourse” and Figure 2 – “Plan View of a Watercourse”.

Overburden - Material overlying a mineral ore deposit, up to but not including the topsoil.

Referable dam - The *Water Resources Act 1989* defines referable dams as -

- (a) works or proposed works that include or would include a barrier whether permanent or temporary that does or could or would impound, divert or control water, which barrier-
 - (i) is more than 8 m in height and has a storage capacity of more than 500 ML; or
 - (ii) is more than 8 m in height and has a storage capacity of more than 250 ML and a catchment area that is more than 3 times its maximum surface area or full supply level;
 - (b) works -
 - (i) that consist of or include or would consist of or include a barrier whether permanent or temporary that does or could or would impound, divert or control water or hazardous waste, other than a barrier defined in paragraph (a);
 - (ii) other than a barrier whether permanent or temporary that does or could or would impound, contain, divert or control hazardous waste;
- declared by the chief executive by notification published in the gazette to be a referable dam by reason of the danger to life or property that could or would eventuate upon the collapse or failure of or the escape of hazardous waste from those works and includes the storage areas created by the works but does not include a tank constructed of steel or concrete or a combination of those materials.

The term does not include a weir, other than a weir that has a variable flow control structure on the crest of the weir.

Regulated waste - Schedule 9 of the *Environmental Protection Regulation 1998* defines regulated waste as non-domestic waste mentioned in schedule 7 (whether or not it has been treated or immobilised), and includes -

- (a) for an element - any chemical compound containing the element; and
- (b) anything that has contained the waste.

(e.g. Regulated waste commonly generated from mining projects include tyres, oils, cyanide, mercury and batteries)

Rehabilitation processes - The measures and actions taken to achieve rehabilitation outcomes, including any or all of the following:

- removing all unwanted infrastructure;
- backfilling mine excavations (e.g. pits) and capping drill holes;
- reshaping the land surface to a stable landform similar to that of surrounding undisturbed areas;
- spreading of topsoil;
- spreading seed or planting seedlings to promote revegetation;
- benching ridge cuts and removing any overhanging material.

Riverine area - Refers to the land adjoining and associated with watercourses, including the bed, banks, adjoining terraced land and riparian vegetation. Refer to Figure 1 – “Cross Section Through a Watercourse”.

Sediment pond - A bunded or excavated structure used to contain and settle waterborne sediment running off disturbed areas.

Sediment trap - A device used to filter waterborne sediment running off disturbed areas. May include silt fences, hay bales or grassed strips.

Serious environmental harm - Section 17 of the *Environmental Protection Act 1994* defines serious environmental harm as -

- (1) environmental harm (other than environmental nuisance)
 - (a) that causes actual or potential harm to environmental values that is irreversible, of a high impact or widespread; or
 - (b) that causes actual or potential harm to environmental values of an area of high conservation value or special significance; or
 - (c) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount; or
 - (d) that results in costs of more than the threshold amount being incurred in taking appropriate action to-
 - (i) prevent or minimise the harm; and
 - (ii) rehabilitate or restore the environment to its condition before the harm.

In this section - “**Threshold amount**” means \$50 000 or, if a greater amount is prescribed by regulation, the greater amount.

Significantly disturbed land - Land is significantly disturbed if –

- (a) it is contaminated land; or
- (b) it has been disturbed and human intervention is needed to rehabilitate it.

Significantly disturbed land includes:

- areas where soil has been compacted, removed, covered, exposed or stockpiled;
- areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion; (vegetation & topsoil)
- areas where land use suitability or capability has been diminished;
- areas within a watercourse, waterway, wetland or lake where mining project activities occur;
- areas submerged by tailings or hazardous contaminant storage and dam walls in all cases;
- areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after mining has ceased; or
- areas where land has been contaminated.

However, the following areas are not included:

- areas off lease (e.g. roads or tracks which provide access to the mining lease);
- areas previously significantly disturbed which have achieved the rehabilitation outcomes;
- by agreement with the EPA, areas previously significantly disturbed which have not achieved the rehabilitation objectives due to circumstances beyond the control of the mine operator (such as climatic conditions);
- areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be left by agreement with the landowner. The agreement to leave permanent infrastructure must be recorded in the Landowner Agreement and lodged with the EPA;
- disturbances that pre-existed the grant of the tenure unless those areas are disturbed during the term of the tenure.

Site management plan - Means a site management plan approved under chapter 7, part 8 of the *Environmental Protection Act 1999*.

Standard criteria - Are defined in schedule 3 of the *Environmental Protection Act 1994*. They are:

- (a) the principles of ecological sustainable development; and
- (b) any applicable environmental protection policy; and
- (c) any applicable Commonwealth, State or local government plans, standards, agreements or requirements; and
- (d) any applicable environmental impact study, assessment or report; and
- (e) the character, resilience and values of the receiving environment; and
- (f) all submissions made by the applicant and interested parties; and
- (g) best practice environmental management; and
- (h) financial implications; and
- (i) the public interest; and
- (j) any applicable site management plan; and
- (k) any other matter prescribed under a regulation.

Standard environmental conditions - For an environmental authority, means the standard environmental conditions approved for the authority under section 549 of the *Environmental Protection Act 1994*.

Standard mining activity - Means a mining activity decided to be a standard activity under section 151 of the *Environmental Protection Act 1994*.

Suitability statement - The *Environmental Protection Act 1994* defines a suitability statement as:

for land, means a statement about the uses and activities for which the land is suitable.

Technical guidelines - Guidelines that indicate best practice environmental management.

Topsoil - The surface layer of a soil profile, which is usually more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300mm in depth from natural surface.

Unreasonable noise - Section 18 of the Environmental Protection (Noise) Policy 1997 defines unreasonable noise as - noise that

- (a) causes unlawful environmental harm; and
- (b) is unreasonable, having regard to the following matters:
 - (i) its characteristics;
 - (ii) its intrusiveness;
 - (iii) the time at which it is made;
 - (iv) where it can be heard;
 - (v) other noises ordinarily present at the place where it can be heard; and
- (c) is not declared to be reasonable in Schedule 2 of the Environmental Protection (Noise) Policy 1997 'Reasonable Noise Levels'.

Unreasonable release - of a contaminant to the air environment, means a release of odours, dust, smoke or other atmospheric contaminants, that:

- (a) cause unlawful environmental harm; and
- (b) is unreasonable having regard to the following matters:
 - (i) its characteristic;
 - (ii) its intrusiveness;
 - (iii) other releases of contaminants at the place affected by the release;
 - (iv) where the effect of the release of the contaminants can be noticed; or
 - (v) the order in which the person releasing the contaminant started to carry out the activity from which the release is made and persons affected by the release started to carry out other activities that may be affected by the release of the contaminant.

Watercourse - Means a river, creek or stream in which water flows permanently or intermittently in a visibly defined channel (natural, artificial or artificially improved) with clear bed and banks and evidence of biological dependence.

Waterway - A naturally occurring feature where surface water runoff normally collects, such as a clearly defined swale or gully, but only flows in response to a local rainfall event.

Wetland - Are areas of permanent or periodic/intermittent inundation, whether natural or artificial, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6m. Wetlands typically include areas such as lakes, swamps, marshes, estuaries or mudflats.

5.0 TECHNICAL GUIDELINES

Australian Standard 1940 - The storage and handling of flammable and combustible liquids. Standards Australia (1993).

Australian Water Quality Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council (1992).

Commonwealth Best Practice Environmental Management in Mining Guidelines, Environment Australia.

Dredging, Extraction and Spoil Disposal, Fish Habitat Management Operational Policy: FHMOP 004, Department of Primary Industries (1998).

Farm Water Supplies Design Manual, Department of Primary Industries, (1992).

Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland, Department of Natural Resources (1998).

Soil Erosion and Sediment Control - Engineering Guidelines for Queensland Construction Sites, The Institution of Engineers, Australia, Queensland Division (1996).

Technical Guidelines for Environmental Management of Exploration and Mining, Department of Mines and Energy, Queensland, 1995.

The Conservation Status of Queensland's Bioregional Ecosystems, Environmental Protection Agency (1999).

6.0 RELEVANT LEGISLATION

State Legislation (published by Go Print, Queensland):

Aboriginal Lands Act 1991

Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987

Environmental Protection Act 1994

Environmental Protection Regulation 1998

Fire and Rescue Authority Act 1990

Fisheries Act 1994

Land and Resources Tribunal Act 1999

Land Act 1994

Mineral Resources Act 1989

Mineral Resources Regulation 1990

Mines Regulation Act 1985

Nature Conservation Act 1992

Queensland Heritage Act 1992

Torres Strait Islander Land Act 1991

Water Act 2000

Water Resources Act 1989

Commonwealth Legislation:

Native Title Act 1993

Environment Protection and Biodiversity Conservation Act 1999

APPENDIX A - ENVIRONMENTALLY SENSITIVE AREAS

Category A - Environmentally Sensitive Areas

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTRATING AUTHORITY
National Parks (Scientific); National Parks; National Parks (Aboriginal Land); National Parks (Torres Strait Islander Land); National Parks (Recovery); and Conservation Parks	Nature Conservation Act 1992	Environmental Protection Agency
Wet Tropics	Wet Tropics World Heritage Protection and Management Act 1993	Wet Tropics Management Authority
Restricted Areas (includes Constructed Water Reservoirs)	Mineral Resources Act 1989	Department of Mines and Energy
Great Barrier Reef Marine Park Region	Great Barrier Reef Marine Park Act 1975 (Cwlth)	Great Barrier Reef Marine Park Authority
Marine Parks (other than general use zones)	Marine Parks Act 1982 (Qld)	Environmental Protection Agency

Category B - Environmentally Sensitive Areas

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTRATING AUTHORITY
<p>Coordinated Conservation Areas;</p> <p>Wilderness Areas;</p> <p>World Heritage Management Areas;</p> <p>International Agreement Areas;</p> <p>An area of Critical Habitat or Major Interest identified under a Conservation Plan;</p> <p>Areas subject to an Interim Conservation Order; and</p> <p>Forest Reserves.</p>	Nature Conservation Act 1992	Environmental Protection Agency
<p>An area subject to following conventions:</p> <p>(a) Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 23 June 1979);</p> <p>(b) Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, 2 February 1971); and</p> <p>(c) Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 16 November 1972).</p>	International Conventions	Environmental Protection Agency
General Use Zones of a Marine Park	Marine Parks Act 1982	Environmental Protection Agency
An Area to the Seaward Side of the Highest Astronomical Tide	Nil	Environmental Protection Agency

Category B - Environmentally Sensitive Areas (continued)

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTRATING AUTHORITY
Place of Cultural Heritage Significance; Protected Area; Registered Places; and Restricted Zone.	Queensland Heritage Act 1992 Queensland Heritage Act 1992	Environmental Protection Agency Environmental Protection Agency
Designated Landscape Area (other than the area known as the 'Stanbroke Pastoral Holding')	Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987	Environmental Protection Agency
Feature Protection Area, State Forest Park or a Scientific Area	Forestry Act 1959	Department of Natural Resources
Fish Habitat Area; and A place in which a Marine Plant is situated	Fisheries Act 1994	Department of Primary Industries
Endangered Regional Ecosystems; and An area of High Nature conservation Value	Nil	Environmental Protection Agency

Category C - Environmentally Sensitive Areas

LAND AREA CLASSIFICATION	ADMINISTERING LEGISLATION	ADMINISTRATING AUTHORITY
Nature Refuges; and Resource Reserves	Nature Conservation Act 1992	Environmental Protection Agency
Declared Catchment Areas; Declared Irrigation and Irrigation Project Areas; and Water Reservoirs and Drainage Areas.	Water Act 2000, various Water Board Acts	Department of Natural Resources and/or Relevant Storage Operator or Board
River Improvement Areas	River Improvement Trust Act 1940	Department of Natural Resources and the Relevant River Trust
Designated Landscape Area (e.g. Stanbroke Pastoral Holding)	Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987	Environmental Protection Agency
Historic Mining Sites	Nil (Inter Departmental Notifications)	Environmental Protection Agency and the Department of Mines and Energy
State Forest or Timber Reserves	Forestry Act 1959	Department of Natural Resources
DPI Research Sites	Nil (Inter Departmental Agreement)	Department of Primary Industries
Critical Areas and Public Purpose Reserves	Land Act 1994	Department of Natural Resources
Areas under Coastal Management Plans and Control Districts	Coastal Protection and Management Act 1995	Environmental Protection Agency
An area subject to a State Planning Policy that the policy declares is in need of environmental protection.	Integrated Planning Act 1997	Environmental Protection Agency
Erosion Prone Areas and Coastal Management Control Districts	Beach Protection Act 1968	Environmental Protection Agency
Areas of land occupied by the Bureau of Sugar Experiment Stations to conduct research	Sugar Industry Act 1999	Department of Primary Industries

APPENDIX B

FORM 1 MONITORING AND RECORD KEEPING SUMMARY

Environmental Authority No:

Project No:

Term of Plan (yrs):

Commencement date:

Data and Information	Method Of Record Keeping To Be Used				Frequency
	site plans	journal	photographs	Other	
Topsoil stripping and stockpiling (e.g. record topsoil stockpiles, location and age)					
Area disturbed and rehabilitation (e.g. map of the area of disturbance and photos of rehabilitation)					
Pre and post-mine landform (e.g. record photographs of the area prior to and following mining)					
Water discharge quality (e.g. note colour of discharge water from sediment dams)					
Dam maintenance (e.g. record of dam maintenance such as sediment removal)					
Record of complaints (e.g. air, noise, tracks etc) (e.g. record in journal any complaints received by adjoining land owner, actions taken and the outcomes of the action)					
Site specific conditions (e.g. record of monitoring to demonstrate compliance with any site specific conditions)					
Remediation of contaminated land (e.g. record of current and remediated contaminated land)					
Waste Management (e.g. record of waste taken to a regulated waste collection depot)					
Rehabilitation quotes, estimates and actual costs					
Others – relevant to performance category					

FORM 2 Emergency Response Table

Emergency situation	Who to contact in case of emergency situation occurring	Equipment required to be kept and maintained on site	Procedure to be followed in case of emergency situation occurring
Hydrocarbon spill causing serious or material environmental harm			
Chemical spill causing serious or material environmental harm			
Other			

FORM 3 SCHEDULE OF REHABILITATION COSTS

TOTAL AREA OF DISTURBANCE	REHABILITATION TYPES	
	Low Risk Simple straightforward rehabilitation. Successful rehabilitation of analogous sites has previously been achieved	HIGH RISK Difficult rehabilitation (e.g. dispersive soils, steep topography, remoteness, sensitive areas, etc.)
Category 1 — Less than 1 hectare	\$2,500	\$5,000
Category 2 — 1 to 4 hectares	\$10,000	\$20,000
Category 3 — 4 to 10 hectares	\$20,000	\$40,000

Notes: The final assurance for each category are based on rehabilitating the maximum area in that category (e.g. financial assurance for 1 to 4 hectares is based on the cost of rehabilitating 4 hectares). The Financial Assurance for environmental authority with additional conditions attached allow that the operator to disturb more than 10ha, will be calculated using the above schedule with the additional area of disturbance calculated according to the relevant category. For example, the financial assurance for 18ha of low risk disturbance will be \$40,000 (i.e. \$20,000 for the first 10ha and another \$20,000 for the extra 8ha because it is also in category 3).

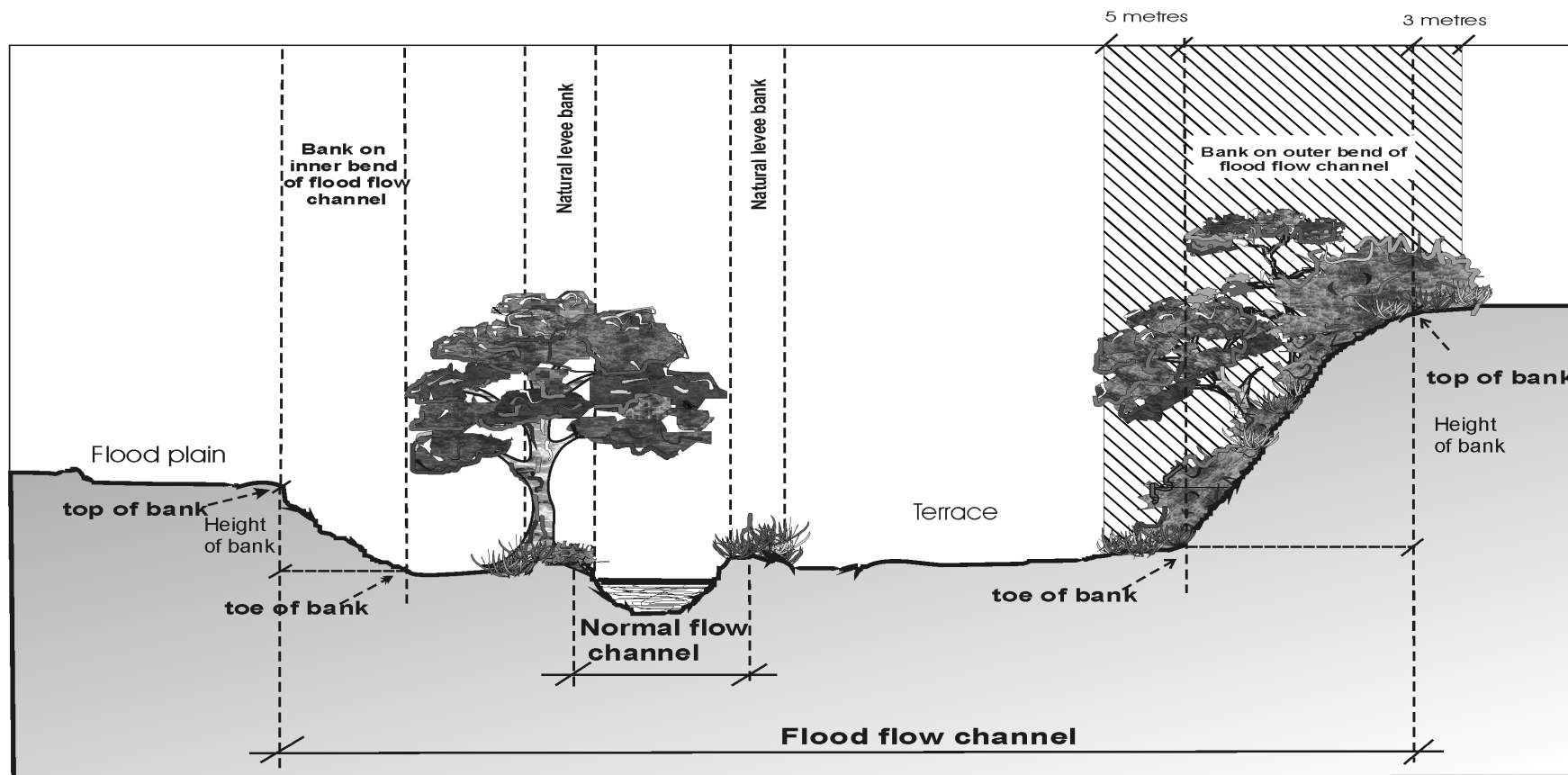
Cross section through a watercourse

showing sections of the banks of the flood flow channel where mining is not permitted.

Figure 1

(not to scale)

Mining is not permitted in the areas shown as

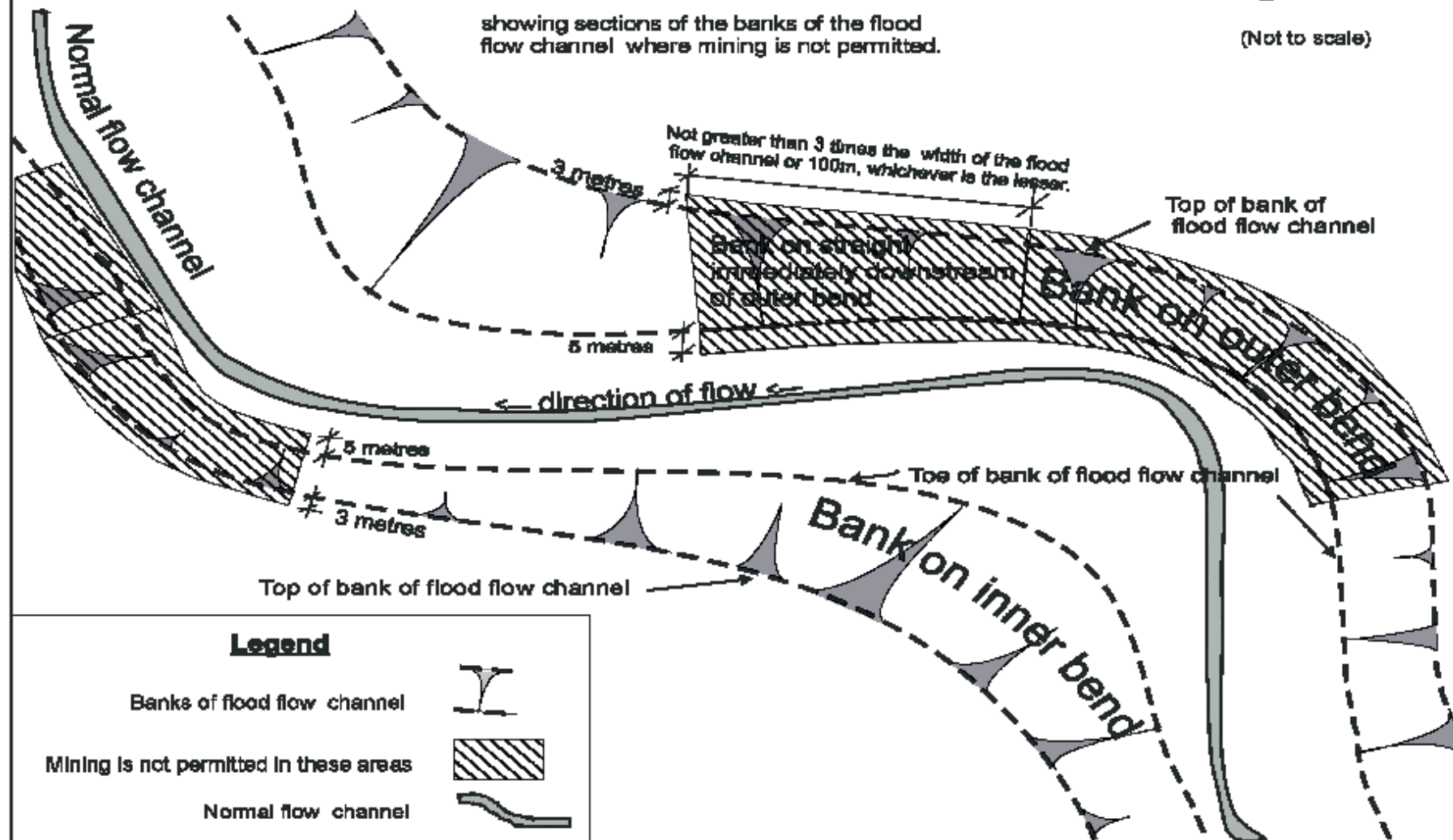


Plan view of watercourse

showing sections of the banks of the flood flow channel where mining is not permitted.

Figure 2

(Not to scale)





Queensland
Government

Enquiries
Telephone
Your reference MIN100748608
Our reference ISA539

Department of
Environment and Resource
Management

25 November 2010

DEPT OF ENVIRONMENT
& RESOURCE MANAGEMENT

Chief Geologist
PO Box 3057
Adelaide Terrace
PERTH WA 6832

25 NOV 2010
ISA 539-2
ISA 2010/1468

Dear Sir,

Compliance Inspection of Mount Oxide Environmental Authority MIN100748608

As you are aware, Department of Environment and Resource Management (the department) officers conducted a compliance inspection on 4 November 2010 at Mount Oxide situated on EPM 10313 to assess compliance with Environmental Authority MIN100748608 issued under the *Environmental Protection Act 1994*.

The purpose of this letter is to detail the non compliances/areas of concern arising from the compliance inspection and to further reiterate the importance of preparing Mount Oxide for the up coming wet season.

Compliance issues

At the time of the inspection the following non compliances with the license and areas of concern were identified by the Department:

- Three (3) non-compliances with Environmental Authority MIN100748608; and
- One (1) areas of concern.

Specifically, the following conditions were found to be in non-compliance with Environmental Authority MIN100748608.

Condition number	Details of non-compliance
G4	<p><i>The Environmental Authority holder must comply with each of the Standard Environmental Conditions contained in the Code of Environmental Compliance for Exploration and Mineral Development Projects.</i></p> <p>Conditions of the Code of Environmental Compliance for Exploration and Mineral Development Projects have not been complied with. Details are as follows.</p>
Condition 23 of the Code.	<p><i>The holder of the environmental authority must ensure that all chemical, fuel and oil storage facilities less than 10,000L on a mining tenement, must be designed and operated in accordance with Australian Standard 1940- "The storage and handling of flammable and combustible liquids" section 2 minor storage.</i></p> <p>DERM officer's observed drums of hydrocarbon and oils stored in unbunded areas on the mining tenement. Hydrocarbons must be stored in properly banded locations in accordance with AS1940.</p>
Condition 33 of the Code.	<p><i>The holder of the environmental authority must ensure that exploration drill holes that are to be retained for future mineral resource evaluation purposes are cased and capped. Holes to be retained for more than three years must be capped with steel casing and appropriate.</i></p> <p>An exploration drill hole to be retained for future mineral resource evaluation purposes located close to Ernest Henry Cave, was not capped or cased and was leaking water.</p>

Areas of Concern

Areas of concern are areas or issues noted which might not technically form a contravention of the Environmental Authority, however rectification of these issues is recommended to ensure compliance with your general environmental duty. Those identified during the site inspection are as follows:

The holder of the environmental authority holder must design, install and maintain adequate banks and/or diversion drains to minimise the potential for storm water runoff to enter disturbed areas.

Exploration tracks on top of waste rock dumps and the pit rim must have adequate diversion drains or banks to minimise storm water entering these areas. Due to the steep topography of the area, stormwater runoff could lead to significant erosion and sediment issues downstream.

Wet Season preparations


Heavy rainfall that can be experienced on site during the North Queensland wet season has the potential to mobilise contaminants. The release of contaminants to the receiving environment that has the potential to cause environmental harm is not authorised in your environmental authority.

Potential issues which may arise at Mount Oxide during the wet season can include but are not limited to:

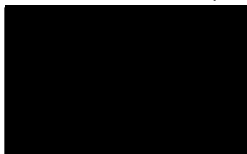
- Erosion and sediment control;
- Stormwater contamination;
- Discharges from hydrocarbon storage areas; and
- Overflows from sewage treatment plants.

As the holder of environmental authority MIN100748608 you are required to comply with all conditions of that authority. Furthermore, under the *Environmental Protection Act 1994* you have a general environmental duty, which requires you to take all reasonable and practicable measures to prevent environmental harm. Leading into the upcoming wet season, it is expected that you take all reasonable and practicable measures in accordance with your general environmental duty to prevent environmental harm.

The department acknowledges that actions to rectify these above detailed non-compliances have already commenced and that all drill pads will be rehabilitated by early December 2010 at Mount Oxide.

If you have any questions regarding the content of this letter, please don't hesitate to contact me on 

Yours sincerely



Manager

Mining & Heavy Industry

Regional Services

Department of Environment and Resource Management



Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1105224	Page	: 1 of 5
Client	: QUEENSLAND DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT	Laboratory	: Environmental Division Brisbane
Contact	: [REDACTED] R	Contact	: Customer Services
Address	: P O BOX 2066 CAIRNS QLD, AUSTRALIA 4870	Address	: [REDACTED]
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Facsimile	: [REDACTED]	Facsimile	: [REDACTED]
Project	: Helicopter Sampling (Mt Oxide & Lady Annie)	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 17-MAR-2011
Sampler	: [REDACTED]	Issue Date	: 28-MAR-2011
Site	: ----		
Quote number	: BN/060/10	No. of samples received	: 8
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

This document is issued in
accordance with NATA
accreditation requirements.

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics

Environmental Division Brisbane
Part of the **ALS Laboratory Group**

32 Shand Street Stafford QLD Australia 4053
Tel. +61-7-3243 [REDACTED] Fax. +61-7-3243 7218 www.alsglobal.com
A Campbell Brothers Limited Company



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- Ionic balances are within acceptable limits as detailed in the 21st Ed. APHA "Standard Methods for the Examination of Water and Wastewater".



Analytical Results

Sub-Matrix: **SOIL**

Client sample ID

Client sampling date / time

				HB160311036	HB160311040			
				16-MAR-2011 15:00	16-MAR-2011 15:00			
Compound	CAS Number	LOR	Unit	EB1105224-004	EB1105224-008			
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	28.3	24.2	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	80	14	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	5	16	----	----	----
Copper	7440-50-8	5	mg/kg	975	69	----	----	----
Lead	7439-92-1	5	mg/kg	14	<5	----	----	----
Nickel	7440-02-0	2	mg/kg	21	8	----	----	----
Zinc	7440-66-6	5	mg/kg	9	16	----	----	----



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				HB160311033	HB160311034	HB160311035	HB160311037	HB160311038
				16-MAR-2011 15:00	16-MAR-2011 15:00	16-MAR-2011 15:00	16-MAR-2011 15:00	16-MAR-2011 15:00
Compound	CAS Number	LOR	Unit	EB1105224-001	EB1105224-002	EB1105224-003	EB1105224-005	EB1105224-006
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	----	----	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	----	----	<1	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	28	----	----	34	----
Total Alkalinity as CaCO ₃	----	1	mg/L	28	----	----	34	----
ED040F: Dissolved Major Anions								
Sulfate as SO ₄ 2-	14808-79-8	1	mg/L	88	----	----	36	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	5	----	----	16	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	18	----	----	10	----
Magnesium	7439-95-4	1	mg/L	16	----	----	9	----
Sodium	7440-23-5	1	mg/L	6	----	----	15	----
Potassium	7440-09-7	1	mg/L	5	----	----	3	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	<0.001	----	----	<0.001
Cadmium	7440-43-9	0.0001	mg/L	----	<0.0001	----	----	<0.0001
Chromium	7440-47-3	0.001	mg/L	----	<0.001	----	----	<0.001
Copper	7440-50-8	0.001	mg/L	----	1.30	----	----	0.080
Nickel	7440-02-0	0.001	mg/L	----	0.017	----	----	0.011
Lead	7439-92-1	0.001	mg/L	----	<0.001	----	----	<0.001
Zinc	7440-66-6	0.005	mg/L	----	0.011	----	----	0.013
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	----	0.004	----	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	----	----	0.002	----	----
Copper	7440-50-8	0.001	mg/L	----	----	2.72	----	----
Nickel	7440-02-0	0.001	mg/L	----	----	0.019	----	----
Lead	7439-92-1	0.001	mg/L	----	----	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	----	----	0.013	----	----
EN055: Ionic Balance								
^ Total Anions	----	0.01	meq/L	2.55	----	----	1.86	----
^ Total Cations	----	0.01	meq/L	2.58	----	----	1.97	----



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

HB160311039

Client sampling date / time

16-MAR-2011 15:00

Compound	CAS Number	LOR	Unit	EB1105224-007	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.003	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.003	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.735	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.006	----	----	----	----
Lead	7439-92-1	0.001	mg/L	0.002	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.034	----	----	----	----

Birla, Mount Oxide and Lady Annie 16/03/2011

Site Description		Upstream Reference Site (Birla)	Mount Oxide Causeway	Downstream of Birla (WC04)	Old TSF Seep	Evaporation Pond Release	Mammoth Portal Retention Pond	Mills Creek Dam	Biral- Statutory Monitoring Location WC13	Cave Creek Mount Oxide	Lady Annie Crusher Sediment Dam	ANZECC 2000
Sample Number		HB160311003	HB160311007	HB160311011	HB160311015	HB160311019	HB160311023	HB160311027	HB160311031	HB160311035	HB160311039	Livestock (cattle)
Date Sampled		16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	
Type of Sample		Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	
Sulphate	mg/L									88	36	1000
arsenic	mg/L									0.004	0.003	0.5
cadmium	mg/L									<0.0001	<0.0001	0.01
Chromium	mg/L									0.002	0.003	1
copper	mg/L									2.72	0.735	1
nickel	mg/L									0.019	0.006	1
lead	mg/L									<0.001	0.002	0.1
zinc	mg/L									0.013	0.034	20
pH	units									6.41	6.94	5-9
EC	uS/cm									308	212	5970
DO	%									93.1	67.8	
temp	°C									30.9	27.8	
		exceeds ANZECC (2000) Livestock (cattle) guidelines (guideline relevant to total metals)										

Site Description		Upstream Reference Site (Birla)	Mount Oxide Causeway	Downstream of Birla (WC04)	Old TSF Seep	Evaporation Pond Release	Mammoth Portal Retention Pond	Mills Creek Dam	Biral- Statutory Monitoring Location WC13	Cave Creek Mount Oxide	Lady Annie Crusher Sediment Dam	Australian Drinking Water Guideline (2004)		Guidelines for Managing Risks in Recreational Water (2006)
Sample Number		HB160311003	HB160311007	HB160311011	HB160311015	HB160311019	HB160311023	HB160311027	HB160311031	HB160311035	HB160311039	Health	Aesthetic	Recreational
Date Sampled		16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011			
Type of Sample		Water	Water	Water	Water	Water	Water	Water	Water	Water	Water			
Sulphate	mg/L									88	36	500	250	5000
arsenic	mg/L									0.004	0.003	0.007		
cadmium	mg/L									<0.0001	<0.0001	0.002		
Chromium	mg/L									0.002	0.003	0.05		0.5
copper	mg/L									2.72	0.735	2	1	20
nickel	mg/L									0.019	0.006	0.02		0.2
lead	mg/L									<0.001	0.002	0.01		
zinc	mg/L									0.013	0.034		3	
pH	units									6.41	6.94		6.5-8.5	
EC	mS/cm									0.308	0.212		1.493	
DO	%									93.1	67.8			
temp	°C									30.9	27.8			
	exceeds drinking water health-based guideline value (guideline relevant to total metals)													
	exceeds drinking water aesthetic guideline value (guideline relevant to total metals)													
	exceeds both drinking water and recreational guideline value (guideline relevant to total metals)													

Site Description		Upstream Reference Site (Birla)	Mount Oxide Causeway	Downstream of Birla (WC04)	Old TSF Seep	Evaporation Pond Release	Mammoth Portal Retention Pond	Mills Creek Dam	Biral- Statutory Monitoring Location WC13	Cave Creek Mount Oxide	Lady Annie Crusher Sediment Dam	ANZECC 2000	
Sample		HB160311002	HB160311006	HB160311010	HB160311010	HB160311018	HB160311022	HB160311026	HB160311030	HB160311034	HB160311038	Ecosystems, slightly-moderately disturbed systems	Ecosystem low reliability values
Date Sampled		16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011		
Type of Sample		Water	Water	Water	Water	Water	Water	Water	Water	Water	Water		
Sulphate	mg/L									88	36		
arsenic	mg/L									<0.001	<0.001	0.024	
cadmium	mg/L									<0.0001	<0.0001	0.0002	
Chromium	mg/L									<0.001	<0.001	0.001	
copper	mg/L									1.3	0.08	0.0014	
nickel	mg/L									0.017	0.011	0.011	
lead	mg/L									<0.001	<0.001	0.0034	
zinc	mg/L									0.11	0.013	0.008	
pH	units									6.41	6.94	6 -7.5	
EC	mS/cm									0.308	0.212	0.25	
DO	%									93.1	67.8	90-120	
temp	°C									30.9	27.8		
exceeds ANZECC (2000) Ecosystemes (95th percentile) guidelines (guideline relevant to dissolved metals)													

Site Description		Upstream Reference Site (Birla)	Mount Oxide Causeway	Downstream of Birla (WC04)	Old TSF Seep	Evaporation Pond Release	Mammoth Portal Retention Pond	Mills Creek Dam	Biral- Statutory Monitoring Location WC13	Cave Creek Mount Oxide	Lady Annie Crusher Sediment Dam		
Sample		HB160311004	HB160311008	HB160311012	HB160311016	HB160311020	HB160311024	HB160311028	HB160311032	HB160311036	HB160311040	ISQG low	ISQG high
date sampled		16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011	16/03/2011		
Type of Sample		Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment		
arsenic	mg/kg									80	14	20	70
cadmium	mg/kg									<1	<1	1.5	10
Chromium	mg/kg									5	16	80	370
copper	mg/kg									975	69	65	270
lead	mg/kg									14	<5	50	220
nickel	mg/kg									21	8	21	52
zinc	mg/kg									9	16	200	410

	exceed ISQG low
	exceeds ISQG high

MT OXIDE EXPERT PANEL MEETING

Level 16 Conference Room, 61 Mary Street Brisbane

Date: Tuesday 26th July 2011

Meeting commenced: 11:40 am

Attendees: Oskar Kadletz (OK), [REDACTED] (DG), [REDACTED] (VH), [REDACTED] (DL), [REDACTED] (RMc), [REDACTED] (ME), [REDACTED] (BN), [REDACTED] (NT), [REDACTED] (BH), [REDACTED] (DS), [REDACTED] (BD), [REDACTED] (DF), [REDACTED] (BS), [REDACTED] (JW), [REDACTED] (CA), [REDACTED] (DM), [REDACTED] (TB)

Teleconference invitees: [REDACTED] k, Southern Gulf Catchments

Apologies: [REDACTED]

Meeting Purpose:

Session 1: Update over last 12 months since previous Expert Panel meeting.

Discuss progress to date on previous Expert Panel recommendations.

To enable contact with Stakeholders, including landholders of Chidna Station; Kalkadoon Community and Southern Gulf Catchment (SGC).

Expert Panel to hear from Brussie Spreadborough (Landholder), regarding an update into considerations of the Expert Panel.

Session 2: Technical discussions on site knowledge to date and further actions/recommendations required.

Proposed Stakeholder Session to be held at Mt Isa on 18th August 2011 with emphasis to follow through/discuss outcomes from Expert Panel Meeting.

ITEM NO	ISSUE	ACTION
1	Apologies and Introductions: Oskar Kadletz commenced the meeting and addressed the Expert Panel (EP). Expert Panel members individually introduced themselves and their relevant expertise.	
2	Update on activities at Mount Oxide abandoned mine site since last panel meeting Oskar introduced [REDACTED] Manager, Abandoned Mines Unit, North to present to Expert Panel members. Broad outcomes from last Expert Panel Meeting:- <ul style="list-style-type: none">• Sources of Contamination;• Monitoring Regime;• Cattle & Wildlife;• Mine Rehabilitation;• Engineering;• Social and Stakeholder.	

	<ul style="list-style-type: none"> • Discussion amongst (DS/OK/ – discussed RPS preliminary data and anticlines. • DS posed questions:- <ul style="list-style-type: none"> ○ Has RPS study has penetrated the fault zone north and south of pit in preliminary data? ○ Is there any transverse dislocation, fracture-set, fault-set that is potentially a conduit of contaminants towards the creek line? • BS advised once pit gets to certain level it leaks. Post-rain, levels rise in pit and leaks down river. • DS – Have Perilya done detailed structural geology mapping of the pit and its immediate environment? • OK advised DEEDI had not seen data, but drilling by Perilya would have included this, very complex. <ul style="list-style-type: none"> ○ OK advised Perilya had discussions that drilling may have pin cushioned the area, creating connections over time, aiding water flow through area. EM survey will provide further information on this issue. i.e. define straight lines, narrow or broad pathways for flow? <p>Social and Stakeholder engagement – ongoing communication protocol, partnership; monitoring slightly superseded due to contracts put out.</p> <ul style="list-style-type: none"> ○ OK explained tendering process and criteria set by DEEDI. ○ Had several tendering runs to optimise opportunity, AECOM successful. SGC were unsuccessful in tender process. • Expert Panel requested feedback on selection in tender process. <ul style="list-style-type: none"> ○ OK advised successful tenderer selected due to technical ability and ability to adhere to DERM sampling guidelines. Price not DEEDI's sole criteria. • BS gave feedback on the sampling techniques utilised, expressed concern that ground water sampling methods were questionable and did not believe they were of same quality/standard as Perilya samples. BS advised samples were taken with use of bailer. <ul style="list-style-type: none"> ○ OK stated there were DERM guidelines for taking samples. ○ DS explained background on ground water sampling, use of bailer is recognised method. ○ DEEDI have installed automated weather station (AWS), EP can log in to view live data, capability to expand that, automated information from pit and stream flowing vents. • In regards to managing mine pit leakage, benefits of AWS are – <ol style="list-style-type: none"> a. able to gauge level fluctuation in mine pits, b. condition monitoring (with evaporators), to ensure pumping system keeps running and; c. live data with remote sensor for downstream monitoring. • Ground water Report – <ul style="list-style-type: none"> • Pre-works – Ground water filtered copper – elevated copper levels south to pit, concern it may be contamination source (DG reiterated only preliminary data). • Surface water tested prior to HDPE Covers:- • Clarification requested by RMc – <ul style="list-style-type: none"> ○ Is this data taken pre or post-works? ○ Any water qualities taken when site was flushing or post-flush? 	<p>AMU Northern to review Groundwater monitoring</p>
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4	<p>12:10 pm – 12:25 pm Teleconference: DG commenced teleconference. Introduction of [REDACTED], Technical Officer – AECOM to Expert Panel. OK requested wildlife update:</p> <ul style="list-style-type: none"> • Macropod Survey - Originally proposed ANZECCs not suitable – <ul style="list-style-type: none"> • Discussed Macropod study - observations of purple neck rock wallabies, scats, home range. • Permissions/limited access to certain areas of site impeded studies. • In summary – Macropod study did not identify suitable background population. • Known population – trip cameras to capture wallabies drinking up to 12 (anecdotal evidence landowners up to 30 observed at site) • Further west - Identified sole purple-neck wallaby, drinking. • Consultant with Perilya, scats found up to 150m from home range. • Observed joeys at MOWS09; drinking observed • Another macropod observed, not determined if euro or red kangaroo. • Another group of wallabies observed 1½ hrs north of site, would require site access. 	
	<ul style="list-style-type: none"> • Hair analysis performed on cattle – heavy metals samples no results, beast killed, samples taken from liver of one cattle (LM) Value of macropod survey is questionable). • Collecting hair samples from scats is impractical methods of hair sampling due to minimal hair available in scats. • Collected bones from main wallaby site, possibly from purple-necked wallaby. • May be worth taking skin samples from another species. • May not pick up scats after rain. 	
	<ul style="list-style-type: none"> • Second population at MOWS16, permission would be required to access that area. • LM - Achievable to find background population, not sure if meaningful. <p>OK stated an expert review of methodology needed to identify risks to population, movement of population, how contact with stream water/contamination and how it would impact on them. Discussion about value of Macropod Survey. LM stated study was initially considered most achievable as macropods were main users of water. BH suggested whether better value for input through monitoring aquatic species, rather than macropods.</p> <ul style="list-style-type: none"> • Expressed belief that monitoring aquatic life may be more valuable due to higher turnover of species. • Cyclical activity, measurement of rise & fall of intoxicants in surface water. <p>Discussion between BH/BS re aquatic life in surface water/indication of how elevated levels of copper could vary during year, according to weather events would be advantageous.</p> <ul style="list-style-type: none"> • Marrying study with automated weather station data would be more fruitful. Ok stated that this was planned for in second level of work planned. • LM – Requested further advice from EP:- <ul style="list-style-type: none"> ○ What type of analysis do they require and what is achievable? 	<p>Expert review of methodology – access to background population if possible – risks to population from adjacent stream; contact with stream water/contamination and how it would impact on them.</p> <p>Talk to Govt Veterinary Science experts; other experts in Wildlife Network DERM to evaluate and perform risk assessment.</p>

	<p>OK questioned BS – Is access to background population possible?</p> <ul style="list-style-type: none"> BS stated his belief that access is possible. <p>LM – In relation to ground water well, AECOM given bore logs.</p> <ul style="list-style-type: none"> samples for ground water zones may not be reliable as screened across multiple water-bearing zones, at 40-60 metres and 10-20 metres. Needs to be taken into consideration when reviewing data. Data results could easily be diluted. <p>Expert Panel posed questions to LM.</p> <ul style="list-style-type: none"> Clarified sample taken was from one well with two lots of screening. SW – first round – noticed two of background sites had no water (MOWS22/MOWS23). May be issue going forward and needs to be considered. ME posed question to LM:- <ul style="list-style-type: none"> Was sampling of pit water quality sampled at depth or one location at surface? LM advised taken from top 30 cms BD – Multiple wells screened at different levels 	<p>██████████ to liaise with ██████████ regarding outcomes and further work to be done.</p> <p>Discuss further sampling required.</p>
5	<p>12:35 pm – 12:50 pm Teleconference:</p> <p>DG commenced teleconference with Don Pollock, A/CEO, SCG. Don introduced to Expert Panel.</p> <ul style="list-style-type: none"> Expressed disadvantage in not being privy to previous briefing. DP apologised on ██████████ (board member for SGC) behalf. ██████████ no longer at SCG. ██████████ transitioning to role with State Govt. DP stated SCG's position is willing to do whatever facilitation required to property in question. SCG keen to work with DEEDI; to represent interests of region and property holders. Once framework has been established, SGC play regional, community role. To communicate where practical/feasible to region. SGC have not formed their position on this issue yet. 	<p>██████████ to meet with ██████████ in Townsville to discuss SGC interests.</p> <p>Make available briefings previously supplied by SGC.</p>
6	<p>Stakeholder's (Landholder) Input:</p> <p>Outlines of issues and concerns presented by Brussie Spreadborough.</p> <p>BS expressed SCG have been a great help to date with sampling etc. Would like to continue ongoing partnership with SCG.</p> <p>██████████ apologised re unable to make contact with BS prior to meeting.</p>	
	<p>Main issues:</p> <ol style="list-style-type: none"> Proposed smaller, paid Action group (10 people) is formed to get things done. <ul style="list-style-type: none"> OK responded DEEDI-AMU is the "action group". The purpose of this meeting is to discuss the work has been done over last year – a culmination of 12 months work. BS expressed lack of communication regarding assessing work progress; updates on what's happening, plan to deal with contamination. <p>Discussion amongst EP members OK/DP/BS) regarding lack of financial assurance from previous mine operators for Mt Oxide site.</p>	<p>Formal update to Stakeholders to be given on progress, plans for Mt Oxide.</p>

	<ul style="list-style-type: none"> • OK advised there is no link between previous mine operators and initiators. Issue now in hands of landholder with no resources and little control. • No financial assurance left behind for this particular mine site which represents challenge for all. Comes back to Govt to address with public money. • Big, complex problem with no simple solution. Issue requires time and effort. • DP - Are you likely to set a precedent in this case that will be a useful policy used for State? DP to BS Has there been a serious commercial offence? Have you got biosecurity issues? • BS replied not that he can prove, believes his cattle have elevated levels of copper; consulted with experts in Canada, yet to be determined level of effect on immune levels. Unsure of level of copper required before it affects their immune systems, does not affect meat. <p>OK indicated a difference of opinion exists between BS & Biosecurity Qld discussions.</p> <ul style="list-style-type: none"> • BH explained information to date did not indicate any untoward difficulties with cattle, difficulties in monitoring productivity, morbidity and mortality with cattle on Chidna Station. • Not much evidence to support downside at present. <p>DP queried renewed prospect interests at Mt Oxide?</p> <ul style="list-style-type: none"> • OK advised Perilya currently evaluating residual mineralisation. In preliminary process. Environmental impact study underway. • DEEDI having discussions with Perilya about their interests in stockpiles in relation to our need to control contamination. • Realistically Board will make decision by early 2012. If applicable, at least 4 yrs before mine takes shape on ground. We can't wait for Perilya to make its decision, basis of DEEDI's work and management we require. • DEEDI having discussion with Perilya re control of contamination. • DP conveyed [REDACTED] feedback more forward notice for meetings should be given for technical meetings. • SGC relying on [REDACTED] input into the Director's considerations of the matter. 	<p>More forward notice for meetings to be given.</p>
	<p>3. BS asked - What funding has been allocated for Mt Oxide? OK explained difficulty in discussing funding at this stage of meeting as funding will be established based on the work plan proposed to EP during meeting.</p> <ul style="list-style-type: none"> • Discussing funding is premature as EP's opinion needed. A better estimate will be given in August. • Explained tendering required including earthworks, contractors. • Significant allocation of funding for next 4 yrs (\$6M) in association with work at Mt Morgan, Horn Island & additional work at Croydon and Southern Region to carry out works. • OK assured BS funding will be enough to do work agreed on at this meeting at Mt Oxide. • BS stated that \$26M funding not enough to fix Abandoned Mines in Qld. • BS stated his belief that funding was a result of the proactive efforts of himself and sister, Georgie. • OK advised whatever works are done in next year won't be enough to fix problem, but 	<p>Agreed outcomes will be given to stakeholders</p>

	<ul style="list-style-type: none"> BS raised question re: Where does EPA stand on making DEEDI comply? OK – any works need to be run past DERM/other appropriate government agencies for best outcomes and solutions. DG assured there is regular interdepartmental communication between DERM and DEEDI. BS asked “Can they (DERM) force DEEDI to do more”? DS stated there are currently:- <ul style="list-style-type: none"> enforcement guidelines, expectations relayed to DEEDI at Senior Level. BS – DERM have clearly stated expectations and outcomes required by DEEDI. Confirmed by OK - ADG’s very interested in progress. <p>4. BS asked why a closed session (excluding stakeholders) was being held after this session?</p> <ul style="list-style-type: none"> OK explained due to confidential nature of information from Perilya discussed, ideas passed around may/may not occur, technical information discussed. Assured BS agreed outcomes will be given at Stakeholder’s Meeting, just taking away the interim discussion. OK does not want non-technical assessment colouring our outcomes. <p>BS emphasised the need for a paid Action Group required to speed the rehabilitation process.</p> <ul style="list-style-type: none"> Reiterated that action has been stalled. <p>OK thanked BS for attending meeting, advised of the opportunity to discuss any issues with EP members during lunch break.</p>	
	LUNCH BREAK	
7	<p>Discussion of monitoring results and outcomes from monitoring programs</p> <p>Discussion of monitoring results and outcomes continued.</p> <p>Power Point presentation presented by Daniel Gillinder/Oskar Kadletz outlining:-</p> <ul style="list-style-type: none"> Overview of last 12 months. Proposed strategies for next 12 months. Additional suggestions by Oskar Kadletz for discussion by Expert Panel. 	
	<p>Discussion amongst EP regarding efficacy of HDPE covers and infiltration of contaminants in Ground water, geological factors involved.</p> <ul style="list-style-type: none"> OK stated that covering needs to be moved; complex DS – engineering required; open cut proposed <p>General discussion on Perilya.</p> <ul style="list-style-type: none"> Verbal comments only from Perilya given unlikely to have board decision in next year. <p>General discussion - (DS/RMc/OK/BH) on ways to overcome high pH levels</p> <p>AECOM queried what standards should be used for ground water?</p> <ul style="list-style-type: none"> DS stated DERM’s preferred choice is ANZECC(2000) Stock Watering is best standard to use. 	<p>Sediment monitoring should focus on -63 micron fraction</p> <p>ANZECC(2000) Stock Watering standard needs to be used (DS)</p>

	<p>DF wanted clarification whether concentration same as last wet season, but volume of contaminants less? General discussion – Tracers are not viable (BN/ME)</p> <p>OK - Is Electromagnetic survey worth conducting? – DS believes viable. RMc queried can Perilya information be accessed? May be more comprehensive data as only sparse information supplied by RPS data.</p> <ul style="list-style-type: none"> OK - More drill holes may be required. <p>Discussion on strategies to reduce attractiveness of pit to birds.</p> <ul style="list-style-type: none"> DG raised question to panel:- Are there any practical measures to do reduce attractiveness of pit to birds? Difficult to eradicate small birds. To deter large birds need to remove roof sites and trees. Scare cannons not effective. <p>Discussion about AECOM investigation.</p> <ul style="list-style-type: none"> What is the effect on wallaby's drinking water? What can be done to improve conditions for wildlife? <p>BN stated that studies on hair is heterogeneous.</p> <ul style="list-style-type: none"> Evidence show that kangaroos/wallabies are less sensitive to contaminants than cattle. Aquatic life has highest intolerance. <p>EP suggested we perform risk assessment on more intolerant species such as cattle/aquatic life</p>	<p>Need to focus in on next wet season - pit & contamination, strategies used (caps)</p> <p>DERM Birla required</p> <p>ICPMS scan for trace elements/ratios of trace elements</p> <p>Electromagnetic survey – DERM</p> <p>Comprehensive review on previous studies done – AECOM not given clear indication of studies to be undertaken.</p> <p>Need to organise library search on impacts to wallabies and managing birds to determine if impact is significant.</p> <p>More field studies to determine problem/impact</p> <p>Determine/identify species that are dying on site.</p> <p>Perform risk assessment on more intolerant species ie. cattle/aquatic life</p> <p>Send data from drilling of the dumps to be sent to DERM (and/or Expert Panel) for interpretation of data.</p>
Reduce flood level.		<p>Investigate groundwater flow measurement in bore hole using down the water technology.</p> <p>Develop a list of sample specifications.</p> <p>Cut wide shallow channel in southern stream</p> <p>Investigate lime treatment</p>

	<p>EP discussed lime dosing of pit water and factors to consider:</p> <ul style="list-style-type: none"> Discussed feasibility to use pit water for pre armouring. Lime dosing results in high 1500tds; more lime required Sludge plug up waste dump impeding preferential flows 	Work up strategy and pass onto DERM for comment.
	<p>DS suggested focus on ground water ingress.</p> <ul style="list-style-type: none"> Establish ground water inflow into pit How do we reduce or prevent? 	<p>Focus on ground water ingress. Establish ground water inflow into pit. Automatic monitoring of # 4 contaminated borehole</p>
8	Discussion of Perilya waste dump characterisation study, update on Perilya's plans and activities on site	
	Need to seek release of data to Expert Panel for discussion in context of future works	
9a	<p>Communication strategy Discussed a revised process for future.</p> <ul style="list-style-type: none"> What can be done for Stakeholders Meeting in August? Currently managing stakeholder requirements through discussion at Stakeholder Meetings. 	<p>Develop communication strategy. Maintain communication with Stakeholders every 3 weeks to advise update on status/developments.</p> <p>Ask BS Stakeholders what communication strategy they would be satisfied with.</p>
	<p>Suggestions by Expert Panel Meeting:– Suggestion made that budget considerations/constraints are not discussed during Expert Panel Meetings.</p>	<p>Develop Working Group Panel. Develop clear terms of reference on agendas for Mt Oxide meetings – i.e. Charter or Agreement</p>
	<p>General discussion on proposed suggestion to form "Rehab" or Working Group Panel with view to holding quarterly meetings allowing more regular updates; and gives Stakeholders more opportunity to participate.</p> <p>Suggested proposed Working Group Panel involves DEEDI - AMU; DERM; other Government Stakeholders; Brussie & Georgie Spreadborough; Kalkadoon Community, Southern Gulf Catchments.</p>	Hold Working Group Panel meetings in Mount Isa on quarterly basis.
	<p>Review of long term site remediation and management</p> <ul style="list-style-type: none"> Develop options/tenders discussed. (long term) 	
9b	Confirmation of updated recommendations and management	
	Suggestions for proposed work program over next 12 months	Review options for solar system to pump back.

	<p>Short term:-</p> <ul style="list-style-type: none"> • Pumping with solar – with constraints of limited flow rates • Continuation of monitoring program • Install remote telemetry option to pit, creek lines and monitoring bores • Develop conceptual model of contamination • Develop water balance model for site • Develop communication plan with conjunction with EP • Earthworks 	
	<ul style="list-style-type: none"> • Monitoring program • Lime dosing ([REDACTED]) • Suggested GRS alternative option for monitoring. <ul style="list-style-type: none"> • Site access problematic. • Needs to occur once finish of rain (suggested March 2012) • DG raised clarification of whether EP agreed on water past the Waste Rock Dump or wide shallow channel re manipulating creek bed. 	<p>Obtain data from Perilya and pit water data from Borers</p> <p>Liaise with Perilya for updated geology with view to moving to east.</p> <p>Inconclusive – consider DEEDI's options</p>
	<ul style="list-style-type: none"> • Suggestion raised regarding the feasibility to train landholders in taking samples. OK explained DEEDI departmental tendering processes would need to be followed. 	
		Look at AECOM Aquatic fauna sampling
	<p>NT raised review of quality and sediment quality</p> <ul style="list-style-type: none"> • How is measurement done? • Is data providing sediment fractions? <p>Bore monitoring – down the hole monitoring.</p>	<p>Pass on data to DERM – tender document, site info, check if any other relevant data available.</p> <p>Send through parameters of sampling requested to be made available to DERM.</p>
	<p>Water Balance Model</p> <p>Catchment/Sub catchment data – use of spreadsheet or ?? program</p> <p>AMU have collated contour data gives rough estimate of data.</p> <p>RMc suggested EP looks into data from Horn Island</p> <p>DL raised issue of potentially shotcreting/grouting to increase draw down</p>	<p>Follow up with DERM regarding stream gauging & rainfall monitoring at Birla, Mt Gordon ([REDACTED])</p> <p>Cross sections to estimate flows.</p> <p>Expert Panel members can contact [REDACTED] regarding information available.</p> <p>Refer to data from Horn Island</p> <p>ICP-MS full range analysis of groundwater & surface water samples to be done at tail end of wet season.</p> <p>AMU to send DERM points to be considered for comment – including height confirmation.</p>

	Liming works	Develop draft process for lime works – look at small scale trial to happen.
10	Discuss Expert Panel representation at upcoming Stakeholder's Meeting	
	<p>Discussed requirement for representation of EP at Stakeholder's Meeting in Mt Isa – DG called for nomination of all interested panel members in attending including Stakeholders:-</p> <ul style="list-style-type: none"> • SCG – Don Pollock/Pieter Swart • Damian Lee - N/A late August due to annual Mining S&H Conference • Dr Daniel Franks advised he was not available 18th August. <p>BN offered to look up toxicology reports</p>	<p>Process together draft for comment to be submitted to EP members.</p> <p>Process for Working Group meeting.</p> <p>6 or 12 month annual technical panel meeting held off working group panel. Require EP members' input re structure.</p> <p>Aim for bi-monthly updates for EP.</p> <p>Toxicology reports to be obtained.</p>
11	Matters Arising/Other Business	
	Proposal – independant validate outcomes of groups findings	

Meeting ceased: 5:10 pm

Responsible Officer – See Action Item Summary (for meeting)

Department of Environment and Resource Management
DIRECTOR-GENERAL BRIEFING NOTE

<input type="checkbox"/> Approved	<input type="checkbox"/> Not Approved	<input checked="" type="checkbox"/> Noted
<input type="checkbox"/> Further information required		
[Redacted]		
DG.	[Redacted]	
Dated	8 / 8 / 10	

TO: Director-General

SUBJECT: Update on Mt Oxide Mine - Expert Panel Meeting

REQUESTED BY

- This briefing note is in response to a request from the Director-General on 10 June 2010 to provide an update on Mt Oxide mine by mid July.

TIMEFRAME

- Noting of this briefing note is required by 30 July 2010 to ensure information is provided to the Department of Employment, Economic Development and Innovation (DEEDI) in a timely manner.

RECOMMENDATION

It is recommended that the Director-General:

- note** the information in this brief and the actions being taken to address the environmental impacts associated with the abandoned Mt Oxide mine (the mine).
- note** that a further briefing will be provided following the next meeting of the expert panel, currently scheduled for late July.
- sign** the letter to the Director-General of the Department of Employment, Economic Development and Innovation confirming the works that need to be implemented at the mine (Attachment 1).

BACKGROUND

- A briefing note was provided to the Director-General on this matter in early June 2010 (Attachment 2).
- A stakeholder meeting held on 22 April 2010 resolved to establish an expert panel (the panel) to review the issues associated with the mine and formulate recommendations to manage those issues.
- The panel, established by Queensland Mines and Energy (QME), is made up of experts from academia, industry and a number of state government departments (Attachment 3).

CURRENT ISSUES

- On 24 June 2010 an inspection of the mine was conducted by members of the panel and other stakeholders including the landholder (Mr Spreadborough) and representatives of Perilya Limited who hold an exploration permit and associated Level 2 Environmental Authority over the mine.
- On 25 June 2010 the panel met in Mt Isa to discuss the outcomes of the inspection and identify short and long term management options to improve the environmental performance of the mine.
- During the meeting stakeholders including the landholder, traditional owners and the local catchment management group made representations to the panel relating to their concerns about the mine; Mr Spreadborough provided a written submission for the panel to consider (Attachment 4).

Rec'd - ODG
20 JUL 2010

Author	Cleared by	Cleared by	Recommended:
[Redacted]			

- The panel membership expressed a variety of views relating to the mine but there was a general consensus that isolation of contamination sources, segregation of clean and contaminated water and development of a communication strategy to improve stakeholder engagement were core issues that needed to be addressed urgently.
- The panel identified a number of short term (to be implemented prior to the next wet season) and long term management strategies based on the core issues identified at the mine.
- The short term strategies identified by the panel related to the reduction of poor quality water volumes by diverting clean water away from contaminated areas, isolation sources of contamination from incident rainfall, increased monitoring in the receiving environment and development of a stakeholder communication plan.
- The long term aims identified by the panel related to detailed characterisation of contaminant sources at the site, development of a rehabilitation program and management of water quality in the open void.
- No costing of the various management strategies identified by the panel has been undertaken at this stage; at the panel meeting QME undertook to identify costs associated with the strategies and available funding sources.
- Following the panel meeting QME advised that outcomes would be circulated to the panel for further comment and a follow up meeting or teleconference would be scheduled for late July.
- The department is awaiting further advice on the outcomes of the panel meeting from QME.
- A commitment was given by QME that a stakeholder meeting would be held in late August to provide a progress update on panel recommendations and the short and long term management strategies that will be implemented at the mine.
- It is understood that a response to the letter tabled by Mr Spreadborough at the stakeholder meeting on 22 April 2010 that identified his concerns about the mine is currently with Minister Robertson for review.

RESOURCE/IMPLEMENTATION IMPLICATIONS

- Departmental officers from Northern Region and Central office are representing the department on the expert panel.
- Resourcing departmental membership of the expert panel will be provided for within the current establishment.

PROPOSED ACTION

- A further briefing will be provided to the Director-General following the next meeting of the expert panel, currently scheduled for late July.
- Correspondence will be provided to QME highlighting the department's expectations in relation to works that need to be implemented at the mine (Attachment 1).
- The department will remain engaged with stakeholders and maintain an active presence on the expert panel and continue to work with QME on addressing the environmental issues at the mine.
- The department will continue to closely liaise with Periliya Limited on the potential for future development of the mine and engage in pre lodgement discussions with the company at the earliest possible stage.

DIRECTOR-GENERAL'S COMMENTS

ATTACHMENTS

- Attachment 1 – Letter to [REDACTED] Director-General (DEEDI)
- Attachment 2 – CTS09723/10

Author	Cleared by	Cleared by	Recommended:
[REDACTED]			

- Attachment 3 – Expert Panel Membership
- Attachment 4 – Written submission from Mr Spreadborough

Author	Cleared by Name: Rob Lawrence	Cleared by Name: Damien Brown	Recommended: Name: Terry Wall



Ref CTS 11915/10

Department of
Environment and Resource
Management

8 AUG 2010

[REDACTED]
Director-General
Department of Employment,
Economic Development and Innovation
PO Box 15168
CITY EAST QLD 4002

Dear [REDACTED]

Mt Oxide Mine

I refer to my meeting on 22 April 2010 with Mr Jim Grundy from the Department of Employment, Economic Development and Innovation (DEEDI) regarding the discharges from the abandoned Mt Oxide Mine.

At this meeting I highlighted the need for DEEDI to take all reasonable and practicable actions to ensure that the level of environmental impact experienced downstream of the site in previous years is not repeated during the upcoming wet season(s).

I understand that DEEDI has now established an expert panel (the panel) to identify environmental impacts associated with the Mt Oxide Mine and to formulate recommendations on the management of the mine site to mitigate the environmental impacts.

I have been advised that the panel, which includes officers from the Department of Environment and Resource Management (DERM), met in Mt Isa on 25 June 2010 and that the meeting has resulted in the panel putting forward a number of short and long term management strategies to address the environmental management issues identified at the mine.

I understand that a complete solution to address all environmental impacts arising from the Mt Oxide Mine may not be achievable prior to the upcoming wet season. Notwithstanding this, I do expect that DEEDI will implement the panel's recommendations for short term works to reduce the environmental risk associated with the mine site before the next wet season.

The long term aim must be that any discharges from the mine comply with Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC 2000) Aquatic Ecosystem Protection Guidelines to ensure that the environmental values of the downstream environment are protected.

- 2 -

Should you have any further enquiries, please do not hesitate to contact Mr Rob Lawrence, Regional Manager, Environmental Services, North Region of the department on telephone [REDACTED]

Yours sincerely

[REDACTED]

John Bradley
Director-General

Subject: _____

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Queensland
Government

Department of
Environment and Resource
Management

15 SEP 2010

Director-General
Department of Employment, Economic Development and Innovation
PO Box 15168
STY EAST QLD 4002

Officers of the Department of Environment and Resource
Management (DERM) and the Department of Employment Economic Development
and Innovation (DEEDI) undertook a joint inspection of the former Mt Oxide Mine
located on Chidna Station.

During this inspection DERM officers identified that once again Gave Creek and the
joining area had been significantly contaminated from runoff originating from the
former mine. Furthermore, DERM officers identified that the environmental controls
currently in place at the site are inadequate to prevent future contamination.

short-term
measures to minimise environmental harm downstream of the mine,
(1)

- Implementing clean water diversions;
- Isolating sources of contamination from incidental rainfall;
- Finalising a stakeholder communication plan; and
- Increasing monitoring in the receiving environment.

After to then DERM Director-General John Bradley of 8 September 2010, you
requested actions that DEEDI would undertake at the Mt Oxide Mine site to minimise
potential for environmental harm downstream of the site.

DERM acknowledges that DEEDI has implemented sections of the
cover rock material with black plastic and to increase monitoring, not all the short-
term actions recommended by the expert panel have been implemented.

On 2011 Mike Bradley, Assistant Director-General Regional Service
met with Associate Director-General Dan Hunt and other DEEDI officers to

Sty QLD 4002

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Director-General

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Queensland
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Department of
Environment and Resource
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15 May 2011

Mrs Brussie and [redacted] Spreadborough
: 835
PO Box 4825
mail [redacted]

re Mrs Spreadborough.

mail received on 15 May 2011 regarding contamination at Mt

The Department of Employment, Economic Development and
Trade (DEED) is responsible for the Mt Oxide Mine under the Abandoned Mines
Land Program. This responsibility includes the remediation of impacted areas and
implementing works to prevent any further release of contaminated water from the
site.

Department of Environment and Resource Management (DERM) has been
monitoring the downstream environment and the remedial actions
undertaken by DEED at Mt Oxide following the release of contaminated water during
a last wet season. DERM is currently seeking further advice from DEED on its
progress in implementing the program of works recommended by the expert panel
and confirmation that DEED is taking all reasonable measures to prevent further
contaminated discharges from the site.

It is evident from the contaminated discharge that occurred during the last wet
season that more work is required and I have highlighted the need for DEED to
undertake this work as a priority. DERM considers this to be a serious environmental
issue and will continue to liaise closely with DEED to ensure that appropriate actions
are being taken to address this matter.

If you have any further enquiries, please do not hesitate to contact [redacted]
[redacted] Team Leader, Environmental Services, North Region of DERM on telephone
[redacted]

[redacted]
Director-General

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Enforcement Guidelines

Prepared by:

Litigation Unit

Department of Environment and Resource Management

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Contact (07) 322 48412 or email <library@derm.qld.gov.au>

October 2010

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Overview

Queensland's economic, social and ecological welfare is reliant upon the sustainable management of its environment and use of natural resources.

The Queensland Government is committed to ecologically sustainable development—protecting the ecological processes on which life depends, while allowing for development that improves the total quality of life, both now and in the future.

In seeking to meet the challenge of protecting Queensland's natural assets, legislation has been introduced to ensure sustainable environmental and natural resource management. The Department of Environment and Resource Management (DERM) is the government's lead agency for the administration of this environmental and natural resource legislation. DERM has produced a solid policy platform on which it has built partnerships with the community and industry to encourage greater understanding of the sustainable environmental and natural resource management practices and support for innovation.

Notwithstanding the co-operative approach taken by DERM, it is sometimes in the public interest for DERM to take enforcement action. The effective management and use of natural resources requires DERM to have a clear guideline for the selection of matters for enforcement.

DERM has an established litigation unit, which works in conjunction with specialist investigation teams, to provide a strong and consistent enforcement response to non-compliance.

- To the extent possible in the circumstances, it is the goal of DERM's enforcement responses to:
- reinforce the legal obligations required under environmental and natural resource legislation
 - achieve good environmental and natural resource outcomes
 - deter non-compliant behaviour from others within the general public.
- This enforcement guideline aims to foster a corporate and community culture of positive action, consultation and co-operation with DERM. They are general in nature to provide a broad understanding of how DERM will approach enforcement.

1. Introduction

DERM is the lead agency responsible for administering the legislation for the protection of the environment and management of natural resources. The legislation that is commonly the focus of enforcement action by DERM includes:

- *Aboriginal Cultural Heritage Act 2003*
- *Coastal Protection and Management Act 1995*
- *Environmental Protection Act 1994*
- *Forestry Act 1959*
- *Sustainable Planning Act 2009 (with respect to those parts relevant to DERM business)*
- *Land Act 1994*
- *Marine Parks Act 2004*
- *Nature Conservation Act 1992*
- *Place Names Act 1994*
- *Queensland Heritage Act 1992*
- *Recreational Areas Management Act 2006*
- *Survey and Mapping Infrastructure Act 2003*
- *Torres Strait Islander Cultural Heritage Act 2003*
- *Vegetation Management Act 1999*
- *Water Act 2000*
- *Wet Tropics World Heritage Protection and Management Act 1993.*

DERM has focused its attention on compliance and is working with the community and industry to achieve good environmental performance and natural resource management through provision of advice, technical assistance and support of innovation. However, in appropriate cases, DERM will pursue enforcement action against those who ignore their legal obligations with respect to their environmental and natural resource responsibilities.

This guideline explains how DERM determines the enforcement action it will take in any given situation. As far as possible, it provides guidance on what behaviour will result in prosecution or other enforcement action. More specific guidance can be obtained by reference to other guidelines addressing specific pieces of legislation. This guideline has been published to ensure that DERM's enforcement responses are:

- proportionate to the conduct
- consistent with past responses for similar conduct
- occur in a timely fashion.

2. Enforcement approach

DERM takes a comprehensive approach to environmental and natural resource regulation. Enforcement is one of the measures used by DERM to achieve the objectives of the legislation it administers. It is not the only tool and will be used with restraint. If an alternative to enforcement action will be more effective in achieving the objectives of the Act being administered, then that alternative will be considered. Sometimes a number of enforcement measures are used in combination. In order to determine whether enforcement action will be taken, DERM will investigate all significant breaches of the law and then exercise its discretion in a consistent and logical fashion.

DERM has a wide range of enforcement measures available to it. Each piece of legislation has its own suite of enforcement measures, but generally they consist of the following:

- encouraging voluntary compliance through education and self regulation
- strategic compliance audits and site impact programs
- working with other agencies
- verbal warnings and warning letters
- infringement notices
- administrative and court orders to stop an activity or to take action to remedy a breach or both
- cancellation, suspension or amendment of licence, lease or other permits
- prosecution.

Rather than focusing on one particular enforcement response, this guideline provides general principles that can be applied to assist in choosing the appropriate enforcement tool in any given situation. The enforcement pyramid below (adapted from the model made famous by Ayers and Braithwaite) demonstrates the path of escalation in the enforcement response that has been adopted by DERM.



From this pyramid, it is clear that prosecution may occur where alternative enforcement measures have not been successful. Consideration needs to be given to whether money is better spent on preventing a problem or remedying the impacts of an unlawful activity rather than undertaking costly prosecution actions. In some cases, DERM may decide to negotiate a prompt and satisfactory environmental or natural resource outcome. However, negotiation does not necessarily suspend investigation. Where DERM is satisfied that negotiation is not leading to a satisfactory and prompt outcome, higher level enforcement tools may be the preferred course of action.

If the impact of the conduct is of a minor or trivial nature, enforcement action from lower down the pyramid is more likely. Higher level enforcement action, such as prosecution, may be the preferred option for unlawful conduct.

- involving dishonesty
 - involving an attempt to deceive DERM or the provision of false information to it
 - involving intentional, negligent or reckless behaviour
 - where that unlawful conduct was motivated wholly or partly by commercial considerations
 - where there has been a failure to assess, manage or mitigate risk associated with commercial and industrial activities
 - resulting in clear commercial gain
 - resulting in severe or irreversible harm to the environment or natural resources
 - if the impact is unacceptable or dangerous.
- Ultimately, DERM has the discretion to determine the appropriate response to unlawful conduct under the legislation administered by it.

2.1 Public interest considerations

DERM may take into account the following public interest considerations when deciding on an appropriate enforcement response:

- the seriousness, the triviality, or 'technical nature' of the offence
 - the harm or potential harm to the environment caused by the offence
 - any mitigating or aggravating circumstances
 - the degree of culpability of the alleged offender
 - the availability and effectiveness of any alternatives to enforcement action
 - whether the offender has been dealt with previously without enforcement action and, if so, what level of enforcement action
 - whether the breach is a continuing or second offence
 - whether the offence is ongoing
 - whether the administrative action or court orders are necessary to prevent a recurrence of the offence
 - the prevalence of the alleged offence and the need for deterrence of the offence
 - the length of time since the alleged offence occurred
 - the age and physical or mental health of the offenders
 - whether there are counter-productive features of the proposed enforcement tools
 - in cases involving Aboriginal and Torres Strait Island cultural heritage issues, the views of the traditional owners of the area or object.
- The following are further factors that should be considered specifically in the case of considering prosecution:
- the length and expense of any court hearing
 - the likely outcome in the event of a conviction having regard to the sentencing options available to the court
 - any precedent which may be set by not instituting proceedings
 - whether the consequences of a conviction would be unduly harsh or oppressive

- whether proceedings are to be instituted against others arising out of the same incident
- the sentencing principles set out in the *Penalties and Sentences Act 1992*.

DERM adopts the overriding principle that enforcement tools must not be instituted (or not instituted) for improper purposes. A decision whether or not to use an enforcement tool will not be influenced by:

- any elements of discrimination against the person, such as ethnicity, nationality, political associations, religion, sex or beliefs
- personal feelings towards the offender or, alternatively, the victim
- possible political advantage or disadvantage to a government or any political group or party
- the possible effect of the decision on the personal or professional circumstance of those responsible for the enforcement response decision.

2.2 Determining who is liable for prosecution or other enforcement action

2.2.1 General principles

Some general considerations in determining who is liable to prosecution or other enforcement action are:

- who was primarily responsible for the offence—that is, who committed the act, who formed the intention (if relevant), and who created the material circumstances leading to the breach
- where a person is liable because the law creates strict liability—what was the role of the potential recipient
- the likely effectiveness of the enforcement tool against the potential recipient.

2.2.2 Corporate liability

The law normally makes legal entities and individuals liable for breaches committed by employees, agents or officers in the course of their employment. Where evidence available to DERM indicates an offence was committed with the employer's knowledge, or the employer failed to take adequate steps to avoid the harm, the employer may be the subject of an enforcement response. DERM will also consider the existence and effective implementation of management programs aimed at ensuring the compliance of the corporation to Queensland's environmental and natural resource laws. This is considered in greater detail in the next section.

2.2.3 Liability of employees

Employees cannot use as a defence the fact that they were acting under direction from a supervisor. Acting under orders might, however, be a mitigating factor in determining the appropriate enforcement response. The guiding principle in deciding whether to pursue an employee is the degree of culpability or responsibility involved. Factors to be considered in assessing the degree of culpability include:

- whether the employee knew or should have known that the activity was probably illegal or inappropriate
- whether the employee feared the loss of livelihood if they did not breach, or continue acting in breach, of the legislation
- the seniority of the employee and the scope of the employee's employment duties
- whether, having regard to the employee's seniority and employment duties, the employee had taken reasonable steps to draw to the attention of the employer or any other relevant person the impropriety of the practice
- whether the employee has taken reasonable steps endeavouring to mitigate or prevent any harm (if it was in the employee's power to do so).

Where employees in good faith and without negligence endeavour to follow specific requirements set by legislation or a licence or permit condition, and an offence occurs, they should not be the subject of an enforcement response.

2.2.4 Liability of directors and executive officers

When determining whether to institute any enforcement response against executive officers, in accordance with a provision that creates executive officer liability, the crucial issue will be whether the person had actual control or influence over the conduct of the corporation.

As a general policy, DERM will institute proceedings under the executive officer liability provisions only where evidence links the person with the corporation's illegal activity. That linkage needs to show:

- intent to engage in the unlawful conduct
- that the action or omission was negligent or reckless
- there was a failure to monitor or periodically assess and manage risks associated with the corporation's relevant activities or review supporting systems and programs
- there was intent to defraud.

The general legislative exceptions to executive officer liability are:

- the executive officer was not in a position to influence the corporation's conduct
- the officer took all reasonable steps to ensure that the corporation complied with the law.

DERM may take the view that reasonable steps were taken if executive officers ensured that:

- the corporation had an effective environmental or natural resource risk management system in place, which was aimed at ensuring compliance with relevant legislative requirements
- all staff were aware of the system
- the system had been effectively implemented throughout the corporation
- the system was under regular review and was amended when necessary.

The better the corporation's documentary evidence of these matters, the stronger the executive officer(s)'s defence.

2.2.5 Liability of lenders, liquidators and trustees

Although there are few situations in which lending institutions might attract liability under the law for an offence, the guiding principle for DERM is the culpability of potential recipients of an enforcement response in relation to an offence. Legal liability is necessary as a pre-requisite to any statutory enforcement response.

DERM acknowledges that in framing the law the intention was not to restrict legitimate commercial activities of lending institutions. DERM takes the view that if the lender did no more than lend money to the corporation under normal commercial processes, and did nothing that led to the causing of the unlawful activity, no enforcement action should be instituted against the lender. The closer the lender is to the management decisions that caused the unlawful activity, the greater the chance of liability.

Where a company has gone into liquidation, the lender might have day-to-day management responsibility for the company, if the lender becomes aware that the company's current activities are unlawful, or were unlawful in the past, then the lender has an obligation to take steps to stop or mitigate the impacts of the activities on the environment. The most appropriate way of doing this, and also the most effective way of ensuring that DERM will not consider the lender to be liable for unlawful environmental or natural resource impacts, is to immediately notify DERM and take steps to prevent future unlawful activities. By mitigating the impacts of unlawful activity on the environment, lenders will not only fulfil their obligations under the law but also maintain the value of their assets. Similarly, trustees and liquidators that take over the management responsibilities of a company must ensure the company's action comply with Queensland's natural resource and environmental legislation.

2.2.6 Liability of state and local governments

The legislation administered by DERM binds all people including state and local governments. The decision to commence enforcement action against state and local governments will depend on whether it is in the public interest. The laws in place are to be equally applied to both private and public sectors. The public has an interest in everyone abiding by these laws and public authorities have a greater responsibility to lead by example. One factor relevant to public interest is the potential cost of enforcement action to the taxpayer; this becomes a significant consideration as this involves a consideration of the costs of both parties.

3. Voluntary compliance

DERM recognises that one way to enhance environmental and natural resource protection is to protect companies that continuously improve their management practices and move beyond 'compliance'. To this end, DERM encourages companies to audit and monitor their operations. To maximise protection from higher level enforcement action, companies can follow these steps:

- implement (not just document) an appropriate risk management system that caters for routine and non-routine situations
- have contingency plans in place
- practise 'due diligence'
- comply with all statutory instruments
- have strategies in place to move towards industry best practice environmental management
- notify DERM immediately of any non-compliance
- give formal notice to DERM that the non-compliance will be appropriately dealt with and rectified.

3.1 Disclosure and co-operation

Encouraging voluntary disclosure and co-operation is in the public interest. DERM recognises that early notification of an incident and full co-operation with any investigation often mitigates the impact of the non-compliant activity. Accordingly, these factors will be taken into account when considering enforcement action.

3.2 Duty to notify and voluntary disclosure

The law creates a duty on all citizens to notify DERM, as soon as they become aware, of any actual or threatened environmental harm arising from an activity. Where this occurs, failure to notify DERM is an offence.

DERM wants to establish a culture of environmental and natural resource stewardship in the community where problems are reported before irreparable harm is caused. In determining whether to use information that a person has disclosed about themselves to initiate an enforcement response, DERM will consider whether the person or corporation made a voluntary, timely and complete disclosure of the incident giving rise to the offence. Specifically:

- whether the person promptly notified DERM
- whether the information assisted in the control or mitigation of any harm caused to the environment or natural resource
- whether the information substantially aided DERM's investigation of the incident
- whether the information was available from other sources
- whether the disclosure occurred prior to DERM or any other regulatory body obtaining knowledge of the non-compliance.

3.3 Without prejudice negotiations with alleged offenders

From time to time, it will be necessary for DERM to enter into 'without prejudice' discussions with alleged offenders about the type of enforcement tool to be employed in response to the unlawful conduct. The driving consideration in these discussions should be to achieve the best environmental or natural resource outcome. No agreement can be reached with an alleged offender who is not prepared to take responsibility for the impacts of the unlawful conduct. When taking part in these discussions, DERM may take into consideration the public interest considerations outlined above and in particular:

- the costs of the enforcement response relative to any outcome achieved
- whether a negotiated response sets an unsatisfactory precedent for DERM's response to the conduct
- whether a negotiated response provides an adequate deterrent for similar conduct.

General guideline on the enforcement tools

4. Administrative response (education and warnings and other statutory enforcement tools)

There are a number of non-statutory tools available to DERM to enhance regulatory compliance with Queensland's environmental and natural resource laws. As most of the community and industry are concerned with protection of the environment and natural resources, the majority of minor non-compliance can be dealt with by way of educating them regarding their obligations. Warning letters and notices are also an effective means to ensure that the recipient is made aware of their responsibilities in this respect.

There are a range of other statutory tools that provide an appropriate regulatory response to situations requiring a stronger response. Generally, the legislative provisions mandate certain criteria that have to be met prior to the use of these tools. Specific guidance on when these tools should be used is contained in separate guides prepared by DERM.

5. Infringement notices

5.1 Background

Infringement notices are a way of dealing with common breaches of the law where the impacts are not serious enough for court action. Some of these could be traversing a State forest without a permit, exceeding noise limits, working outside given hours, emitting black smoke from chimneys, or failing to carry out monitoring. The State Penalties Enforcement Regulation 2000 nominates the infringement notice offences and penalties under the law.

The infringement notice system modifies the traditional legal system. A notice is served because it appears an offence has been committed. However, payment of the penalty does not lead to the recording of a criminal conviction. Non-payment of the fine is not dealt with by a jail sentence but is recoverable as a civil debt. On the other hand, if a person elects to have the matter heard, proceedings are commenced in the criminal jurisdiction of the Magistrates Court.

Infringement notices can be issued by authorised officers. These can include officers from organisations, such as local governments and DERM. DERM has no direct control over how authorised officers from other organisations carry out their duties. However, for fairness and consistency, DERM's authorised officers will implement the infringement notice guidelines set out here.

5.2 Operation

Just as there is discretion to use any other enforcement tool, there is discretion whether to serve an infringement notice. Any discretion by individual officers must take into account the intention of the legislation to penalise those breaches that, in the past, might have gone unpunished, and to recognise those active in managing and minimising their environmental and natural resource use impacts.

Infringement notices are designed primarily to deal with one-off breaches that can be remedied easily. They are usually a first response when a preventable breach is discovered. Issuing successive infringement notices for multiple statutory breaches is generally inappropriate, unless the breaches are unrelated. In such circumstances, even though each breach might be comparatively minor, there is probably a major and continuing compliance problem. Such a problem needs to be dealt with through other enforcement measures if a past infringement notice has not motivated the recipient to successfully address the underlying issue.

The legislation does not set a time by which infringement notices have to be issued. Since serving a notice might be the first notification a person has of an alleged breach, it should be issued promptly out of fairness and courtesy. The *State Penalties Enforcement Act 1999* gives DERM the discretion to withdraw an infringement notice after serving the notice. This allows for two possibilities:

- A more serious breach of the law might have taken place without the authority's knowledge when the notice was issued. The notice can be withdrawn to allow the more serious breach to be pursued.
- A mistake of fact was made and the notice should not have been issued. In such a case, the State Penalties Enforcement Regulation 2000 allows the authority to withdraw the notice, even if the penalty has been paid. Withdrawal provisions should be seen as a safety net, not a mechanism to be applied regularly.

5.3 Summary

Infringement notices are generally appropriate when the following conditions are met:

- the breach is minor
 - the facts are apparently indisputable
 - the breach is a one-off situation easily remedied
 - inspection discovers a breach that normal operating procedures should have prevented
 - where the issuing of an infringement notice is likely to act as a deterrent
- Infringement notices should not be issued in the following circumstances:
- where large-scale habitat or environmental damage has occurred
 - where the breach is continuing and not within the alleged offender's ability to remedy quickly
 - where the penalty seems inadequate for the severity of the offence

- where the extent of the harm to the environment cannot be assessed immediately
- where the evidence is so controversial or insufficient that court action is unlikely to succeed
- where there has been substantial delay since the alleged breach
- where another authority has issued a notice for the same or similar offence in the same period
- where a notice, direction or order has been issued by DERM to do specified work within a time limit and the limit has not expired
- where multiple breaches have occurred, unless all are minor
- where the offence took place under a proposal approved by DERM.

6. Court orders

Many of the Acts administered by DERM provide a power to seek orders from a court to ensure compliance with legislative requirements. These orders may take a variety of forms, including declaratory orders, enforcement orders, restraint orders or orders resulting from a criminal prosecution. Court orders are amongst the strongest enforcement tools available to DERM and will only be sought where other alternatives have failed or where the conduct is of such a serious nature that DERM considers it necessary. The public interest considerations listed above (at section 2.1) should be considered by DERM when deciding whether court orders are appropriate.

6.1 Model litigant

As a Queensland Government department, DERM is bound to follow the model litigant principles, which can be found on the Department of Justice and Attorney General website. The principles ensure that when conducting litigation, DERM meets the community's and the courts' expectations that the State conducts itself in a manner which exemplifies the principles of justice, and that State power be used in the public interest.

6.2 Declarations

Where there is uncertainty regarding if an activity is unlawful in relation to the provisions of an Act administered by DERM, the Act may provide an avenue to seek a declaration from the court. A declaration is a formal statement of legal rights enabling or disallowing an activity. Seeking a court declaration enables an activity to proceed with a clear statement of the legal situation.

An example of where a court declaration may be sought is for consideration of whether a proposed commercial activity venture would be 'interfering' with the habitat of an endangered wildlife resource in a national park. Under similar provisions in the *Sustainable Planning Act 2009* people may seek a declaration about whether an activity is lawful under a planning scheme or is in breach of a condition of the development approval.

6.3 Enforcement and restraint orders

Where there is an existing ongoing or potential unlawful activity under legislation administered by DERM, the legislation may provide that a court may issue either a restraint order or an enforcement order. Enforcement orders are applied in the case of a development offence. Restraint orders may be issued for a threatened or anticipated offence against relevant legislative provisions.

Generally the legislation provides the court with very broad powers when issuing orders. For example, the court may, in some cases, direct the company or person to:

- stop an activity that either constitutes, or will constitute, the offence
- do anything to comply with the law
- cease activities that are in contravention of the law
- do anything required to stop committing an offence
- rehabilitate or restore an area.

When making a restraint or enforcement order, the court will specify the time required for compliance with the order. It is usually an offence for a person to contravene a court order. In order to stop frivolous or vexatious applications for restraint or enforcement orders, the court has the discretion to make an order in relation to costs.

7. Principle prosecution

7.1 Background

This guideline aims to identify the key steps in DERM's approach to initiating and progressing prosecutions by outlining:

- the basis on which DERM makes a decision to prosecute
- factors taken into account in deciding which charges to lay
- factors considered in determining the appropriate type of proceedings
- submissions on sentence.

7.2 The decision to prosecute

7.2.1 Evidence

The basic pre-requisite of any prosecution is that the available evidence, on first impression, appears to establish a *prima facie* case. At all times there is discretion not to prosecute, but the discretion to prosecute only arises once there is a *prima facie* case. This is a well established principle of law and has been enunciated in the Prosecutions Guidelines of the Queensland Office of the Director of Public Prosecutions.

The criteria that are to be applied in deciding whether to prosecute fall into two categories. First, is the evidence sufficient to justify proceedings? Second, does the public interest require a prosecution? The prosecutor must be satisfied as to the first question before moving on to the second.

Similarly, the Prosecution Policy and Guidelines of the Director of Public Prosecutions, New South Wales states:

A *prima facie* case is a necessary but not sufficient condition for launching a prosecution. Given the existence of a *prima facie* case it must be understood that a prosecution should not proceed if there is no reasonable prospect of a conviction being secured. . . . This decision requires an evaluation of how strong the case is likely to be when presented in court. It must take into account such matters as the availability, competence and credibility of witnesses and their likely impression on the arbiter of fact, and the admissibility of any alleged confession or other evidence. The prosecutor should also have regard to any lines of defence which are plainly open to, or have been indicated by the alleged offender and any other factors which in the view of the prosecutor could affect the likelihood or otherwise of a conviction.

7.2.2 Discretion

Sufficient evidence is not the only criterion for prosecution since:

- not every breach of the criminal law is automatically prosecuted
- the laying of charges is discretionary
- the dominant factor in exercising that discretion is the public interest.

The Prosecution Policy of the Commonwealth Director of Public Prosecutions notes:

The decision whether or not to prosecute is the most important step in the prosecution process. In every case great care must be taken in the interests of the victim (in this case the environment), the suspected offender and the community at large to ensure that the right decision is made. . . . The criteria for the exercise of this discretion cannot be reduced to something akin to a mathematical formula; indeed it would be undesirable to attempt to do so.

The breadth of the factors to be considered in exercising this discretion indicates a candid recognition of the need to tailor general principles to individual cases.

One of Parliament's main aims in making a breach of the law a criminal offence is to deter someone else from similar behaviour. By extending criminal liability to many people, for example, landowners and directors and managers of corporations, the law generates increased awareness and responsibility for environmental performance and natural resource management within corporate structures and throughout the community. Prosecution is part of DERM's strategy for achieving its objectives. If prosecution is unlikely to lead to deterrence, other measures may be considered.

Each case is to be assessed to determine whether prosecution is the appropriate strategic response. The factors to be considered when deciding to institute proceedings are listed above in 'Public Interest considerations' (at section 2.1).

Once a decision has been made to prosecute, DERM must present facts fairly and impartially to the court. DERM should have no interest in procuring a conviction, other than to ensure that the right person is convicted, that the truth is known and that justice is done (*R v Hay and Lindsay* (1968) QdR 459 at 478 and the Queensland Barnisters' Rules).

7.3 Decisions relating to what charges to lay

7.3.1 General principle

The charges laid must reflect the nature and extent of the conduct disclosed by the evidence with the aim of providing a basis for the court to impose an appropriate penalty. In line with this general principle, the following policy is adopted:

The administering authority has a duty to refuse its case to avoid laying either duplicate or multiple charges. There will be occasions where the same conduct is prohibited under separate statutes and involves an offence under each. Where another prosecuting authority is involved, DERM is to liaise with the other organisation to ensure the most appropriate charge(s) are laid. Conversely, other prosecuting bodies, which know of DERM's actual or potential involvement in a case, should initiate contact before proceedings begin.

7.4 Mode of trial – summary or indictable proceedings

Most offences under legislation administered by DERM are 'summary' offences that are heard by a Magistrate, who is the arbiter of fact and law. However, some offences are indictable, meaning that they may be heard in the District Court. Often the decision as to whether an indictable matter is to be heard summarily (before a Magistrate) is an election that can be made by the prosecution. In DERM's case, the decision as to whether or not to proceed on indictment ultimately rests with the Office of the Director of Public Prosecutions (ODPP). The ODPP have published guidelines on when it considers proceeding on indictment appropriate in the circumstances of environmental and natural resource offences. The Director of DPP guidelines can be found on its website at <www.justice.qld.gov.au>.

7.5 Sentencing considerations

The *Penalties and Sentences Act 1992* outlines the factors that can be considered by a court at sentence. When seeking a sentence for environmental and natural resource offences, the following is a non-exclusive list of factors which may be considered by DERM in preparing sentence submissions:

- the seriousness of the environmental impact or impact on natural resources (the 'victim' of the offence)
- the potential for the impact to be rectified or mitigated
- the steps taken by the defendant to rectify or mitigate the impact
- the level of cooperation by the defendant with DERM
- any prior convictions of the defendants relevant to environmental or natural resource management
- the level of penalty sufficient to deter others from similar conduct
- the prevalence of the offence
- the maximum penalty for the offence
- any relevant sentencing precedents.

8. Breaches of licence conditions

Breaches of licence, lease, permit, authority or the conditions of some other form of permission, can in some cases, lead to the following:

- the issuing of a warning notice or letter
- the issuing of an infringement notice
- prosecution of the offender
- the licence being cancelled.

Cancelling or suspending a licence is potentially the strongest penalty DERM can invoke as it may result in licensee's operations to close. In most cases, DERM will only take this step when:

- the breach of licence conditions has had serious consequences to human health, environment or natural resources
- continual minor breaches have occurred despite warnings being given by DERM
- provision is made for the automatic cancellation of the licence (e.g. accumulation of demerit points).

Specific legislative provisions provide the process DERM must follow before suspending or cancelling a licence. Once the process has been followed and a decision to suspend or cancel has been made, a licensee has the option to seek to have the decision reviewed by a court.

9. Conclusion

This guideline is not intended to have legal status. The matters outlined in this guideline are not legally binding on DERM and do not confine, restrain or limit the discretion of DERM to take any action. However, they provide general guidance on how enforcement decision-making is approached by DERM. More specific guidance can be obtained by reference to guidelines addressing specific pieces of legislation.

Should you wish to make comments or suggestions on this guideline, send them to:

Litigation Unit
Department of Environment and Resource Management
GPO Box 2454
Brisbane QLD 4001

If you want to provide information about an incident relating to Queensland environment or natural resource legislation, the DERM hotline is available 24 hours a day on 13 74 68 (13QGOV).

Department of Environment and Resource Management
MINISTERS BRIEFING NOTE

TO: Minister for Environment and
 Resource Management.

OBJECT: Contaminated water discharges from the Mt Oxide mine

REQUESTED BY
 Minister's office

RE:
 If this brief is urgent to keep the Minister
 Oxide mine.

RECOMMENDATION

It is recommended that the Minister
 to the attached correspondence (Attachment 1 and 2) to [redacted] and [redacted]
 [redacted] Spreadborough for signature by the Minister's Principal Policy Advisor detailing the
 Department of Environment and Resource Management's regulatory control over the
 Department of Employment Economic Development and Innovation (DEEDI) with respect to
 its management of abandoned mines; and
 that the department has concerns that DEEDI's reported budget submission of 4
 two years to rehabilitate Mt Oxide mine may be insufficient to mitigate the current
 environmental impacts posed by the site.

BACKGROUND

The Mt Oxide mine is an abandoned mine administered by DEEDI under the Abandoned
 Mines Lands Program (AMLP). The site has a history of contaminated water releases during
 the wet season (refer to CTS01305/11 at Attachment 3).

On 4 March 2011 the landholder of Chinda Station (Mr Spreadborough)
 requested to advise that blue precipitates had again been found downstream of the mine
 from the department and DEEDI conducted a joint inspection of Mt Oxide on 28
 2011 during which bright blue precipitates were observed in Cave Creek (refer
 to Attachment 4).

Results from samples obtained during the inspection indicated low pH
 conditions, with copper exceeding livestock drinking water guidelines.

Contamination is primarily located in the upper sections of Cave Creek close to the mine
 and at this stage is not as extensive as the release that occurred during the
 previous season.

On 1 March 2011 ministerial correspondence was received from [redacted] on
 the subject of contamination, relating to the ongoing contamination from the Mt Oxide mine
 (refer to Attachment 5). Similar correspondence was received on 31 March 2011 from Ms
 Spreadborough, (Mr Spreadborough's sister) (refer to Attachment 6).

Ministerial correspondence from [redacted] and Ms Spreadborough request details of the
 department's regulatory control over DEEDI with respect to DEEDI's management of
 abandoned mines. [redacted] also questioned the implementation status of recommendations

Position: ADG OER
 Tel No: [redacted]
 Name: [redacted]
 Position: [redacted]
 Tel No: [redacted]

Position: Director General
 Tel No: [redacted]
 Date: [redacted]

into the
based on the implementation
(13/11).

Finance Co
own as the Kellier review.
Attachment 7 (refer

CURRENT ISSUES

- The department met with Mr Spreadborough requested that the department take statutory action under the EEDI to ensure contaminated water is not released from Mt Oxide mine in the future.
- Department is continuing to liaise with Mr Spreadborough about his concerns and provided him with analytical results obtained from the joint departmental and DEEDI action conducted on 28 March 2011.
- As Spreadborough's and [redacted] questions are [redacted] is able to the department to address the contamination issues.
- Environmental Protection Act 1994 binds all persons including the State. The number of regulatory tools which are available to the department to prevent or environmental harm.*
- The department's enforcement guidelines state 'The decision to commence enforcement action against state and local governments will depend on whether it is in the public interest. Laws in place are to be equally applied to both private and public sectors. The public has interest in everyone abiding by these laws and public authorities have a greater responsibility to lead by example. One factor relevant to public interest is the potential cost of inaction to the taxpayer; this becomes a significant consideration as this involves the cost of the costs of both parties'.*
- responsible for this mine site, the department is currently [redacted] [redacted] of enforcement action in accordance with the enforcement guidelines.
- indicated to the department that a budget submission of \$4 million over two years to address the discharges from the abandoned mine. The department is budget allocation of this amount may be insufficient to mitigate the current impacts associated with Mt Oxide.
- indicated the funding for Mt Oxide mine is likely to be known by the end of 2011.

ing a [redacted]
ment 8). This correspondence
1 information on the actions it will immediately take to prevent [redacted]
the Mt Oxide Mine along with further details about the actions to be undertaken
the 2011 dry season to reduce the risk of ongoing contamination occurring.
re received from DEEDI following the above meeting will be considered in the
s deliberations regarding the appropriateness of enforcement action.

CURCE/IMPLEMENTATION IMPLICATIONS

- Department will continue to use existing resources to address [redacted]
DI regarding environmental issues at Mt Oxide mine.

POSED ACTION

- Assistant Director-General Regional Service Delivery [redacted]
DI staff to discuss DEEDI's management of the Mt Oxide Mine
- Principal Policy Advisor to the Minister for Environment and Resource Management [redacted] on 30 March 2011
- ide responses to ministerial correspondence received from [redacted]

Cleared by
Name: Terry Wall
Position: ADG OER
Tel No: [redacted]
Name:
Position:
Tel No:

Recommended:
Name: John Bradley
Position: Director-General
Tel No: [redacted]
Date:

MINISTERS COMMENTS

[REDACTED]

Correspondence [REDACTED]
Correspondence from [REDACTED] Spreadsheet used as Attachment 1 to [REDACTED]
Previous brief CTS00113/11
Correspondence to the Director-General of DEED (GTS 057/11)

[REDACTED]

[REDACTED]

[REDACTED]

7 Wall
ADG DER

[REDACTED]

Illion: Director-General
No. [REDACTED]
Date: [REDACTED]



Queensland
Government

[Redacted]

[Redacted]

Thank you for your email of 30 March
about the Mt Oxide mine. The Minister for Environment and Resource
Management will respond on her behalf.

It is the Department's
policy as part of the State Government's
Department of Environment and Resource
Management to work with DEEDI and local stakeholders in
managing the Mt Oxide mine.

Information to abandoned mines
1994, which binds all
mines which are available to DEEM.
Other available non-statutory measures, to

controls DEEM has used since 1994 to ensure
contaminated water issues at Mt Oxide and in
managing the *Environmental Protection*
The Act creates a number of statutory
tools where appropriate, along
with or mitigate environmental harm.

PA)
report produced in January
January 2007 (the Kelliher Report) made
recommendations for the administration of abandoned
mines, including the Abandoned Mines Lands Program.

Information is currently

[Redacted]

...the case in relation to

...

...

...

ncipal Policy Advisor



Queensland
Government



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sked

DEEDI) as
Department of Environment and Resource
ly engage with DEEDI and local stakeholders in
to the management of contaminated water at the Mt Oxide mine.

m the mine and, to this end
ntify remedial measures required at the

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uding the state. The Act
DERM utilises these tools where
asures, to prevent mitigate environmental

THE ACT

le, continue to
rently the case.

the Abandoned Mines Edition



...part parier convert...

...[redacted]...

...[redacted]...

Principal Policy

COPY

large of site

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The Mount Oxide mine has not operated since it was
surrendered in the late 1990s (Refer CTS 5665/10 at Attachment 1).
The Mount Oxide mine is considered to be an abandoned mine under
the Abandoned Mines Lands Program (AMLPP) by the Department of Environment, Economic
Development and Innovation (DEEDI).
In the 2008/2009 and 2009/2010 wet season, contaminated water was released
into Cave Creek, a tributary of the Gunpowder Creek (Refer CTS0135/11 Attachment 1).

the site.

An expert panel met on 25 June 2010
regarding downstream contamination at Mount Oxide (refer CTS11915/10
Attachment 1).
In August 2010 a letter from the Director-General of the Department of Environment and
Heritage Management to the Director-General of DEEDI highlighted the need to implement
short term actions before the 2010/2011 wet season with a long term focus of ensuring
no further water releases from the site comply with current environmental standards (refer
CTS11915/10 Attachment 3).
On 8 September 2010 the Director-General of DEEDI
advised the department indicating that short term actions would be implemented prior to the
2010/2011 wet season (refer Attachment 4).
The department has continually engaged with the landowner over this time regarding
stream contamination at Mount Oxide and has provided assistance wherever possible.

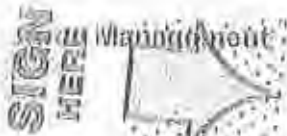
CURRENT ISSUES

On 28 January 2011 and on 24
February 2011 the department advised that blue precipitates were visible in Cave
Creek. The department and DEEDI conducted a joint inspection of Mount Oxide on 28 March 2011
and observed bright blue precipitates in Cave Creek (see pictures at Attachment 5).

Cleared by
Name: Terry Wall
Position: Assoc. Dir.
Tel No: 3330 6240
Name:
Position:
Tel No:

31 MAR 2011

Tel No: 3330 6208
Date:



PG... [redacted]
Dated 17/9/00



11

1. [redacted]
d works proposed to be

IS
from the [redacted] expressing dissatisfaction with the lack of
and works to date and concerns that further discharges will occur in the upcoming wet
on.

il to deal with the contamination.
nly intending to implement some of the
e upcoming wet season,
ks include:
acing electric fencing
aring mineralised stockpiles with plastic to prevent rainwater
k piles; and
ementing a [redacted] program
entified funding options for these works [redacted] king Minister Robertson's
implementation of the works.
aft brief states that DEEDI expects that even with the works,
d discharges will occur from the site for several years to come.
identified that a further proposal to remove all mineralised stockpiles from the site
source of much of the contaminated discharge is being considered.
discussions about this further proposal are occurring between QME and Perilya
ld the Exploration Permit (Minerals) (EPM) over the Mount Oxide Mine and if
ral legal advice is being sought.
ed that the DEEDI Director-General will be
with further details on these proposals (refer Attachment 2).

neral's

11
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1



QME proposals for
not to consideration by QME.
a cause of the contamination.
an officer as the point of contact for the contamination
Spreadborough.
on-ground works to date that

ESOURCE/IMPLEMENTATION
Departmental officers from
expert panel.

ED ACTION
ment officers will attend

DIRECTOR-GENERAL'S COMMENTS

[Redacted]

[Redacted]

[Redacted]

Copy

It Oxide mine was
located in the late 1990's (refer to [Redacted])
The Oxide mine is considered to be an abandoned mine.
The abandoned Mines Lands Program (AMLP) facilitated by the Department of Employment,
Economic Development and Innovation (DEEDI).
The program identifies historic mine disturbance, and
conducts remedial works on these sites in a priority order.
In 2008/2009 and 2009/2010 wet season, contaminated water was released from
the Oxide mine into Caves Creek, a tributary of Gunpowder Creek.
This release significantly impacted on Caves Creek with the formation of a bright blue
precipitate over several kilometres of the creek.
Sampling conducted at the time indicated that water and
precipitate exceeded livestock watering standards.
The water quality downstream of Caves Creek in [Redacted]
did not exceed values for livestock or human consumption.
DEEDI carried out remediation and in-stream cleanup works in 2009 at
approximately \$1 million.
In 2010 DEEDI established an expert panel
to assess the site.
DEEDI conducted further works in [Redacted] discharge,
which primarily consisted of covering some of the more contaminated [Redacted] stockpiles with plastic.
The feedback from DEEDI in late 2010 was that it was progressing with a proposal to remove all of
the contaminated material from the site in 2011.
I liaised with the owner of Chidna Station on the works that were conducted.

19.
3

onment and
stream of Mt Oxide.

that blue precipitates were found

[Redacted]

Cleared by
Name: Terry Wall
Position: Associate
Tel No: [Redacted]
Name:
Position:
Tel No:

Recommended:
[Redacted]

In previously abandoned
landholder's cattle.
therefore low.

PROPOSED ACTION

The abandoned will
DERM will continue to liaise with both the landholder
inspections of the site to monitor the level of contamination in



COPY



Fig. [REDACTED]
Dated 27/9/10

SUBJECT:

COPY

On 2 August 2010 to brief them on actions to date and to be taken in the next wet season.

The local landowner has subsequently contacted the Department of Resource Management expressing dissatisfaction with the lack of on-site and concern that further discharges will occur in the upcoming wet

season.

Further work is being undertaken to ensure that event rainwater infiltrating the

implementing a monitoring program.

Identified funding options for these or implementation of the works.

is seeking further input

draft brief states that DEED expects that even with the works proposed, some discharges will occur from the site for several years to come.

Identified that a further proposal to remove all mineralised rockpiles from the site, the source of much of the contaminated discharge is being considered.

Discussions about this further proposal are occurring between QME and Perilya who hold the Exploration Permit (Minerals) (EPM) over the Mount Oxide Mine and it is noted that legal advice is being sought.

It is noted that the DEED Director-General will be responding to the request for further details on these proposals (refer Attachment 2).

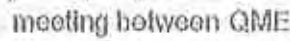
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



meeting between QME

ed

3

RESOURCES

- Departmental officers from North Region and Central Office have been involved in expert panel.

Red 02/09/10

073

[Redacted]

818110

Panel Meeting

Director-General on 10 June 2010 to

Employment,

Director-General.

his brief and the actions being taken to address
the abandoned Mt Oxide mine (the mine).

will be provided following the next meeting of the expert panel,
July.

he Director-General of the Department of Employment,
Innovation confirming the works that need to be implemented

ter in early June.

is
iated with the

Department

is
panel to consider

[Redacted]

1 No: 97 3330 630
of 2/20/10
me:
sition:
rel No:

[Redacted]

[Redacted]

her comment and

department is awaiting further advice

be scheduled

panel meeting from QML.

commitment was given by QME that a stakeholder meeting will be held in late August to
a progress update on panel recommendations and the short and long term
rent strategies that will be implemented at the mine.

stood that a response to the letter tabled by Mr Spreadborough at the stakeholder
22 April 2010 that identified his concerns about the mine is currently with Minister
for review.

Regional

tal

ing the department's expectations
t the mine (Attachment 1).

holders and maintain an active presence on
on addressing the environmental issues at

ne potential for
th the company

best possible stage.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

berange
from Mr Spreadborough

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

St
on:
St



Department
of the Environment

[REDACTED]

[REDACTED]

[REDACTED]

highlighted the need for DEED to
that the level of environmental impact experienced downstream of the site
not repeated during the upcoming wet season(s).

environmental impacts associated with the Mt Oxide Mine and to formulate
recommendations on the management of the mine site to mitigate the environmental

to and short
term
ied at the

that a complete [REDACTED]
may not be achievable prior to the upcoming wet season. Furthermore,
that DEED will implement the panel's recommendations for short term
the environmental risk associated with the mine site before the next wet

lian [REDACTED]
0) Aquatic
downstream

restraint

[REDACTED]
(d)gov.au

- 2 -

Should you have any further enquiries, please do not hesitate to contact Mr Rob Lawrence,
Regional Manager, Environmental Services, North Region of the department on telephone
[REDACTED]

Yours sincerely

[REDACTED]
John Bradley
Director-General



queensland
government

copy

ISBANE

Dear Sir

actions recommended by the expert panel. This plan was
by early November 2010, before the start of the next wet

Επικοινωνία: **Ιλίας Θαρύκας** ilyas@math.upatras.gr <http://www.math.upatras.gr/~ilyas>

[illegible]

the relevant

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1994-1995

Mount Oxide – 28 March 2011



Please quote: MN115902 DG1588
Contact officer: [REDACTED]
Contact phone: [REDACTED]



- 8 SEP 2010

Department of
**Employment, Economic
Development and Innovation**

Mr John Bradley
Director-General
Department of Environment and Resource Management
GPO Box 254
BRISBANE QLD 4001

Dear John,

Thank you for your letter of 8 August 2010, reference number CTS 11915/10, regarding management of the environmental issues at the Mount Oxide mine site.

A briefing on the Mount Oxide Expert Panel recommendations is being progressed for consideration by the Minister. The expert panel's considerations include submissions from the meetings held in Mount Isa and these submissions will be included in the briefing to the Minister.

The department is focusing on solving the environmental issues on the site by spending resources on first time fixes, wherever possible, rather than interim solutions.

I have been told that the removal of significant volumes of residual mineralised material contained in stockpiles adjacent to the local streams will be required to achieve the long term goal of stopping stream contamination from the mine site.

Given that the legalities and details of options for removal of the stockpiles (including removal off site) will require some time to resolve, DEEDI is preparing to implement a number of short term management actions recommended by the expert panel. It is planned that these actions be implemented by early November 2010, before the start of the next wet season.

There are three main parts to these actions:

- covering of the most contaminated areas of the residual stockpiles with plastic to shed water and minimise infiltration
- managing risks to cattle by upgrading the existing electric fencing around contaminated areas downstream to four strand barbed wire to ensure that cattle are kept away from these areas, and continuing to provide lick supplements to the landholder
- undertaking an extensive monitoring program both on the site and downstream. The information gained from this monitoring program will improve understanding of site mechanisms, ecological impacts downstream and any possible impact of mine pit water on stream contamination.

Level 26, 111 George Street
BRISBANE QLD 4000
PO Box 15168
CITY EAST QLD 4002

Telephone [REDACTED]
Facsimile [REDACTED]
Website www.deedi.qld.gov.au
ABN 24 830 236 406

The monitoring will be in compliance with guidelines and standards provided by your department. Wherever possible, monitoring will be carried out with local people, and consideration will be given to collaborating with Southern Gulf Catchments Ltd in these activities.

This will help to ensure the effectiveness of remediation and contamination management works, as well as to define further actions for the protection of wildlife. The monitoring will also provide a baseline for future studies to measure improvement over time.

In order to define the options for removal of the stockpiles, including removal off site, DEEDI is also reviewing the implications of Perilya's exploration permit and the potential to develop a mine at Mount Oxide in the future

A meeting has been arranged with Perilya for 10 September 2010 to discuss the removal of the problem stockpiles. This discussion will be within the context of Perilya's interests, and the need to address this issue as soon as possible without waiting for the possible development of a new mine at the site. I am advised that an officer of your department has accepted an invitation to attend this meeting.

In order to be able to complete the short term works described above by early November 2010, quotations are currently being sought for the engagement of contractors for these works.

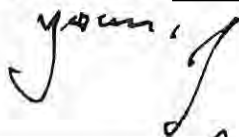
While equipment is on site, it will be used to perform other minor works consistent with segregating clean and potentially contaminated waters.

In order to further review and progress long term site contamination solutions, the next meeting of the Mount Oxide Expert Panel is planned for later this year. Once the outcomes from the expert panel meeting have been collated and agreed upon, another meeting will be called to continue the consultation process. DEEDI will continue to work with the relevant expert panel members to improve communication.

Following on from this, it is likely that a Cabinet Budget Review Committee submission will be required to seek funding to carry out stockpile removal and other long term works. I will be seeking your input and support for such a submission.

An item included in the expert panel's initial recommendations was that it would be advantageous to expedite the renewal of the Chidna lease as it would help to address the landholder's concerns about security of his pastoral tenure. I understand that DERM is currently processing this renewal, and I am aware that DEEDI regional staff have met with DERM regional staff to expedite the finalisation of the land condition and assessment report.

Should you have any queries regarding the information contained in this letter, [REDACTED] [REDACTED] Director, Northern, Mines, of the Department of Employment, Economic Development and Innovation will be pleased to assist you and can be contacted on telephone 4760 [REDACTED]



Director-General





LABORATORY REPORT COVERSHEET

Date: 19 March 2009

To: Environmental Protection Agency
Cnr Mary & Camooweal Streets
MOUNT ISA QLD 4825

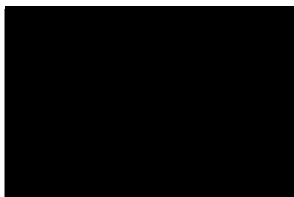
Attention: 

Your Reference: ISA 539 Mt Oxide
Laboratory Report No: 63067
Samples Received: 13/03/2009
Samples / Quantity: 1 Water

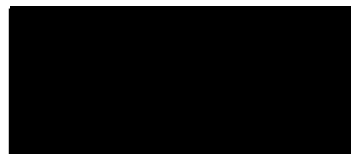
The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

This report supersedes our preliminary results issued 17 March 2009.

This Report must not be reproduced, except in full.



Manager
CAIRNS



Administration Manager
CAIRNS



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Date Extracted		16/03/2009
Date Analysed		16/03/2009
Fluoride, F	mg/L	0.22



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

Metals 31 Scan - ICP-OES Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Date Extracted		16/03/2009
Date Analysed		16/03/2009
Silver, Ag	mg/L	<0.005
Aluminium, Al	mg/L	0.02
Arsenic, As	mg/L	<0.005
Boron, B	mg/L	[NT]
Barium, Ba	mg/L	0.084
Beryllium, Be	mg/L	<0.001
Calcium, Ca	mg/L	90
Cadmium, Cd	mg/L	<0.005
Cobalt, Co	mg/L	0.14
Chromium, Cr	mg/L	<0.005
Copper, Cu	mg/L	4.2
Iron, Fe	mg/L	0.04
Potassium, K	mg/L	11
Lithium, Li	mg/L	0.060
Magnesium, Mg	mg/L	95
Manganese, Mn	mg/L	0.50
Molybdenum, Mo	mg/L	<0.005
Sodium, Na	mg/L	21
Nickel, Ni	mg/L	0.047
Lead, Pb	mg/L	<0.02
Antimony, Sb	mg/L	<0.02
Selenium, Se	mg/L	<0.05
Silicon, Si	mg/L	9.7
Tin, Sn	mg/L	<0.05
Strontium, Sr	mg/L	0.06



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

Metals 31 Scan - ICP-OES Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Titanium, Ti	mg/L	<0.005
Thallium, Tl	mg/L	<0.05
Vanadium, V	mg/L	<0.01
Zinc, Zn	mg/L	0.10



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

31 Metals Scan ICP-OES - Total Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Total Silver, Ag	mg/L	<0.005
Total Aluminium, Al	mg/L	0.64
Total Arsenic, As	mg/L	<0.005
Total Boron, B	mg/L	[NT]
Total Barium, Ba	mg/L	0.084
Total Beryllium, Be	mg/L	<0.001
Total Calcium, Ca	mg/L	100
Total Cadmium, Cd	mg/L	<0.005
Total Cobalt, Co	mg/L	0.14
Total Chromium, Cr	mg/L	<0.005
Total Copper, Cu	mg/L	31
Total Iron, Fe	mg/L	0.15
Total Potassium, K	mg/L	11
Total Lithium, Li	mg/L	0.070
Total Magnesium, Mg	mg/L	100
Total Manganese, Mn	mg/L	0.52
Total Molybdenum, Mo	mg/L	<0.005
Total Sodium, Na	mg/L	21
Total Nickel, Ni	mg/L	0.051
Total Lead, Pb	mg/L	<0.02
Total Antimony, Sb	mg/L	<0.02
Total Selenium, Se	mg/L	<0.05
Total Silicon, Si	mg/L	11
Total Tin, Sn	mg/L	<0.05
Total Strontium, Sr	mg/L	0.06
Total Titanium, Ti	mg/L	0.011
Total Thallium, Tl	mg/L	<0.05



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

31 Metals Scan ICP-OES - Total Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Total Vanadium, V	mg/L	<0.01
Total Zinc, Zn	mg/L	0.11
Total Mercury, Hg	mg/L	[NT]



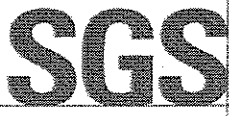
CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD

Date Extracted			
Date Analysed			
Fluoride, F	mg/L	0.05	AN141
Metals 31 Scan - ICP-OES			
Date Extracted			
Date Analysed			
Silver, Ag	mg/L	0.005	AN320
Aluminium, Al	mg/L	0.005	AN320
Arsenic, As	mg/L	0.005	AN320
Boron, B	mg/L	0.005	AN320
Barium, Ba	mg/L	0.005	AN320
Beryllium, Be	mg/L	0.001	AN320
Calcium, Ca	mg/L	0.05	AN320
Cadmium, Cd	mg/L	0.005	AN320
Cobalt, Co	mg/L	0.005	AN320
Chromium, Cr	mg/L	0.005	AN320
Copper, Cu	mg/L	0.005	AN320
Iron, Fe	mg/L	0.005	AN320
Potassium, K	mg/L	0.05	AN320
Lithium, Li	mg/L	0.005	AN320
Magnesium, Mg	mg/L	0.05	AN320
Manganese, Mn	mg/L	0.005	AN320
Molybdenum, Mo	mg/L	0.005	AN320
Sodium, Na	mg/L	0.05	AN320
Nickel, Ni	mg/L	0.005	AN320
Lead, Pb	mg/L	0.02	AN320
Antimony, Sb	mg/L	0.02	AN320



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD
Selenium, Se	mg/L	0.05	AN320
Silicon, Si	mg/L	0.05	AN320
Tin, Sn	mg/L	0.05	AN320
Strontium, Sr	mg/L	0.005	AN320
Titanium, Ti	mg/L	0.005	AN320
Thallium, Tl	mg/L	0.05	AN320
Vanadium, V	mg/L	0.01	AN320
Zinc, Zn	mg/L	0.005	AN320
31 Metals Scan ICP-OES - Total			
Total Silver, Ag	mg/L	0.005	AN320
Total Aluminium, Al	mg/L	0.005	AN320
Total Arsenic, As	mg/L	0.005	AN320
Total Boron, B	mg/L	0.005	AN320
Total Barium, Ba	mg/L	0.005	AN320
Total Beryllium, Be	mg/L	0.001	AN320
Total Calcium, Ca	mg/L	0.05	AN320
Total Cadmium, Cd	mg/L	0.005	AN320
Total Cobalt, Co	mg/L	0.005	AN320
Total Chromium, Cr	mg/L	0.005	AN320
Total Copper, Cu	mg/L	0.005	AN320
Total Iron, Fe	mg/L	0.005	AN320
Total Potassium, K	mg/L	0.05	AN320
Total Lithium, Li	mg/L	0.005	AN320
Total Magnesium, Mg	mg/L	0.05	AN320
Total Manganese, Mn	mg/L	0.005	AN320
Total Molybdenum, Mo	mg/L	0.005	AN320
Total Sodium, Na	mg/L	0.05	AN320
Total Nickel, Ni	mg/L	0.005	AN320



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD
Total Lead, Pb	mg/L	0.02	AN320
Total Antimony, Sb	mg/L	0.02	AN320
Total Selenium, Se	mg/L	0.05	AN320
Total Silicon, Si	mg/L	0.05	AN320
Total Tin, Sn	mg/L	0.05	AN320
Total Strontium, Sr	mg/L	0.005	AN320
Total Titanium, Ti	mg/L	0.005	AN320
Total Thallium, Tl	mg/L	0.05	AN320
Total Vanadium, V	mg/L	0.01	AN320
Total Zinc, Zn	mg/L	0.005	AN320
Total Mercury, Hg	mg/L	0.0002	AN312 CEI-202



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

NOTES:

LOR - Limit of Reporting.

Geneva Legal Comment

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ISO 17025

Unless otherwise stated the results shown in this test report only refer to the sample(s) tested and such sample(s) are only retained for 60 days only. This document cannot be reproduced except in full, without prior approval of the Company.

Analysis Date: Between 16/03/09 and 19/03/09

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[REDACTED]

From: [REDACTED]
Sent: Thursday, 19 March 2009 10:16 AM
To: [REDACTED] ian [REDACTED]
Cc: [REDACTED]
Subject: Test Results- Mt Oxide

[REDACTED]

As discussed by phone just now I have spoken to SGS and have answers to your questions below:

- Summary of the analytical method used
The method used was ICP-OES (Inductively coupled plasma- Optical Emission Spectroscopy). The samples were filtered with a 45um filter and TOTALS were digested over night at 90C in 1% nitric acid.
- What the term TOTAL implies in the test results
Total implies TOTAL recoverable (from 1% nitric digest).
- What the use of the # symbol signifies when used against results
The hash symbol signifies that the digest is not NATA accredited.

Please note that the results from ICP-OES are not NATA accredited. They were done quickly in Cairns to give indicative results from which to base further sample analyses on. These results will be expected next week.

If you require any further information do not hesitate to contact Ash or myself.

Thanks

[REDACTED]
Principal Environmental Officer
Far Northern Region - Environmental Services
Environmental Protection Agency

☎ (07) 4744 [REDACTED]
☎ (07) 4744 7800
✉ elaine.[REDACTED]

Visit us online at www.epa.qld.gov.au

From: [REDACTED] (PIB) [mailto:[REDACTED]]
Sent: Wednesday, 18 March 2009 2:10 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: Re : SGS Test results - Mt Oxide Water Sample ISA 539 Mt Oxide
Importance: High

Greetings [REDACTED] Thankyou for your assistance.

To assist with interpretation of preliminary results dated 17/3/2009 **Laboratory Report 63067**

Can EPA Please request SGS to provide additional information for analysis of Water Sample ISA 539 Mt Oxide

Specifically details on :

- Summary of the analytical method used
- What the term TOTAL implies in the test results
- What the use of the # symbol signifies when used against results

Regards

[REDACTED]
Principal Policy Officer, Food Safety

Biosecurity Queensland

Department of Primary Industries & Fisheries

GPO Box 46 Level 3 Primary Industries Building, 80 Ann St

BRISBANE QLD 4000

Ph. 323 [REDACTED] Facsimile [REDACTED]

Mob. 0417 [REDACTED]

Queensland celebrates its 150th anniversary in 2009. Check out what's on today at www.q150.qld.gov.au



LABORATORY REPORT COVERSHEET

Date: 17 March 2009

To: Environmental Protection Agency
Cnr Mary & Camooweal Streets
MOUNT ISA QLD 4825

Attention: [REDACTED]

Your Reference: ISA 539 Mt Oxide
Laboratory Report No: 63067
Samples Received: 13/03/2009
Samples / Quantity: 1 Water

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

**The results contained in this report are preliminary only.
Awaiting QA/QC checks.**



CLIENT: Environmental Protection Agency

PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Date Extracted		
Date Analysed		
Fluoride, F	mg/L	



CLIENT: Environmental Protection Agency

PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

Metals 31 Scan - ICP-OES Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Date Extracted		16/03/2009
Date Analysed		16/03/2009
Silver, Ag	mg/L	<0.005
Aluminium, Al	mg/L	0.02
Arsenic, As	mg/L	<0.005
Boron, B	mg/L	[NT]
Barium, Ba	mg/L	0.084
Beryllium, Be	mg/L	<0.001
Calcium, Ca	mg/L	90
Cadmium, Cd	mg/L	<0.0050
Cobalt, Co	mg/L	0.14
Chromium, Cr	mg/L	<0.005
Copper, Cu	mg/L	4.2
Iron, Fe	mg/L	0.04
Potassium, K	mg/L	11
Lithium, Li	mg/L	0.060
Magnesium, Mg	mg/L	.95
Manganese, Mn	mg/L	0.50
Molybdenum, Mo	mg/L	<0.005
Sodium, Na	mg/L	21
Nickel, Ni	mg/L	0.047
Lead, Pb	mg/L	<0.020
Antimony, Sb	mg/L	<0.020
Selenium, Se	mg/L	<0.050
Silicon, Si	mg/L	9.7
Tin, Sn ^	mg/L	<0.05
Strontium, Sr	mg/L	0.06
Titanium, Ti ^ *	mg/L	<0.005
Thallium, Tl	mg/L	<0.050
Vanadium, V	mg/L	<0.010



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

Metals 31 Scan - ICP-OES Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Zinc, Zn	mg/L	0.10



CLIENT: Environmental Protection Agency

PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

31 Metals Scan ICP-OES - Total Our Reference Your Reference Date Sampled Type of Sample	Units	63067-1 Twibbles Creek 11/03/2009 Water
Total Silver, Ag #	mg/L	<0.005
Total Aluminium, Al #	mg/L	0.64
Total Arsenic, As #	mg/L	<0.005
Total Boron, B #	mg/L	[NT]
Total Barium, Ba #	mg/L	0.084
Total Beryllium, Be #	mg/L	<0.001
Total Calcium, Ca #	mg/L	100
Total Cadmium, Cd #	mg/L	<0.0050
Total Cobalt, Co #	mg/L	0.14
Total Chromium, Cr	mg/L	<0.005
Total Copper, Cu #	mg/L	31
Total Iron, Fe #	mg/L	0.15
Total Potassium, K #	mg/L	11
Total Lithium, Li #	mg/L	0.070
Total Magnesium, Mg #	mg/L	100
Total Manganese, Mn #	mg/L	0.52
Total Molybdenum, Mo #	mg/L	<0.005
Total Sodium, Na #	mg/L	21
Total Nickel, Ni #	mg/L	0.051
Total Lead, Pb #	mg/L	<0.020
Total Antimony, Sb #	mg/L	<0.020
Total Selenium, Se #	mg/L	<0.050
Total Silicon, Si #	mg/L	11
Total Tin, Sn #	mg/L	<0.05
Total Strontium, Sr #	mg/L	0.06
Total Titanium, Ti #	mg/L	0.011
Total Thallium, Tl #	mg/L	<0.050
Total Vanadium, V #	mg/L	<0.010
Total Zinc, Zn #	mg/L	0.11
Total Mercury, Hg #	mg/L	[NT]



CLIENT: Environmental Protection Agency

PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD

Date Extracted			
Date Analysed			
Fluoride, F	mg/L	0.05	AN141
Metals 31 Scan - ICP-OES			
Date Extracted			
Date Analysed			
Silver, Ag	mg/L	0.005	AN320
Aluminium, Al	mg/L	0.005	AN320
Arsenic, As	mg/L	0.005	AN320
Boron, B	mg/L	0.005	AN320
Barium, Ba	mg/L	0.005	AN320
Beryllium, Be	mg/L	0.001	AN320
Calcium, Ca	mg/L	0.05	AN320
Cadmium, Cd	mg/L	0.005	AN320
Cobalt, Co	mg/L	0.005	AN320
Chromium, Cr	mg/L	0.005	AN320
Copper, Cu	mg/L	0.005	AN320
Iron, Fe	mg/L	0.005	AN320
Potassium, K	mg/L	0.05	AN320
Lithium, Li	mg/L	0.005	AN320
Magnesium, Mg	mg/L	0.05	AN320
Manganese, Mn	mg/L	0.005	AN320
Molybdenum, Mo	mg/L	0.005	AN320
Sodium, Na	mg/L	0.05	AN320
Nickel, Ni	mg/L	0.005	AN320
Lead, Pb	mg/L	0.02	AN320
Antimony, Sb	mg/L	0.02	AN320
Selenium, Se	mg/L	0.05	AN320
Silicon, Si	mg/L	0.05	AN320
Tin, Sn ^	mg/L	0.05	AN320
Strontium, Sr	mg/L	0.005	AN320



CLIENT: Environmental Protection Agency

PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD
Titanium, Ti ^ *	mg/L	0.005	AN320
Thallium, Tl	mg/L	0.05	AN320
Vanadium, V	mg/L	0.01	AN320
Zinc, Zn	mg/L	0.005	AN320
31 Metals Scan ICP-OES - Total			
Total Silver, Ag #	mg/L	0.005	AN320
Total Aluminium, Al #	mg/L	0.005	AN320
Total Arsenic, As #	mg/L	0.005	AN320
Total Boron, B #	mg/L	0.005	AN320
Total Barium, Ba #	mg/L	0.005	AN320
Total Beryllium, Be #	mg/L	0.001	AN320
Total Calcium, Ca #	mg/L	0.05	AN320
Total Cadmium, Cd #	mg/L	0.005	AN320
Total Cobalt, Co #	mg/L	0.005	AN320
Total Chromium, Cr	mg/L	0.005	AN320
Total Copper, Cu #	mg/L	0.005	AN320
Total Iron, Fe #	mg/L	0.005	AN320
Total Potassium, K #	mg/L	0.05	AN320
Total Lithium, Li #	mg/L	0.005	AN320
Total Magnesium, Mg #	mg/L	0.05	AN320
Total Manganese, Mn #	mg/L	0.005	AN320
Total Molybdenum, Mo #	mg/L	0.005	AN320
Total Sodium, Na #	mg/L	0.05	AN320
Total Nickel, Ni #	mg/L	0.005	AN320
Total Lead, Pb #	mg/L	0.02	AN320
Total Antimony, Sb #	mg/L	0.02	AN320
Total Selenium, Se #	mg/L	0.05	AN320
Total Silicon, Si #	mg/L	0.05	AN320
Total Tin, Sn #	mg/L	0.05	AN320
Total Strontium, Sr #	mg/L	0.005	AN320
Total Titanium, Ti #	mg/L	0.005	AN320
Total Thallium, Tl #	mg/L	0.05	AN320



CLIENT: Environmental Protection Agency

PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD
Total Vanadium, V #	mg/L	0.01	AN320
Total Zinc, Zn #	mg/L	0.005	AN320
Total Mercury, Hg #	mg/L	0.0002	AN312 CEI-202



CLIENT: Environmental Protection Agency
PROJECT: ISA 539 Mt Oxide

Laboratory Report No: 63067

LABORATORY REPORT

NOTES:

LOR - Limit of Reporting.

Analysis Date: Between 16/03/09 and

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LABORATORY REPORT COVERSHEET

Date: 30 March 2009

To: Environmental Protection Agency
Cnr Mary & Camooweal Streets
MOUNT ISA QLD 4825

Attention: [REDACTED]

Your Reference: Mt Oxide
Laboratory Report No: 63116
Samples Received: 18/03/2009
Samples / Quantity: 11 Waters, 3 Soils

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

This report supersedes our preliminary results issued 27 March 2009.

[REDACTED]
[REDACTED]
[REDACTED]
Manager
CAIRNS

[REDACTED]
[REDACTED]
[REDACTED]
Administration Manager
CAIRNS

CLIENT: Environmental Protection Agency
PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63116-1 OCP 1 13/03/2009 Water	63116-2 OCP 2 13/03/2009 Water	63116-3 CC 1 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009	19/03/2009
Date Analysed		19/03/2009	19/03/2009	19/03/2009
Chloride, Cl	mg/L	12	14	41
Sulphate, SO ₄	mg/L	320	360	800
Fluoride, F	mg/L	0.19	0.20	0.34
pH	pH Units	6.5	6.8	7.1
Bicarbonate Alkalinity	mg/L CaCO ₃	86	120	240
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	86	120	240
Calcium, Ca	mg/L	66	69	150
Magnesium, Mg	mg/L	52	72	200
Potassium, K	mg/L	9.9	9.9	16
Sodium, Na	mg/L	12	13	49
Hardness (as CaCO ₃)	mg/L CaCO ₃	380	470	1,200

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63116-4 CC 2 13/03/2009 Water	63116-5 CC 3 13/03/2009 Water	63116-6 CC 4 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009	19/03/2009
Date Analysed		19/03/2009	19/03/2009	19/03/2009
Chloride, Cl	mg/L	23	23	24
Sulphate, SO ₄	mg/L	440	430	440
Fluoride, F	mg/L	0.24	0.25	0.26
pH	pH Units	7.1	7.4	8.2
Bicarbonate Alkalinity	mg/L CaCO ₃	170	170	190
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	170	170	190
Calcium, Ca	mg/L	95	93	100
Magnesium, Mg	mg/L	95	90	97
Potassium, K	mg/L	11	9.9	11
Sodium, Na	mg/L	22	21	23
Hardness (as CaCO ₃)	mg/L CaCO ₃	630	600	650

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63116-8 CC 6 13/03/2009 Water	63116-9 CC 7 13/03/2009 Water	63116-11 UP OCP 1 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009	19/03/2009
Date Analysed		19/03/2009	19/03/2009	19/03/2009
Chloride, Cl	mg/L	23	22	9
Sulphate, SO ₄	mg/L	410	410	340
Fluoride, F	mg/L	0.25	0.27	0.28
pH	pH Units	7.1	7.0	4.1
Bicarbonate Alkalinity	mg/L CaCO ₃	130	120	<5
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	130	120	<5
Calcium, Ca	mg/L	87	150	51
Magnesium, Mg	mg/L	94	160	33
Potassium, K	mg/L	7.3	7.0	7.6
Sodium, Na	mg/L	14	12	7.2
Hardness (as CaCO ₃)	mg/L CaCO ₃	600	1,000	260

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63116-12 UP OCP 2 13/03/2009 Water	63116-14 Waste Rock Catch Dam 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009
Date Analysed		19/03/2009	19/03/2009
Chloride, Cl	mg/L	19	8
Sulphate, SO ₄	mg/L	130	2,500
Fluoride, F	mg/L	0.09	0.15
pH	pH Units	6.8	2.8
Bicarbonate Alkalinity	mg/L CaCO ₃	120	<5
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5
Total Alkalinity	mg/L CaCO ₃	120	<5
Calcium, Ca	mg/L	31	34
Magnesium, Mg	mg/L	34	34
Potassium, K	mg/L	9.4	8.0
Sodium, Na	mg/L	7.7	4.6
Hardness (as CaCO ₃)	mg/L CaCO ₃	220	220



CLIENT: Environmental Protection Agency
PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-1 OCP 1 13/03/2009 Water	63116-2 OCP 2 13/03/2009 Water	63116-3 CC 1 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009	19/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
Aluminium, Al ^	mg/L	<0.05	<0.05	<0.05
Total Aluminium, Al #^	mg/L	0.25	0.29	0.40
Arsenic, As ^	mg/L	<0.003	<0.003	<0.003
Total Arsenic, As #^	mg/L	<0.003	<0.003	<0.003
Beryllium, Be ^	mg/L	<0.005	<0.005	<0.005
Total Beryllium, Be #^	mg/L	<0.005	<0.005	<0.005
Boron, B ^	mg/L	0.048	0.044	0.061
Total Boron, B #^	mg/L	0.052	0.049	0.067
Cadmium, Cd ^	mg/L	0.0002	0.0001	<0.0001
Total Cadmium, Cd #^	mg/L	0.0002	0.0002	<0.0001
Chromium, Cr ^	mg/L	<0.001	<0.001	<0.001
Total Chromium, Cr #^	mg/L	<0.001	<0.001	<0.001
Cobalt, Co ^	mg/L	0.27	0.20	0.050
Total Cobalt, Co #^	mg/L	0.23	0.17	0.055
Copper, Cu ^	mg/L	11	8.4	0.70
Total Copper, Cu #^	mg/L	22	19	2.0
Lead, Pb ^	mg/L	<0.001	<0.001	<0.001
Total Lead, Pb #^	mg/L	<0.001	<0.001	<0.001
Molybdenum, Mo ^	mg/L	<0.005	<0.005	<0.005
Total Molybdenum, Mo #^	mg/L	<0.005	<0.005	<0.005
Nickel, Ni ^	mg/L	0.075	0.060	0.015
Total Nickel, Ni #^	mg/L	0.077	0.061	0.016
Selenium, Se ^	mg/L	<0.003	<0.003	<0.003
Total Selenium, Se #^	mg/L	<0.003	<0.003	<0.003
Tin, Sn ^	mg/L	<0.05	<0.05	<0.05
Total Tin, Sn #^	mg/L	<0.05	<0.05	<0.05
Zinc, Zn	mg/L	0.062	0.058	0.014
Total Zinc, Zn #	mg/L	0.070	0.063	0.018

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-1 OCP 1 13/03/2009 Water	63116-2 OCP 2 13/03/2009 Water	63116-3 CC 1 13/03/2009 Water
Iron, Fe	mg/L	<0.05	<0.05	<0.05
Total Iron, Fe #	mg/L	<0.05	<0.05	<0.05
Manganese, Mn	mg/L	0.93	0.69	0.06
Total Manganese, Mn #	mg/L	0.95	0.71	0.06
Total Mercury, Hg #	mg/L	<0.0002	<0.0002	<0.0002

Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-4 CC 2 13/03/2009 Water	63116-5 CC 3 13/03/2009 Water	63116-6 CC 4 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009	19/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
Aluminium, Al ^	mg/L	<0.05	<0.05	<0.05
Total Aluminium, Al #^	mg/L	0.82	0.091	0.15
Arsenic, As ^	mg/L	<0.003	<0.003	<0.003
Total Arsenic, As #^	mg/L	0.005	<0.003	<0.003
Beryllium, Be ^	mg/L	<0.005	<0.005	<0.005
Total Beryllium, Be #^	mg/L	<0.005	<0.005	<0.005
Boron, B ^	mg/L	0.049	0.050	0.047
Total Boron, B #^	mg/L	0.054	0.053	0.054
Cadmium, Cd ^	mg/L	0.0001	<0.0001	<0.0001
Total Cadmium, Cd #^	mg/L	0.0001	0.0001	<0.0001
Chromium, Cr ^	mg/L	<0.001	<0.001	<0.001
Total Chromium, Cr #^	mg/L	<0.001	<0.001	<0.001
Cobalt, Co ^	mg/L	0.12	0.090	0.080
Total Cobalt, Co #^	mg/L	0.12	0.10	0.082
Copper, Cu ^	mg/L	3.6	2.6	1.1
Total Copper, Cu #^	mg/L	25	6.6	7.6
Lead, Pb ^	mg/L	<0.001	<0.001	<0.001
Total Lead, Pb #^	mg/L	<0.001	<0.001	<0.001
Molybdenum, Mo ^	mg/L	<0.005	<0.005	<0.005

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide

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Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-4 CC 2 13/03/2009 Water	63116-5 CC 3 13/03/2009 Water	63116-6 CC 4 13/03/2009 Water
Total Molybdenum, Mo #^	mg/L	<0.005	<0.005	<0.005
Nickel, Ni ^	mg/L	0.043	0.035	0.028
Total Nickel, Ni #^	mg/L	0.045	0.037	0.031
Selenium, Se ^	mg/L	<0.003	<0.003	<0.003
Total Selenium, Se #^	mg/L	<0.003	<0.003	<0.003
Tin, Sn ^	mg/L	<0.05	<0.05	<0.05
Total Tin, Sn #^	mg/L	<0.05	<0.05	<0.05
Zinc, Zn	mg/L	0.054	0.029	0.013
Total Zinc, Zn #	mg/L	0.068	0.030	0.025
Iron, Fe	mg/L	<0.05	<0.05	<0.05
Total Iron, Fe #	mg/L	0.52	<0.05	<0.05
Manganese, Mn	mg/L	0.48	0.38	0.31
Total Manganese, Mn #	mg/L	0.52	0.39	0.32
Total Mercury, Hg #	mg/L	<0.0002	<0.0002	<0.0002

Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-8 CC 6 13/03/2009 Water	63116-9 CC 7 13/03/2009 Water	63116-11 UP OCP 1 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009	19/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
Aluminium, Al ^	mg/L	<0.05	<0.05	0.87
Total Aluminium, Al #^	mg/L	0.06	0.12	0.95
Arsenic, As ^	mg/L	<0.003	<0.003	<0.003
Total Arsenic, As #^	mg/L	<0.003	<0.003	<0.003
Beryllium, Be ^	mg/L	<0.005	<0.005	<0.005
Total Beryllium, Be #^	mg/L	<0.005	<0.005	<0.005
Boron, B ^	mg/L	0.043	0.040	0.053
Total Boron, B #^	mg/L	0.047	0.045	0.057
Cadmium, Cd ^	mg/L	<0.0001	<0.0001	0.0003
Total Cadmium, Cd #^	mg/L	<0.0001	<0.0001	0.0004

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Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-8 CC 6 13/03/2009 Water	63116-9 CC 7 13/03/2009 Water	63116-11 UP OCP 1 13/03/2009 Water
Chromium, Cr ^	mg/L	<0.001	<0.001	<0.001
Total Chromium, Cr #^	mg/L	<0.001	<0.001	<0.001
Cobalt, Co ^	mg/L	0.050	0.030	0.45
Total Cobalt, Co #^	mg/L	0.049	0.030	0.48
Copper, Cu ^	mg/L	1.2	0.80	49
Total Copper, Cu #^	mg/L	2.1	1.8	52
Lead, Pb ^	mg/L	<0.001	<0.001	<0.001
Total Lead, Pb #^	mg/L	<0.001	<0.001	<0.001
Molybdenum, Mo ^	mg/L	<0.005	<0.005	<0.005
Total Molybdenum, Mo #^	mg/L	<0.005	<0.005	<0.005
Nickel, Ni ^	mg/L	0.023	0.015	0.13
Total Nickel, Ni #^	mg/L	0.024	0.015	0.12
Selenium, Se ^	mg/L	<0.003	<0.003	<0.003
Total Selenium, Se #^	mg/L	<0.003	<0.003	<0.003
Tin, Sn ^	mg/L	<0.05	<0.05	<0.05
Total Tin, Sn #^	mg/L	<0.05	<0.05	<0.05
Zinc, Zn	mg/L	0.022	0.019	0.13
Total Zinc, Zn #	mg/L	0.029	0.028	0.13
Iron, Fe	mg/L	<0.05	<0.05	<0.05
Total Iron, Fe #	mg/L	<0.05	<0.05	<0.05
Manganese, Mn	mg/L	0.12	0.07	2.1
Total Manganese, Mn #	mg/L	0.12	0.08	2.1
Total Mercury, Hg #	mg/L	<0.0002	<0.0002	<0.0002

Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-12 UP OCP 2 13/03/2009 Water	63116-14 Waste Rock Catch Dam 13/03/2009 Water
Date Extracted		19/03/2009	19/03/2009
Date Analysed		24/03/2009	24/03/2009

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Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-12 UP OCP 2 13/03/2009 Water	63116-14 Waste Rock Catch Dam 13/03/2009 Water
Aluminium, Al ^	mg/L	<0.05	270
Total Aluminium, Al #^	mg/L	<0.05	270
Arsenic, As ^	mg/L	<0.003	0.068
Total Arsenic, As #^	mg/L	<0.003	0.069
Beryllium, Be ^	mg/L	<0.005	0.024
Total Beryllium, Be #^	mg/L	<0.005	0.028
Boron, B ^	mg/L	0.034	0.21
Total Boron, B #^	mg/L	0.040	0.21
Cadmium, Cd ^	mg/L	<0.0001	0.0031
Total Cadmium, Cd #^	mg/L	<0.0001	0.0031
Chromium, Cr ^	mg/L	<0.001	0.022
Total Chromium, Cr #^	mg/L	<0.001	0.024
Cobalt, Co ^	mg/L	0.010	7.5
Total Cobalt, Co #^	mg/L	0.008	7.7
Copper, Cu ^	mg/L	0.65	340
Total Copper, Cu #^	mg/L	1.0	340.000
Lead, Pb ^	mg/L	<0.001	<0.001
Total Lead, Pb #^	mg/L	<0.001	<0.001
Molybdenum, Mo ^	mg/L	<0.005	0.11
Total Molybdenum, Mo #^	mg/L	<0.005	<0.005
Nickel, Ni ^	mg/L	0.006	1.1
Total Nickel, Ni #^	mg/L	0.006	0.92
Selenium, Se ^	mg/L	<0.003	0.011
Total Selenium, Se #^	mg/L	<0.003	0.019
Tin, Sn ^	mg/L	<0.05	<0.05
Total Tin, Sn #^	mg/L	<0.05	<0.05
Zinc, Zn	mg/L	0.021	0.69
Total Zinc, Zn #	mg/L	0.022	0.70
Iron, Fe	mg/L	<0.05	23
Total Iron, Fe #	mg/L	<0.05	23
Manganese, Mn	mg/L	0.07	5.2



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Heavy Metals Suite-12 (ANZECC) Our Reference Your Reference Date Sampled Type of Sample	Units	63116-12 UP OCP 2 13/03/2009 Water	63116-14 Waste Rock Catch Dam 13/03/2009 Water
Total Manganese, Mn #	mg/L	0.08	5.2
Total Mercury, Hg #	mg/L	<0.0002	<0.0002

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Heavy Metals Suite -12 Our Reference Your Reference Date Sampled Type of Sample	Units	63116-7 CC 5 13/03/2009 Soil	63116-10 CC 8 13/03/2009 Soil	63116-13 Foam 13/03/2009 Soil
Date Extracted		24/03/2009	24/03/2009	24/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
Fluoride, F (1:5) ##	mg/kg	23	17	1.8
Aluminium, Al	mg/kg	43,000	44,000	660
Arsenic, As	mg/kg	31	33	<5
Beryllium, Be	mg/kg	10	10	<3
Boron, B ^	mg/kg	3	<3	<3
Cadmium, Cd	mg/kg	<0.5	<0.5	<0.5
Chromium, Cr	mg/kg	<5	<5	<5
Cobalt, Co	mg/kg	160	230	11
Copper, Cu	mg/kg	350,000	370,000	79,000
Lead, Pb	mg/kg	<3	<3	<3
Mercury, Hg	mg/kg	0.06	0.06	<0.05
Molybdenum, Mo	mg/kg	<5	<5	<5
Nickel, Ni	mg/kg	83	120	6
Manganese, Mn	mg/kg	74	90	<20
Selenium, Se	mg/kg	<3	<3	<3
Zinc, Zn	mg/kg	170	210	64
Iron, Fe	mg/kg	5,000	5,300	170
Tin, Sn ##	mg/kg	<5	<5	<5

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TEST PARAMETERS	UNITS	LOR	METHOD
Date Extracted			
Date Analysed			
Chloride, Cl	mg/L	2	AN274 CEA-020
Sulphate, SO ₄	mg/L	2	AN275 CEA-021
Fluoride, F	mg/L	0.05	AN141
pH	pH Units	0.1	AN101
Bicarbonate Alkalinity	mg/L CaCO ₃	5	AN135 CEI-012
Carbonate Alkalinity	mg/L CaCO ₃	5	AN135 CEI-012
Total Alkalinity	mg/L CaCO ₃	5	AN135 CEI-012
Calcium, Ca	mg/L	0.5	AN300 CEI-200
Magnesium, Mg	mg/L	0.5	AN300 CEI-200
Potassium, K	mg/L	0.5	AN300 CEI-200
Sodium, Na	mg/L	0.5	AN300 CEI-200
Hardness (as CaCO ₃)	mg/L CaCO ₃	5	AN124



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TEST PARAMETERS	UNITS	LOR	METHOD
Date Extracted			
Date Analysed			
Aluminium, Al ^	mg/L	0.05	AN318
Total Aluminium, Al #^	mg/L	0.05	AN318
Arsenic, As ^	mg/L	0.003	AN318
Total Arsenic, As #^	mg/L	0.003	AN318
Beryllium, Be ^	mg/L	0.005	AN318
Total Beryllium, Be #^	mg/L	0.005	AN318
Boron, B ^	mg/L	0.002	AN318
Total Boron, B #^	mg/L	0.002	AN318
Cadmium, Cd ^	mg/L	0.0001	AN318
Total Cadmium, Cd #^	mg/L	0.0001	AN318
Chromium, Cr ^	mg/L	0.001	AN318
Total Chromium, Cr #^	mg/L	0.001	AN318
Cobalt, Co ^	mg/L	0.005	AN318
Total Cobalt, Co #^	mg/L	0.005	AN318
Copper, Cu ^	mg/L	0.001	AN318
Total Copper, Cu #^	mg/L	0.001	AN318
Lead, Pb ^	mg/L	0.001	AN318
Total Lead, Pb #^	mg/L	0.001	AN318
Molybdenum, Mo ^	mg/L	0.005	AN318
Total Molybdenum, Mo #^	mg/L	0.005	AN318
Nickel, Ni ^	mg/L	0.002	AN318
Total Nickel, Ni #^	mg/L	0.002	AN318
Selenium, Se ^	mg/L	0.003	AN318
Total Selenium, Se #^	mg/L	0.003	AN318
Tin, Sn ^	mg/L	0.05	AN318
Total Tin, Sn #^	mg/L	0.05	AN318
Zinc, Zn	mg/L	0.005	AN300 CEI-200
Total Zinc, Zn #	mg/L	0.005	AN300 CEI-200
Iron, Fe	mg/L	0.05	AN300 CEI-200
Total Iron, Fe #	mg/L	0.05	AN300 CEI-200



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TEST PARAMETERS	UNITS	LOR	METHOD
Manganese, Mn	mg/L	0.05	AN300 CEI-200
Total Manganese, Mn #	mg/L	0.05	AN300 CEI-200
Total Mercury, Hg #	mg/L	0.0002	AN312 CEI-202



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TEST PARAMETERS	UNITS	LOR	METHOD
Date Extracted			
Date Analysed			
Fluoride, F (1:5) ##	mg/kg	0.3	AN141
Aluminium, Al	mg/kg	50	AN300 CEI-200
Arsenic, As	mg/kg	5	AN304 CEI-201
Beryllium, Be	mg/kg	3	AN300 CEI-200
Boron, B ^	mg/kg	3	ICP
Cadmium, Cd	mg/kg	0.5	AN300 CEI-200
Chromium, Cr	mg/kg	5	AN300 CEI-200
Cobalt, Co	mg/kg	3	AN300 CEI-200
Copper, Cu	mg/kg	3	AN300 CEI-200
Lead, Pb	mg/kg	3	AN300 CEI-200
Mercury, Hg	mg/kg	0.05	AN312 CEI-202
Molybdenum, Mo	mg/kg	5	AN300 CEI-200
Nickel, Ni	mg/kg	3	AN300 CEI-200
Manganese, Mn	mg/kg	20	AN300 CEI-200
Selenium, Se	mg/kg	3	AN304 CEI-201
Zinc, Zn	mg/kg	3	AN300 CEI-200
Iron, Fe	mg/kg	20	AN300 CEI-200
Tin, Sn ##	mg/kg	5	AN304 CEI-201

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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike Sm#	Spike Recovery
Date Extracted		-	63116-1	19/03/2009 19/03/2009	Batch Spike	-
Date Analysed		-	63116-1	19/03/2009 19/03/2009	Batch Spike	-
Chloride, Cl	mg/L	<2	63116-1	12 [N/T]	Batch Spike	-
Sulphate, SO ₄	mg/L	<2	63116-1	320 [N/T]	Batch Spike	-
Fluoride, F	mg/L	<0.05	63116-1	0.19 [N/T]	Batch Spike	-
pH	pH Units	-	63116-1	6.5 6.6 RPD: 2	Batch Spike	-
Bicarbonate Alkalinity	mg/L CaCO ₃	-	63116-1	86 86 RPD: 0	Batch Spike	-
Carbonate Alkalinity	mg/L CaCO ₃	-	63116-1	<5 <5	Batch Spike	-
Total Alkalinity	mg/L CaCO ₃	-	63116-1	86 86 RPD: 0	Batch Spike	-
Calcium, Ca	mg/L	<0.5	63116-1	66 65 RPD: 2	Batch Spike	98%
Magnesium, Mg	mg/L	<0.5	63116-1	52 55 RPD: 6	Batch Spike	99%
Potassium, K	mg/L	<0.5	63116-1	9.9 10 RPD: 1	Batch Spike	100%
Sodium, Na	mg/L	<0.5	63116-1	12 11 RPD: 9	Batch Spike	100%
Hardness (as CaCO ₃)	mg/L CaCO ₃	-	63116-1	380 390 RPD: 3	Batch Spike	-



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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike Sm#	Spike Recovery
Date Extracted		-	63116-1	19/03/2009 19/03/2009	Batch Spike	-
Date Analysed		-	63116-1	24/03/2009 24/03/2009	Batch Spike	-
Aluminium, Al ^	mg/L	<0.05	63116-1	<0.05 <0.05	Batch Spike	108%
Total Aluminium, Al #^	mg/L	<0.05	63116-1	0.25 0.25 RPD: 0	Batch Spike	108%
Arsenic, As ^	mg/L	<0.003	63116-1	<0.003 <0.003	Batch Spike	102%
Total Arsenic, As #^	mg/L	<0.003	63116-1	<0.003 <0.003	Batch Spike	106%
Beryllium, Be ^	mg/L	<0.005	63116-1	<0.005 <0.005	Batch Spike	99%
Total Beryllium, Be #^	mg/L	<0.005	63116-1	<0.005 <0.005	Batch Spike	99%
Boron, B ^	mg/L	<0.002	63116-1	0.048 0.046 RPD: 4	Batch Spike	105%
Total Boron, B #^	mg/L	<0.002	63116-1	0.052 0.050 RPD: 4	Batch Spike	104%
Cadmium, Cd ^	mg/L	<0.0001	63116-1	0.0002 0.0002 RPD: 0	Batch Spike	101%
Total Cadmium, Cd #^	mg/L	<0.0001	63116-1	0.0002 0.0002 RPD: 0	Batch Spike	102%
Chromium, Cr ^	mg/L	<0.001	63116-1	<0.001 <0.001	Batch Spike	102%
Total Chromium, Cr #^	mg/L	<0.001	63116-1	<0.001 <0.001	Batch Spike	100%
Cobalt, Co ^	mg/L	<0.005	63116-1	0.27 0.27 RPD: 0	Batch Spike	100%
Total Cobalt, Co #^	mg/L	<0.005	63116-1	0.23 0.21 RPD: 9	Batch Spike	98%
Copper, Cu ^	mg/L	<0.001	63116-1	11 11 RPD: 0	Batch Spike	102%
Total Copper, Cu #^	mg/L	<0.001	63116-1	22 23 RPD: 4	Batch Spike	100%
Lead, Pb ^	mg/L	<0.001	63116-1	<0.001 <0.001	Batch Spike	104%
Total Lead, Pb #^	mg/L	<0.001	63116-1	<0.001 <0.001	Batch Spike	101%
Molybdenum, Mo ^	mg/L	<0.005	63116-1	<0.005 <0.005	Batch Spike	93%
Total Molybdenum, Mo #^	mg/L	<0.005	63116-1	<0.005 <0.005	Batch Spike	98%
Nickel, Ni ^	mg/L	<0.002	63116-1	0.075 0.075 RPD: 0	Batch Spike	102%
Total Nickel, Ni #^	mg/L	<0.002	63116-1	0.077 0.073 RPD: 5	Batch Spike	101%
Selenium, Se ^	mg/L	<0.003	63116-1	<0.003 <0.003	Batch Spike	106%



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Total Selenium, Se #^	mg/L	<0.003	63116-1	<0.003 <0.003	Batch Spike	105%
Tin, Sn ^	mg/L	<0.05	63116-1	<0.05 <0.05	Batch Spike	89%
Total Tin, Sn #^	mg/L	<0.05	63116-1	<0.05 <0.05	Batch Spike	104%
Zinc, Zn	mg/L	<0.005	63116-1	0.062 0.062 RPD: 0	Batch Spike	100%
Total Zinc, Zn #	mg/L	<0.005	63116-1	0.070 0.067 RPD: 4	Batch Spike	100%
Iron, Fe	mg/L	<0.05	63116-1	<0.05 <0.05	Batch Spike	100%
Total Iron, Fe #	mg/L	<0.05	63116-1	<0.05 <0.05	Batch Spike	100%
Manganese, Mn	mg/L	<0.05	63116-1	0.93 0.93 RPD: 0	Batch Spike	99%
Total Manganese, Mn #	mg/L	<0.05	63116-1	0.95 0.96 RPD: 1	Batch Spike	99%
Total Mercury, Hg #	mg/L	<0.0002	63116-1	<0.0002 <0.0002	Batch Spike	92%
QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike Sm#	Spike Recovery
Date Extracted		-	[NT]	[NT]	Batch Spike	-
Date Analysed		-	[NT]	[NT]	Batch Spike	-
Fluoride, F (1:5) ##	mg/kg	<0.3	[NT]	[NT]	Batch Spike	-
Aluminium, Al	mg/kg	<50	[NT]	[NT]	Batch Spike	104%
Arsenic, As	mg/kg	<5	[NT]	[NT]	Batch Spike	95%
Beryllium, Be	mg/kg	<3	[NT]	[NT]	Batch Spike	102%
Cadmium, Cd	mg/kg	<0.5	[NT]	[NT]	Batch Spike	93%
Chromium, Cr	mg/kg	<5	[NT]	[NT]	Batch Spike	91%
Cobalt, Co	mg/kg	<3	[NT]	[NT]	Batch Spike	94%
Copper, Cu	mg/kg	<3	[NT]	[NT]	Batch Spike	92%
Lead, Pb	mg/kg	<3	[NT]	[NT]	Batch Spike	92%
Mercury, Hg	mg/kg	<0.05	[NT]	[NT]	Batch Spike	91%
Molybdenum, Mo	mg/kg	<5	[NT]	[NT]	Batch Spike	96%
Nickel, Ni	mg/kg	<3	[NT]	[NT]	Batch Spike	94%
Manganese, Mn	mg/kg	<20	[NT]	[NT]	Batch Spike	95%
Selenium, Se	mg/kg	<3	[NT]	[NT]	Batch Spike	95%



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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike Sm#	Spike Recovery
Zinc, Zn	mg/kg	<3	[NT]	[NT]	Batch Spike	91%
Iron, Fe	mg/kg	<20	[NT]	[NT]	Batch Spike	96%
Tin, Sn ##	mg/kg	<5	[NT]	[NT]	Batch Spike	94%

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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate
Date Extracted		[NT]	63116-11	19/03/2009 19/03/2009
Date Analysed		[NT]	63116-11	19/03/2009 19/03/2009
Chloride, Cl	mg/L	[NT]	63116-11	9 [N/T]
Sulphate, SO ₄	mg/L	[NT]	63116-11	340 [N/T]
Fluoride, F	mg/L	[NT]	63116-11	0.28 [N/T]
pH	pH Units	[NT]	63116-11	4.1 4.1 RPD: 0
Bicarbonate Alkalinity	mg/L CaCO ₃	[NT]	63116-11	<5 <5
Carbonate Alkalinity	mg/L CaCO ₃	[NT]	63116-11	<5 <5
Total Alkalinity	mg/L CaCO ₃	[NT]	63116-11	<5 <5
Calcium, Ca	mg/L	[NT]	63116-11	51 32 RPD: 46
Magnesium, Mg	mg/L	[NT]	63116-11	33 33 RPD: 0
Potassium, K	mg/L	[NT]	63116-11	7.6 8.0 RPD: 5
Sodium, Na	mg/L	[NT]	63116-11	7.2 5.0 RPD: 36
Hardness (as CaCO ₃)	mg/L CaCO ₃	[NT]	63116-11	260 220 RPD: 17

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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate
Date Extracted		[NT]	63116-11	19/03/2009 19/03/2009
Date Analysed		[NT]	63116-11	24/03/2009 24/03/2009
Aluminium, Al ^	mg/L	[NT]	63116-11	0.87 0.87 RPD: 0
Total Aluminium, Al #^	mg/L	[NT]	63116-11	0.95 0.96 RPD: 1
Arsenic, As ^	mg/L	[NT]	63116-11	<0.003 <0.003
Total Arsenic, As #^	mg/L	[NT]	63116-11	<0.003 <0.003
Beryllium, Be ^	mg/L	[NT]	63116-11	<0.005 <0.005
Total Beryllium, Be #^	mg/L	[NT]	63116-11	<0.005 <0.005
Boron, B ^	mg/L	[NT]	63116-11	0.053 0.053 RPD: 0
Total Boron, B #^	mg/L	[NT]	63116-11	0.057 0.055 RPD: 4
Cadmium, Cd ^	mg/L	[NT]	63116-11	0.0003 0.0004 RPD: 29
Total Cadmium, Cd #^	mg/L	[NT]	63116-11	0.0004 0.0004 RPD: 0
Chromium, Cr ^	mg/L	[NT]	63116-11	<0.001 <0.001
Total Chromium, Cr #^	mg/L	[NT]	63116-11	<0.001 <0.001
Cobalt, Co ^	mg/L	[NT]	63116-11	0.45 0.46 RPD: 2
Total Cobalt, Co #^	mg/L	[NT]	63116-11	0.48 0.48 RPD: 0
Copper, Cu ^	mg/L	[NT]	63116-11	49 49 RPD: 0
Total Copper, Cu #^	mg/L	[NT]	63116-11	52 52 RPD: 0
Lead, Pb ^	mg/L	[NT]	63116-11	<0.001 <0.001
Total Lead, Pb #^	mg/L	[NT]	63116-11	<0.001 <0.001
Molybdenum, Mo ^	mg/L	[NT]	63116-11	<0.005 <0.005
Total Molybdenum, Mo #^	mg/L	[NT]	63116-11	<0.005 <0.005
Nickel, Ni ^	mg/L	[NT]	63116-11	0.13 0.12 RPD: 8
Total Nickel, Ni #^	mg/L	[NT]	63116-11	0.12 0.12 RPD: 0
Selenium, Se ^	mg/L	[NT]	63116-11	<0.003 <0.003
Total Selenium, Se #^	mg/L	[NT]	63116-11	<0.003 <0.003
Tin, Sn ^	mg/L	[NT]	63116-11	<0.05 <0.05
Total Tin, Sn #^	mg/L	[NT]	63116-11	<0.05 <0.05
Zinc, Zn	mg/L	[NT]	63116-11	0.13 0.13 RPD: 0

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate
Total Zinc, Zn #	mg/L	[NT]	63116-11	0.13 0.13 RPD: 0
Iron, Fe	mg/L	[NT]	63116-11	<0.05 <0.05
Total Iron, Fe #	mg/L	[NT]	63116-11	<0.05 <0.05
Manganese, Mn	mg/L	[NT]	63116-11	2.1 2.1 RPD: 0
Total Manganese, Mn #	mg/L	[NT]	63116-11	2.1 2.1 RPD: 0
Total Mercury, Hg #	mg/L	[NT]	63116-11	<0.0002 <0.0002



CLIENT: Environmental Protection Agency
PROJECT: Mt Oxide

Laboratory Report No: 63116

LABORATORY REPORT

NOTES:

LOR - Limit of Reporting.

Determined as Total Acid Extractable Metal. Please note current NATA accreditation does not cover the digestion.

This test is not covered by our current NATA accreditation.

^ This analysis was determined at our Sydney Laboratory.

Analysis Date: Between 20/03/09 and 30/03/09

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Geneva Legal Comment

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ISO 17025

Unless otherwise stated the results shown in this test report only refer to the sample(s) tested and such sample(s) are only retained for 60 days only. This document cannot be reproduced except in full, without prior approval of the Company.

LABORATORY REPORT COVERSHEET

Date: 31 March 2009

To: Environmental Protection Agency
Cnr Mary & Camooweal Streets
MOUNT ISA QLD 4825

Attention: [REDACTED]

Your Reference: Mt Oxide - River Samples
Laboratory Report No: 63155
Samples Received: 24/03/2009
Samples / Quantity: 17 Waters, 10 Soils

The above samples were received intact and analysed according to your written instructions. Unless otherwise stated, solid samples are reported on a dry weight basis and liquid samples as received.

This report supersedes our preliminary results issued 27 March.

[REDACTED]
[REDACTED]
Manager
CAIRNS

[REDACTED]
Administration Manager
CAIRNS

CLIENT: Environmental Protection Agency
PROJECT: Mt Oxide - River Samples

Laboratory Report No: 63155

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-1 Sample Point 1 - A 19/03/2009 Water	63155-3 Sample Point 2 - A 19/03/2009 Water	63155-5 Sample Point 3 - A 19/03/2009 Water
Date Extracted		24/03/2009	24/03/2009	24/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
pH	pH Units	6.5	6.8	7.8
Bicarbonate Alkalinity	mg/L CaCO ₃	30	36	170
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	30	36	170
Chloride, Cl	mg/L	4	22	15
Sulphate, SO ₄	mg/L	15	330	24
Fluoride, F	mg/L	0.08	[NA]	[NA]
Sodium, Na	mg/L	3.9	18	11
Potassium, K	mg/L	5.3	9.5	8.8
Calcium, Ca	mg/L	4.8	69	27
Magnesium, Mg	mg/L	5.3	64	26
Hardness (as CaCO ₃)	mg/L CaCO ₃	34	440	170
Total Iron, Fe #	mg/L	1.0	<0.05	0.08
Total Manganese, Mn #	mg/L	0.28	<0.05	<0.05
Total Zinc, Zn #	mg/L	0.010	0.012	0.007
Total Aluminium, Al #^	mg/L	0.08	<0.05	<0.05
Total Arsenic, As #^	mg/L	<0.003	[NA]	[NA]
Total Beryllium, Be	mg/L	<0.001	[NA]	[NA]
Total Boron, B #^	mg/L	0.009	[NA]	[NA]
Total Cadmium, Cd #^	mg/L	<0.0001	<0.0001	<0.0001
Total Chromium, Cr #^	mg/L	<0.005	[NA]	[NA]
Total Cobalt, Co #^	mg/L	<0.005	<0.005	<0.005
Total Copper, Cu #^	mg/L	0.003	0.43	0.002
Total Lead, Pb #^	mg/L	<0.001	[NA]	[NA]
Total Molybdenum, Mo #^	mg/L	<0.005	[NA]	[NA]
Total Nickel, Ni #^	mg/L	<0.005	0.007	<0.005
Total Selenium, Se #^	mg/L	<0.003	[NA]	[NA]
Total Strontium, Sr	mg/L	0.013	[NA]	[NA]



CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide - River Samples

Laboratory Report No: 63155

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-1 Sample Point 1 - A 19/03/2009 Water	63155-3 Sample Point 2 - A 19/03/2009 Water	63155-5 Sample Point 3 - A 19/03/2009 Water
Mercury, Hg	mg/L	<0.0002	[NA]	[NA]

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-7 Sample Point 4 - A 19/03/2009 Water	63155-8 Sample Point 5 - A 19/03/2009 Water	63155-9 Sample Point 6 - A 19/03/2009 Water
Date Extracted		24/03/2009	24/03/2009	24/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
pH	pH Units	7.7	7.9	7.8
Bicarbonate Alkalinity	mg/L CaCO ₃	110	120	100
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	110	120	100
Chloride, Cl	mg/L	15	17	13
Sulphate, SO ₄	mg/L	19	22	17
Fluoride, F	mg/L	[NA]	0.10	[NA]
Sodium, Na	mg/L	16	17	15
Potassium, K	mg/L	4.2	4.2	4.3
Calcium, Ca	mg/L	21	24	20
Magnesium, Mg	mg/L	13	14	13
Hardness (as CaCO ₃)	mg/L CaCO ₃	110	120	100
Total Iron, Fe #	mg/L	0.21	0.11	0.10
Total Manganese, Mn #	mg/L	0.05	<0.05	<0.05
Total Zinc, Zn #	mg/L	0.010	0.014	0.022
Total Aluminium, Al #^	mg/L	0.09	<0.05	<0.05
Total Arsenic, As #^	mg/L	[NA]	<0.003	[NA]
Total Beryllium, Be	mg/L	[NA]	<0.001	[NA]
Total Boron, B #^	mg/L	[NA]	0.031	[NA]
Total Cadmium, Cd #^	mg/L	<0.0001	<0.0001	<0.0001
Total Chromium, Cr #^	mg/L	[NA]	<0.005	[NA]
Total Cobalt, Co #^	mg/L	<0.005	<0.005	<0.005



CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide - River Samples

Laboratory Report No: 63155

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-7 Sample Point 4 - A 19/03/2009 Water	63155-8 Sample Point 5 - A 19/03/2009 Water	63155-9 Sample Point 6 - A 19/03/2009 Water
Total Copper, Cu #^	mg/L	0.007	0.005	0.006
Total Lead, Pb #^	mg/L	[NA]	<0.001	[NA]
Total Molybdenum, Mo #^	mg/L	[NA]	<0.005	[NA]
Total Nickel, Ni #^	mg/L	<0.005	<0.005	<0.005
Total Selenium, Se #^	mg/L	[NA]	<0.003	[NA]
Total Strontium, Sr	mg/L	[NA]	0.065	[NA]
Mercury, Hg	mg/L	[NA]	<0.0002	[NA]

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-10 Sample Point 7 - A 19/03/2009 Water	63155-12 Sample Point 8 - A 19/03/2009 Water	63155-13 Sample Point 9 - A 19/03/2009 Water
Date Extracted		24/03/2009	24/03/2009	24/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
pH	pH Units	7.1	8.0	7.9
Bicarbonate Alkalinity	mg/L CaCO ₃	76	210	200
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	76	210	200
Chloride, Cl	mg/L	8	20	19
Sulphate, SO ₄	mg/L	8	13	14
Fluoride, F	mg/L	[NA]	0.21	[NA]
Sodium, Na	mg/L	8.7	41	40
Potassium, K	mg/L	4.0	3.8	3.6
Calcium, Ca	mg/L	13	34	35
Magnesium, Mg	mg/L	8.0	13	14
Hardness (as CaCO ₃)	mg/L CaCO ₃	65	140	140
Total Iron, Fe #	mg/L	0.66	0.23	0.20
Total Manganese, Mn #	mg/L	0.15	0.05	0.09
Total Zinc, Zn #	mg/L	0.009	<0.005	0.006
Total Aluminium, Al #^	mg/L	0.093	0.06	0.06



CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide - River Samples

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LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-10 Sample Point 7 - A 19/03/2009 Water	63155-12 Sample Point 8 - A 19/03/2009 Water	63155-13 Sample Point 9 - A 19/03/2009 Water
Total Arsenic, As #^	mg/L	[NA]	<0.003	[NA]
Total Beryllium, Be	mg/L	[NA]	<0.001	[NA]
Total Boron, B #^	mg/L	[NA]	0.027	[NA]
Total Cadmium, Cd #^	mg/L	<0.0001	<0.0001	<0.0001
Total Chromium, Cr #^	mg/L	[NA]	<0.005	[NA]
Total Cobalt, Co #^	mg/L	<0.005	<0.005	<0.005
Total Copper, Cu #^	mg/L	0.005	0.001	0.002
Total Lead, Pb #^	mg/L	[NA]	<0.001	[NA]
Total Molybdenum, Mo #^	mg/L	[NA]	<0.005	[NA]
Total Nickel, Ni #^	mg/L	<0.005	<0.005	<0.005
Total Selenium, Se #^	mg/L	[NA]	<0.003	[NA]
Total Strontium, Sr	mg/L	[NA]	0.098	[NA]
Mercury, Hg	mg/L	[NA]	<0.0002	[NA]

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-15 Sample Point 10 - A 19/03/2009 Water	63155-17 Sample Point 11 - A 19/03/2009 Water	63155-19 Sample Point 12 - A 19/03/2009 Water
Date Extracted		24/03/2009	24/03/2009	24/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
pH	pH Units	7.8	7.9	7.2
Bicarbonate Alkalinity	mg/L CaCO ₃	160	160	45
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	160	160	45
Chloride, Cl	mg/L	17	15	6
Sulphate, SO ₄	mg/L	13	12	2
Fluoride, F	mg/L	[NA]	0.16	0.06
Sodium, Na	mg/L	31	29	5.8
Potassium, K	mg/L	3.9	4.1	4.3
Calcium, Ca	mg/L	29	29	6.0

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide - River Samples

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----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-15 Sample Point 10 - A 19/03/2009 Water	63155-17 Sample Point 11 - A 19/03/2009 Water	63155-19 Sample Point 12 - A 19/03/2009 Water
Magnesium, Mg	mg/L	12	12	4.1
Hardness (as CaCO ₃)	mg/L CaCO ₃	120	120	32
Total Iron, Fe #	mg/L	0.25	0.22	1.1
Total Manganese, Mn #	mg/L	0.11	0.09	0.06
Total Zinc, Zn #	mg/L	0.009	0.016	0.020
Total Aluminium, Al #^	mg/L	0.08	0.098	0.33
Total Arsenic, As #^	mg/L	[NA]	<0.003	<0.003
Total Beryllium, Be	mg/L	[NA]	<0.001	<0.001
Total Boron, B #^	mg/L	[NA]	0.029	0.025
Total Cadmium, Cd #^	mg/L	<0.0001	<0.0001	<0.0001
Total Chromium, Cr #^	mg/L	[NA]	<0.005	<0.005
Total Cobalt, Co #^	mg/L	<0.005	<0.005	<0.005
Total Copper, Cu #^	mg/L	0.003	0.003	0.002
Total Lead, Pb #^	mg/L	[NA]	<0.001	<0.001
Total Molybdenum, Mo #^	mg/L	[NA]	<0.005	<0.005
Total Nickel, Ni #^	mg/L	<0.005	<0.005	<0.005
Total Selenium, Se #^	mg/L	[NA]	<0.003	<0.003
Total Strontium, Sr	mg/L	[NA]	0.093	0.033
Mercury, Hg	mg/L	[NA]	<0.0002	<0.0002

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-21 Sample Point 13 - A 19/03/2009 Water	63155-23 Sample Point 14 - A 19/03/2009 Water	63155-24 Sample Point 15 - A 19/03/2009 Water
Date Extracted		24/03/2009	24/03/2009	24/03/2009
Date Analysed		24/03/2009	24/03/2009	24/03/2009
pH	pH Units	8.0	8.1	7.8
Bicarbonate Alkalinity	mg/L CaCO ₃	160	140	120
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	160	140	120

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide - River Samples

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LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-21 Sample Point 13 - A 19/03/2009 Water	63155-23 Sample Point 14 - A 19/03/2009 Water	63155-24 Sample Point 15 - A 19/03/2009 Water
Chloride, Cl	mg/L	14	12	6
Sulphate, SO ₄	mg/L	12	10	6
Fluoride, F	mg/L	0.15	0.14	[NA]
Sodium, Na	mg/L	27	24	12
Potassium, K	mg/L	3.7	3.7	4.3
Calcium, Ca	mg/L	30	27	26
Magnesium, Mg	mg/L	12	11	7.9
Hardness (as CaCO ₃)	mg/L CaCO ₃	120	110	97
Total Iron, Fe #	mg/L	0.31	0.36	0.41
Total Manganese, Mn #	mg/L	0.06	<0.05	0.14
Total Zinc, Zn #	mg/L	0.022	<0.005	0.007
Total Aluminium, Al #^	mg/L	0.22	0.32	0.091
Total Arsenic, As #^	mg/L	<0.003	<0.003	[NA]
Total Beryllium, Be	mg/L	<0.001	<0.001	[NA]
Total Boron, B #^	mg/L	0.032	0.029	[NA]
Total Cadmium, Cd #^	mg/L	<0.0001	<0.0001	<0.0001
Total Chromium, Cr #^	mg/L	<0.005	<0.005	[NA]
Total Cobalt, Co #^	mg/L	<0.005	<0.005	<0.005
Total Copper, Cu #^	mg/L	0.003	0.002	0.001
Total Lead, Pb #^	mg/L	<0.001	<0.001	[NA]
Total Molybdenum, Mo #^	mg/L	<0.005	<0.005	[NA]
Total Nickel, Ni #^	mg/L	<0.005	<0.005	<0.005
Total Selenium, Se #^	mg/L	<0.003	<0.003	[NA]
Total Strontium, Sr	mg/L	0.11	0.093	[NA]
Mercury, Hg	mg/L	<0.0002	<0.0002	[NA]

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-25 Sample Point 16 - A 19/03/2009 Water	63155-27 Sample Point 17 - A 19/03/2009 Water
Date Extracted		24/03/2009	24/03/2009



CLIENT: Environmental Protection Agency
PROJECT: Mt Oxide - River Samples

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LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-25 Sample Point 16 - A 19/03/2009 Water	63155-27 Sample Point 17 - A 19/03/2009 Water
Date Analysed		24/03/2009	24/03/2009
pH	pH Units	8.0	7.9
Bicarbonate Alkalinity	mg/L CaCO ₃	180	180
Carbonate Alkalinity	mg/L CaCO ₃	<5	<5
Total Alkalinity	mg/L CaCO ₃	180	180
Chloride, Cl	mg/L	22	22
Sulphate, SO ₄	mg/L	15	15
Fluoride, F	mg/L	0.18	[NA]
Sodium, Na	mg/L	46	46
Potassium, K	mg/L	4.1	4.1
Calcium, Ca	mg/L	28	27
Magnesium, Mg	mg/L	13	13
Hardness (as CaCO ₃)	mg/L CaCO ₃	120	120
Total Iron, Fe #	mg/L	0.18	0.12
Total Manganese, Mn #	mg/L	0.07	<0.05
Total Zinc, Zn #	mg/L	0.013	0.009
Total Aluminium, Al #^	mg/L	0.07	0.06
Total Arsenic, As #^	mg/L	<0.003	[NA]
Total Beryllium, Be	mg/L	<0.001	[NA]
Total Boron, B #^	mg/L	0.025	[NA]
Total Cadmium, Cd #^	mg/L	<0.0001	<0.0001
Total Chromium, Cr #^	mg/L	<0.005	[NA]
Total Cobalt, Co #^	mg/L	<0.005	<0.005
Total Copper, Cu #^	mg/L	0.002	0.001
Total Lead, Pb #^	mg/L	<0.001	[NA]
Total Molybdenum, Mo #^	mg/L	<0.005	[NA]
Total Nickel, Ni #^	mg/L	<0.005	<0.005
Total Selenium, Se #^	mg/L	<0.003	[NA]
Total Strontium, Sr	mg/L	0.074	[NA]
Mercury, Hg	mg/L	<0.0002	[NA]

CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide - River Samples

Laboratory Report No: 63155

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-2 Sample Point 1 - B 19/03/2009 Soil	63155-4 Sample Point 2 - B 19/03/2009 Soil	63155-6 Sample Point 3 - B 19/03/2009 Soil
Date Extracted		26/03/2009	26/03/2009	26/03/2009
Date Analysed		26/03/2009	26/03/2009	26/03/2009
Fluoride, F (1:5) #	mg/kg	0.6	[NA]	[NA]
Aluminium, Al	mg/kg	3,100	4,800	4,500
Arsenic, As	mg/kg	20	[NA]	[NA]
Beryllium, Be	mg/kg	<3	[NA]	[NA]
Boron, B ^	mg/kg	3	[NA]	[NA]
Cadmium, Cd	mg/kg	<0.5	<0.5	<0.5
Chromium, Cr	mg/kg	7	[NA]	[NA]
Cobalt, Co	mg/kg	7	46	10
Copper, Cu	mg/kg	16	1,700	300
Lead, Pb	mg/kg	4	[NA]	[NA]
Mercury, Hg	mg/kg	<0.05	[NA]	[NA]
Molybdenum, Mo	mg/kg	<5	[NA]	[NA]
Nickel, Ni	mg/kg	4	13	7
Selenium, Se	mg/kg	<3	[NA]	[NA]
Zinc, Zn	mg/kg	6	27	16
Iron, Fe	mg/kg	18,000	39,000	26,000
Manganese, Mn	mg/kg	210	410	230
Strontium, Sr ^	mg/kg	4.7	[NA]	[NA]



CLIENT: Environmental Protection Agency
PROJECT: Mt Oxide - River Samples

Laboratory Report No: 63155

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-11 Sample Point 7 - B 19/03/2009 Soil	63155-14 Sample Point 9 - B 19/03/2009 Soil	63155-16 Sample Point 10 - B 19/03/2009 Soil
Date Extracted		26/03/2009	26/03/2009	26/03/2009
Date Analysed		26/03/2009	26/03/2009	26/03/2009
Aluminium, Al	mg/kg	4,800	8,000	2,200
Cadmium, Cd	mg/kg	<0.5	<0.5	<0.5
Cobalt, Co	mg/kg	9	8	6
Copper, Cu	mg/kg	50	14	5
Nickel, Ni	mg/kg	7	7	3
Zinc, Zn	mg/kg	18	19	6
Iron, Fe	mg/kg	19,000	20,000	7,900
Manganese, Mn	mg/kg	200	210	200

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-18 Sample Point 11 - B 19/03/2009 Soil	63155-20 Sample Point 12 - B 19/03/2009 Soil	63155-22 Sample Point 13 - B 19/03/2009 Soil
Date Extracted		26/03/2009	26/03/2009	26/03/2009
Date Analysed		26/03/2009	26/03/2009	26/03/2009
Fluoride, F (1:5) #	mg/kg	1.2	<0.3	0.7
Aluminium, Al	mg/kg	13,000	2,800	2,600
Arsenic, As	mg/kg	<5	<5	<5
Beryllium, Be	mg/kg	<3	<3	<3
Boron, B ^	mg/kg	<3	<3	<3
Cadmium, Cd	mg/kg	<0.5	<0.5	<0.5
Chromium, Cr	mg/kg	15	7	8
Cobalt, Co	mg/kg	10	3	4
Copper, Cu	mg/kg	29	3	5
Lead, Pb	mg/kg	5	<3	<3
Mercury, Hg	mg/kg	<0.05	<0.05	<0.05
Molybdenum, Mo	mg/kg	<5	<5	<5



CLIENT: Environmental Protection Agency

PROJECT: Mt Oxide - River Samples

Laboratory Report No: 63155

LABORATORY REPORT

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-18 Sample Point 11 - B 19/03/2009 Soil	63155-20 Sample Point 12 - B 19/03/2009 Soil	63155-22 Sample Point 13 - B 19/03/2009 Soil
Nickel, Ni	mg/kg	10	<3	3
Selenium, Se	mg/kg	<3	<3	<3
Zinc, Zn	mg/kg	27	6	7
Iron, Fe	mg/kg	32,000	8,800	8,600
Manganese, Mn	mg/kg	250	100	150
Strontium, Sr ^	mg/kg	9.8	3.3	5.1

----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-26 Sample Point 16 - B 19/03/2009 Soil
Date Extracted		26/03/2009
Date Analysed		26/03/2009
Fluoride, F (1:5) #	mg/kg	0.7
Aluminium, Al	mg/kg	4,000
Arsenic, As	mg/kg	<5
Beryllium, Be	mg/kg	<3
Boron, B ^	mg/kg	<3
Cadmium, Cd	mg/kg	<0.5
Chromium, Cr	mg/kg	7
Cobalt, Co	mg/kg	5
Copper, Cu	mg/kg	10
Lead, Pb	mg/kg	4
Mercury, Hg	mg/kg	<0.05
Molybdenum, Mo	mg/kg	<5
Nickel, Ni	mg/kg	3
Selenium, Se	mg/kg	<3
Zinc, Zn	mg/kg	13
Iron, Fe	mg/kg	12,000
Manganese, Mn	mg/kg	100



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----- Our Reference Your Reference Date Sampled Type of Sample	Units	63155-26 Sample Point 16 - B 19/03/2009 Soil
Strontium, Sr ^	mg/kg	4.5



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TEST PARAMETERS	UNITS	LOR	METHOD
Date Extracted			
Date Analysed			
pH	pH Units	0.1	AN101
Bicarbonate Alkalinity	mg/L CaCO ₃	5	AN135 CEI-012
Carbonate Alkalinity	mg/L CaCO ₃	5	AN135 CEI-012
Total Alkalinity	mg/L CaCO ₃	5	AN135 CEI-012
Chloride, Cl	mg/L	2	AN274 CEA-020
Sulphate, SO ₄	mg/L	2	AN275 CEA-021
Fluoride, F	mg/L	0.05	AN141
Sodium, Na	mg/L	0.5	AN300 CEI-200
Potassium, K	mg/L	0.5	AN300 CEI-200
Calcium, Ca	mg/L	0.5	AN300 CEI-200
Magnesium, Mg	mg/L	0.5	AN300 CEI-200
Hardness (as CaCO ₃)	mg/L CaCO ₃	5	AN124
Total Iron, Fe #	mg/L	0.05	AN300 CEI-200
Total Manganese, Mn #	mg/L	0.05	AN300 CEI-200
Total Zinc, Zn #	mg/L	0.005	AN300 CEI-200
Total Aluminium, Al #^	mg/L	0.05	AN318
Total Arsenic, As #^	mg/L	0.003	AN318
Total Beryllium, Be	mg/L	0.001	AN318
Total Boron, B #^	mg/L	0.002	AN318
Total Cadmium, Cd #^	mg/L	0.0001	AN318
Total Chromium, Cr #^	mg/L	0.001	AN318
Total Cobalt, Co #^	mg/L	0.005	AN318
Total Copper, Cu #^	mg/L	0.001	AN318
Total Lead, Pb #^	mg/L	0.001	AN318
Total Molybdenum, Mo #^	mg/L	0.005	AN318
Total Nickel, Ni #^	mg/L	0.002	AN318
Total Selenium, Se #^	mg/L	0.003	AN318
Total Strontium, Sr	mg/L	0.005	AN318
Mercury, Hg	mg/L	0.0002	AN312 CEI-202



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TEST PARAMETERS	UNITS	LOR	METHOD
Date Extracted			
Date Analysed			
Fluoride, F (1:5) #	mg/kg	0.3	AN141
Aluminium, Al	mg/kg	50	AN300 CEI-200
Arsenic, As	mg/kg	5	AN304 CEI-201
Beryllium, Be	mg/kg	3	AN300 CEI-200
Boron, B ^	mg/kg	3	ICP
Cadmium, Cd	mg/kg	0.5	AN300 CEI-200
Chromium, Cr	mg/kg	5	AN300 CEI-200
Cobalt, Co	mg/kg	3	AN300 CEI-200
Copper, Cu	mg/kg	3	AN300 CEI-200
Lead, Pb	mg/kg	3	AN300 CEI-200
Mercury, Hg	mg/kg	0.05	AN312 CEI-202
Molybdenum, Mo	mg/kg	5	AN300 CEI-200
Nickel, Ni	mg/kg	3	AN300 CEI-200
Selenium, Se	mg/kg	3	AN304 CEI-201
Zinc, Zn	mg/kg	3	AN300 CEI-200
Iron, Fe	mg/kg	20	AN300 CEI-200
Manganese, Mn	mg/kg	20	AN300 CEI-200
Strontium, Sr ^	mg/kg	0.3	AN300 CEI-200

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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike Sm#	Spike Recovery
Date Extracted		24/03/09	63155-1	24/03/2009 24/03/2009	Batch Spike	-
Date Analysed		24/03/09	63155-1	24/03/2009 24/03/2009	Batch Spike	-
pH	pH Units	-	63155-1	6.5 6.5 RPD: 0	Batch Spike	-
Bicarbonate Alkalinity	mg/L CaCO ₃	-	63155-1	30 30 RPD: 0	Batch Spike	-
Carbonate Alkalinity	mg/L CaCO ₃	-	63155-1	<5 <5	Batch Spike	-
Total Alkalinity	mg/L CaCO ₃	-	63155-1	30 30 RPD: 0	Batch Spike	-
Chloride, Cl	mg/L	<2	63155-1	4 4 RPD: 0	Batch Spike	99%
Sulphate, SO ₄	mg/L	<2	63155-1	15 15 RPD: 0	Batch Spike	95%
Fluoride, F	mg/L	<0.05	63155-1	0.08 0.07 RPD: 13	Batch Spike	-
Sodium, Na	mg/L	<0.5	63155-1	3.9 3.7 RPD: 5	Batch Spike	100%
Potassium, K	mg/L	<0.5	63155-1	5.3 5.1 RPD: 4	Batch Spike	100%
Calcium, Ca	mg/L	<0.5	63155-1	4.8 4.9 RPD: 2	Batch Spike	100%
Magnesium, Mg	mg/L	<0.5	63155-1	5.3 5.2 RPD: 2	Batch Spike	100%
Hardness (as CaCO ₃)	mg/L CaCO ₃	-	63155-1	34 34 RPD: 0	Batch Spike	-
Total Iron, Fe #	mg/L	<0.05	63155-1	1.0 [N/T]	Batch Spike	109%
Total Manganese, Mn #	mg/L	<0.05	63155-1	0.28 [N/T]	Batch Spike	100%
Total Zinc, Zn #	mg/L	<0.005	63155-1	0.010 [N/T]	Batch Spike	105%
Total Aluminium, Al #^	mg/L	<0.05	63155-1	0.08 [N/T]	Batch Spike	104%
Total Arsenic, As #^	mg/L	<0.003	63155-1	<0.003 [N/T]	Batch Spike	101%
Total Beryllium, Be	mg/L	<0.001	63155-1	<0.001 [N/T]	Batch Spike	105%
Total Boron, B #^	mg/L	<0.002	63155-1	0.009 [N/T]	Batch Spike	-
Total Cadmium, Cd #^	mg/L	<0.0001	63155-1	<0.0001 [N/T]	Batch Spike	102%
Total Chromium, Cr #^	mg/L	<0.001	63155-1	<0.005 [N/T]	Batch Spike	107%
Total Cobalt, Co #^	mg/L	<0.005	63155-1	<0.005 [N/T]	Batch Spike	106%
Total Copper, Cu #^	mg/L	<0.001	63155-1	0.003 [N/T]	Batch Spike	103%



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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike Sm#	Spike Recovery
Total Lead, Pb #^	mg/L	<0.001	63155-1	<0.001 [N/T]	Batch Spike	105%
Total Molybdenum, Mo #^	mg/L	<0.005	63155-1	<0.005 [N/T]	Batch Spike	96%
Total Nickel, Ni #^	mg/L	<0.002	63155-1	<0.005 [N/T]	Batch Spike	96%
Total Selenium, Se #^	mg/L	<0.003	63155-1	<0.003 [N/T]	Batch Spike	99%
Total Strontium, Sr	mg/L	<0.005	63155-1	0.013 [N/T]	Batch Spike	100%
Mercury, Hg	mg/L	<0.0002	63155-1	<0.0002 [N/T]	Batch Spike	98%
QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate	Spike Sm#	Spike Recovery
Date Extracted		26/03/09	[NT]	[NT]	Batch Spike	-
Date Analysed		26/03/09	[NT]	[NT]	Batch Spike	-
Fluoride, F (1:5) #	mg/kg	<0.3	[NT]	[NT]	Batch Spike	-
Aluminium, Al	mg/kg	<50	[NT]	[NT]	Batch Spike	96%
Arsenic, As	mg/kg	<5	[NT]	[NT]	Batch Spike	103%
Beryllium, Be	mg/kg	<3	[NT]	[NT]	Batch Spike	101%
Cadmium, Cd	mg/kg	<0.5	[NT]	[NT]	Batch Spike	100%
Chromium, Cr	mg/kg	<5	[NT]	[NT]	Batch Spike	99%
Cobalt, Co	mg/kg	<3	[NT]	[NT]	Batch Spike	98%
Copper, Cu	mg/kg	<3	[NT]	[NT]	Batch Spike	102%
Lead, Pb	mg/kg	<3	[NT]	[NT]	Batch Spike	100%
Mercury, Hg	mg/kg	<0.05	[NT]	[NT]	Batch Spike	90%
Molybdenum, Mo	mg/kg	<5	[NT]	[NT]	Batch Spike	102%
Nickel, Ni	mg/kg	<3	[NT]	[NT]	Batch Spike	100%
Selenium, Se	mg/kg	<3	[NT]	[NT]	Batch Spike	102%
Zinc, Zn	mg/kg	<3	[NT]	[NT]	Batch Spike	106%
Iron, Fe	mg/kg	<20	[NT]	[NT]	Batch Spike	105%
Manganese, Mn	mg/kg	<20	[NT]	[NT]	Batch Spike	91%

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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate
Date Extracted		[NT]	63155-11	26/03/2009 26/03/2009
Date Analysed		[NT]	63155-11	26/03/2009 26/03/2009
Fluoride, F (1:5) #	mg/kg	[NT]	[NT]	[NT]
Aluminium, Al	mg/kg	[NT]	63155-11	4800 5000 RPD: 4
Arsenic, As	mg/kg	[NT]	[NT]	[NT]
Beryllium, Be	mg/kg	[NT]	[NT]	[NT]
Cadmium, Cd	mg/kg	[NT]	63155-11	<0.5 <0.5
Chromium, Cr	mg/kg	[NT]	[NT]	[NT]
Cobalt, Co	mg/kg	[NT]	63155-11	9 9 RPD: 0
Copper, Cu	mg/kg	[NT]	63155-11	50 50 RPD: 0
Lead, Pb	mg/kg	[NT]	[NT]	[NT]
Mercury, Hg	mg/kg	[NT]	[NT]	[NT]
Molybdenum, Mo	mg/kg	[NT]	[NT]	[NT]
Nickel, Ni	mg/kg	[NT]	63155-11	7 7 RPD: 0
Selenium, Se	mg/kg	[NT]	[NT]	[NT]
Zinc, Zn	mg/kg	[NT]	63155-11	18 18 RPD: 0
Iron, Fe	mg/kg	[NT]	63155-11	19000 20000 RPD: 5
Manganese, Mn	mg/kg	[NT]	63155-11	200 200 RPD: 0

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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate
Date Extracted		[NT]	63155-21	24/03/2009 24/03/2009
Date Analysed		[NT]	63155-21	24/03/2009 24/03/2009
pH	pH Units	[NT]	63155-21	8.0 8.0 RPD: 0
Bicarbonate Alkalinity	mg/L CaCO ₃	[NT]	63155-21	160 160 RPD: 0
Carbonate Alkalinity	mg/L CaCO ₃	[NT]	63155-21	<5 <5
Total Alkalinity	mg/L CaCO ₃	[NT]	63155-21	160 160 RPD: 0
Chloride, Cl	mg/L	[NT]	63155-21	14 14 RPD: 0
Sulphate, SO ₄	mg/L	[NT]	63155-21	12 12 RPD: 0
Fluoride, F	mg/L	[NT]	63155-21	0.15 0.16 RPD: 6
Sodium, Na	mg/L	[NT]	63155-21	27 27 RPD: 0
Potassium, K	mg/L	[NT]	63155-21	3.7 3.9 RPD: 5
Calcium, Ca	mg/L	[NT]	63155-21	30 29 RPD: 3
Magnesium, Mg	mg/L	[NT]	63155-21	12 12 RPD: 0
Hardness (as CaCO ₃)	mg/L CaCO ₃	[NT]	63155-21	120 120 RPD: 0
Total Iron, Fe #	mg/L	[NT]	63155-21	0.31 [N/T]
Total Manganese, Mn #	mg/L	[NT]	63155-21	0.06 [N/T]
Total Zinc, Zn #	mg/L	[NT]	63155-21	0.022 [N/T]
Total Aluminium, Al #^	mg/L	[NT]	63155-21	0.22 [N/T]
Total Arsenic, As #^	mg/L	[NT]	63155-21	<0.003 [N/T]
Total Beryllium, Be	mg/L	[NT]	63155-21	<0.001 [N/T]
Total Boron, B #^	mg/L	[NT]	63155-21	0.032 [N/T]
Total Cadmium, Cd #^	mg/L	[NT]	63155-21	<0.0001 [N/T]
Total Chromium, Cr #^	mg/L	[NT]	63155-21	<0.005 [N/T]
Total Cobalt, Co #^	mg/L	[NT]	63155-21	<0.005 [N/T]
Total Copper, Cu #^	mg/L	[NT]	63155-21	0.003 [N/T]
Total Lead, Pb #^	mg/L	[NT]	63155-21	<0.001 [N/T]
Total Molybdenum, Mo #^	mg/L	[NT]	63155-21	<0.005 [N/T]
Total Nickel, Ni #^	mg/L	[NT]	63155-21	<0.005 [N/T]
Total Selenium, Se #^	mg/L	[NT]	63155-21	<0.003 [N/T]



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QUALITY CONTROL	UNITS	Blank	Duplicate Sm#	Duplicate Sample Duplicate
Total Strontium, Sr	mg/L	[NT]	63155-21	0.11 [N/T]
Mercury, Hg	mg/L	[NT]	63155-21	<0.0002 [N/T]



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NOTES:

LOR - Limit of Reporting.

Determined as Total Acid Extractable Metal. Please note current NATA accreditation does not cover the digestion.

^ This analysis was determined at our Sydney Laboratory 68246.

Analysis Date: Between 24/03/09 and 31/03/09

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Geneva Legal Comment

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ISO 17025

Unless otherwise stated the results shown in this test report only refer to the sample(s) tested and such sample(s) are only retained for 60 days only. This document cannot be reproduced except in full, without prior approval of the Company.

Reference	Units	PQL	Method																	Australian Drinking Water Guideline (2004)	Guidelines for Managing Risks in Recreational Water (2006)	
Site Description				OCF 1	OCF 1	OCF 2	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	UP OCF 1	UP OCF 1	UP OCF 2	Foam	Waste Rock Catch Dam	Health	Aesthetic	Recreational
Replicate				0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0			
Date Sampled				39885	39885	39885	39885	39885	39885	39885	39885	39885	39885	39885	39885	39885	39885	39885	39885			
Type of Sample				Water	Water	Water	Water	Water	Water	Water	Soil	Water	Water	Soil	Water	Water	Water	Soil	Water			
Date Extracted				39891	39891	39891	39891	39891	39891	39891	39891	39891	39891	39891	39891	39891	39891	39891	39891			
Date Analysed				39896	39896	39896	39896	39896	39896	39896	39896	39896	39896	39896	39896	39896	39896	39896	39896			
Chloride, Cl	mg/L	<2	AN274 CEA-020	12	[NT]	14	41	23	23	24		23	22		9	[NT]	19		8		250	
Sulphate, SO4	mg/L	<2	AN275 CEA-021	320	[NT]	360	800	440	430	440		410	410		340	[NT]	130		2500	500	250	5000
Fluoride, F	mg/L	<0.05	AN141	0.19	[NT]	0.2	0.34	0.24	0.25	0.26		0.25	0.27		0.28	[NT]	0.09		0.15	1.5		
pH	pH Units	<0.1	AN101	6.5	6.6	6.8	7.1	7.1	7.4	8.2		7.1	7		4.1	4.1	6.8		2.8			
Bicarbonate Alkalinity	mg/L CaCO3	<5	AN135 CEI-012	86	86	120	240	170	170	190		130	120		<5	<5	120		<5			
Carbonate Alkalinity	mg/L CaCO3	<5	AN135 CEI-012	<5	<5	<5	<5	<5	<5	<5		<5	<5		<5	<5	<5		<5			
Total Alkalinity	mg/L CaCO3	<5	AN135 CEI-012	86	86	120	240	170	170	190		130	120		<5	<5	120		<5			
Calcium, Ca	mg/L	<0.5	AN300 CEI-200	66	65	69	150	95	93	100		87	150		51	32	31		34			

Magnesium, Mg	mg/L	<0.5	AN300 CEI-200	52	55	72	200	95	90	97		94	160		33	33	34		34				
Potassium, K	mg/L	<0.5	AN300 CEI-200	9.9	10	9.9	16	11	9.9	11		7.3	7		7.6	8	9.4		8				
Sodium, Na	mg/L	<0.5	AN300 CEI-200	12	11	13	49	22	21	23		14	12		7.2	5	7.7		4.6				
Hardness (as CaCO3)	mg/L CaCO3	<5	AN124	380	390	470	1200	630	600	650		600	1000		260	220	220		220			200	
Aluminium, Al ^	mg/L	<0.05	AN318	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05		0.87	0.87	<0.05		270				
Total Aluminium, Al #^	mg/L	<0.05	AN318	0.25	0.25	0.29	0.4	0.82	0.091	0.15		0.06	0.12		0.95	0.96	<0.05		270			0.2	
Arsenic, As ^	mg/L	<0.003	AN318	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003		<0.003	<0.003		<0.003	<0.003	<0.003		0.068				
Total Arsenic, As #^	mg/L	<0.003	AN318	<0.003	<0.003	<0.003	<0.003	0.005	<0.003	<0.003		<0.003	<0.003		<0.003	<0.003	<0.003		0.069		0.007		
Beryllium, Be ^	mg/L	<0.005	AN318	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	<0.005	<0.005		0.024				
Total Beryllium, Be #^	mg/L	<0.005	AN318	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	<0.005	<0.005		0.028				
Boron, B ^	mg/L	<0.002	AN318	0.048	0.046	0.044	0.061	0.049	0.05	0.047		0.043	0.04		0.053	0.053	0.034		0.21				
Total Boron, B #^	mg/L	<0.002	AN318	0.052	0.05	0.049	0.067	0.054	0.053	0.054		0.047	0.045		0.057	0.055	0.04		0.21		4		
Cadmium, Cd ^	mg/L	<0.0001	AN318	0.0002	0.0002	0.0001	<0.0001	0.0001	<0.0001	<0.0001		<0.0001	<0.0001		0.0003	0.0004	<0.0001		0.0031				
Total Cadmium, Cd #^	mg/L	<0.0001	AN318	0.0002	0.0002	0.0002	<0.0001	0.0001	0.0001	<0.0001		<0.0001	<0.0001		0.0004	0.0004	<0.0001		0.0031		0.002		
Chromium, Cr ^	mg/L	<0.001	AN318	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001		0.022				
Total Chromium, Cr #^	mg/L	<0.001	AN318	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001		0.024		0.05		0.5
Cobalt, Co ^	mg/L	<0.005	AN318	0.27	0.27	0.2	0.05	0.12	0.09	0.08		0.05	0.03		0.45	0.46	0.01		7.5				
Total Cobalt, Co #^	mg/L	<0.005	AN318	0.23	0.21	0.17	0.055	0.12	0.1	0.082		0.049	0.03		0.48	0.48	0.008		7.7				
Copper, Cu ^	mg/L	<0.001	AN318	11	11	8.4	0.7	3.6	2.6	1.1		1.2	0.8		49	49	0.65		340				
Total Copper, Cu #^	mg/L	<0.001	AN318	22	23	19	2	25	6.6	7.6		2.1	1.8		52	52	1		340		2	1	20
Lead, Pb ^	mg/L	<0.001	AN318	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001		<0.001				
Total Lead, Pb #^	mg/L	<0.001	AN318	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001		<0.001		0.01		
Molybdenum, Mo ^	mg/L	<0.005	AN318	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	<0.005	<0.005		0.11				
Total Molybdenum, Mo #^	mg/L	<0.005	AN318	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		<0.005	<0.005	<0.005		<0.005		0.05		
Nickel, Ni ^	mg/L	<0.002	AN318	0.075	0.075	0.06	0.015	0.043	0.035	0.028		0.023	0.015		0.13	0.12	0.006		1.1				
Total Nickel, Ni #^	mg/L	<0.002	AN318	0.077	0.073	0.061	0.016	0.045	0.037	0.031		0.024	0.015		0.12	0.12	0.006		0.92		0.02		0.2
Selenium, Se ^	mg/L	<0.003	AN318	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003		<0.003	<0.003		<0.003	<0.003	<0.003		0.011				
Total Selenium, Se #^	mg/L	<0.003	AN318	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003		<0.003	<0.003		<0.003	<0.003	<0.003		0.019		0.01		
Tin, Sn ^	mg/L	<0.05	AN318	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05	<0.05	<0.05		<0.05				
Total Tin, Sn #^	mg/L	<0.05	AN318	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05	<0.05	<0.05		<0.05				
Zinc, Zn	mg/L	<0.005	AN300 CEI-200	0.062	0.062	0.058	0.014	0.054	0.029	0.013		0.022	0.019		0.13	0.13	0.021		0.69				
Total Zinc, Zn #	mg/L	<0.005	AN300 CEI-200	0.07	0.067	0.063	0.018	0.068	0.03	0.025		0.029	0.028		0.13	0.13	0.022		0.7			3	
Iron, Fe	mg/L	<0.05	AN300 CEI-200	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05	<0.05	<0.05		23				
Total Iron, Fe #	mg/L	<0.05	AN300 CEI-200	<0.05	<0.05	<0.05	<0.05	0.52	<0.05	<0.05		<0.05	<0.05		<0.05	<0.05	<0.05		23			0.3	
Manganese, Mn	mg/L	<0.05	AN300 CEI-200	0.93	0.93	0.69	0.06	0.48	0.38	0.31		0.12	0.07		2.1	2.1	0.07		5.2				
Total Manganese, Mn #	mg/L	<0.05	AN300 CEI-200	0.95	0.96	0.71	0.06	0.52	0.39	0.32		0.12	0.08		2.1	2.1	0.08		5.2		0.5	0.1	
Total Mercury, Hg #	mg/L	<0.0002	AN312 CEI-202	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002		<0.0002	<0.0002	<0.0002		<0.0002		0.001		
Fluoride, F (1:5) ##	mg/kg	<0.3	AN141								23			17				1.8					
Aluminium, Al	mg/kg	<50	AN300 CEI-200								43000			44000				660					
Arsenic, As	mg/kg	<5	AN304 CEI-201								31			33				<5					
Beryllium, Be	mg/kg	<3	AN300 CEI-200								10			10				<3					
Boron, B ^	mg/kg	<3	ICP								3			<3				<3					
Cadmium, Cd	mg/kg	<0.5	AN300 CEI-200								<0.5			<0.5				<0.5					
Chromium, Cr	mg/kg	<5	AN300 CEI-200								<5			<5				<5					
Cobalt, Co	mg/kg	<3	AN300 CEI-200								160			230				11					
Copper, Cu	mg/kg	<3	AN300 CEI-200								350000			370000				79000					
Lead, Pb	mg/kg	<3	AN300 CEI-200								<3			<3				<3					
Mercury, Hg	mg/kg	<0.05	AN312 CEI-202								0.06			0.06				<0.05					
Molybdenum, Mo	mg/kg	<5	AN300 CEI-200								<5			<5				<5					
Nickel, Ni	mg/kg	<3	AN300 CEI-200								83			120				6					
Manganese, Mn	mg/kg	<20	AN300 CEI-200								74			90				<20					
Selenium, Se	mg/kg	<3	AN304 CEI-201								<3			<3				<3					
Zinc, Zn	mg/kg	<3	AN300 CEI-200								170			210				64					
Iron, Fe	mg/kg	<20	AN300 CEI-200								5000			5300				170					
Tin, Sn ##	mg/kg	<5	AN304 CEI-201								<5			<5				<5					
	exceeds drinking water health-based guideline value (guideline relevant to total metals)																						
	exceeds drinking water aesthetic guideline value (guideline relevant to total metals)																						
	exceeds both drinking water and recreational guideline value (guideline relevant to total metals)																						

Results - Leichhardt River Catchment Survey

Water quality

None of the samples taken during the Leichhardt river catchment survey exceeded the water quality limits for livestock drinking water. In addition none of the samples exceeded the drinking water health based guidelines or the recreational guidelines for primary contact. This confirms that the water within the catchment is suitable for those uses.

The drinking water guidelines were exceeded for aesthetic guidelines at various sites particularly for hardness, total iron, total manganese and total aluminium. Both aluminium and iron are present in relative high levels in clays. A further discussion in terms of each parameter is offered below:

For aluminium the drinking water guidelines for aesthetic states that higher levels than the recommended aesthetic guidelines refer to acid soluble aluminium post treatment of water with aluminium as a flocculent. As previously mentioned most of the aluminium is actually associated with clay particles and it can therefore be assumed that aluminium is not of concern from a drinking water perspective.

In terms of iron the drinking water guidelines for aesthetic states that at level above 0.3mg/l, there may be a foul taste to the water as well as potential for (orange) staining of laundry and fittings. It should be noted that iron occurs naturally at levels of upto 1mg/L and does not represent a health risk to the consumer.

In terms of Iron the drinking water guidelines for aesthetic states that at levels above 200mg/L water may be hard to lather and may cause scaling problems, however there is no issue from a health perspective.

For manganese the drinking water guidelines for aesthetic is lower (0.1mg/L) than that for health (0.5mg/L). As stated above the health limit was not exceeded. At the levels observed there may be issues in terms of the taste of water as well as some (black) staining to staining of laundry and fittings.

From an aquatic ecosystems point of view the trigger guidelines for the protection of 95% of species was exceeded at various sites for pH (slightly higher than recommended values), total iron, total aluminium, total copper, total zinc and total nickel. The ANZECC guidelines for the protection of ecosystem specifically state that if the trigger values for the protection of 95% of species is exceeded that a further investigation is entered into. As these results are all based on total metal analysis a further investigation is warranted in terms of the bio-available fraction of these parameters as well as what would naturally occur in the area as the area is potentially already mineralised and some of these metals may occur at higher than guidelines values in the waters naturally. This will be followed up by DERM in due course.

Ash: we need to see if we can get filterable metals done for the stuff above as well as some further assessment of reference sites.

Sediment quality

In sediments copper exceeded the guideline value in cave creek (Site 2 and 3). This warrants further investigation in terms of copper being available in salts which are accessible to livestock and a possible requirement for clean up. At this stage it would be advisable to prevent stock accessing these areas.

Arsenic level at site 1 in cave creek was 20mg/kg which is equivalent to the lower limit of the guidelines. Arsenic does occur naturally in levels of between 0.2 to 30mg/kg (reference contaminated land guidelines). The level observed does not warrant any further investigation at this stage.



Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1002026	Page	: 1 of 13
Client	: ENVIRONMENTAL PROTECTION AUTHORITY - QLD	Laboratory	: Environmental Division Brisbane
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: P O BOX 2066 CAIRNS QLD, AUSTRALIA 4870	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: [REDACTED]	E-mail	: Services.Brisbane@alsenviro.com
Telephone	: +61 07 [REDACTED]	Telephone	: +61-7- [REDACTED]
Facsimile	: +61 07 [REDACTED]	Facsimile	: +61-7- [REDACTED]
Project	: Helicopter Sampling	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 05-FEB-2010
C-O-C number	: ----	Issue Date	: 16-FEB-2010
Sampler	: [REDACTED]	No. of samples received	: 47
Site	: Leichhardt Survey	No. of samples analysed	: 47
Quote number	: BN/002/09		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



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This document is issued in
accordance with NATA
accreditation requirements.

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories

Position

Accreditation Category

[REDACTED]

Senior Inorganic Chemist
Senior Inorganic Chemist

Inorganics
Inorganics

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A Campbell Brothers Limited Company



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020A T (Total Metals): LCS recovery for Sb falls outside Dynamic Control Limits. It is however within ALS Static Control Limits and hence deemed acceptable.**



Analytical Results

Sub-Matrix: SOIL

Client sample ID

Client sampling date / time

				HB040210004	HB040210010	HB040210014	HB040210018	HB040210023
				04-FEB-2010 09:05	04-FEB-2010 10:00	04-FEB-2010 10:40	04-FEB-2010 11:15	04-FEB-2010 11:35
Compound	CAS Number	LOR	Unit	EB1002026-004	EB1002026-010	EB1002026-014	EB1002026-018	EB1002026-023
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	21.7	24.5	19.0	24.8	37.0
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	8	16	56	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	12	5	7	20
Copper	7440-50-8	5	mg/kg	13	92	19	2370	90
Lead	7439-92-1	5	mg/kg	<5	<5	<5	11	7
Nickel	7440-02-0	2	mg/kg	7	12	4	9	19
Zinc	7440-66-6	5	mg/kg	18	23	<5	12	38



Analytical Results

Sub-Matrix: SOIL

Client sample ID

Client sampling date / time

				HB040210027	HB040210031	HB040210035	HB040210039	HB040210043
				04-FEB-2010 12:00	04-FEB-2010 12:30	04-FEB-2010 12:45	04-FEB-2010 13:10	04-FEB-2010 14:20
Compound	CAS Number	LOR	Unit	EB1002026-027	EB1002026-031	EB1002026-035	EB1002026-039	EB1002026-043
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	13.2	26.2	20.6	21.3	20.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	6	20	10	6	9
Copper	7440-50-8	5	mg/kg	35	31	7	<5	16
Lead	7439-92-1	5	mg/kg	<5	7	<5	<5	<5
Nickel	7440-02-0	2	mg/kg	6	15	3	2	5
Zinc	7440-66-6	5	mg/kg	10	30	<5	<5	7



Analytical Results

Sub-Matrix: SOIL				Client sample ID	HB040210047	----	----	----	----
				Client sampling date / time	04-FEB-2010 14:40	----	----	----	----
Compound	CAS Number	LOR	Unit		EB1002026-047	----	----	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)		----	1.0	%	21.4	----	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		3	----	----	----	----
Copper	7440-50-8	5	mg/kg		<5	----	----	----	----
Lead	7439-92-1	5	mg/kg		<5	----	----	----	----
Nickel	7440-02-0	2	mg/kg		<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg		6	----	----	----	----



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB040210001	HB040210002	HB040210003	HB040210005	HB040210006
				04-FEB-2010 09:05	04-FEB-2010 09:05	04-FEB-2010 09:05	04-FEB-2010 09:30	04-FEB-2010 09:30
Compound	CAS Number	LOR	Unit	EB1002026-001	EB1002026-002	EB1002026-003	EB1002026-005	EB1002026-006
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	----	----	104	----	3270
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	----	7	----	2200
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	----	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.001	0.001	----	0.047	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	0.017	----
Lead	7439-92-1	0.001	mg/L	<0.001	0.001	----	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	0.015	----



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB040210007	HB040210008	HB040210009	HB040210011	HB040210012
				04-FEB-2010 10:00	04-FEB-2010 10:00	04-FEB-2010 10:00	04-FEB-2010 10:40	04-FEB-2010 10:40
Compound	CAS Number	LOR	Unit	EB1002026-007	EB1002026-008	EB1002026-009	EB1002026-011	EB1002026-012
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	----	----	270	----	----
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	----	104	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	----	0.001	0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.004	0.005	----	0.002	0.002
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	----	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	0.001	0.002	----	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	<0.005	0.006



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB040210013	HB040210015	HB040210016	HB040210017	HB040210019
				04-FEB-2010 10:40	04-FEB-2010 11:15	04-FEB-2010 11:15	04-FEB-2010 11:15	04-FEB-2010 11:35
Compound	CAS Number	LOR	Unit	EB1002026-013	EB1002026-015	EB1002026-016	EB1002026-017	EB1002026-019
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	4	----	----	107	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	<0.001	<0.001	----	<0.001
Cadmium	7440-43-9	0.0001	mg/L	----	<0.0001	<0.0001	----	<0.0001
Chromium	7440-47-3	0.001	mg/L	----	<0.001	<0.001	----	<0.001
Copper	7440-50-8	0.001	mg/L	----	0.217	0.224	----	0.004
Nickel	7440-02-0	0.001	mg/L	----	0.003	0.003	----	<0.001
Lead	7439-92-1	0.001	mg/L	----	<0.001	0.001	----	<0.001
Zinc	7440-66-6	0.005	mg/L	----	0.007	0.006	----	<0.005



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB040210020	HB040210021	HB040210022	HB040210024	HB040210025
				04-FEB-2010 11:35	04-FEB-2010 11:35	04-FEB-2010 11:35	04-FEB-2010 12:00	04-FEB-2010 12:00
Compound	CAS Number	LOR	Unit	EB1002026-020	EB1002026-021	EB1002026-022	EB1002026-024	EB1002026-025
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	----	11	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.006	<0.001	----	0.004	0.006
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	0.001	<0.001	----	0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	<0.005	<0.005



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB040210026	HB040210028	HB040210029	HB040210030	HB040210032
				04-FEB-2010 12:00	04-FEB-2010 12:30	04-FEB-2010 12:30	04-FEB-2010 12:30	04-FEB-2010 12:45
Compound	CAS Number	LOR	Unit	EB1002026-026	EB1002026-028	EB1002026-029	EB1002026-030	EB1002026-032
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	10	----	----	4	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	<0.001	<0.001	----	<0.001
Cadmium	7440-43-9	0.0001	mg/L	----	<0.0001	<0.0001	----	<0.0001
Chromium	7440-47-3	0.001	mg/L	----	<0.001	0.002	----	<0.001
Copper	7440-50-8	0.001	mg/L	----	0.002	0.008	----	0.004
Nickel	7440-02-0	0.001	mg/L	----	<0.001	0.002	----	<0.001
Lead	7439-92-1	0.001	mg/L	----	<0.001	0.002	----	<0.001
Zinc	7440-66-6	0.005	mg/L	----	<0.005	0.008	----	<0.005



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB040210033	HB040210034	HB040210036	HB040210037	HB040210038
				04-FEB-2010 12:45	04-FEB-2010 12:45	04-FEB-2010 13:10	04-FEB-2010 13:10	04-FEB-2010 13:10
Compound	CAS Number	LOR	Unit	EB1002026-033	EB1002026-034	EB1002026-036	EB1002026-037	EB1002026-038
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	4	----	----	4
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	0.002	----	<0.001	0.002	----
Copper	7440-50-8	0.001	mg/L	0.008	----	0.004	0.010	----
Nickel	7440-02-0	0.001	mg/L	0.002	----	<0.001	0.003	----
Lead	7439-92-1	0.001	mg/L	0.001	----	<0.001	0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	<0.005	0.013	----



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB040210040	HB040210041	HB040210042	HB040210044	HB040210045
				04-FEB-2010 14:20	04-FEB-2010 14:20	04-FEB-2010 14:20	04-FEB-2010 14:35	04-FEB-2010 14:35
Compound	CAS Number	LOR	Unit	EB1002026-040	EB1002026-041	EB1002026-042	EB1002026-044	EB1002026-045
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	----	5	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.002	0.003	----	0.002	0.002
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	0.002	<0.001
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	<0.005	0.012



Analytical Results

Sub-Matrix: WATER

				Client sample ID	HB040210046	----	----	----	----
				Client sampling date / time	04-FEB-2010 14:40	----	----	----	----
Compound	CAS Number	LOR	Unit		EB1002026-046	----	----	----	----
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L		5	----	----	----	----



Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1005409	Page	: 1 of 10
Client	: DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT - QLD	Laboratory	: Environmental Division Brisbane
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: PO BOX 2316 MOUNT ISA QLD, AUSTRALIA 4825	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: [REDACTED]	E-mail	: Services.Brisbane@alsenviro.com
Telephone	: + [REDACTED]	Telephone	: + [REDACTED]
Facsimile	: + [REDACTED]	Facsimile	: + [REDACTED] 7218
Project	: Mount Oxide 22-3-10	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 25-MAR-2010
C-O-C number	: ----	Issue Date	: 08-APR-2010
Sampler	: [REDACTED]	No. of samples received	: 35
Site	: Mount Oxide	No. of samples analysed	: 35
Quote number	: BN/060/10		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories

Position

Accreditation Category

[REDACTED]

Senior Inorganic Chemist
Senior Inorganic Chemist

Inorganics
Inorganics

Environmental Division Brisbane

Part of the **ALS Laboratory Group**

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A Campbell Brothers Limited Company



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG005T (Total Metals): Sample EB1005409-020 (HB220310021) shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.**



Analytical Results

Sub-Matrix: SOIL

Client sample ID

Client sampling date / time

				HB220310004	HB220310008	HB220310012	HB220310016	HB220310017
				22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00
Compound	CAS Number	LOR	Unit	EB1005409-004	EB1005409-008	EB1005409-011	EB1005409-015	EB1005409-016
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	18.0	47.5	18.6	19.9	79.6
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	215	223	106	66	48
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<3
Chromium	7440-47-3	2	mg/kg	7	6	6	8	<6
Copper	7440-50-8	5	mg/kg	959	759	1350	1540	551000
Lead	7439-92-1	5	mg/kg	13	86	13	22	13
Nickel	7440-02-0	2	mg/kg	22	20	14	21	54
Zinc	7440-66-6	5	mg/kg	10	9	9	15	254



Analytical Results

Sub-Matrix: SOIL

Client sample ID

Client sampling date / time

				HB220310021	HB220310025	HB220310029	HB220310033	----
				22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	----
Compound	CAS Number	LOR	Unit	EB1005409-020	EB1005409-024	EB1005409-028	EB1005409-032	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	62.5	54.4	41.6	53.1	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	59	122	145	187	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	10	6	7	8	----
Copper	7440-50-8	5	mg/kg	18800	3950	3240	8980	----
Lead	7439-92-1	5	mg/kg	17	24	50	70	----
Nickel	7440-02-0	2	mg/kg	31	22	12	18	----
Zinc	7440-66-6	5	mg/kg	35	11	9	13	----



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB220310001	HB220310002	HB220310003	HB220310005	HB220310006
				22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00
Compound	CAS Number	LOR	Unit	EB1005409-001	EB1005409-002	EB1005409-003	EB1005409-005	EB1005409-006
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	----	296	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.001	----	----	0.022	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	0.0023	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	0.020	----
Copper	7440-50-8	0.001	mg/L	0.301	----	----	234	----
Nickel	7440-02-0	0.001	mg/L	0.002	----	----	1.09	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	0.524	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	0.002	----	----	0.022
Cadmium	7440-43-9	0.0001	mg/L	----	0.0002	----	----	0.0024
Chromium	7440-47-3	0.001	mg/L	----	<0.001	----	----	0.019
Copper	7440-50-8	0.001	mg/L	----	0.493	----	----	249
Nickel	7440-02-0	0.001	mg/L	----	0.006	----	----	1.14
Lead	7439-92-1	0.001	mg/L	----	0.003	----	----	<0.001
Zinc	7440-66-6	0.005	mg/L	----	0.046	----	----	0.508



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB220310007	HB220310009	HB220310011	HB220310013	HB220310014
				22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00
Compound	CAS Number	LOR	Unit	EB1005409-007	EB1005409-009	EB1005409-010	EB1005409-012	EB1005409-013
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	3050	----	562	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	<0.001	----	<0.001	0.001
Cadmium	7440-43-9	0.0001	mg/L	----	<0.0001	----	<0.0001	0.0001
Chromium	7440-47-3	0.001	mg/L	----	<0.001	----	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	----	0.461	----	3.82	5.41
Nickel	7440-02-0	0.001	mg/L	----	0.008	----	0.030	0.028
Lead	7439-92-1	0.001	mg/L	----	<0.001	----	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	----	0.013	----	0.028	0.020



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB220310015	HB220310018	HB220310019	HB220310020	HB220310022
				22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00
Compound	CAS Number	LOR	Unit	EB1005409-014	EB1005409-017	EB1005409-018	EB1005409-019	EB1005409-021
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	328	----	----	324	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	<0.001	0.001	----	<0.001
Cadmium	7440-43-9	0.0001	mg/L	----	0.0002	<0.0001	----	0.0004
Chromium	7440-47-3	0.001	mg/L	----	<0.001	<0.001	----	<0.001
Copper	7440-50-8	0.001	mg/L	----	1.54	3.37	----	15.5
Nickel	7440-02-0	0.001	mg/L	----	0.021	0.023	----	0.108
Lead	7439-92-1	0.001	mg/L	----	<0.001	<0.001	----	<0.001
Zinc	7440-66-6	0.005	mg/L	----	0.011	0.019	----	0.088



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB220310023	HB220310024	HB220310026	HB220310027	HB220310028
				22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00
Compound	CAS Number	LOR	Unit	EB1005409-022	EB1005409-023	EB1005409-025	EB1005409-026	EB1005409-027
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	407	----	----	216
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.002	----	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	0.0008	----	0.0002	0.0003	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	18.2	----	62.5	63.8	----
Nickel	7440-02-0	0.001	mg/L	0.108	----	0.069	0.070	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.088	----	0.061	0.071	----



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				HB220310030	HB220310031	HB220310032	HB220310034	HB220310035
				22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00	22-MAR-2010 15:00
Compound	CAS Number	LOR	Unit	EB1005409-029	EB1005409-030	EB1005409-031	EB1005409-033	EB1005409-034
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	----	----	20	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.005	0.010	----	0.012	0.013
Cadmium	7440-43-9	0.0001	mg/L	0.0005	<0.0001	----	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.347	0.988	----	0.082	0.123
Nickel	7440-02-0	0.001	mg/L	0.008	0.009	----	0.019	0.018
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	0.006	0.007	----	0.009	0.008



Analytical Results

Sub-Matrix: **WATER**

Client sample ID

HB220310036

Client sampling date / time

22-MAR-2010 15:00

Compound	CAS Number	LOR	Unit	EB1005409-035	----	----	----	----
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	3330	----	----	----	----
ED040F: Dissolved Major Anions								
Sulfate as SO4 2-	14808-79-8	1	mg/L	2240	----	----	----	----

Mount Oxide 22-03-2010

[illegible]

Site Description		Upstream of waste rock catch dam	Waste rock catch dam	Downstream of waste rock catch dam and upstream of confluence with	Downstream of Mount Oxide in Cave Creek	Further downstream of Mount Oxide in Cave Creek	Cave creek adjacent to QME dumps	Waste dump seepage collection pond (north)	Waste dump seepage collection point (South)	Discharge from Birla into Gunpowder River at Mount Oxide causeway.	Australian Drinking Water Guideline (2004)		Guidelines for Managing Risks in Recreational Water (2006)
Sample Number		HB220310002	HB220310006	HB220310010	HB220310014	HB220310019	HB220310023	HB220310027	HB220310031	HB220310035	Health	Aesthetic	Recreational
Date Sampled		22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010			
Type of Sample		Water	Water	Water	Water	Water	Water	Water	Water	Water			
Sulphate	mg/L	296	3050	562	328	324	407	216	20	2240	500	250	5000
arsenic	mg/L	0.002	0.022		0.001	0.001	0.002	<0.001	0.01	0.013	0.007		
cadmium	mg/L	0.0002	0.0024		0.0001	<0.0001	0.0008	0.0003	<0.0001	<0.0001	0.002		
Chromium	mg/L	<0.001	0.019		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.05		0.5
copper	mg/L	0.493	249		5.41	3.37	18.2	63.8	0.988	0.123	2	1	20
nickel	mg/L	0.006	1.14		0.028	0.023	0.108	0.07	0.009	0.018	0.02		0.2
lead	mg/L	0.003	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.01		
zinc	mg/L	0.046	0.524		0.02	0.019	0.088	0.071	0.007	0.008		3	
pH	units	6.76	3.8	6.9	7.05	7.72	6.41	4.72	5.98	6.92		6.5-8.5	
EC	mS/cm	0.781	3.24	2.084	0.887	0.678	0.854	0.486	0.0634	1.02		1.493	
DO	%	44.38	21.8	39.2	73.8	78.9	68	27.7	72.8	89.6			
temp	°C	33.4	31.5	31.1	34.8	37	34.9	35.8	36.4	27.7			
	exceeds drinking water health-based guideline value (guideline relevant to total metals)												
	exceeds drinking water aesthetic guideline value (guideline relevant to total metals)												
	exceeds both drinking water and recreational guideline value (guideline relevant to total metals)												

exceeds ANZECC (2000) Ecosystemes (95th percentile) guidelines (guideline relevant to dissolved metals)

Site Description		Upstream of waste rock catch dam	Waste rock catch dam	Downstream of waste rock catch dam and upstream of confluence with Cave Creek	Downstream of Mount Oxide in Cave Creek	Further downstream of Mount Oxide in Cave Creek	Cave creek adjacent to QME dumps	Waste dump seepage collection pond (north)	Waste dump seepage collection point (South)	Discharge from Birla into Gunpowder River at Mount Oxide causeway.	Blue foam from Cave Creek		
Sample		HB2220310004	HB2220310008	HB2220310012	HB2220310016	HB2220310021	HB2220310025	HB2220310029	HB2220310033	No Sample	HB2220310017	ISQG low	ISQG high
date sampled		22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010	22/03/2010		
Type of Sample		Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment		
arsenic	mg/kg	215	223	106	66	59	122	145	187		48	20	70
cadmium	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1		<3	1.5	10
Chromium	mg/kg	7	6	6	8	10	6	7	8		<6	80	370
copper	mg/kg	959	759	1350	1540	18800	3950	3240	8980		551000	65	270
lead	mg/kg	13	86	13	22	17	24	50	70		13	50	220
nickel	mg/kg	22	20	14	21	31	22	12	18		54	21	52
zinc	mg/kg	10	9	9	15	35	11	9	13		254	200	410

	exceed ISQG low
	exceeds ISQG high

Mount Oxide Data Interpretation.

Mount Oxide

ANZECC 2000 Livestock Drinking Water Quality Guideline

- Sulphate exceeded guideline at sample location 2- waste rock catch dam.
- Copper exceeded guideline at sample location 2, 4, 5, 6 and 7.
- Nickel exceeded guideline at sample location 2- waste rock catch dam.
- pH exceeded guideline at sample location 2 and 7.

Australia Drinking Water Quality Guideline (2004)

- Sulphate exceeded guideline at sample location 1, 4, 5 and 6 for aesthetics.
- Sulphate exceeded guideline at sample location 2 and 3 for health.
- Arsenic exceeded guideline at sample location 2 and 8 for health.
- Cadmium exceeded guideline at sample location 2 for health.
- Chromium exceeded guideline at sample location 2 for health.
- Copper exceeded guideline at sample location 2, 4, 5, 6 and 7 for both health and aesthetics.
- Nickel exceeded guideline at sample location 2, 4, 5, 6 and 7 for health.
- pH exceeded guideline at sample location 2, 5, 6 and 7 for aesthetics.

Guideline for Managing Recreational Risks in Water (2006)

- Copper exceeded guideline at sample location 2 and 7 for recreation.
- Nickel exceeded guideline at sample location 2 for recreation.

ANZECC 2000 Freshwater Ecosystems (95%) Guideline

- Cadmium exceeded guideline at sample location 2, 5, 6, 7 and 8.
- Chromium exceeded guideline at sample location 2.
- Copper exceeded guideline at all sample locations.
- Nickel exceeded guideline at sample location 2, 4, 5, 6 and 7.
- Zinc exceeded guideline at sample location 2, 3, 4, 5, 6 and 7.
- pH exceeded guideline at sample location 2, 4, 6 and 8.

ANZECC ISQG Low Guideline

- Arsenic exceeded guideline at sample location 4 and 5.
- Lead exceeded guideline at sample location 2, 7 and 8.
- Nickel exceeded guideline at sample location 1, 4, 5 and 6.
- Blue foam exceeded guideline for arsenic, cadmium and zinc.

ANZECC ISGQ High Guideline

- Arsenic exceeded guideline at sample location 1, 2, 3, 6, 7 and 8.
- Copper exceeded guideline at all sample locations.
- Blue foam exceeded guideline for copper and nickel.

Sample Summary-Mount Oxide 22 March 2010

Sample Location	GPS Coordinates	In situ Measurements	Samples Collected	Observations
Sample point 1- Upstream of waste rock catch dam.	S19.47915 E139.39337	DO 44.38 EC 781us/cm pH 6.76 Temp 33.4C	Filtered Metals (HB220310001) Total Metals (HB220310002) Sulphate (HB220310003) Sediment (HB220310004)	Not blue contamination or iron staining above waste rock catch dam. Some small contamination immediately upstream, may be from water transgressing along fault zones in the area.
Sample point 2- Waste rock catch dam.	S19. 47975 E139.39290	DO 21.8% EC 3.24Ms pH 3.8 Temp 31.5C	Filtered Metals (HB220310005) Total Metals (HB220310006) Sulphate (HB220310007) Sediment (HB220310008)	Water colour black and seeping out of dam. Salting and iron staining downstream of this point.
Sample point 3- Downstream of waste rock catch dam and upstream of confluence with Cave Creek.	S19.48397 E139.39288	DO 39.2% EC 2084us/cm pH 6.9 Temp 31.1C	Filtered Metals (HB220310009) Total Metals (HB220310010) Sulphate (HB220310011) Sediment (HB220310012)	Water a clear colour with blue contamination of the creek bed. No flow and riparian vegetation around.
Sample point 4- Downstream of Mount Oxide in Cave Creek.	S19.48470 E139.39336	DO 73.8% EC 887us/cm Ph 7.05 Temp 34.8C	Filtered Metals (HB220310013) Total Metals (HB220310014) Sulphate (HB220310015) Sediment (HB220310016) Blue Foam (HB220310017)	Water a clear colour with very distinct blue sediments in the creek bed. Rocks and tree roots stained blue and foam appearing on rocks and the water surface. Wallabies

				observed on the rock face next to Cave Creek.
Sample point 5- Further downstream of Mount Oxide in Cave Creek.	S19.48633 E139.39513	DO 78.9% EC 678us/cm Ph 7.72 Temp 37C	Filtered Metals (HB220310018) Total Metals (HB220310019) Sulphate (HB220310020) Sediment (HB220310021)	Water a clear colour with very distinct blue sediments in the creek bed. Rocks and tree roots stained blue and foam appearing on rocks and the water surface.
Sample point 6- Cave Creek adjacent to QME heap leach pads.	S19.48305 E139.38841	DO 68% EC 854us/cm Ph 6.41 Temp 34.9.	Filtered Metals (HB220310022) Total Metals (HB220310023) Sulphate (HB220310024) Sediment (HB220310025)	Creek located adjacent to QME leach pads has clear water with blue sediments. Blue tide marks can be found in creek bed where water has evaporated.
Sample point 7- Seepage collection pond (North).	S19.48353 E139.38832	DO 27.7% EC 486us/cm Ph 4.72 Temp 35.8C	Filtered Metals (HB220310026) Total Metals (HB220310027) Sulphate (HB220310028) Sediment (HB220310029)	Seepage from the waste rock dumps constructed by QME is contained in this location before overflowing into Cave Creek.
Sample point 8- Seepage collection pond (South)	S19.48251 E139.38705	DO 72.8% EC 63.4us/cm Ph 5.98 Temp 36.4C	Filtered Metals (HB220310030) Total Metals (HB220310031) Sulphate (HB220310032) Sediment (HB220310033)	Seepage from the waste rock dumps constructed by QME is contained in this location before overflowing into Cave

Sample point 9- Discharge from Birla at Mount Oxide causeway into Gunpowder River.	S19.60895 E139.35670	DO 89.6% EC 1020us/cm Ph 6.92 Temp 27.7C	Filtered Metals (HB220310034) Total Metals (HB220310035) Sulphate (HB220310036)	Creek. Discharge coming out of the black pipe was sampled at the statuary point on the licence to ensure discharge complied with EA limits.
--	-------------------------	---	--	--

Sample Summary-Birla, Mount Oxide and Lady Annie 16 March 2011

Sample Location	GPS Coordinates (GDA 94)	In situ Measurements	Samples Collected	Observations
Sample Location 1- Upstream Reference Site (Birla)	S 19 42 32.3 E 139 70 08.9	DO 74.4% EC 0.145MS pH 7.23 Temp 27.89C	HB160311001 (Sulphate) HB160311002 (Filtered Metals) HB160311003 (Total Metals) HB160311004 (Sediment)	Water flowing fast slightly brown in colour, banks muddy and Gunpowder in flood event.
Sample Location 2- Mount Oxide Causeway	S 19 41 24.0 E139 21 18.5	DO 85.5% EC 0.138MS pH 7.4 Temp 28.11C	HB160311005 (Sulphate) HB160311006 (Filtered Metals) HB160311007 (Total Metals) HB160311008 (Sediment)	Water flowing over causeway and fast rate by at least 1 meter. Water also brown and muddy at this location
Sample Location 3- Downstream of Birla in Gunpowder Creek (WCO4)	S 19 40 06.2 E139 22 37.3	DO 90% EC 0.151MS pH 7.71 Temp 27.18C	HB160311009 (Sulphate) HB160311010 (Filtered Metals) HB160311011 (Total Metals) HB160311012 (Sediment)	Water flowing fast slightly brown in colour, banks muddy and Gunpowder in flood event.
Sample Location 4- Old TSF seep.	S 19 41 06.8 E139 21 56.8	DO 70.1% EC 3.213MS pH 6.83 Temp 30.92C	HB160311013 (Sulphate) HB160311014 (Filtered Metals) HB160311015 (Total Metals) HB160311016 (Sediment)	Water observed seeping out of old TSF, resulted in Blue coloration being observed downstream of the point.
Sample Location 5- Evaporation pond Release	S 19 41 41.1 E139 22 13.3	DO 94% EC 0.157MS pH 7.78 Temp 27.85C	HB160311017 (Sulphate) HB160311018 (Filtered Metals) HB160311019 (Total Metals) HB160311020 (Sediment)	Evaporation pond releasing into magazine creek through narrow rocky channel. Water flowing fast through this location.
Sample	S19 41 44.0	DO 76.4%	HB160311021	Water a clear

Location 6- Mammoth Portal Retention Pond	E139 22 05.4	EC 0.557MS pH 3.41 Temp 28.02C	(Sulphate) HB160311022 (Filtered Metals) HB160311023 (Total Metals) HB160311024 (Sediment)	colour with a blue tinge. Banks rocky with small amount of seepage coming from the underground operation.
Sample Location 7- North waste rock seepage.		DO 45.4% EC 3.048MS pH 3.70 Temp 32.82C	No samples collected, samples water collected by Russ McConnell from this location 2 weeks ago.	Seepage is starting to progress towards the road, further rain events could result in release to Gunpowder.
Sample Location 8- Mills Creek Dam.	S 19 41 29.1 E139 21 35.6	DO 44% EC 5.204MS pH 3.08 Temp 29.17C	HB160311025 (Sulphate) HB160311026 (Filtered Metals) HB160311027 (Total Metals) HB160311028 (Sediment)	Water clear significant amount of water in dam, pumps in place but not operating at time of inspection.
Sample Location 9- Statutory monitoring location WC13	S19 40 54.8 E139 22 29.2	DO 82.1% EC 0.175MS pH 7.02 Temp 27.7C	HB160311029 (Sulphate) HB160311030 (Filtered Metals) HB160311031 (Total Metals) HB160311032 (Sediment)	Located downstream of greenstone Creek water brown and flowing fast with a muddy bank.
Sample Location 10- Downstream of QME heap leach pad remediation- Mount Oxide.	S 19 29 09.6 E139 23 13.9	DO 89.5% EC 0.260MS pH 6.34 Temp 30.6C	No samples collected from this location.	Probe put in downstream of heap leach pad remediation. Black plastic was observed to be intact.
Sample Location 11- Cave Creek- Mount Oxide	S19 29 10.0 E139 23 31.6	DO 93.1% EC 0.308MS pH 6.41 Temp 30.90C	HB160311033 (Sulphate) HB160311034 (Filtered Metals) HB160311035 (Total Metals)	Water flowing quite fast through area, no significant blue sediments

			HB160311036 (Sediment)	observed during inspection.
Sample Location 12- Torpedo Water Hole		DO 71.5% EC 0.121MS pH 7.01 Temp 28.37C	No samples collected.	One of the main water holes for Chidna Station location on the Gunpowder River.
Sample Location 13- Lady Annie Crusher sediment dam.	S 19 53 52.3 E139 07 10.9	DO 67.8% EC 0.212MS pH 6.94 Temp 27.80	HB160311037 (Sulphate) HB160311038 (Filtered Metals) HB160311039 (Total Metals) HB160311040 (Sediment)	Water still releasing at time of inspection, only small flow but brown and muddy in colour.

