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COMSTOCK MINE ENVIRONMENTAL MANAGEMENT PLAN REVIEW

For
Zeehan Zinc Limited

October 2007
Revision 3

Project No: 1292.001

PREFACE

PROJECT: Comstock Mine EMP Review **PROJECT NO.:** 1292.001

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FOREWORD

Function of the Environmental Management Plan Review

The Environmental Management Plan Review (EMP Review) has been prepared as a public document for submission to the Department of Primary Industries, Water, and Environment (DTAE). The reports provides, but it not limited to, a detailed review of the environmental effects of the Zeehan Zinc operations during the scheduled 3 year review period i.e. between July 2002 and July 2005, and also includes all current monitoring results up to March 2006. The report also provides a review of the major changes to the operations since the original DPEMP was approved in 2001. In addition, the report includes:

- A summary of the results of all monitoring programs undertaken during the review period and interpretation of the results;
- Reviews the development of the activity and operational procedures during the review period, highlighting any changes from the predictions in the EMP and the reasons for such changes;
- Summarises the management commitments, which have been made for the period until the next review to ensure the activity is undertaken in accordance with statutory requirements and to demonstrate continual environmental improvement;
- Reviews the current permit and environmental protection notice requirements and any proposed amendments; and
- Concludes whether or not the EMP should be revised/amended.

EXECUTIVE SUMMARY

The environmental commitments provided in the Development Proposal and Environmental Management Plan (DPEMP) December 2001 for Zeehan Zinc Ltd (Zeehan Zinc) mine development at the Comstock Mine, western Tasmania has been reviewed. This review has been undertaken to comply with Condition 7 of Environmental Land Management System (ELMS) 6194 for the site. A review of monitoring data from July 2002 to March 2006 and a discussion of management from July 2002 to March 2006 is provided.

The review provides, but is not limited to, a detailed review of the environmental effects of the Zeehan Zinc operations during the review period i.e. between December 2002 and March 2006, and compared the results with the DPEMP forecasts. The report also provides a review of the major changes to the operations since the last DPEMP review in December 2002. In addition, the report includes:

- A summary of the results of all monitoring programs undertaken during the review period and interpretation of the results;
- Reviews the development of the activity and operational procedures during the review period, highlighting any changes from predictions in the DPEMP and the reasons for such changes;
- Reviews the proposed operations for the period until the next review and where practicable details time frames for changes to equipment, operational procedures, production levels, monitoring programs and potential environmental impacts;
- Summarises the management commitments, which have been made for the period until the next review to ensure the activity is undertaken in accordance with statutory requirements and to demonstrate continual environmental improvement;
- Reviews the current permit and Environmental Protection Notice requirements and any proposed amendments;
- Fulfils the requirements of the Annual Environmental Compliance Report (as requested by the Department of Primary Industries, Water, and Environment);
- Makes reference to the Decommissioning and Rehabilitation Plan;
- Provides the results of flora, fauna and Aboriginal heritage surveys not previously included in the DPEMP;
- Provides copies of the Spill Management Plan, Weed and Disease Management Plan, Water Management Plan, Process Water Management Plan, Waste Rock Management Plan, Visual Waste Rock Characterisation Manual, and the Mine Managers Environmental Handbook;
- Reviews the possible environmental impacts related to implementation of the proposed Waste Management Plan (2003) for waste rock; and
- Concludes whether or not the DPEMP should be revised/amended.

The environmental issues covered by the DPEMP review are briefly summarised below and reflect Zeehan Zinc's commitment to practice good environmental management and ensure environmental performance improvements.

Flora

A complete botanical survey of the Comstock Mine site was carried out in February and March 2006, with 5 vegetation communities identified. Further survey work was carried out in September 2007. The results from the survey will be used in the future management of the mine site and in the Decommissioning and Rehabilitation Plan.

Fauna

A detailed threatened fauna assessment of the Comstock Mine site and associated mining leases was undertaken in February and March 2006. During the survey, no threatened fauna were identified. Threatened fauna have been recorded within the general area, and appropriate habitat exists over the mining leases.

Aboriginal Heritage

In February 2006, an Aboriginal cultural heritage survey was conducted over the Comstock Mine and associated leases, with a particular focus placed on areas likely to be disturbed during future mine developments such as development of the tailings co-disposal area. No sites were identified during the survey.

European Heritage

Throughout the review period, European heritage sites of significance such as two mine portals have been protected. A survey was conducted in February 2006, to assess the possible impacts of the development of a tailings co-disposal facility on an areas that were not assessed during the original European heritage survey. No sites were identified during the 2006 survey.

Fugitive Dust Emissions

Fugitive dust emissions during the review period have been limited to periods of mine activity such as rehabilitation works. The high local rainfall rate at the site during the review period would have provided a measure of dust emission control. There has been no complaints regarding fugitive dust emissions during the review period.

Groundwater

There has been limited monitoring of groundwater emissions through monitoring of the main adit outflow at the Comstock Mine. Installation of groundwater monitoring bores will occurred in September 2007 as part of the development of a tailings co-disposal facility.

Surface Water Emissions

Monitoring of surface waters has occurred during the review period in line with the requirements specified in ELMS 6194 and the DPEMP (2001). The results indicate that the Comstock Creek and the main adit outflow contains elevated metal concentrations resulting from acid and metalliferous drainage within the mine area and the Zeehan Field. Appropriate management of acid and metalliferous drainage at the site is a priority and management options have been identified as part of this review.

Noise Emissions

Throughout the review period, limited noise emissions have occurred. All noise emissions would have been the result of mining equipment activity such as excavators. There have been no complaints received during the review period with regard to noise emissions.

Solid Waste Management

There has been no general waste disposed of on site during the review period, with all wastes transported off site for disposal at approved sites. Small amounts of solid waste have been generated as a result of the limited mining activities and there have been no complaints regarding the management of solid waste at the Comstock Mine.

Hazardous Materials Management

The management of hazardous materials has been undertaken in compliance with the EPN. A hazardous materials audit is to be undertaken in 2006 to reassess site facilities against the relevant Australian Standards.

Waste Rock Management

Throughout the review period, the rehabilitation of disturbed areas, including the Central Waste Rock Dump (CWRD) has been an important part in the management of waste rock

material. As part of this review, a visual waste characterisation manual has been developed, to assist in the segregation of acid producing waste rock types from non-acid producing, and thereby allow appropriate management of the waste rock material. The Swansea Tramway Waste Rock Dump (STWRD) has been identified as an active source of acid and metalliferous drainage, and a management solution has been developed as part of this review. A Waste Rock Management Plan has also been developed.

Visual Impact Management

A visual vegetation buffer has been maintained along the roadsides at the mine site where practical, and in general the site is well screened from surrounding vantage points. The proposed diversion of a section of the Trial Harbour Road is likely to improve the visual amenity of the mine site, with the opportunity to retain a continuous vegetation buffer along the roadside mine site boundary.

Traffic Management

There have been no adverse impacts associated with the limited transport movements to and from the site during the review period.

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ABBREVIATIONS

ACDC	Assessment Committee for Dam Construction
Ag	silver
Al	aluminium
AMD	Acid and Metalliferous Drainage
BPEM	Best Practice Environmental Management
CWRD	Central Waste Rock Dump
DPEMP	Development Proposal and Environmental Management Plan
DPIWE	Department of Primary Industries, Water and Environment
DPIW	Department of Primary Industries and Water
DTAE	Department of Tourism, Arts, and the Environment
ELMS	Environmental Land Management System
EMP	Environmental Management Plan
EPN	Environmental Protection Notice
FPP	Forest Practices Plan
g/t	grams per tonne
ha	hectares
JORC	Joint Ore Reserves Committee
JORC Code	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves.
m	metres
m^3	cubic metres
MRT	Mineral Resources Tasmania
MSDS	Material Safety Data Sheet
NAF	Non Acid Forming
NAG	Net Acid Generation
NAPP	Net Acid Production Potential
Oceania Tasmania	Oceania Tasmania Pty Ltd
OH&S	Occupational Health and Safety
PAF	Potentially Acid Forming
Pb	lead

SCP	South Comstock Pit
SEMF	SEMF Pty Ltd
STWRD	Swansea Tramway Waste Rock Dump
TALSC	Tasmanian Land and Sea Council
TASI	Tasmanian Aboriginal Sites Index
tpa	tones per annum
WCC	West Coast Council
Zeehan Zinc	Zeehan Zinc Ltd
ZZ Exploration	ZZ Exploration Pty Ltd
Zn	zinc

1 INTRODUCTION

1.1 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PLAN REVIEW

The Environmental Management Plan Review (EMP Review) has been prepared as a public document for submission to the Department of Tourism, Arts and the Environment (DTAE) (formerly the Department of Primary Industry, Water, and Environment (DPIWE)).. The report provides, but is not limited to, a detailed review of the environmental effects of the Zeehan Zinc operations during the review period i.e. between December 2002 and March 2006, and compared the results with the EMP forecasts. The report also provides a review of the major changes to the operations since the last EMP in February 2001. In addition, the report includes:

- A summary of the results of all monitoring programs undertaken during the review period and interpretation of the results;
- Examines the development of the activity and operational procedures during the review period, highlighting any changes from predictions in the EMP and the reasons for such changes;
- Reviews the proposed operations for the period until the next review and where practical details time frames for changes to equipment, operational procedures, production levels, monitoring programs and potential environmental impacts;
- Summarises the management commitments, which have been made for the period until the next review to ensure the activity is undertaken in accordance with statutory requirements and to demonstrate continual environmental improvement;
- Reviews the current permit and Environmental Protection Notice requirements and any proposed amendments;
- Makes reference to the Decommissioning and Rehabilitation Plan;
- Provides the results of flora, fauna and Aboriginal heritage surveys not previously included in the DPEMP;
- Provides copies of the Spill Management Plan, Weed and Disease Management Plan, Water Management Plan, Process Water Management Plan, Waste Rock Management Plan, Visual Waste Rock Characterisation Manual, and the Mine Managers Environmental Handbook;
- Reviews the possible environmental impacts related to implementation of the proposed Waste Management Plan (2003) for waste rock; and
- Concludes whether or not the EMP should be revised/amended.

1.2 ROLE IN THE REGULATION PROCESS

This report fulfils Condition 7 of ELMS 6194, which outlines requirements under the *Environmental Management and Pollution Control Act 1994* that applies to the operations of Zeehan Zinc at the Comstock Mine.

1.3 THE PROPONENT

Zeehan Zinc Ltd (Zeehan Zinc) is currently developing an open cut mine and processing operation at the Comstock Mine, west of Zeehan, Tasmania. The Comstock Mine is based on a zinc (Zn), lead (Pb), and silver (Ag) deposit. A mill for ore processing was installed at the mine site in 2001/2002 and consists of a crushing, screening, and gravity separation plant.

Oceania Tasmania Pty Ltd (Oceania Tasmania) is a fully owned subsidiary of Zeehan Zinc. Zeehan Zinc, which through its subsidiary Oceania Tasmania, currently hold four mining leases that cover the Comstock Mine.

Zeehan Zinc has been operating under the guidelines of its Development Proposal and Environmental Management Plan (DPEMP), Environmental Land Management System 6194 (ELMS 6194), and Environmental Protection Notice 684/1 (EPN 684/1).

1.4 SITE LOCATION AND OPERATIONS

1.4.1 Site Location and Mineral Resource Mining Area

The Comstock mine is located approximately 5km west of the township of Zeehan, on the west coast of Tasmania (Figure 1).

The four mining leases previously held by Oceania Tasmania that cover the Comstock mine operations are:

- ML 123M/1947 (145ha);
- ML 43M/1985 (80ha);
- ML 19M/1995 (11ha); and
- ML 9M/2002 (11ha).

In 2007, the four leases were consolidated into a single mining lease, 5M/2007.

All current and proposed operations by Zeehan Zinc related to the Comstock Mine are limited to the area covered by the mining lease 5M/2007 (Figure 1).

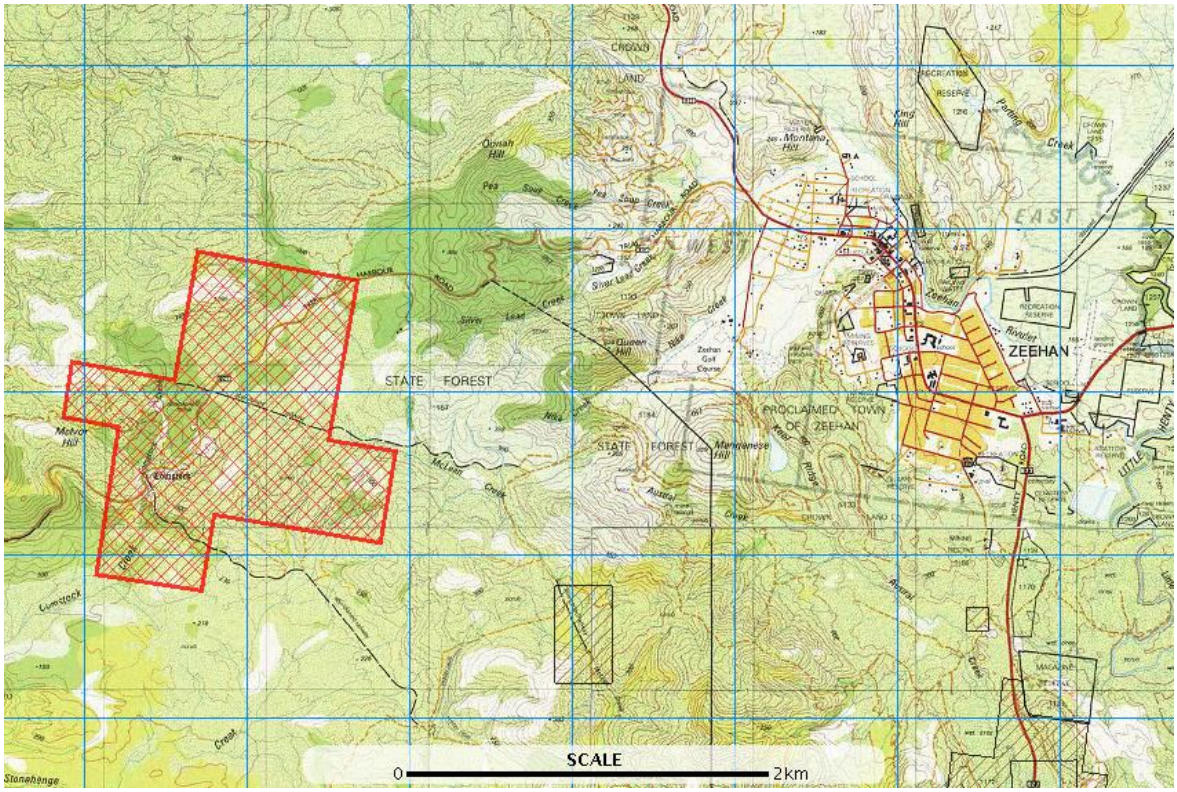


Figure 1: Location of the Comstock Mine relative to the township of Zeehan, and the mining lease 5M/2007 (outlined in red) held by Oceania Tasmania over the Comstock Mine.

1.4.2 Operations

The Comstock Mine has previously operated under mining leases ML 123M/1947, ML 43M/1985, ML 19M/1995, ML 9M/2002, and under permits ELMS 6194 and EPN 684/1.

Current and future operations will occur under mining lease 5M/2007.

Presently, the Comstock mine is approved as a Level 2 activity, permitting 200,000 tonnes of ore to be extracted each year (ELMS Permit 6194, Condition 1, 2001).

Previous operations prior to the review period extracted approximately 3,300 tonnes of high-grade ore (21.5% Zn, 14.5% Pb, 540 Ag g/t), which is currently stockpiled and has not been processed. Development of the tailings management approach has been the primary focus of mine operations during the review period. Extensive rehabilitation operations of waste rock dumps and exploration aimed at further definition of ore reserves have also been undertaken.

Ore concentrate production using the existing mill facility is planned to commence in 2007.

The major site features are illustrated in Figure 2.

1.4.3 Ore Reserves and Resources

Extensive drilling and sampling programs have resulted in the further definition of ore bodies within the Comstock mine site.

Two independent reviews and estimations of the zinc (Zn), lead (Pb), and silver (Ag) resources associated the Comstock Mine were carried out in 2005 by competent geologists under the requirements of the Joint Ore Reserves Committee (JORC) Code (Cottle 2005, SMG Consultants 2005) (Section 3.2).

A probable reserve of 98,881 tonnes at 5.46% Zn, 1.93% Pb, and 42.67 Ag g/t has been calculated for Allison's Lode (Minserve 2006b).

In December 2005, the total mineral deposits associated with the Comstock Mine were valued at between $93.5 million and $166.5 million (Anderson and Schwab 2005).

Based on current JORC compliant resource estimates, the mine life of the Comstock Mine and associated deposits is 24 years, extracting 200,000 tonnes per year (Cottle 2005).

THE COMSTOCK MINE

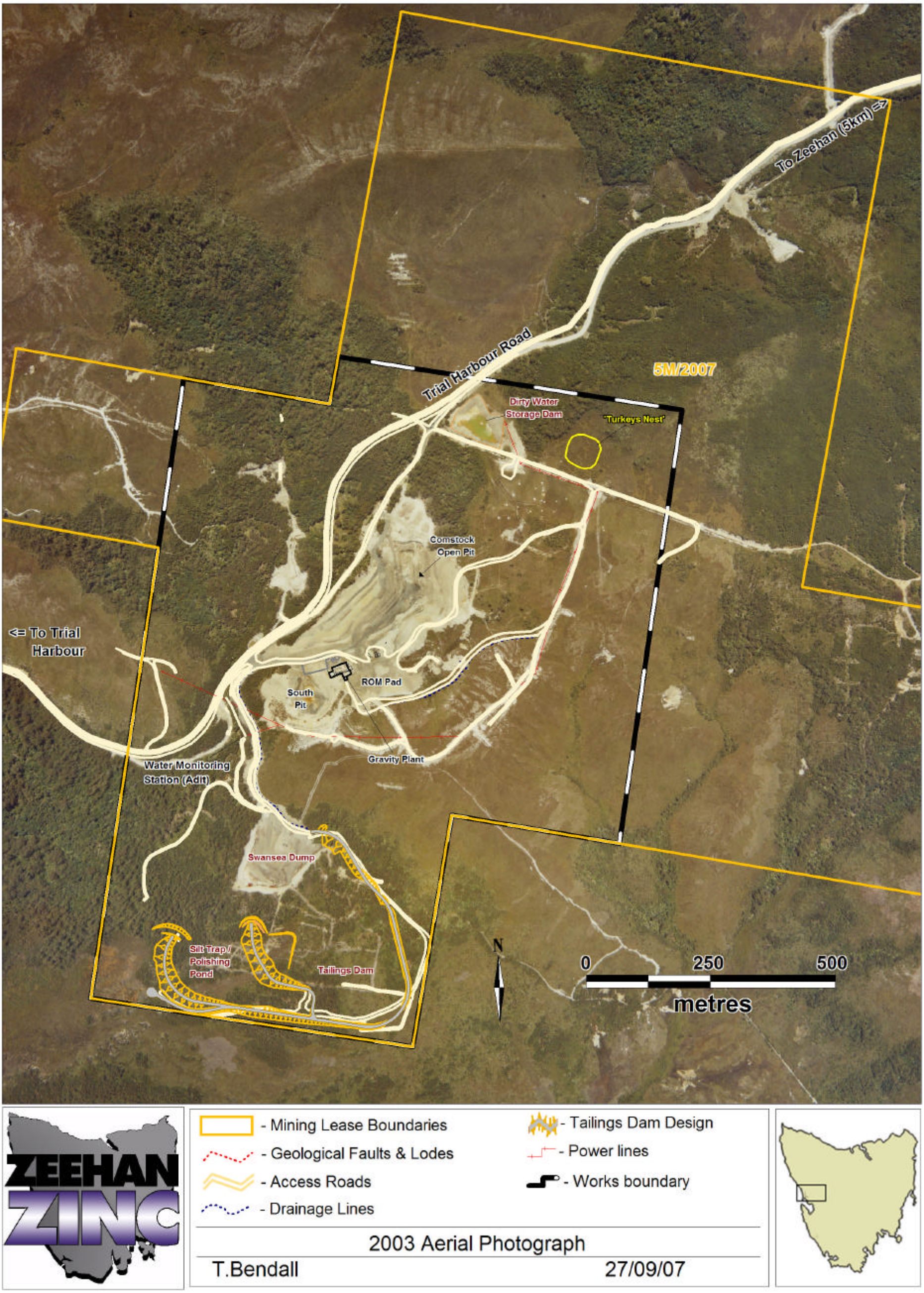


Figure 2: Major features of the Comstock Mine site.

1.5 RELEVANT LEGISLATION, REGULATIONS, CODES AND POLICIES

Legislation, regulations, policies and guidelines that are that are relevant to the review include the following:

- *Environmental Management and Pollution Control Act 1994 (and associated policies and regulations regarding water pollution, noise, etc);*
- *Land Use Planning and Approvals Act 1993;*
- *Dangerous Goods Act 1998;*
- *Dangerous Goods Regulations 1998;*
- *Environment Protection (Air Pollution) Regulations 1974;*
- *Environmental Protection Policy (Air Quality) 2004;*
- *National Environment Protection Measure for Ambient Air Quality 1998;*
- *State Policy on Water Quality Management 1997;*
- *Water Management Act 1999;*
- *Workplace Health and Safety Act 1995;*
- *(Draft) Environmental Protection Policy (Noise) 2003;*
- *National Pollution Inventory (NPI);*
- *Tasmanian Solid Waste Management Policy 1994;*
- *Historic Cultural Heritage Act 1995;*
- *Tasmania Threatened Species Act 1995;* and
- *Forest Practices Act 1997*.

1.6 STRUCTURE OF THIS REPORT

A brief description of the structure of this report is provided in Table 1.

Table 1: Brief Description of the EMP Review Report Structure

Section Heading	Brief Description of the Information Provided
Foreword	A brief description of the function of the EMP Review.
Executive Summary	A summary of the findings of the EMP Review, the commitments, and the environmental permit requirements and proposed amendments.
1.0 Introduction	Description of the proponent, a brief site history, and a list of relevant legislation and policies that have been considered when preparing the EMP Review.
2.0 Environmental Effects Review	Describes the environmental effects of the activity during the review period and provides a comparison to EMP forecasts. In addition, summaries of all monitoring program results are provided with interpretation.
3.0 Operations Development	Summing up of the DRP and a summary of the environmental commitments that Zeehan Zinc have provided throughout the DRP document.
4.0 Environmental Improvements and Permit Review	Summarises additional mitigation measures. Where the current permit and environmental protection notice requirements are no applicable, proposed amendments are recommended.
5.0 Conclusions and Commitments	Summing up of the report findings for the prevention of pollution and protection of the environment, and a summary of the environmental commitments that Zeehan Zinc have provided throughout the EMP Review document.

2 ENVIRONMENTAL EFFECTS REVIEW

2.1 INTRODUCTION

This section summarises the results of environmental monitoring during the review period. A review of the environmental effects of the Zeehan Zinc operations at the Comstock Mine on all environmental aspects, comparisons with the predictions in the original DPEMP (2001) and compliance with permits ELMS 6194 and EPN 684/1 is provided.

In addition, the results of a complete flora, fauna, and Aboriginal cultural heritage surveys are provided. These surveys were not required to be undertaken or included in the original DPEMP (2001).

2.2 FLORA

2.2.1 Existing Environment

Native Plant Communities

In February 2006, an extensive flora survey was carried out over the Comstock Mine site and associated landscape (Appendix A). The Comstock Mine site and associated mining leases is characterised by complex geology associated with the mineralisation of the Zeehan area. The topography of the site is gently undulating hills with the Comstock Creek flowing through the western section (French 2006). Given the past history of the mine site, the area was considered to be in good natural condition, with the dominant vegetation communities identified including wet eucalyptus forest, rainforest and moorland. During the flora survey, potential management issues were assessed during the course of the fieldwork, with particular attention paid to potential occurrences of *Phytophthora cinnamomi* and the presence of invasive exotic plant species.

No plant species listed in the schedule within the *Tasmanian Threatened Species Protection Act 1995 (TSPA 1995)* were identified from the area surveyed in 2006.

A total of 117 vascular plants were identified within the Comstock lease Area, and of these 107 are native species (including 18 endemic species) and 10 exotic species (French 2006). A summary of the plant species recorded in provide in Table 2, with full species lists provided in Appendix A.

Table 2: Summary of vascular plant species recorded in the Comstock area (French 2006).

Group	Native Species		Exotic Species	Total
	Endemic	Other		
Fern & fern allies	0	15	0	**15**
Gymnosperms	1	0	0	**1**
Monocotyledons	3	25	3	**31**
Dicotyledons	14	49	7	**70**
Total	**18**	**89**	**10**	**117**

No species of conservation significance were identified during the survey in 2006, and the Natural Values Report (DPIWE GIS Web Server) did not indicate the presence of any other threatened plant species within 500m of the study area. A record exists for the presence of the horned orchid (*Orthoceras strictum*) within 5,000m of the survey area. This species was not recorded during the survey.

Seven vegetation communities were recorded from the Comstock Mine area under the current TASVEG mapping scheme (French 2006). Areas associated with mining activities were mapped as Extra-Urban Miscellaneous (FUM). All plant communities recorded within the survey areas were in good condition with few weed species present, given the long history of mining operations (French 2006). The plant community structure present at the Comstock site is directly related to the high fire regimes within the area, with the communities gradually blending between the frequently burnt buttongrass and the wet

forest/rainforest communities. Table 3 provides a summary of the plant communities and their conservation status identified during the survey. For detailed descriptions of each plant community, refer to Appendix A.

Table 3: Summary of the plant communities identified at the Comstock Mine and their status (French 2006).

TASVEG Community	RFA Community	Floristic Community	Conservation Status
Eucalyptus nitida dry forest and woodland (DNI)	Dry *Eucalyptus nitida* forest (N)	Scrubby *Eucalyptus nitida* forest/woodland (DRY-scNIT)	Non-priority
Eucalyptus nitida forest over rainforest (WNR)	Tall *E.nitida* forest (NT)	*E.nitida - Andopetalum biglandulosum - Leptospermum glaucescens* wsf/mixed forest (WET-NIT0)	Non-priority
Eucalyptus nitida forest over *Leptospermum* (WNL)	Tall *E.nitida* forest (NT)	*E. nitida-Melaleuca squarrosa-Monotoca glauca* wsf (WET-NIT2)	Non-priority
Acacia melanoxylon forest on rises (NAR)	*Acacia melanoxylon* forest on rises (BR)	Riparian Blackwood, myrtle/dogwood forest	Non-priority
Leptospermum with rainforest scrub (RLS)	Thamnic rainforest on less fertile sites (M-)	*Leptospermum lanigerym - Phyllocladus aspeniifolius - Nothofagus cunninghamii* over *Anopterus glandulosus - Andopetalum biglandulosum*	Non-priority
Western wet scrub (SWW)	*Leptospermum* sp. *Melaleuca squarrosa* swamp forest (L)	*Leptospermum glaucescens - Leptospermum scoparium* closed forest.	Non-priority
Buttongrass moorland with emergent shrubs (MBS)	Not covered by RFA mapping	Standard peat (B1a)	Non-priority
Extra-urban miscellaneous (FUM)	Not covered by RFA mapping	This is a non-native mapping unit – there are no native floristic communities	Non-priority

Further survey work was carried out in September 2007, and identified the rare *Epacris curtisiae* (northwest heath). The northwest heath is listed as rare on the Tasmanian *Threatened Species Protection Act (1995)*. Refer to Appendix A for further details.

Weeds and Diseases

Small infestations of the listed weeds, gorse (*Ulex europaeus*), blackberry (*Rubus fruticosus* agg.), and Himalayan honeysuckle (*Leycesteria formosa*) were identified along the abandoned tramway and on the margins of tracks within the lease areas (French 2006).

The soil born pathogen *Phytophthora cinnamomi* (Root rot fungus) was observed along the margins of the tracks within the susceptible vegetation type, buttongrass moorland

with emergent shrubs (MBS) (French 2006). The infestations were identified as being local. The proposed construction activities could potentially expand the range of the pathogen in the area if hygiene precautions are not followed.

In September 2007, Zeehan Zinc undertook a *Phytophthora cinnamomi* sampling program at the Comstock Mine. All samples returned a negative result. Further sampling will be undertaken.

Future developments such as the road diversion, open pit extension and tailings co-disposal facility are subject to the *Forest Practices Act 1997* and will therefore require a Forest Practices Plan (FPP), as the area of land to be cleared is greater than 1 ha. Based on information collected during the flora survey in February and March 2006, a FPP has been submitted and certified by the Forest Practices Authority (refer to Appendix B).

2.2.2 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no requirement for monitoring of native vegetation.

During the review period, there has been limited disturbance to native vegetation communities, and future operations will be designed to minimise the amount of land cleared.

To ensure that future mining activities do not have an adverse impact on native vegetation communities, Zeehan Zinc will develop a monitoring program, as outlined in Section 2.2.3.

2.2.3 Environmental Effects

Native Plant Communities

Zeehan Zinc will seek to minimise the land clearing and vegetation removal practices where possible, and following the cessation of mining operations, rehabilitate disturbed areas to ensure a return to native vegetation. In order to achieve these goals, certain measures will be taken including:

- During site preparation for the expansion of the open pit area and tailings co-disposal area, vegetation removal will occur;
- Mine developments will be carefully planned to ensure that the disturbance footprint created is minimised, and vegetation communities are retained in an undisturbed condition where practical;
- Where possible, vegetation that is removed will be stockpiled, and if it cannot be used within the immediate vicinity for rehabilitation, it will be used in rehabilitation works elsewhere within the Comstock Mine area; and
- Mine rehabilitation and associated revegetation works will involve consultation with appropriately qualified personnel to ensure that only local native plant species are used, in order to avoid the introduction of new species to the area.

A major development proposed at the Comstock Mine is construction of the initial stages of the tailings co-disposal facility (including a polishing pond) below the existing Swansea Tramway Waste Rock dump. This development is estimated to involve the removal of approximately 10ha of vegetation. In order to minimise the environmental impacts resulting from this development, the following approach has been developed;

- Vehicle movements during construction of the tailings disposal facility will be restricted to existing tracks where possible and the creation of new tracks will be minimised;
- The area of vegetation to be cleared will be carefully marked out using markers such as flagging tape and the physical removal of vegetation will be supervised to ensure that only essential areas are cleared;
- All vegetation, associated organic matter and soils will be stockpiled in line with Best Practice Environmental Management (BPEM) and utilised for rehabilitation operations elsewhere on the Comstock Mine site if appropriate; and

- Progressive rehabilitation of the tailings storage facility using local native plant species will be conducted as soon as is practical.

Details on revegetation and monitoring programs to be followed at mine closure are provided in the Comstock Mine Decommissioning and Rehabilitation Plan.

Weeds and Diseases

In order to control the current weed and disease infestations with the Comstock area, the following management approaches have been identified (French 2006):

- Zeehan Zinc will work in conjunction with the West Coast Council (WCC) on the removal of the current infestations prior to any further disturbance occurring in the area. This will aid in controlling the further spread of these potentially invasive species into the surrounding native vegetation or other areas;
- The material used in the construction of the diversion of the Trial Harbour Road will be sourced from a quarry that has been designated as weed and disease free. This will further reduce the potential infestation by other weed species and the spread of *Phytophthora cinnamomi* ;
- Machinery hygiene prescriptions will be applied to further minimise the introduction of weed species and *Phytophthora cinnamomi* ;
- Monitoring and control of weed infestations will continue to occur, and will include all tracks and disturbed areas.

Zeehan Zinc has an active program to control gorse within their lease area and all seedlings of gorse identified during the botanical survey have since been flagged with tape and spraying with an appropriate herbicide will occur by April 2006.

Furthermore, as part of improvements to mining operations at the Comstock Mine, Zeehan Zinc have developed a Weed and Disease Management Plan in line with the *Weed Management Act 1999* to ensure that future operations do not adversely impact on the native environment (refer to Appendix C).

Currently Zeehan Zinc follow a basic vehicle wash down procedure, as outlined in the Mining Code of Practice, for all vehicles after use at the Comstock Mine and prior to movement to other mine sites. This is particularly relevant, as Zeehan Zinc also has operations at the Oceana Mine, which contains an extensive infestation of gorse, and vehicle wash down procedures are important in ensuring that spreading of seeds does not occur. All vehicles are washed down either at the mine site or at the Zeehan Zinc sheds in the township of Zeehan. The Weed and Disease Management Plan outlines the washdown procedures that will be implemented at the site (refer to Appendix C).

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 4.

Table 4: EMP commitments, permit conditions, and related actions by Zeehan Zinc for native vegetation communities.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
20: Rehabilitate to achieve a self sustaining vegetation community in a stable environment.		A site specific Decommissioning and Rehabilitation Plan has been developed and includes details of revegetation works that will be undertaken following mine closure.
39: Maintain and enhance roadside vegetation.		A minimum buffer of 10m of native vegetation has been retained along the roadsides at the mine site where practical.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	ELMS 6194 Condition 44: Weeds on the land must be controlled to the satisfaction of the Director.	Weeds have been managed as necessary at the site and Zeehan Zinc has not received any notification that the Director is not satisfied with their weed management practise during the review period.

To assist in ensuring that future operations at the Comstock Mine do not have an adverse environmental impact, Zeehan Zinc has made commitments for the future with regard to the management of native vegetation. These commitments are summarised in Table 5.

Table 5: Future commitments made by Zeehan Zinc for the management of native vegetation communities.

No.	Native Vegetation Commitments
1	Undertake progressive rehabilitation using native species wherever practical.
2	Undertake regular surveys of the mine site for introduced plants and address weed populations as necessary.
3	Implement and maintain the Weed and Disease Management Plan.

2.3 FAUNA

2.3.1 Existing Environment

A fauna survey was carried out at the same time as the flora survey in February 2006 (Appendix A). During the survey, no fauna species were identified as listed on schedules of the *TSPA 1995.* A database search (GTSpot) did not indicate the presence of threatened fauna species within 500m of the Comstock lease area (Table 6) (French 2006). However, within 5km of the lease area, the database search indicated the presence of listed threatened fauna species.

Table 6: Threatened fauna species recorded within the Comstock mine area (French 2006).

Scientific Name	Common Name	Comments
Aquila audux fleayi	Wedge-tailed Eagle	Suitable habitat present
Dasyurus maculates	Spotted-tailed Quoll	Suitable habitat present
Sarcophilus harrisii	Tasmanian Devil	Recorded in area
Accipter novae-hollandiae	Grey Goshawk	Suitable habitat present
Haliaeetus leucogaster	White-bellied Sea Eagle	No suitable habitat present
Halobaena caerulea	Blue Petrel	No suitable habitat present
Pachyptila turtur	Fairy Prion	No suitable habitat present

Wedge-tailed eagle (Aquila audux fleayi)

A nest search was conducted in suitable habitat (wet forest) on the leeward slopes to the prevailing wind. No nests were found (French 2006). Wedge-tailed eagles have been seen within the mining area (pers.comms. P.Heath 2006).

Spotted-tailed quoll *(Dasyurus maculates)*

The Spotted-tailed quoll has been recorded near the proposed exploration area, and much of the habitat in the area is suitable habitat for this species. The Spotted-tailed quoll was not observed during the survey (French 2006).

Grey goshawk (Accipter novae-hollandiae)

The Comstock area is suitable for the Grey goshawk, however no nests or the species were observed during the survey. The proposed activites will not affect the habitat of the species in the area. Further assessments will need to be made if further vegetation clearance is to occur in the area in the future (French 2006).

Tasmania Devil (Sarcophilus harrisii)

Tasmania devil scats were observed at a number of locations within the study area. The vegetation recorded within the area is suitable habitat for the Tasmania devil (French 2006).

2.3.2 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no requirements for monitoring of native fauna.

During the review period, there has been limited disturbance to native vegetation communities, and future operations will be designed to minimise the amount of land cleared in order to provide a measure of protection for native fauna.

2.3.3 Environmental Effects

The proposed developments in the Comstock mining lease area such as the development of the tailings co-disposal area will have little effect on the flora or fauna that occur in the area (French 2006). This is due to the high levels of disturbance from the mining activities that have occurred over the previous 100 years.

The Tasmania devil is recorded from the lease area. The western Tasmanian populations of the species are currently free from the facial tumour disease that is threatening the species. Is a Tasmanian devil is observed in the area and is suspected of having the devil facial tumour disease, the Wildlife Management Branch (DTAE) should be contacted and the suspected disease reported.

Comparatively small areas of native vegetation will be affected by the proposed activities in the lease area, and will not have large adverse impacts on recorded threatened fauna in the area. However, if a suspected Wedge-tailed eagle or Grey goshawk nest is identified within the Comstock Mine area, the Threatened Species Unit of the Department of Primary Industries and Water (DPIW) will be contacted, and suitable management prescriptions arranged.

Zeehan Zinc will ensure that all operations are designed to avoid adverse impacts on native fauna, where practical.

There are no commitments made in the 2001 DPEMP or in the current the permit conditions regarding the management of native fauna.

To assist in ensuring that future operations at the Comstock Mine do not have an adverse environmental impact on native fauna, Zeehan Zinc has made commitments for the future. These commitments are summarised in Table 7.

Table 7: Future commitments made by Zeehan Zinc for the management of native fauna.

No.	Native Vegetation Commitments
4	Minimise clearing of native vegetation where practical.
5	Contact the relevant authorities should a Wedge-tailed eagle or Grey goshawk nest be identified, or a Tasmanian devil with facial tumour disease be observed.

2.4 ABORIGINAL AND CULTURAL HERITAGE

2.4.1 Existing Environment

The Comstock Mine site has been subjected to intermittent periods of mining activity since the 1880's, and as a result the landscape has been directly impacted. The general area surrounding Zeehan is known to have been used by local Aboriginal people (Sainty 2006).

In late February 2006, Rocky Sainty was engaged to undertake a full survey over the Comstock Mine site, with a particular focus on the areas likely to be developed in the near future (Appendix D). During the survey, no Aboriginal heritage sites were identified (Sainty 2006). Furthermore, there were no sites previously listed on the Tasmanian Aboriginal Site Index (TASI) (Sainty 2006).

As a result of the Aboriginal heritage survey, there are no objections to the proposed developments occurring at the Comstock Mine (Sainty 2006), which include the development of a tailings co-disposal facility, polishing pond and the diversion of the Comstock Creek (refer to Section 2.13.2).

During mine development, should any Aboriginal cultural material be unearthed such as shell material, then works should cease immediately and the Tasmanian Aboriginal Land and Sea Council (TASLC) or the Aboriginal Heritage Office (DTAE) will be contacted.

2.4.2 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no requirement for monitoring Aboriginal heritage.

During mining activities during the review period, and prior to the review period, there have been no Aboriginal heritage sites or cultural material unearthed.

2.4.3 Environmental Effects

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 8.

Table 8: EMP commitments, permit conditions, and related actions by Zeehan Zinc for Aboriginal heritage.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
No commitments relevant to Aboriginal heritage.	*ELMS 6194 Condition 9:* No Aboriginal sites, regardless of their significance, must not be disturbed, other than in accordance with any necessary permits under the *Aboriginal Relics Act 1975*.	No Aboriginal sites have been uncovered during mining operations by Zeehan Zinc.

To assist in ensuring that future operations at the Comstock Mine do not have an adverse environmental impact, Zeehan Zinc has made commitments for the future with regard to the management of Aboriginal heritage sites. These commitments are summarised in Table 9.

Table 9: Future commitments made by Zeehan Zinc for the management of Aboriginal heritage.

No.	Aboriginal Heritage Commitments
6	Should any Aboriginal cultural material be uncovered during mine operations, all operations in the immediate area will be ceased and the relevant authorities contacted.
7	Ensure that all employees are aware of the importance of Aboriginal heritage sites and their protection.

2.5 EUROPEAN HERITAGE

2.5.1 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no specific requirement for monitoring sites of European heritage.

During the review period there has been no disturbance of sites previously identified during the European heritage archaeological survey of Comstock Mine by P. Kotsoglou in 2000 (refer to Appendix E).

2.5.2 Environmental Effects

There have been no complaints during the review period with regard to the protection of European heritage sites.

Since the original European heritage survey was conducted for the Comstock mining lease by P. Kostoglou in 2000, the lease boundaries have been revised to include a section to the south and southwest with an area of 11ha. The new lease areas were obtained to allow for the development of the tailings co-disposal area and polishing pond (discussed in detail in Section 2.13.2). This new mining lease was surveyed for European archaeological heritage sites in February 2006, and no sites were identified (Kostoglou 2006, Appendix E).

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 10.

Table 10: EMP commitments, permit conditions, and related actions by Zeehan Zinc for European heritage.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
21: Commission an archaeological field survey of the new tailings dam site	*ELMS 6194 Condition 8:* The Tasmania Mining Heritage Committee must be consulted prior to the commencement of any activity on the land which may disturb or destroy the integrity of any site, feature, or object of cultural significance.	Area proposed to be used for the construction of a tailings co-disposal area and polishing pond surveyed in February 2006.
22: Provide protection of Portals 1 and 2, adjacent to the Swansea Tramway Waste Rock Dump		All works associated with the Swansea Tramway Waste Rock Dump have been designed and managed to ensure protection to Portals 1 and 2. Both portals have been flagged off and all personnel associated with Swansea Tramway Waste Rock Dump operations are aware of the existence and importance of the portals.
		No consultation has occurred with the Tasmanian Mining Heritage Committee since this requirement took effect in July 2001, as no activity onsite since this time has triggered this requirement.

Zeehan Zinc is committed to the continued protection of European mining heritage sites, and has made several commitments regarding the future management of mining heritage structures. These commitments are summarised in Table 11.

Table 11: Future commitments made by Zeehan Zinc for the management of European Heritage.

No.	European Heritage Commitments
8	Continue to protect significant mining heritage sites.
9	Ensure all staff are aware of the importance of protecting mine heritage sites.

2.6 ATMOSPHERIC EMISSIONS

2.6.1 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no requirement for monitoring atmospheric emissions from the site.

As the mill infrastructure and associated mining operations have not been operational during the review period, the only atmospheric emissions to have been generated on site are associated with exhaust fumes from vehicle and machinery activity on the site.

2.6.2 Environmental Effects

The relatively small amount of exhaust emissions generated from the limited machinery activity that has occurred during the review period is unlikely to have had an adverse impact on the environment. Once active mining operations occur, the amount of vehicle emissions will increase. Given the isolation of the site and the comparatively small amount of emissions that will be generated from mining activities, it is unlikely for a detrimental environmental impact to occur.

There have been no complaints during the review period with regard to atmospheric emissions from the site.

In the absence of greenhouse gas emission data for the local area, it is assumed that emission sources are predominantly local vehicle traffic and methane emissions from agricultural animals. These emissions are likely to be low.

Future mine operations are likely to have a minimal greenhouse gas emissions, as the crushing and gravity separation mill run on electrical power, thereby limiting greenhouse gas emissions to mine vehicles such as excavators and trucks. Zeehan Zinc will undertake estimations of the amount of greenhouse gases emitted during full mining operations using the Australian Greenhouse Gas Office formulas.

There were no commitments specified in the 2001 DPEMP or the permit conditions regarding the management of atmospheric emissions. Zeehan Zinc is committed to operating under Best Practice Environmental Management (BPEM) principles, and has made commitments regarding the future management of atmospheric emissions. These commitments are summarised in Table 12.

Table 12: Future commitments made by Zeehan Zinc for the management of atmospheric emissions.

No.	Atmospheric Emission Commitments
10	Regularly service vehicles to ensure particulate emissions are within allowable levels.
11	Estimate amount of greenhouse gases emitted during full mining operations.
12	Investigate tree planting options within the mine site area to offset greenhouse gas emissions.

2.7 FUGITIVE DUST EMISSIONS

2.7.1 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no requirement for monitoring fugitive dust emissions from the site.

During the review period, small amounts of dust would have been generated during vehicular movements, drilling operations, and movement of material associated with rehabilitation of the waste rock dumps. Any dust produced from these activities is likely to have been short lived and remained within the local area. Furthermore, the high local annual rainfall rate at Zeehan (2,758mm) will have provided a measure of fugitive dust control.

2.7.2 Environmental Effects

Given the West Coast climate with a high rainfall rate and the isolation of the site, operations that have occurred during the review period are highly unlikely to have caused any environmental harm or nuisance to the general public.

Once the ore processing infrastructure and associated mining operations become operational, Zeehan Zinc will ensure that Conditions 41-43 of ELMS 6194 are followed, including:

- The use of water to settle any dust producing by crushing and screening activities;
- The use of dust control measures for trucks transporting material from the mine site; and
- Dampening of high traffic areas when necessary to control dust emissions.

The development of a fugitive dust source management plan will be of assistance to Zeehan Zinc in the management of dust emissions once the mine is operational.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 13.

Table 13: EMP commitments, permit conditions, and related actions by Zeehan Zinc for fugitive dust emissions.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
19: Reduce dust emissions by spraying dusty areas when necessary.	*ELMS 6194 Condition 41:* Traffic areas on the land must be dampened when necessary to control dust emissions of when required in notice from the Director.	Dust emissions from traffic areas have been minimal and controlled effectively by the local climate.
	ELMS 6194 Condition 42: Trucks leaving the land and travelling by public roads and carrying loads containing material which may blow or spill out of the trucks will use dust control measures.	Trucks have not been transporting material off site.
	ELMS 6194 Condition 43: Dust produced by the operation of all crushing and screening plants must be effectively controlled. Dust control procedures are deemed to be ineffective if dust can be seen crossing the land boundary and causing an environmental nuisance.	There have been no crushing or screening operations during the review period.

There have been no complaints during the review period with regard to fugitive dust emissions from the site.

To assist in ensuring that future operations at the Comstock Mine do not have an adverse environmental impact, Zeehan Zinc has made several commitments for the future with regard to the management of fugitive dust emissions. These commitments are summarised in Table 14.

Table 14: Future commitments made by Zeehan Zinc for the management of fugitive dust emissions.

No.	Fugitive Dust Emission Commitments
13	Use water to settle any areas where dust emissions could occur.
14	Ensure all material transported from the site is in covered vehicles.
15	Ensure visible dust from the mine operations does not cross the mining lease boundary.
16	Fit and maintain conveyors with water spraying devices for dust suppression.
17	Establish and run a site management system that integrates dust control provisions, and train staff in the site management system.

2.8 GROUNDWATER

2.8.1 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no specific requirement for monitoring groundwater quality from the site.

In 1935, the Mines Department of the State Government extended the existing Comstock adit north-east towards the Sylvester Mine with the intention to drain the Zeehan Field and facilitate exploration of ore deposits (Blake 1936). The adit extension was stopped after intersecting Allison's Lode (Blake 1936).

The adit continues to drain the Zeehan Field and outflows at the Comstock Mine, where it discharges into the Comstock Creek. The main adit at the Comstock Mine is connected to a network of old tunnels and shafts (Figure 3).

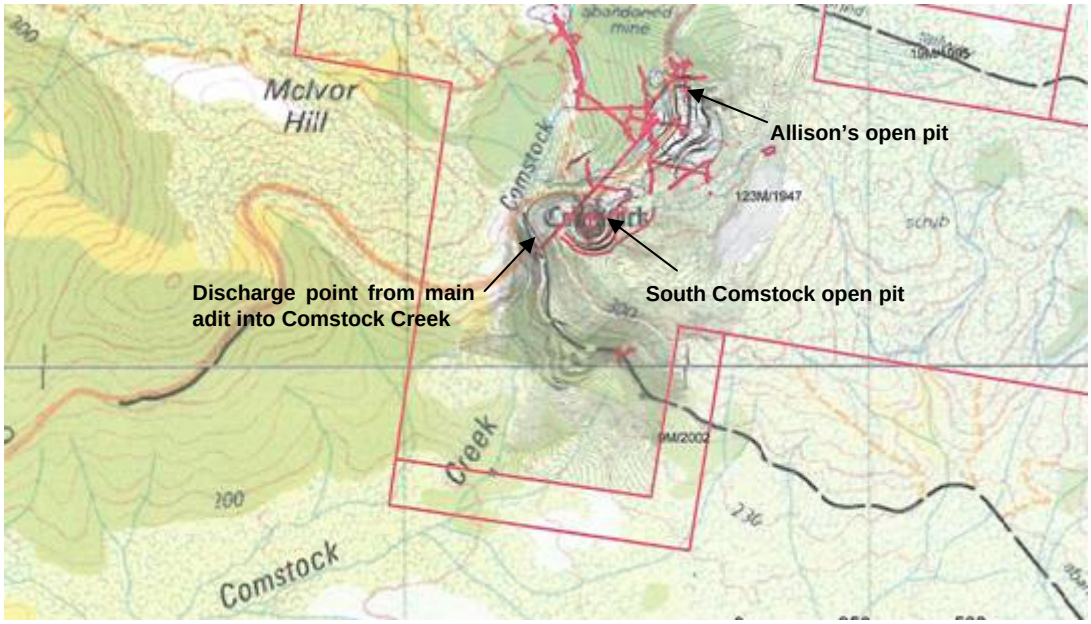


Figure 3: Network of old adits and shafts at the Comstock Mine (outlined in red), with major features of the mine site labelled.

Past studies have indicated that the drainage of the adit water into the Comstock Creek is adversely affecting the water quality (Meskanen 2000). A historic system of shafts and adits associated with old mining operations constructed along shallow ore veins has allowed oxidation of the sulphidic host rocks and mineralised rocks.

A portion of water exiting the Comstock drainage adit will be derived from groundwater, and it is possible that a larger portion is derived from surface runoff entering the network of adits within the Zeehan Field area. A detailed investigation into the exact origins of water exiting the adit near Comstock Creek has not been undertaken.

The water quality and the effect of the adit water entering the Comstock Creek is discussed in detail in Section 2.9.

In September 2007, 5 groundwater monitoring bores were installed adjacent to the tailings storage facility (refer to Appendix F). Monitoring will commence in late 2007.

2.8.2 Environmental Effects

There have been no complaints during the review period with regard to groundwater quality from the site.

Zeehan Zinc acknowledge that AMD entering the Comstock Creek via adit outflow requires active management to minimise the environmental impacts, and are currently investigating mitigation measures that can be adopted for the long term remediation of Comstock Creek.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 15.

Table 15: EMP commitments, permit conditions, and related actions by Zeehan Zinc for groundwater.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
41: Establish groundwater bore holes for groundwater monitoring adjacent to the tailings dam.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	In September 2007, 5 groundwater bores were installed. Monitoring will commence in late 2007.
42: Monitor groundwater every 3 months.		Limited monitoring of groundwater has also been achieved through monitoring the main adit outflow.
46: Monitoring of groundwater will occur one year after tailings dam closure.		Not applicable during this review period, as tailings dam is not yet operational.

Zeehan Zinc is committed to operating under BPEM principles, and has made several commitments regarding the future management of groundwater. These commitments are summarised in Table 16.

Table 16: Future commitments made by Zeehan Zinc for the management of groundwater.

No.	Groundwater Commitments
18	Investigate groundwater rates of flow within the local area.
19	Identify the sources of water entering the adit network.

2.9 SURFACE WATER EMISSIONS

2.9.1 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 require water samples to be collected quarterly. The DPEMP Addendum (2000) and the DPEMP (2001) relating to the Comstock mine, outlined the water monitoring program that was to be followed (Table 17), and the sites to be monitored, including:

1. W1 – Comstock Creek upstream of the mine site, adjacent to historical workings;
2. W2 – Sediment trap before main adit at the base of Allison's decline;
3. W3 – Main adit outflow into Comstock Creek;
4. W4 – Sediment trap at the base of Swansea Tramway Waste Rock Dump (SWTRD).
5. W5 – Runoff from the ore stockpile and processing plant;
6. W6 – South Comstock Pit (SCP) tailings dam overflow (if overflow occurs);
7. W7 – New tailings dam (if overflow occurs); and
8. W8 – Designed wetland outflow.

The locations of the water monitoring sites is illustrated in Figure 4.

During the review period sites W1 - 4 have been monitored. Runoff from the ore stockpile and processing plant is directed along surface drains into the sediment trap at the base of the STWRD (site W4), and as a result site sampling site W5 was not sampled during the review period. Runoff was also highly dependent on rainfall events that may not necessarily coincide with water sample collection. Sites W6-8 were not relevant during review period, as the SCP was not used as a tailings dam and the 'new' tailings dam and designed wetland had not been constructed.

Table 17: Water monitoring sites and parameters analysed.

Site	Parameter to be Monitored	Monitoring Frequency	Reporting Frequency
W1	pH, total suspended solids, metals (Al, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn)	3 monthly	3 monthly
W2	pH, total suspended solids, metals (Al, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn)	3 monthly	3 monthly
W3	pH, total suspended solids, metals (Al, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn)	3 monthly	3 monthly
W4	pH, total suspended solids, metals (Al, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn)	3 monthly	3 monthly

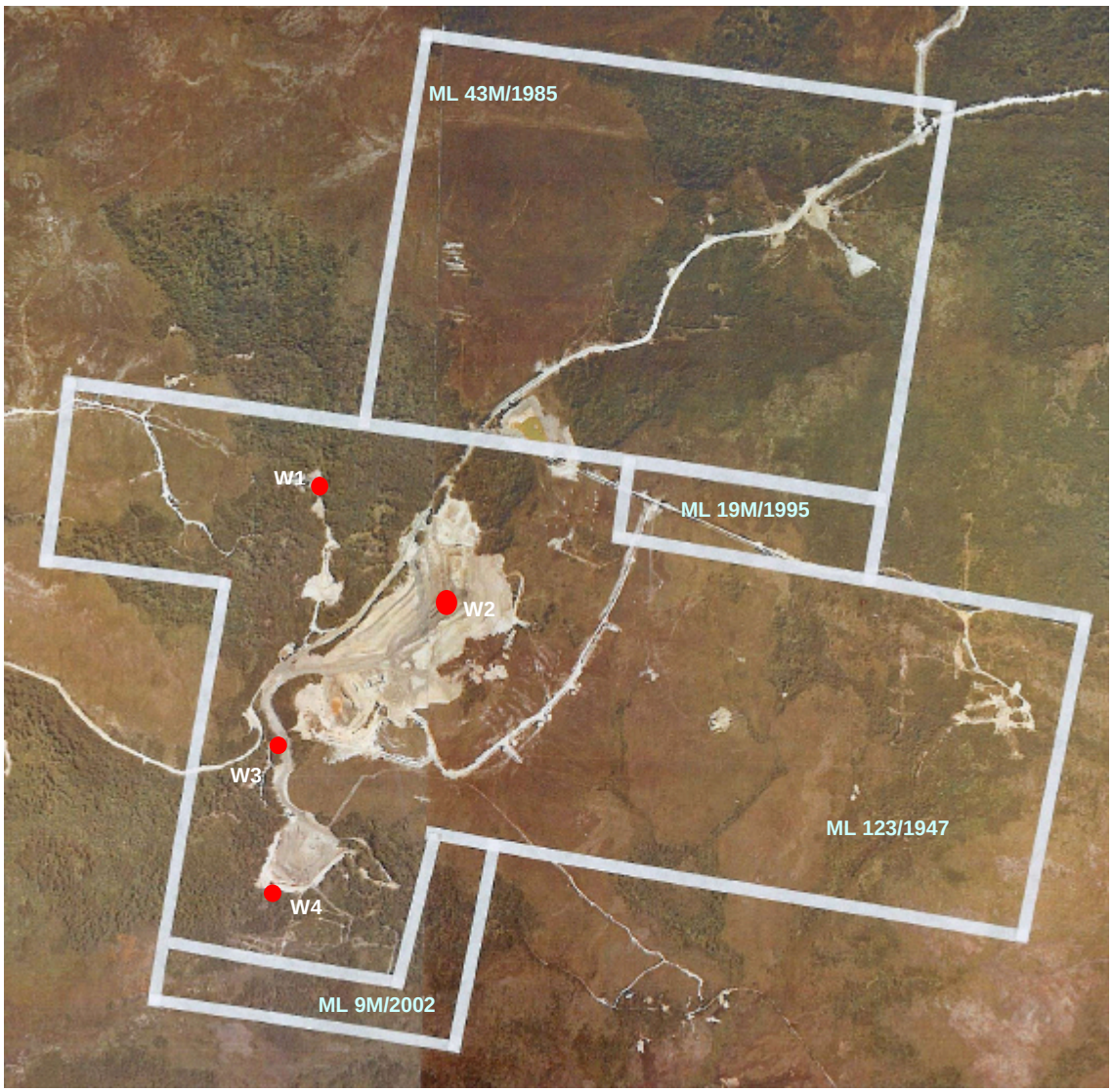


Figure 4: Location of water monitoring sites (W1-W4) (aerial photograph taken in 2003).

The average values during the review period for the four sites are provided in Table 18, and the complete data set of water monitoring data is provided in Appendix G.

Previous studies of the water quality at the Comstock mine site have indicated that the water is adversely contaminated upstream and downstream of the mine site. Table 18 indicates that there are active sources of AMD at the Comstock Mine site, with water samples having a low pH and high concentrations of metals. As expected, the samples collected from the base of Allison's decline (W2) and the base of the STWRD (W4) contain the highest concentrations of heavy metals and the lowest pH. The samples collected upstream from the mine (W1) indicate that adit outflow from the Comstock Mine is affecting water quality downstream of the mine, and that upstream of the mine there is a minor amount of AMD. The poor water quality (low pH, high concentration of heavy metals) from the adit discharge (W3) is evidence of AMD being generated from exposed sulphidic minerals in local old mine workings, and probably from AMD draining into the main adit system from throughout the Zeehan field.

There was no requirement in the DPEMP Addendum (2000), the DPEMP (2001) or the operating permits to monitor water quality in Comstock Creek downstream of the adit discharge i.e. the mixing zone.

The Comstock Creek on the northern side of Trial Harbour Road originally flowed over a network of old mining workings, including exposed ore and into a series of adits and

shafts before returning to the surface on the south side of the Trial Harbour Road. In 2002, Zeehan Zinc infilled part of the old workings and diverted the Comstock Creek to ensure that flows remained at the surface and minimised interactions between exposed sulphides and creek water, in an attempt to maintain Comstock Creek water quality prior to mixing with the adit outflow. Through the diversion of the Comstock Creek from the old workings, it is possible that the amount of AMD leaving the main adit resulting from water interacting with exposed minerals in the network of old shafts and adits has been reduced.

Table 18: Annual water quality results for water monitoring sites during the review period.

Site	Year	Conductivity	TSS (mg/L)	Total Alkalinity ($CaCO_3$ mg/L)	pH	Total Al (mg/L)	Total As (mg/L)	Total Cd (mg/L)	Total Co (mg/L)	Total Cr (mg/L)	Total Cu (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Ni (mg/L)	Total Pb (mg/L)	Total Zn (mg/L)
W1	2003	112	10	1	4.53	426	370	2	4	1	8	1783	181	11	110	474
	2004	114	1	1	4.75	317	<5	2	3	1	5	749	149	12	101	627
	2005	90	4	<2	4.67	1316	159	14	21	2	7	13973	3048	40	135	8750
W2	2003	3883	87	1	2.50	264833	1928	1670	892	192	4027	753000	18233	1901	2211	149867
	2004	1657	28	1	2.73	32667	287	246	142	35	612	138633	3835	297	657	29037
	2005	1680	26	<2	2.70	38267	89	278	188	36	680	124633	2713	378	498	29433
W3	2003	981	106	1	3.13	4123	156	43	59	1	12	42875	9740	118	275	31550
	2004	949	109	1	3.43	5148	180	51	63	2	11	55225	9643	122	274	34075
	2005	845	87	<2	3.90	2893	186	25	55	1	9	49533	8787	105	181	25733
W4	2003	4693	39	1	2.53	219667	1500	1889	1067	314	1675	990333	20667	2610	1583	400000
	2004	4407	19	1	2.57	160000	951	1079	877	388	1356	927000	15097	2230	423	267333
	2005	3130	88	<2	2.60	143033	422	1344	587	252	1240	477333	9390	1384	753	178900

*Note: Values presented in Table 18 are yearly average values based on the results of quarterly water sampling. Zeehan Zinc have some concerns regarding the reliability of the results analysed from December 2005, and therefore these results have been excluded from the calculations.

A comparison of the pH and total Al, Fe, Pb and Zn concentrations upstream of the site (W1) and the adit water (W3) since monitoring began in 2000 is provided in Figures 5-9 (based on data provided in Oceania Tasmania's environmental monitoring report, Appendix G).

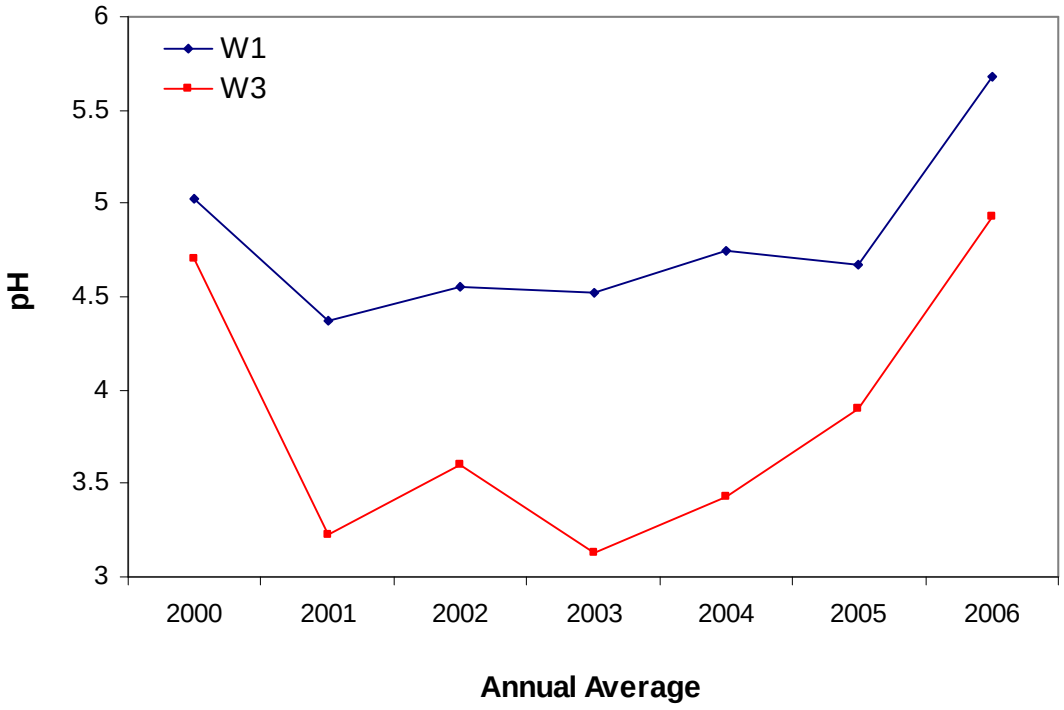


Figure 5: Annual average pH values for water monitoring sites W1 and W3.

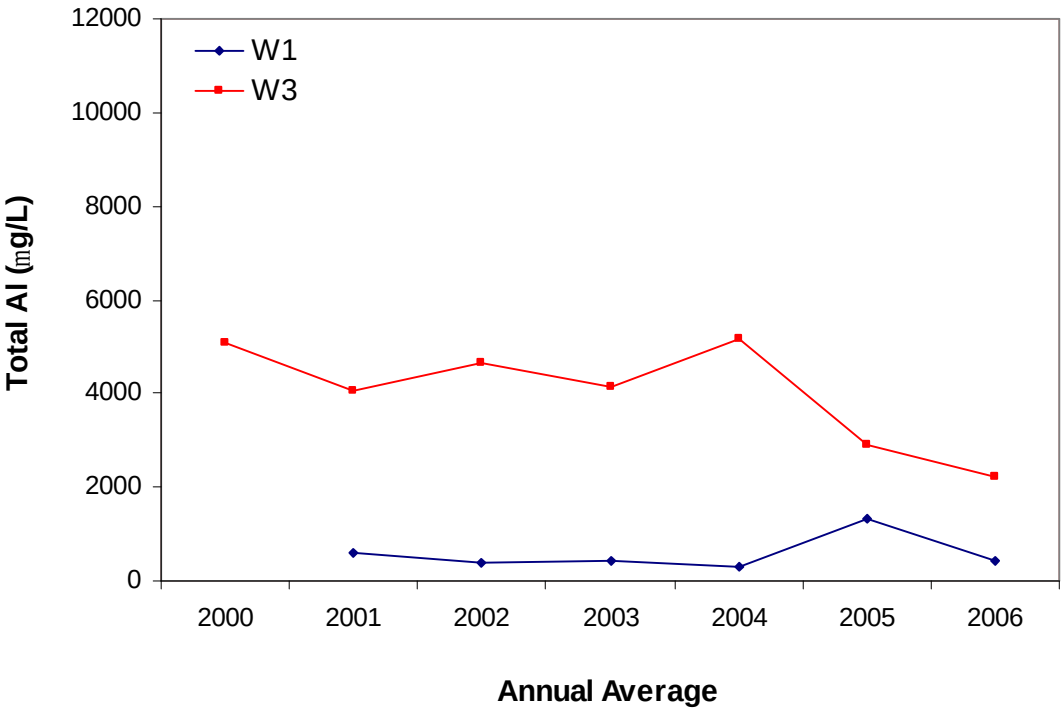


Figure 6: Annual average total Al concentrations for water monitoring sites W1 and W3.

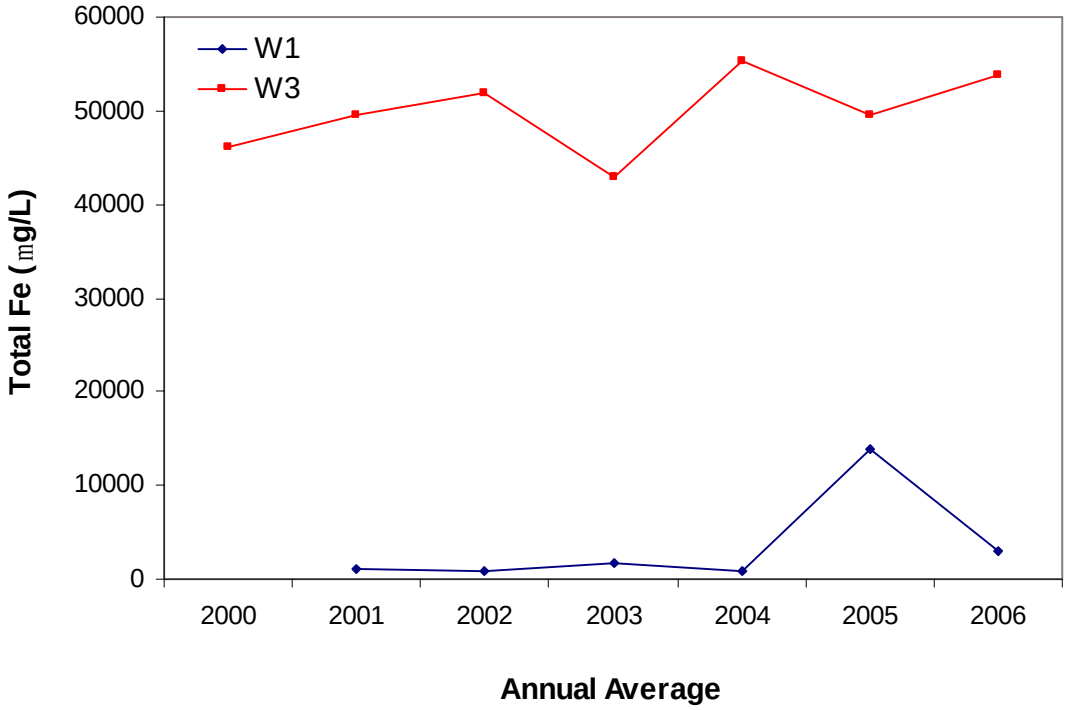


Figure 7: Annual average total Fe concentrations for water monitoring sites W1 and W3.

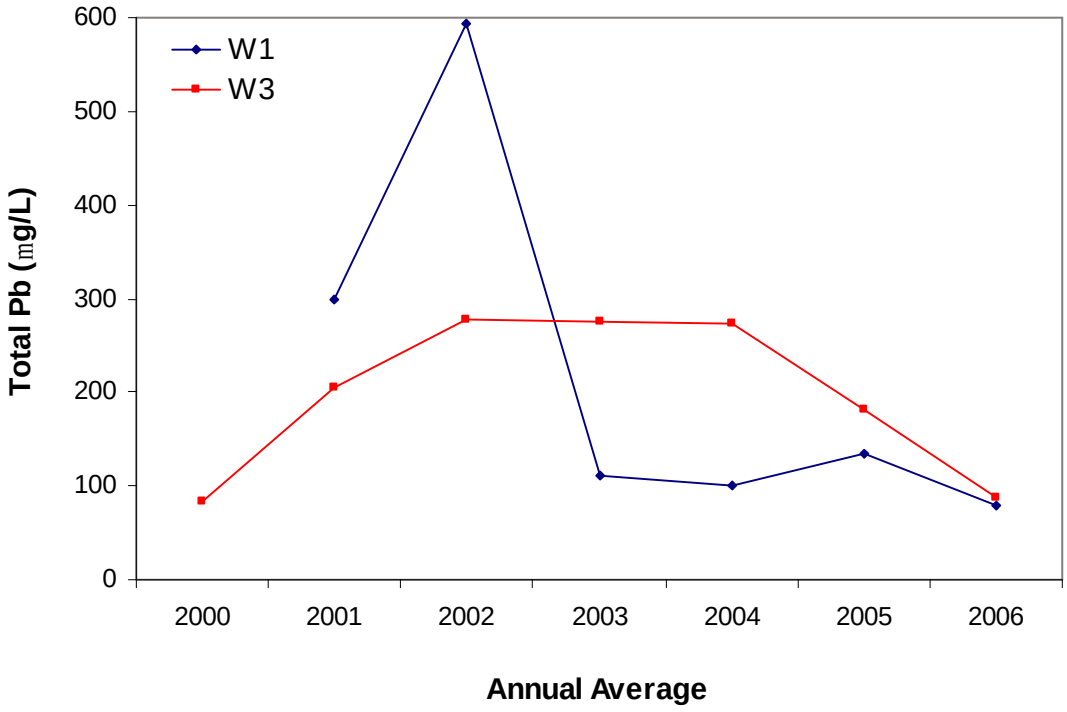


Figure 8: Annual average total Pb concentrations for water monitoring sites W1 and W3.

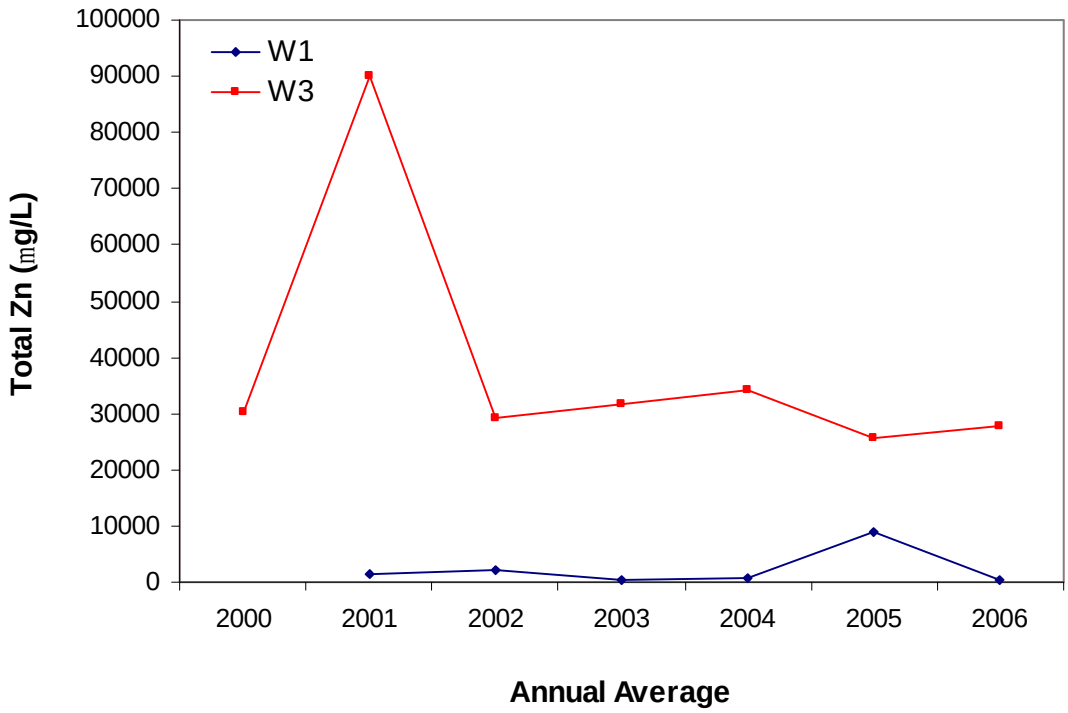


Figure 9: Annual average total Zn concentrations for water monitoring sites W1 and W3.

The effect of the adit water on the downstream quality of Comstock Creek was investigated in 2000, with samples collected approximately 150m downstream of the adit discharge showing a decreased in water quality (Appendic C in DPEMP 2001). Table 19 provides the results for pH and dissolved Al, Fe, Pb and Zn concentrations (for other metals refer to Appendix F in DPEMP 2001). There is some indication of dilution of the adit water downstream of the adit discharge point leading to an apparent decrease in metal concentration (Meskanen 2000).

Since 2000, the water quality downstream from the adit discharge point has not been recorded.

Table 19: Comstock Creek water quality during high flow periods (Meskanen 2000).

Site	Date	pH	Total Al (mg/L)	Total Fe (mg/L)	Total Pb (mg/L)	Total Zn (mg/L)
Upstream of all mine workings	June 2000	4.58	330	580	10	240
Upstream of Comstock mine (but near old workings)	June 2000	4.50	250	580	280	230
Adit Water at discharge point	June 2000	4.97	2,740	23,910	410	14,250
Downstream of adit (mixing zone)	June 2000	5.29	1,930	16,270	300	10,470

Future water monitoring programmes will include sampling of the Comstock Creek downstream of the adit discharge to identify :

- The effect of the adit water on Comstock Creek;
- The effect of mining operations on the quality of the adit water; and
- The effect of mining operations on the quality of water in the Comstock Creek.

There are periods during which the Comstock Creek does not flow, and the dominant water source in the Comstock Creek streambed is the adit discharge (pers.comms. P. Heath 2006).

Zeehan Zinc acknowledges the ongoing problem of AMD at the Comstock Mine and throughout the review period have been implementing measures to try and manage AMD where possible or provide a measure of remediation. The sources of AMD identified at the Comstock Mine are:

- Sulphide ore exposed to the atmosphere in the open cut;
- Stockpiled ore;
- Oxidising material in the waste rock dumps; and
- Drainage from historic sources, discharging from the Comstock adit.

The minimisation of AMD from entering the main adit system, where practical, was previously identified as an important step in managing AMD at the mine site. As a result, surface drains have been constructed around the mill facility, the ore stockpile (Plate 1), and the South Comstock Pit (SCP). Surface waters flowing in these drains are directed around to the STWRD, where the run-off passes through a series of silt traps prior to discharge (Plate 2). Furthermore, crushed limestone is regularly used in these surface drains to provide some measure of buffering capacity and aid in preventing erosion.

The water monitoring results have indicated that the crushed limestone currently utilised in surface drains is insufficient as a treatment for AMD, and an alternative method needs to be developed which also includes management of metal precipitates arising from an increase in pH. Zeehan Zinc are currently investigating appropriate treatment options that will manage the high metal and acidity load of the AMD at the Comstock Mine.

AMD arising from the decline area is directed into a concrete lined sediment trap prior to discharge into the main adit, and crushed limestone is regularly added (Plate 3).

In December 2005, drains containing limestone were constructed on the Central Waste Rock Dump (CWRD) to direct surface runoff (Plate 4). During monitoring of the erosion site E2 (as identified in the 2001 DPEMP), slight erosion of the southern end of the CWRD was identified.

Plate 1: Stockpile surface drain.

Plate 2: Silt traps at the base of STWRD.

Plate 3: Sediment trap and drain in Allion's decline.

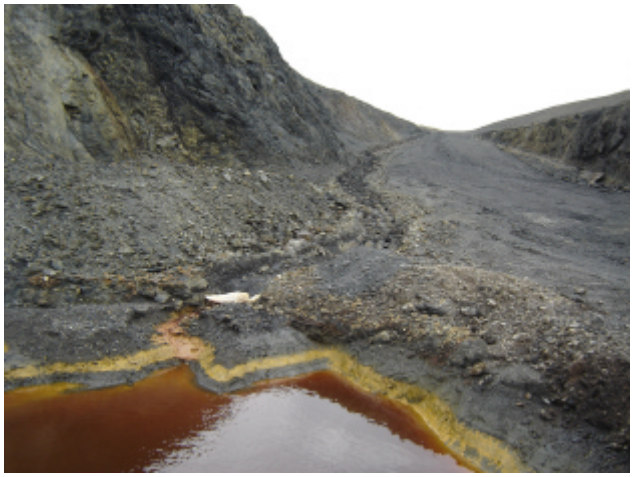


Plate 4: Surface drain on CWRD.

2.9.2 Environmental Effects

There have been no complaints during the review period with regard to surface water quality from the site.

Zeehan Zinc is actively undertaking research into AMD remediation efforts that can be undertaken to improve the surface water quality. In 2006, dosing trials using solid sodium hydroxide (NaOH) to increase the alkalinity of AMD seepage from the STWRD and general surface run off from the mine were undertaken. The trials indicated that while sodium hydroxide did raise the pH, the effect was short term, highly dependent on flow rates and a more practical and long-term method of AMD treatment should be developed. Zeehan Zinc acknowledges criticism of the sodium hydroxide trials and are currently working to identify a more appropriate treatment.

A water management plan (Koehnken 2006a) has been developed to address the issue of AMD at the Comstock Mine in conjunction with the waste management plan (Thompson and Brett 2003), and thereby allow for better water quality at the site and disposal of waste rock material. At this stage, the water management plan is considered to be a conceptual plan, as there is limited flow data and there is no water balance for the site. Zeehan Zinc is committed to collecting the appropriate information so that the conceptual water management plan can be refined and developed into a water budget for the site. The conceptual water management plan is provided in Appendix H, and a summary of the advantages of the plan are provided below (Koehnken 2006a):

- Containment of all long term diffuse water sources within one catchment with all water sources reporting to the tailings dam or polishing pond;
- Only one permanent discharge point from the site, which will reflect all diffuse sources following mine closure;
- The potential to discharge the historic adit water into Comstock Creek (as will occur during mining) or towards the polishing pond;
- The potential to stockpile alkali waste rock for the establishment of passive water treatment options during the close out of the site;
- A better understanding of the sources of the water to the historic adit will be gained during mining which could lead to the identification of management options;
- The remanent Comstock Creek channel can be used to collect and passively treat acidic sources, with the polishing pond used to settle solids;

- The final shaping of the combined waste rock and tailings storage facility will allow water shedding with surface waters to be directed away from potential acid sources.

The conceptual water management plan is showed diagrammatically in Figure 10.

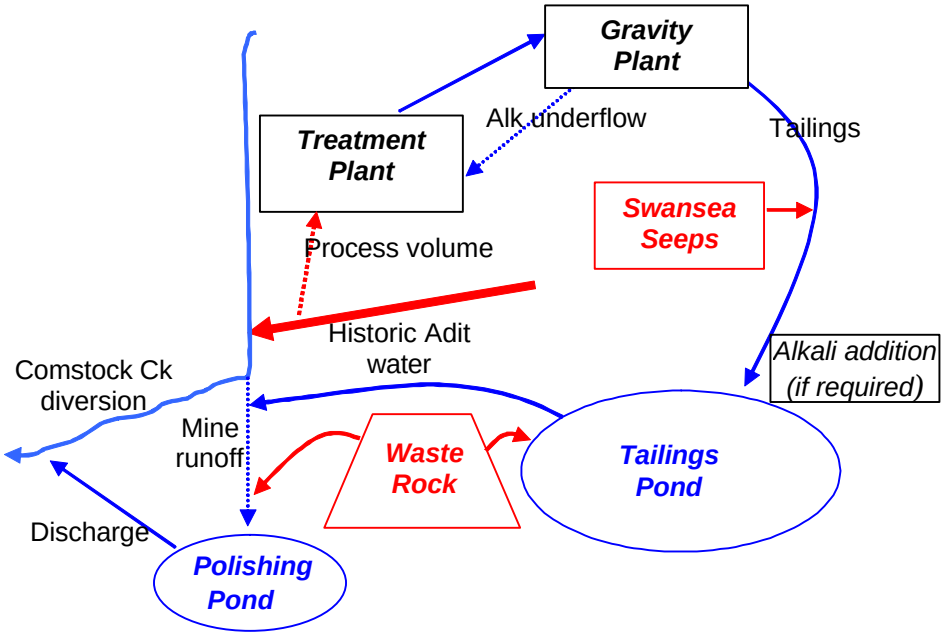


Figure 10: Conceptual water management plant at the Comstock Mine (Koehnken 2006).

Koehnken (2006b) has also provided advice on passive treatment of AMD options for seepage from the STWRD (Appendix I). The high acidity and metal concentration of AMD at the base of the STWRD, necessitates the addition of a neutralising reagent, followed by appropriate disposal of the resulting metal sludges. Three neutralisation agents have been identified that could be used and issues associated with each reagent is summarised below.

Calcium carbonate (limestone)

Inexpensive reagent but requires a fluidised bed reactor or larger mixer and potentially multiple stages to attain desired pH. Reaction with AMD would most likely result in formation of gypsum, which in addition to the metal solids precipitating out with the increased pH, lead to clogging of the system.

Hydrated lime

More expensive compared to limestone, but more efficient at increasing the pH. Reaction with AMD would require extensive physical mixing to efficiently release the alkalinity contained in the reagent and like limestone, lead to the precipitation of gypsum.

Sodium hydroxide

Most expensive alkaline reagent, but mixes easily with AMD in liquid form and can easily achieve the required pH of 7.5. Reaction with AMD does not produce gypsum, but does lead to the formation of gelatinous iron hydroxides which are difficult to handle. Strong solutions (50%) freeze at relatively high temperatures (12°C). Use of weaker solutions at 20% can overcome the problem with solutions freezing at high temperatures.

Zeehan Zinc is currently in the process of developing a short term treatment system for AMD arising from the STWRD. The use of a liquid sodium hydroxide dosing plant in combination with material with a high surface area to collect metal precipitates has been suggested by Lois Koehnken as the most appropriate short-term method, and is outlined schematically below (Figure 11). In order to ensure that precipitation of the metals occurs,

the pH of the AMD would need to be raised to approximately 7.5. With time, the hay and sand material will become clogged with metal precipitates. The amount of time for this to occur is dependent on the flow rate of AMD from the seeps and the metal concentrations. Therefore, regular inspections would be required to ensure that the treatment system remains effective. The clogged hay and sand material would then be disposed off in the STWRD or within the tailings disposal facility once constructed. Once the tailings disposal facility is constructed and active mining operations are underway, the sodium hydroxide dosing plant could then be utilised to treat the adit water prior to use in the ore processing plant.

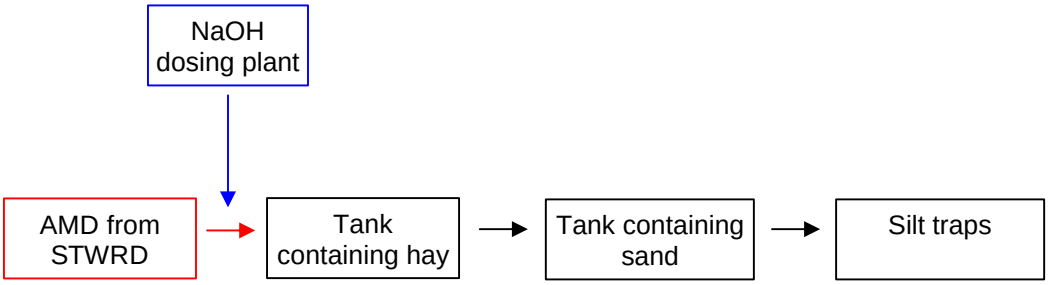


Figure 11: Schematic outline of a short-term treatment solution for AMD at the STWRD.

Zeehan Zinc is continuing to undertake research into the options of AMD treatment for the SWTRD and will continue to liaise with Lois Koehnken to identify the best way forward.

In 2006, Zeehan Zinc are proposing to construct the polishing pond and tailings co-disposal dam, and divert the Comstock Creek as outlined in the Waste Management Plan 2003 and Section 2.13.2 (Thompson and Brett 2003) (Appendix L). Construction of the tailings disposal facility and diversion of the Comstock Creek will assist in the treatment and management of AMD. In particular, the separation of the Comstock Creek from the adit drainage is likely to be beneficial, as the adit is an active source of AMD, with metal hydroxides being deposited in Comstock Creek. The diversion of the Comstock Creek is also an integral part of the conceptual water management plan, as discussed above.

As part of the development of a more appropriate method of treating AMD at the Comstock Mine, Zeehan Zinc have begun installation of a v-notch weir on the outflow of the main adit (Plates 5 and 6). A continuous monitoring station will be installed on the weir to provide flow data and basic water quality information such as temperature and pH. The flow data in particular will be essential in implementation of the conceptual water management plan and allow the calculation of metal loadings entering the Comstock Creek. In 2007, the continuous flow monitoring station was commissioned.

In 2007, a review of the conceptual water management plan was undertaken by Lois Koehnken (Technical Advice on Water) (refer to Appendix H).

A Process Water Management Plan (2007) has been developed, which outlines the sources of water for the mineral processing equipment, consumption rates, and the required infrastructure (refer to Appendix J).

A Water Management Plan (2007) has also been developed for the mine site, that outlines the procedures that will be used by Zeehan Zinc to enable manage on-site stormwater run-off and manage erosion and sediment control within ML 5M/2007 (refer to Appendix K).

Plate 5: V-notch weir at adit outflow.

Plate 6: Adit outflow downstream of v-notch weir.

In October 2004, Zeehan Zinc received approval from the Assessment Committee for Dam Construction (ACDC) (Appendix L) for the construction of the proposed waste rock and tailings dam. Further details of the planned construction of tailings dam is provided in Section 2.13.2.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 20.

Table 20: EMP commitments, permit conditions, and related actions by Zeehan Zinc for surface water emissions.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
4: Install drainage ditches fitted with sediment traps and erosion control structures	*ELMS 6194 Condition 14*: Cutoff drains and associated sediment ponds are to be constructed at strategic locations on the land to maximise sediment retention on site.	Surface drains have been constructed around the mine site to direct surface run-off to the silt traps at the base of the STWRD. Where practical drains contain crushed limestone to provide a measure of erosion control and buffering.
9: Construct surface drains around the stockpile and processing plant.	*ELMS 6194 Condition 15*: All runoff water from within the designated mine works area, including process areas, haul roads and hard standing areas, which contain sediment, pollutants, or discolouration must be delivered to settling dams and/or treated to BPEM, prior to discharge to natural drainage lines. *ELMS 6194 Condition 16*: The settling dams referred to in Condition 15: a) Should be designed and maintained to mitigate sediment loss which would result	Surface drains around stockpile, processing plant and other areas of the mine site directed to the STWRD. Drains constructed during 2001. Silt traps at the base of the STWRD are regularly cleaned and overflow discharges via a stable spill way to the Comstock Creek. Construction of the tailings storage facility and implementation of the Water Management Plan (Koehnken 2007) will assist in management of acid and metalliferous drainage of surface flows. Zeehan Zinc have also

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	from a 1 in 10 year, 12 hour duration storm event. b) Must be cleaned out regularly such that no more than one third of the depth of the settling dams contain sediment; and c) Must discharge the overflow via a stable spillway and where necessary incorporate a silt filter.	developed a Water Management Plan for the mine site, to address the management of stormwater (refer to Appendix K).
10: Monitor the Comstock Creek stream flow prior to entering the mine adit.		Comstock Creek upstream of the mine site monitored and the results reported to DTAE (water sampling site W1).
11: Sample water flowing through the decline sediment trap and treat appropriately.		Decline sediment trap constructed in 2001, including a geofabric lining. Results of sampling provided in this review (water sampling site W2).
12: Adapt water quality mitigation measures as results of monitoring indicate.		Zeehan Zinc currently investigating practical AMD mitigation measures that can be utilised based on the results of water monitoring.
13: Direct waste rock dump drainage to the designed wetland.		The Waste Management Plan (Thompson & Brett 2003) will facilitate the management of the AMD drainage from the waste rock dumps.
16: Monitor all active water monitoring sites.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	All active water monitoring sites monitored in line with permit, and results provided to DTAE.
24: Install and maintain silt traps and erosion control structures.		During the review period, silt traps at the base of STWRD were maintained. Where practical, drains lined with crushed limestone have been installed to minimise surface erosion at the mine site. A shotcrete drain will be constructed at the back of the CWRD to address the minor erosion problem.
42: Monitor surface water	*ELMS 6194 Condition 18:* The	Surface water flows

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
every 3 months.	pH of surface waters in the mine works areas must be monitored and recorded weekly and crushed limestone applied, as required, to maintain surface water pHs within ± 1.0 pH unit of background surface waters. *ELMS 6194 Condition 36*: All water samples, required by the permit, must be subject to the following: a) All samples must be tested in a Government laboratory, a N.A.T.A registered laboratory or a laboratory approved in writing by the Director; b) All samples must be collected and analysed in accordance with the relevant Australian Standards and Codes of Practice; c) All records of sampling and analysis (including an estimate of flow of effluent at the time of sampling) must be retrained for at least 2 years after the date of sampling and made available to the Director upon written request. *ELMS 6194 Condition 37*: The person responsible for the activity must undertake the monitoring and reporting regime prescribed in the EMP and summarised in Attachment 3 to the permit, unless otherwise approved in writing by the Director, and forward the quarterly results to the Director as soon as is reasonable and practicable.	monitored in line with DPEMP (quarterly sampling), and results provided to DTAE. Crushed limestone has been ineffective at treating AMD at the Comstock site, with metal precipitates rapidly coating the limestone and thereby limiting the buffering capacity. Zeehan Zinc are currently investigating more appropriate methods of treating AMD. During the review period, all water samples were analysed by a N.A.T.A register laboratory, and collected in accordance with the relevant Australian Codes of Practice and Standards. All records of sampling have been kept from the review period. Throughout the review period, quarterly water sampling results were forwarded to the Director as soon as was reasonable and practical.
	ELMS 6194 Condition 17: The person responsible for the activity must ensure that a minimum of 10 tonnes of crushed limestone is always strategically located on the land, for application in and around the areas of activity.	At least 10 tonnes of crushed limestone always kept on site in an accessible area. Limestone frequently added to surface drains and sediment traps to provide a measure of pH control.
	EPN 684/1 11: Collect a	This was not undertaken.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	representative water sample from the adit system below the South Comstock Pit three times per week following disposal of non-acid producing waste rock.	

Zeehan Zinc is committed to the continued protection of the local environment, and has made several commitments regarding the future management of surface water emissions. These commitments are summarised in Table 21.

Table 21: Future commitments made by Zeehan Zinc for the management of surface water emissions.

No.	Surface Water Emission Commitments
20	Monitor the Comstock Creek water quality downstream of the adit discharge point (i.e. the mixing zone).
21	Continue to regularly sample water at the 4 monitoring sites and begin regular flow monitoring.
22	Develop a detailed water budget for the Comstock Mine site.
23	Continue to install and maintain sediment traps, including regularly emptying silt traps.
24	Implement and annually revise the Conceptual Water Management Plan.
25	Utilise the Waste Management Plan to facilitate the management of AMD through construction of a tailings co-disposal facility and diversion of the Comstock Creek.
26	Continue to develop the network of surface drains to minimise surface runoff over material that could lead to AMD.
27	Drainage from undeveloped areas will continue to flow in natural drainage lines.

2.10 NOISE EMISSIONS

2.10.1 Monitoring Results and Compliance Summary

ELMS 6194 and EPN 684/1 have no requirement for monitoring noise emissions from the site.

During the review period, minor noise emissions would have been generated during vehicular movements, drilling operations, and movement of material associated with rehabilitation of the waste rock dumps. Any noise emissions from these activities were localised and short term.

2.10.2 Environmental Effects

The relatively small amount of noise emissions generated from the limited machinery activity that has occurred during the review period is unlikely to have had an adverse impact on the local environment. Once active mining operations occur, the amount of noise emissions associated with the crushing and processing plant, and the mining operations will increase.

There are no residents on the Trial Harbour Road, and the closest residents are located over 4km to the west, in Zeehan. Given the isolation of the site, it is unlikely for noise emissions to present an environmental problem or affect the local community of Zeehan.

There have been no complaints during the review period with regard to noise emissions from the site.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 22.

Table 22: EMP commitments, permit conditions, and related actions by Zeehan Zinc for noise emissions.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
26: Work in compliance with the *Work Health and Safety Act 1995.*	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	All operations (including those performed by contactors) undertaken at the Comstock Mine were in line with the *Work Health and Safety Act 1995.*

Zeehan Zinc is committed to ensuring the health and safety of mine personnel and minimising adverse environmental impacts arising from noise emissions.

Zeehan Zinc has made al commitment regarding the future management of noise emissions and this commitment is summarised in Table 23.

Table 23: Future commitments made by Zeehan Zinc for the management of groundwater.

No.	Noise Emission Commitments
28	Ensure all mine personnel continue to operate in compliance with the *Work Health and Safety Act 1995*.

2.11 SOLID WASTE MANAGEMENT (COMMERCIAL & DOMESTIC)

2.11.1 Monitoring Results and Compliance Summary

The future mining operations proposed for the site will lead to the generation of solid wastes. Solid wastes (commercial and domestic) that are likely to be generated by mining operations will include general refuse and limited amounts of building and structural materials.

For the purposes of this document, general refuse is therefore defined as material that is foreign to the area and typically generated by general mining activities. This will include packaging materials (e.g. cardboard boxes, wood), office waste (e.g. paper, cardboard) and other solid non-hazardous materials. Putrescible materials that are likely to occur on the mine site include organic matter (e.g. food scraps, animal and plant material), which would breakdown and could potentially result in odour and leachate.

To date, there has been limited amounts of general refuse generated through activities that have occurred at the Comstock Mine. All refuse that has been generated has been collected and disposed of offsite at an approved landfill facility.

2.11.2 Environmental Effects

There have been no complaints during the review period with regard to general refuse management at the site.

Zeehan Zinc will continue to ensure that the mine site and associated development areas remain free of windblown and accumulated general refuse during mining and rehabilitation to avoid environmental pollution and vermin attraction.

Following the commencement of active mining operations, in line with best practice, waste materials will be managed in one or more of the following methods in order of preference:

- Minimising waste generation;

- Reuse, recycling or reclamation of waste materials; and
- Dispose of waste materials at an approved off-site location .

General refuse will be regularly collected (including windblown wastes) from around the mine site and stored in a central location. Furthermore, all collection and storage areas will be established in areas away from waterways and water storages. Where possible, the mining personnel will stockpile materials such as pallets etc and reuse or recycle waste materials within the mining operation, or through the use of external organisations/contractors.

Separate bins will be provided by Zeehan Zinc for the collection of recyclable wastes such as bottles and cans. This material will be recycled in consultation with West Coast Council (WCC).

All putrescible materials will be collected in bins with lids and removed regularly to minimise health risks and vermin.

General wastes that cannot be recycled, will be collected regularly and disposed of off-site in the local WCC operated landfill site near Zeehan, approximately 15km from the mine site. Consultation with the WCC will be made to ensure that the waste can be accepted at the landfill site.

All mining personnel will be trained in the identification, labelling, and segregation of wastes so that work sites are maintained in a clean and tidy manner.

Furthermore, Zeehan Zinc is aware that littering should not occur, as it is a finable offence under the *Litter Act 1973 Tasmania*. Also, under the *Environmental Management and Pollution Control (Waste Management) Regulations 2000* and the subsequent amendments made in May 2005, no land can be used for the disposal of general waste without environmental approval and an approved management plan.

There were no commitments specified in the 2001 DPEMP or the permit conditions regarding the management of solid waste. Zeehan Zinc is committed to operating under BPEM principles, and has made several commitments regarding the future management of solid waste. These commitments are summarised in Table 24.

Table 24: Future commitments made by Zeehan Zinc for the management of solid waste.

No.	Solid Waste Commitments
29	Remove refuse regularly and recycle all wastes where possible.
30	Separate bins will be provided for the collection of recyclable wastes.
31	Train staff in solid waste handling and management.
32	General refuse will be regularly collected and deposited at an approved landfill facility.
33	Implement the waste management hierarchy for solid waste.

2.12 HAZARDOUS MATERIALS MANAGEMENT

2.12.1 Monitoring Results and Compliance Summary

At present, limited amounts of hazardous materials are stored on site, including sodium hydroxide (NaOH), and lime. The majority of hazardous materials utilised by Zeehan Zinc at the Comstock Mine (including fuels, oils, and lubricants) are stored off site in the Zeehan Zinc work sheds, located in Zeehan.

Explosives were not stored on site during the review period and will not be stored on site in the future. Any explosives used in mining operations will be the responsibility of the blasting contractor, who will comply with all statutory regulations.

2.12.2 Environmental Effects

During the review period, limited amounts of hazardous materials such as oil or petrol have been brought onto site during mining or rehabilitation operations, to assist in machinery maintenance. These materials were stored in appropriate containers at all times.

Small quantities of caustic sodium hydroxide granules have been utilised on site during AMD treatment trials in an attempt to raise the pH of liquid seeping from waste rock dumps and from surface run off. The sodium hydroxide was handled by mine personnel equipped with appropriate safety equipment.

Once active mining operations commence, oils and lubricants will be brought onto the mine site to assist in machinery maintenance and operation. A diesel fuel tank will be installed for machinery operations. Prior to these materials being brought onto site, Zeehan Zinc will ensure that a list of all hazardous materials likely to be on site at any one time is kept at the mine site office, and appropriate Material Safety Data Sheets (MSDS's) are readily accessible. All fuel, oils, and lubricants that will be stored at the mine site will be located within bunded areas and follow the BPEM approach to hazardous materials storage.

In September 2007, a Spill Management Plan for the Comstock Mine site was developed, and implementation has commenced (refer to Appendix M).

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 25.

Table 25: EMP commitments, permit conditions, and related actions by Zeehan Zinc for hazardous materials.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
36: Store hazardous materials in designated facility and in consultation and accordance with Industry Safety Inspectorate requirements.	*ELMS 6194 Condition 40*: Dangerous goods and hazardous materials must be stored and handled on the land and transported in compliance with: • *Dangerous Goods Act 1998*; • *Dangerous Goods (General) Regulations 1998*; • *Workplace Health and Safety Act 1995*; • *Workplace Health and Safety Regulations 1998*; • *Dangerous Goods (Road and Rail Transport) Regulations 1998*; Or any subsequent variation or replacement to the abovementioned Acts or Regulations.	During the review period, hazardous materials have not been stored at the mine site. Any hazardous materials utilised at the mine site during the review period would have been in small quantities and in compliance with ELMS 6194 Condition 40.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
37: Provide impervious containment bunds and clean-up materials on site.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	During the review period, there has not been sufficient quantities of hazardous materials stored at the mine site to necessitate the construction of containment bunds. Spill kits were not present on the mine site during the review period.
38: Provide a spill management plan, staff training, and monitoring of hazardous materials transported to and from the site and stored on site.	*ELMS 6194 Condition 39*: a) The person responsible for the activity must ensure that all persons used or engaged to transport hazardous waste from the land, in relation to the operations, hold all necessary Waste Transport Business Environmental Protection Notices (WTB-EPNs) under the *Environmental Management and Pollution Control Act 1994* and that those persons undertake to transport all relevant materials in accordance with the Australian Code for the Transport of Dangerous Goods by Road or Rail (ADG Code); b) All hazardous waste, as defined in the *Environment Protection (Waste Disposal) Regulations 2000* or any subsequent Regulation, transported from the premises for disposal, must be disposed of at a site approved by the Director.	A Spill Management Plan has been developed for the Comstock Mine site (refer to Appendix M), and implementation has begun. There has been no formal staff training with regard to the use and storage of hazardous materials. During the review period, there has been limited use of hazardous materials at the mine site, including oils, diesel, petrol, and lubricants such as grease.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	ELMS 6194 Condition 38: Unless otherwise approved in writing by the Director, no material with the potential to cause environmental harm or hazardous waste as defined in the *Environment Protection (Waste Disposal) Regulations 2000* or any subsequent Regulation (other than tailings and waste rock) shall be disposed of on the land.	No hazardous materials have been disposed on site during the review period.

Zeehan Zinc is committed to continuously improving operating procedures at the Comstock Mine and has made several commitments regarding the future management of hazardous materials. These commitments are summarised in Table 26.

Table 26: Future commitments made by Zeehan Zinc for the management of hazardous materials.

No.	Hazardous Materials Commitments
34	Hazardous materials will be stored with appropriate signage and fire control measures.
35	MSDS's will be displayed with hazardous materials and appropriate OH&S equipment provided by Zeehan Zinc.
36	Hazardous waste fluids released during operations will be collected for reuse or appropriate disposal.
37	Spill kits will be maintained on site and staff trained in emergency spill kit use.
38	Establish an emergency response plan and train staff in procedures and responsibilities.
39	Prepare a management plan for hazardous materials including an inventory of all hazardous materials stored and handled on site.
40	Utilise oil booms in the sediment trap at the base of Allison's decline to collect any hydrocarbons present in surface waters during active mining periods.

2.13 WASTE ROCK MANAGEMENT

2.13.1 Waste Characterisation

Zeehan Zinc has undertaken extensive studies into the nature of waste rock material that will be removed from the open pit during mining operations.

The current Allison's open pit comprises four rock types that form part of the Upper Oonah Formation which include carbonaceous shales, siliceous shales, sandstones, and talcose altered dolomites (Plates 7-8). The talcose altered dolomites host the Zn-Pb-Ag sulphide bodies that are the object of mining operations at the Comstock Mine. The talcose dolomite unit outside the sulphide zone is barren in visual sulphides and forms the vast majority of the waste rock that will be removed during mining operations. Drilling investigations have indicated that the geochemical nature of waste rock could alter as the open pit develops (Thompson and Brett 2003).

Plate 7: High grade ore in host rock.

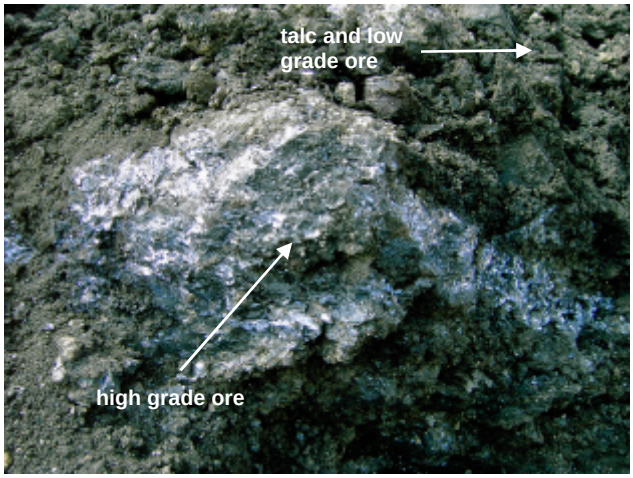
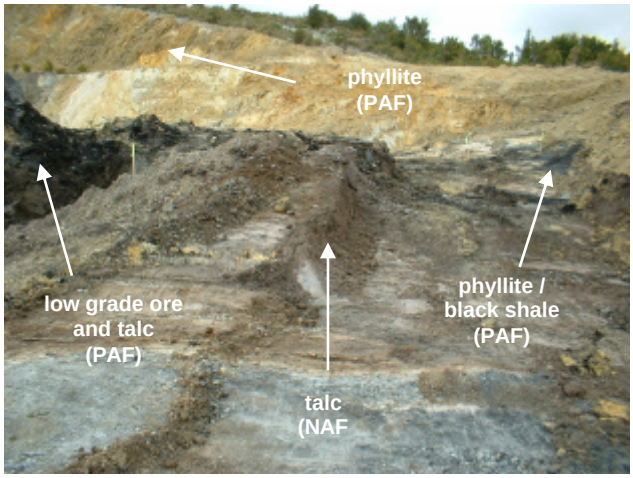


Plate 8: Dominant rock types in situ.



The tailings likely to be produced by gravity processing at the Comstock Mine are expected to be relatively coarse (~8mm) and contain only low levels of sulphides (Minserve 2006a). Ore material extracted in the gravity separation phase will be sent off-site for further concentration and processing.

The limited mining operations that have occurred to date have indicated that the waste rock material removed from the open pit is reasonably soft and is expected to have a relatively low permeability once compacted in a waste rock dump (Thompson and Brett 2003). This characteristic will be used to allow for selective dumping of waste rock material and treatment to isolate more reactive materials.

Investigations into the acid producing nature of waste rock and mineralised rocks has been undertaken during 2000-2006. A summary of these results is provided in Table 21, where the nature of the main rock types is described (non-acid forming (NAF) or potentially acid forming (PAF)). The complete analytical results are included in Appendix N).

Analysis of the waste rock types and the potential for acid production, has identified that the black shale at the Comstock Mine is acid producing (and contains visible pyrite), while the carbonate, talcose and siliceous material found outside the ore zone is not acid producing (Oceania Tasmania 2003, Appendix Q).

Table 27: Waste rock characterisation analysis performed at the Comstock Mine (2002-2006).

Date Sampled	Sample Type	Location	Rock Type	Nature
2000	CWRD (CMD1)	Within ore zone	composite	PAF
	CWRD (CMD2)	Within ore zone	composite	PAF
	STWRD 1	Within ore zone	talc, black shale and low grade ore	PAF
	STWRD 2	Within ore zone	talc, black shale and low grade ore	PAF
2002	Waste Rock 01-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 02-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 03-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 04-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 05-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 06-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 07-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 08-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 09-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 10-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 11-02	Outside ore zone	carbonate (silicate-micrite-talc)	NAF
	Waste Rock 12-02	Outside ore zone	carbonate (silicate-micrite-talc)	PAF
	Drill core SY021 (2-3M)	Outside ore zone	carbonate (silicate-micrite-talc)	NAF (with acid buffering capacity)
	Drill core SYO21 (8-11M)	Outside ore zone	black shale	PAF
	Drill core SYO22 (1.3-6.2M)	Outside ore zone	carbonate (silicate- micrite-talc)	NAF
	Drill core STO22 (6.2-10.8M)	Outside ore zone	carbonate (silicate- micrite-talc)	NAF
	Drill core SYO22 (13-14M)	Within the ore zone	black shale	PAF
2003	STWRD 1	-	composite	PAF
	STWRD 2	-	composite	PAF
	Main Lode Comstock Creek (R1)	Within the ore zone	carbonate (silicate-micrite-talc)	NAF
	Main Lode Comstock Creek (R2)	Within the ore zone	carbonate (dolomite)	NAF (with acid buffering capacity)
2004	STWRD	-	composite	PAF
2005	STWRD 1	-	composite	PAF

Date Sampled	Sample Type	Location	Rock Type	Nature
	STWRD 2	-	composite	PAF
2006	Drill core SYO33 0-1 (W)	Within the ore zone	pink clay (weathered dolomite)	NAF
	Drill core SYO33 3-4 (W)	Within the ore zone	pink clay (weathered dolomite)	NAF
	Drill core SYO33 28-29	Within the ore zone	carbonate (dolomite)	NAF (with acid buffering capacity)
	Drill core SYO34 1-2 (W)	Within the ore zone	pink clay (weathered dolomite)	NAF
	Drill core SYO34 12-13 (W)	Within the ore zone	carbonate (dolomite)	NAF (with acid buffering capacity)
	Drill core SYO41 1-2 (W)	Within the ore zone	pink clay (weathered dolomite)	PAF
	Drill core SYO41 2-3 (W)	Within the ore zone	pink clay (weathered dolomite)	PAF
	STWRD - Upper	-	composite	PAF
	STWRD - Lower	-	composite	PAF

It is estimated that during mining operations for Allison's Lode 205,238 tonnes of waste rock (equivalent to 78,938m^3), will be extracted, with the majority of the material classified as non-acid producing (Minserve 2006a, Appendix R). Coffey Geoscience (2005, Appendix S) estimated that 17,320 tonnes of potentially acid producing shale (equivalent to 6,391m^3) would be extracted during mining of Allison's Lode. During active mining operations of Allison's Lode, Zeehan Zinc will continue to model the amount of acid producing material likely to be extracted during mining and ensure that an appropriate management procedure is followed.

Non-acid producing waste rock will be used to continue to fill in the SCP and be used as material for the construction of tailings dam walls as outlined in the Thompson & Brett Waste Management Plan (2003). All waste rock material extracted will be characterised into potentially acid producing material, non-acid producing material, and acid consuming material, prior to appropriate disposal of waste rock. Where possible, the inherent buffering capacity in waste rock material extracted will be used to assist in treatment of AMD at the Comstock Mine.

A Visual Waste Characterisation Manual has been developed as part of this review (Appendix N). Zeehan Zinc will ensure that all staff and contractors associated with mining operations are familiar with the basic rock types that occur at the Comstock Mine and follow the waste characterisation procedure.

A Waste Rock Management Plan has been developed, which outlines the waste rock sampling program, tailings sampling program and the appropriate management measures (refer to Appendix O).

The Mine Managers Environmental Handbook has been developed and implemented (refer to Appendix P).

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 28.

Table 28: EMP commitments, permit conditions, and related actions by Zeehan Zinc for waste characterisation.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
3: Conduct NAPP tests of excavated material and ensure suitable use.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	Extensive analysis of waste rock material from the open pit has been undertaken (refer to Section 2.13.1). Material from the tailings co-disposal area was not extracted during the review period. During preliminary construction of the tailings disposal area, tests will be carried out on material to determine the most appropriate use of the waste rock.
44: Monitor waste rock NAG.	*EPN 874/1 Condition 7b*: The identification of the PAF characteristics of waste rock must be based on the results of the Allison's Pit Waste Rock Study as included in the revised environmental management plan, December 2002.	Waste rock characteristics have been determined during review period, and results used to separate recent waste rock material extracted. Waste rock characterisation manual including visual descriptions has been developed (Appendix N).

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	EPN 874/1 Condition 7c: The handling and disposal procedures for waste rock must be in accordance with the requirements of Condition 2 of this EPN and BEMP.	Zeehan Zinc is currently refining waste rock disposal procedures to ensure BPEM are followed.
31: Conduct geological assessment of waste material to determine the volume of neutralising material available.	*EPN 874/1 Condition 8b*: A record of the waste rock source, type, and disposal location for all waste rock generated on site during operations must be maintained and made available for inspection by the Director, on request.	Waste characterisation studies were carried out during the review period. The mine plan for Allison's Lode estimates the amount of waste rock to be removed, and possible volumes of acid producing material.
45: Conduct environmental reviews and maintain the *Mine Managers Environmental Handbook*.		Environmental reviews outside of the permitting requirements have not be undertaken. The *Mine Managers Environmental Handbook* was not developed during the review period. In September 2007, the *Mine Managers Environmental Handbook* for the Comstock Mine was developed and implemented (Appendix P).

Zeehan Zinc is committed to continuously improving operating procedures at the Comstock Mine and has made several commitments regarding the future management of waste rock management. These commitments are summarised in Table 29.

Table 29: Future commitments made by Zeehan Zinc for the management of waste rock.

No.	Waste Characterisation Commitments
41	Implement the visual waste characterisation procedure to be used during mining operations.
42	Develop a Mine Managers Environmental Handbook.
43	Ensure all mine personnel are trained in the visual identification of acid and non-acid producing rock types.
44	Continue to follow BPEM for waste rock dump construction.
45	Undertake progressive rehabilitation of waste rock dumps wherever practical

2.13.2 Waste Rock and Tailings Disposal

In order to dispose of waste rock material and the coarse tailings generated during mining operations at the Comstock Mine, a three year Waste Management Plan was developed by Thompson and Brett in 2003 (Appendix T).

It is predicted that the mine will extract approximately 200,000 tonnes of ore per annum (tpa) during active mining, which will then be crushed and gravity separated at the on-site mill to produce approximately 50,000 tpa of concentrate. The concentrate is expected to contain the majority of sulphides associated with the ore deposit. The remaining 150,000 tpa of tailings will be relatively coarse grained (~8mm or less), and will be disposed of in a

tailings storage area. The physical properties of the tailings such as oxygen and water permeability and waste characteristics cannot be accurately determined until representative tails are produced. In 2006, a full trial of the gravity plant using the existing stockpile of ore will be undertaken and produce representative tails likely to be produced during mining operations.

It is predicted that over the initial 3 years of mine development, a total of 450,000 tonnes of tailings and 1,350,000 tonnes of waste rock will be generated.

The general site area for waste disposal is located within mining leases 123M/1947 and 9M/2002, south of the mine and mill site (Figure 12).

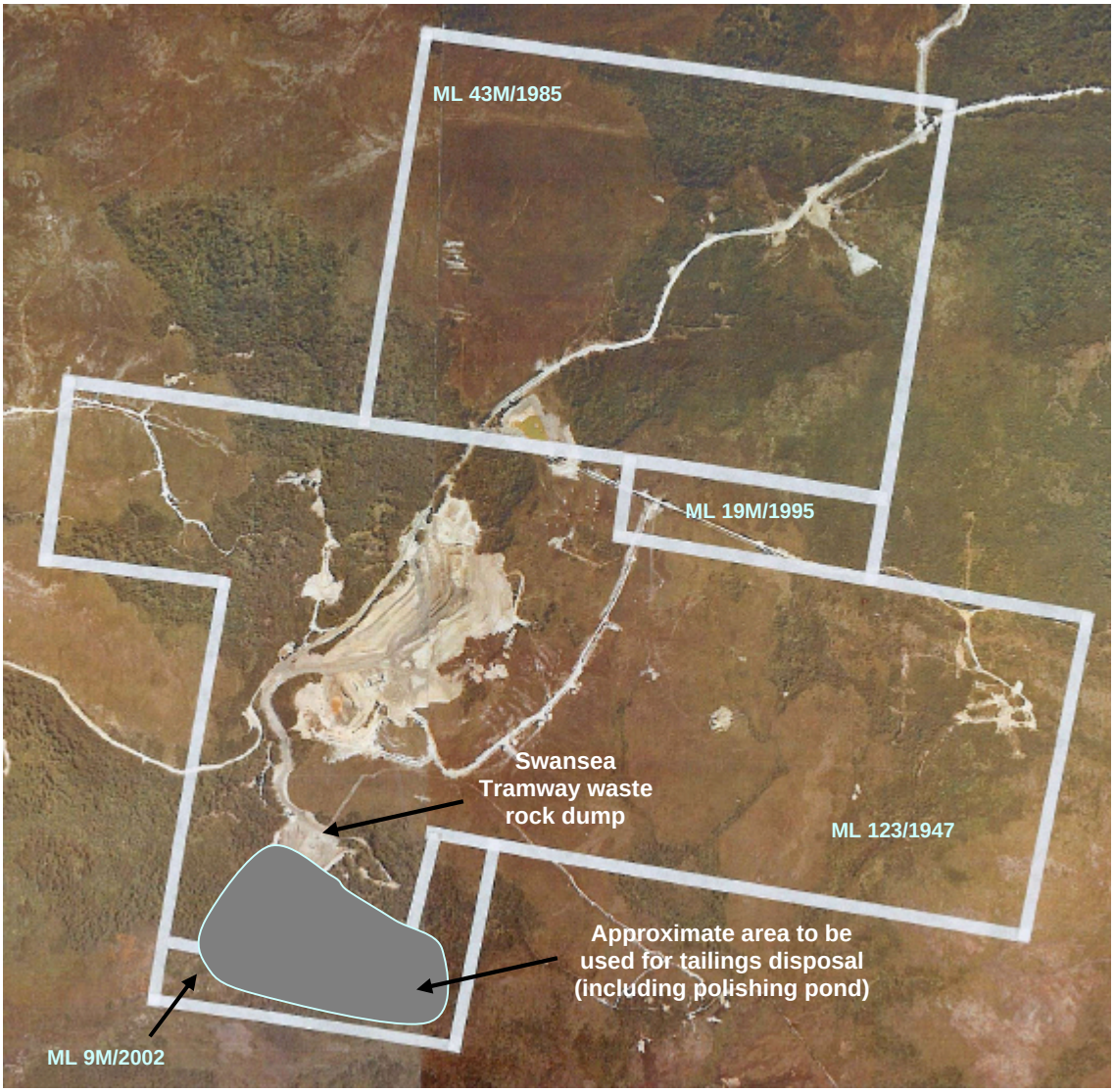


Figure 12: Approximate area of mining leases ML 123/1947 and 9M/2002 to be used as part of tailings and waste rock disposal (aerial photograph taken in 2003).

The waste management plan involves a number of steps and is summarised below (Thompson and Brett 2003):

1. Divert Comstock Creek. The Comstock Creek is to be diverted to a new channel to the west of site, which will allow the possibility of the existing channel to be used for the collection of potentially contaminated site run-off and seepage from historical workings. A diversion dam will be required.

2. Construct an adit diversion weir and pipeline to collect and divert adit water. The adit diversion structure will incorporate a pump-out well to allow collection of adit water for use in the mill and gravity plant. Input of material to adjust the pH to a suitable level for use in the mill and gravity plant will occur at this point.
3. Construct an access road to the site, that will be suitable for use as a haul road with drainage to collect run-off and direct it to a silt trap/polishing pond.
4. Construct a silt trap/polishing pond on the existing creek bed on the southern end of the site. The pond overflow will incorporate a V-notch weir and will be the environmental monitoring point for water leaving the site. The weir it proposed to be fitted with a level sensor and data logger for continuous flow monitoring, combined with continuous loggers for conductivity and pH.
5. Construct an initial tailings storage facility to suit the first 6-9 months production, which and will comprise an excavated pond with clay lining. Any overflow from the pond will be directed to the polishing pond via a decant tower comprising precast concrete sections to allow control of the water level. The TSF will be designed to allow future encapsulation of the tailings if testing identifies that the tailings material is potentially acid producing.
6. Continue development of long-term waste rock storage on the southern boundary. Once rock movement commences a program of acid and metalliferous drainage testing will be initiated to further define waste material classification as material is extracted from the open pit.

The water quality leaving the tailings and waste rock disposal area will be dependent on the quality of adit water entering the site, and the water treatment techniques utilised by Zeehan Zinc. At this point in time, limited flow readings are available for the adit. A continuous monitoring weir is currently being installed and will be completed in 2006 to develop a better understanding of adit flow rates and basic water quality.

In order for water to be used from the adit in the processing of ore at the mill and gravity plant, the pH will need to be increased from its current average of approximately 3 to ideally greater than 5 in order to avoid damage to the steel structure of processing equipment. The increase in pH of the adit water will lead to the precipitation of metals in the forms of sludges. Zeehan Zinc is currently refining the Waste Management Plan to incorporate the Conceptual Water Management Plan outlined in Section 2.9.2, and address the management of metal precipitates.

The Waste Management Plan (Thompson and Brett 2003) also identifies several aspects of environmental management that need to be addressed during the development of the tailings co-disposal facility and include:

1. Comstock Creek – Diversion of the Comstock Creek from the TSF area into an adjacent tributary will assist in improving the water quality through separating the contaminated adit water from the creek. The Comstock Creek diversion channel will need to be to engineering BPEM.
2. Adit Water – Water required for processing at the Comstock Mine will utilise existing adit flows. Adit water will need to be treated to raise the pH, which will also lead to precipitation of dissolved and total metals in the adit water, and improve the water quality. Resulting metal precipitates will need to be disposed of appropriately.
3. Tailings Water – This is water that will be used to transport the tailings from the gravity plant to the TSF. It is anticipated that the pH of the tailings and tailings water will vary according to the nature of the rock material processed, and that generally the pH will be greater than the adit water due to the predicted neutralising capacity of the tailings. Monitoring of the tailings pH will be essential and remediation methods will need to be flexible to manage the potential changes in tailings characteristics.

4. Surface Water – Surface water from existing drains, road run-off, and adit flow will be collected and delivered via open drains to the TSF for treatment and retention.
5. Waste Dump Walls – The dump walls will be initially capped with clay until accurate geochemical characterisation is established. If the waste rock is characterised as being non-acid producing or if adequate permeability to prevent oxidisation of sulphides is achieved, clay capping will be stopped. After the dump walls are constructed and stabilised, progressive rehabilitation will then commence.

Zeehan Zinc is currently seeking expert advice from water specialist Lois Koehnken and liasing with DTAE regarding the treatment of adit water prior to use, and the management of all water emissions on site (Koehnken 2006 a,b, 2007 and Appendices H & I).

A Tailings Storage Facility Operation, Maintenance, and Surveillance Manual has been developed in September 2007. This Manual outlines:

- The Emergency Response Plan;
- Management of tailings beach development;
- Construction methodology of the waste rock disposal;
- Operating procedures; and
- Surveillance and maintenance procedures, including inspection forms.

This Manual is currently in draft format, and will be reviewed once the nature of the tailings produced by the gravity plant is known (refer to Appendix U).

An assessment of the acid and metalliferous drainage potential of material from the tailings storage facility used in the construction of the polishing pond embankment and access roads at the Comstock Mine was conducted in September 2007 (refer to Appendix V).

Initial preparation for the diversion of Comstock Creek has been undertaken (Plates 9 & 10).

Plate 9: Comstock Creek and start of diversion.

Plate 10: Proposed diversion channel.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 30.

Table 30: EMP commitments, permit conditions, and related actions by Zeehan Zinc for waste rock and tailings disposal.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
1: Construction material will be clean material from the mine operation.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	Construction of tailings disposal facility has not yet begun. Initial construction material will be sourced from existing non-acid producing material stockpiles, and from material extracted during construction.
2: Construct and maintain a weir on Comstock Creek to best practice hydraulic engineering standards.		Construction of a weir on Comstock Creek did not occur during the review period.
17: Construct tailings dam to specifications.		Construction of a tailings dam did not occur during the review period. Initial stages of a tailings and waste rock co-disposal facility is planned to be constructed in 2006. Tailings disposal facility will be constructed as per the Thompson and Brett Waste Management Plan (2003), ACDC specifications and in consultation with appropriate authorities.
26: Dispose all tailings in tailings dam.	*ELMS 6194 Condition 26*: a) All tailings produced as a result of mineral processing of the land may only be disposed of into a sub-aqueous environment at the South Comstock Pit b) A depth of at least 1m of water must be maintained over the tailings in the South Comstock Open Pit at all times. Condition 26a is no longer relevant, as the SCP is now used for non-acid producing waste rock disposal.	Mine operations have not produced tailings during the review period. Tailings disposal facility will be constructed as per the Thompson and Brett Waste Management Plan (2003) and in consultation with appropriate authorities.
27: Conduct preparatory surveys, sealing, and planning of tailings dam.		Planning of tailings disposal area was completed during the review period. Initial survey tracks have been cut down to the area to provide foot access. Archaeological, Aboriginal heritage and flora and fauna surveys carried out over the

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
		tailings area, with no heritage sites of threatened flora or fauna located.
29: Studies of the geohydrological environment and construction materials will be undertaken during Stage 1 and submitted for approval prior to dam construction.	*ELMS 6194 Condition 27*: a) Details of preparatory investigations into alternative tailings storage facilities at the land must be reported to the Director at six monthly intervals from the date of issue of this permit; b) Development of these facilities must not be carried out unless specifically approved of in writing by the Director.	Detailed studies of the geohydrological environment and tests of the proposed construction materials will be carried out in 2006 when tailings dam construction commences and the results submitted to DTAE. Zeehan Zinc is awaiting approval for construction of tailings storage facility as outlined in the Thompson and Brett Waste Management Plan (2003), submitted in 2003. An assessment of the acid producing nature of the materials used to build the tailings storage facility and access roads was carried out in September 2007 is provided in Appendix V.
30: Construct buffer storage around South Comstock Tailings Dam		South Comstock Pit has not been used for tailings storage during the review period, as per EPN 684/1, and therefore construction of buffer storage was not necessary. The South Comstock Pit will continue to be used for non-acid waste rock disposal and therefore this commitment is no longer valid.
32: Dispose waste rock at STWRD and subsequent planned dumps.	*ELMS 6194 Condition 21*: Waste rock must be disposed of only at the Swansea Tramway Waste Rock Dump, following segregation in accordance with Condition 19 (Condition 19 replaced by EPN 684/1 Condition 7a). All waste rock must be compacted as soon as practical after its placement at the Swansea Tramway Waste Dump.	Waste rock has only be disposed of at the STWRD during the review period. When STWRD was first developed in 2000 waste rock segregation was not undertaken, and as a result the STWRD is producing small quantities of AMD. Future operations will ensure that this practice is not continued. All material disposed of the STWRD was compacted as soon as is practical during the review period.
33: Ensure correct ratio of acid producing and non-acid producing material in dumps.		During the review period, limited quantities of potentially acid forming waste rock from the CWRD has been disposed

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
		of at the STWRD, with the majority of waste rock disposed being classified as non-acid producing.
34: Install and maintain silt traps at the base of waste rock dumps.		Silt traps were installed in 2000 at the bottom of the SWTRD and cleaned out when necessary to ensure that they remain functional.
40: Conduct NAG tests to determine appropriate use of excavated material from tailings dam site.		Extraction of material from the tailings dam site has not occurred during the review period. Excavation is proposed to begin in 2006 and appropriate testing of the acid producing characteristics of extracted material will be undertaken.
42: Monitor the tailings dam water every 3 months.		This commitment is not applicable during the review period, as the tailings storage facility has not yet been constructed. Appendix U provides the Tailings Storage Facility Operation, Maintenance, and Surveillance Manual.
43: Monitor designed wetland regularly and treat accordingly		This commitment is not applicable during the review period as the wetland design outlined in the 2001 DPEMP has not been implemented.
	EPN 684/1 Condition 1: Completion of the rehabilitation of the Central Waste Rock Dump must be undertaken by June 2003.	Rehabilitation of the CWRD began in February 2003, and was not completed by June 2003 due to weather and equipment delays, which were acknowledged by DTAE. To date, only ~30% of CWRD is not covered with organic matter, and rehabilitation will be completed in 2006. Refer to Section 2.13.3
	EPN 684/1 Condition 2: Completion of the Central Waste Rock Dump clay cap must be undertaken to BPEM mining standards and in accordance with the following requirements: a) The surfaces, benches, and berms of the dump must be compacted and covered with one metre of clay that achieves a coefficient	All surfaces of the CWRD were capped with clay to a minimum depth of 1m, using clay with appropriate physical properties.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	permeability of less than $1x10^{-8}$ metres per second and a degree of saturation not less than 85%.	
	b) To optimise the maximum moisture content and resistance to erosion of the clay cap, selection of the suitable clays must be in accordance with the recommendations contained in the Coffey Geosciences inspection report dated 3 March 2003. Placement of and track rolling clay in at least 3 layers is recommended.	Rehabilitation of the CWRD was carried out following BPEM, with the clay cap being applied in three layers and compacted between layers. CWRD clay cap was tested by Coffey Geoscientists Pty Ltd and considered to be fit for providing environmental protection against AMD. Refer to Section 2.13.3.
	c) The Central Waste Rock Dump is to be covered with an uncompacted topsoil/vegetation layer, to seal the clay cap and further prevent the potential for erosion.	Organic matter has been applied to 70% of the CWRD with the remaining 30% to be covered in 2006, and seeding to commence in spring 2006.

Zeehan Zinc is committed to continuously improving operating procedures at the Comstock Mine and has made several commitments regarding the future management of waste rock material. These commitments are summarised in Table 31.

Table 31: Future commitments made by Zeehan Zinc for the management of waste rock material.

No.	Waste Rock and Tailings Disposal Commitments
46	Undertake analysis of the physical properties of tailings produced during the mill trial.
47	Continue using SCP as a waste rock disposal site for low NAG waste rock, following BPEM with regard to the final landform design.
48	Perform column leach tests on future waste rock material dumped in the SCP.
49	Complete topsoiling and seeding operations on the CWRD in 2006.
50	Undertake progressive rehabilitation works on waste rock dumps wherever practical.
51	Develop and maintain all waste rock dumps following BPEM.
52	Manage AMD seepage or runoff from waste rock dumps.
53	Disposal of waste rock material appropriately following the visual waste characterisation and identification manual developed for the Comstock Mine.

2.13.3 Waste Rock Dump Rehabilitation

Active mining operations at the Comstock mine site involving the extraction of ore have not occurred since 2001. The vast majority of mining activity on the mine site since 2001 has been centred on rehabilitation of areas previously disturbed, with over 5ha of rehabilitation having been completed. Zeehan Zinc is dedicated to undertaking progressive rehabilitation wherever practical.

During the review period, three waste rock dumps have been the focus of re-contouring and rehabilitation operations. In particular, completion and rehabilitation of the Central Waste Rock Dump (CWRD) has been a priority for Zeehan Zinc.

In May 2003, EPN 684/1 was issued to Zeehan Zinc, and contained several amendments to the ELMS permit issued by WCC, including the requirement for rehabilitation of the CWRD to be completed by the 30th June 2003 and the use of the South Comstock Pit as a dump for non-acid producing waste rock material.

Central Waste Rock Dump

The CWRD contains a mixture of talcose and shale material, which when exposed to oxygen and water, has the potential to react and lead to the formation of acid and metalliferous drainage (AMD). In order to prevent this from occurring, waste rock material generated from previous mining operations was placed in the CWRD and then contoured to ensure structural stability, followed by capping with clay to ensure that the potentially acid producing rocks are isolated from water and oxygen.

In 2003, the CWRD was re-contoured following BPEM to ensure structural stability of the dump. Clay capping and rehabilitation of the CWRD took place during 2002-2005. In line with the condition specified in EPN 684/1, the clay was placed in 3 layers of approximately 20-35cm thick, with track rolling or tamping of each layer. Approximately 55,800m^3 of clay was applied to the CWRD, at a minimum depth of 1m.

Several delays in the rehabilitation process were experienced due to poor weather conditions and restrictions on the availability of relevant machinery.

A timeline of the rehabilitation for the CWRD is provided in Table 32, and the rehabilitation process of the CWRD is illustrated in Plates 11-14.

Table 32: Timeline of rehabilitation operations of the Central Waste Rock Dump

Date	Operations Undertaken
September 2002	Contouring the CWRD in accordance with BPEM
February 2003	Commencement of clay capping of the CWRD.
March 2003	Temporary termination of operations on the CWRD.
May 2003	EPN 684/1 issued to complete clay capping of the CWRD by 30th June 2003
June 2003	Recommencement of clay capping operations.
August 2003	Coffey Geoscience Pty Ltd were engaged to assess the clay capping being conducted on the CWRD.
September 2003	Temporary termination of operations due to wet weather and limited availability of equipment. At this point ~95% of the dump had been covered with clay >1m thick.
September 2003	Letter issued to the Director of Environmental Management from Zeehan Zinc regarding a status report on the CWRD, and a request for a compliance update by the Environment Division.
October 2003	Issue of a compliance update from the Director of Environmental Management with the acknowledgement of Zeehan Zinc's positive commitment demonstrated to the Environment Division with respect to rehabilitation of the CWRD.

Date	Operations Undertaken
October 2003	Recommencement of clay capping on the CWRD.
November 2003	Temporary termination of operations due to wet weather and limited availability of equipment.
April 2004	Recommencement of clay capping on the CWRD.
April 2004	Completion of clay capping operations on the CWRD.
April 2004	Coffey Geosciences Pty Ltd engaged to assess the final clay capping of the CWRD – CWRD considered to be fit for providing environmental protection against AMD.
January 2005	Completion of placement and spreading of organic matter over CWRD
Spring 2006	To date ~70% of the CWRD has been covered with organic matter. Application of the remaining organic matter is planned for early 2006, with reseeding and fertilising of the CWRD in Spring 2006.

Plate 11: CWRD prior to clay capping.

Plate 12: Application of clay on CWRD.

Plate 13: Organic matter on CWRD prior being spread.

Plate 14: CWRD ~70% covered with organic matter.

Coffey Geosciences Pty Ltd assessed the clay cap and emplacement process throughout the capping of the CWRD (March 2002-April 2004). The assessments were based on general field observations, engineering logs of test pits dug through the cap material and on push-tube samples taken for laboratory testing on in situ moisture content and density (Coffey Geosciences 2004, Appendix W).

The assessments indicated that the shaping of the dump surface into batter slopes and berms has produced a structure that rapidly sheds rainwater with no significant surface ponding. This is particularly important in preventing potential infiltration from rainwater in the west coast climate of Tasmania. The clay cap was determined to be forming a broad barrier without obvious points of weakness, and it was considered to be fit for providing environmental protection from AMD (Coffey Geosciences 2004).

In July 2004, DTAE acknowledged that the CWRD had been successfully capped with clay and that final rehabilitation measures involving the spreading of organic material were underway. DTAE also made further recommendations to assist with the successful rehabilitation of the CWRD including the long-term assessment of the clay cap of the CWRD and undertaking infiltration modelling following the completion of the spreading of organic matter.

Zeehan Zinc has engaged Coffey Geotechnics to undertake infiltration modelling of the CWRD in 2007 (refer to Appendix X).

Application of the organic matter to the remaining ~30% of the CWRD will occur in 2006, and hydro seeding and fertilisation will occur in early spring 2006, to complete the rehabilitation operations. In line with BPEM, only native indigenous species will be used in the seed mix.

Swansea Tramway Waste Rock Dump

During June 2000 to September 2003, overburden material from Allison's decline was placed at the Swansea Tramway Waste Rock Dump (STWRD). In 2002, the STWRD was re-contoured to ensure stability. Analysis of rock material placed in the STWRD has indicated that there are acid producing materials present, with the majority of the material present in the dump being classified as 'potentially acid producing' (Oceania Tasmania 2003). In 2003, parts of the STWRD was considered to be actively oxidising with minor amounts of buffering capacity available to neutralise any sulphuric acid generated from the waste rock material, and to date AMD is still being produced by the STWRD. The STWRD is considered to be sealed with no surface ponding occurring during high rain periods.

In 2001, a series of silt traps were constructed to assist in management of AMD and sediment runoff originating from the STWRD prior to discharge to the Comstock Creek. The silt traps are lined with non-acid producing rock and limestone to provide a measure of buffering capacity. The silt traps are regularly cleaned of sediment, which is carefully disposed of due to its acidic origins, and were last cleaned out in March 2006.

During the early stages of the construction of the STWRD dump in 2000, talcose and pyritic waste rock, and low grade ore was indiscriminately mixed and placed in the STWRD. Monitoring of water seeping out from the base of the STWRD (Site W4) has indicated that AMD has been occurring actively since 2001 (Oceania Tasmania 2006). In 2006, trials using sodium hydroxide (NaOH) granules as a treatment for the AMD seeping out from the STWRD were undertaken. The trials indicated that NaOH could raise the pH. However, the effectiveness of using NaOH granules in raising the pH was found to be highly dependant on water flow conditions and associated mixing (Oceania Tasmania 2006). Further research into alternative methods for treating the AMD arising from the STWRD is currently underway.

South Comstock Pit Waste Rock Dump

The South Comstock Pit (SCP) was originally developed in 1989, during mining operations. In 2001, it was evident that exposed material within the open pit was oxidising and leading to the production of AMD. As previously mentioned, EPN 684/1 provided for the use of the SCP as a dump site for non-acid producing waste rock.

During 2004-2005 the SCP was filled with non-acid producing waste rock. All potentially acid producing material identified during operations associated with infilling of the SCP

was segregated and disposed of in the STWRD. In accordance with BPEM, all waste rock material dumped in SCP was compacted as soon as was practical. To date, approximately 26,000m^3 of non-acid producing material has been placed in the SCP. The waste rock material dumped in the SCP was waste rock that was previously extracted from the SCP.

EPN 684/1 Condition 9 requires that waste rock material disposed of in the SCP must be compacted until a height of RL 273 is reached, and thereafter waste rock material placed in the SCP must be benched and compacted according to BPEM practices and must conform with the surrounding landform. SCP has been infilled to an estimated height of RL 273. Zeehan Zinc plans to continue to use the SCP for disposal of non-acid producing waste rock material in line with EPN 684/1 during future mining operations. Plates 15-18 illustrate the infilling of the SCP.

Plate 15: South Comstock Pit 2001

Plate 16: Compaction of waste material

Plate 17: South Comstock Pit 2005

Plate 18: Completed South Comstock Pit 2005

Rehabilitation operations of the SCP uncovered a small ore body near the SCP (the West Lode). The ore body subsequently drilled in February 2005, in order to delineate depth and width extents.

The permit conditions, and the actions taken by Zeehan Zinc with regard to the SCP are summarised in Table 33.

Table 33: EMP commitments, permit conditions, and related actions by Zeehan Zinc for the SCP.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
No EMP commitments directly applicable to the South Comstock Pit.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	
	ELMS 6194 Condition 25: Conditions 25c-f refer to the use of the South Comstock Pit as a tailings dam. EPN 684/1 has replaced some conditions regarding the South Comstock Pit.	South Comstock Pit not used as a tailings disposal site.
	EPN 684/1 Condition 7a: An operating manual detailing the visual identification criteria for potentially acid forming and non-acid forming types of waste rock plus handling and disposal requirements to BPEM must be developed and implemented for training of the relevant personnel, prior to the commencement of disposal of any waste rock to the South Comstock Pit. A copy of this manual must also be submitted to the Director, prior to the commencement of disposal operations to the South Comstock Pit.	A waste rock manual has been developed as part of this review and will be used for the future training of personnel associated with active mining operations (Appendix N).
	EPN 684/1 Condition 8a: All waste rock generated on-site must be identified and any non-acid (low NAG) forming types segregated from potentially acid (high NAG) forming rock types, prior to disposal to the South Comstock Pit. All potentially acid forming waste rock generated from mine development works must be disposed of to the STWRD in accordance with the requirements of Conditions 19 and 21 of the permit and/or any approved revision of the STWRD management strategy.	To date, all material that has been dumped in the SCP is material that was originally extracted from the SCP and is predominantly composed of non-acid producing carbonate derived waste rock (talc). Previous tests on these rock types by Zeehan Zinc have demonstrated that they are non-acid producing.
	EPN 684/1 Condition 9: All waste rock disposed of to the SCP is to be benched and compacted as soon as practicable after placement within the SCP until a height of	During 2004-2005 the SCP was filled with waste material to a RL height of 273m. Non-acid producing waste rock will continue to be disposed of in the SCP to a

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	RL 273 is reached. Thereafter, waste rock disposed of the SCP must be benched and compacted to BPEM standard heights/ gradients, to conform with the surrounding landform. Upon exhaustion of all the available area in the SCP to accept low NAG waste rock, it must be rehabilitated in accordance with the requirements of Condition 2 of this EPN.	RL height of 273m, and any further material dumped will be benched and compacted following BPEM principles, followed by progressive rehabilitation of the SCP.
	EPN 684/1 Condition 10: The person responsible for the activity must undertake monthly sampling during active dumping periods, obtaining representative samples of waste rock disposed of to the SCP. The waste rock samples are to be subject to long term (at least 6 month) column leach tests to verify the effectiveness of the waste rock segregation procedure required by Condition 8 of this EPN. The results of this testing is to be reported to the Director, in accordance with the reporting regime required by Condition 37 of the permit.	Previous studies in 2000 of waste rock materials extracted from and near the Allison's decline identified from static leach column tests that there was no lag-time prior to acid generation in the columns (Meskanen 2000). This characteristic is highly likely to apply for materials extracted from (and returned to) the SCP.
	EPN 684/1 Condition 11: A representative water sample from the adit system below the SCP must be taken 3 times per week, until otherwise advised in writing by the Director and measured for pH to verify whether or not the disposal of low NAG waste rock to the SCP is having a detrimental impact on the adit water quality. The results of this monitoring must be provided to the Director in accordance with the reporting regime, required by Condition 37 of the permit.	During SCP active dumping periods, water samples were not collected as per EPN 684/1 Condition 11. All water samples during the review period collected from the adit outflow have been quarterly. As a result, there is no clear indication that dumping periods have had an effect on the water quality exiting the main adit. No results have been submitted to the Director regarding this condition.

Top Soil Stockpiling Practices

Throughout the review period, all organic matter removed during mine operations has been stockpiled following BPEM. In several areas, stockpiled organic matter has begun to regrow, which illustrates the high viability of the organic matter stockpiled (Plates 19 and 20). The growth of indigenous plants from the stockpiled organic matter will assist in maintaining the viability of the organic matter to be used in subsequent rehabilitation operations.

It is BPEM practice for organic matter to be stockpiled for the shortest amount of time possible in order to maintain continued viability.

Plate 19: Stockpiled organic matter in 2001.

Looking North-East

Plate 20: Same organic matter in 2003.

Looking North

Zeehan Zinc is committed to continuously improving operating procedures at the Comstock Mine and has made several commitments regarding the future management of topsoil and organic matter. These commitments are summarised in Table 34.

Table 34: Future commitments made by Zeehan Zinc for the management of stockpiling of organic matter.

No.	Topsoil Stockpiling Practice Commitments
54	Strip topsoil and stockpile using BPEM, and minimise the time that organic matter is stockpiled for.
55	Avoid disturbing topsoil stockpiles in order to protect soil structure and prevent erosion.
56	Prevent the spread of *Phytophthora cinnamomi* by use of soil and plants free of the disease.
57	Prevent the spread of *Phytophthora cinnamomi* by use of soil free machinery and staff training.

Clay Reserves

In order to ensure that Zeehan Zinc could successfully rehabilitate all disturbed areas, a clay reserve was required to be identified. In 2001, two clay reserves were identified within the lease areas currently operated by Oceania Tasmania (Appendix Y). Two clay reserves were identified and it was estimated that there is a minimum reserve of between 240,000m^3 and 360,000m^3 of clay available (Figure 13).

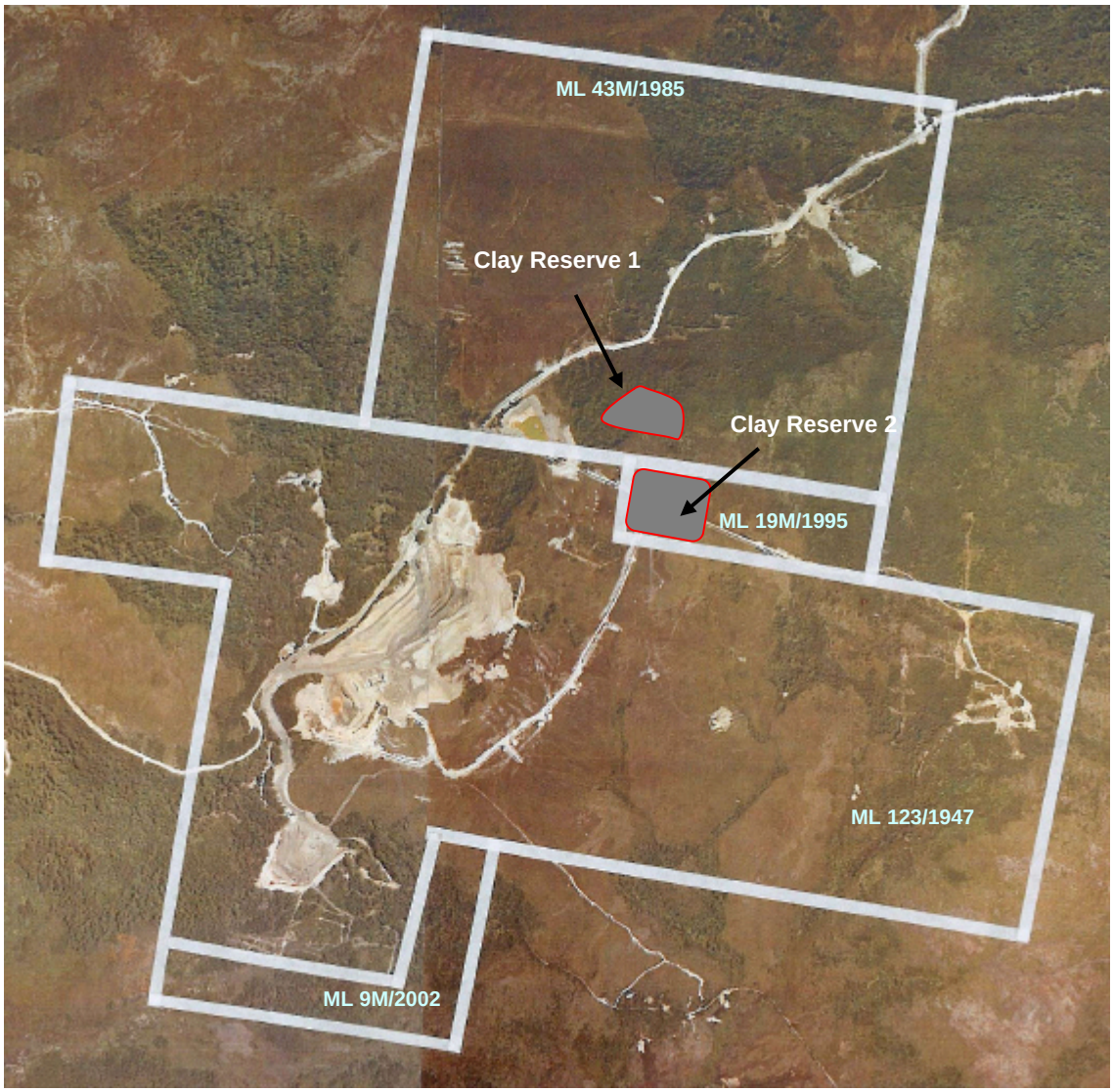


Figure 13: Location of clay reserves (aerial photograph taken in 2003).

In 2002, the Stage 1 clay reserve was opened up to provide clay material for rehabilitating the CWRD. Following the end of clay removal operations, the pit filled with water and effectively became a dam, and rapidly began to rehabilitate with native plants (Plates 21-23). The depth of the clay reserve was predicted to be approximately 2-3m, however during clay extraction operations the depth of the clay was up to 10m. This indicates that given the similar geology of Clay Reserve 2, it is likely there is a greater volume of clay available for rehabilitation than originally calculated, and probable that there is in excess of 500,000 m^3 of clay available at Clay Reserve 2 for rehabilitation works. In 2006, the water in the clay dam was used to assist fire-fighting operations in the Zeehan area and was considered an important asset to the local community.

Plate 21: Extraction of clay from Clay Reserve 1.

Plate 22: Same view as Plate 21 after 48 hours from the cessation of clay extraction.

Plate 23: Natural revegetation of Clay Reserve 1.

During clay extraction, black shale was used as a track base to allow machinery to access the clay reserve. Black shale material has been previously identified as being a waste rock type on site that is acid producing. Zeehan Zinc removed the exposed shale material associated with the clay extraction operations in 2003 and disposed of it in the STWRD.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc regarding the clay reserve are summarised in Table 35.

Table 35: EMP commitments, permit conditions, and related actions by Zeehan Zinc for the management of the clay reserves.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
6: Conduct complete survey of available clay on the mine lease during Stage 1	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	Clay reserves were identified during 2001-2002, and the results of investigations provided in the 2002 EMP Review, and in Appendix N.
7: Rehabilitation of clay pits will include re-contouring, grading with topsoil and seeding.		Following removal of clay from Clay Reserve 1, the excavated pit rapidly filled with

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
		water within 48 hours of cessation of clay extraction operations. As the clay reserve was effectively a dam during the review period, rehabilitation of the floor of the clay reserve was not possible. The organic matter was spread around the margins of the clay pit, and the edges of the clay pit are naturally revegetating. There is no evidence of erosion of the banks of the clay pit. Future clay reserves will be rehabilitated as soon as is practical.
	ELMS 6194 Condition 13: The person responsible for the activity must submit a report to the Director no later than 90 days after the issuing for this permit containing the following information: a) the results of investigations into the availability of clay resources for use in the management of waste rock and tailings as detailed in Conditions 23, 24, and 25; b) The location, quantity, and quality of the clay. Specifically, the permeability and homogeneity of the clay must be reported; c) If the clay resources is not at the lease site, proposed arrangements for accessing the clay must be reported. d) If no clay resources is identified at the land, alternative arrangements to meet the requirements of this permit must be reported.	A clay reserve was identified in 2001 and the results reported to the Director. In 2002, Zeehan Zinc received approval for the two clay reserves (refer to Figure 13), and the two stage approach to extracting clay from Clay Reserve 2. The clay reserves identified within the current mining lease utilised by Zeehan Zinc fulfil the requirements of DTAE. During the review period, only Clay Reserve 1 was used. During clay extraction the depth of clay present was substantially more than predicted thereby inferring a greater clay resource at the Comstock Mine.
	ELMS 6194 Condition 25: The person responsible for the activity must not process any minerals on the land until: a) the report on clay resources required by	Condition 13 was fulfilled in 2001 and active processing of minerals has not occurred during the review period. Zeehan Zinc received written confirmation of the Director's

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	Condition 13 has been submitted to the Director; b) the director has advised in writing that he/she is satisfied that the conditions of this permit requiring the use of clay can be complied with; Conditions 25c-f refer to the use of the South Comstock Pit as a tailings dam which is no longer relevant.	approval of the clay reserves located at the Comstock Mine in 2002.
	EPN 684/1 Condition 3: In accordance with the Director's approval granted to Oceania Tasmania Pty Ltd in April 2003 to develop the identified two stage clay reserve, the area of mine operations must not extend beyond the additional area of land identified in the relevant application by Oceania Tasmania and as indicated on Attachment 1 to this notice.	Throughout the review period, the area of mine associated operations have not extended beyond the area indicated in Attachment 1 to EPN 684/1.
	EPN 684/1 Condition 4: Development of the two stage second clay reserve must not commence until all suitable clay from the first clay reserve is exhausted. Extraction from Stage 2 of the two stage second clay reserve must not commence until approved in writing by the Director.	In 2004, Clay Reserve 1 was considered to be exhausted, and the pit naturally began to rehabilitate. Zeehan Zinc propose that clay extraction from Clay Reserve 2 will begin in 2006 to allow for progressive rehabilitation of the mine area. Zeehan Zinc is committed to complying with EPN 684/1 Condition 4.
	EPN 684/1 Condition 5: Rehabilitation of the first clay reserve must be undertaken in accordance with the following procedures: a) Removal of all pyritic hard stand material previously utilised in the first clay reserve and its disposal to the STWRD; b) Contouring of the clay reserve boundary walls; c) Spreading of topsoil over the reserved floor to a depth consistent with the surrounding	In 2003, all pyritic material (black shale) previously used in clay extraction operations was removed from the clay reserve area and disposed of appropriately in the STWRD. The clay pit resulting from clay extraction rapidly filled with water in 2004 following closure of the clay reserve, and has remained full of water during the review period. This has prevented Zeehan Zinc from complying with *EPN 684/1 Condition 5b-c*. Residual topsoil and organic matter removed during clay extraction operations was applied to the edges of the

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
	landform; d) Residual stockpiled topsoil is acceptable for rehabilitation uses elsewhere on the site, including the CWRD.	dam that formed in the clay pit. Excess organic matter was utilised on the CWRD.
	EPN 6841/1 Condition 6: In developing the two stage second clay reserve, development of both stages must be undertaken in accordance with the following procedures: a) Excavation, removal and stockpiling of topsoil must be undertaken in accordance with BPEM, by removal of clay in strips to enable the previously stripped topsoil to be replaced sequentially with each new clay strip excavated; b) Rehabilitation of the two stage clay reserve must also be undertaken consistent with the procedures outlined above in Condition 5 (b-d).	During the review period, Zeehan Zinc have not commenced clay extraction operations from Clay Reserve 2. Zeehan Zinc anticipate that in 2006 the extraction of clay from Clay Reserve 2 will commence, and all operations will be in compliance with *EPN 6841/1 Condition 6*.

Zeehan Zinc is committed to continuously improving operating procedures at the Comstock Mine and has made several commitments regarding the future management of the clay reserves. These commitments are summarised in Table 36.

Table 36: Future commitments made by Zeehan Zinc for the management of clay reserves.

No.	Clay Reserve Commitments
58	Clay extraction operations will not utilise known acid producing material for track basements.
59	Removal of clay from clay reserves will be line with BPEM.
60	Clay reserves will be rehabilitated following completion of clay extraction.

Environmental Bond

Sudden unplanned or temporary closures can occur in the mining industry. These events are often due to changing economic, technical, or political circumstances, and are most often unforseen. This has resulted in many mine closures being poorly managed, with considerable environmental consequences and legacies worldwide.

As a provision for sudden or temporary mine closure, Zeehan Zinc will develop contingency plans to ensure that all aspects of the operations are stabilised and will not result in pollution or a public health and safety hazard should a temporary or sudden mine closure occur.

In order to protect the public's interest and minimise ongoing liabilities in the event of an unplanned permanent mine closure, Zeehan Zinc has provided a bond to the Tasmania Government.

Future developments at the Comstock Mine may require the bond to be adjusted to ensure that rehabilitation operations can be successful following mine closure. Furthermore, rehabilitation works undertaken by Zeehan Zinc may entitle them to request a revision to the current bond.

Rehabilitated Areas and Future Disturbance Areas

Throughout the review period, rehabilitation has been the primary focus of operations at the Comstock Mine. The areas that have been rehabilitated or disturbed during the review period are illustrated in Figure 14. In total, approximately 5ha has been rehabilitated at the Comstock Mine. Areas that will be the subject to disturbance during future developments are also provided in Figure 15.

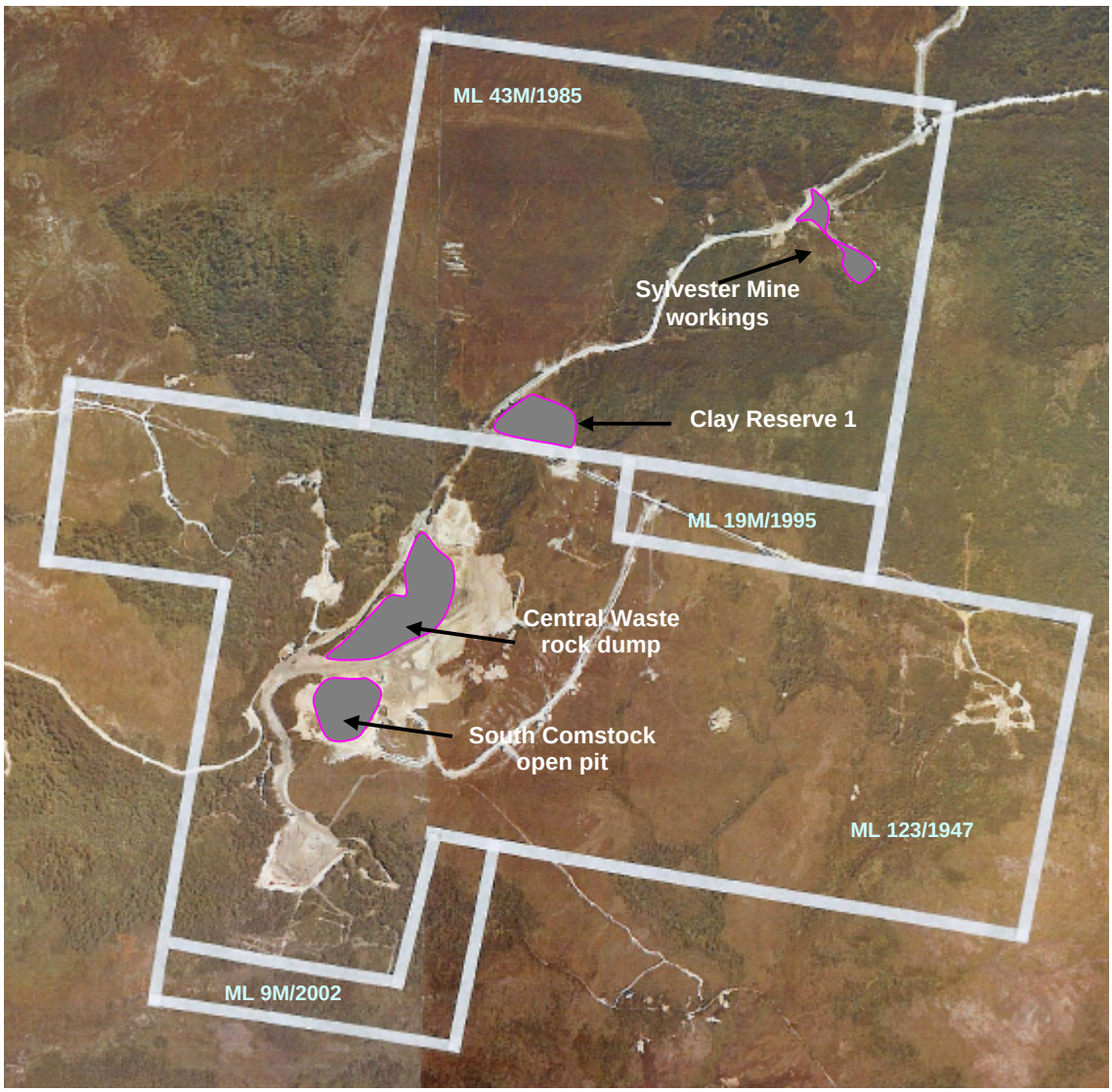


Figure 14: Areas that have been rehabilitated (pink) (aerial photograph taken in 2003).

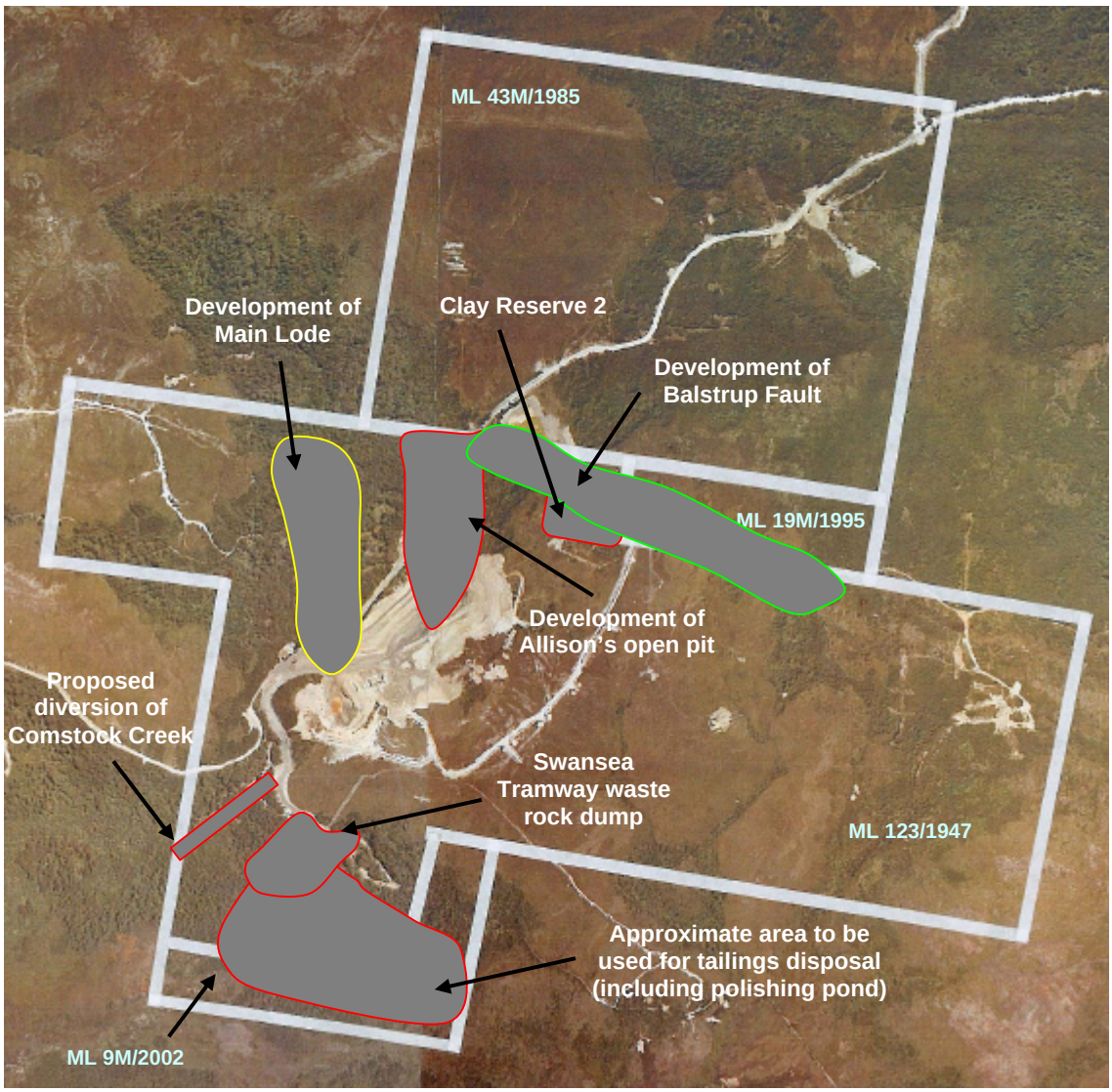


Figure 15: Schematic location of approximate areas likely to disturbed during future mine developments (red = within 2 years, green = within 5-10 years, yellow = >10 years) (aerial photograph taken in 2003).

Decommissioning and Rehabilitation Plan

Open-cut mining operations and the associated removal and disposal of overburden and waste-rock can lead to significant changes to the topography and stability of the landscape. Zeehan Zinc is committed to ensuring that operations at the Comstock Mine do not have detrimental environmental impacts and that when mining operations are completed, the mine site is left in an environmentally safe manner. As part of this commitment, prior to commencement of mining operations Zeehan Zinc has prepared a Decommissioning and Rehabilitation Plan (DRP).

The DRP will ensure that rehabilitation activities achieve environmental stability, maintain public safety, provide compatible land use and aim towards the establishment of sustainable ecosystems as a long-term goal.

Decommissioning and rehabilitation operations need to be progressive and flexible both during mining operations and following mine closure. Modifications or amendments may need to take into account any changes in site conditions and results of monitoring or inspections.

The objectives of the Decommissioning and Rehabilitation Plan (DRP) are to:

- Minimise environmental risk and the potential to cause environmental harm from the cessation of activities on the land, decommissioning, rehabilitation and further activities on the land once the land has been rehabilitated to an appropriate land use consistent with the appropriate standards for that land use;
- Reduce the potential environmental liability to the public, Zeehan Zinc, and the Tasmanian Government;
- Provide an agreed process for planning, validation and reporting of decommissioning and rehabilitation actions;
- Provide an agreed system of environmental monitoring and reporting of environmental conditions on the site during and after the decommissioning and rehabilitation of the site; and
- Ensure that the full cost of decommissioning and rehabilitation is understood and full mechanisms for funding are available.

Following mine closure, five broad rehabilitation tasks have been identified that will need to be completed by Zeehan Zinc. These include:

- Sale and removal of equipment and buildings;
- Site preparation;
- Revegetation;
- Maintenance of the site; and
- Monitoring the success of the rehabilitation.

Detailed cost estimates for decommissioning and rehabilitation will be developed during the operational phase of the mine, once waste material characteristics and earthmoving and other costs are known. In line with best practice, an effective means of calculating the cost of decommissioning various aspects of the operation is to develop a series of spreadsheets. This approach will allow for periodic updating of cost estimates to accommodate changes in operations and unit costs. Zeehan Zinc will adopt this method.

As the mining operation develops and matures it is conceivable that it may be different from that described in the project-planning phase, and as a result the conceptual DRP could be largely irrelevant to the actual operating project. Therefore, it is important that Zeehan Zinc reviews the DRP annually to take into account new rehabilitation issues that have come to light, and to where necessary, revise cost estimates to reflect changing circumstances and the timelines for rehabilitation.

Progressive rehabilitation is an important tool in minimising and managing environmental impacts associated with mining operations. Zeehan Zinc will undertake progressive rehabilitation wherever practical, and will list these activities in annual reports submitted to MRT and DTAE. Furthermore, the establishment of progressive rehabilitation targets by Zeehan Zinc and assessing the success of rehabilitation operations against these targets will ensure that the company is committed to rehabilitation works during and after mining operations.

The Comstock Mine DRP will be submitted as a separate document to DTAE, and will include a discussion of the current permit requirements that relate to decommissioning and rehabilitation of the Comstock Mine. The DRP will be reviewed concurrently with future reviews of the Comstock Mine EMP. This will ensure that the DRP is maintained in line with current mining operations.

Current permit conditions that apply to the DRP are presented in Table 37.

Table 37: Permit conditions relevant to mine decommissioning and rehabilitation.

EMP Commitments	ELMS 6194 Conditions	EPN 684/1 Conditions
5: Rehabilitate disturbed areas and waste rock dumps once 8m vertical lift is complete using recovered or stockpiled topsoil.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	
7: Rehabilitation of clay pits will include re-contouring and grading with topsoil and seeding.		*EPN 684/1 Condition 5:* Rehabilitation of the first clay reserve must be undertaken in accordance with the following procedures: a) Removal of all pyritic hard stand material previously utilised in the first clay reserve and its disposal to the STWRD; b) Contouring of the clay reserve boundary walls; c) Spreading of topsoil over the reserved floor to a depth consistent with the surrounding landform; Residual stockpiled topsoil is acceptable for rehabilitation uses elsewhere on the site, including the CWRD.
8: Rehabilitate the mine site at the end of the mine life.	*ELMS 6194 Condition 30:* If permanent cessation of operations on the land is planned, then the Director must be notified of the planned cessation of operations: a) at least 30 days prior to the planned date of cessation; or b) within 14 days of the person responsible for the activity becoming aware that the cessation is planned; or c) if notification to the Australian Stock Exchange is required under "Chapter 3 Continuous Disclosure" of the Australian Stock	

EMP Commitments	ELMS 6194 Conditions	EPN 684/1 Conditions
	Exchange Listing Rules then, within 24 hours after that notification of the planned cessation, whichever is the later date. *ELMS 6194 Condition 30:* Following permanent cessation of the operations, rehabilitation of the designated mine works area, as outlined in Attachment 2 to the permit, must be carried out by the person responsible for the activity in accordance with a decommissioning and rehabilitation plan, reflecting BPEM, and as approved in writing by the Director. The rehabilitation measures described in this plan must include, but not be limited to the following: a) The methods for the removal and disposal of designated equipment, structures and associated waste material; b) The grading and levelling/re-contouring and revegetating (or other approved method of soil stabilisation) of the surface of both current and previously disturbed areas; c) The management of drainage on the land so as to reduce erosion and prevent or reduced the release of "pollutants" from the land; d) A validation monitoring programme of the environmental decommissioning and rehabilitation plan for a period of not less than 3 years, from the date of cessation of operations; e) The rehabilitation of the waste rock dumps	

EMP Commitments	ELMS 6194 Conditions	EPN 684/1 Conditions
	and other surface workings including previously disturbed areas and infrastructure; and f) Any other detail requested in writing by the Director. *ELMS 6194 Condition 32:* Unless otherwise approved in writing by the Director, the person responsible for the activity must submit that decommissioning and rehabilitation plan, referred to in Condition 31 of this permit, to the Director for approval within 30 days of receiving a request to provide such a plan. *ELMS 6194 Condition 35*: Unless otherwise approved by the Director, cessation of substantial and continuous operations on the land for a period of 2 years or more will be deemed a permanent cessation of operations and rehabilitation of the land must commences pursuant to Condition 31.	
14: Design wetland in Stage 1.		
15: Rehabilitate the designed wetland at the end of the mine life.		
18: Close tailings dam to specifications.		
20: Rehabilitate to achieve a self sustaining vegetation community in a stable environment.	*ELMS 6194 Condition 33:* Revegetation of the land must only utilise plant species which are native to the local area, unless otherwise approved in writing by the government agency responsible for management of the land.	
28: Tailings dams will be closed to meet best practices requirements.		
35: Ensure appropriate closure of waste rock dumps.		

EMP Commitments	ELMS 6194 Conditions	EPN 684/1 Conditions
47: Rehabilitation monitoring program will be established upon closure of the mine.		

2.14 VISUAL IMPACT MANAGEMENT

ELMS 6194 and EPN 684/1 have no requirement for monitoring or recording for this activity.

Historic workings, the present pit excavation, and the entrance to the mine site are visible at a limited number of sites along the Trial Harbour Road. Views of the mine site and associated operations are interrupted by native vegetation and natural topography. In line with BPEM and where practical on the mine site, a vegetative buffer of 10-15m has been retained along Trial Harbour Road boundary.

The planned diversion of Trial Harbour Road in 2006 to facilitate the proposed pit extension will provide the opportunity to improve visual amenity by ensuring the presence of a more extensive buffer of vegetation between the road and the mine operations.

There have been no public complaints regarding visual impact within the review period.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 38.

Table 38: EMP commitments, permit conditions, and related actions by Zeehan Zinc for visual amenity.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
39: Maintain and enhance roadside vegetation.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	Roadside vegetation has been retained where practical, with a buffer of 10-15m between the mine site and the Trial Harbour Rd where possible.

Zeehan Zinc is committed to continuously improving operating procedures at the Comstock Mine and has made commitments regarding the future management of the visual amenity of the Comstock Mine site. These commitments are summarised in Table 39.

Table 39: Future commitments made by Zeehan Zinc for the management of visual amenity.

No.	Visual Amenity Commitments
61	Maintain a buffer of vegetation along Trial Harbour Road.
62	Prevent unnecessary clearing of vegetation.

2.15 TRAFFIC MANAGMENT

ELMS 6194 and EPN 684/1 have no requirement for monitoring or recording for this activity.

In order to allow access to future ore reserves and the expansion of the current open pit, a short section of the Trial Harbour Road will be diverted. This has been timed to occur with an upgrade to Trial Harbour Road. Plans of the proposed road diversion are provided in Appendix O.

Once active mining operations, including the transport of ore concentrate, occur at the Comstock Mine, traffic movements along the Trial Harbour Road will increase. Truck movements will be limited to between 7am and 7pm. Furthermore, mining operations at the nearby Avebury Mine will also increase local traffic movements.

Prior to active transporting of ore along Trial Harbour Road, Zeehan Zinc will undertake a detailed traffic impact assessment.

The commitments made in the 2001 DPEMP, the permit conditions, and the actions taken by Zeehan Zinc are summarised in Table 40.

Table 40: EMP commitments, permit conditions, and related actions by Zeehan Zinc for traffic impacts.

EMP Commitments	Permit Conditions	Action by Zeehan Zinc
25: Provide detailed plans of the new Trial Harbour Road alignment with Stage 2 plans.	*ELMS 6194 Condition 6:* Activities on the land must be undertaken and managed in accordance with the prescriptions and the commitments set out in the EMP.	Detailed plans of proposed road diversion have been submitted to and approved by West Coast Council, with construction to occur in 2006.

Zeehan Zinc is committed to continuously improving operating procedures at the Comstock Mine and has made several commitments regarding the future management of the traffic impacts of the Comstock Mine. These commitments are summarised in Table 41.

Table 41: Future commitments made by Zeehan Zinc for the management of traffic.

No.	Traffic Commitments
63	Undertake a detailed traffic impact assessment prior to commencing active mining operations.
64	Liase with West Coast Council regarding the need for signage during active mining operations.

2.16 SUMMARY OF PERMIT COMPLIANCE

The following table summarises the environmental commitments outlined in the 2001 DPEMP and as discussed previously in this report, and indicates whether the commitments have been achieved during the review period (Table 42).

Table 42: Summary of EMP commitments achieved during the review period.

No.	EMP Commitments	Achieved ?	Relevant Section in this Report
1	Construction material will be clean material from the mine operation.	Not applicable during review period	Section 2.13.2
2	Construct and maintain a weir on Comstock Creek to best practice hydraulic engineering standards.	Not applicable during review period	Section 2.13.2
3	Conduct NAPP tests of excavated material and ensure suitable use.	Yes	Section 2.13.1
4	Install drainage ditches fitted with sediment traps and erosion control structures.	Yes	Section 2.9.2
5	Rehabilitate disturbed areas and waste dumps once 8m vertical lift is complete	Yes	Section 2.13.3

	using recovered or stockpiled topsoil.		
6	Conduct complete survey of available clay on the mine lease during Stage 1.	Yes	Section 2.13.3
7	Rehabilitation of clay pits will include re-contouring, grading with topsoil and seeding.	No	Section 2.13.3
8	Rehabilitate the mine site at the end of the mine life.	Not applicable during review period	Section 2.13.3
9	Construct surface drains around the stockpile and processing plant.	Yes	Section 2.9.2
10	Monitor Comstock Creek stream flow prior to entering the mine adit.	Yes	Section 2.9.2
11	Sample water flowing through the decline sediment trap and treat appropriately.	Yes	Section 2.9.2
12	Adapt water quality mitigation measures as results of monitoring indicate.	In progress	Section 2.9.2
13	Direct waste rock dump drainage to the designed wetland.	No	Section 2.9.2
14	Design wetland in Stage 1.	Not applicable during review period	Section 2.13.3
15	Rehabilitate the designed wetland at the end of the mine life.	Not applicable during review period	Section 2.13.3
16	Monitor all active water monitoring sites.	Yes	Section 2.9.2
17	Construct tailings dam to specifications.	Not applicable during review period	Section 2.13.2
18	Close tailings dam to specifications.	Not applicable during review period	Section 2.12.3
19	Reduce dust emissions by spraying water when necessary.	Yes	Section 2.6.1
20	Rehabilitate to achieve a self sustaining vegetation community in a stable environment.	In progress	Section 2.13.3
21	Commissioning an archaeological field survey of the new tailings dam site.	Yes	Section 2.8.2
22	Provide protection of Portals 1 and 2 adjacent to STWRD.	Yes	Section 2.8.2
23	Work in compliance with the Work Health and Safety Act 1995.	Yes	Section 2.10.2
24	Install and maintain silt traps and erosion control structures.	Yes	Section 2.9.2
25	Provide detailed plans of the new Trial Harbour Road alignment with Stage 2 plans.	Yes	Section 2.15

26	Dispose all tailings in tailings dams.	Not applicable during review period	Section 2.13.2
27	Conduct preparatory surveys, sealing and planning of tailings dams.	Yes	Section 2.13.2
28	Tailings dams will be closed to meet best practices requirements.	Not applicable during review period	Section 2.13.3
29	Studies of the geohydrological environment and construction materials, will be undertaken during Stage 1 and submitted for approval prior to dam construction.	Not applicable during review period	Section 2.13.2
30	Construct buffer storage around South Comstock Tailings Dam.	Not applicable during review period	Section 2.13.2
31	Conduct geological assessment of waste material to determine volume of neutralising material available.	Yes	Section 2.12.2
32	Dispose waste rock at STWRD and subsequent planned dumps.	Yes	Section 2.13.2
33	Ensure correct ratio of acid producing and non-acid producing material in dumps.	No	Section 2.13.2
34	Install and maintain silt traps at the base of the waste rock dumps.	Yes	Section 2.13.2
35	Ensure appropriate closure of waste rock dumps.	Yes	Section 2.13.3
36	Store hazardous materials in designated facility and in consultation and accordance with Industry Safety Inspectorate requirements.	Yes	Section 2.12.2
37	Provide impervious containment bunds and clean-up materials on site.	Partially	Section 2.12.2
38	Provide a spill management plan, staff training and monitoring of hazardous materials transported to and from the site and stored on site.	No	Section 2.12.2
39	Maintain and enhance roadside vegetation.	Yes	Section 2.14
40	Conduct NAG tests to determine appropriate use of excavated material from tailings dam site.	Not applicable during review period	Section 2.13.2
41	Establish groundwater bore holes for groundwater monitoring adjacent to the tailings dam.	Not applicable during review period	Section 2.7.2
42	Monitor surface water, the tailings dam and ground water every 3 months.	Yes	Section 2.7.2, Section 2.9.2 and Section 2.13.2
43	Monitor designed wetland regularly and treat accordingly.	Not applicable during review period	Section 2.13.2
44	Monitor waste rock NAG.	Yes	Section 2.13.1

45	Conduct environmental reviews and maintain the *Mine Managers Environmental Handbook.*	Partially	Section 2.13.1
46	Monitoring of groundwater will occur one year after tailings dam closure.	Not applicable during review period	Section 2.7.2
47	Rehabilitation monitoring program will be established upon closure of the mine.	Not applicable during review period	Section 2.13.3

Table 43 summarises the current environmental permit requirements and whether Zeehan Zinc have achieved compliance during their operations within the review period.

Table 43: Summary of compliance with current permits for Comstock Mine.

Permit	Condition No.	Complied With?	Comments
ELMS 6194	1	Yes	During review period, there has been no active mining or processing of ore at the mine site.
	2	Yes	Activities have been conducted in line with relevant legislation.
	3	Yes	Any changes (planned or undertaken) have not occurred without the approval of the Director.
	4	Yes	No incidents have occurred during the review period.
	5	N/A	Condition deleted under EPN 684/1
	6	Partially	Activities have been managed in accordance with the 2001 DPEMP. Not all commitments outlined in the 2001 DPEMP have been followed.
	7	Yes	All EMP reviews as required have been undertaken (including this report).
	8	Yes	Archaeological surveys have been conducted as appropriate. See Section 2.8.2
	9	Yes	No Aboriginal heritage sites or artefacts have been identified at the mine site. Aboriginal heritage survey carried out in 2006 over the site.
	10	Yes	Weed management measures have been used during the review period, including vehicle wash down practices. See Section 2.2.3
	11	N/A	Condition deleted under EPN 684/1
	12	Yes	All operations during the review period have not jeopardised the integrity of the Trial Harbour Road.
	13	Yes	Clay reserves reported to the Director in 2002. See Section 2.13.2
	14	Yes	Drains and sediment traps constructed at the mine site where practical. See Section 2.9.2
	15	Yes	All runoff directed where practical to silt traps at the base of the STWRD. See Section 2.9.2
	16	Yes	See Section 2.9.2
	17	Yes	See Section 2.9.2
	18	No	See Section 2.9.2
	19	N/A	Condition deleted under EPN 684/1

Permit	Condition No.	Complied With?	Comments
	20	No	There is currently approximately 3300 tonnes of ore stockpiled near the mill. The ore has been stockpiled since 2000. There is limited amounts of sulphidic ore exposed to the air in the open pit is estimated to be 10m^3 and has been exposed since 2001. Mine works during the review period have been designed to avoid exposing more ore to the air.
	21	Yes	See Section 2.13.2
	22	N/A	Condition deleted under EPN 684/1
	23	N/A	Condition deleted under EPN 684/1
	24	N/A	Condition deleted under EPN 684/1
	25	Yes, some conditions N/A	See Section 2.13.2
	26	N/A	See Section 2.13.2
	27	N/A	See Section 2.13.2
	28	N/A	Condition deleted under EPN 684/1
	29	N/A	Condition deleted under EPN 684/1
	30	Not applicable during review period	Permanent cessation of operations has not occurred during the review period.
	31	Not applicable during review period	Permanent cessation of operations has not occurred during the review period.
	32	Yes	Zeehan Zinc was requested on 20th December 2005 by the Director to submit a DRP by the 31st March 2006. A DRP will be submitted in accordance with this condition.
	33	In progress	There have been limited rehabilitation activities including revegetation during the review period. Revegetation that has occurred has utilised native indigenous plants. Rehabilitation procedures outlined in the DRP only use indigenous species.
	34	Yes	All temporary suspensions of activity that have occurred during the review period have been managed to ensure that there were no adverse environmental impacts.
	35	Not applicable during review period	Activities on the mine site have not ceased for a period of 2 years or more during the review period.
	36	Yes	See Section 2.9.2
	37	Yes	All water monitoring results during the review period were forwarded to the Director as soon as was practical.
	38	Yes	See Section 2.12.2
	39	Yes	See Section 2.12.2
	40	Yes	See Section 2.12.2
	41	Yes	See Section 2.6.2
	42	Not applicable during review period	See Section 2.6.2
	43	Not applicable during review period	Crushing and screening plants have not been operational during the review period. See Section 2.6.2

Permit	Condition No.	Complied With?	Comments
	44	Yes	There has been no complaints from the Director regarding the management of weeds at the Comstock Mine site during the review period.
EPN 684/1	1	No	Zeehan Zinc liaised with DTAE regarding the permit condition for rehabilitation of the CWRD to be completed by the 20th June 2003. See Section 2.13.2
	2	Yes	See Section 2.13.2
	3	Yes	See Section 2.13.3
	4	Yes	Commencement of extraction of clay from Clay Reserve 2 has not yet occurred. See Section 2.13.3
	5	Yes	See Section 2.13.3
	6	Yes	See Section 2.13.3
	7	No	See Section 2.13.1, Section 2.13.3
	8	No	See Section 2.13.1, Section 2.13.3
	9	Yes	See Section 2.13.3
	10	No	See Section 2.13.3
	11	No	See Section 2.9.2, Section 2.13.3
	12	Yes	A copy of EPN 684/1 has been held in a known location throughout the review period.

3 OPERATIONS DEVELOPMENT

3.1 PAST DEVELOPMENTS

3.1.1 Mine Status

The original DPEMP was submitted by Oceania Tasmania for approval in 2001, and a permit was issued by DTAE and West Coast Council in July 2001 to mine 200,000 tonnes per annum, with the gravity tails initially being disposed of at the SCP. The Thompson and Brett proposal for co-disposal of mine waste and tailings at the STWRD was submitted for approval in 2002. This plan was revised in December 2003 after lease boundaries were revised to include a further 11ha to allow an increased tailings co-disposal area and thereby facilitate a mine life of approximately 3 years (storage capacity for 1,200,000 tonnes of waste rock and tailings). The approval process for the tailings disposal facility with DTAE and WCC is still in progress.

3.1.2 Mill Construction

Construction of the crushing and gravity separation mill was completed in 2002, with the mill designed to allow for production of an ore pre-concentrate. The main stages involved in pre-concentrate production include crushing, screening and gravity separation (Plate 24). A complete trial of the mill is planned for 2006, using ore from the existing stockpile.

Plate 24: Completed gravity separation mill.

3.1.3 Allison's Open Pit Development

Construction of the Allison's open pit has been directly associated with the intermittent episodes of mining at the Comstock Mine. In 2000, Oceania Tasmania extended the open pit and extracted 3,300 tonnes of high grade ore (21.5% Zn, 14.5% Pb, 540 Ag g/t). Since 2000, the Allison's open pit has not been extended. The rehabilitation of the CWRD and associated operations lead to minor alterations to the walls of the Allison's open pit. The current state of the Allison's open pit is illustrated in Plate 25.

Plate 25: Allison's open pit (January 2006).

3.2 FUTURE DEVELOPMENTS

3.2.1 Comstock Mine Plan

Coffey Geosciences (2001) prepared a 10 year mining plan, consisting of 4 separate stages (Figure 16, Appendix Z):

- Stage 1 – Extension of Allison's open cut northwards to complete mining of Allison's Lode;
- Stage 2 – Open cut mining of Balstrup Fault at shallow depths;
- Stage 3 – Construction of Main Lode open cut; and
- Stage 4 – Linkage of the Balstrup and Main Lode open cuts to continue mining of the western surface section of the Balstrup Fault.

The results of further resource definition activities by Zeehan Zinc during the review period have not altered the conceptual 10 year mine plan developed in 2001. As a result, Zeehan Zinc have revised the timing of the extraction of the ore reserves, and a block model for Allison's Lode has been generated to assist in planning of ore extraction (Appendix AA).

A resource statement has been issued for Allison's Lode (Appendix BB) with further definition of the Main Lode and Balstrup Fault to a JORC compliant Indicated or Measured category is planned to occur concurrent with active mining of Allison's Lode. Drilling of Main Lode is currently underway.

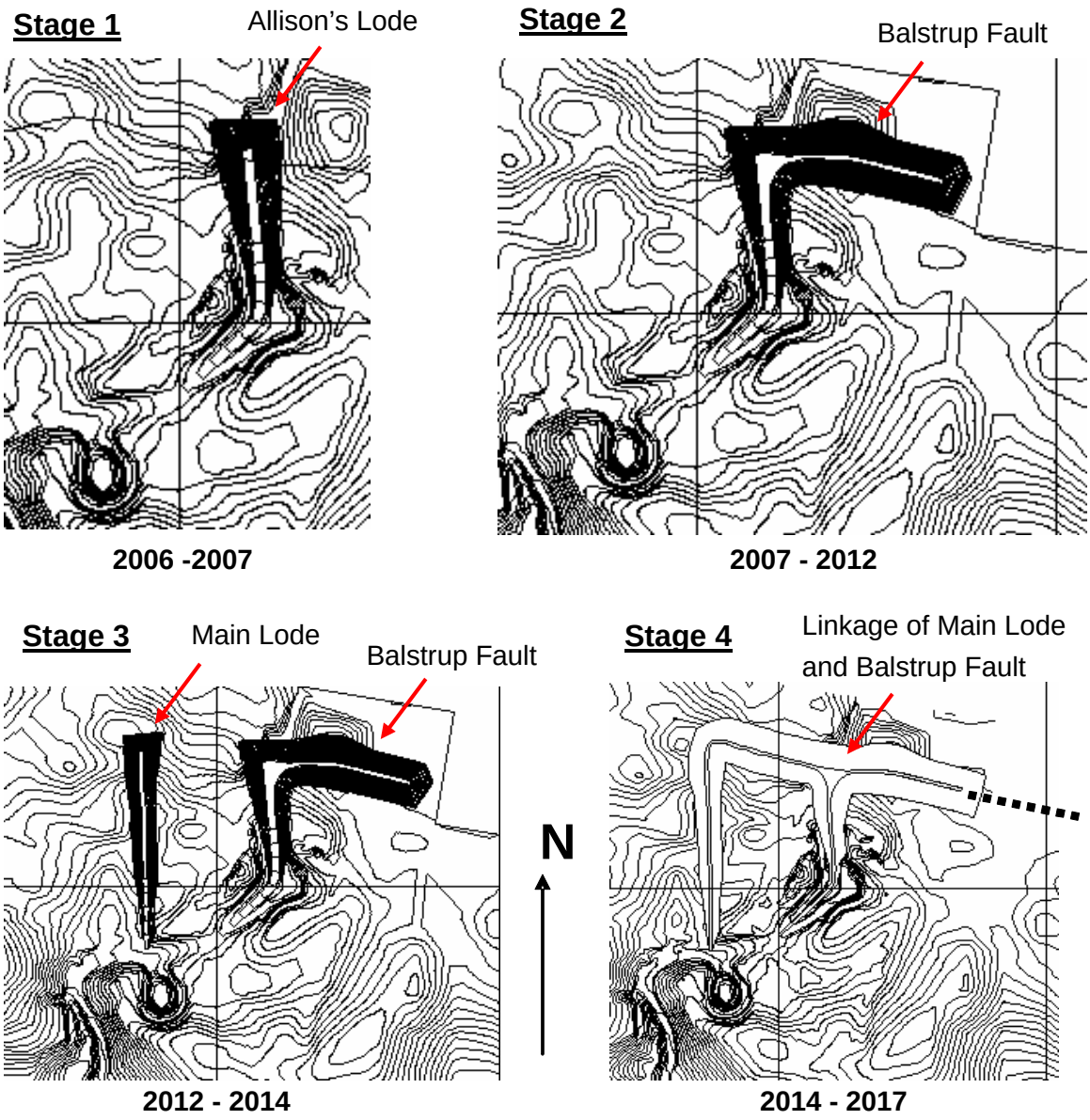


Figure 16: Comstock Mine 10 year mine plan (Coffey 2001).

Under the production schedule outlined in Minserve (2006a), it is estimated that Allison's Lode will be mined by contractors in less than 12 months, assuming that mining will start at the highest bench and excavate benches in sequence from the top down to the final pit design. A total volume of approximately 106,600m^3 of material has been estimated to be excavated, comprising of approximately 27,700m^3 of ore and 78,900m^3 of waste rock. Details of the production schedule are provided in Appendix R, with the assumption that all ore material removed is crushed and passes through the pre-concentration gravity plant on site.

In 2005, the Allison's open pit design was revised by Coffey Geosciences (Appendix S). The open pit design was based on the following parameters:

- Maximum bench height of 12m;
- Access ramp grade of 10%;
- Minimum berm width of 4m (at 283m and 293m RL);
- Single width ramp at ~13m;

- Maximum batter slope of 65 degrees (below 283m RL);
- Minimum batter slope of 45 degrees (above 283m RL to surface intercept);
- Pit base of ~20m, consistent with ore width and adequate working space requirements; and
- Pit base at 271m RL and maximum ramp elevation of approximately 289m RL.

Associated with the development of the mine plan, are several other developments. As outlined in Section 2.13.2, Zeehan Zinc is planning to begin construction of a tailings co-disposal facility in 2006 as outlined in the Waste Management Plan (2003) (Appendix T), which has approval from the ACDC (Appendix L). As previously mentioned, the Waste Management Plan (2003) was submitted for approval in 2003, and to date the decision is still pending.

Section 2.15 provided the proposed diversion of a short section of the Trial Harbour Road, concurrent with current upgrades to the road by WCC, to allow access to future ore reserves at the Comstock Mine. The diversion of the road is planned to occur in 2006, and Appendix CC provides the current road diversion plans.

3.2.2 Comstock Mine Ore Reserves

There are several zones of mineralisation identified within the Comstock Mine area that could be utilised by Zeehan Zinc's mining operations (SMG 2005) including:

- Allison's Lode;
- Main Lode;
- Balstrup Fault;
- Boss Lode;
- Sylvester Lode;
- Susanite Lode; and
- Britannia Lode.

ZZ Exploration Pty Ltd (ZZ Exploration), a subsidiary of Zeehan Zinc, have applied for mining lease 5M/2005 over the extension of the Balstrup Fault, which connects to mining lease 43M/1985 and 123M/1947. This mining lease could provide access to future resources for the Comstock Mine.

Two independent reviews and estimations of the zinc (Zn), lead (Pb), and silver (Ag) resources associated the Comstock Mine were carried out in 2005 by competent geologists under the requirements of the Joint Ore Reserves Committee (JORC) Code (Cottle 2005 (Appendix DD), SMG Consultants 2005a (Appendix BB)) (Table 44). Differences in tonnage estimates for the Allison's Lode resource are due to different estimation methods used.

Table 44: Resource estimates for the Comstock Mine.

	Tonnes	Grade Zn% / Pb% / Ag g/t	Source
Allison's Lode			
Measured	7,420	16.3 / 8.6 / 277	Cottle September 2005
Inferred	26,150	7.0/ 1.9 / 35	
Indicated	30,160	7.2 / 2.0 / 36	
Measured	32,028	5.7 / 1.5 / 29.1	SMG Consultants November 2005
Inferred	62,637	4.77 / 1.08 / 22.8	
Indicated	3,563	2.25 / 0.67 / 17.1	
West Comstock (Main Lode)			
Measured	5,070	4.1 / 3.2 / 40	Cottle September 2005
Inferred	12,710	4.3 / 1.7 / 24	

	Tonnes	Grade Zn% / Pb% / Ag g/t	Source
Balstrup Fault			
Inferred	4,600,000	5.7 / 3.3 / 35	Cotlco February 2005

A probable reserve of 98,881 tonnes at 5.46% Zn, 1.93% Pb, and 42.67 Ag g/t has been calculated for Allison's Lode (Minserve 2006b, Appendix EE).

In December 2005, the total mineral deposits associated with the Comstock Mine were valued at between $93.5 million and $166.5 million (Anderson and Schwab 2005, Appendix FF).

3.2.3 Other Resources

Zeehan Zinc has potential access to two other deposits within the Zeehan area: the Oceana deposit and the Marisposa deposit. Ore extracted from these deposits could potentially be transported to the Comstock Mine for pre-concentration using the gravity mill.

ZZ Exploration has applied for mining lease 2M/2005 over the Oceana deposit, located approximately 4km south of the township of Zeehan. An extensive exploration program has lead to the following JORC compliant resources estimate:

- A total indicated resource of 665,531 tonnes at 5.2% Pb, 2.3% Zn, and 29.8 Ag g/t; and
- An inferred resource of 938,147 tonnes at 2.6% Pb, 1.2% Zn, and 16.3 Ag g/t (SMG 2006a).

Zeehan Zinc's exploration company, ZZ Exploration Pty Ltd currently holds an exploration licence (EL 20/2002) over the Marisposa deposit, located approximately 6km southeast from the township of Zeehan, and have also applied for mining lease 4M/2006. A review of known data from this deposit has produced the following JORC compliant resource estimate:

- An inferred resource of 573,737 tonnes at 5.09% Pb, 2.02% Zn, and 62.0 Ag g/t (SMG 2006b).

Zeehan Zinc is continuing exploration over the Oceana and Mariposa deposits to improve resource estimates, and obtain a better understanding of the local geology at these sites.

3.2.4 Summary of Proposed Operations at the Comstock Mine

A summary of the Comstock Mine operations in the next three years is provided below:

2006

- Construction of the polishing pond and initial stage of tailings storage facility;
- Diversion of the Comstock Creek and separation of adit flow from natural creek flow;
- Diversion of the Trial Harbour Road to allow for expansion of the current open pit;
- Complete application of topsoil to CWRD;
- Hydroseed the CWRD in spring 2006;
- Begin mining of ore from Allison's Lode;
- Undertake active onsite trials of mill and gravity plant using stockpiled ore;
- Further resource definition through drilling of Main Lode and the Balstrup Fault; and
- Processing of ore at Comstock Mine.

2007

- Complete extraction of ore from Allison's Lode;

- Further drilling over Main Lode and the Balstrup Fault;
- Submit mine plan for mining of Main Lode;
- Begin preparations for active mining of Main Lode;
- Continue progressive rehabilitation where practical; and
- Processing of ore at Comstock Mine.

2008

- Begin active mining operations at Main Lode;
- Continue resource definition over Balstrup Fault and the local area;
- Continue progressive rehabilitation where practical; and
- Processing of ore at Comstock Mine.

4 ENVIRONMENTAL IMPROVEMENTS AND PERMIT REVIEW

4.1 ENVIRONMENTAL IMPROVEMENTS

Since 2000, Zeehan Zinc has undertaken works at the Comstock Mine to improve the management of the natural environment and minimise adverse impacts from their mining operations.

A summary of all the major improvements to Zeehan Zinc's activities from 2000-2005 is provided in Table 45.

Table 45: Summary of environmental improvements at the Comstock Mine.

Date	Improvement	Location	Affect
2001	Construction of surface drainage system.	Ore stockpile, mill facility, STWRD.	Collection of surface water runoff to a central location for treatment prior to discharge to the Comstock Creek.
2001	Construction of silt traps.	STWRD and Allison's decline	Collection of silt from surface run-off prior to discharge to the Comstock Creek
2002	Recontouring of the CWRD.	CWRD	Improvement landform stability and an important part of rehabilitation works.
2002	Preventing the Comstock Creek from passing through old mine workings.	Northern side of the Trial Harbour Road.	Minimising the contact of Comstock Creek water with potentially acid producing rock material.
2002	Construction of new sites gates.	Mine entrance	Improved security and reduced risk of vandalism.
2003	Development of a Waste Management Plan for waste rock and tailings material.	STWRD	Provides a detailed management plan for waste rock and tailings material during active mining operations.
2004	Completion of rehabilitation of the CWRD including clay capping.	CWRD	Prevention of acid and metalliferous drainage resulting from oxidation of potentially acid producing waste rock material.
2005	Infilling of South Comstock Pit	SCP	Disposal of non-acid producing material and prevention of AMD from exposed sulphidic waste rocks.
2005	Installation of the v-notch weir.	Main adit outflow	Provides the opportunity for installation of continuous water monitoring system including flow rates and pH.
2006	Consultation with water specialist Lois Koehnken and development of a Conceptual Water Management Plan.	Comstock Mine site.	Presents site specific water management methods for acid and metalliferous drainage at

			the Comstock Mine.

4.2 ENVIRONMENTAL PERMIT REVIEW

4.2.1 Current Environmental Permits

ELMS 6194 was issued to Zeehan Zinc Ltd on 19th July 2001, by West Coast Council.

EPN 684/1 was issued to Zeehan Zinc Ltd on 19th May 2003, by the Director of Environmental Management. This EPN replaced several conditions within ELMS 6194 that related to the use of the SCP as a tailings disposal dam.

4.2.2 Recommended Amendments

There are several conditions within ELMS 6194 relating to the use of the SCP as a tailings impoundment, that have not been replaced by EPN 684/1 and are no longer relevant. The conditions relating to the use of the SCP as a tailings dam that are still active are Condition 25c-f and Condition 26. Revision of these now obsolete conditions is recommended.

EPN 684/1 Condition 9 restricts the limit that the SCP can be filled in to RL 273m, and thereafter benching of waste rock must occur. Zeehan Zinc propose to continue to dispose non-acid producing waste rock material into the SCP. A revision of the height to which the SCP can be filled to prior to benching is recommended, given that Zeehan Zinc have reached RL 273m and the open pit has not yet been re-filled. A revision of the relative height to which the SCP can be filled to 285m RL would effectively fill the SCP to the second highest bench and would create a stable landform. The surface created through the infilling of the SCP to RL 285m could potentially be used as a site for future mine infrastructure if required, assuming it met the appropriate engineering requirements.

ELMS 6194 Condition 18 requires that the surface waters within the mine site be monitored weekly and through the use of crushed limestone, maintain surface water pH readings to within ± 1.0 pH unit of background surface waters. Given the ineffectiveness of crushed limestone in raising pH of AMD and the resulting armouring of the limestone with iron hydroxides (which has been recognised by DTAE), a revision of the wording of the condition is recommended, to allow for other methods of AMD treatment to be fully realised.

5 CONCLUSIONS AND COMMITMENTS

5.1 CONCLUSION

The environmental commitments provided in the DPEMP 2001 and whether the Zeehan Zinc operations have been operating in compliance with ELMS 6194 and EPN 684/1 have been reviewed. A review of monitoring data from 2003 to 2005 and a discussion of environmental management for the same time period has also been undertaken.

The review has identified that the Zeehan Zinc operation has undergone several improvements in environmental performance during the review period, and that in general, Zeehan Zinc has complied with the relevant environmental permits.

Several changes to the development of the mine, ore processing method, and disposal of waste rock material has occurred since development of the 2001 DPEMP, with some sections of the DPEMP no longer applicable (e.g. use of the SCP as a tailings dam). As a result, it is recommended that the management strategies outlined in this review should be applied to all current and future operations at the Comstock Mine.

Zeehan Zinc is committed to continued improvement in environmental performance during 2006 and beyond. In order to achieve this, Zeehan Zinc has committed to future environmental improvements that will assist in achieving Best Practice Environmental Management. These commitments are summarised in Table 46.

Table 46: Summary of future environmental commitments made by Zeehan Zinc.

No.	Commitment Description	Page No.
1	Undertake progressive rehabilitation using native species wherever practical.	10
2	Undertake regular surveys of the mine site for introduced plants and address weed populations as necessary.	10
3	Develop a Weed Management Plan.	10
4	Minimise clearing of native vegetation where practical.	11
5	Contact the relevant authorities should a Wedge-Tailed Eagle or Grey Goshawk nest be identified, or a Tasmanian Devil with facial tumour disease be observed	11
6	Should any Aboriginal cultural material be uncovered during mine operations, all operations in the immediate area will be ceased and the relevant authorities contacted.	13
7	Ensure that all employees are aware of the importance of Aboriginal heritage sites and their protection.	13
8	Continue to protect significant heritage sites.	14
9	Ensure all staff are aware of the importance of protecting mine heritage sites.	14
10	Regularly service vehicles to ensure particulate emissions are within allowable levels.	14
11	Estimate the amount of greenhouse gases emitted during full mining operations.	14
12	Investigate tree planting options within the mine site area to offset greenhouse gas emissions.	15
13	Use water to settle any areas where dust emissions could occur.	16
14	Ensure all material transported from the site is in covered vehicles.	16
15	Ensure visible dust from the mine operations does not cross the mining lease boundary.	16
16	Fit and maintain conveyors with water spraying devices for dust suppression.	16
17	Establish and run a site management system that integrates dust control provisions, and train staff in the site management system.	16

18	Investigate groundwater rates of flow within the local area.	18
19	Identify the sources of water entering the adit network.	18
20	Monitor the Comstock Creek water quality downstream of the adit discharge point (i.e. the mixing zone).	32
21	Continue to regularly sample water at the 4 monitoring sites and begin regular flow monitoring.	32
22	Develop a detailed water budget for the Comstock Mine site.	32
23	Continue to install and maintain sediment traps, including regularly emptying silt traps.	32
24	Implement and annually revise the Conceptual Water Management Plan (Koehnken 2006).	32
25	Utilise the Thompson & Brett (2003) Waste Management Plan to allow for the management of AMD through construction of a tailings co-disposal facility and diversion of the Comstock Creek.	32
26	Continue to develop the network of surface drains to minimise surface runoff over material that could lead to AMD.	32
27	Drainage from undeveloped areas will continue to flow in natural drainage lines.	32
28	Ensure all mine personnel continue to operate in compliance with the *Work Health and Safety Act 1995*.	33
29	Remove refuse regularly and recycle all wastes where possible.	34
30	Separate bins will be provided for the collection of recyclable wastes.	34
31	Train staff in solid waste handling and management.	34
32	General refuse will be regularly collected and deposited at an approved landfill facility.	35
33	Implement the waste management hierarchy for solid waste.	35
34	Hazardous materials will be stored with appropriate signage and fire control measures.	37
35	MSDS's will be displayed with hazardous materials and appropriate OH&S equipment will be provided by Zeehan Zinc.	37
36	Hazardous waste fluids released during operations will be collected for reuse or appropriate disposal.	37
37	Spill kits will be maintained on site and staff trained in emergency spill kit use.	37
38	Establish and emergency response plan and train staff in procedures and responsibilities.	37
39	Prepare a management plan for hazardous materials including an inventory of all hazardous materials stored and handled on site.	37
40	Utilise oil booms in the sediment trap at the base of Allison's decline to collect any hydrocarbons present in surface waters during active mining periods.	37
41	Implement the visual waste characterisation procedure to be used during mining operations.	42
42	Develop a Mine Managers Environmental Handbook.	42
43	Ensure all personnel are trained in the visual identification of acid and non-acid producing rock types.	42
44	Continue to follow BPEM for waste rock dump construction.	42
45	Undertake progressive rehabilitation of waste rock dumps wherever practical.	42
46	Undertake analysis of the physical properties of tailings produced during the mill trial.	49
47	Continue using the SCP as a waste rock disposal site for low NAG waste rock, following BPEM with regard to the final landform design.	49
48	Perform column leach tests of future waste rock material dumped in the SCP.	49

49	Complete topsoiling and seeding operations on the CWRD in 2006.	49
50	Undertake progressive rehabilitation works on waste rock dumps whenever practical.	49
51	Develop and maintain all waste rock dumps following BPEM.	49
52	Manage AMD seepage and runoff from waste rock dumps.	49
53	Dispose of waste rock material appropriately following the visual waste characterisation and identification manual developed for the Comstock Mine.	49
54	Strip topsoil and stockpile using BPEM, and minimise the amount of time the organic matter is stockpiled for.	56
55	Avoid disturbing topsoil stockpiles in order to protect soil structure and prevent erosion.	56
56	Prevent the spread of *Phytophora cinnamomi* by use of soil and plants free of the disease.	56
57	Minimise the spread of *Phytophora cinnamomi* by the use of soil free machinery and staff training.	56
58	Clay extraction operations will not utilise known acid producing material for track basements.	61
59	Removal of clay from clay reserves will be line with BPEM.	61
60	Clay reserves will be rehabilitated following completion of clay extraction.	61
61	Maintain a buffer of vegetation along Trial Harbour Road.	61
62	Prevent unnecessary clearing of vegetation.	61
63	Undertake a detailed traffic impact assessment prior to commencing active mining operations.	70
64	Liaise with West Coast Council regarding the need for signage during active mining operations.	70

6 REFERENCES

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7 PERSONAL COMMUNICATIONS

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8 APPENDICES

Appendix A: Comstock Mine Flora and Fauna Survey – ECI Pty Ltd, 2006

Ecological Assessment of the Proposed Comstock Mining Lease Area Extension – ECOtas Pty Ltd, 2007

Weed and Root Rot Fungus (*Phytophthora cinnamomi*) Management Plan for Zeehan Zinc Ltd Mining Lease Areas – ECOtas Pty Ltd, 2007

Appendix B: Certified Forest Practices Plan for the Comstock Mine – TAS Land and Forest Pty Ltd, 2007

Appendix C: Comstock Mine Weed and Disease Management Plan – SEMF Pty Ltd, 2007

Appendix D: Aboriginal Heritage Survey– R. Sainty 2006

Appendix E: European Heritage Survey – Archaeological Services Tasmania, 2006

Appendix F: Groundwater Monitoring and Management Plan – REM Pty Ltd, 2007

Appendix G: Comstock Mine Environmental Monitoring Report - Oceania Tasmania Pty Ltd, 2006

Appendix H: Conceptual Water Management Plan for the Comstock Mine – L. Koehnken, 2006

Conceptual Water Management Plan for the Comstock Mine - Update – L. Koehnken, 2007

Appendix I: Comments on Passive Approaches to Treating AMD – L. Koehnken, 2006

Appendix J: Process Water Management Plan – GHD Pty Ltd, 2007

Appendix K: Comstock Mine Water Management Plan – SEMF Pty Ltd, 2007

Appendix L: Proposed Mine Waste and Tailings Dam Approval Letter – ACDC, 2004

Appendix M: Comstock Mine Spill Management Plan – SEMF Pty Ltd, 2007

Appendix N: Comstock Mine Visual Waste Characterisation Manual – SEMF Pty Ltd, 2007

Appendix O: Waste Rock Management Plan – GHD Pty Ltd, 2007

Appendix P: Comstock Mine Mine Managers Environmental Handbook – SEMF Pty Ltd 2007

Appendix Q: Acid Mine Drainage Status Report – Oceania Tasmania Pty Ltd, 2003

Appendix R: Allison's Lode Mining Reserve Study - The Minserve Group Pty Ltd, 2006

Appendix S: Allison's Revised Pit Design – Coffey Geosciences Pty Ltd, 2005

Appendix T: Waste Management Plan – Thompson & Brett Pty Ltd, 2003

Appendix U: Tailings Storage Facility Operation, Maintenance, and Surveillance Manual – GHD Pty Ltd, 2007

Appendix V: Comstock Mine Access Road and Polishing Pond Construction Material AMD Assessment – GHD Pty Ltd, 2007

Appendix W: Geotechnical Assessment of the Capping of the Central Waste Rock Dump – Coffey Geosciences Pty Ltd, 2004

Appendix X: Comstock Mine Infiltration Modelling – Coffey Geotechnics Pty Ltd, 2007

Appendix Y: Clay Reserve Report – Oceania Tasmania Pty Ltd, 2002

Appendix Z: Comstock Conceptual Year Mine Plan – Coffey Geosciences Pty Ltd, 2001

Appendix AA: Block Model Report for Allison's Lode – SMG Consultants Pty Ltd, 2005

Appendix BB: JORC Resource Statement for Allison's Lode – SMG Consultants Pty Ltd, 2005

Appendix CC: Diversion of Trial Harbour Road Plans - SKM Pty Ltd, 2006

Appendix DD: Resources Estimation and Classification Update – Cotlco Pty Ltd, 2005

Appendix EE: Allison's Lode Reserves Statement – The Minserve Group Pty Ltd, 2006

Appendix FF Review and Valuation of the Mineral Assets of Zeehan Zinc – Anderson & Schwab, 2005