



51IZ2704



Yallourn Energy Pty Ltd

**Mining Licence Bond Review**

"Close Now" Liability at 30 Sep 2002

Report

December 2002



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## 1. INTRODUCTION

A Cost Model for the Whole of Life Rehabilitation of the Yallourn Mine, which incorporates the Township, East and Maryvale coalfields, was previously developed in 1999 and revised in July 2001. This model was originally based on meeting the rehabilitation proposal as outlined in the "Rehabilitation Master Plan" (RMP) 1998, and the 2001 revision incorporated mine development changes resulting from the adoption of the Alternate Morwell River Diversion. The plan defined how and when areas were to be rehabilitated.

The current mine plan involves the completion of coal winning in 2032 (an extension of 5 years on the original plan). The principles of the 1998 RMP have been maintained with changes made to the shape of rehabilitation areas and the timing of rehabilitation works to conform with the current mine development concept plans.

The long term proposal to flood the mine after completion of mining activities is maintained, with the final water level and range consistent with the previous report. (ie. Water level to range between RL 36.0 and 38.0.) Treatment of shoreline areas also remains consistent with the previous report.

Where possible, rates for works were based on actual experience in the Yallourn mine, and these can be compared with DNRE rates published in their 1997 document: "Guidelines for the Establishment of Rehabilitation Bonds for Mining and Extractive Industry". At the closure of the mine, coal handling equipment, pipelines and dredgers will need to be dismantled, rehabilitation finished and the mine made safe for ultimate public access. Dewatering will be progressively slowed and channels, weirs and other work carried out to allow the mine to be flooded. These activities have been itemised and costed.

This study shows the costs for rehabilitation under a "close now" scenario based on the mine development as at 30 September 2002.



## 2. REHABILITATION AREAS

Rehabilitation areas are defined for the purpose of this costing exercise. They have been based on the RMP and areas designated according to the timing of activities and the geographic zone. The areas allow separate costing of the rehabilitation works above and below the future water level as well as those activities required to ensure the final rehabilitation of the mine.

The areas used in this report are generally the same as those used in the previous 1999 report, with some changes in area, with new areas added for the YNOC area and extractive industries activities on the perimeter of the future Maryvale Field. The areas are shown on the Disturbed Areas Plan included as Figure 1 in this report. Details of each area (name, area, current status, proposed mining activity, end use, rehabilitation requirements and timing) are included in Appendix A. Note that the activities associated with each area are based on whole of life rehabilitation planning and some of these, such as interim vegetation in areas ultimately to be inundated, would not proceed under a "Close Now" scenario.

The cost of rehabilitating Areas 15, 16, 20 and 23 has been reduced compared with the allowances provided in the 1999 and 2001 reports referred to above, as significant portions of these areas will be inundated and no rehabilitation treatment is proposed below the inundation line.

Appendix B details areas for rehabilitation under the "Close Now" scenario which are represented by the working faces and southern batters of the current East Field mining operation.



### 3. COSTING OF REHABILITATION WORK

The cost of rehabilitation work is based on the estimated rehabilitation areas, the treatment of each rehabilitation area, the quantities estimated from detailed cross sections, and unit rates for the rehabilitation work. The treatment for the rehabilitation work is taken from the RMP and the rates used for rehabilitation works are detailed in Appendix C. These rates were developed based on experience within Yallourn Mine. Also included in Appendix C is a tabulation of DNRE rates from the 1997 report referred to above for comparison with YE rates.

A spreadsheet has been developed for each area showing the costs of rehabilitation works (Appendices D & E).



## 4. REHABILITATION ASSUMPTIONS

The following assumptions have been made:

- ▶ The current Rehabilitation Master Plan (RMP) is the basis for rehabilitation treatment and timing.
- ▶ The Yallourn Mine will be inundated after mining has ceased. Coal production is currently planned for completion in 2032. Inundation will be assumed to commence in 2035 and take approximately 10 years to complete. This scenario is maintained under the "Close Now" scenario.
- ▶ The top water level in the flooded mine has been set at AHD 38 (dictated by the Morwell River level at the south end of the mine) and the lower water level has been set at AHD 36.0.
- ▶ The water level may vary between the above limits. Inlet and outlet structures will be required to accommodate the change in level. Indicative costs for these structures have been included.
- ▶ Generally all surfaces above the future water level will be topsoiled. It has been assumed that 125 mm thick topsoil will be used.
- ▶ The finished batter slopes for areas above the future water line will be 3H to 1V.
- ▶ Within the shoreline zone a batter slope of 6H to 1V is assumed. To limit the effect of wave erosion, planting of wetland vegetation will be required when the final water level is attained. In some areas likely to be used for swimming a "beach" may be developed with a minimum slope of 8H to 1V.
- ▶ Coal batters and some areas on the base of the mine which will be below the water line will not be clay covered. Coal benches below the water line, apart from the final operating bench positions, are clay covered during mining operations to minimise the risk of fire. This is not a rehabilitation cost.
- ▶ Sowing to pasture is the initial stabilising and fire safe treatment for areas above water level. Subsequent planting of some areas to woodlands and wetlands is as shown in the RMP.
- ▶ At the closure of mining the equipment and buildings are to be dismantled. The Raw Coal Bunker dismantling is considered to be part of the Yallourn W Power Station and its cost is not included in this study.
- ▶ To flood the mine it has been assumed that a connection will be made to the Morwell River at the southern end of the mine, and that water will discharge into the Morwell River at the confluence with the Latrobe River. Provision has been made for channels and weirs to be constructed.



## 5. CONCLUSION

Cost rates have mainly been established based on experience in the Yallourn Mine. Where experience is limited (eg woodland and wetland development) estimates have been made based on estimates made for the Morwell River diversion. The rehabilitation rates are detailed in Appendix C, together with comparison rates from DNRE.

The costs for removal of buildings and plant, construction of water diversion infrastructure, and construction of public facilities have been taken from the 1999 and 2001 Whole of Life rehabilitation cost studies referred to earlier.

The estimated cost for rehabilitation under the "Close Now" scenario is \$13,356,872. This cost is based on the whole-of-life rehabilitation cost model modified for areas of land that have not yet been disturbed, and removes the cost of interim treatment for areas subject to inundation. Additional areas included in this estimate include Morwell River Diversion, operating faces in East Field, southern batters of East Field and borrow areas ahead of the operating faces in East Field. A summary spreadsheet showing the cost for each area is provided in Appendix D while Appendix E contains a breakdown of costs for each of the areas.

Costs not included in the estimate include:

- ▶ Maryvale External Disturbance (Area 34 – the 2 former quarry operations were extractive industries and would be subject to rehabilitation bonds under the Extractive Industries Act)
- ▶ YNOC Ash Landfill area (Area 33 – an EPA Landfill Assurance covers this area)
- ▶ "Public facilities" (Area 32 - car parks, walking tracks, etc – not considered necessary for bond calculation purposes)





Appendix A

## DESCRIPTION OF REHABILITATION AREAS (WHOLE OF LIFE PLAN)

## Areas 1 to 11 – Inundated Areas

### AREA 1 - SOUTHERN OVERBURDEN DUMP

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<b>Area:</b>	<b>191 Ha</b>
Current Status:	Site is currently available to rehabilitate.
Proposed Mining Activity	None
Commitment to Rehabilitate	Current
End Use:	Inundation
Rehabilitation:	Interim stabilisation from 2002 (Approx. 40 Ha each year)

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### AREA 2 - FIRE SERVICE PONDS

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<b>Area:</b>	<b>133 Ha</b>
Current Status:	Site includes Fire Service and Flocculation Ponds (80 Ha).
Proposed Mining Activity	These will remain until end of mine
Commitment to Rehabilitate	Land between ponds is available to be rehabilitated.
End Use:	Inundation
Rehabilitation:	Master plan does not show any rehabilitation of the pond areas. Part interim stabilisation (50 Ha) could be undertaken when other Areas of the internal dumps are treated. (say 2016 to 2018)

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### AREA 3 - WESTERN OVERBURDEN DUMP

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Area has been combined with Area 4 which covers the current Township Field Overburden Dump.

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AREA 4 - OVERBURDEN DUMP TOWNSHIP FIELD

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<b>Area:</b>	<b>366 Ha</b>
Current Status:	Overburden dump and Coal floor
Proposed Mining Activity	Overburden dumping – 2001 to 2010. A small lake is developed on the dump adjacent to the coal dyke for preliminary treatment of runoff prior to discharge via the Fire Service Pond.
Commitment to Rehabilitate	Following placement of backside pass.
End Use:	Inundation
Rehabilitation:	Rehabilitation after dumping completed. Interim stabilisation in 2007 – 2015, Approx. 40 Ha/annum.

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AREA 5 - OLD MIDFIELD DUMP

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<b>Area:</b>	<b>81 Ha</b>
Current Status:	Shaped and stabilised now. Vegetation contains many weeds.
Proposed Mining Activity	Morwell River Diversion embankment works.
Commitment to Rehabilitate	As part of Morwell River Diversion Project
End Use:	Morwell River Diversion embankment remains
Rehabilitation:	Around 2005 as part of Morwell River Diversion Project works.

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AREA 6 - OLD MIDFIELD DUMP

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<b>Area:</b>	<b>169 Ha</b>
Current Status:	Old worked out mine that has significant vegetation cover and is substantially rehabilitated to pasture already.
Proposed Mining Activity	None
Commitment to Rehabilitate	Minor interim stabilisation of O/B dump, conveyor formations and dredger transfer routes.
End Use:	Inundation
Rehabilitation:	Minor rehabilitation – Interim stabilisation (8 Ha) around 2010 after O/B conveyors relocated.

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AREA 7 – NORTHERN PARTS OF ORIGINAL YALLOURN MINE

<b>Area:</b>	<b>51 Ha</b>
Current Status:	Rehabilitated substantially completed
Proposed Mining Activity	None
Commitment to Rehabilitate	Minor rehabilitation in short term.
End Use:	Inundation apart from batter areas.
Rehabilitation:	Modify batters to 6 to 1 in shoreline zone with some small steeper batters on the west side near rising conveyors. Carry out around 2012 using waste fill from Maryvale operations.

AREA 8 - CONVEYOR FORMATIONS ETC.

<b>Area:</b>	<b>81 Ha</b>
Current Status:	Conveyor formations
Proposed Mining Activity	Conveyor formations required till end of mine
Commitment to Rehabilitate	Current
End Use:	Will be substantially inundated at end of mine.
Rehabilitation:	May need to remove slabs and formation over 5Ha section, which will be above water line, and sew to pasture.

AREA 9 – EAST FIELD – FLOOR

<b>Area:</b>	<b>392 Ha</b>
Current Status:	Mine floor partially exposed.
Proposed Mining Activity	East Field mining development includes excavating the coal, dumping of BWE removed overburden and truck dumping of overheight O/B from Maryvale. Drainage retention ponds to be developed
Commitment to Rehabilitate	Area created as bottom system completes excavation, ie. Current (160 Ha) – to 2012 (392 Ha)
End Use:	Inundation
Rehabilitation:	Progressively interim rehabilitate as dump areas are completed. (ie 2016 to 2030 – Approx. 25 Ha/year).

AREA 10 - MARYVALE NORTHERN FLOOR – INCLUDING DRAINAGE POND

<b>Area:</b>	<b>195 Ha (Including 65 Ha of pond)</b>
Current Status:	Not mined
Proposed Mining Activity	Maryvale field excavation. Overburden dumping.
Commitment to Rehabilitate	Area created as bottom system completes excavation, ie. 2012 to 2019. Overburden dumping will continue in this area towards end of overburden excavation in Maryvale.
End Use:	Inundation
Rehabilitation:	Progressive interim rehabilitation after internal overburden placed. Interim treatment in 2019 to 2024.

AREA 11 - MARYVALE – SOUTHERN SECTION FLOOR

<b>Area:</b>	<b>136 Ha.</b>
Current Status:	Not yet mined.
Proposed Mining Activity	Maryvale field coal winning followed by O/B dumping partially covering the coal floor. Substantial area of coal floor will remain.
Commitment to Rehabilitate	Area progressively created as bottom system completes coal excavation and O/B dump is developed, ie. 2020 to 2031
End Use:	Inundation
Rehabilitation:	Rehabilitate northernmost overburden dump area only (80Ha) with interim stabilisation in 2029/32. Southern dump areas do not justify rehabilitation effort, as inundation would occur shortly after completion.

## Areas 12 to 28 – Above Water Line

### AREA 12 - SOUTHERN OVERBURDEN DUMP

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<b>Area:</b>	<b>104 Ha</b>
Current Status:	Site is currently available for rehabilitation.
Proposed Mining Activity	None
Commitment to Rehabilitate	Current commitment for final rehabilitation.
End Use:	Open woodland with some closed woodland and wetlands.
Rehabilitation:	Plant pasture cover – Say 2015 to 2025. Open woodland created around 2022 to 2028. Old topside dump requires dozing to shape as part of wetland formation. Closed woodland and wetland created around 2032. 80 % open woodland, 15 % closed woodland and 5 % wetland.

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### AREA 13 – WESTERN OVERBURDEN DUMP

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Previous Area 13 reduced in size, due to overburden dumping changes, and combined with area 12.

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### AREA 14 – MIDFIELD DUMP

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<b>Area:</b>	<b>57 Ha</b>
Current Status:	Shaped & stabilised now, vegetation predominantly weeds. 9.5 Ha of area stripped for conveyor works.
Proposed Mining Activity	None
Commitment to Rehabilitate	Commitment now to final rehabilitation.
End Use:	Open woodland with some closed woodland and wetlands.
Rehabilitation:	Open and closed woodland and wetlands created after 2024. Upgrade existing pasture in 2028/9 planting of trees. 80 % open woodland, 15 % closed woodland & 5 % wetland.

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AREA 15 – EASTERN BATTERS OLD YALLOURN MINE

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<b>Area:</b>	<b>31 Ha</b>
Current Status:	Worked out batters.
Proposed Mining Activity	None in current plan.
Commitment to Rehabilitate	Commitment now for final rehabilitation.
End Use:	Open woodland with some closed woodland.
Rehabilitation:	Rehabilitation should be undertaken with river diversion works around 2005 to 2007.  Batter flattening above water level by cut and fill with dozers, where necessary cover coal, topsoil and then plant to pasture. Woodland planting in 2032.

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AREA 16 – SOUTHERN BATTERS OLD YALLOURN MINE

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<b>Area:</b>	<b>81 Ha</b>
Current Status:	Worked out batters with low grade pasture to edge of mine.
Proposed Mining Activity	None
Commitment to Rehabilitate	Commitment now for final rehabilitation.
End Use:	Open woodland with some closed woodland.
Rehabilitation:	Carry out progressively after Area 15 completed – Say 2009 to 2012. Batter flattening by cut and fill with dozers, provide coal cover, topsoil and then plant to pasture (31 Ha). Woodland planting (25 Ha - open, 6 Ha – closed) and upgrade existing pasture (42 Ha) in 2028.

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AREA 17 – SOUTH WEST BATTERS OLD YALLOURN MINE

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<b>Area:</b>	<b>86 Ha</b>
Current Status:	Worked out.
Proposed Mining Activity	None
Commitment to Rehabilitate	Commitment now for final rehabilitation.
End Use:	Pasture areas with open and some closed woodland on batters.
Rehabilitation:	Batter flattening 2012 to 2016 by cut & fill with dozers, provide coal cover, topsoil and then plant to pasture 44 Ha. Woodland planting (15 Ha open, 4 Ha closed) and upgrade pasture (35 Ha) in 2032.

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AREA 18 – WESTERN BATTER OLD YALLOURN MINE – SURCHARGE DUMP

<b>Area:</b>	<b>30 Ha</b>
Current Status:	Worked out batter
Proposed Mining Activity	None
Commitment to Rehabilitate	Commitment now for final rehabilitation.
End Use:	Pasture areas with open woodland and some closed woodland on batter slopes.
Rehabilitation:	Carry out between 2020 to 2025; Batter flattening by cut and fill with dozers, provide coal cover, topsoil and then plant to pasture (25 Ha). Woodland planting (12 Ha open, 5 Ha closed) in 2027.

AREA 19 – WESTERN AREA ABOVE BATTERS

<b>Area:</b>	<b>126 Ha</b>
Current Status:	Already rehabilitated to pasture and woodlands
Proposed Mining Activity	None
Commitment to Rehabilitate	Commitment now for final rehabilitation.
End Use:	Pasture areas with open woodland and some closed woodland.
Rehabilitation:	Carry out around 2025/26; Upgrade existing pasture (61 Ha). Woodland planting (10 Ha open, 50 Ha closed).

AREA 20 – TOWNSHIP FIELD NORTHERN BATTERS

<b>Area:</b>	<b>22 Ha</b>
Current Status:	Worked out batters
Proposed Mining Activity	None
Commitment to Rehabilitate	Commitment now for final rehabilitation.
End Use:	Pasture with open woodland.
Rehabilitation:	Carry out commencing 2004 to 2008. Batter flattening by cut and fill with dozers, provide coal cover, topsoil and then plant to pasture (22 Ha). Woodland planting (10 Ha open woodland) in 2009.



AREA 21 – POWER STATION AND PRODUCTION AREA

<b>Area:</b>	<b>113 Ha. (25 Ha to be rehabilitated by mine)</b>
Current Status:	Mine support buildings, workshops, etc.
Proposed Mining Activity	Current status. These facilities required until end of mine life.
Commitment to Rehabilitate	Commitment now for final rehabilitation. Demolition of buildings included under Area 30.
End Use:	Woodlands (open with some closed).
Rehabilitation:	Carry out after 2032 – Say 2034/35. Topsoil and sow to pasture. Woodland (open (23 Ha), closed (2 Ha).

AREA 22 – OLD EXTERNAL OVERBURDEN DUMP & FUTURE SURCHARGE DUMP

<b>Area:</b>	<b>128 Ha</b>
Current Status:	Currently approx. 70 % rehabilitated to final requirement.
Proposed Mining Activity	Construction of surcharge dump. Morwell River Diversion through area.
Commitment to Rehabilitate	Commitment now for final rehabilitation.
End Use:	Pasture areas with open and some closed woodland.
Rehabilitation:	Earthworks could be carried out along with river diversion works - around 2005/6. Woodlands planted (open (30 Ha), closed (6 Ha) around 2017 to 2019

AREA 23 – EAST FIELD NORTHERN BATTERS

<b>Area:</b>	<b>31 Ha</b>
Current Status:	Current mine operation area. Batters partly developed and some interim stabilisation.
Proposed Mining Activity	East Field mining operations.
Commitment to Rehabilitate	Area currently committed to final rehabilitation is 25 Ha. Remaining area will be progressively created by 2006.
End Use:	Shoreline of open woodland with some closed woodland.
Rehabilitation:	Batter earthworks carried out progressively from 2012 to 2018 when coal conveyors transfer to Maryvale. Fill used from Maryvale over height operation (substantially an operations cost). Progressively planted to pasture (total 16 Ha) when sections of earthworks completed, with open woodland (13 Ha) and closed woodland (3 Ha) planted in 2020.

AREA 24 – EAST FIELD NORTH EAST BATTERS

<b>Area:</b>	<b>65 Ha</b>
Current Status:	Not mined.
Proposed Mining Activity	Eastfield mining operations.
Commitment to Rehabilitate	Commitment of area created in 2012 when coal conveyors removed from these batters.
End Use:	Shoreline area of open woodland with some closed woodland.
Rehabilitation:	Batter earthworks cannot be carried out until trunk conveyors have been shifted to the Maryvale Field. Earthworks in 2016 to 2020 using fill from Maryvale over height operation (substantially an operations cost). Planted to pasture (total 21 Ha) when sections of earthworks completed, with open woodland (15 Ha) and closed woodland (3 Ha) planted in 2024 to 2026.

AREA 25 – EAST FIELD SOUTH EASTERN BATTERS

<b>Area:</b>	<b>48 Ha</b>
Current Status:	Not mined.
Proposed Mining Activity	East Field Extension mining operations.
Commitment to Rehabilitate	Commitment of area created in 2010 when overburden operations finish East Field Extension.
End Use:	Shoreline area of pasture with open woodland and some closed woodland.
Rehabilitation:	Batter earthworks carried out in 2021 to 2025, using fill from Maryvale over height operation (substantially an operations cost). Planted to pasture (total 38 Ha) when sections of earthworks completed, with open woodland (25 Ha) and closed woodland (3 Ha) planted in 2027 following closure of the overburden operations into East Field.

AREA 26 – MARYVALE EASTERN BATTERS

<b>Area:</b>	<b>61 Ha</b>
Current Status:	Not Mined
Proposed Mining Activity	Maryvale operations.
Commitment to Rehabilitate	Commitment of area created between 2012 and 2028 as overburden operations move through Maryvale.
End Use:	Shoreline area of pasture with open woodland and some closed woodland.
Rehabilitation:	Batter earthworks carried out after 2030 when overburden operations are completed and the overburden trunk conveyor removed. Batter flattening by cut and fill with dozers, 2030 to 2032. Planted to pasture (total 40 Ha) when sections of earthworks completed, with open woodland (32 Ha) and closed woodland (3 Ha) in 2033.

AREA 27 – MARYVALE SOUTHERN BATTERS

<b>Area:</b>	<b>33 Ha</b>
Current Status:	Not mined.
Proposed Mining Activity	Maryvale operations.
Commitment to Rehabilitate	Commitment of area created between 2029 and 2030 when overburden operations undertake the final pivot of Maryvale.
End Use:	Shoreline area of pasture with open woodland.
Rehabilitation:	Batter earthworks to be dozed down from 1 to 1 final batters following completion of overburden operations in 2030. Planted to pasture (total 18 Ha) when earthworks completed, with open woodland (12 Ha) planted in 2032.

AREA 28 – MARYVALE WESTERN BATTERS

<b>Area:</b>	<b>75 Ha</b>
Current Status:	Not mined
Proposed Mining Activity	Maryvale operations.
Commitment to Rehabilitate	Commitment of area created between 2012 and 2029 when overburden operations move through Maryvale.
End Use:	Shoreline area of pasture with open and some closed woodland.
Rehabilitation:	Overburden batter could be progressively rehabilitated after the overburden face moves past, however best done after coal conveyors remain on benches below. Batter flattening by cut and fill with dozers, then plant sections to pasture (40 Ha) when dozing is completed. Open woodland (32 Ha) and closed woodland planting (3 Ha) in 2032.

#### ITEM 29 – STRIP TOPSOIL AND STOCKPILE

Each year, topsoil is stripped in advance of the overburden removal activities. Some of this topsoil will be used directly on various rehabilitation projects and the remainder will be stockpiled for later use.

In the early years where stripping is from the East Field, much of the topsoil stripped will be stockpiled and used for later rehabilitation works. The depth of topsoil removed from East Field ranges from 100 to 600 mm due to variation across the flood plain. The quantities of topsoil removed from East Field have been taken from estimates supplied by Yallourn Energy.

Topsoil from the Maryvale field has an average thickness of 136 mm ("Yallourn Mine Topsoil Resource" February 1997 report by M Ireland). It is assumed that approx. 80% of this topsoil will be recoverable. Most of the topsoil removed from Maryvale will be used directly in "current" rehabilitation works with any remainder placed in stockpile.

Topsoil in stockpile is regarded as a capital item and has been assigned a value based on the cost to cart to the stockpile (\$3.98/m<sup>3</sup>). This cost will be recouped when the topsoil is taken from stockpile and used for the rehabilitation works. Topsoil in stockpile will therefore be assigned as a committed cost against rehabilitation works. (For the purpose of estimating rehabilitation costs for calculating NRE rehabilitation bond requirements, the cost of topsoil in stockpile should not be considered.) At this stage, the topsoil stockpile will increase until around 2010, after which it will be drawn down to meet the proposed rehabilitation works. As the stockpile is drawn down, the capital cost of the topsoil used will be recouped as a committed cost against the rehabilitation works.

The total quantity of topsoil available from stripping operations is in excess of the requirements for rehabilitation of all areas above the water line. Excess topsoil will therefore also be used on the interim rehabilitation areas below the waterline to enhance the establishment of the interim vegetation. A nominal thickness of 65 mm of topsoil over the interim rehabilitation areas enables the total topsoil resource to be utilised.

#### AREA 33 – YNOC ASHING AREA

<b>Area:</b>	<b>98 Ha</b>
Current Status:	Worked out mine used for wet ash management and ash landfill
Proposed Mining Activity	Nil.
Commitment to Rehabilitate	Rehabilitation Plan for YNOC area presently under development.
End Use:	Recreation with open and some closed woodland.
Rehabilitation:	Ash landfill being developed with suitable landform for rehabilitation.

AREA 34 – MARYVALE FIELD EXTERNAL DISTURBANCE

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Current Status:	Not mined by YE but 2 pre-existing extractive industries operations have left rehabilitation liability; "Jeffrey's Quarry" on east side of Maryvale field was to have been consumed by original Morwell River Diversion, but final river diversion avoids this area. Areas not affected by extractive industries activities require no rehabilitation.
Proposed Mining Activity	Nil.
Commitment to Rehabilitate	YE will rehabilitate Jeffrey's Quarry, and will partially rehabilitate "Kennedy's Quarry" – an Extractive Industries rehabilitation bond is held by NRE for this site.
End Use:	Open and some closed woodland.
Rehabilitation:	Batter flattening by cut and fill with dozers, then plant sections to pasture when dozing is completed. Open woodland and closed woodland planting to follow.

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## Closure Activities

### ITEM 30 – WATER DIVERSION FACILITIES

This item is for works associated with filling the mine with water after the completion of mining activity. It includes:

- ▶ An inlet channel is to be excavated from the Morwell River to the Yallourn Mine near the Flocculation Pond. A channel width of 50 metres has been assumed to enable a flood flow to be substantially redirected from the Morwell River Channel to the Mine. The channel could be approx. 400 m long and generally directed through the low lying river flood plain. The main excavation will be required through the current levee bank. (Allowance \$1,000,000)
- ▶ A diversion structure within the Morwell River Channel to ensure that a flood flow is substantially redirected to the Mine. (Allowance \$100,000)
- ▶ An inlet drop structure within the mine to enable water to drop from the upper level of RL 38.0 to the lower level of 36.0. (Allowance \$300,000)
- ▶ A temporary channel and drop structure within the mine to minimise erosion when the mine is filling. (Allowance \$180,000)
- ▶ An outlet channel from the eastern Eastfield batter of the mine back to the Morwell River Diversion. A channel width of 15 metres has been assumed. (Allowance \$100,000)
- ▶ An outlet structure to control the lake level and/or outlet flow. (Allowance \$200,000)
- ▶ Planting of the shoreline when the mine has been flooded to final level. There will be approx. 27 km of shoreline. (Allowance \$540,000 at \$20,000/km)
- ▶ Beaching of the shore line along the Morwell River Diversion embankment. Embankment batter works will be placed at say 3 to 1 and will not be flattened to 6 to 1 for the ultimate shoreline. Beaching will therefore be required before inundation, say 2035. Approx. 2000 m of beaching will be required. (Allowance \$250/m)

### ITEM 31 – REMOVE BUILDINGS/PLANT

This item is for works associated with the removal of mine buildings and mine plant following completion of mining activities. It includes:

- ▶ Clearing asbestos from the various buildings and plant prior to final demolition/removal. Yallourn Energy has determined that \$1,170,000 will be required to remove the asbestos remaining at the end of the mine life. Asbestos, which will be required to be removed prior to the end of mining activities, has been budgeted elsewhere by the mine.
- ▶ Demolition of buildings. Yallourn Energy advise that \$1,600,000 will be required for the removal of mine buildings and associated infrastructure. Mine offices and currently used workshops are assumed to be made available for use by others at the end of mining operations.

- ▶ Demolish and remove Bucket Wheel Excavators (BWE) and the Stacker. While it may be possible that the salvage value of demolition/removal of these machines will be greater than the cost, a nominal allowance of \$100,000 has been made for each machine.
- ▶ Removal of conveyors and conveyor structures. Similarly to machines, a nominal cost of \$10/m has been allowed for the removal of conveyors.
- ▶ Removal of fire service and dewatering pipelines. Similarly to machines, a nominal cost of \$5/m has been allowed for the removal of pipes.
- ▶ Sealing of bores. At the end of mine life there will be a number of groundwater pumping and monitoring bores and relief wells which will need to be decommissioned and sealed to prevent movement of water to and from the aquifers. 8 relief wells, 2 pumping bores and 80 monitoring bores have been allowed for sealing at an estimated total cost of \$360,000. This amount will be relatively constant between now and the end of the mine. As new bores are added to the network, old bores will be decommissioned.

#### ITEM 32 – PUBLIC FACILITIES

These are the provision of facilities to enable the mine site to be used by the public after the completion of mining activities. The facilities to be provided are those shown on the RMP “Finalised Project” drawing. MV15-5/6. It is assumed that the facilities within the Morwell River Diversion for the Maryvale Project will be included under the Maryvale Project works. The facilities included in this rehabilitation costing report are:

- ▶ Access roads. Allowance has been made for 1.2 km of vehicle access roads to the north west shoreline of the lake. New road construction is assumed, however it may be possible to use some of the current access roads from within the power station and production centre areas.
- ▶ Car parks. Car parking for approx. 100 to 150 vehicles has been allowed in connection with the north west access roads. The north west area is likely to be a point from which boat launching facilities could be readily provided, (The old rising conveyor slabs could be used as boat ramps).
- ▶ Beaches. Allowance has been made for 3 constructed beach areas around the mine. This would involve flattening the shoreline zone to 8H to 1V and back dumping with sandy/gravel material from the over burden operations. (\$100,000)
- ▶ Footways. Allowance has been made for 23 km of gravel footways, mostly around the lake perimeter.
- ▶ Major facilities. Allowance has been made for two major recreation nodes, one near the north west access area and one in the south. Facilities would include toilet blocks, information sites, picnic and play facilities, and additional landscaping associated with the recreation nodes.
- ▶ Minor Facilities. Allowance has also been made for minor recreational facilities at other locations.

With these facilities, the commitment is considered to arise at the end of the mining in 2032. The construction of the facilities being carried out by 2035.





Appendix B

**DESCRIPTION OF REHABILITATION  
AREAS (ADDITIONAL AREAS UNDER  
“CLOSE NOW” SCENARIO)**

## Current East Field Mining Operations

### EAST FIELD OPERATING FACES

<b>Area:</b>	<b>Approx 1500 metres length of operating face</b>
Current Status:	Current mine operation area. Batters partly developed
Proposed Mining Activity	East Field mining operations
Commitment to Rehabilitate	Only required under a "Close Now" scenario.
End Use:	Inundation under whole of life scenario; shoreline of open woodland with some closed woodland under "Close Now" scenario
Rehabilitation:	Batter earthworks, sowing to pasture, and tree planting only under a "Close Now" scenario.

### EAST FIELD SOUTHERN BATTERS

<b>Area:</b>	<b>Approx 2000 metres length of semi permanent batters</b>
Current Status:	Current mine operation area. Batters partly developed.
Proposed Mining Activity	East Field mining operations
Commitment to Rehabilitate	Only required under a "Close Now" scenario.
End Use:	Inundation under whole of life scenario; shoreline of open woodland with some closed woodland under "Close Now" scenario
Rehabilitation:	Batter earthworks, sowing to pasture, and tree planting only under a "Close Now" scenario.

### BORROW AREAS AHEAD OF EAST FIELD MINING OPERATIONS

<b>Area:</b>	<b>33 Ha</b>
Current Status:	Borrow area ahead of mine operating faces
Proposed Mining Activity	East Field mining operations.
Commitment to Rehabilitate	Only required under a "Close Now" scenario.
End Use:	Inundation under whole of life scenario; mostly inundated with shoreline under "Close Now" scenario
Rehabilitation:	Batter earthworks, sowing to pasture (5 Ha) only under a "Close Now" scenario.



Appendix C  
**UNIT COST RATES**

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 COSTING RATE DETAILS

ITEM	Unit	YE Unit Cost 2002	Comment	NRE Equivalent Item	NRE Unit Cost 1997	
<u>Earthworks</u>						
Topsoil strip and stockpile (2005/6 rate)	m³	\$4.20		Dose, load and cart to stockpile	\$4.00	
Doze from cut to fill batter	m³	\$1.10		Doze - Long push	\$1.00	
Cart and place using truck & shovel - Short haul	m³	\$3.25		Excavate and cart - short distance	\$3.50	
Cart and place using truck & shovel - Long haul	m³	\$5.50		Excavate and cart - long distance	\$5.50	
Excavate coal and cart to BWE	m³	\$3.25		Excavate and cart - short distance	\$3.50	
Additional to cart and place for clay capping material	m³	\$0.55		Dozer spread and compact - short distance	\$0.75	
Place & compact material from overheight operation	m³	\$0.55		Dozer spread and compact - short distance	\$0.75	
Finish shaping with dozer - Old O/B dump scollops	Ha	\$3,300.00		Dozer spread - short dist - surface +/- 1.5	\$2,613.00	
Finish shaping with dozer - regular surface	Ha	\$1,100.00		Dozer spread - short dist - surface +/- 0.5	\$938.00	
<u>Interim Treatment</u>						
Rip and/or harrow surface	Ha	\$1,300.00		Medium ground	\$300.00	
Topsoil placement (65 mm depth)	Ha	\$2,800.00	not reqd	Long haul plus spread	\$3,169.00	
Sow seed and fertilise	Ha	\$800.00			\$350.00	
Total	Ha	\$2,100.00			\$3,819.00	
Additional to extract topsoil from stockpile	Ha	\$2,600.00	not reqd	Double handling	\$2,275.00	
<u>Sow to Pasture</u>						
Rip and/or harrow clay surface	Ha	\$300.00		Medium ground	\$300.00	
Fencing , drainage, etc	Ha	\$1,300.00	Assume 50% of area fenced only		\$1,313.00	
Topsoil placement (100 mm depth)	Ha	\$5,250.00	=\$4.20/m² plus 25%	Long haul plus spread	\$6,093.00	
Sow grass, fertilise and lime as required	Ha	\$700.00			\$350.00	
Total	Ha	\$7,550.00			\$8,056.00	
Additional to place topsoil for Township & SE Fields	Ha	\$2,000.00		Additional haul distance	\$2,500.00	
Additional to extract topsoil from stockpile	Ha	\$4,975.00	not in KB rates	Double handling	\$4,375.00	
<u>Open Woodland</u>						
Preparation of planting areas	Ha	\$550.00		Rip and harrow	\$500.00	
Upgrade pasture grasses (10% native grasses)	Ha	\$1,850.00		Direct seeding, fertilising	\$600.00	
Planting of Trees/Shrubs - 20% cover	Ha	\$1,200.00		5 metre spacing	\$1,200.00	Scope to direct seed
Total	Ha	\$3,600.00			\$2,300.00	
<u>Closed Woodland</u>						
Preparation of planting areas	Ha	\$550.00		Rip and harrow	\$500.00	
Planting of trees - 80% cover	Ha	\$4,200.00		3 metre spacing	\$3,267.00	Scope to direct seed
Upgrade pasture grasses (5% native grasses)	Ha	\$950.00		Direct seeding, fertilising	\$600.00	
Total	Ha	\$5,700.00			\$4,367.00	
<u>Wetland Development</u>						
Preparation of wetland surface/drains	Ha	\$2,200.00		Dozer spread - short dist - surface +/- 0.5	\$938.00	
Preparation of planting areas	Ha	\$1,300.00		Rip and harrow	\$500.00	
Planting of wetland species	Ha	\$5,500.00		Intense planting at edges - 1000/Ha	\$3,000.00	
Total	Ha	\$9,000.00			\$4,438.00	
<u>Shoreline Development</u>						
Rock beaching	m	\$250.00		No NRE costing equivalent		
<u>Public Facilities</u>						
Access roads	km	\$160,000.00		)		
Parking areas	Ha	\$130,000.00		)		
Pathways	km	\$27,000.00		)		
Recreational nodes - Major	No.	\$110,000.00		)		
Recreational nodes - Minor	No.	\$33,000.00		)		



Appendix D  
**COST SUMMARY SPREADSHEET**



**YALLOURN ENERGY**  
**COSTING OF MINE REHABILITATION MASTER PLAN**  
**SUMMARY SHEET (YE UNIT RATES)**

Area No.	Area Description	Area Ha.	End Use	Cost
1	South west overburden dump	191	Inundation	\$0
2	Service ponds and surrounds	133	Inundation	\$0
3	Western overburden dump	0	Inundation	\$0
4	Overburden dump - Township	366	Inundation	\$0
5	Central dump - southern	81	Morwell river diversion (Project work)	\$611,550
6	Central dump - North	169	Inundate	\$0
7	Northern	51	Inundation - Mostly pasture	\$30,000
8	Conveyor Formations	99	Substantially inundation	\$43,250
9	Eastfield bottom of mine	392	Inundation	\$0
10	Maryvale- North floor (F/S pond)	195	Inundation	\$0
11	Maryvale - Southern section	136	Inundation	\$0
12	South west overburden dump	104	Open woodland, some forest	\$1,523,550
13	Western Overburden dump	0	Mixed woodland	\$0
14	Midfield Dump	57	Mixed woodland	\$357,335
15	Eastern batter - Current Mine	31	Wooded shoreline, some forest	\$130,500
16	Southern Batters	81	Wooded shoreline, some forest	\$945,150
17	South West Batters	86	Wooded shoreline, some forest	\$816,700
18	Western Batter - Surcharge	30	Wooded shoreline, some forest	\$707,550
19	Western Area Above Batters	126	Pasture, woodland and forest	\$433,850

20	Northern Batter - Township	22	Wooded shoreline	\$1,080,550
21	Power Strn/Production Centre	113	Wooded area with some forest	\$0
22	Old External Dump	128	Woodland and Forest	\$272,250
23	Eastfield - Northern Batters	31	Wooded shoreline with some forrest	\$216,300
24	Eastfield NE Batters	65	Wooded shoreline with some forrest	\$0
25	Eastfield - Southern Batters	48	Wooded shoreline with some forrest	\$0
26	Maryvale - Eastern Batters	61	Wooded shoreline with some forrest	\$0
27	Maryvale - South East Batters	33	Wooded shoreline	\$0
28	Maryvale - Western Batters	75	Wooded shoreline	\$0
29	Strip Topsoil and Stockpile	0	Topsoil for rehabilitation	\$0
30	Water Diversion Facilities	0	Regulate water in mine	\$3,000,000
31	Remove Buildings/Plant	0		\$2,580,000
32	Public Facilities	0		\$0
33	YNOC	98		\$0
34	Maryvale External Disturbance	0		\$0
	East Field Operating Batters		Wooded shoreline with some forrest	\$180,258
	East Field Southern Batters		Wooded shoreline with some forrest	\$240,330
	East Field Borrow Areas		sow to pasture	\$187,750
			Total Cost	\$13,356,872



Appendix E

**COST BREAKDOWN FOR EACH AREA**

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
5	Central dump - southern	81	Morwell river diversion (Project work)	Earthworks		Ha	\$0
				Interim stabilisation		Ha	\$0
				Sow to pasture	81	Ha	\$611,550
				Tree/ shrub planting		Ha	\$0
				Forestry		Ha	\$0
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$611,550

**YALLOURN ENERGY  
COSTING OF MINE REHABILITATION MASTER PLAN  
AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
7	Northern	51	Inundation - Mostly pasture	Earthworks - Dozing	5000	m <sup>3</sup>	\$7,700
				Earthworks - Place - T & S		m <sup>3</sup>	
				Earthworks - Clay cover	4000	m <sup>3</sup>	
				Interim stabilisation		Ha	\$0
				Sow to pasture	2	Ha	\$15,100
				Tree/ shrub planting	2	Ha	\$7,200
				Forestry		Ha	\$0
				Wetland development		Ha	\$0
			On going maintenance				
					Total Cost		\$30,000

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
8	Conveyor Formations	99	Substantially inundation	Earthworks	5	Ha	\$5,500
				Interim stabilisation		Ha	\$0
				Sow to pasture	5	Ha	\$37,750
				Tree/ shrub planting		Ha	\$0
				Forestry		Ha	\$0
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$43,250

**YALLOURN ENERGY**  
**COSTING OF MINE REHABILITATION MASTER PLAN**  
**AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
12	South west overburden dump	104	Open woodland, some forest	Earthworks - Doze	104	Ha	\$343,200
				Interim stabilisation		Ha	\$0
				Sow to pasture	99	Ha	\$747,450
				Tree/ shrub planting	84	Ha	\$302,400
				Forestry	15	Ha	\$85,500
				Wetland development	5	Ha	\$45,000
				On going maintenance			
					Total Cost		\$1,523,550



YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
14	Midfield Dump (Currently under pasture)	57	Mixed woodland	Earthworks		Ha	\$0
				Interim stabilisation		Ha	\$0
				Sow to pasture	9.7	Ha	\$73,235
				Tree/ shrub planting	54	Ha	\$194,400
				Forestry	11	Ha	\$62,700
				Wetland development	3	Ha	\$27,000
				On going maintenance			
					Total Cost		\$357,335

**YALLOURN ENERGY  
COSTING OF MINE REHABILITATION MASTER PLAN  
AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
15	Eastern batter - Current Mine	31	Wooded shoreline, some forest (mostly inundated)	Earthworks - Dozing	54000	m <sup>3</sup>	\$59,400
				Interim stabilisation		Ha	\$0
				Sow to pasture	6	Ha	\$45,300
				Tree/ shrub planting	4	Ha	\$14,400
				Forestry	2	Ha	\$11,400
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$130,500

**YALLOURN ENERGY  
COSTING OF MINE REHABILITATION MASTER PLAN  
AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
16	Southern Batters	81	Wooded shoreline, some forest (approx 25% inundated)	Earthworks - Dozing	165000	m³	\$630,000
				Earthworks - T & S carting	138000		
				Interim stabilisation		Ha	\$0
				Sow to pasture	15	Ha	\$190,950
				Upgrade existing pasture	42		
				Tree/ shrub planting	25	Ha	\$90,000
				Forestry	6	Ha	\$34,200
				Wetland development		Ha	\$0
On going maintenance							
					Total Cost		\$945,150

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
17	South West Batters	86	Wooded shoreline, some forest	Earthworks - Dozing	220000	m <sup>3</sup>	\$242,000
				Interim stabilisation		Ha	\$0
				Sow to pasture	44	Ha	\$497,900
				Upgrade existing pasture	42		
				Tree/ shrub planting	15	Ha	\$54,000
				Forestry	4	Ha	\$22,800
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$816,700

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
18	Western Batter - Surcharge	30	Wooded shoreline, some forest	Earthworks - Doze	319000	m <sup>3</sup>	\$397,100
				Earthworks - fill - T & S		m <sup>3</sup>	
				Earthworks - Clay cover	84000	m <sup>3</sup>	
				Interim stabilisation		Ha	\$0
				Sow to pasture	25	Ha	\$238,750
				Tree/ shrub planting	12	Ha	\$43,200
				Forestry	5	Ha	\$28,500
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$707,550

**YALLOURN ENERGY  
COSTING OF MINE REHABILITATION MASTER PLAN  
AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
19	Western Area Above Batters (Currently pasture)	126	Pasture, woodland and forest	Earthworks		m <sup>3</sup>	\$0
				Interim stabilisation		Ha	\$0
				Upgrade existing pasture	61	Ha	\$112,850
				Tree/ shrub planting	10	Ha	\$36,000
				Forestry	50	Ha	\$285,000
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$433,850

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
20	Northern Batter - Township	22	Wooded shoreline (approx 50% inundated)	Earthworks - Dozing	250000	m <sup>3</sup>	\$957,500
				Earthworks - T & S	210000	m <sup>3</sup>	
				Interim stabilisation		Ha	\$0
				Sow to pasture	11	Ha	\$105,050
				Tree/ shrub planting	5	Ha	\$18,000
				Forestry		Ha	\$0
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$1,080,550

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
22	Old External Dump (Currently mostly rehabilitated except old Northern Batters)	128	Woodland and Forest	Earthworks - Dozing	9	Ha	\$29,700
				Interim stabilisation		Ha	\$0
				Sow to pasture	9	Ha	\$67,950
				Tree/ shrub planting	39	Ha	\$140,400
				Forestry	6	Ha	\$34,200
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$272,250



**YALLOURN ENERGY  
COSTING OF MINE REHABILITATION MASTER PLAN  
AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
23	Eastfield - Northern Batters	31	Wooded shoreline with some forrest	Earthworks - Cart from O/H	230000	m <sup>3</sup>	\$145,200
				Earthworks - Dozing	17000	m <sup>3</sup>	
				Interim stabilisation		Ha	\$0
				Sow to pasture	6	Ha	\$45,300
				Tree/ shrub planting	4	Ha	\$14,400
				Forestry	2	Ha	\$11,400
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$216,300

**YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
30	Water Diversion Facilities		Regulate water in mine	Inlet channel	500	m	\$1,000,000
				Inlet diversion structures	1	No.	\$100,000
				Inlet drop structure	1	No.	\$300,000
				Temporary inlet droppers	1	No.	\$180,000
				Outlet channel	300	m	\$300,000
				Outlet structures	1	No.	\$200,000
				Shoreline planting	20	km	\$420,000
				Shoreline beaching	2000	m	\$500,000
					Total Cost		\$3,000,000

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
31	Remove Buildings/Plant			Clear Asbestos from mine	1	Item	\$1,170,000
				Demolish/Salvage BWE's/Stacks	5	No.	\$500,000
				Demolish/Salvage conveyors	25000	m	\$250,000
				Remove/Salvage pipe work	60000	m	\$300,000
				Demolish buildings	0	Item	
				Sealing of bores	1	Item	\$360,000
					Total Cost		\$2,580,000

**YALLOURN ENERGY  
COSTING OF MINE REHABILITATION MASTER PLAN  
AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
	East Field - Operating Batters		Wooded shoreline with some forrest	Earthworks - Cart from O/H	191667	m3	\$121,001
Earthworks - Dozing				14167			
Interim stabilisation					Ha	\$0	
Sow to pasture				5	Ha	\$37,750	
Tree/ shrub planting				3.33	Ha	\$11,988	
Forestry				1.67	Ha	\$9,519	
Wetland development					Ha	\$0	
On going maintenance							
					Total Cost		\$180,258

**YALLOURN ENERGY  
COSTING OF MINE REHABILITATION MASTER PLAN  
AREA DETAILS**

Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
	East Field - Southern Batters		Wooded shoreline with some forrest	Earthworks - Cart from O/H	255555	m3	\$161,333
Earthworks - Dozing				18889			
Interim stabilisation					Ha	\$0	
Sow to pasture				6.67	Ha	\$50,359	
Tree/ shrub planting				4.44	Ha	\$15,984	
Forestry				2.22	Ha	\$12,654	
Wetland development					Ha	\$0	
On going maintenance							
					Total Cost		\$240,330

YALLOURN ENERGY  
 COSTING OF MINE REHABILITATION MASTER PLAN  
 AREA DETAILS

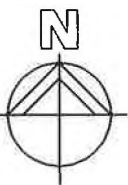
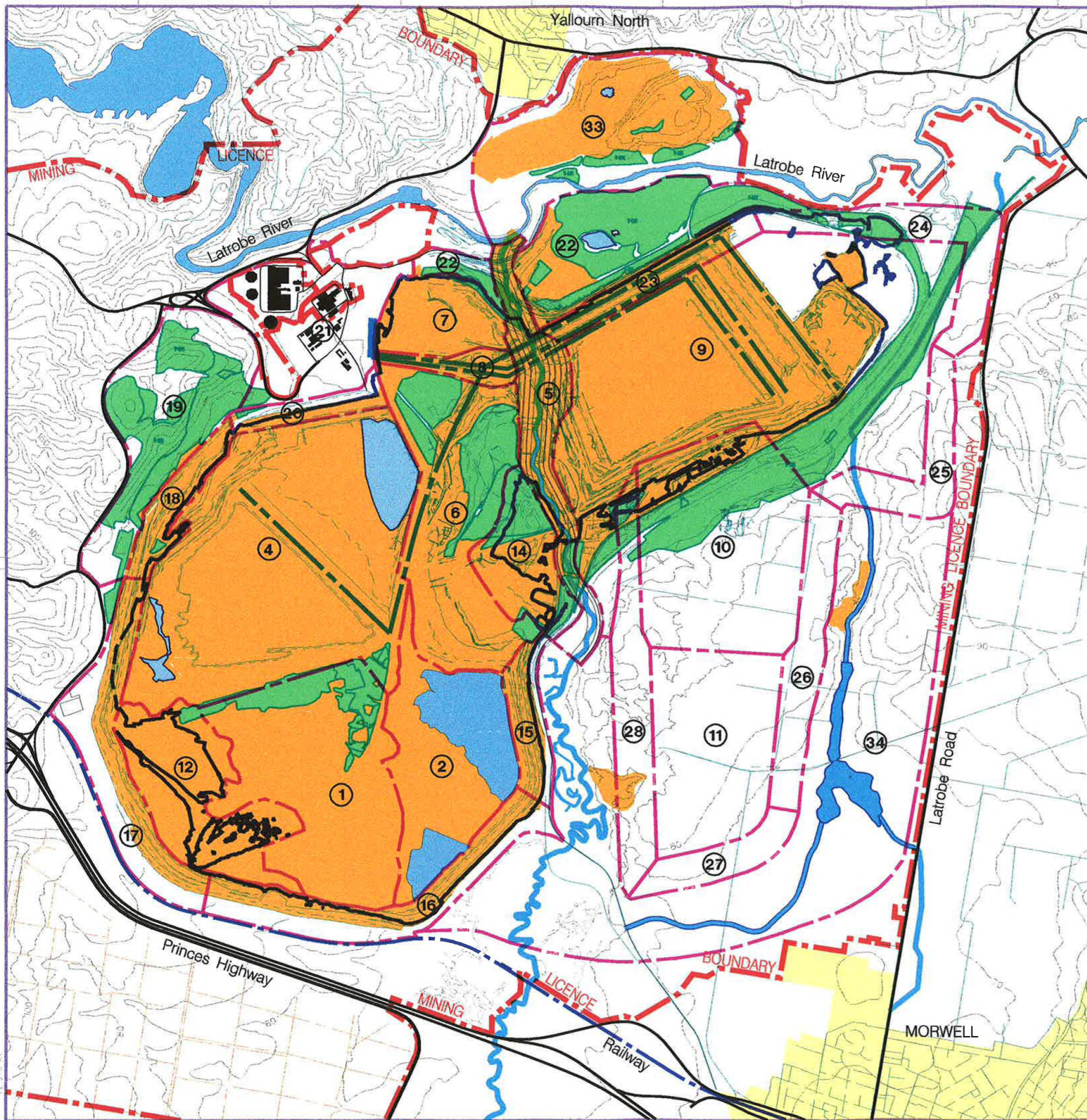
Area No.	Area Description	Area Ha.	End Use	Rehabilitation Description	Quantity	Unit	Cost
	East Field - Borrow Areas		sow to pasture	Earthworks	?	m3	\$150,000
				Interim stabilisation		Ha	\$0
				Sow to pasture	5	Ha	\$37,750
				Tree/ shrub planting		Ha	\$0
				Forestry		Ha	\$0
				Wetland development		Ha	\$0
				On going maintenance			
					Total Cost		\$187,750



Appendix F

## FIGURE 1 - DISTURBED AREAS PLAN





LEGEND

- REHABILITATED AREAS AT 30 SEPTEMBER 2002
- DISTURBED AREAS AT 30 SEPTEMBER 2002
- RL 38 INUNDATION LINE
- - - ZONE BOUNDARIES
- 25 ZONE



Yallourn Energy Pty Ltd Mine Rehabilitation Supplementary EES	Drg No 31 12974 C0001 Approved	<b>FIGURE 1</b> Date 6 - 12- 02
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**YALLOURN MINE**  
REHABILITATED AND DISTURBED AREAS  
AT 30 SEPTEMBER 2002

**GHD Pty Ltd** ABN 39 008 488 373

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**Document Status**

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	John Bohan	Vic Sedunary	<i>VS</i>	Steve Newcomb	<i>S Newcomb</i>	11/12/02