MINERAL RESOURCES DEVELOPMENT ACT 1990

APPROVED WORK PLAN VARIATION

LICENCE TYPE	MINING LICENCE
LICENCE NUMBER	5004
NAME OF LICENSEE	Hazelwood Power Corporation Limited
ADDRESS OF LICENSEE	Hazelwood Drive, Morwell Victoria 3840
AREA	2725 hectares
NATURE OF WORK:	Variation of Work Plan provides information for the continuation of overburden removal and coal winning beyond the current extraction limit within the current Mining Licence.
DATE OF VARIATION APPROVAL	- 6 DEC 2000
STRATUM OF LAND	N/A

Approval of this Work Plan variation is subject to the following condition:

Work on the Hazelwood Mine Eastfield Development shall not commence until the Environmental Management Plan that includes the management of native vegetation is completed to the satisfaction of the Manager, Minerals and Petroleum Regulation.

Date of Registration

06/12/2000

Time of Registration

4 :00 ~~a~~m/pm

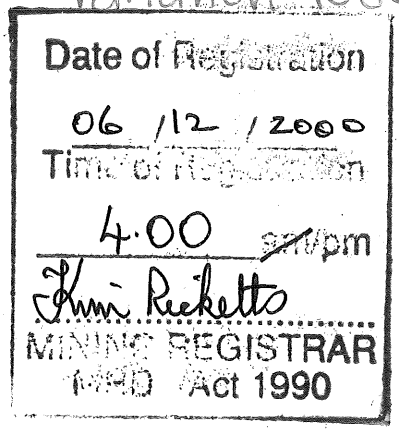
Kerri Ricketts

MINING REGISTRAR
MRDA 1990 (Section 69)

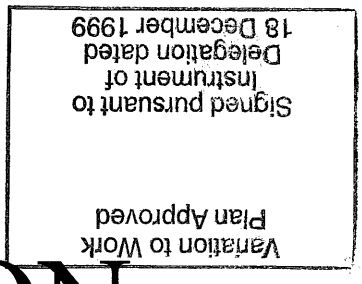
F11,026.

SLMPO NRE TRARALGON

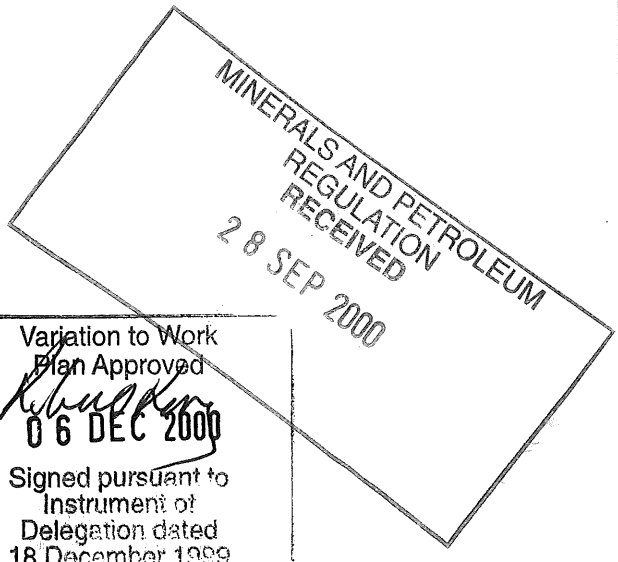
MIN 5004
Variation No4



HAZELWOOD MINE WORK PLAN VARIATION



SUBMISSION



22 SEPTEMBER 2000

TABLE OF CONTENTS

1 INTRODUCTION

Hazelwood Power is one of the three main Victorian suppliers of electricity to the National Electricity Market. The business was formed by the purchase of Hazelwood Power Corporation from the State of Victoria in September 1996. Hazelwood was purchased for in excess of Two Billion Dollars as a long-term supplier of low cost electricity to the Market.

In the four-year life of the business to date, record levels of electricity have been produced. Performance standards in such areas of community relations, environmental management, regulatory compliance and Health and Safety have remained high.

The assessment of the coal reserves in the mining licence area made in the work plan submission of May 1995 was 570 Mt, (180 Mt in the South East Field and 390 Mt in the North and West Fields). The 1995-work plan submission was approved, authorising the development of the South East Field. The Mine is developing toward the natural limit of the South East Field (Hazelwood Power Station).

Planning has identified the need to develop the current mine operation to the west of existing operations to ensure a reliable future coal supply. This submission details the work plan variation required for continuation of coal winning beyond the South East Field. This continuation of coal winning is called ***'The West Field Development'***.

Hazelwood Power plans to develop the West Field in phases. Phase No. 1 is for operations associated with the development of blocks 1a and 1b (Refer to Drawing M191D006B). The submission details the work plan variation necessary for the Phase 1 development **only**.

Phase 1 of the West Field Development is completely within Hazelwood Power's Mining Lease and Land Ownership Boundaries. The Mining techniques to be used are unchanged from our existing methods (Bucket Wheel Excavators, Conveyors and Truck and Shovel). The direction of the West Field Development is away from the nearest main population centre to the Mine – Morwell.

At a meeting with local Regulatory Representatives on 30 May 2000 it was agreed that the appropriate form of State approval for this activity would be a Variation to Work Plan. We believe this submission includes all information required - including that required under Schedule 14 of the Titles Regulations 'Work Plan Information Mining Licences'. Point No. 1 of Schedule 14 calls for a general description of geological information - for this information refer to our 1995 Work Plan Submission.

2 THE WORK PLAN VARIATION SOUGHT

Hazelwood Power is requesting the approval of a Work Plan Variation for:

- Initial truck and shovel overburden stripping in block 1a and placement of this material in the 3 nominated placement sites (Refer to Stage Plans 2001 - 2005),
- Subsequent bucket wheel stripping in blocks 1a and 1b and placement of overburden into the stage 2 internal overburden placement (Refer to Drawing LV66/19-1/037),
- Temporary diversion of a section of Eel Hole Creek (Refer to 2003 Stage Plan),
- Coal winning from blocks 1a and 1b, and
- Normal ancillary activities to support operations.

3 *THE OPERATIONAL PLAN*

3.1 Objectives and Imperatives

The first phase of the future Mine development needs to commence early in 2001. Coal winning activities will need to transfer from the South East Field (SEF) to West Field (WF) and during the transition three coal supply systems must remain operable at all times. This is required to maintain coal supply reliability to Hazelwood Power Station.

Initial works involve overburden stripping by truck and shovel within Block 1a. Overburden removal in Block 1b is planned to be by Bucket wheel Excavator once fire hole #8 (a historic fire caused depression in the top coal filled with low bearing capacity clays and silts) has been cleared. Removal of this overburden will allow for the installation and initial operation of Coal System 1 (CS1) in West Field.

The area of Blocks 1a and 1b is 176Ha (Total Licence Area 2725Ha) and they contain 122 Mt of coal suitable for Hazelwood Power Station.

Coal excavation will continue at current production quantities throughout the completion of South East Field and the development / mining of West Field blocks 1a and 1b. The existing mining and conveyor equipment will be utilised to carry out this role. As each operating level is completed in South East Field, appropriate equipment will be transferred to the West Field. Transfer begins in late 2003 and will be completed by 2006. A major component of this transfer is the construction of a new conveyor outlet area, on the western side of South East Field. From this outlet, new conveyors will be constructed to supply coal to the existing bunker system.

No excavation will take place within 20 metres of the Mining Licence boundary. All of the planned works only affect land within the current ownership and mining licence boundaries of Hazelwood Power. Mining methods will be unchanged from our proven Bucket Wheel Excavator, conveyor and truck and shovel method.

3.2 Production Plan in the South East Field

During the truck and shovel overburden stripping in block 1a and prior to the transfer operations, the SEF will continue as is, ie. Four operating systems with the uppermost system being primarily overburden removal, with the three lower systems being coal winning. Throughout the time line, stripping of overburden from the first operating level is conducted by Dredger (D10). This system, becomes the critical pivot for the West Field development sequence. D10 production targets must be achieved to ensure a minimum SEF reserve profile and to allow for the transfer of following systems into West Field. Significant truck and shovel quantities need also to be removed, primarily from level 2 fire holes, with an annual allowance of 60,000 m3 for tail end gullets. The timing of the removal of this material is critical in relation to the rapid "closing up" of the D11 system with the D10 system towards the end of SEF.

3.3 Transfer Sequence of Plant and Systems within SEF and from SEF to WF

At the completion of SEF the overburden system will be transferred to West Field as Coal System 1 (CS1). The topmost coal winning system (level 3) in SEF, currently D11, is programmed as primarily a coal operating system, but will also need to dig minor quantities of overburden. Truck and shovel operations will remove the remaining overburden (Fire hole material) from the operating faces. D11 will continue to have the capacity to operate to Travelling Stacker No. 2 (TS2) until it completes its level 3 requirement. The coal quantities required from this system to maintain coal reserves into West Field are approximately 42% of total coal production (7.9 Mt / annum)). At the completion of level 3, D11 will transfer down to the next Dredger (D9) operating level, and after a major maintenance period will begin operating on this level as the coal-winning Dredge. The level 3 conveyor system will be utilised as the West Field CS2 system upon completion of that level in SEF.

The D9 operating system (level 5) is programmed to supply both HPS and EBAC. At the operational transfer of D11 to this system, D9 will transfer to West Field as the Coal System 2 (CS2) dredge, and will commence this task after a major maintenance outage. D11 will continue operating on level 5 until the completion of this level. D11 will then, again transfer down to the next level (level 7) and allow D25 to transfer to West Field as the future overburden Dredge in that field. The level 5 conveyor system will be utilised as the West Field CS3 system upon completion of that level in SEF.

The lowest coal operating system in SEF (level 7), currently D25, is programmed to supply both HPS and EBAC. At the operational transfer of D11 to this level, D25 will transfer to West Field and undergo a major maintenance outage. D11 again will finish the SEF task at this level and will subsequently transfer to the lowest coal operating system (CS3) in West Field. The SEF level 7 conveyor systems will be utilised as part of the West Field overburden system at this time. Post D11 transfer to West Field, D25 and its operating conveyors will be set up in West Field.

3.4 Key Program Dates

A summary of the programmed SEF completion dates is as follows.

OB System	- Complete 07/2003
Level 3 Coal System	- Complete 04/2004 (includes TS2 System)
Level 5 Coal System	- Complete 02/2005
Level 7 Coal System	- Complete 11/2005

A summary of the programmed West Field start up dates is as follows

Initial Truck and Shovel Development	- 2001 (Completes at CS1 Start Up)
CS1 Development Truck and Shovel	- 2002 (Completes at OB Start Up)
CS1 Dredger Operations (D.10)	- 01/2004
CS2 Dredger Operations (D.9)	- 02/2005
CS3 Dredger Operations (D.11)	- 11/2005
OB Dredger Operations (D.25)	- 01/2006(includes TS2 System)

A cross sectional sequence plan for the initial West Field installation and operation is also attached. This plan is critical in the understanding and subsequent development of the time line. The digging sequence, in particular the "double" bottom side operation on CS1 (levels 4 and 4a) and ultimately from CS3 (levels 8&9) are a major factor in determining the total Truck and shovel overburden requirements. See Appendix I.

3.5 West Field Fire Hole No. 8 Removal Plan

Hazelwood Power has prepared a Risk Assessment and Control Plan for the removal and placement of Fire Hole #8. See Appendix A.

Initial works involve overburden stripping by truck and shovel within Block 1a. Overburden removal in Block 1b is planned to be by Bucket wheel Excavator once fire hole #8 has been cleared. Additionally a significant quantity of Fire hole #8 material, that is unsuitable for dredger operation will also be removed from the topside of the CS1 operating face. After CS1 system is operational, further truck and shovel overburden removal is required to maintain the minimum coal reserves. Additionally further Fire hole #8 material will need to be removed from the bottom side of the CS1 operating face and from CS2 topside face, during this time, by truck and shovel.

3.6 Overburden Production and Placement Operational Plan

During the period from the completion of the SEF level 3 overburden (04/2004) until (01/2006) there will be no dredger removed overburden. At the completion of the SEF overburden, Level 2 of the existing (Stage 1) internal dump will be completed. On commencement of the West Field D25 overburden system, the stage 2 (SEF area) internal dump will be developed.

An overburden placement sequence plan attached as Appendix I shows the planned strategy for the West Field truck and shovel development project. The placement sequence is designed to safely handle the known quantities of very poor ("slop") material present in the West Field development and Fire Hole #8 areas. The plan allows for a large number of potential placement sites (or layers) for the overburden material. Due to the actual physical restraints of handling, and with concern on the placement of the "slop" material, the sequence plan indicates a strategy of mining the correct mineable split of material types in relation to safely dumping that material.

Due to a degree of uncertainty in relation to the amount of "slop" material contingency dumping areas have been made available to absorb this additional material if required. The dumping plan shows, in effect, 3 major placement sites, with 2 minor sites required for development of West Field. The 3 major areas each contain approximately 5.0 m bcm of excavated material.

The details of these Truck and Shovel placement sites are as follows:

- South West Embankment Screen (Refer stage plans 2002 - 2004)
  Overburden materials will be placed into an external embankment screen to act as a visual screen to shield views from Brodribb Road and the Hazelwood Cemetery of the advancing mine. It will be located between the Western batters of SEF and the current alignment of Brodribb Road.

  Designed as a series of 10m lifts, to a maximum height above existing topography of 26m. The placement is planned to have 1:6 batters with 20m wide berms at the 10m lift

levels – the resulting slope gradients have been the standard used in the Mine for many years and there is no history of stability incidents.

A drainage path (with minor wetlands) will also be constructed on the West Side of the placement. It is planned to complete this placement over a two-season period so as to minimise the effect on visitors to Hazelwood cemetery.

- Stage 1 Internal Placement (Refer Drawing LV66/19-1/037)
  Truck-spread material is programmed to effectively complete the stage 1 internal placement dump, level 2, to both its western and Northern limits. This placement will be constructed as a series of floor placed lifts accessed from the existing northern batter haul roads. Additional material will be transported to the top of level 2 for future ash disposal.

- Stage 2 Internal Placement (Refer stage plans 2001 – 2005)
  Truck placed material will form the base or bottom level of the Stage 2 Placement. This base is required to ensure that the stacker placements do not exceed 20m depth (the maximum safe placement depth for the Travelling Stacker No. 2 (TS2). Bucket wheel dug and stacker placement of some 15 Mm3 of overburden will follow into the stage 2 internal overburden placement. Access to this placement will (until the installation of West Field CS1) be via the western batters ramp system, and after this access is no longer available, via the stage 1 internal placement area.

3.7 Overall Mine Stability

3.7.1 Mine Batter Stability

Mine Batters comprise of Overburden Batters, Coal Batters and Internal Overburden Dump Batters. The following tables provide generalise safety parameters for safe mining. Safe digging slope angles may be varied depending on the height of batters, material type, method of operation and size of Dredgers; therefore individual cases may be handled separately. As an example, the mine has an ongoing program of mapping the overburden face – if low strength clay or silt material is encountered, pre-stripping is carried out by truck and shovel prior to the Dredger removal of the remainder of material. Hazelwood Mine has successfully controlled the mine stability risks during the life of the mine and is well versed in methods and techniques required – these proven methods and techniques will be utilised in our West Field Development. The typical safe slope angles for the various materials encountered are as follows:

Safe digging slope angles for overburden Batters are as follows;

	Side Batter ◺	Front Batter ◺
Gray Clay, Silty Clay	30^0 - 36^0	35^0 - 45^0
Sandy Silts & Baked Clays	45^0	45^0

Safe digging slope angles for Coal Batters are as follows;

	Side Batter ◺	Front Batter ◺
Coal	45^0	45^0
Wet Highly Fractured Coal	35^0	40^0

Safe slope angles for Internal Overburden Dump Batters are as follows;

Slope Height, m	Bottom Side ◺	Top Side ◺	Berm Width, m
10	Not used	26^0	Not used
20	26^0	Not recommended	80
> 20	15^0	Not recommended	100

3.7.2 Mine Floor Stability

M1 & M2 Aquifer pressures at the top of the aquifer would be approximately 22 bars if ground water extraction were not carried out. Weight of the aquifer sands, clays and coal could produce a maximum pressure of 17 bars (Factor of safety < 1). To achieve a safe mining operation, aquifer pressures need to be reduced to below 17 bars. If the aquifer pressure was not reduced, the Mine's floor would lift and cause damage to Infrastructure, inflows of water to the Pit would also occur. In addition high aquifer pressure could increase water pressures in the coal batters and result in large-scale mine batter failures.

To prevent mine floor and batter failures and inflows into the Mine, a series of pump bores have been drilled into M1 & M2 aquifers and aquifer depressurisation is carried out around the clock to maintain aquifer pressures at safe levels. There are twenty M1 & M2 pump bores and 150 observation bores in the aquifer depressurisation operation system. Observation bores are monitored at weekly, monthly and quarterly intervals and aquifer pressures modelling & reporting are carried out monthly.

Hazelwood Power has been depressurising the aquifers beneath the mine for many years to ensure mine stability. Development into the West Field will not require any significant changes to how the mine manages this risk. Pumping volumes are not anticipated to increase over current volumes and will remain within our licence conditions, safe target pressure levels will also remain unchanged.

4 APPROVALS AND BACKGROUND

4.1 General Approvals and Background

Significant discussions have taken place with local regulatory representatives about the planned activities and the expected extent of impact. Hazelwood's Mining Engineers, Environmental Officers and Managers will continue to be available for discussions on the detail of this submission and to make available any additional information required.
Hazelwood Power seek State approval for phase 1 activities by way of:

- a variation to work plan under the Mineral Resources Development Act for works commencing early 2001, and
- a licence to divert a watercourse for the temporary deviation of Eel Hole Creek in 2003/04.

All of the planned works only affect land within the current ownership and mining licence boundaries of Hazelwood Power.

4.2 Brodribb Road Screening Embankment

The planned external visual screen placement to shield views from Brodribb Road and the Hazelwood Cemetery of the advancing mine has been discussed and plans shown and agreed with the Hazelwood Cemetery Trust.

4.3 Deviation of Eel Hole Creek

The minor deviation of Eel Hole Creek planned for 2003/04 has been discussed with local representatives of Southern Rural Water (SRW), West Gippsland Catchment Management Authority (WGCMA), Natural Resources and Environment (NRE) and Environment Protection Authority (EPA). It is planned to seek a licence to divert a watercourse from the appropriate regulator (SRW currently) at the appropriate time.

4.4 Native Title

Phase 1 of the West Field Development is on freehold land owned by Hazelwood Power. No Native Title claim is known to exist over the site of the proposed works associated with this request.

4.5 Replacement Wetlands

The work is being undertaken in partnership with the local Catchment Management Authority and a representative group of interested parties known as the Morwell River Wetlands Committee. Membership of the Morwell River Wetlands Committee comprises:

- West Gippsland Catchment Management Authority,
- Hazelwood Power, Yallourn Energy, Gippsland Water,
- Environment Protection Authority (Vic),
- Geo-Eng Australia,
- Field and Game Australia Gippsland Region,
- City of Latrobe,
- Water Watch Gippsland,
- Monash University Gippsland Student Union Environment Association,
- Latrobe Valley Field Naturalists Club,
- Individual community members.

4.6 Phase 2 onwards of the West Field Development (Not part of this submission)

It is presently envisaged that an Environmental Effects Statement would be used for approval of subsequent phases, due to the extent of impact on public infrastructure.

5 *KEY ISSUES, IMPACTS AND CONTROL MEASURES*

5.1 GENERAL ENVIRONMENTAL IMPACTS

History and Description of the Area

The area covered by this submission comprises an environment highly modified by:

1. European settlers through substantive land clearing and drainage activities over the last 150 years, and
2. Activities conducted by the State Electricity Commission of Victoria in the 1970's to allow continued coal winning for the Hazelwood Power Station. The works comprised:
   - A four- (4) kilometre diversion of Morwell River into a 3 metre diameter low flow pipe,
   - A three- (3) kilometre diversion of Eel Hole Creek to continue discharge into Morwell River, and
   - Construction of a levee across a riparian swamp at the former intersection of Eel Hole Creek and Morwell River for run off control, resulting in flooding of the area.

In 1992 the State Electricity Commission of Victoria constructed a flood protection levee across the former Morwell River flood plain. Behind this levee was developed a series of three- (3) interconnected wetland environments. All of this work was completed on the premise that the remaining available coal would see out the life of the Hazelwood Power Station.

With the subsequent sale of Hazelwood Power in 1996 the life outlook for Hazelwood Power Station was increased. A mine plan was required to support the new life of business objectives. As the developed wetlands are located over the most favourable future coal winning site, procurement of suitable alternate lands for development of replacement wetlands was concluded in 1998. Design, physical earthworks and the majority of tree planting's have now been completed.

5.2 REMOVAL AND PLACEMENT OF FIRE HOLE NO. 8

a) Issue

Fire hole # 8 (a historic fire caused depression in the top coal filled with low bearing capacity clays and silts) is located in block 1a of the development. The handling and placement of this material would present some risks to plant and personnel if not adequately controlled.

b) Impact

A risk assessment and control plan has been developed to minimise the Occupation Health and Safety Risks associated with the handling and placement of the low strength clays and silts in Fire Hole 8. Hazelwood Power is confident that with the proper application of these risk controls measures, Fire Hole 8 will be removed and placed without undue risk.

c) Control Measure

The risk assessment and controls to be implemented, associated with truck shovel removal and placement of fire hole 8 material is appended as Appendix A.

5.3 TRANSFER OF OPERATIONS.

a) Issue

As described in our Operational Plan, as each operating level is completed in the South East Field, appropriate equipment will be transferred to the West Field. Hazelwood Power recognises that the transfer of the mining equipment would present some risks to plant and personnel if not adequately controlled.

b) Impact

A risk assessment and control plan will be developed to minimise the Occupation Health and Safety Risks associated with the transfer of operations to West Field. Hazelwood Power is confident that with the proper application of these risk control measures, the equipment will be transferred without undue risk

c) Control Measure

The Mine has engaged a design consultant and construction contractor to undertake the detailed design, hazard analysis and risk assessment associated with new conveying plant required for transferring operations to the West Field. Risk assessments for conveying plant will be prepared closer to the point in time of usage.

5.4 SEALING OF BORE HOLES

a) Issue

The development will require overburden to be placed over abandoned boreholes. Hazelwood Power recognises that there would be a risk of surface water contamination of the ground water aquifers beneath the mine if not properly controlled.

b) Impact

A risk assessment and control plan has been developed to minimise the risk of contamination of ground water beneath the mine. Hazelwood Power is confident that with the proper application of these risk controls measures, there will be no contamination of the ground water.

c) Control Measure

Prior to the placement of material over abandoned bore holes, the boreholes will be sealed using a procedure approved by Southern Rural Water (the statutory authority responsible for Hazelwood Power's ground water licence conditions). The detailed borehole sealing procedures have been approved and used previously (prior to the development of the internal overburden placement within the mine in 1998).

5.5 CULTURAL HERITAGE IMPACTS

5.5.1 Heritage Sites

a) Issue

The need to minimise the impact on Heritage Sites that may exist within impacted areas of the development.

b) Impact

An initial cultural heritage survey of the general area covered by this submission has been conducted using desktop and fieldwork investigations in conjunction with Biosis Research Pty Ltd, the Morwell Historical Society and representatives of the Central Gippsland Aboriginal Health and Housing Co-operative (An Aboriginal Affairs Victoria authorised

organisation). The initial cultural survey did not indicate any significant impacts nevertheless control measures will be developed as detailed in c) hereunder.

c) Control Measure

A risk assessment and control plan will be developed to minimise the impact on heritage sites due to the West Field development. To complement the initial cultural heritage survey, further work will be carried out in conjunction with a properly authorised archaeologist to confirm the nature and extent of the sites identified, and the appropriate treatments. All necessary consents to clear will be gained prior to work progressing.

5.5.2 European Cultural Heritage

a) Issue

Within the area of proposed impacted areas, generally bounded by Brodribb Road, Strzelecki Highway, and the western batters of the current mine, there are no items listed on the Heritage Register. The Heritage Inventory, however, shows item H8121-0018 the foundation remains of "MacMillan Homestead" (Driffield 18 Easting 443600 Northing 5764100), lying between the western boundary of block 1b and Brodribb Road.

b) Impact

The foundation remnants of the MacMillan Homestead will be impacted during construction of a mine perimeter road in 2003/04, and further phases of the mine development.

b) Control Measure

Consent to clear this site will be sought through Heritage Victoria. As the site has local heritage significance, the Morwell Historical Society has indicated their wish to recognise the location. Local recognition activities will be undertaken as agreed with the Latrobe Shire, Morwell Historical Society and Monash University Centre for Gippsland Studies.

5.5.3 Aboriginal Cultural Heritage

a) Issue

Within the area covered by this submission, there is an isolated indigenous artefact scatter evident at grass level in a small triangular area bounded by the northern boundaries of blocks 1a, 1b and Strzelecki Hwy.

b) Impact

The site of the indigenous artefact scatter is likely to be impacted by the formation of the mine perimeter road in 2003/04 and future mine development phases.

c) Control Measure

Permission to clear the site of the indigenous artefact scatter will be sought through AAV, and the Central Gippsland Aboriginal Health and housing Co-operative.

Work is in progress to establish a response strategy and protocol in the event of encountering unexpected Cultural Heritage relics. A training program will be run for Contractor personnel prior to commencement of truck shovel stripping.

5.6 FLORA AND FAUNA

5.6.1 Wetlands

a) Issue

It has been recognised for a number of years that the existing wetlands are located over the likely western development and that appropriate measures would need to be implemented to protect or enhance the flora and fauna supported by these wetlands.

b) Impact

The risk of a negative impact on the flora and fauna supported by the existing wetlands has been recognised by Hazelwood Power and therefore plans were developed and implemented not only to minimise the negative impact but also to enhance the wetland environment. These replacement wetlands encompass a more significant area and potential aquatic diversity, through greater variations in water depth. The tree planting's are equivalent in number to those being lost with the potential for increases over time because of the larger areas available for self-seeding. The plans are detailed in the following control measure.

c) Control Measure

Suitable alternate land for development of replacement wetlands was procured in 1998 and developed. Design, physical earthworks and the majority of tree planting's for the replacement have now been completed.

The following table provides a direct physical comparison between the existing wetland sites and those developed as replacements:

	Existing Wetland Sites	Replacement Wetland Sites*
Water Areas at HWL (Ha)	26.8	32.2
Ephemeral Zone (HWL–0.5m)	1.9	9.3
Approx Water Volume (Ml)	260	290
Approx Number of Trees	76,000 mostly Melaleuca	76,000 mostly Melaleuca

Table 1 – Direct physical comparison between wetland sites

* Excludes Brodribb Road Wetland Site

The replacement wetlands encompass a more significant area and potential aquatic diversity, through greater variations in water depth. The tree planting's are equivalent in number to those being lost with the potential for increases over time because of the larger areas available for self seeding. Management and recommendations made by Biosis Research state that *'Overall, the direct affects on flora and fauna of the proposed development are low. The proposed development would result in: the loss of a small area of roadside vegetation; a relatively small number of mature eucalypts which occur as scattered paddock trees; and a wetland considered to be of high local conservation significance' (Biosis).* It is important to remember that this study encompassed a much larger area than that of concern for this submission.

A program of works has been developed to complete the wetlands and ensure diversity of habitat prior to loss of the existing wetlands. While these new wetlands are not ecologically mature only time will make a mature ecosystem. Biosis recommended in their assessment of the area that *'While it is considered virtually impossible to re-establish a native vegetation*

community, planting the structural dominants should provide a significant cover of native vegetation.' To date upper storey and middle storey species have been planted at all three sites. All species are locally indigenous with the seed being sourced from existing species on site or from the immediate area.

In consultation with Established Tree Transplanters it was recommended that older trees which are reaching the end of their life would not successfully relocate. The remaining work required to complete this development is detailed in Appendix B. The works program to complete the development utilises the independent studies of the flora and fauna impacts as listed hereunder:

- An Assessment of the Aquatic Biodiversity Values of the Hazelwood Power Wetlands and Eel Hole Creek, dated July 2000, by Phil Papas, Matthew Jones, Diane Crowther and Jason Lieschke of Freshwater Ecology, Arthur Rylah Institute for Environmental Research, Department of Natural Resources and Environment.
- Stage 1 Flora and Fauna Assessment of potential extensions to the Hazelwood Mine, Morwell, Victoria, dated December 1999, by Steve Mueck and Lance Williams of Biosis Research (Natural & Cultural Heritage Consultants, Port Melbourne, Victoria.) pp.42-46, 49-51
- Bird Species List for Hazelwood Power Western Wetlands, observed by Latrobe Valley Field Naturalists – May 1996 and October 1999.

These works provide the species lists to cross-reference those referred to under the Federal Environment Protection and Biodiversity Conservation Act 1999, the State Flora and Fauna Guarantee Act 1991 and the Draft West Gippsland Native Vegetation Plan August 2000.

Assessment against the relevant lists and proposed mitigation strategies are contained as:
Appendix C – Threatened and/or Endangered Species under the EPBC Act 1999,
Appendix D – Migratory Species List under the EPBC Act 1999,
Appendix E – State and Regional Species Lists under FFG Act 1991,

Strategies, and an action plan (Appendix B), are in place that will result in an enhancement of the biodiversity values contained with the existing wetland environments. It is Hazelwood Power practice to only plant species of local provenance for all revegetation works. As part of this process all environmental weeds are controlled and part of the ongoing management of the site. All species not indigenous to the area are also targeted and their dispersal monitored annually.

5.6.2 Other Lands

The 'Other Lands' (non-wetlands) impacted by the proposed West Field Development are low habitat value farmland pastures. The impact on the Flora and Fauna within these lands is considered to be minimal, as there are vast areas of similar farmland pastures immediately abutting blocks 1a and 1b.

5.7 TOPSOIL

a) Issue

The West Field Development will require the pre-stripping of the topsoil covering blocks 1a and 1b and the external-screening embankment. Appropriate strategies will be required for the handling and eventual optimum utilisation of this topsoil.

b) Impact

Topsoil materials are classified as fragile and structurally degraded. Preferably the topsoil should be immediately used for rehabilitation purposes rather than stockpiling where the organic matter, nutrients, structure and seed banks deteriorate and may even become anaerobic. Rehabilitation is likely to be compromised because substantial volumes of topsoil are required to be stockpiled and the substantial prestripping of topsoil is likely to lead to run off contamination problems. Further detail is contained within Appendix F.

c) Control Measure

A study has been undertaken to analyse the timing of encountering topsoil and the opportunities for use. It shows that initially large volumes of topsoil need to be placed into stockpiles and that later on substantial pre-stripping is required.

Topsoil mapping and testing has been completed for the areas associated with this submission. The outputs are 2 plans contained within attached drawing lists.

Hazelwood Power therefore proposes to balance topsoil stockpiling to the quantities required for our immediate use, the excess will be transferred to where it can be best utilised in the community.

5.8 REHABILITATION

5.8.1 Brodribb Road Screening Embankment

a) Issue

The Brodribb Road screening embankment (screening the Mine from the Cemetery and Brodribb Road) will require a stable and aesthetically pleasing finish.

b) Impact

The embankment will be built over a 3-year period to minimise disruption. Design of the shape of the embankment has been based upon retaining views of the Baw Baw ranges from the Cemetery and ensuring water quality during construction. Cut off drainage paths will be constructed to intercept all site run off and channel the run off through existing treatment facilities before discharge at an existing licensed discharge point into the Morwell River (M 90). The proper application of these proposed rehabilitation control measures will result in little or no impact as a stable and aesthetically pleasing finish will result.

c) Control Measure

The site will be progressively grassed and treed.

5.8.2 Internal Overburden Placements

a) Issue

The internal overburden placements will require appropriate treatment to minimise erosion.

b) Impact

The erosion impact will be minimised by the proper application of erosion control treatment methods as detailed in the control measure details below.

c) Control Measure

Batter treatment shall consist of progressive shaping and sowing with low maintenance grasses with the prime objective of minimising sedimentary run off. Materials will be

contained within the "hole" and will not protrude above the general contours at the edge of the Mine. Any part of the internal placement that may protrude above the future flooded water level will be rehabilitated. (This technique has been successfully employed at the SECV's former Yallourn North Extension Mine).

The current agreed method of rehabilitation treatment for the existing Eastern Overburden placement is the use of native grasses. This method was adopted at the suggestion of NRE officers when insufficient topsoil materials were available for pasture creation. The use of native grasses has proven successful despite prolonged low rainfall periods over the last 3 years of trialing.

It is therefore proposed that the internal overburden placements will be rehabilitated using native grasses.

5.8.3 Life of Mine Rehabilitation

The 'End of Mine Life' rehabilitation obligation is recognised and at this point no change is proposed to the 'Rehabilitation Concept Master Plan' which was included and approved in the 1995 work plan submission.

5.9 DUST AND NOISE

a) Issue

The West Field development will generate some levels of dust and noise. Hazelwood Power recognises it obligations to control the dust and noise emissions caused by its proposed development. In this regard its task is assisted by the fact that the proposed development is towards the West – away from the nearest population centre to the Mine – Morwell.

b) Impact

Hazelwood Power considers that with the proper implementation of proposed control measures (detailed below) the dust and noise impact will be minimal. We have reached this conclusion by carrying out preliminary modelling of potential dust and noise during the truck shovel opening up and subsequent bucket wheel operations. This modelling indicates little or no impact on neighbours apart from one family.

One family group of neighbour households may be subjected to excessive dust during the temporary diversion of Eel Hole Creek planned for 2003/04. This activity involves the removal of some 300,000 m3 of material over a 6-week period based on daylight hour operations only. These same neighbours are currently involved in discussions with us on potential impacts from possible further mine development phases. Similarly, noise estimates indicate that placement of overburden into the screening embankment may need to be restricted on still nights to minimise the impact on this one family group. This would not occur before 2001/02.

c) Control Measures

Discussions have been held with the affected neighbours. These discussions centre on them being relocated to the far end of their property or selling their property to us. Early agreement on these measures will ensure they are not subjected to excessive dust or noise. Hazelwood Power will ensure that our neighbours will not be involuntarily subjected to excessive dust or noise from our activities. At the very least we will be establishing a direct communication link between the task supervisor and the affected people. Refer to Appendix J.

6 *CONCLUSION*

The proposed Phase 1 development of West Field is essential for the continuation of coal winning for Hazelwood Power Station and the continuation of the business.

The Phase 1 development will have some impacts on the environment, flora and fauna and the local community. Hazelwood Power has consulted widely with interested parties and believes that all impacts have been clearly identified within this submission and that appropriate control measures have been detailed to minimise these impacts.

Following approval, overburden removal, by truck and shovel, is planned to commence in January 2001.

Our Managers and Mining Engineers are available for ongoing discussions with your officers should you require further information.

We submit this Work Plan Variation submission for your approval.

APPENDIX A - RISK ASSESSMENT PROCESS FOR REMOVAL AND PLACEMENT OF FIREHOLE 8

WORK PROCEDURE FOR: FIREHOLE 8 EXCAVATION

Revision Status

Issue/ Rev.	Date	Revision Description	By	Checked	Checked	Approved
A0	8/09/00	Draft				

1.0 PURPOSE AND SCOPE

Firehole 8 consists of material, which is not suitable for excavation by BWE. This procedure describes the safety requirements and work methods to be adopted by the company for the excavation of Firehole 8 by means of truck and shovel operation.

2.0 DEFINITIONS

Not applicable to this procedure.

3.0 FLOWCHART

Not applicable to this procedure.

4.0 PROCEDURAL TEXT

4.1 Personnel Responsibilities

Title: Project Manager .....?

Responsibilities: To ensure the specified requirements are met.

To use the methods proposed unless otherwise approved.

To approve and issue this Works Procedure.

Title: Supervisor.....?

Responsibilities: To manage the process including organising all relevant personnel, plant and equipment, survey, existing services protection, testing, liaison with the Superintendent's Representative on all matters including Hold Points and completion of checklists.

Title: Project Engineer.....?

Responsibilities: To verify conformance and maintain records of inspection status.

To monitor the implementation of this procedure and report on compliance.

To liaise with the relevant Authorities regarding the location of existing services.

4.2 Sequence of Operations

4.2.1 Preparations:

1. The area for excavation as per drawing ..... will be barricaded at appropriate locations to limit access to/from the excavation area.

2. Arrange plant in accordance with the work method approved.

3. Prior to commencing excavation in any area and during excavation work the Project Engineer and Foreman shall inspect the material and agree on the classification of the material.

4. The Project Engineer & Foreman shall locate spoil sites and assess haul routes.

   - Grades on the routes will be checked in relation to the capacity of the plant proposed including safety (braking, sliding and overturning).

5. Survey and peg the area to be excavated and protect the pegs as appropriate.

6. The Project Engineer shall arrange for the location of existing services. Service Authorities representatives will be contacted to facilitate this action. Also see TCV – 13**-OPS-WP01 "Protection of Services".

   For overhead cables the Engineer shall determine the height of the cables in consultation with the Project Engineer and the Surveyor and shall ensure that any plant operating within the vicinity of the cables can do so while maintaining the required minimum distances.

In areas where clearances are insufficient, barriers and/or sign posting shall be erected to prevent access to plant. Also refer to Thiess Management System Volume 2 - Occupational Health & Safety.

4.2.2 Excavation Routine

1. The Project Engineer shall allocate a lot number for each excavation site.

2. The Surveyor shall check the batters in relation to the tolerance and accuracy of survey pegs and re-establish/setout as required.

3. The Supervisor or his delegate shall check that service protection and safety devices are intact.

4. Excavate material using mechanical techniques as required.

5. The Project Engineer shall inspect the excavation site with the Supervisor should the character of material change from that previously classified.

6. The Project Manager shall be immediately informed of any groundwater encountered.

7. Catch drains shall be constructed at the top of batters prior to the commencement of the excavation process. Drains with a gradient in excess of 1 in 200 shall be protected from erosion. Refer to Environmental Management Program WP1 "Erosion and Sediment Control".

8. The stability of excavations shall be monitored by the Project Engineer and/or the Supervisor and any cracking and/or slippage reported immediately to the Project Manager.

9. Haul roads shall be watered as necessary using a water truck to control dust. See Environmental Management Program AP1 "Dust Suppression".

10. Protective barriers shall be erected at the top of cuts where batter slopes exceed 1.5H to 1V, below unstable cuts and wherever there is a risk of injury to personnel or the public.

11. Excavations shall be conducted such that they are free draining or drain to a sump. This is to ensure minimal delay after wet weather and to prevent material to be used in the works becoming saturated. Drainage water from the earthworks shall be disposed of in

accordance with Environmental Management Program WP1 "Erosion and Sediment Control".

12. The excavation sites and adjacent areas shall be maintained in a tidy condition. The Supervisor or his delegate shall check any other Hazelwood Power roads utilised as haul routes for mud and spillage and clean up as required.

4.2.3 Completion Activities and Final Inspections

The excavation shall be left in a tidy, well-drained condition ready for the next activity. The QAE shall verify that all lots conform to specification.

4.3 Types of Equipment

The requirements of the Specification shall be met using conventional earthmoving equipment. Plant to be utilised will include:

- Rigid and Articulated Dump Trucks
- LGP "Swamp" Dozers
- Excavators – equipped with wider grouser plates and long track frames where required.

All equipment shall be maintained in good working order and shall be controlled by qualified operators. These operators would have had experience in working with this type of material under similar conditions; e.g. "Davey's Swamp" removal from Hazelwood Mine.

4.4 Work Methods

Mechanical methods of bulk excavation and earthmoving shall be employed as deemed appropriate.

4.4.1. Excavation

The standard pattern of excavation will be:

- Excavators will dig in benches from the top loading into either rigid body dump trucks or six-wheel drive articulated dump trucks dependant on the ground conditions. The purpose of this excavation method in removing the material from the top is to decrease the loading force by reducing the quantity and weight of material, which can cause heaving, and slips.

In the event where extremely wet material is encountered and/or significant cracking occurs the following method will apply.

- Swamp dozers will utilised to push the material down at not less than 2H and 1V batter. The material will be picked up by excavator and loaded into trucks from the toe of the batter. Existing hard stand surfaces such as the haul road will be utilised as initial loading points.

4.4.2 Dumping

Material will be dumped in the areas as defined in Hazelwood Power Drawing No. DUMPT.

The pattern of dumping will be as follows:

- Poorest material will be "floor tipped" initially at dump xvii and xviii. This material will be given considerable time to dry to enable further dumping.
- Alternative dumpsites will be maintained as per the drawing to ensure a working dumpsite is available at all times.

Safe dumping of material will be controlled as follows:

- On approaching the dump, dump truck drivers are to ensure the spotter and dump dozer are clear of the turning and dumping area.
- Truck speeds on dumps are to be determined by road conditions.
- A spotter will be present at the dumpsite to direct where material is to be dumped. The spotter is to maintain eye contact with the dump truck driver at all times. Hi visibility clothing is to be compulsory for spotters on the dump.
- Regular inspections of the dump are to be conducted to ensure that no cracking or slumping is evident at the tip head.
- A Safety windrow of to be maintained at the tip head and dumping should occur with the rear wheels at a minimum of 1 meter short from the windrow.
- In the event of low safety windrows – less than 1.2m high - and cracking or slumping, dumping is to be significantly short of the tip head and the supervisor is to be notified immediately.
- If at any time it is considered that a direction or site condition is unsafe, do not proceed and contact the supervisor immediately.

4.5 Lot Definition, Lot Numbering and Inspection Status

4.5.1 Lot Definition

A lot shall be defined as a complete excavation between chainages.

4.5.2 Lot Numbering

Lots shall be numbered sequentially.

4.5.3 Inspection Status

Checklists shall be used to provide inspection status.

4.7 Inspection, Test and Control Points

These points are detailed in Inspection and Test Plans.

4.8 Care of Work and Environmental Protection

When the excavation process is complete the site shall be kept in a well-drained and tidy condition.

Batters requiring topsoil shall be topsoiled and grassed without delay.

Temporary erosion and sedimentation control measures shall be undertaken and maintained in accordance with the Environmental Management Program WP1 "Erosion and Sediment Control" until permanent drains and landscaping works are completed.

Dust control measures shall be implemented at all times in accordance with Environmental Management Program AP1 "Dust Suppression".

5.0 EMERGENCY PREPAREDNESS

Prior to commencing work on site all personnel will have completed an induction directed by Hazelwood Power. Work activity briefings will also be conducted to communicate to personnel any work instructions relevant to the task being undertaken. The Hazelwood Power Emergency Response Plan is the governing document by which RTL will follow in the event of an emergency.

Section 5.9 of the Hazelwood Power ERP refers to Machinery out of Control. In the event of an emergency involving machinery out of control:

1. Follow the Emergency Response Plan Flow Chart Procedures – Section 1
2. Evacuate the immediate area around the machine
3. Place barriers or post personnel at suitable points to prevent unauthorised access
4. For internal combat resources see section 2.3 for responsible persons
5. If additional specialist external combat resources are required contact-

- Major machine collapse - SILCAR/WBM
- Plant vehicle accident - SES

RTL will also maintain an emergency rescue crew amongst its workforce. All plant is to be equipped with CB radios.

6.0 REFERENCES

5.1 Thiess Management System Volume 2 - Occupational Health and Safety
5.2 Hazelwood Power Emergency Response Plan
5.3 Environmental Management Program WP1 - "Erosion and Sediment Control".

6.0 ATTACHMENTS

22 November, 2000

Mr Greg Sleziak
Mines Inspector
Department of Natural Resources and Environment
71 Hotham St
Traralgon 3844

Dear Greg

WORK PLAN VARIATION - ADDITIONAL MATERIAL ON FIREHOLE 8 REMOVAL

Further to our meeting of 10 November 2000 at which you asked for additional risk assessment information on Firehole 8 removal, I include:

- the Job Safety Analysis, including references to machine recovery, undertaken by the Contractor (RTL) for the work,
- a copy of the Contractors Erosion and Sediment Control Procedure from within their Environmental Management Program No. WP1 (referred to in our original submission), and
- a copy of the Contractors Safe Work Procedure covering Haul Roads (highlighting relevant haul road issues including clean up of spillage and safety windrows).

Also, at our meeting of 10 November 2000 you enquired about designs covering progressive removal of material in and around Dredger operations. I discussed the work programs and stage plans included in our original submission and showed you the detailed annual stage plans covering the integrated completion of all development activities. As it is not an easy task to develop specific plans showing just the firehole 8 activities I do not intend preparing more plans for inclusion into our submission, however, you are most welcome to review the detailed annual stage plans at any time.

The decision to use truck and shovel removal methods for firehole 8 was arrived at following a process of assessing the options after the obvious difficulties encountered using D10 in 1992. Truck and shovel methods were used to recover the situation in 1992 and remain the most technically sound and cost effective solution.

Please direct any further enquiries to myself on 5135 5055. As work is to commence within 6 weeks approvals must be expedited. Would you please advise whether the attached material satisfies your enquiry so that I can bind it into our original submission for resubmission.

Yours faithfully

Richard Polmear
MINE ENGINEERING MANAGER / PROJECT MANAGER MINE DEVELOPMENT

enc

CC Terry McKinley (NRE)
John Mitas (NRE)

JOB SAFETY ANALYSIS

Job Title (and number if applicable) FIREHOLE 8 Page ..... of ..... JSA No.:		Date:	☑ New ☐ Revised
Title of Person:	Supervisor:	Analysis By: A. RYAN / C. SHEPHERD	
Plant / Location:	Department:	Reviewed By:	
Required and/or Recommended Personal Protective Equipment: HAZELWOOD POWER P.P.E		Approved By:	
Attended by:			

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE	RESPONSIBILITY
Break the job down into steps. Each of the steps should accomplish some major task and be logical.	Identify the hazards associated with each step. Examine each to find possibilities that could lead to an accident.	Using the first two columns as a guide, decide what actions are necessary to eliminate or minimise the hazards that could lead to an accident, injury or occupational illness.	Determine who is responsible for carrying out / checking the action.
EXCAVATION OF FIREHOLE	1) BATTER COLLAPSE	• REMOVE WEIGHT FROM TOP	SUPERVISOR
MATERIAL	- DEATH / DISABLEMENT	• LOW DIGGING FACE	
	- PLANT DAMAGE	• DOZE MATERIAL DOWN	" "
	- BOGGED MACHINERY	AT NO LESS THAN 2:1	
		• DRAINS TO DIVERT WATER	" "
		AT TOP OF EXCAVATION	

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE	RESPONSIBILITY
Break the job down into steps. Each of the steps should accomplish some major task and be logical.	Identify the hazards associated with teach step. Examine each to find possibilities that could lead to an accident.	Using the first two columns as a guide, decide what actions are necessary to eliminate or minimise the hazards that could lead to an accident, injury or occupational illness.	Determine who is responsible for carrying out / checking the action.
EXCAVATION OF FIREDAY MATERIAL (cont)	AS PREVIOUS	• REGULAR INSPECTION FOR SIGNS OF MOVEMENT	P.E / SUPERVISOR
		• RADIO CONTACT ALL PLANT	WORKSHOP / OPERATOR
HAULAGE	WET MATERIAL ON ROADS	• NO OVERLOADING	SUPERVISOR / OPERATOR
	- ACCIDENTS INVOLVING PLANT (INJURY / DAMAGE)	• PARTICULARLY WET MATERIAL IN TAILGATED TRUCKS	" / "
		• REGULAR GRADING	" "
DUMPING	DUMP SLIP	• 'FLOOR' TIP	SUPERVISOR
	- TRUCK BOGGED	• MATERIAL TIPPED IN	
	- FALL OVER (SERIOUS INJURY / DAMAGE)	CELLS TO CONTAIN MATERIAL	
		• MAINTAIN ALTERNATIVE DUMP SITES	P.E / SUPERVISOR
		• SPOTTER AT DUMP	SUPERVISOR
		• WINDROW AT TIP-HEAD	SUPERVISOR / SPOTTER
		• VISUAL INSPECTION	SUPERVISOR / SPOTTER

Roche Thiess Linfox Joint Venture
Environmental Management System
Project: Hazelwood Power – Mobile Plant & Earthworks
Environmental Management Program No. WP1/A1
Title: Erosion and Sediment Control

RTL

Objective:	To minimise erosion on site and prevent dirty water and sediment entering adjacent waterways.			
Target:	Stormwater discharge quality to meet Hazelwood Power EPA Licence/Instructions.			
To be achieved by (date):	Ongoing.			
Applicable Licences / Permits:	EPA Licence No: EM 30856			
Controls:	All open cut drainage systems to flow to internal fire dam. Sedimentation basins and sumps to be constructed to intercept runoff and allow for Outflow of "clean" water via drains or pumping to fire dam. Catch drains, temporary drains and sedimentation basins shall be established as per Client instructions. Clean runoff from adjacent areas shall be intercepted and redirected to the nearest drainage line to prevent it from entering the earthworks area as well as working coal benches. All stockpiles of topsoil and embankment material shall be located away from drainage Lines and areas liable to flooding from streams and waterways. Drainage from stockpiles shall be collected and directed to a sedimentation basin. Silt fences where required shall be located at the toe of all batters and stockpiles to prevent silt entering drainage lines. This requirement can be ignored if a good grass cover exists between stockpiles and drainage lines.			
Resources:	Hay bales, silt fences.			
Emergency Response:	The works shall be managed in a way to minimise adverse impacts such as erosion and flooding of coal levels during extreme storm events.			
Monitoring and Inspection:	The Supervisor or his nominee shall inspect the drainage and sediment controls systems on a regular basis. The client will be notified of the results of inspections and any maintenance work shall be recorded in the Foreman's Daily Diary. The QAE shall conduct random audits and shall report on the performance of the drainage and sediment control system as required.			
Responsibility	**Activity**	**Position**	**Initialled**	**Date**
	Design	Project Manager		
	Issue & Instruct	Project Manager/Supervisor		
	Operating	Supervisor		
	Monitoring	Supervisor / QAE		
	Reporting	Supervisor / QAE		
References	EPA Act 1970, SEPP; EPA Publication 480 – "Environmental Guidelines for Major Construction Sites			
Attachments:	Drainage plans - as applicable			

Approved by: _____ Date: _____

Position: Project Manager

Haul Roads

- No person is permitted to drive or operate on the mine site without the appropriate authorisation. Due care and caution must be exercised at all times.
- All access points onto the haul road have precautionary slow down barricades to ensure Mine and Contractor personnel are aware that they are entering main truck haul roads.
- Where visibility or road construction are poor, speed shall be reduced, so that safe control is maintained at all times.
- Speed limits to be observed at all times and particular care taken to speed when descending ramps. Speed limits as per HPC regulations:
  ROADS = 60 KPH
  COAL = 15 KPH
- Safety windrow to be maintained on ramps haul road edge to minimum of half wheel height of largest vehicle where no fire service pipe exists.
- All vehicles are to stay as close as practicable to the left-hand side of the haul roads.
- A gap of no less than 30m is to be maintained between all vehicles on ramps and haul roads.
- Trucks shall under no circumstances, run over spillage on haul roads. If it is unsafe to detour around spillage you must stop. Do not proceed until spillage is cleared.
- The pre-selection of the correct gear is to be made prior to ascending or descending a ramp.
- All vehicles are to give way to the water trucks and grader when they are actually working on the roads.
- **Light vehicles are to give way to all Haul Trucks and Mobile Plant.**
- Empty haulage vehicles are to give way to loaded haulage vehicle, except where regulatory signs dictate otherwise.
- Tracked earthmoving equipment shall have right of way at all times.
- Safety belts to be worn by all vehicle occupants.

APPENDIX B - LIST OF ACTIVITIES TO COMPLETE REPLACEMENT WETLAND SITES

Significant species	Activity	Comment	Progress
Eucalyptus strzeleckii **(Strzelecki gum)**			
	Identification	Identify and tag plants in the field.	
		Protect current plants from grazing	
	Preservation	Collect seed	Commenced
	Propagation	Seed to be propagated and planted on areas, which have been designated for threatened or endangered species.	
	Monitoring	Set up a monitoring program	
Cardamine paucijuga s.s Annual Bitter-cress			
	Identification	Identify and tag plants in the field.	
		Protect current colonies from grazing	
	Preservation	Collect seed and if required lift a small number of plants to be raised in a nursery to assist in seed collection.	
		If relocation of plants from the field is successful other plants should be relocated when conditions are suitable.	
		Identify suitable sites for relocation at new wetland sites	
	Monitoring	Set up a monitoring program	
Oxalis thompsoniae Fluffy-fruit Wood Sorrel			
	Identification	Identify and tag plants in the field.	
		Protect current colonies from grazing	
	Preservation	Collect seed and if required lift a small number of plants to be raised in a nursery to assist in seed collection.	
		Vegetative divisions may need to be used.	
		If relocation of plants from the field is successful other plants should be relocated when conditions are suitable.	
	Propagate	Seed and vegetative material for relocation in to the field	
		Identify suitable sites for relocation at new wetland sites	

	Monitoring	Set up a monitoring program	
Family Accipitridae (Birds of prey)			
	Native Grass Reserve	Continue with the establishment of native grasses on the Eastern Overburden	
		Continue with the establishment of the wetlands	
Family Anatidae (Waterbirds)			
	Preservation	Introduce water to the new wetlands prior to draining the existing wetlands	
	Ephemeral Zone	Introduce water into the wetlands and establish suitable food sources.	
Family Charadriidae (Shorebirds and Waders)			
	Establish breeding ground	Establish areas free from pest animals	Completed
	Native Grass Reserve	Continue with the establishment of native grasses on the Eastern Overburden	
	Old logs/rocks	Rocks and logs to provide shelter on designated islands	Completed
Family Muscicapidae (Perching birds)			
	Upperstorey	Selected species planted	Completed
	Relocation of *melaleuca ericifolia*	*Melaleuca ericifolia* transplanted to create habitat	Completed
	Understorey	Some species have already been planted some still yet to be sourced, propagated and planted	Partial
	Debris	Introduce debris to attract insects and introduce water	Partial
***Chelodina longicollis* (Common long necked tortoise)**			
Habitat	Habitat	Introduce water into the wetlands and establish suitable food sources.	
		Introduce and submerge logs	
		Collect soil from ephemeral zone of existing wetland and relocate to new wetlands	
Relocation	Relocation	Any tortoises found in the existing wetlands to be relocated to new wetlands	
Breeding ground	Breeding ground	Establish areas for the tortoise to	Partial

		breed	completion
***Egretta garzetta* (Little Egret)** ***Ardea alba* (Great Egret)** ***Platalea regia* (Royal Spoonbill)**			
	Ephemeral Zone	Introduce water into the wetlands and establish suitable food sources.	
	Habitat	Preserve and manage remnant vegetation for breeding sites on new wetlands	
		Relocation of old trees for roosting	
		Establish water plants for food sources	
Overall strategy			
Pest Plant and Animal Control			
	Weed control	Weed control has commenced and will continue in the future	Continuous
	Exotic animals	Annual program of control is established with follow up programs scheduled where necessary.	Continuous
	European carp	Put in place a structure to prevent carp from entering the through the inlet.	Completed
	Monitoring	Establish a monitoring/removal program	Being developed by the MRWC.
	Slashing	Long grass will require slashing until the trees are high enough.	Continuous
	Nesting boxes	to be established around HP	
	Water to be introduced		
	Divert catchment from swamp to EHC		
	Breach wetlands wall at pump station		
	Recover flora and fauna from wetlands		
	Drain existing wetlands		31 March 2001

APPENDIX C - THREATENED AND/OR ENDANGERED SPECIES

Comparison of species lists under Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Source of species lists for the planned activities are from:

- An Assessment of the Aquatic Biodiversity Values of the Hazelwood Power Wetlands and Eel Hole Creek, dated July 2000, by Phil Papas, Matthew Jones, Diane Crowther and Jason Lieschke of Freshwater Ecology, Arthur Rylah Institute for Environmental Research, Department of Natural Resources and Environment.
- Stage 1 Flora and Fauna Assessment of potential extensions to the Hazelwood Mine, Morwell, Victoria, dated December 1999, by Steve Mueck and Lance Williams of Biosis Research (Natural & Cultural Heritage Consultants, Port Melbourne, Victoria.)
- Bird Species List for Hazelwood Power Western Wetlands, observed by Latrobe Valley Field Naturalists – May 1996 and October 1999.

EPBC Threatened Species Lists *	Proposed Hazelwood Development Species Lists
Mammals	None
Birds	None
Fish	None
Insects	Unknown
Amphibians	None
Plants – Endangered	None
Plants - Vulnerable	*Eucalyptus strzeleckii* (Strzelecki gum)

* Threatened species and ecological community lists:

- Wildlife Australia EPBC site – Species that are Endangered – Animals Plants http://www.biodiversity.environment.gov.au/wildlife/lists/threatsp/end.html 16/08/2000

- Wildlife Australia EPBC site – Species that are Vulnerable – Animals Plants http://www.biodiversity.environment.gov.au/wildlife/lists/threatsp/vun.html 16/08/2000

Mitigation Strategy for *Eucalyptus strzeleckii*

Only a very small number of *Eucalyptus strzeleckii* exist within the potentially impacted area. These trees are isolated from each other and generally stressed. They do not appear to provide critical habitat. The major concern is preservation of the species. Suitable potential habitat sites exist on the new wetlands area. The plan is to collect seed from the existing trees, have the seed grown to tube stock and plant them in the designated sites at the new wetlands. If the trees are too stressed to provide seed prior to their removal, then *strzeleckii* seed will be sourced to undertake the activity as planned.

APPENDIX D - MIGRATORY SPECIES LISTS

Comparison of species lists under Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Source of species lists for the planned activities are from:

- An Assessment of the Aquatic Biodiversity Values of the Hazelwood Power Wetlands and Eel Hole Creek, dated July 2000, by Phil Papas, Matthew Jones, Diane Crowther and Jason Lieschke of Freshwater Ecology, Arthur Rylah Institute for Environmental Research, Department of Natural Resources and Environment.
- Stage 1 Flora and Fauna Assessment of potential extensions to the Hazelwood Mine, Morwell, Victoria, dated December 1999, by Steve Mueck and Lance Williams of Biosis Research (Natural & Cultural Heritage Consultants, Port Melbourne, Victoria.)
- Bird Species List for Hazelwood Power Western Wetlands, observed by Latrobe Valley Field Naturalists – May 1996 and October 1999.

EPBC Migratory Species Lists *	Proposed Hazelwood Development Species Lists
Birds Family Acciptridae	*Accipiter fasciatus* (Brown Goshawk)
	Falco cenchroides (Nankeen Kestrel)
	Elanus axillaris (Black-shouldered Kite)
	Circus approximans (Swamp Harrier)
	Aquila audax (Wedge-tailed Eagle)
	Haliaeetus leucogaster (White-bellied Sea-Eagle)
Family Anatidae	*Cygnus atratus* (Black swan)
	Tadorna tadornoides (Australian Shelduck)
	Chenonetta jubata (Australian Wood Duck)
	Anas superciliosa Pacific Black Duck
	Anus gracilis (Grey Teal)
	Anus castanea (Chestnut Teal)
Family Charadriidae	*Vanellus miles* (Masked Lapwing)
Family Muscicapidae	*Pachycephala rufiventris* (Rufous Whistler)
	Myiagra cyanoleuca (Satin flycatcher)
	Rhipidura fuliginosa

	(Grey Fantail)
	Colluricincla harmonica (Grey Shrike-thrush)
Reptiles	*Chelodina longicollis* (Common Long-necked Tortoise)

* Listed migratory species:

- Declaration under s209 of the EPBC Act 1999, by Robert Murray Hill, Minister for the Environment and Heritage – List of Migratory Species for EPBC Act, as supplied by Senior Project Officer, Wetlands Unit, Environment Australia on 16 August 2000.

Mitigation Strategy for the family Accipitridae
All of the birds mentioned are predatory and operate at the top of the food chain. Loss of the existing wetlands habitat will be more than offset by an increased area of potential hunting ground provided by the new wetlands. Open areas are of importance to these predators and the establishment of a native grass reserve, which they currently frequent, is ideal habitat for their prey and has increased their hunting grounds. *Haliaeetus leucogaster* the White bellied Sea Eagle has been sited in the area but is not known for staying for any length of time. Like the other birds in this group, the White bellied Sea Eagle will benefit from an increase of potential hunting ground provided by the new wetlands.

Mitigation Strategy for the family Anatidae
Loss of the existing wetlands habitat will be more than offset by an increased area of potential browsing ground provided by the new wetlands. Swans and ducks feed on vegetable matter and aquatic animals. Islands have been established safe from predators and food sources are being established.

Mitigation Strategy for the family Charadriidae
Lapwing, plovers, and dotterels feed on shores and open ground. They nest in a scrape in the ground. Islands have been established safe from predators, which are ideal for breeding. Food sources are being developed around the shores and open ground has been provided.

Mitigation Strategy for the family Muscicapidae
Flycatchers, thrushes, whistlers, fantail and allies.
A wide range of understorey is being developed at the new wetland sites. This is important to attract these birds to the area, which are important for plant health. Debris to house and introduce insects is also important, as they are insect eating birds.

Mitigation Strategy for *Chelodina longicollis*
The Common Long-necked Tortoise typically inhabits swamps, oxbow lakes and billabongs, or slow moving rivers for feeding and breeding. Eggs are laid in a hole excavated in the bank of a stream or swamp usually in summer. Where these reptiles have been discovered before, at Hazelwood Power, they have been relocated to suitable other localities both on Hazelwood lands and private lands. Further discoveries of the Common Long-necked Tortoise will be used to colonise the new wetlands once sufficient cover has been established to ensure their long-term safety. Works planned to provide sufficient cover include the introduction of debris.

The organisms that generally provide the basic feed for the Common Long-necked Tortoise are a variety of aquatic organisms – molluscs, crustaceans, tadpoles and small fish.

APPENDIX E - STATE and REGIONAL SPECIES LISTS

Comparison of species lists under the State of Victoria Flora and Fauna Guarantee Act 1991 and the Draft West Gippsland Native Vegetation Plan Aug 2000.

Source of species lists for the planned activities are from:
An Assessment of the Aquatic Biodiversity Values of the Hazelwood Power Wetlands and Eel Hole Creek, dated July 2000, by Phil Papas, Matthew Jones, Diane Crowther and Jason Lieschke of Freshwater Ecology, Arthur Rylah Institute for Environmental Research, Department of Natural Resources and Environment.
Stage 1 Flora and Fauna Assessment of potential extensions to the Hazelwood Mine, Morwell, Victoria, dated December 1999, by Steve Mueck and Lance Williams of Biosis Research (Natural & Cultural Heritage Consultants, Port Melbourne, Victoria.)
Bird Species List for Hazelwood Power Western Wetlands, observed by Latrobe Valley Field Naturalists – May 1996 and October 1999.

Hazelwood Development Species Lists	**FFG Act Threatened Species Lists ***	**West Gippsland Native Vegetation Plan Species Lists ***
Egretta garzetta (Little Egret)	Critically Endangered Bird	Critically Endangered Bird
Ardea alba (Great Egret)	Endangered Bird	Endangered Bird
Haliaeetus leucogaster (White-bellied Sea-Eagle)	Endangered Bird	Endangered Bird
Platalea regia (Royal Spoonbill)		Vulnerable Bird
Eucalyptus strzeleckii (Strzelecki gum)	Vulnerable Plant	Endangered Plant
Cardamine paucijuga s.s (Annual Bitter-cress)	Vulnerable Plant	
Oxalis thompsoniae (Fluffy-fruit Wood-sorrel)	Poorly Known Plant	

http://www.nre.vic.gov.au/
Plants and Animals: Flora and Fauna Guarantee Act: Index by Scientific Name 18/08/00
Plants and Animals: Threatened Vertebrate Fauna in Victoria–2000–Mammals 21/08/00
Rare or Threatened Vascular Plants in Victoria–2000 18/08/00
West Gippsland Native Vegetation Plan – Management Priorities for Protection and Enhancement of Remnants and the Reconstruction of Native Vegetation Communities – Draft for public comment August 2000.

Mitigation strategy for *Egretta garzetta*
The Little Egret requires shallow waters generally fresh, brackish or salt, tidal estuaries and mudflats, mangrove swamps, saltmarshes, lagoons, flooded grassland, sewage farms and freshwater wetlands to provide feeding/breeding grounds. The existing wetlands provide such conditions to support the Little Egret. The new wetlands, when flooded, will provide additional areas of similar conditions which represents a net increase in suitable habitat. The

organisms that generally provide the basic feed for the Little Egret are fish, amphibians, crustaceans, aquatic insects and their larvae also larger terrestrial insects found by foraging in shallow water. Breeding occurs November to January. The Little Egret nests in a scanty of sticks in colony often with other waterbirds over water. Occasionally they nest far from water in introduced cypress. Hazelwood Power will transfer topsoil from the ephemeral parts of the existing wetland to the replacement wetland to facilitate the creation of equivalent habitat.

Mitigation strategy for *Ardea alba*
The Great Egret requires the shallows of rivers, estuaries, tidal mudflats, freshwater wetlands, sewage ponds, irrigation areas and larger dams and grassland to provide feeding/breeding grounds. The existing wetlands provide such conditions to support the Great Egret. The new wetlands, when flooded, will provide additional area of similar conditions which represents a net increase in suitable habitat. The organisms that generally provide the basic feed for the Great Egret are mainly fish; amphibians and aquatic insects and larvae, molluscs, crustaceans, small reptiles and occasionally small birds and mammals. They usually hunt in water and often wade deeper than other egrets. Breeding occurs October to December and they typically nest in the crown of tree over water or occasionally in a dense reed bed. Hazelwood Power will transfer topsoil from the ephemeral parts of the existing wetland and rocks and logs to the replacement wetland to facilitate the creation of equivalent habitat.

Mitigation Strategy for Haliaeetus leucogaster
The White-bellied Sea-Eagle is mainly coastal but also requires rivers, lakes, reservoirs, coastline estuaries and offshore islands for habitat. Breeding usually occurs in a mass of sticks usually in a tall tree or on a cliff, pinnacle or offshore island. The organisms that generally provide the basic feed for the White-bellied Sea-Eagle are varied fishes, crustaceans, turtles, snakes, birds, mammals and carrion.

Mitigation Strategy for *Platalea regia*
Royal spoonbill inhabits shallow water generally fresh, brackish or salt of lagoons, swamps, floodwaters, estuarine mudflats and mangrove swamps. The Royal Spoonbill forages alone or in parties in shallow water or on mudflats, roosting in trees. The basic feed for the Royal spoonbill is mainly fish, molluscs and crustaceans. Nesting occurs in July- November on a shallow platform of sticks, rushes, and reeds over water in heads of trees such as paperbarks and mangroves or on the ground.

Mitigation Strategy for *Eucalyptus strzeleckii*
Only a very small number of *Eucalyptus strzeleckii* exist within the potentially impacted area (be specific – when known). These trees are isolated from each other and generally stressed. They do not appear to provide critical habitat. The major concern is preservation of the species. Suitable potential habitat sites exist on the new wetlands area. The plan is to collect seed from the existing trees, have the seed grown to tube stock and plant them in the designated sites at the new wetlands. If the trees are too stressed to provide seed prior to their removal, then *strzeleckii* seed will be sourced to undertake the activity as planned.

Mitigation strategy for *Cardamine paucijuga s.s*
The full extent of Annual Bitter-cress within the potentially impacted area is to date not fully known. The major concern is preservation of the species. As Annual Bitter cress exists in a habitat of riparian and swamp scrub suitable potential habitat sites exists on the new wetlands area. Seed may be collected during June to November and propagated in the nursery before relocation to a suitable site at the new wetlands. If necessary a small number of plants could

be raised under nursery conditions to assist with seed collection and to also trail relocation individual plants.

Mitigation strategy for *Oxalis thompsoniae*

To date not much is known about Fluffy-fruit wood sorrel in order to preserve the species, propagation using the current stand through seed collection and vegetative division. A number of plants could be raised for seed collection and vegetative division is a nursery environment. This procedure will assist in identifying how successful individual plant relocation will be.

APPENDIX F - TOPSOIL STRIPPING DETAILS

In February 1999 an analysis of topsoil quantity and quality was completed by Nicole Bubb* for the remaining potential coal excavation areas contained within the boundaries of Brodribb Road and Strzelecki Highway.

The following is an edited extract from the document:
Topsoil materials are classified as "fragile and structurally degraded" and "require particular attention to recovery, storage and redistribution to preserve desirable attributes of the soil". Preferably the topsoil should be immediately used for rehabilitation purposes rather than stockpiling where the organic matter, nutrients, structure and seed banks deteriorate and may even become anaerobic. Where stockpiling must occur it should be stored less than two (2) metres high and only for short periods of time (less than 2 years) otherwise the value of the topsoil is lost. It is recommended that only the A1 horizon material be used. The testing regime indicated that rehabilitation is likely to be compromised by multiple handling of topsoil, which is usually the case when stockpiling. To increase the certainty of rehabilitation outcomes topsoil should be removed immediately to the intended rehabilitation site.

A study has been undertaken to analyse the timing of encountering topsoil and the opportunities for use. The opportunities for recovery of topsoil are as follows:

- Recovery ahead of South East Field operations (36,000 m3 between 2002/03),
- Recovery ahead of West Field truck/shovel operations (upto 5,000 m3 between 2003/04),
- Recovery ahead of West Field dredger operations (97,000 m3 between 2005 to 2009),
- Recovery ahead of External Screening Embankment (68,000 m3 between 2001 to 2003).

Gives a total available resource of 206,000 m3.

The areas requiring treatment over this same period, based on 100 mm coverage, are:

- External Screening Embankment (65,000 m3 between 2002 to 2004),
- South West Batters of West Field (,000 m3 between 2005 and 2010),
- Final Batters of South East Field (12,000 m3 total, half in 2005 and half in 2010),
- Southern Outlet Area (12,000 m3 in 2006),
- Next stage of Eastern Overburden Placement (60,000 m3 between 2003 and 2006).

Gives a total required volume of 149,000 plus WF south west batters)

In total, sufficient quantity of topsoil exists to match the areas requiring rehabilitation, however significant timing issues exist. Initially large volumes of topsoil need to be placed into stockpiles (greater than 50,000 m3), and later on substantial pre stripping is required (several years ahead of the operations). Experience, and the testing regime referred to earlier, indicate that rehabilitation is likely to be compromised if topsoil requires stockpiling. The substantial pre stripping is also likely to lead to run off contamination problems.

It is proposed to ease the requirement for pre stripping and stockpiling by completing the external eastern overburden placement with native grasses. It is also proposed that topsoil in excess to Hazelwood Power's immediate requirements be reused off site rather than be degraded in stockpiles or placed in the stacker overburden dump.

* Topsoil Quality and Quantity Analysis, Prepared for Hazelwood Power, February 1999, by Nicole Bubb (Bachelor of Applied Science in Natural Resources Management, University of Adelaide, Roseworthy. Graduate Diploma of Land Rehabilitation, The University of Ballarat).

APPENDIX G - ENVIRONMENTAL MANAGEMENT PLAN

This area requires further development with the intended Contractor(s) conducting the works. A series of headings have been discussed with Terry McKinley of Natural Resources and Environment as a start in the development of the EMP.

ENVIRONMENTAL MANAGEMENT PLAN WEST FIELD

1. Introduction
2. Project Overview
3. Summary of Environmental Management System (EMS)
4. Description of Works
5. Associated Drawings
6. Management Flow Chart showing reporting Hierarchy
7. Environmental Issues

Hazelwood Power accepts that Natural Resources and Environment wishes to see these heading structures developed further. Whilst some of the information is currently available further discussions and negotiations are required before the document can be completed.

APPENDIX H - HAZELWOOD WEST WORK PLAN DRAWING LIST

NOTE: THESE PLANS ARE A SEPARATE ATTACHMENT TO THE BOUND TEXT – 'HAZELWOOD MINE WORK PLAN VARIATION – SUBMISSION 22 SEPTEMBER 2000'

LV66/19-1/016	SITE PLAN INFRASTRUCTURE & SERVICES
LV66/19-1/017	EASTERN O/B DUMP PROPOSED DEVELOPMENT
LV66/19-1/024	TOPSOIL STRIPPING QUALITY, DEPTH & EXCAVATION MAP
LV66/19-1/025	AVAILABLE TOPSOIL PLACEMENT SITES
LV66/19-1/026	PROPOSED HAZWEST DEVELOPMENT GENERAL LOCATION MAP
LV66/19-1/027	HAZELWOOD POWER LAND OWNERSHIP MINING LICENCE AREA
LV66/19-1/028	MRDA MINING LICENCE AREA WITH 1KM BUFFERT
LV66/19-1/029	MIONE REHAB MASTER PLAN EXISTING REHAB @ SEPT 2000
LV66/19-1/030	MINE REHAB 5 YEAR PROGRAM
LV66/19-1/031	PROPOSED MINE DESIGN AT COMPLETION OF SE FIELD
LV66/19-1/032	EXCAVATION & DUMP AREAS 2001
LV66/19-1/033	EXCAVATION & DUMP AREAS 2002
LV66/19-1/034	EXCAVATION & DUMP AREAS 2003
LV66/19-1/035	EXCAVATION & DUMP AREAS 2004
LV66/19-1/036	EXCAVATION & DUMP AREAS 2005
LV66/19-1/037	OVERBURDEN DUMP SITES
LV66/19-1/038	FINAL REHAB PRELIMINARY CONCEPT SKETCH
LV66/19-1/039	HAZELWOOD WEST PROJECT WITHIN THE MINING LICENCE AND PROPERTY BOUNDARY
M036D003A	FIRE SERVICE NETWORK SCHEMATIC DIAGRAM
M163D002	DREDGER & CONVEYOR SYSTEM LAYOUT
M191D006B	MINEABLE COAL RESERVES @ 31/03/2000
M191D007	GEOLOGICAL CROSS SECTIONS
M201D009	ENVIRONMENTAL MONITORING WATER, ASH, LAND & AIR

MIN 5004
Variation No 4.

Date of Registration
06 /12 /2000
Time of Registration
4.00 am/pm
Lyn Ricketts
MINING REGISTRAR
MRD Act 1990

Variation to Work Plan Approved
06 DEC 2000
Signed pursuant to Instrument of Delegation dated 18 December 1999

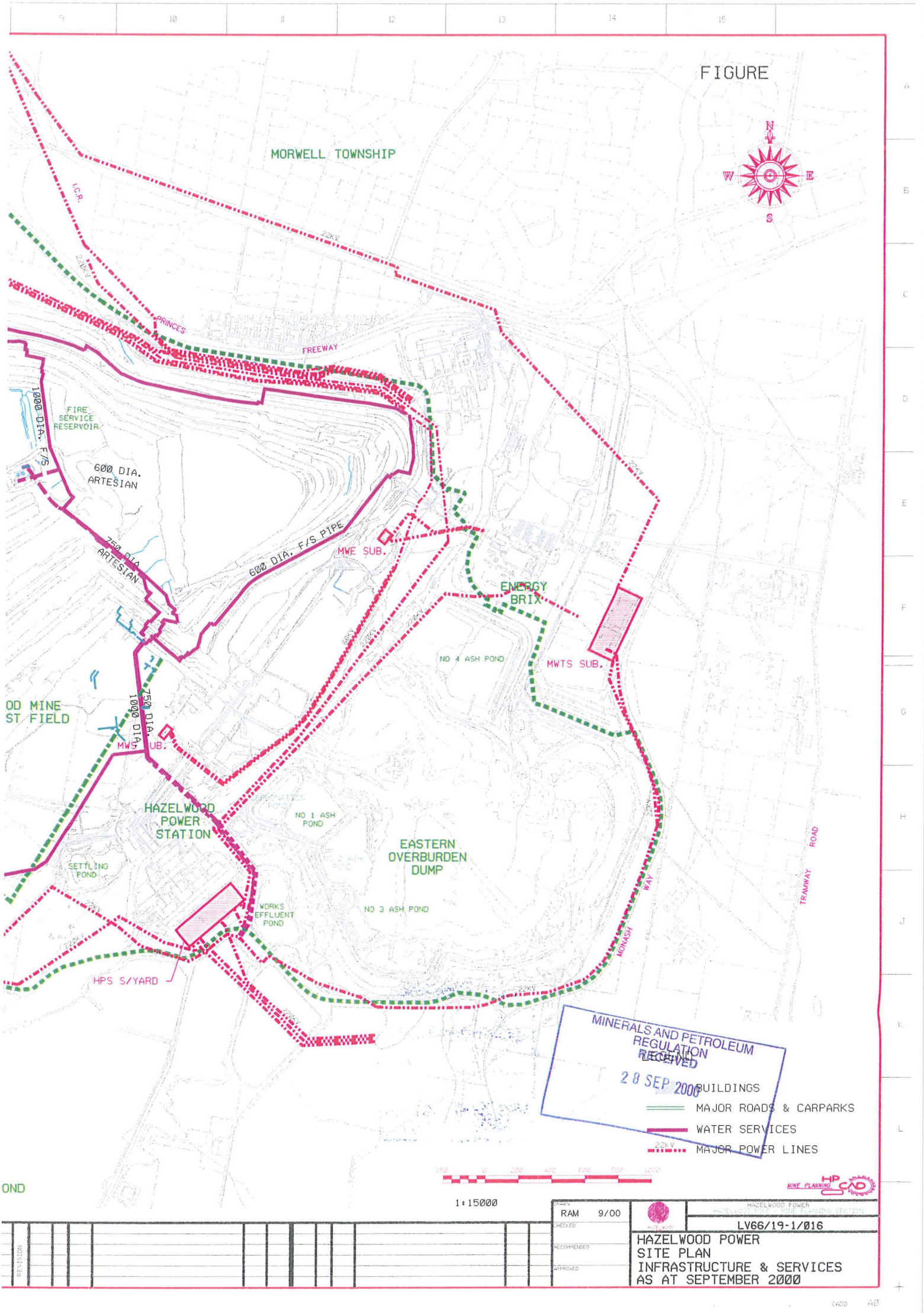
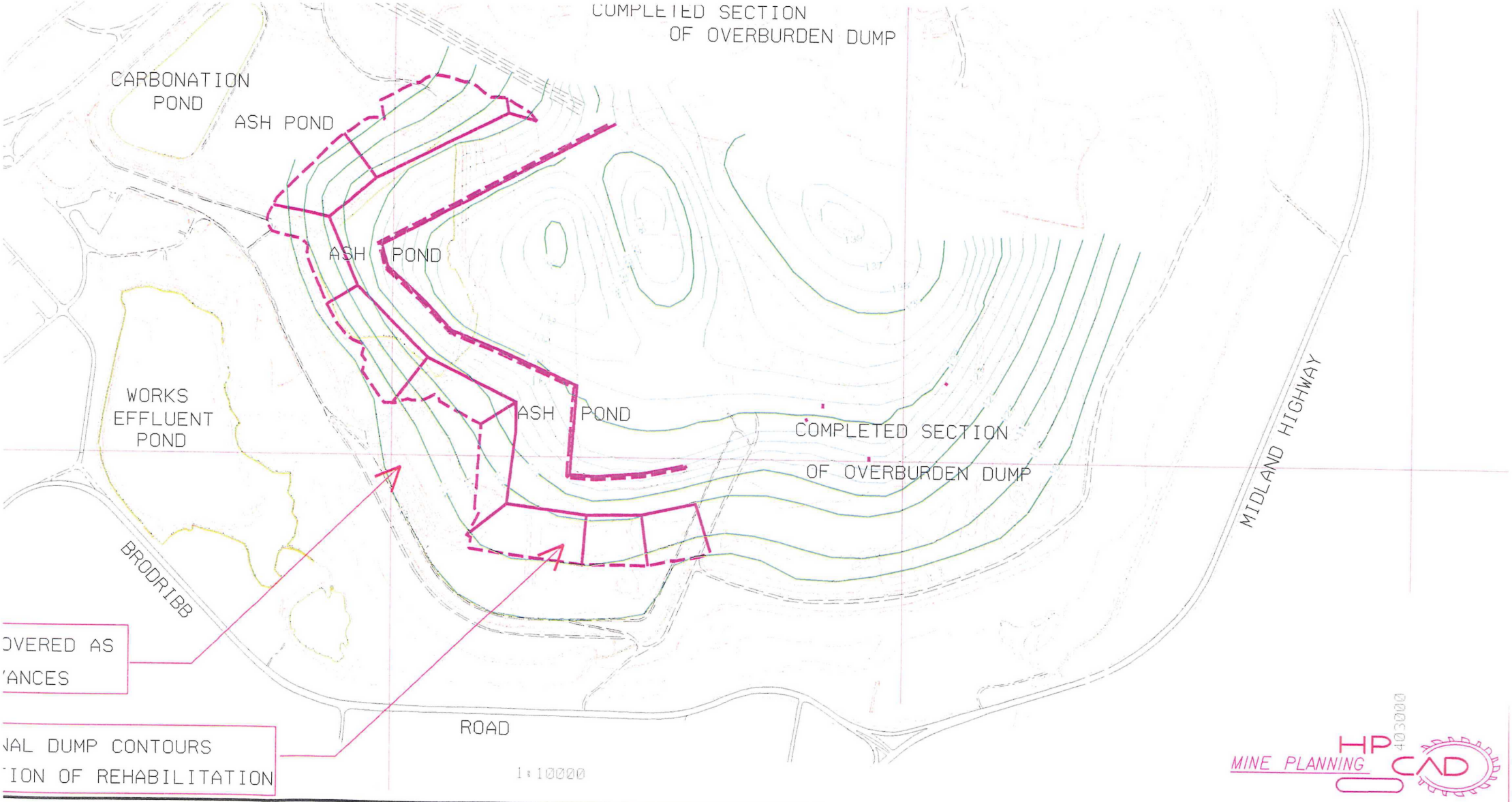


FIGURE
N
W
E
S
MORWELL TOWNSHIP
I.C.R.
22KV
PRINCES
FREEWAY
FIRE SERVICE RESERVOIR
1000 DIA. F/S
600 DIA. ARTESIAN
750 DIA. ARTESIAN
600 DIA. F/S PIPE
MWE SUB.
ENERGY BRIX
NO 4 ASH POND
MWTS SUB.
OD MINE
ST FIELD
750 DIA.
1000 DIA.
MWT SUB.
HAZELWOOD POWER STATION
NO 1 ASH POND
EASTERN OVERBURDEN DUMP
SETTLING POND
WORKS EFFLUENT POND
NO 3 ASH POND
HPS S/YARD
MONASH WAY
TRAMWAY ROAD
MINERALS AND PETROLEUM REGULATION
RECEIVED
28 SEP 2000
BUILDINGS
MAJOR ROADS & CARPARKS
WATER SERVICES
MAJOR POWER LINES
1:15000
MINE PLANNING
RAM 9/00
CHECKED
RECOMMENDED
APPROVED
REVISION
HAZELWOOD POWER
LV66/19-1/016
HAZELWOOD POWER
SITE PLAN
INFRASTRUCTURE & SERVICES
AS AT SEPTEMBER 2000
CADD A0



OVERED AS
'ANCES

NAL DUMP CONTOURS
TION OF REHABILITATION

HP MINE PLANNING CAD

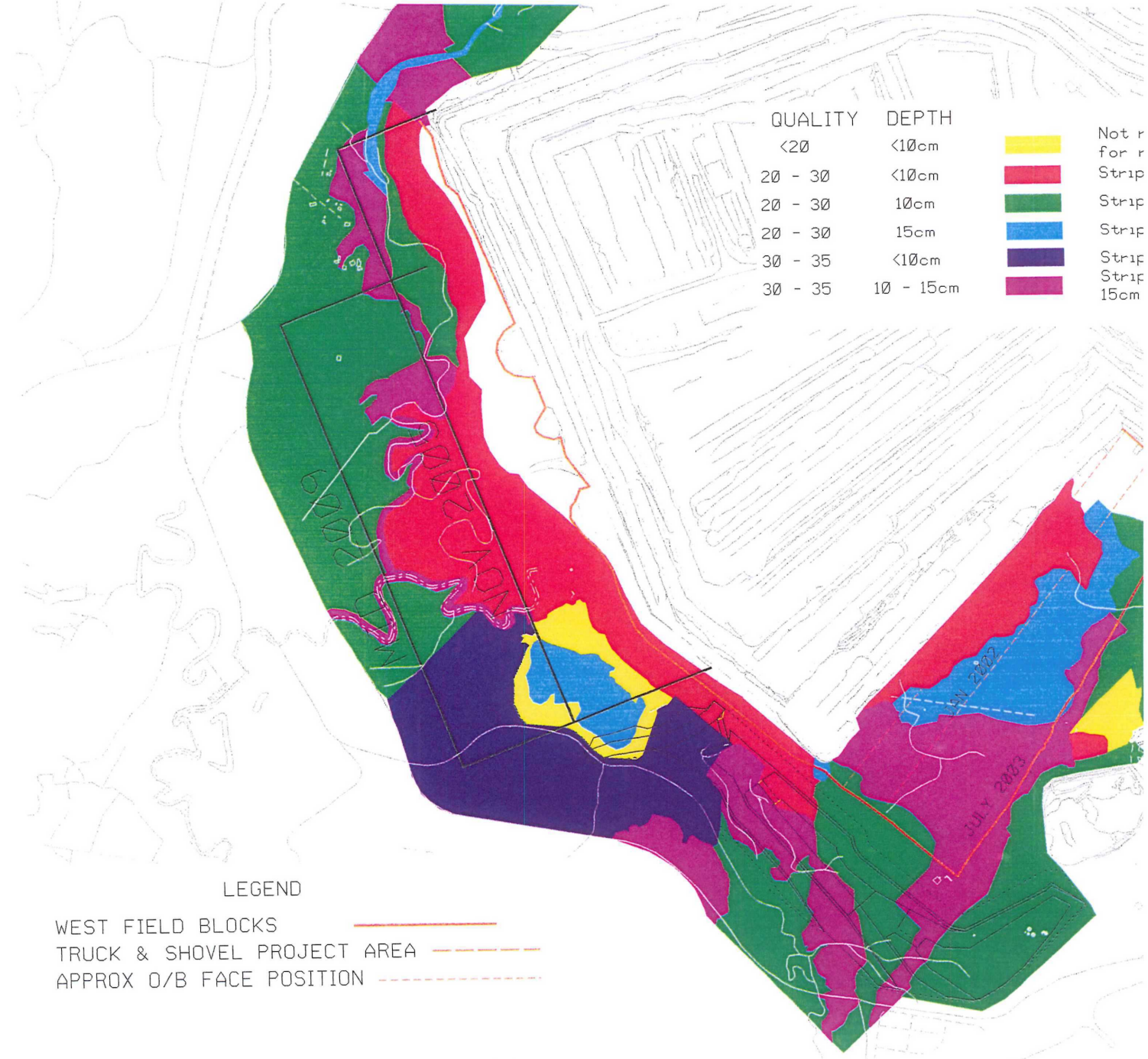
DRAWN	RAM 9/00
CHECKED	
RECOMMENDED	
APPROVED	

HAZELWOOD POWER
HAZELWOOD MINE - MINE PLANNING SECTION

LV66/19-1/017

HAZELWOOD MINE
EASTERN OVERBURDEN DUMP
PROPOSED DEVELOPMENT

47-18



TOPSOIL (M3) RELEASED

Excavation	2001	2002	2003	2004	2005	2006	2007	2008	2009
S.E. Field		21,000	15,500						

BLE

2007	2008	2009
6		
21		

HP CAD MINE PLANNING

REVISION								

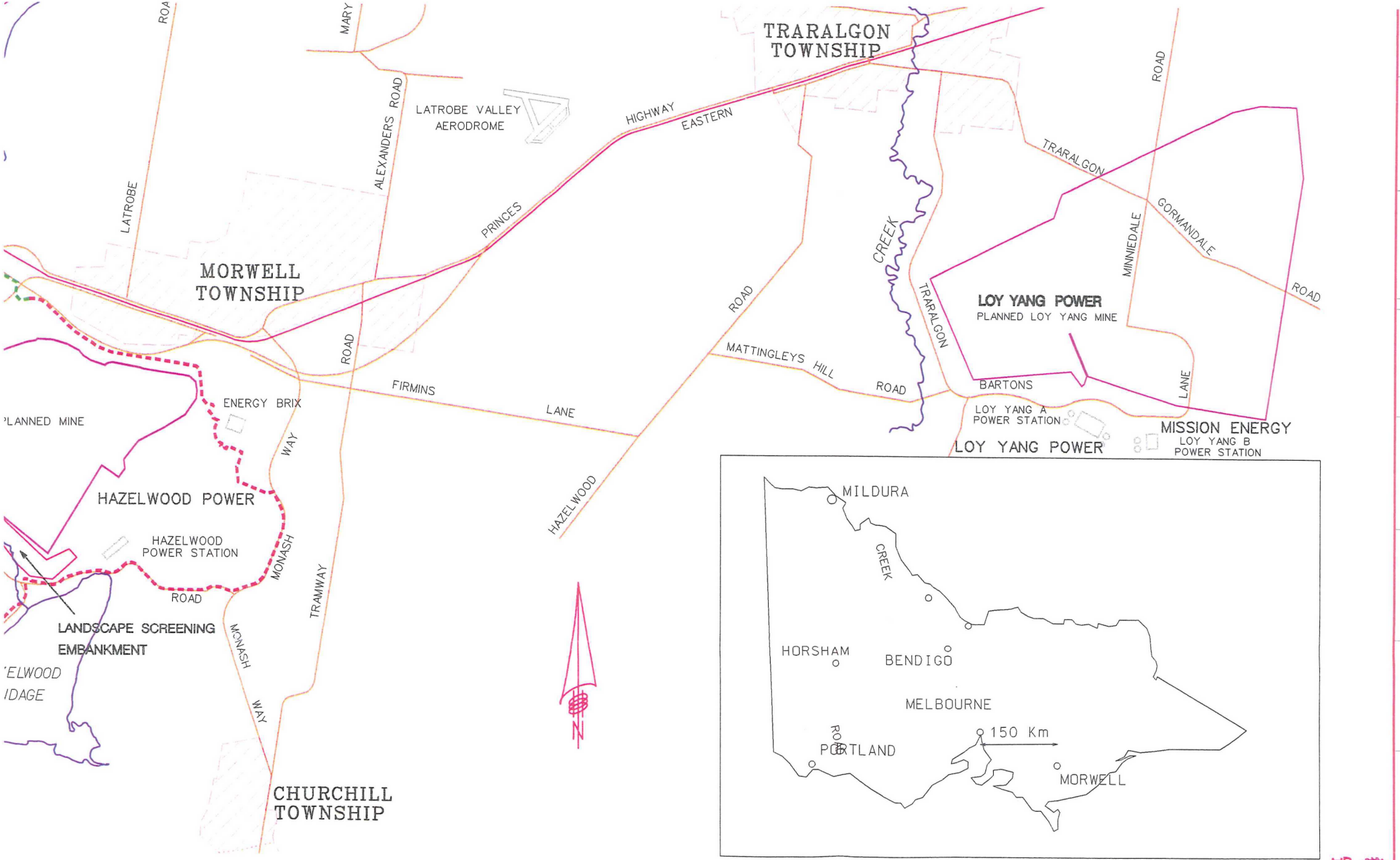
DRAWN
RAM 8/98
CHECKED
P. Kelly
RECOMMENDED
APPROVED

HAZELWOOD POWER
HAZELWOOD MINE - MINE PLANNING SECTION

LV66/19-1/025

HAZELWOOD MINE WEST EXTENSION AVAILABLE TOPSOIL PLACEMENT SITES

CADD A2



REFERENCE F4-147-5

REVISION

DRAWN

CHECKED

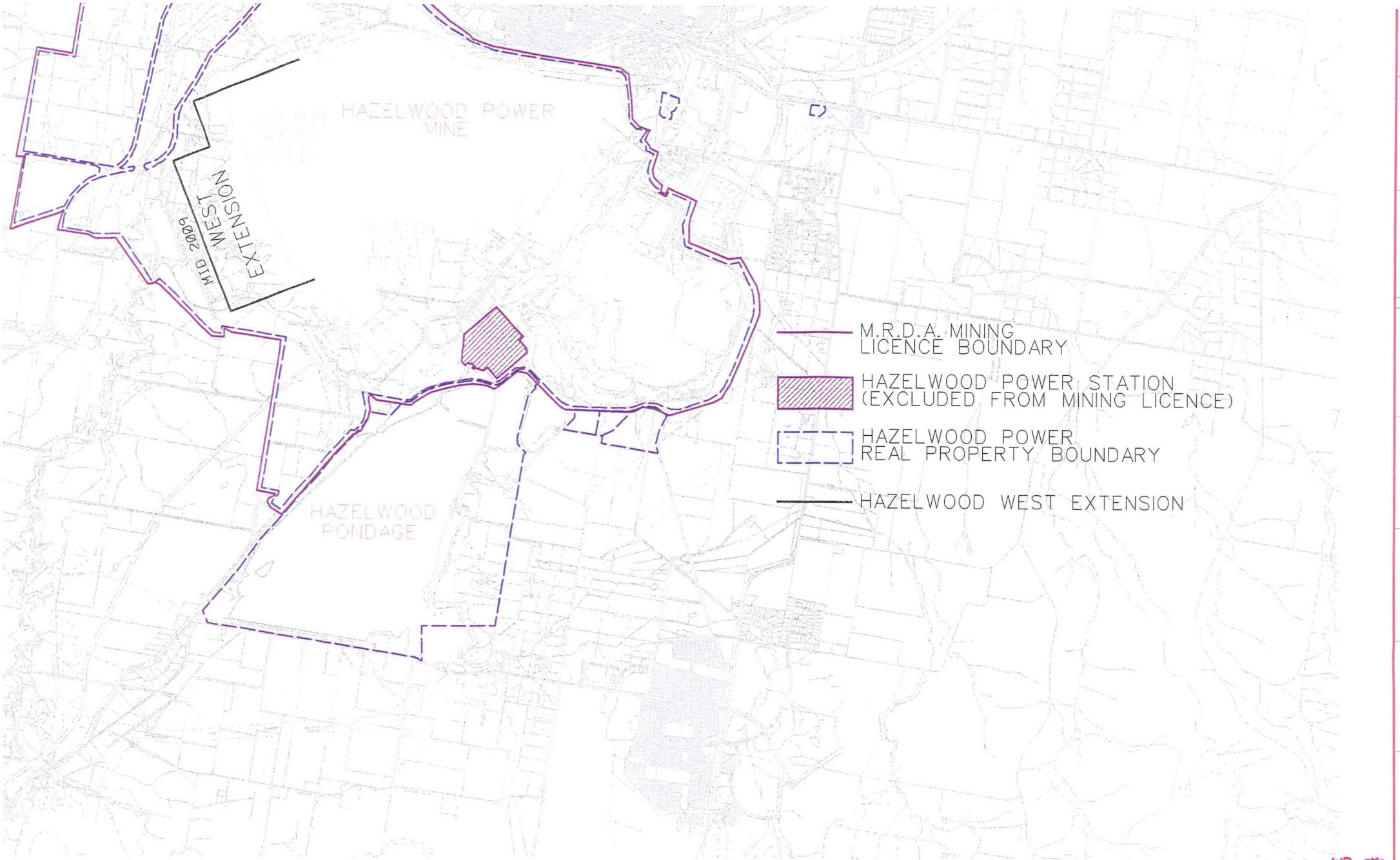
RECOMMENDED

APPROVED

HAZELWOOD POWER
HAZELWOOD MINE - MINE PLANNING SECTION

LV66/19-1/026

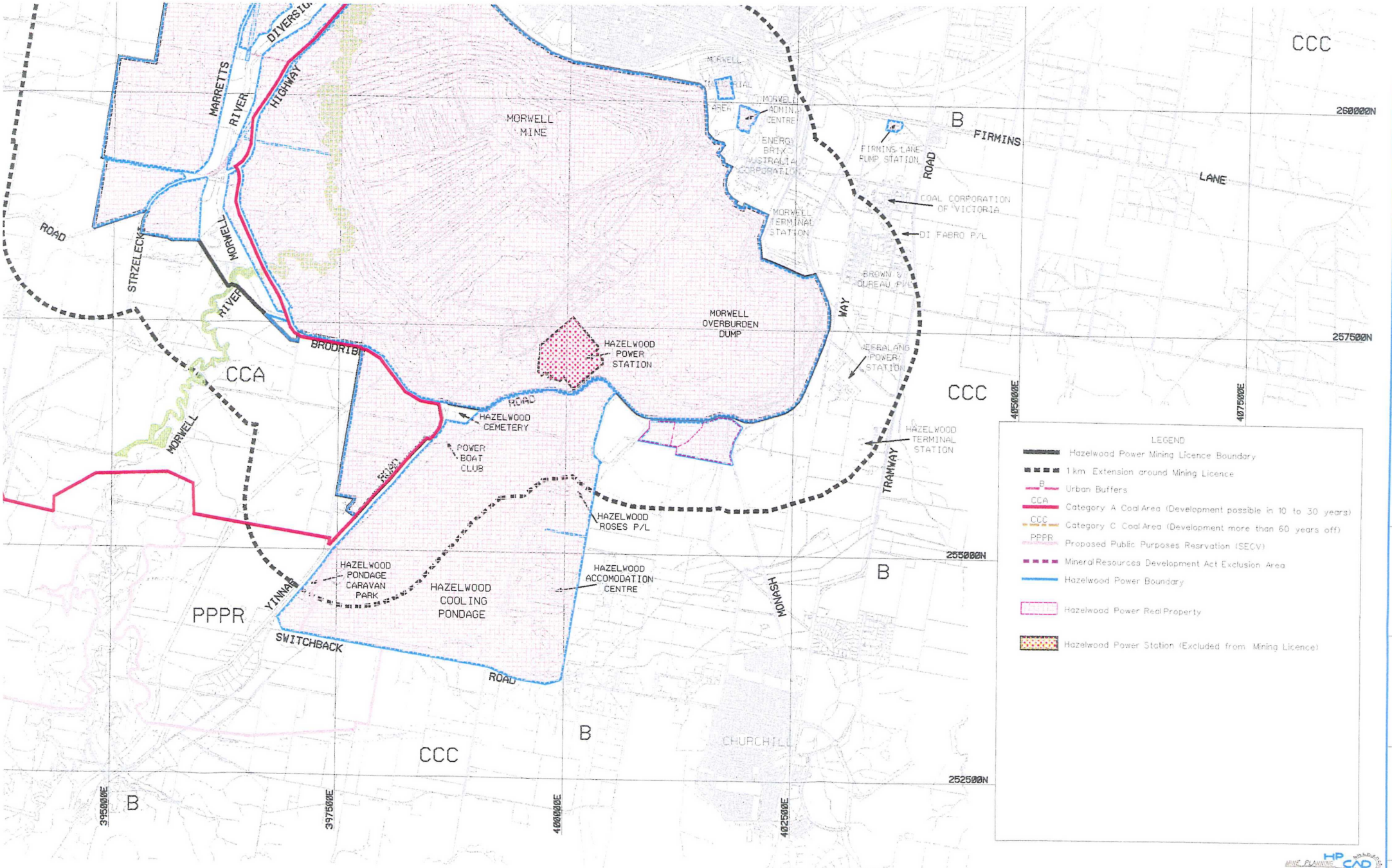
HAZELWOOD POWER
PROPOSED HAZELWOOD WEST DEVELOPMENT
WITHIN MRDA MINING LICENCE AREA
GENERAL LOCATION PLAN



1:40000

REFERENCE	REVISION	DRAWN	HAZELWOOD POWER
4-147-6 S VERHELLEN MAY 1995		RAM 9/00	L66/19-1/027
		CHECKED	HAZELWOOD POWER LAND OWNERSHIP HAZELWOOD WEST EXTENSION MINING LICENCE AREA
		RECOMMENDED	
		APPROVED	

MINE PLANNING

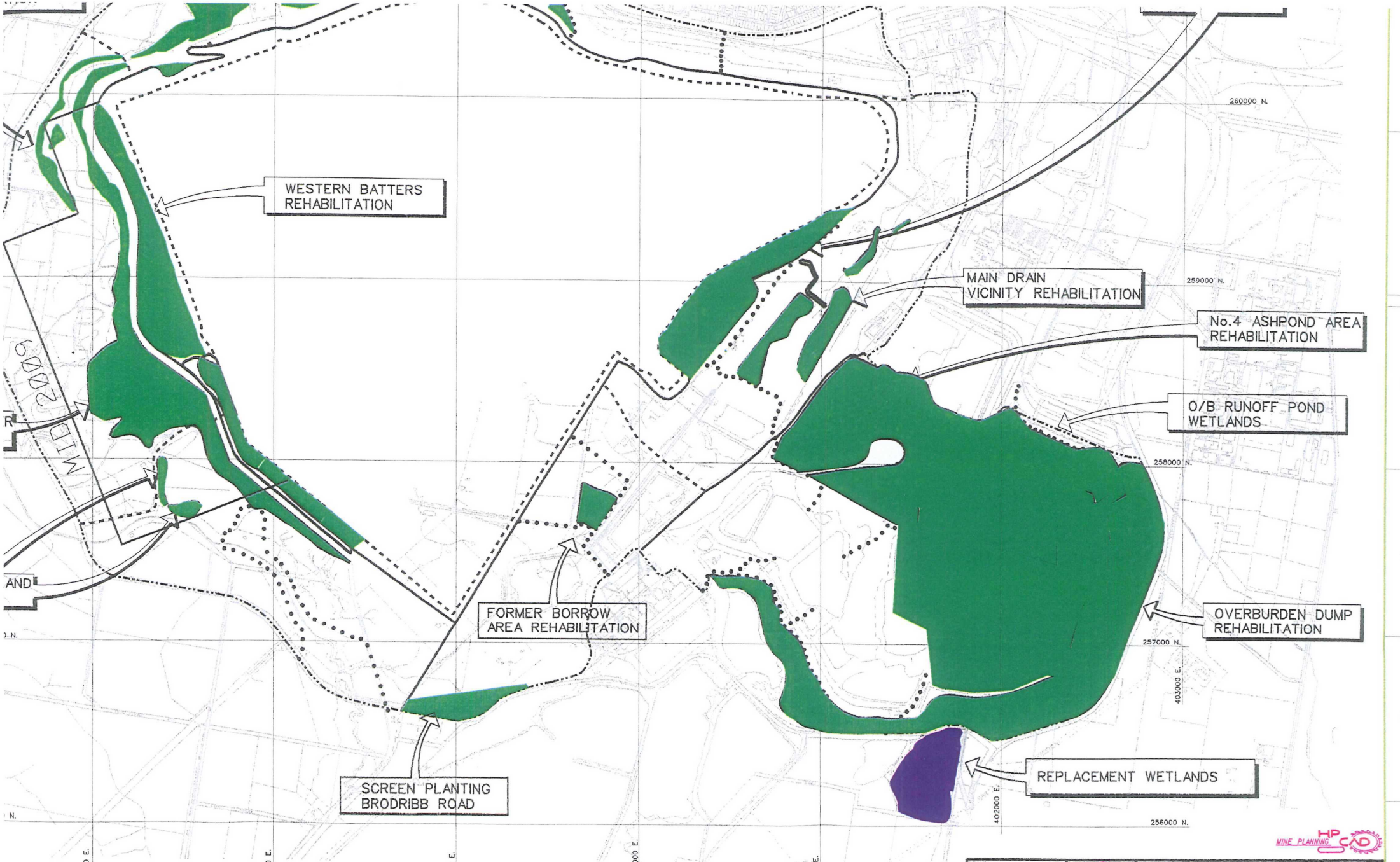


REFERENCE	REVISION	DRAWN: RAM 9/00
		CHECKED
		RECOMMENDED
		APPROVED

HAZELWOOD POWER
HAZELWOOD MINE - MINE PLANNING SECTION
LV66/19-1/028

HAZELWOOD POWER
MRDA MINING LICENCE AREA
WITH 1KM EXTENSION
LAND OWNERSHIP DETAILS

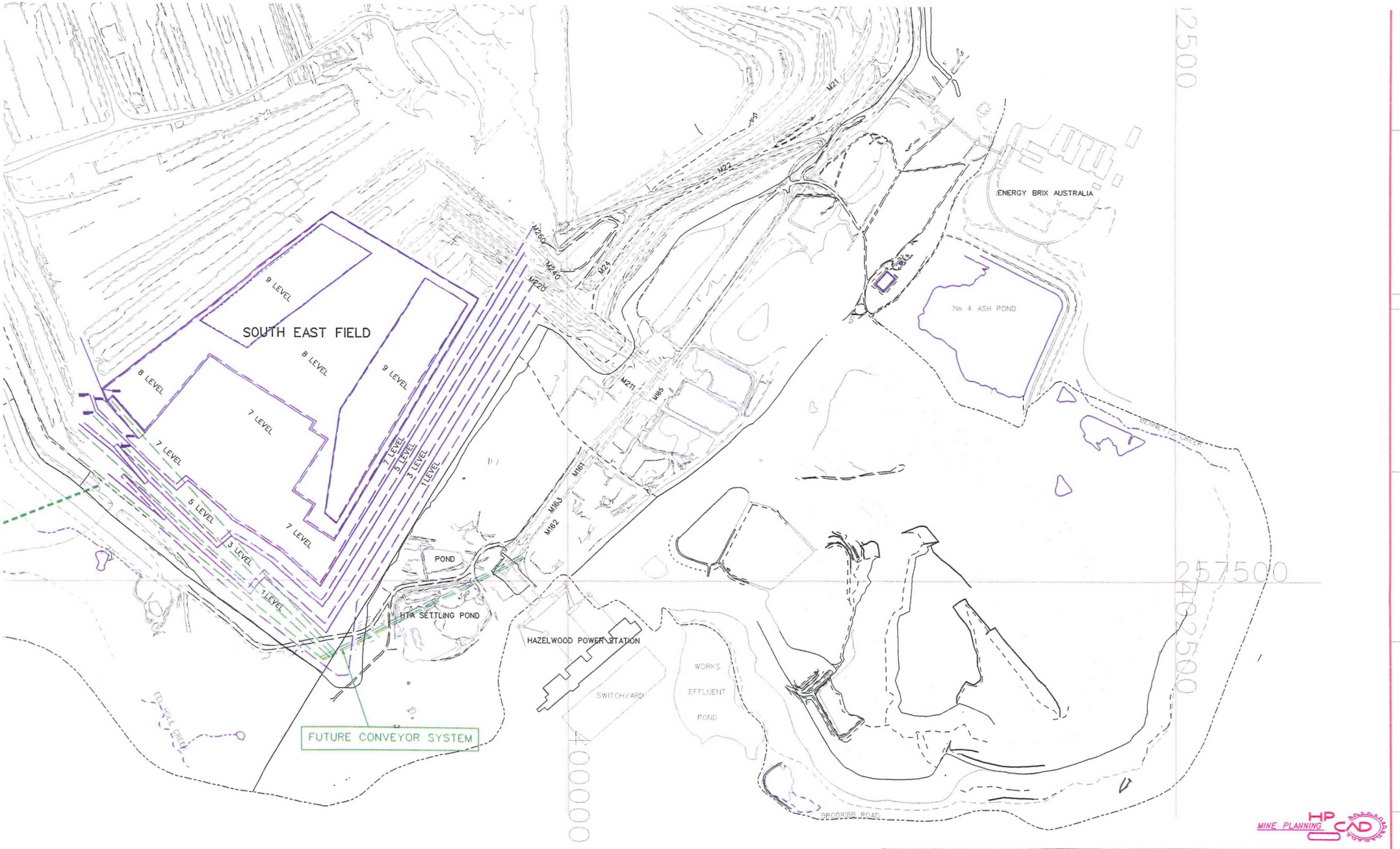
CADD A0


WESTERN BATTERS REHABILITATION
MAIN DRAIN VICINITY REHABILITATION
No.4 ASHPOND AREA REHABILITATION
O/B RUNOFF POND WETLANDS
FORMER BORROW AREA REHABILITATION
OVERBURDEN DUMP REHABILITATION
SCREEN PLANTING BRODRIBB ROAD
REPLACEMENT WETLANDS
260000 N.
259000 N.
258000 N.
257000 N.
256000 N.
397000 E.
398000 E.
399000 E.
400000 E.
401000 E.
402000 E.
403000 E.
MAY 2009
AND
REVISION
DRAWN
RAM 9/00
CHECKED
RECOMMENDED
APPROVED
HAZELWOOD POWER CORPORATION
MORWELL MINE - MINE PLANNING SECTION
LV66/19-1/029
HAZELWOOD POWER
MINE REHABILITATION MASTER PLAN
EXISTING REHABILITATED AREAS
AS AT SEPTEMBER 2000

REFERENCE	REVISION	DRAWN RAM 9/00	HAZELWOOD POWER HAZELWOOD MINE - MINE PLANNING SECTION
F137D038 B		CHECKED K JONES	LV66/19-1/030
		RECOMMENDED K JONES	HAZELWOOD POWER MINE REHABILITATION INCLUDING HAZELWOOD WEST 5 YEAR PROGRAM 2000 - 2005
		APPROVED	

MINE PLANNING HP CAD

A0



MINE PLANNING HP CAD

DRAWN	RAM 9/00
CHECKED	
RECOMMENDED	
APPROVED	

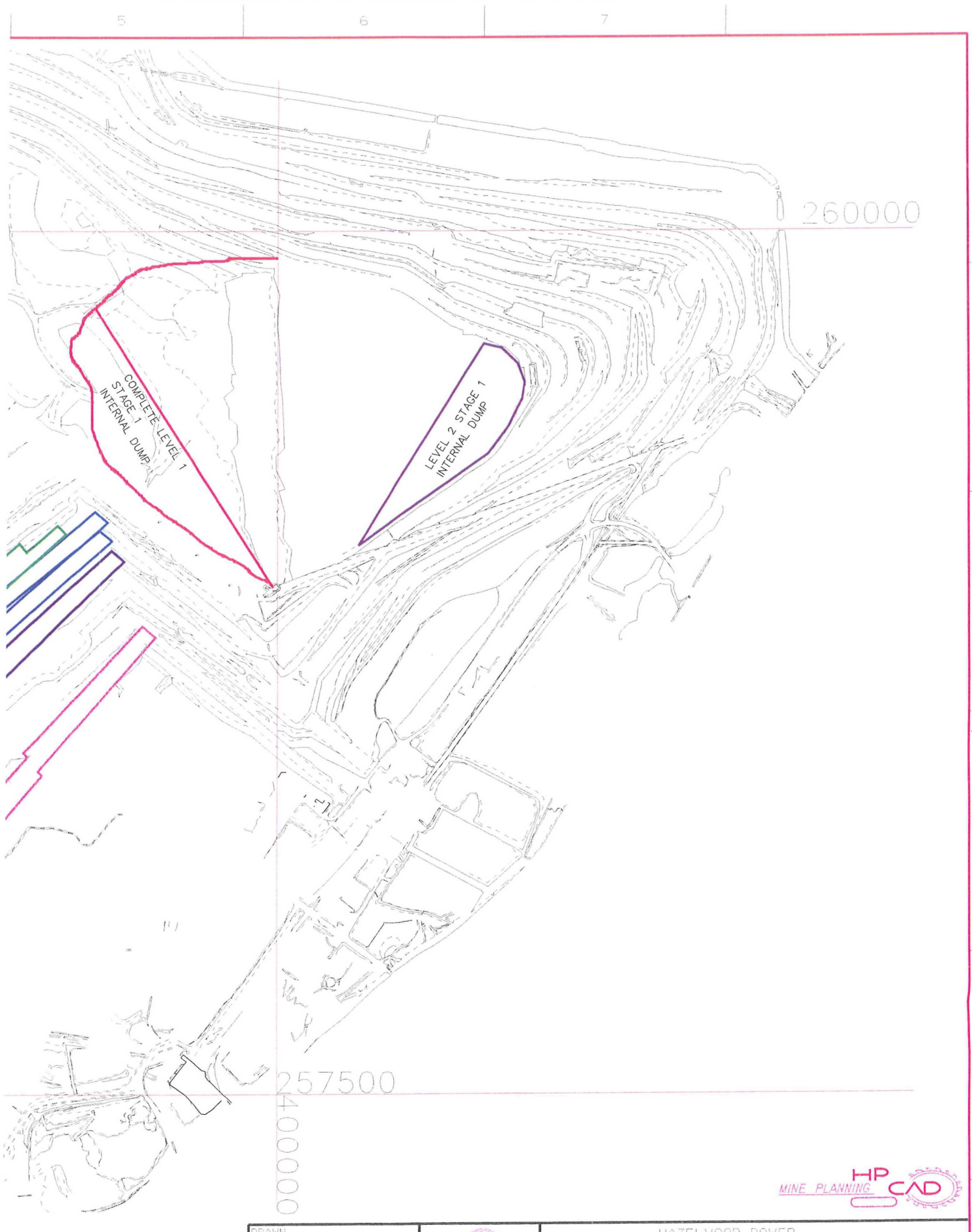
HAZELWOOD POWER
HAZELWOOD MINE - MINE PLANNING SECTION

LV66/19-1/031

HAZELWOOD MINE
PROPOSED MINE DESIGN AT COMPLETION OF SOUTH EAST FIELD & FUTURE HAZELWOOD WEST

REVISION

F A D CADD A1



HP CAD MINE PLANNING

DRAWN RAM 9/00

CHECKED

RECOMMENDED

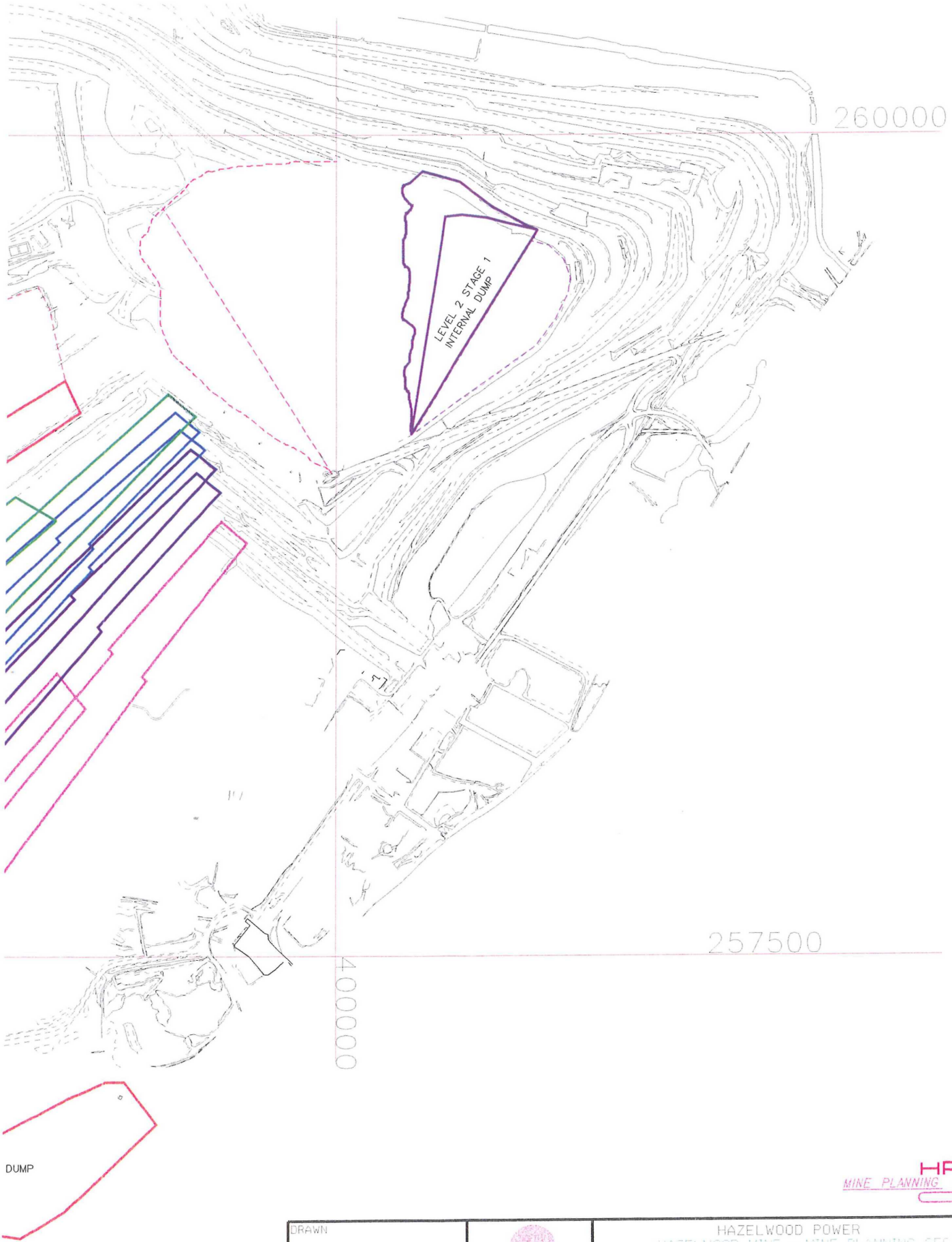
APPROVED

HAZELWOOD POWER
HAZELWOOD MINE - MINE PLANNING SECTION

LV66/19-1/032

HAZELWOOD MINE
EXCAVATION AND DUMP AREAS
2001 STAGE PLANS

CADD A2



HP CAD MINE PLANNING

DRAWN RAM 9/00	HAZELWOOD POWER HAZELWOOD MINE - MINE PLANNING SECTION
CHECKED	LV66/19-1/033
RECOMMENDED	HAZELWOOD MINE EXCAVATION AND DUMP AREAS 2002 STAGE PLANS
APPROVED	

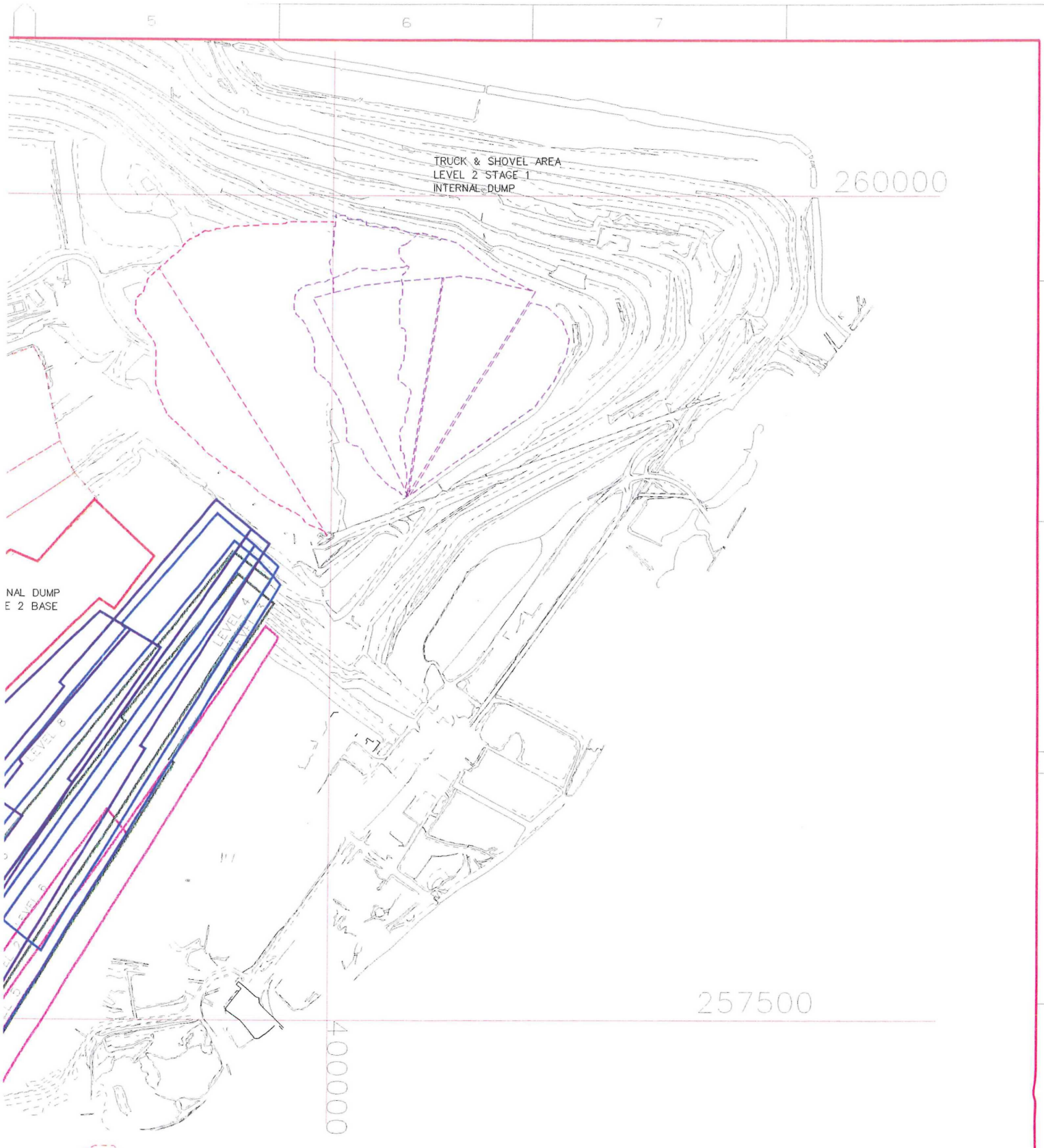
CADD A2

JMP

HP MINE PLANNING CAD

DRAWN RAM 9/00	HAZELWOOD POWER HAZELWOOD MINE - MINE PLANNING SECTION
CHECKED	LV66/19-1/034
RECOMMENDED	HAZELWOOD MINE EXCAVATION AND DUMP AREAS 2003 STAGE PLANS
APPROVED	

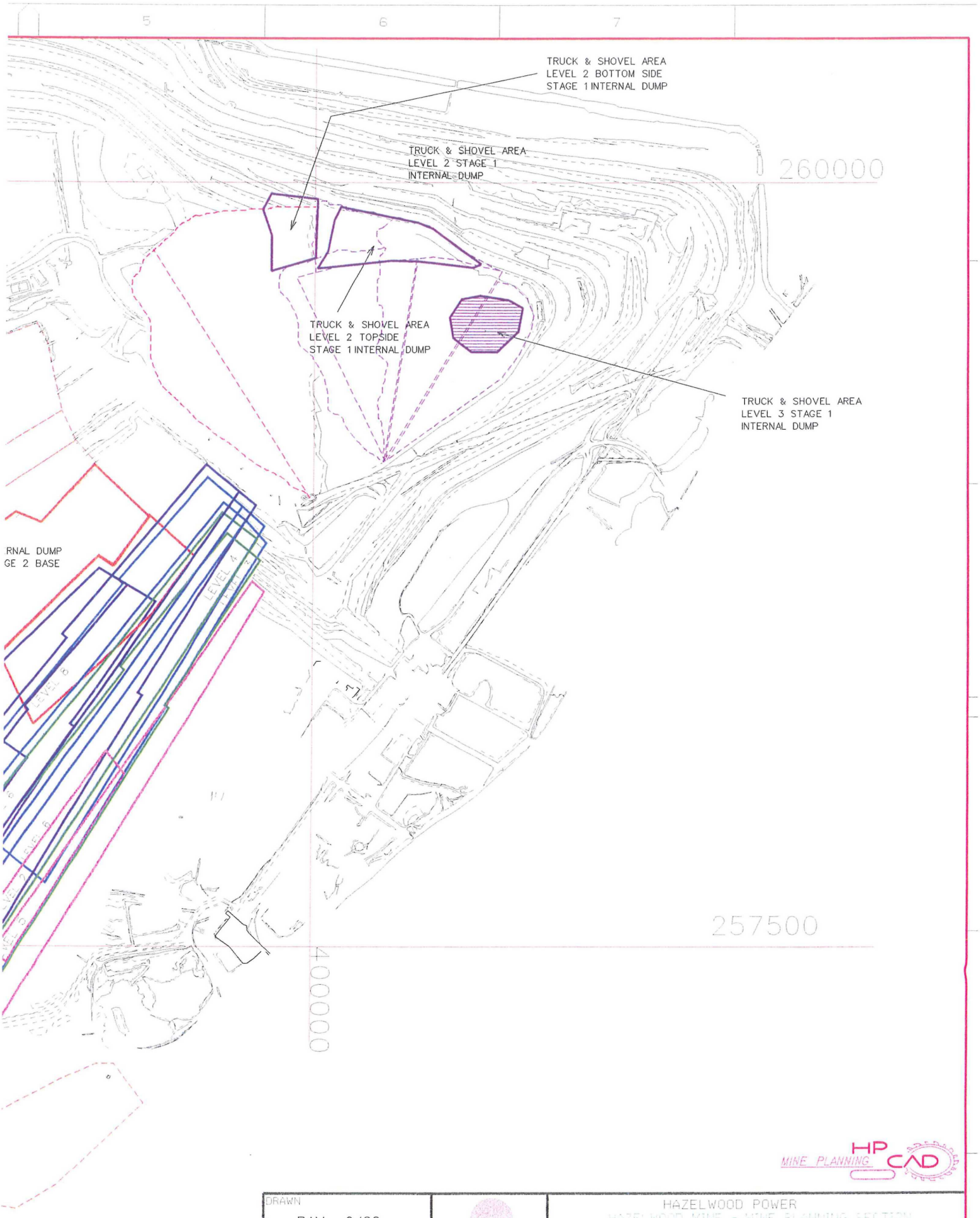
CADD A2



HP MINE PLANNING CAD

DRAWN RAM 9/00	HAZELWOOD POWER HAZELWOOD MINE - MINE PLANNING SECTION
CHECKED	LV66/19-1/035
RECOMMENDED	HAZELWOOD MINE EXCAVATION AND DUMP AREAS 2004 STAGE PLANS
APPROVED	

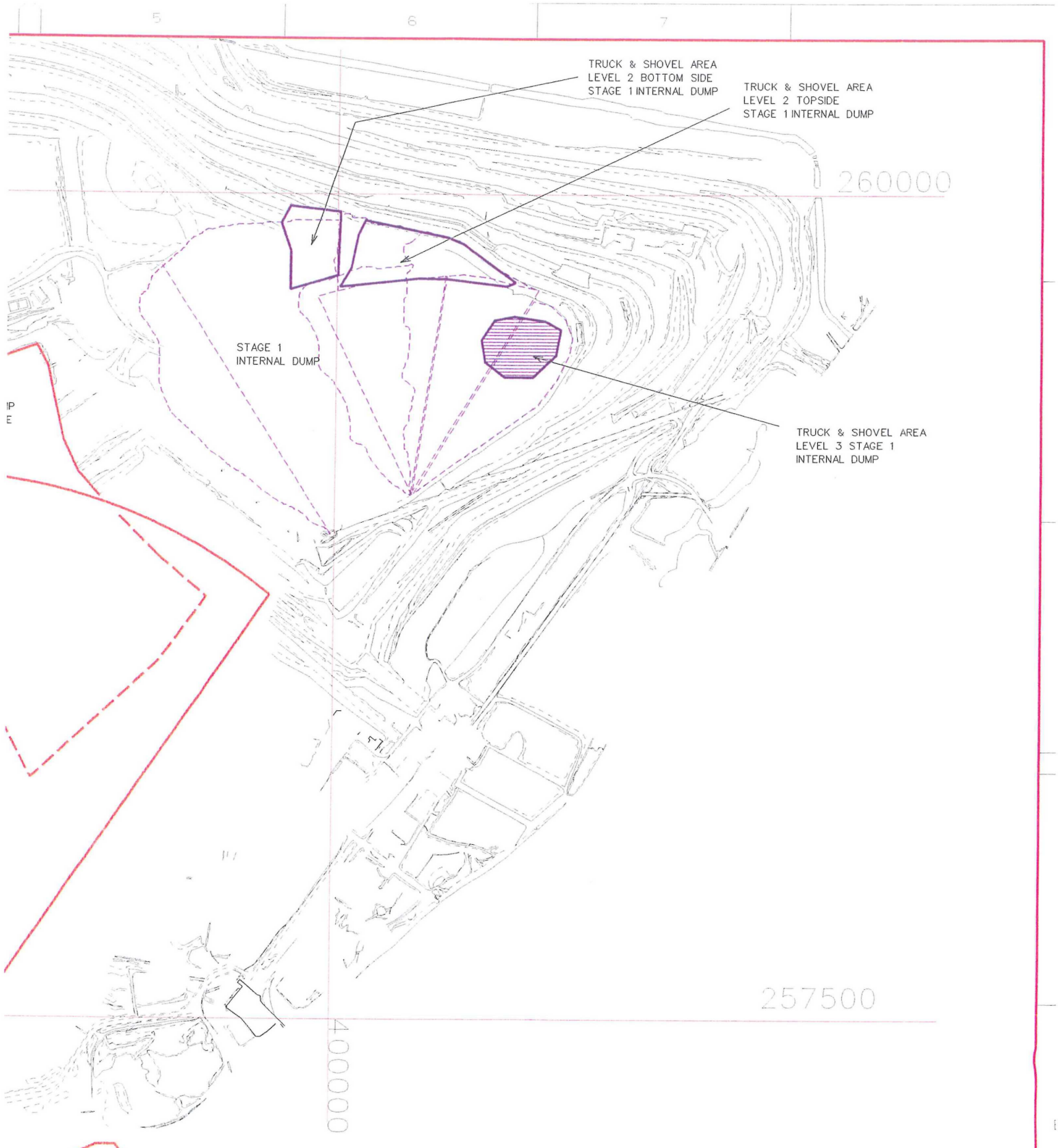
CADD A2



HP MINE PLANNING CAD

DRAWN RAM 9/00	HAZELWOOD POWER HAZELWOOD MINE - MINE PLANNING SECTION
CHECKED	LV66/19-1/036
RECOMMENDED	HAZELWOOD MINE EXCAVATION AND DUMP AREAS 2005 STAGE PLANS
APPROVED	

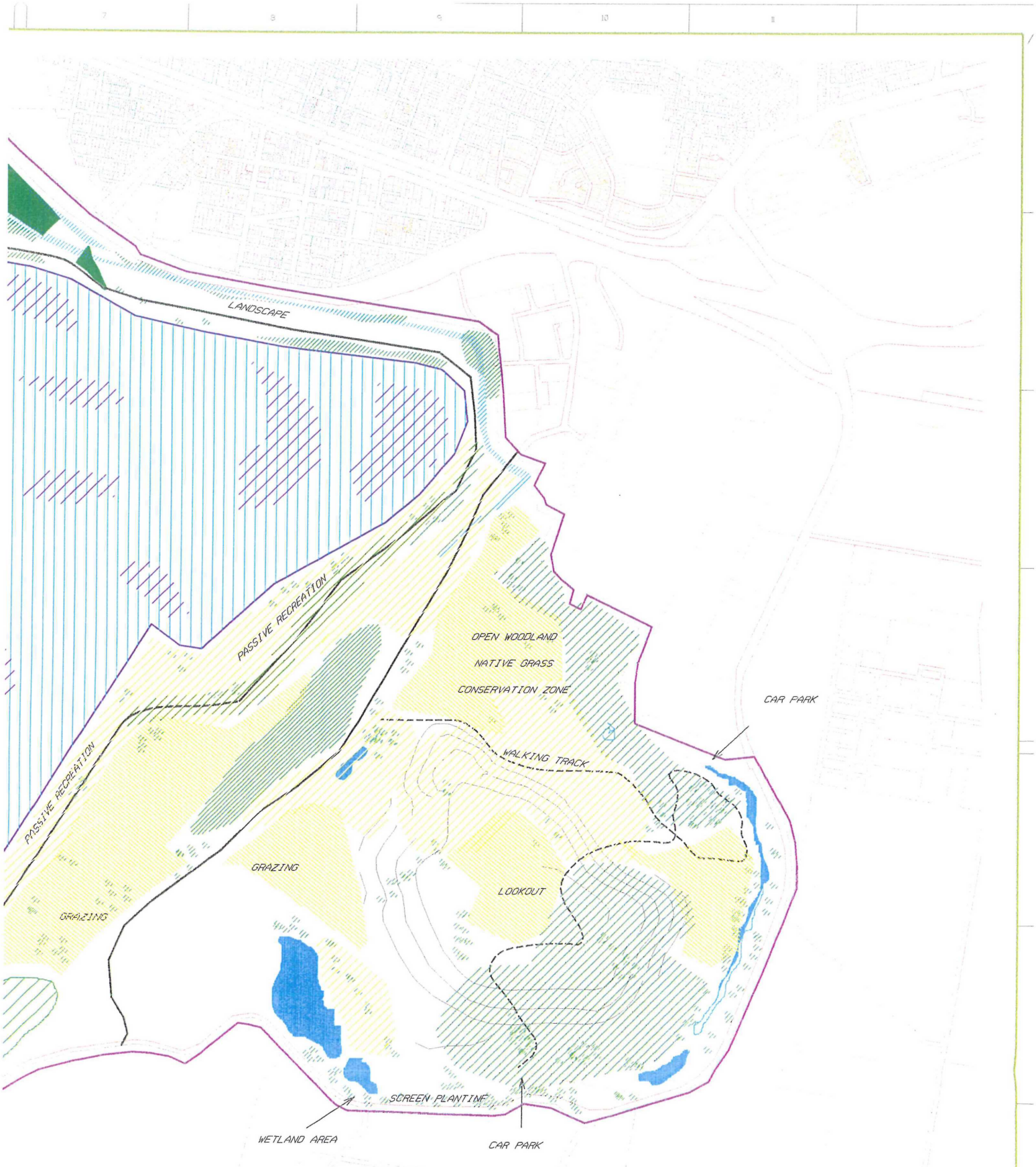
CADD A2



HP MINE PLANNING CAD

DRAWN RAM 9/00	HAZELWOOD POWER HAZELWOOD MINE - MINE PLANNING SECTION
CHECKED	LV66/19-1/037
RECOMMENDED	HAZELWOOD MINE OVERBURDEN DUMP SITES
APPROVED	

CADD A2



MINE PLANNING HP CAD

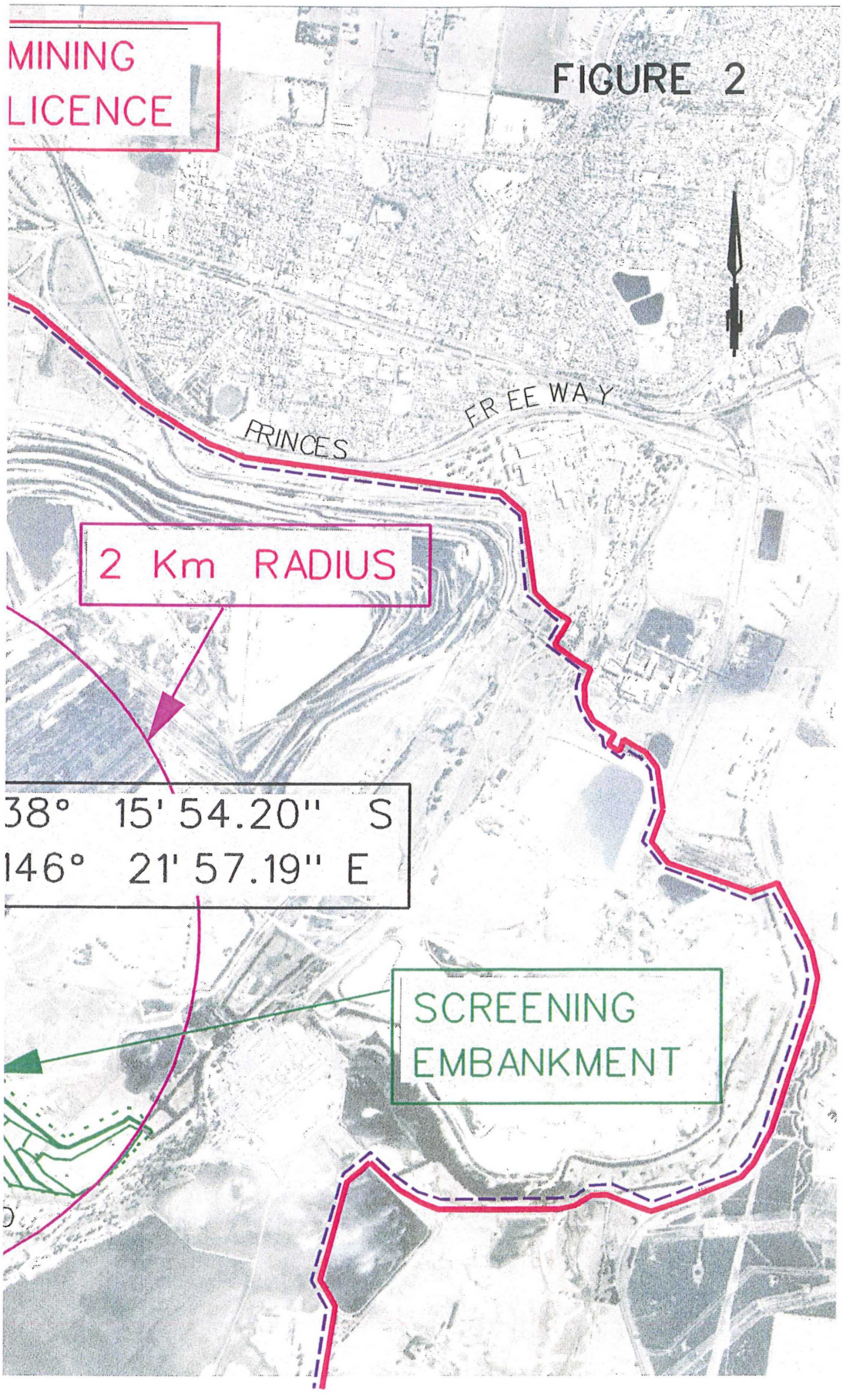
DRAWN	RAM 9/00
CHECKED	
RECOMMENDED	
APPROVED	

HAZELWOOD POWER CORPORATION
MORWELL MINE - MINE PLANNING SECTION

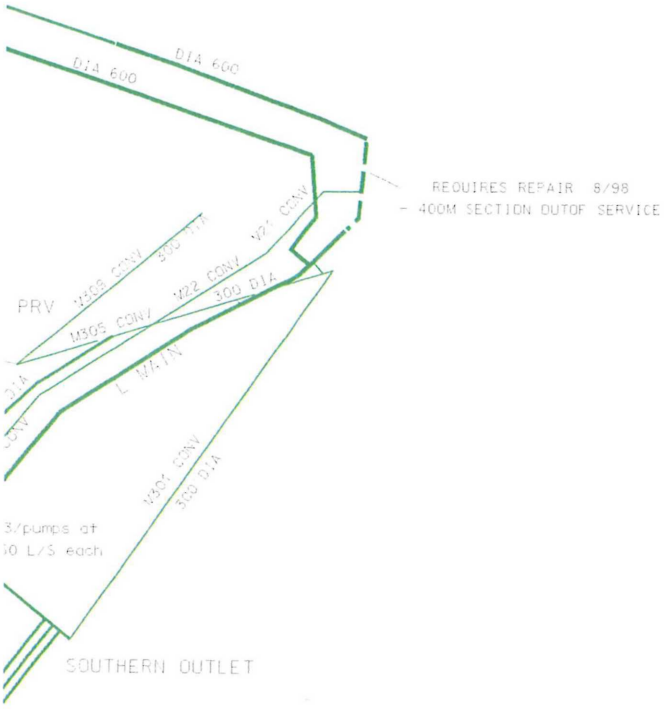
LV66/19-1/038

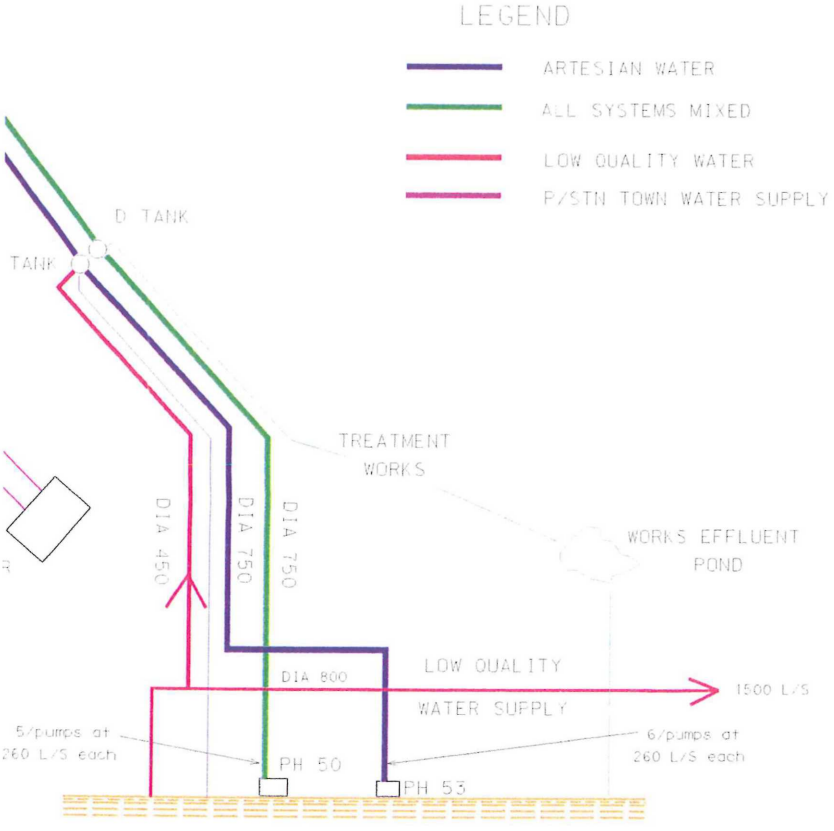
HAZELWOOD POWER
MINE FINAL REHABILITATION
PRELIMINARY CONCEPT SKETCH

CADD B1



REVISION	RAM 9/00	HAZELWOOD POWER HAZELWOOD MINE - MINE PLANNING SECTION LV66/19-1/039
	CHECKED	HAZELWOOD MINE HAZELWOOD WEST PROJECT WITHIN MINING LICENCE & PROPERTY BOUNDARY
	RECOMMENDED	
	APPROVED	





HAZELWOOD COOLING POND

LUGED PUMP CAPACITIES RJP

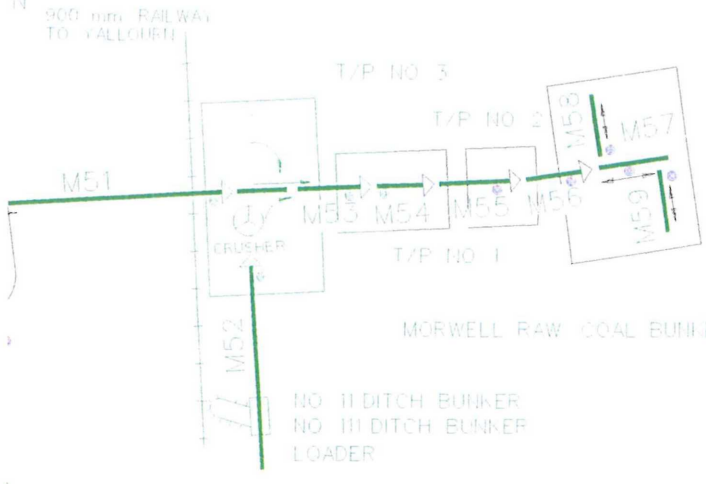
DRAWN RAM 8/98
CHECKED P MACKAY 8/98
RECOMMENDED
APPROVED

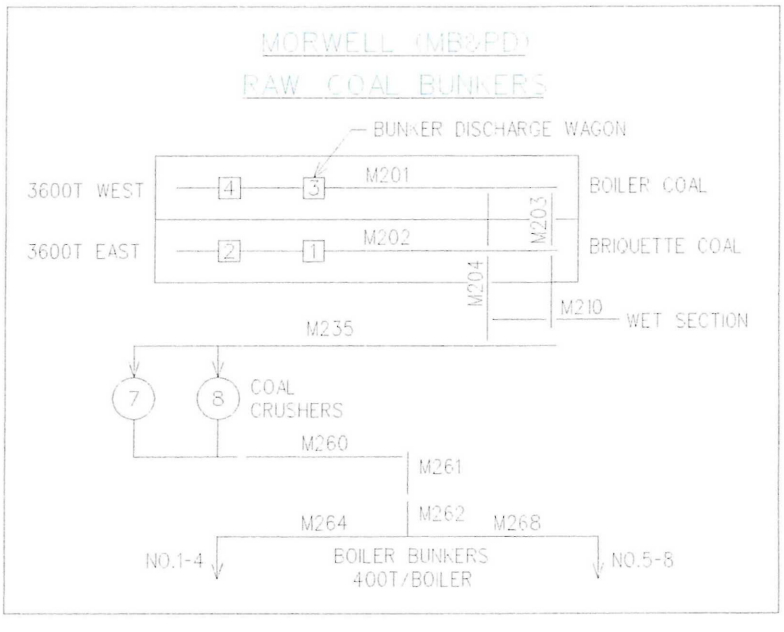
HAZELWOOD POWER CORPORATION
MORWELL MINE MINE PLANNING SECTION

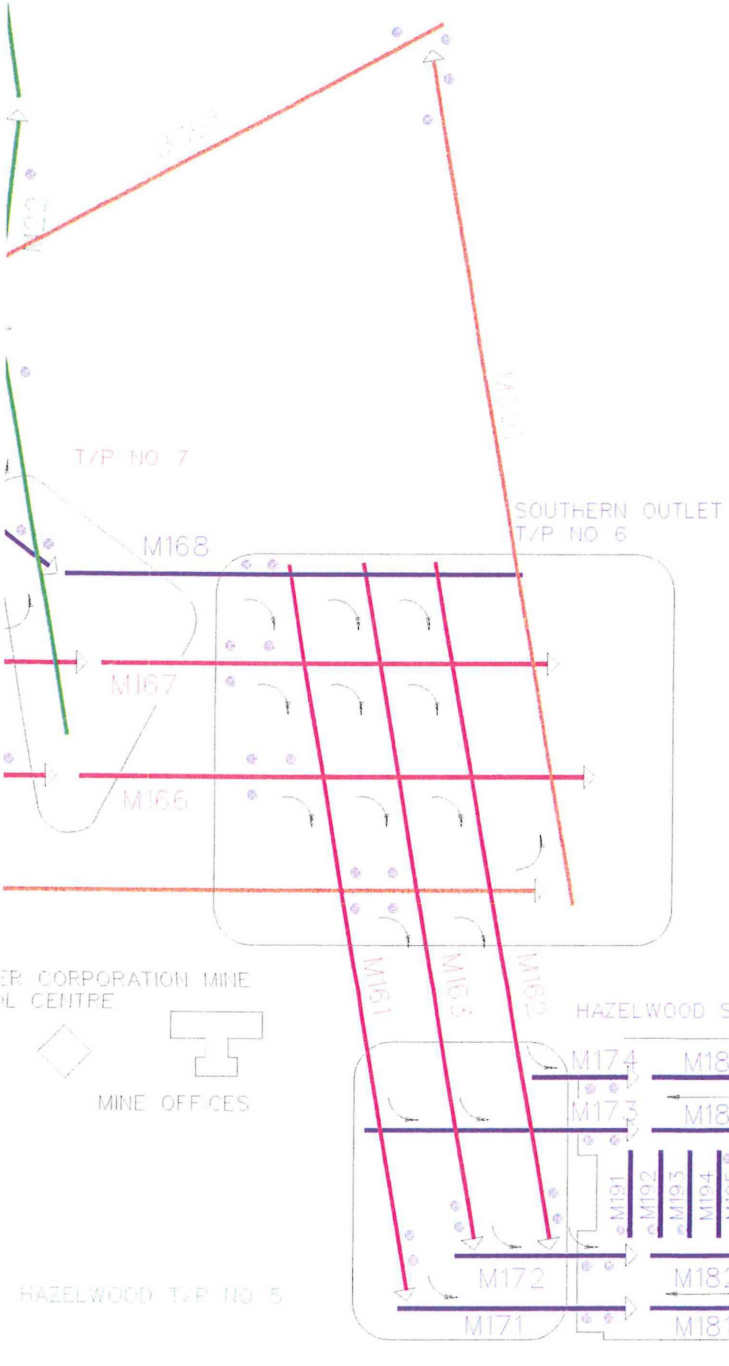
M03D3003 A

- HAZELWOOD POWER MINE
- FIRE SERVICE NETWORK
- SCHEMATIC DIAGRAM
- MAXIMUM DEMAND - ALL SYSTEMS MIXED

CADD







AVERAGE DREDGER OUTPUTS (t/hr)			
DREDGER NO	HOURLY		DAILY
	AVERAGE	MAXIMUM	
24	1000	1200	16000
9	1300	1500	20000
10 coal o/b	1900 900	2500 1100	30000 8500
11	1650	2000	25000
25	1700	2200	25000

MAX. CAPACITIES ON M160 CONV'S	
M161 CONV.	2000t/hr
M162 CONV.	2000t/hr
M163 CONV.	2500t/hr

MOC CAD

DRAWN	D.M & R.P 1/7/93
DESIGNED	

HAZELWOOD POWER CORPORATION
MINE PLANNING - ENGINEERING

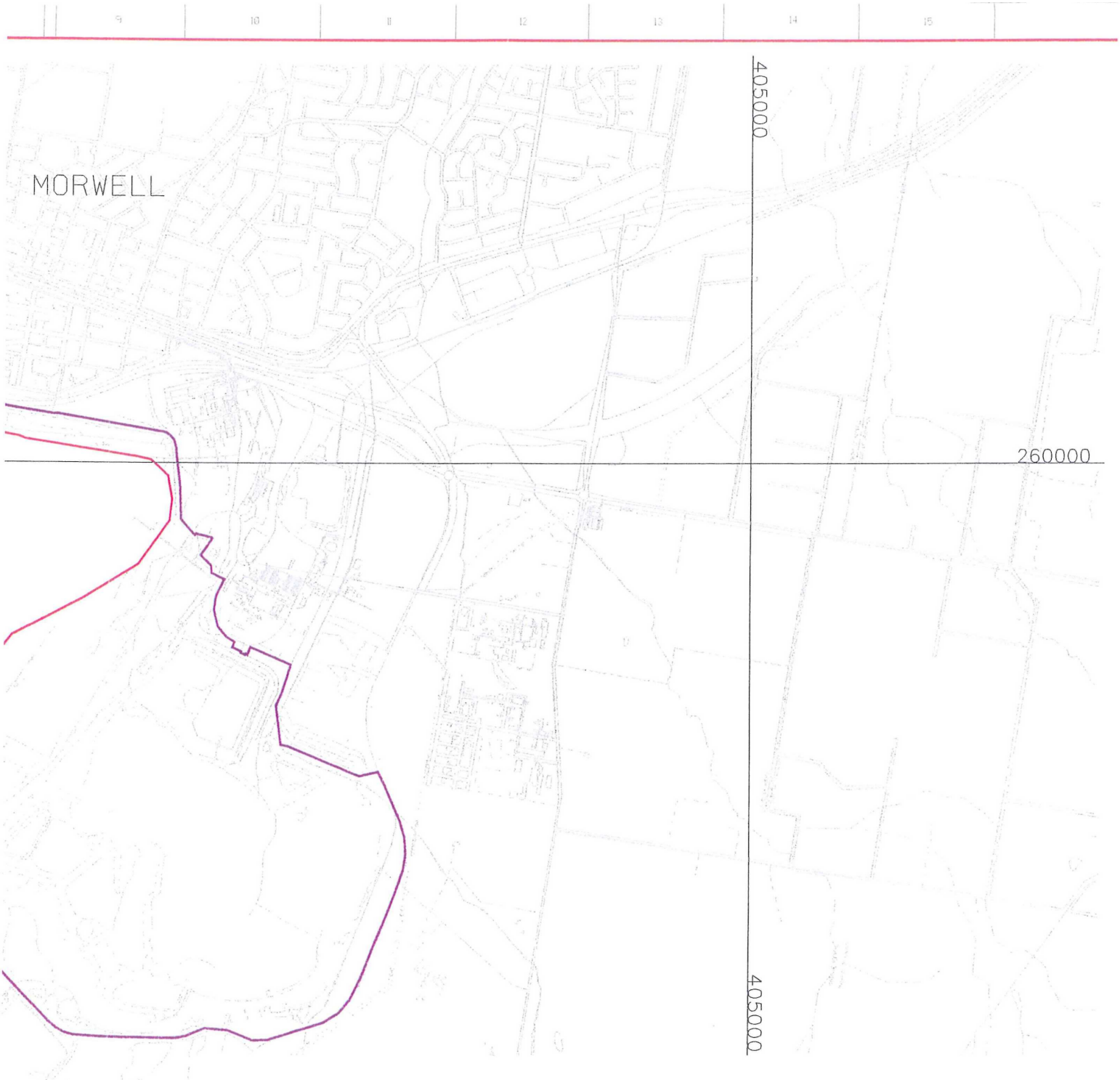
M163D002

HPC MINE
DREDGER & CONVEYOR SYSTEM
LAYOUT AS AT 17/5/99

ANNEXE DRAWING

MOC PROJECT NO:m163d002

A



M.R.D.A. MINING
LICENCE BOUNDARY

HAZELWOOD POWER STATION
(EXCLUDED FROM MINING LICENCE)

EXISTING MINING BLOCK

PROPOSED FUTURE MINING BLOCK

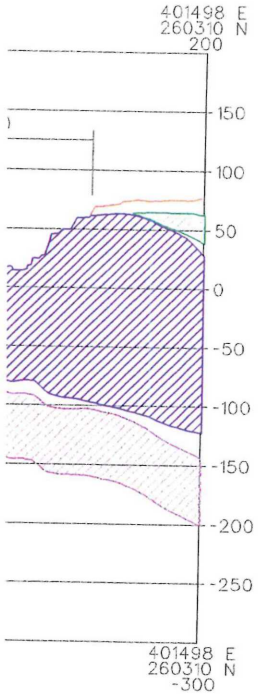
FIG 3-13

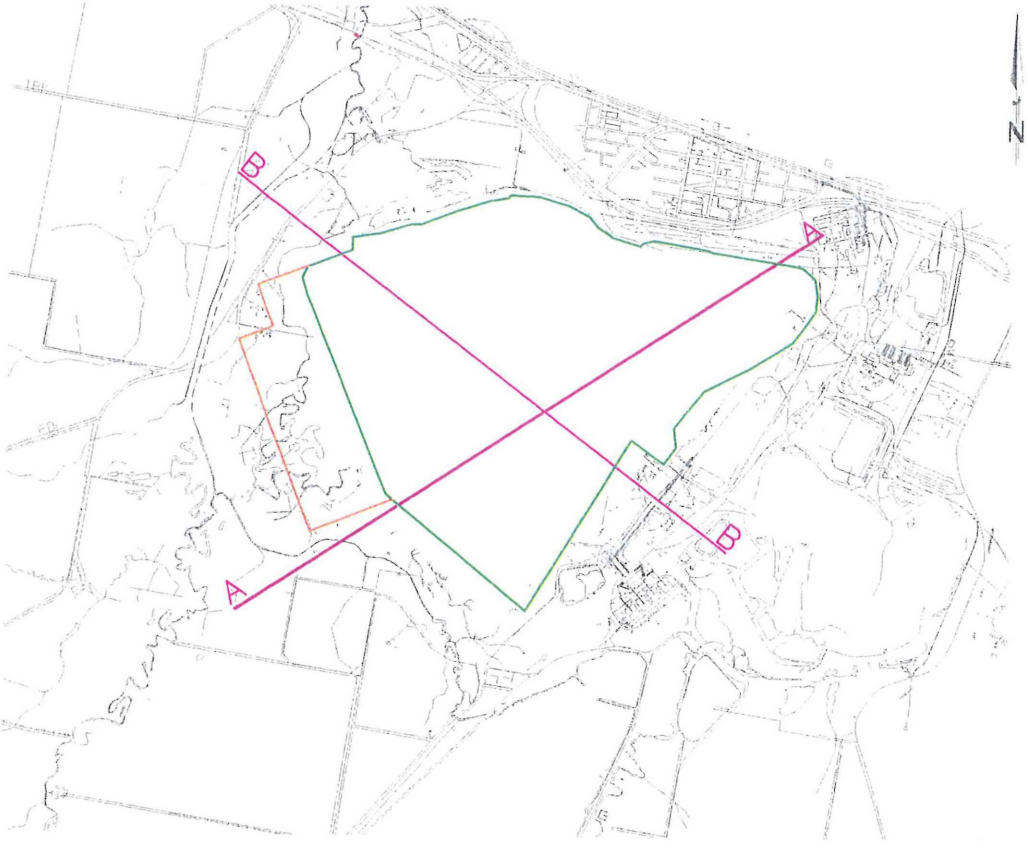
REVISION			
B	4/00	CHANGE TO MINEABLE COAL	
A	6/99	SE FIELD COAL RESERVE	

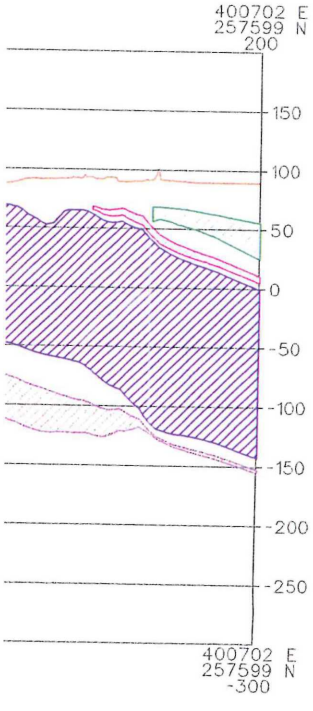
DRAWN
CHECKED
RECOMMENDED
APPROVED

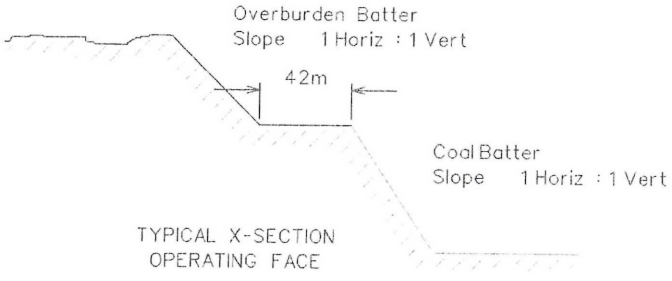
HAZELWOOD POWER
M191D006B

HAZELWOOD POWER
MINE WORK PLAN
MINEABLE COAL RESERVES
AT 31 MARCH 2000

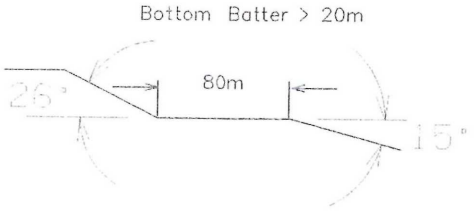


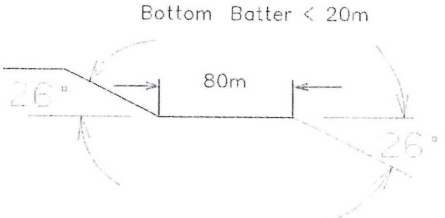






TYPICAL X-SECTION
OPERATING FACE



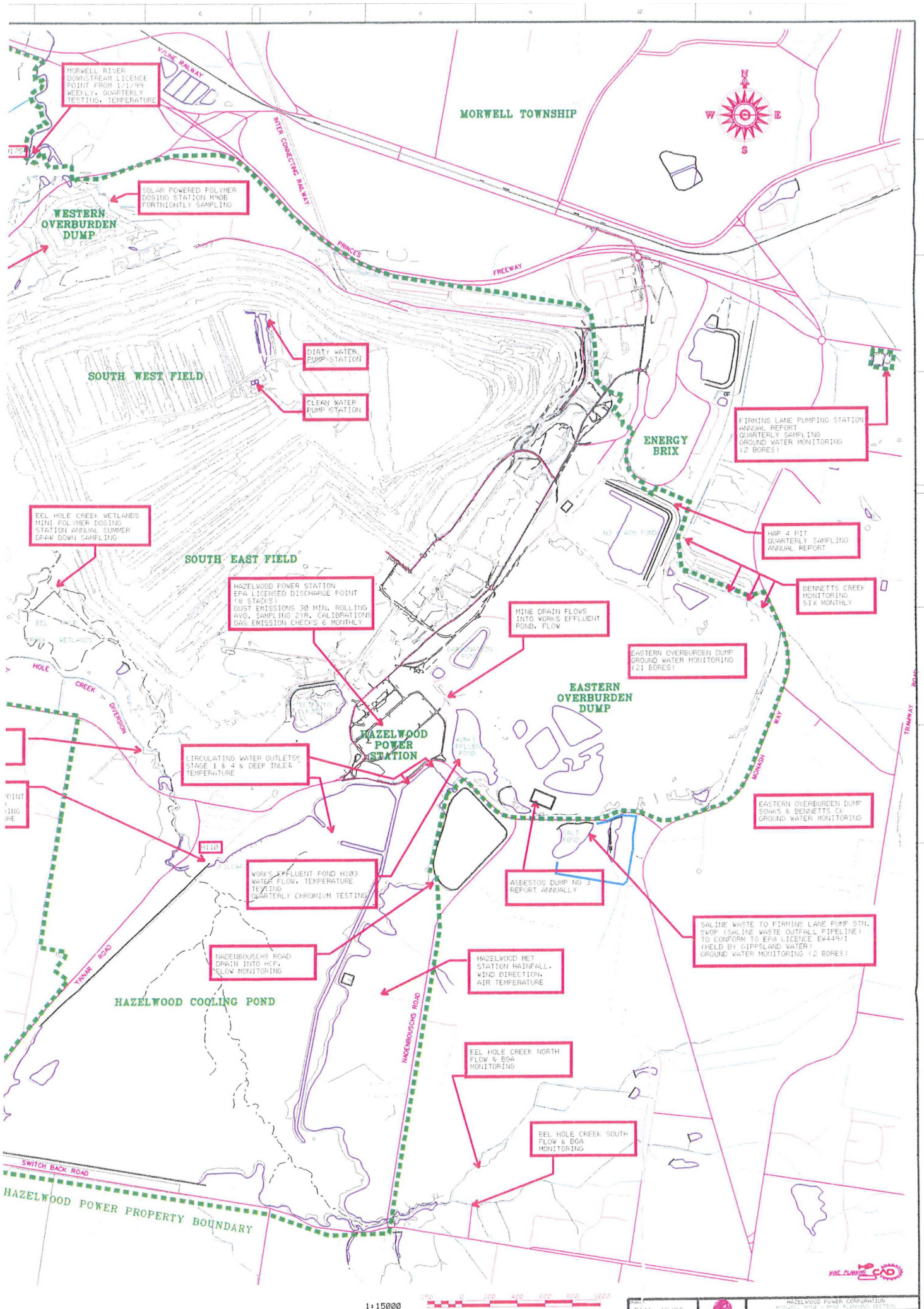


:1 VERT. EXAG.

TYPICAL X-SECTIONS
STACKER PLACEMENT

FIG. 3-12

HAZELWOOD POWER
MINE PLANNING SECTION
M191D007
HAZELWOOD POWER
MINE WORK PLAN
GEOLOGICAL CROSS SECTIONS

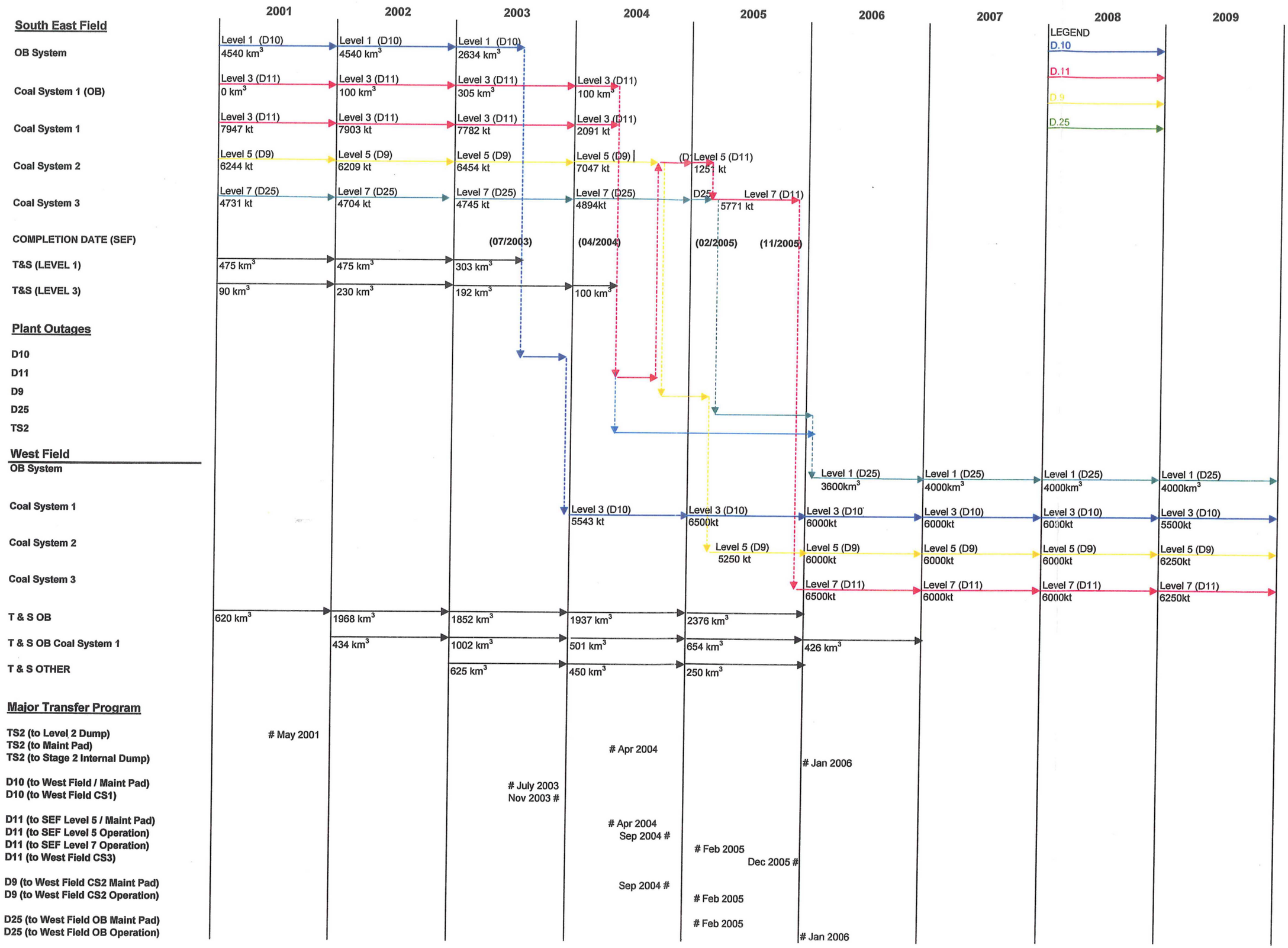

MORWELL RIVER DOWNSTREAM LICENCE POINT FROM 1/1/99 WEEKLY, QUARTERLY TESTING, TEMPERATURE
V/LINE RAILWAY
INTER CONNECTING RAILWAY
MORWELL TOWNSHIP
N
W
E
S
SOLAR POWERED POLYMER DOSING STATION M90B FORTNIGHTLY SAMPLING
WESTERN OVERBURDEN DUMP
PRINCES FREEWAY
DIRTY WATER PUMP STATION
CLEAN WATER PUMP STATION
SOUTH WEST FIELD
FIRMINS LANE PUMPING STATION ANNUAL REPORT QUARTERLY SAMPLING GROUND WATER MONITORING (2 BORES)
ENERGY BRIX
EEL HOLE CREEK WETLANDS MINI POLYMER DOSING STATION ANNUAL SUMMER DRAW DOWN SAMPLING
HAP 4 PIT QUARTERLY SAMPLING ANNUAL REPORT
SOUTH EAST FIELD
HAZELWOOD POWER STATION EPA LICENSED DISCHARGE POINT (8 STACKS) DUST EMISSIONS 30 MIN. ROLLING AVG. SAMPLING 2YR. CALIBRATIONS DAS EMISSION CHECKS 6 MONTHLY
BENNETTS CREEK MONITORING SIX MONTHLY
MINE DRAIN FLOWS INTO WORKS EFFLUENT POND. FLOW
EASTERN OVERBURDEN DUMP GROUND WATER MONITORING (21 BORES)
EEL HOLE CREEK DIVERSION
EASTERN OVERBURDEN DUMP
HAZELWOOD POWER STATION
CIRCULATING WATER OUTLETS STAGE 1 & 4 & DEEP INLET TEMPERATURE
MONASH WAY
TRARALGON ROAD
EASTERN OVERBURDEN DUMP SOAKS & BENNETTS CK GROUND WATER MONITORING
H110
WORKS EFFLUENT POND H103 WATER FLOW, TEMPERATURE TESTING QUARTERLY CHROMIUM TESTING
ASBESTOS DUMP NO 3 REPORT ANNUALLY
SALINE WASTE TO FIRMINS LANE PUMP STN. SWOP (SALINE WASTE OUTFALL PIPELINE) TO CONFORM TO EPA LICENCE EW4491 (HELD BY GIPPSLAND WATER) GROUND WATER MONITORING (2 BORES)
YINNAR ROAD
NADENBOUSCHS ROAD DRAIN INTO HCP, FLOW MONITORING
HAZELWOOD MET STATION RAINFALL, WIND DIRECTION, AIR TEMPERATURE
NADENBOUSCHS ROAD
HAZELWOOD COOLING POND
EEL HOLE CREEK NORTH FLOW & BGA MONITORING
EEL HOLE CREEK SOUTH FLOW & BGA MONITORING
SWITCH BACK ROAD
HAZELWOOD POWER PROPERTY BOUNDARY
1:15000
HAZELWOOD POWER CORPORATION
M201D009
HAZELWOOD POWER
ENVIRONMENTAL MONITORING
WATER, ASH, LAND & AIR PROGRAMS
RAM 12/98
K.T/DA
D FROUD
REVISION
CADD B1
...\environ-20\m201d009.dgn Sep. 21, 2000 10:08:59

APPENDIX I – MINE PLANNING CHARTS (Version 15)

I1 - Time line based on calendar years
I2 - Volume estimates by system and calendar year
I3 - Progress by cross-section
I4 - Dump sequence plans
I5 - Topsoil utilisation table (no adjustments)

I1 Time line based on calendar years

Timeline: (Calander Financial Year) VERSION 15



I2 Volume estimates by system and calendar year

Full Truck and Shovel Option (VERSION 15)

West Field Sequence Plan - Initial Development

Overburden Level (33m) Sequence	Level / Strip	OB (BCM)	Slop (BCM)	Total (BCM)	T&S Project 2001	T&S Project 2002	T&S Project 2003	T&S Project 2004	T&S Project 2005	D25 Prod 2006	D25 Prod 2007	D25 Prod 2008	D25 Prod 2009
A	G5OB:1	334,163	94,587	428,750	Complete								
B	G5OB:2	893,194	237,431	1,130,625	OB Rem 736,502	Complete							
					Slop Rem 202,349	Complete							
C	G5OB:3	1,154,887	325,738	1,480,625		OB Rem 375,917	Complete						
						Slop Rem 75,244	Complete						
D	G5OB:4	1,061,287	299,338	1,360,625			OB Rem 63,989	Complete					
							Slop Complete						
E	G5OB:5	1,080,819	287,306	1,368,125				Complete					
							Slop Rem 183,250	Complete					
F	G5OB:6	1,256,850	239,400	1,496,250				OB Rem 727,169	Complete				
								Slop Rem 159,600	Complete				
G (BWE) -33m	G5OB:7	962,074		1,348,763						Complete			
G (T&S) -33m	G5OB:7	259,468		-					Complete				
H (BWE) -33m	G5OB:8	1,004,254		1,401,488						Complete			
H (T&S) -33m	G5OB:8	263,713		-					Complete				
I (BWE) -33m	G5OB:9	1,095,064		1,515,000						Complete			
I (T&S) -33m	G5OB:9	277,965		-					Complete				
J (BWE) -33m	G5OB:10	987,084		1,380,025						Rem 548,476	Complete		
J (T&S) -33m	G5OB:10	220,359		-					Complete				
Gullet	G5OB7,8,9,10	467,744		467,744					Complete				
K	G1OB:1	976,875		976,875							Complete		
L	G1OB:2	993,750		993,750							Complete		
M	G1OB:3	871,875		871,875							Complete		
N	G1OB:4	832,500		832,500							Rem 223,476	Complete	
O	G1OB:5	963,125		963,125								Complete	
P	G1OB:6	836,250		836,250								Complete	
Q	G1OB:7	770,625		770,625								Complete	
R	G1OB:8	753,125		753,125								Complete	
S	G1OB:9	744,375		744,375								Rem 290,976	Complete
T	G1OB:10	823,750		823,750									Complete
U	G1OB:11	691,875		691,875									Complete
V	G1OB:12	574375		574,375									Complete
													OB Rem 1,619,024

Coal System 1

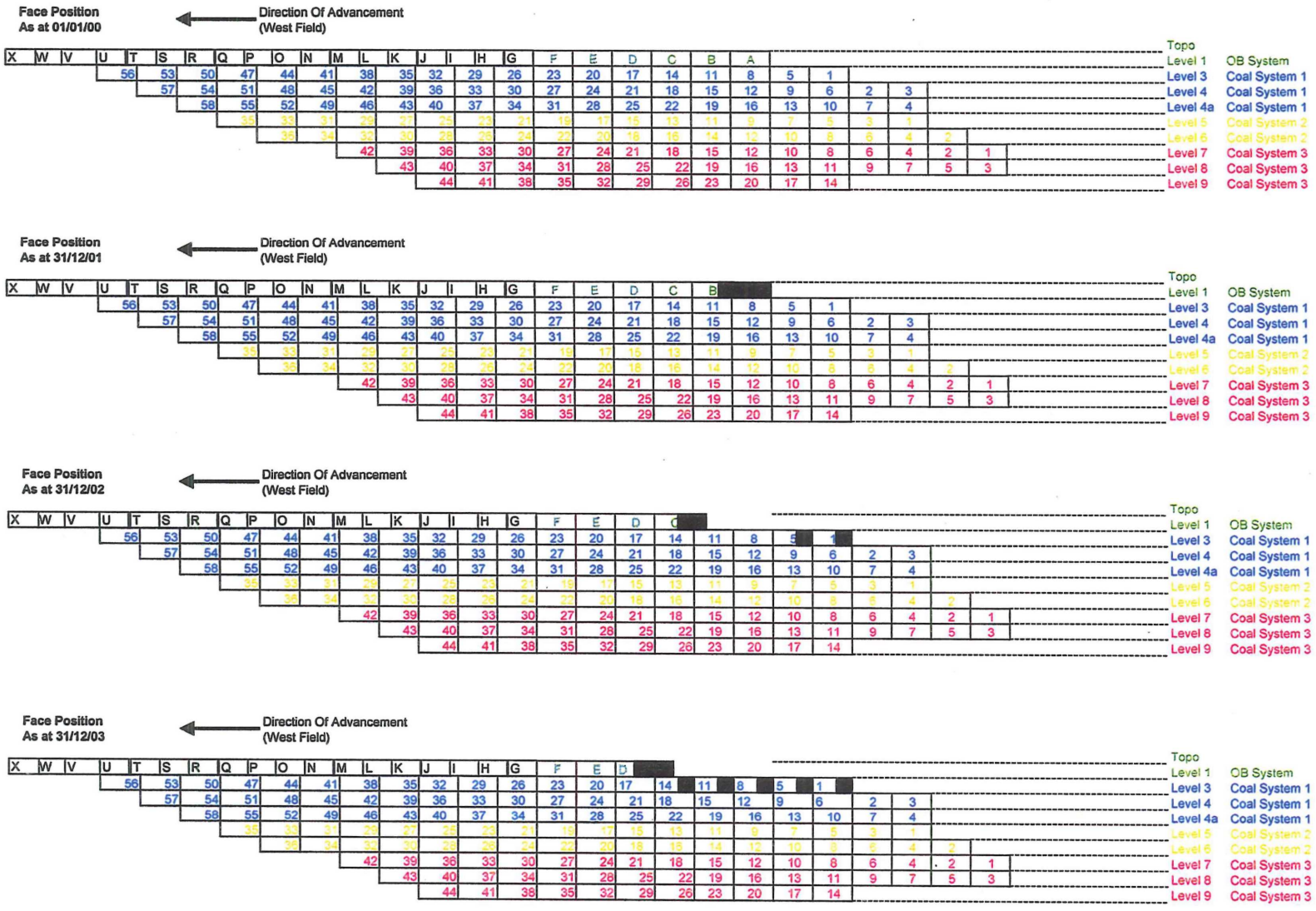
Sequence	Level / Strip	Firehole#8 OB m3	Firehole#8 Slop m3	OB - Other Total m3	Coal (t)	T&S Project 2001	T&S Project 2002	T&S Project 2003	D10 Prod T&S Project 2004	D10 Prod T&S Project 2005	D10 Prod T&S Project 2006	D10 Prod 2007	D10 Prod 2008	D10 Prod 2009
1	G1C1:2	138,732	109,004	-	1,327,118		FH#8 Complete		Coal Complete					
2	G1C2:04	-	-	-	527,250				Coal Complete					
3	G1C2:03	-	-	-	442,462				Coal Complete					
4	G1C3:03	-	-	-	428,925				Coal Complete					
5	G1C1:3	131,528	121,410	-	1,205,763		FH OB Rem 40993	FH#8 Complete	Coal Complete					
							FH SP Rem 28364	FH#8 Complete						
6	G1C2:05	-	-	-	557,887				Coal Complete					
7	G1C3:04	-	-	-	408,262				Coal Complete					
8	G1C1:4	222,044	196,907	135,625	777,109			FH#8 Complete	Coal Rem 131,776	Coal Complete				
									YS Complete					
9	G1C2:06	-	-	-	599,912					Coal Complete				
10	G1C3:05	-	-	-	418,950					Coal Complete				
11	G1C1:5	195,496	187,829	135,625	717,260			FH#8 Complete	YS Rem 65,511	Coal Complete				
										YS Complete				
12	G1C2:07	39,900	-	22,087	612,864					Coal Complete				
										FH#8 Complete				
13	G1C3:06	-	-	-	436,762					YS Complete				
14	G1C1:6	99,650	84,887	254,362	974,514			FH#8 Complete		Coal Complete				
										Coal Complete				
15	G1C2:08	81,225	-	-	492,366					YS Complete				
										Coal Complete				
16	G1C3:07	36,480	-	8,400	371,663					FH#8 Complete				
										Coal Complete				
										FH#8 Complete				
17	G1C1:7	124,388	90,074	56,250	919,738				FH#8 Complete	Coal Complete				
18	G1C2:09	93,480	-	-	499,770					Coal Complete				
										FH#8 Complete				
										YS Complete				
19	G1C3:08	58,140	-	3,158	294,245					Coal Complete				
										YS Complete	FH#8 Complete			
20	G1C1:8	926	499	16,250	1,352,126				FH#8 Complete	YS Complete	Coal Complete			
21	G1C2:02	115,140	-	-	604,040						FH#8 Complete			
											Coal Complete			
22	G1C3:09	45,600	-	-	339,178						FH#8 Complete			
											Coal Complete			
23	G1C1:9	784	641	188,215	1,260,926						FH#8 Complete			
										FH#8 Complete	Coal Complete			
24	G1C2:10	35,340	-	-	647,987					YS Rem 131,992	YS Complete			
											Coal Complete			
25	G1C3:10	5,643	-	-	431,754						OB Complete			
											Coal Complete			
26	G1C1:10	33,302	-	22,800	1,245,249						OB Complete			
											Coal Complete			
											OB Complete			
											YS Complete			
27	G1C2:11	4,560	-	-	663,839						Coal Rem 545,099	Coal Complete		
											OB Complete			
28	G1C3:11	6,498	-	-	440,042						OB Complete	Coal Complete		
29	G1C1:1	-	-	2,000	1,231,913						YS Complete	Coal Complete		
30	G1C2:01	-	-	-	688,987							Coal Complete		
31	G1C3:12	5,415	-	-	421,327							Coal Complete		
												OB Complete		
32	G1C1:11	-	-	-	764,512							Coal Complete		
33	G1C2:12	-	-	-	493,762							Coal Complete		
34	G1C3:02	11,771	-	-	412,657							Coal Complete		
												OB Complete		
35	G1C1:12	-	-	-	738,862							Coal Complete		
36	G1C2:13	-	-	-	498,750							Coal Rem 235,911	Coal Complete	
37	G1C3:01	-	-	-	211,820								Coal Complete	
38	G1C1:13	-	-	-	750,975								Coal Complete	
39	G1C2:14	-	-	-	502,312								Coal Complete	
40	G1C3:13	-	-	-	215,887								Coal Complete	
41	G1C1:14	-	-	-	768,075								Coal Complete	
42	G1C2:15	-	-	-	475,237								Coal Complete	
43	G1C3:14	-	-	-	198,787								Coal Complete	
44	G1C1:15	-	-	-	770,212								Coal Complete	
45	G1C2:16	-	-	-	477,375								Coal Complete	
46	G1C3:15	-	-	-	187,962								Coal Complete	
47	G1C1:16	-	-	-	767,362								Coal Complete	
48	G1C2:17	-	-	-	460,987								Coal Rem 22,902	Coal Complete
49	G1C3:16	-	-	-	173,137									Coal Complete
50	G1C1:17	-	-	-	784,462									Coal Complete
51	G1C2:18	-	-	-	460,275									Coal Complete
52	G1C3:17	-	-	-	181,687									Coal Complete
53	G1C1:18	-	-	-	775,200									Coal Complete
54	G1C2:19	-	-	-	438,400									Coal Complete
55	G1C3:18	-	-	-	166,725									Coal Complete
56	G1C1:19	-	-	-	780,900									Coal Complete
57	G1C2:20	-	-	-	438,400									Coal Complete
58	G1C3:19	-	-	-	156,037									Coal Rem 1,121,874

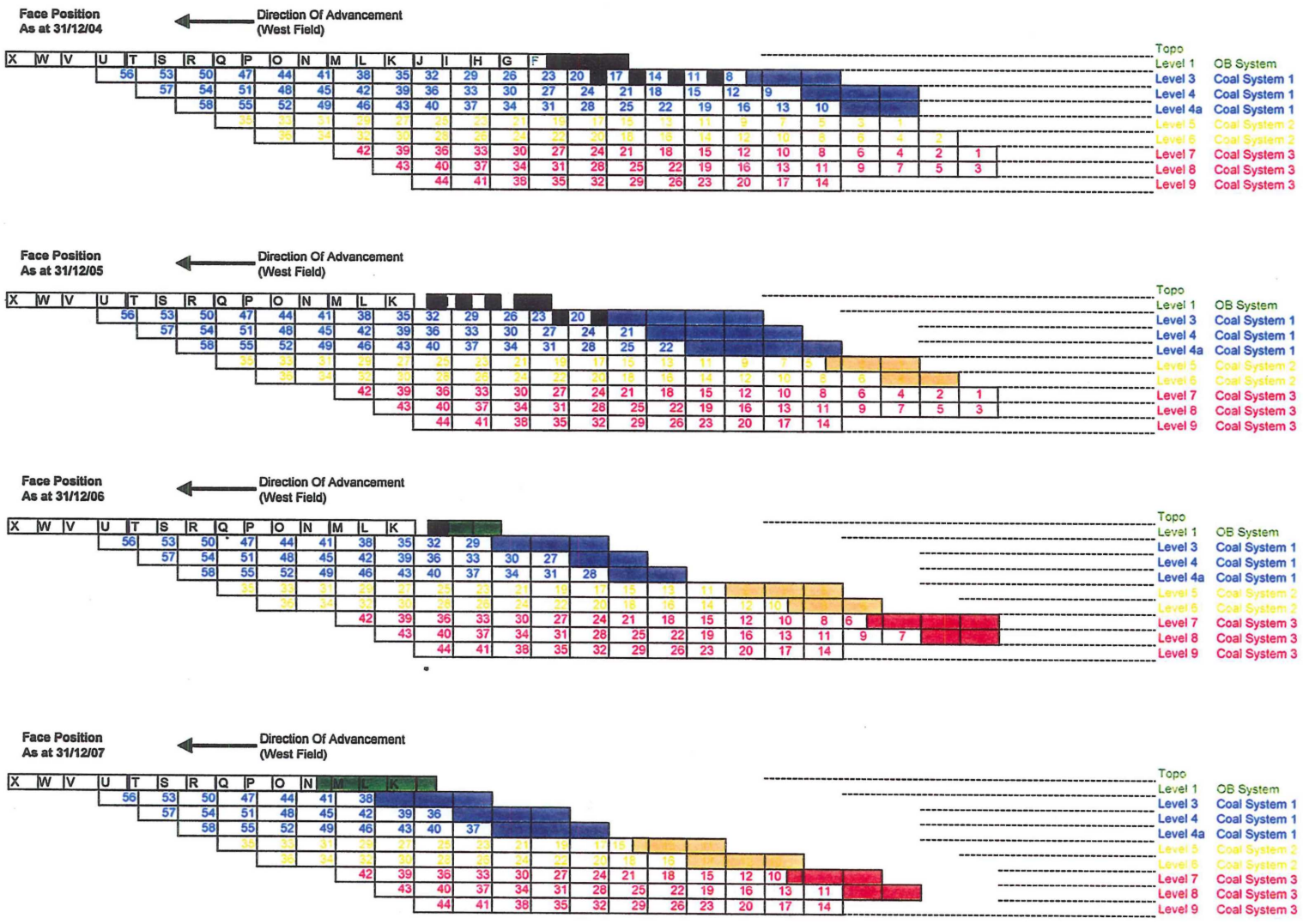
Coal System 2 Sequence	Level / Strip	Firehole#8 OB m3	Firehole#8 Slop m3	OB - Other Total m3	Coal (t)	2001	2002	2003	2004	D9 Prod 2005	D9 Prod 2006	D9 Prod 2007	D9 Prod 2008	D9 Prod 2009
1	G1C4:02	-	-	-	1,843,950					Coal Complete				
2	G1C5:02	-	-	-	421,087					Coal Complete				
3	G1C4:03	-	-	-	1,891,687					Coal Complete				
4	G1C5:03	-	-	-	434,625					Coal Complete				
5	G1C4:04	-	-	-	1,924,462					Coal Rem 1,265,811	Coal Complete			
6	G1C5:04	-	-	-	445,312						Coal Complete			
7	G1C4:05	-	-	-	1,893,825						Coal Complete			
8	G1C5:05	-	-	-	448,875						Coal Complete			
9	G1C4:06	-	-	-	1,876,725						Coal Complete			
10	G1C5:06	-	-	-	446,025						Coal Rem 376,573	Coal Complete		
11	G1C4:07	30,780	-	-	1,875,123							Coal Complete		
12	G1C5:07	-	-	-	463,837							OB Complete		
13	G1C4:08	27,617	-	-	1,920,054							Coal Complete		
14	G1C5:08	-	-	-	473,812							Coal Complete		
15	G1C4:09	6,498	-	-	1,911,354							OB Complete		
16	G1C5:09	-	-	-	473,802							Coal Complete		
17	G1C4:10	2,850	-	-	1,941,876							Coal Rem 1,020,753	Coal Complete	
18	G1C5:10	-	-	-	487,350								OB Complete	
19	G1C4:11	10,559	-	-	1,918,125								Coal Complete	
20	G1C5:01	-	-	-	494,475								Coal Complete	
21	G1C4:01	17,969	-	-	1,357,491								OB Complete	
22	G1C5:11	-	-	-	296,400								Coal Rem 336,381	Coal Complete
23	G1C4:12	-	-	-	1,374,562									Coal Complete
24	G1C5:12	-	-	-	285,000									OB Complete
25	G1C4:13	-	-	-	1,410,750									Coal Complete
26	G1C5:13	-	-	-	291,412									Coal Complete
27	G1C4:14	-	-	-	1,390,087									Coal Complete
28	G1C5:14	-	-	-	279,300									Coal Complete
29	G1C4:15	-	-	-	1,419,300									Coal Rem 492,083

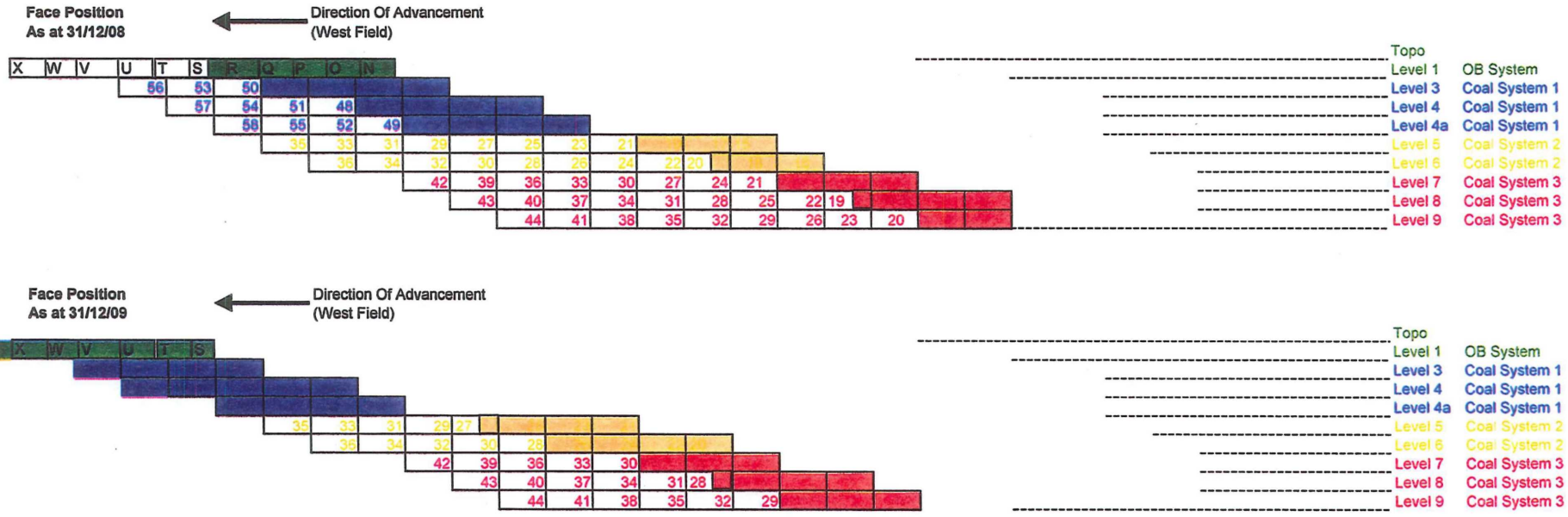
Coal System 3 Sequence	Level / Strip	Firehole#8 OB m3	Firehole#8 Slop m3	OB - Other Total m3	Coal (t)	2001	2002	2003	2004	2005	D11 Prod 2006	D11 Prod 2007	D11 Prod 2008	D11 Prod 2009
1	G1C6:02	-	-	-	1,952,250						Coal Complete			
2	G1C6:03	-	-	-	1,890,262						Coal Complete			
3	G1C7:03	-	-	-	278,587						Coal Complete			
4	G1C6:04	-	-	-	1,918,762						Coal Complete			
5	G1C7:04	-	-	-	294,975						Coal Complete			
6	G1C6:05	-	-	-	1,920,187						Coal Rem 1,755,02	Coal Complete		
7	G1C7:05	-	-	-	339,150							Coal Complete		
8	G1C6:06	-	-	-	1,908,787							Coal Complete		
9	G1C7:06	-	-	-	405,414							Coal Complete		
10	G1C6:07	-	-	-	1,895,250							Coal Rem 303,624	Coal Complete	
11	G1C7:07	-	-	-	464,550								Coal Complete	
12	G1C8:07	-	-	-	6,412								Coal Complete	
13	G1C6:08	-	-	-	1,876,012								Coal Complete	
14	G1C7:08	-	-	-	473,100								Coal Complete	
15	G1C8:08	-	-	-	23,512								Coal Complete	
16	G1C6:09	-	-	-	1,800,487								Coal Complete	
17	G1C7:09	-	-	-	506,587								Coal Complete	
18	G1C8:09	-	-	-	42,750								Coal Complete	
19	G1C6:10	-	-	-	1,771,275								Coal Rm 1,268,30	Coal Complete
20	G1C7:10	-	-	-	532,950									Coal Complete
21	G1C8:10	-	-	-	79,087									Coal Complete
22	G1C6:01	-	-	-	1,690,050									Coal Complete
23	G1C7:11	-	-	-	571,425									Coal Complete
24	G1C8:05	-	-	-	101,887									Coal Complete
25	G1C6:11	-	-	-	1,117,912									Coal Complete
26	G1C7:01	-	-	-	583,587									Coal Complete
27	G1C8:11	-	-	-	17,100									Coal Complete
28	G1C6:12	-	-	-	1,073,737									Coal Complete
29	G1C7:02	-	-	-	289,275									Coal Rem 786,044
30	G1C8:06	-	-	-	39,900									
31	G1C6:13	-	-	-	1,078,725									

I3 Progress by cross-section

Full Truck and Shovel Option Development (Version 15)




Face Position
As at 31/12/04
Direction Of Advancement
(West Field)
X W V U T S R Q P O N M L K J I H G F
56 53 50 47 44 41 38 35 32 29 26 23 20 17 14 11 8
57 54 51 48 45 42 39 36 33 30 27 24 21 18 15 12 9
58 55 52 49 46 43 40 37 34 31 28 25 22 19 16 13 10
42 39 36 33 30 27 24 21 18 15 12 10 8 6 4 2 1
43 40 37 34 31 28 25 22 19 16 13 11 9 7 5 3
44 41 38 35 32 29 26 23 20 17 14
Topo
Level 1 OB System
Level 3 Coal System 1
Level 4 Coal System 1
Level 4a Coal System 1
Level 5 Coal System 2
Level 6 Coal System 2
Level 7 Coal System 3
Level 8 Coal System 3
Level 9 Coal System 3
Face Position
As at 31/12/05
Direction Of Advancement
(West Field)
X W V U T S R Q P O N M L K
56 53 50 47 44 41 38 35 32 29 26 23 20
57 54 51 48 45 42 39 36 33 30 27 24 21
58 55 52 49 46 43 40 37 34 31 28 25 22
42 39 36 33 30 27 24 21 18 15 12 10 8 6 4 2 1
43 40 37 34 31 28 25 22 19 16 13 11 9 7 5 3
44 41 38 35 32 29 26 23 20 17 14
Topo
Level 1 OB System
Level 3 Coal System 1
Level 4 Coal System 1
Level 4a Coal System 1
Level 5 Coal System 2
Level 6 Coal System 2
Level 7 Coal System 3
Level 8 Coal System 3
Level 9 Coal System 3
Face Position
As at 31/12/06
Direction Of Advancement
(West Field)
X W V U T S R Q P O N M L K
56 53 50 47 44 41 38 35 32 29
57 54 51 48 45 42 39 36 33 30 27
58 55 52 49 46 43 40 37 34 31 28
42 39 36 33 30 27 24 21 18 15 12 10 8 6
43 40 37 34 31 28 25 22 19 16 13 11 9 7
44 41 38 35 32 29 26 23 20 17 14
Topo
Level 1 OB System
Level 3 Coal System 1
Level 4 Coal System 1
Level 4a Coal System 1
Level 5 Coal System 2
Level 6 Coal System 2
Level 7 Coal System 3
Level 8 Coal System 3
Level 9 Coal System 3
Face Position
As at 31/12/07
Direction Of Advancement
(West Field)
X W V U T S R Q P O N
56 53 50 47 44 41 38
57 54 51 48 45 42 39 36
58 55 52 49 46 43 40 37
42 39 36 33 30 27 24 21 18 15 12 10
43 40 37 34 31 28 25 22 19 16 13 11
44 41 38 35 32 29 26 23 20 17 14
Topo
Level 1 OB System
Level 3 Coal System 1
Level 4 Coal System 1
Level 4a Coal System 1
Level 5 Coal System 2
Level 6 Coal System 2
Level 7 Coal System 3
Level 8 Coal System 3
Level 9 Coal System 3


Face Position
As at 31/12/08
Direction Of Advancement
(West Field)
X W V U T S R Q P O N
Topo
Level 1 OB System
Level 3 Coal System 1
Level 4 Coal System 1
Level 4a Coal System 1
Level 5 Coal System 2
Level 6 Coal System 2
Level 7 Coal System 3
Level 8 Coal System 3
Level 9 Coal System 3

Face Position
As at 31/12/09
Direction Of Advancement
(West Field)
X W V U T S
Topo
Level 1 OB System
Level 3 Coal System 1
Level 4 Coal System 1
Level 4a Coal System 1
Level 5 Coal System 2
Level 6 Coal System 2
Level 7 Coal System 3
Level 8 Coal System 3
Level 9 Coal System 3

I4 Dump sequence plans

VERSION 15

Truck and Shovel Quantities (all bcm)

Financial Year	West Field (Good)	West Field (Poor)	SEF (Good)	Eel Hole Ck (Good)	HTA Pond (Poor)	TP8 /Series 80 (Good)	SEF Batters (Good)	TOTAL
2001	490,855	129,669	565,000	-	-	-	-	1,185,524
2002	1,744,739	657,893	705,000	-	-	-	-	3,107,632
2003	1,931,398	976,625	495,000	125,000	150,000	350,000	-	4,028,023
2004	2,005,542	353,623	100,000	200,000		-	250,000	2,909,165
2005	2,950,528	160,241	-	-	-	-	250,000	3,360,769
2006	375,672	-	-	-	-	-	-	375,672
								-
Total	9,498,734	2,278,051	1,865,000	325,000	150,000	350,000	500,000	14,966,785

DUMP SEQUENCE PLAN

Full Truck Option

Assumptions
No eel hole creek flood protection levee
Swell Volume Insitu : Dump 15%
Level 3 pass 2 15% good material to form "slop" bays
Option 3 SEF DUMP Criteria Utilised For dumps (xvii,xviii & xix)
10% (by volume) "slop absorbtion rate into dumps (vi), (vii), (viii), (xii), (xiii), (xiv) and (xv)

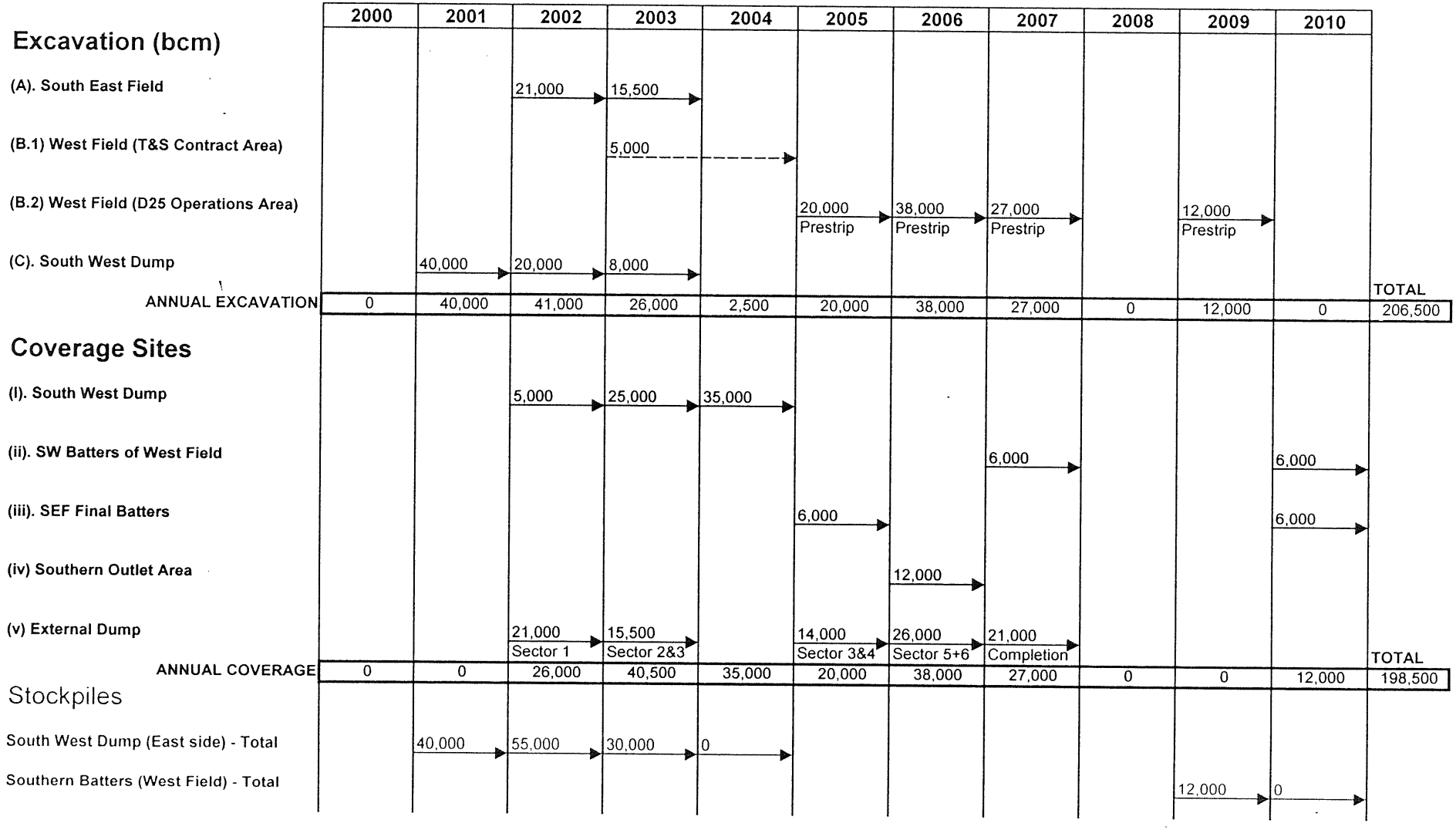
	Dump	Good (BCM)	Slop (BCM)	Required	Good (BCM)	Slop (BCM)	Remaining (BCM)
(i)	West Field CS1 Establishment	386,000	-	2003	386,000	-	Complete
(ii)	West Field CS2 Establishment	175,000	-	2004	175,000		Complete
(iii)a	Base of Nth Face Dump - Sector 5	550,000	350,000				900,000
(iv)	Nth Face Dump - Groyne Construction	100,000	-				100,000
(vi)	Level 3 Internal Dump (Pass 1)	3,930,000	435,000				4,365,000
(vii)	Level 3 Internal Dump (Pass 1)	3,428,000	380,000				3,808,000
(viii)	Level 3 Internal Dump (Pass 1)	2,727,000	300,000				3,027,000
(ix)	Level 3 Internal Dump (Pass 2)	150,000	488,000				638,000
(x)	Level 3 Internal Dump (Pass 2)	150,000	700,000				850,000
(xi)	Level 3 Internal Dump (Pass 2)	150,000	700,000				850,000
(xii)	Nth Face Dump - Level 1 (Sector 5 Only)	1,100,000	-				1,100,000
(xiii)	Nth Face Dump - Level 2 (Sector 5 Only)	850,000	-				850,000
(xiv)	Nth Face Dump - Level 3 (Sector 5 Only)	450,000	-				450,000
(xv)	South West Corner Dump (all Levels)	4,200,000	800,000	2002	705,000		
				2002	1,645,992	64,187	
				2003	125,000		
				2003	350,000		
				2003		150,000	
				2003	495,000		
				2004	100,000		
				2004	200,000		
				2004	1,014,821	150,000	Complete
(xvi)	East External Dump	500,000	-	2004	250,000		
				2005	250,000		Complete
(xvii)	SEF Stage 2 Internal Dump Base -Pre CS1	2,500,000	1,250,000	2001	565,000	-	
				2001	490,855	129,669	
				2002	98,747	593,706	
				2003	1,345,398	526,625	Complete
(xviii)	SEF Stage 2 Internal Dump Base -Post CS1	520,000	250,000	2005	609,759	160,241	Complete
(xix)	Stage 1 Internal Dump Level 2 Completion (Bottomside Void)	1,350,000	650,000	2003	200,000	450,000	
				2004	815,721	203,623	
				2005	334,279		Complete
(xx)	Stage 1 Internal Dump Level 2 Completion (Topside Void)	1,500,000		2005	1,500,000		Complete
(xxi)	Stage 1 Internal Dump Level 3 (ASH Setup)	1,500,000		2005	506,490		
				2006	375,672		617,838
	Total	26,216,000	6,303,000	Totals	12,538,734	2,428,051	17,555,838
	Total Dumping Capacity	32,519,000					

Timing	Dumping	Good (BCM)	Slop (BCM)	Total
Year 2001 Financial Year				
	Behind D25 SEF	565,000	-	565,000
	Dump (xvii)			
	Dump (xvii)	490,855	129,669	620,524
	Total	1,055,855	129,669	1,185,524
Year 2002 Financial Year				
	Dump (xv)	705,000	-	705,000
	Dump (xv)	1,645,992	64,187	1,710,179
	Dump (xvii)	98,747	593,706	692,453
	Total	2,449,739	657,893	3,107,632
Year 2003 Financial Year				
	Dump (i)	386,000	-	386,000
	Dump (xv)	125,000	-	125,000
	Dump (xv)	350,000	-	350,000
	Dump (xv)	-	150,000	150,000
	Dump (xv)	495,000	-	495,000
	Dump (xvii)	1,345,398	526,625	1,872,023
	Dump (xix)	200,000	450,000	650,000
	Total	2,901,398	1,126,625	4,028,023
Year 2004 Financial Year				
	Dump (ii)	175,000	-	175,000
	Dump (xv)	100,000	-	100,000
	Dump (xv)	200,000	-	200,000
	Dump (xv)	1,014,821	150,000	1,164,821
	Dump (xix)	815,721	203,623	1,019,344
	Dump (xvi)	250,000	-	250,000
	Total	2,555,542	353,623	2,909,165
Year 2005 Financial Year				
	Dump (xvi)	250,000	-	250,000
	Dump (xviii)	609,759	160,241	770,000
	Dump (xix)	334,279	-	334,279
	Dump (xx)	1,500,000	-	1,500,000
	Dump (xxi)	506,490	-	506,490
	Total	3,200,528	160,241	3,360,769
Year 2006 Financial Year				
	Dump (xviii)	375,672	-	375,672
	Total	375,672	-	375,672

I5 Topsoil utilisation table (no adjustments)

TOPSOIL PROGRAM

Option 1 - Complete External Dump / Limited Additional Excavation



APPENDIX J – INDEPENDENT DUST AND NOISE REPORTS

J1 - Hazelwood West Project – Air quality impact assessment study
Budget Year 2001/2002 Results

J2 - Noise emissions due to Fire Hole No8 clearing and over-height overburden removal

Consulting
Air pollution
Modelling &
Meteorology

HAZELWOOD WEST PROJECT AIR QUALITY IMPACT ASSESSMENT STUDY:

PHASE 1 - PRE-APPROVALS:

"BUDGET YEAR 2001/2002" RESULTS

Report to:

Hazelwood Power

Consulting Air pollution Modelling & Meteorology (CAMM)

CAMM Report No. 6/00

September, 2000

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

Project Title	Hazelwood West Project Air Quality Impact Assessment Study Phase 1 - Pre-Approvals: "Budget Year 2001/2002" Results		
Client	Hazelwood Power		
Project No.	6/00	**Project Manager**	Graeme Ross
		QA/QC	Graeme Ross and Andrew Lewis
Report Authors	Graeme Ross and Andrew Lewis		

ABSTRACT

Consulting Air pollution Modelling & Meteorology (CAMM) has been engaged to undertake the dust dispersion modelling component of an air quality impact assessment for the Hazelwood West Project being embarked upon by Hazelwood Power.

This report presents results and outcomes arising from: (i) the preparation of an emissions inventory for dust from the various sources at the Hazelwood Power mine as proposed for "Budget Year 2001/2002" (ie. 1st April 2001 to 31st March 2002); (ii) the use of this inventory to predict the likely impact at key locations around the mine site; and (iii) an assessment of the dust impacts with respect to compliance with relevant air quality criteria for airborne dust.

Report	Internal ×	Restricted ✓	Open ×	Research ×
Rel. No.	**Date of Issue**	**Checked by**	**Approved by**	**Reason for Update**
00	September 2000	AL,GR	GR	

DISCLAIMER

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

CONTENTS

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

1. INTRODUCTION

Hazelwood Power is embarking on what is termed the Hazelwood West Project whose primary objective is "to determine, secure and deliver transfer of operations into the preferred coal winning sequence beyond the South-East Field". The project is being undertaken in three phases:

- Phase 1 – Pre-Approvals
- Phase 2 – Approvals
- Phase 3 – Detailed Design and Construction

The primary output from the initial "Pre-Approvals" phase will be a recommendation to the Board of Hazelwood Power on a preferred Mine Development sequence, having taken into account an environmental impact assessment of alternative development options in the context of all relevant approval requirements.

Consulting Air pollution Modelling & Meteorology (CAMM) is undertaking the dust dispersion modelling component of the air quality impact assessment for the Hazelwood West Project. This report presents results and outcomes for Budget Year 2001/2002 (ie. 1st April 2001 to 31st March 2002) as part of the Pre-Approvals phase. This scenario corresponds to the first year of truck and shovel removal of overburden associated with the opening of the West Field, with the South-East Field operating concurrently under normal conditions. The report includes:

(i) An emissions inventory for dust as PM-10 (airborne particles with a mean aerodynamic diameter of less than 10 microns) and TSP (Totally Suspended Particulates, as measured by a high-volume sampler, and typically taken to have a mean aerodynamic diameter of less than 30 microns) from the various sources at Hazelwood Power under "Budget Year 2001/2002" mine operating conditions.

(ii) The results of a dust impact assessment for the "Budget Year 2001/2002" mine operating conditions obtained from application of the ISCST3 model with the following input data:

- The emissions inventory prepared in (i);
- The meteorological file and corresponding daily-varying background PM-10 levels as used for the Maryvale Project assessment conducted for Yallourn Energy. These data were chosen on the basis of discussions with the Environment Protection Authority of Victoria (EPAV) and span the period 1st January to 31st December 1996.

(iii) An assessment of the dust impacts with respect to compliance with relevant air quality criteria for airborne dust.

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

2. IMPACT ASSESSMENT STANDARDS

Following discussions with the Environment Protection Authority of Victoria (EPAV), and taking account of the approach desired by the EPAV and the Department of Human Services (DHS) for the Maryvale Project, the predicted airborne dust impacts arising from the Hazelwood West Project have been assessed in this report in regard to compliance with the following air quality 'standards':

(i) *EPAV Design GLC for dust*

- 3 minute average ground level concentration (glc) for dust (as TSP) of 330 micrograms per cubic metre (99.9^{th} percentile) to be met at the nearest residences or boundary of the mine site (refer SEPP (Ambient Air Quality) 1999).

(ii) *DHS 'Project Standards' for the Maryvale Project*

- 24 hour average glc for PM-10 of 50 micrograms per cubic metre, not to be exceeded more than 6 times per year at identified residential receptors. The exceedances of the 24 hour PM-10 standard are to include any exceedances due to background.
- Annual average glc for PM-10 at the nearest residence not to exceed 20 micrograms per cubic metre.

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

3. MODELLING APPROACH

3.1 Introduction

Modelling of dust dispersion, for all sources except the power station stacks, has been based on the ISCST3 plume dispersion model, which has been used to predict airborne concentrations of TSP and respirable (PM-10) dust, resulting from dust emissions estimated as described in Section 3.5 and Section 4. Dust emissions from the power station stacks have been modelled using the AUSPLUME plume dispersion model, as discussed in CAMM Report 8/98. In what follows, the focus is on the sources associated with the direct mining activities and, as such, on the ISCST3 model.

3.2 ISC Model

The ISCST3 atmospheric dispersion model is a version of the Industrial Source Complex (ISC) dispersion model developed by the US EPA for evaluating the air quality impact of emissions from industrial source complexes. It has been approved by the US EPA for use as a regulatory air quality model and has been accepted by the NSW EPA for regulatory applications. It has also been used recently to assess dust impacts from the proposed Williams gold mine site at Bendigo and the Maryvale Project for Yallourn Energy, with the results accepted by the EPAV and a Government Panel in both cases.

The ISCST3 model may be used to assess pollutant concentration or deposition for a wide variety of sources. Features include settling and dry-deposition of particulates; building downwash; point, line, area and volume sources; plume rise as a function of downwind distance; arbitrary orientation of sources; and terrain adjustment. The model is highly flexible with a range of emission types, and has a range of options (see Section 3.3) which allow the user to adapt the model to suit particular applications and make the best use of available source and meteorological data.

The ISCST3 model has been chosen in preference to the more commonly used (in Victoria) AUSPLUME model for the mining sources because it is better suited to the application at hand, where deficiencies in AUSPLUME are evident. The characteristics of most of the emission sources within the Hazelwood Power mine site are such that they need to be modelled as area, volume or line sources. In addition, the location of "nearby" residences highlights the need to focus on predictions at receptors which are in the near-field of these sources. The source algorithms available within AUSPLUME suffer from restrictions and limitations, particularly when predictions at near-field receptors are required. In addition, dry deposition can only be modelled crudely. In contrast, ISCST3 includes state-of-the-art algorithms for area sources and dry deposition, with flexibility to model the full range of area and line source emissions at the current Hazelwood Power mine site, as well as during the various "development" scenarios.

It is relevant to note that the AUSPLUME model is currently undergoing a major upgrade, which includes the implementation of the ISCST3 algorithms for the modelling of area sources and dry deposition. The upgrade is being conducted by CAMM under contract to the EPAV. The resulting model is presently undergoing acceptance testing by the EPAV and, as such, is currently not available for use in this project.

3.3 Selection of Options

The following options were selected for modelling atmospheric dispersion of emissions from the Hazelwood West Project:

(i) Unless stated otherwise, regulatory and/or default options were used, as based upon previous studies (US EPA, 1995).

(ii) Ground-level concentrations of TSP and PM-10 were predicted on a Cartesian receptor grid with AMG grid coordinates and with a resolution of 250 metres. Figure 3.1 illustrates the modelling domain selected.

(iii) Pit-retention has been included for sources within the pit using the technique and criteria described in NERDDC(1988).

(iv) Terrain at the proposed site and surrounds was considered, with topographic data provided by Hazelwood Power.

(v) The effect of plume mass depletion by dry deposition processes was included when predicting ground level concentrations of TSP. The effects of wet depletion on the plume are likely to be small with the effect of rain also acting to reduce the emissions from the mine sources.

3.4 Model Calibration

The configuration and major inputs to the ISCST3 model adopted here have been evaluated and calibrated for the Hazelwood mine site using results from a PM-10 monitoring survey conducted by Envirogen (1999) at "Kesby Plains" during the period 3rd February to 16th May, 1999 (CAMM, 1999). Although preliminary, the results of the evaluation indicate that the model and its configuration are an adequate base for use in the current assessment.

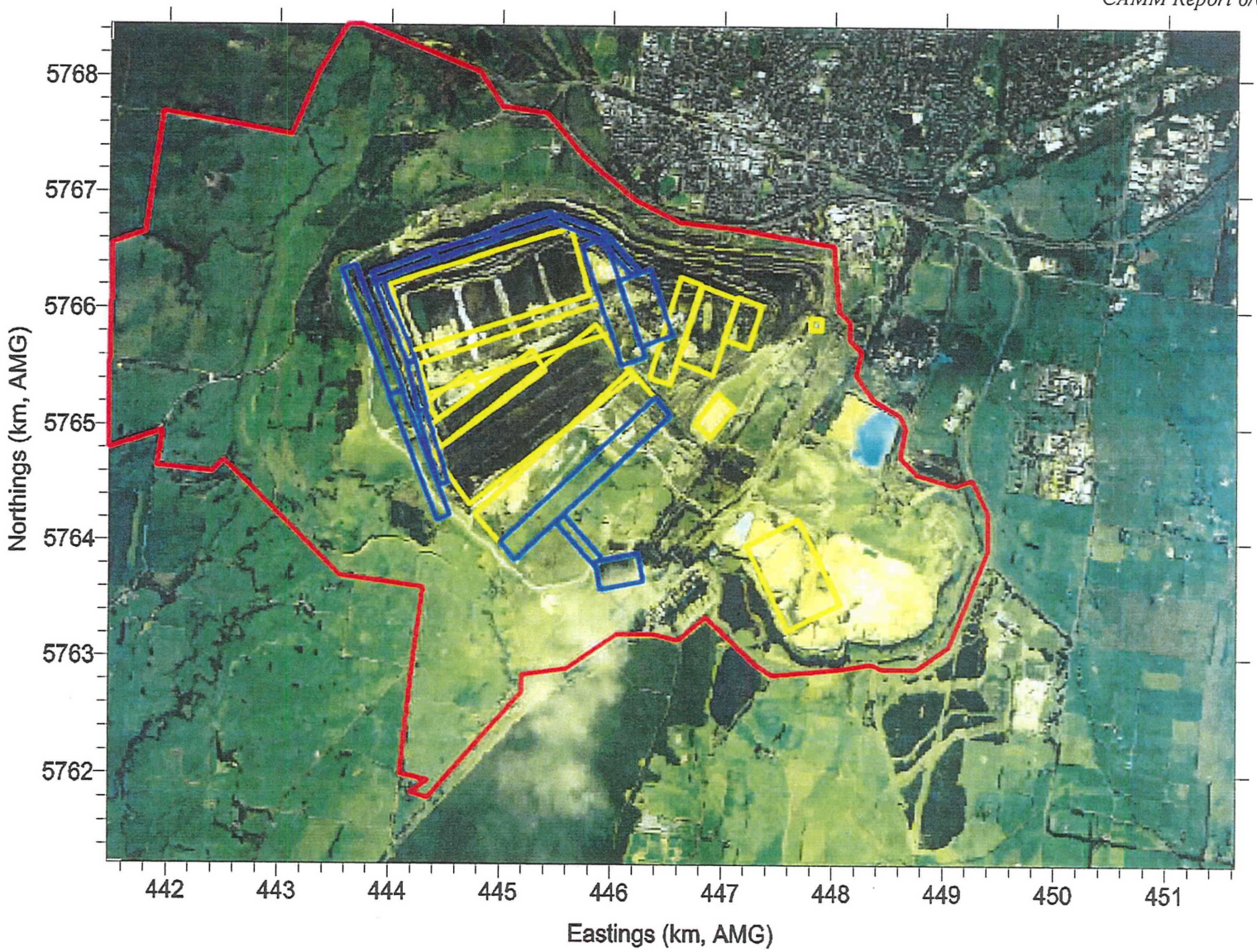


Figure 3.1: **Modelling domain with the location of the mine sources for the "Budget Year 2001/2002" scenario indicated. The mine sources outlined in blue represent those associated with the truck and shovel overburden removal activity.**

3.5 Source Representation - Dust Sources

The sources of dust emission from the mine may be divided into two categories: those from wind erosion (such as roads, active stockpiles, the open pit and exposed areas); and those from mechanically-induced activity (such as digging, loading and unloading and transport of overburden and coal). Section 4 lists these in more detail for the "Budget Year 2001/2002" emission scenario. The various mechanically-induced sources have been assumed to emit only during working hours, while wind erosion has been assumed to occur continuously.

Model predictions have been obtained for TSP and PM-10. In the case of PM-10, the emissions have been assumed to remain totally suspended in air with no gravitational settling or mass depletion from the plume. For modelling of TSP, an important factor is the size distribution of the particles emitted from the sources or source categories. The size, and hence the mass, of the particles strongly influences the distance that the individual particles are transported. Particles of sizes less than 30 μm have been allocated to the particle size categories shown in Table 3.1, with each size category given the mean particle size diameter listed. The proportions and particle size categories have been based on an analysis of samples of coal and overburden conducted by Envirogen, together with high volume sampling results taken at Thoms bridge by Envirogen for the Maryvale Project, which show that PM-10 comprises 58% of the collected TSP mass. This percentage and the proportions shown in Table 3.1 are also consistent with other studies (eg. SPCC, 1986). All emitted particles have been assumed to have a density of 1.8 g/cm^3, which is typical of overburden at the Hazelwood Power site.

The area source algorithm for ISCST3 has been used for all sources or source groups associated with the direct mining activities, with the horizontal dimensions, orientation, and groupings of the sources chosen to represent the geometry or distribution of emissions from particular activities. The major sources representing emissions from mechanically induced activities have been assumed to emit only during working hours for a normal daytime shift or for 2 nine-hour shifts when specified during the overburden removal operations by truck and shovel. Each source has been given an initial vertical spread which is characteristic of the specific nature of the activities.

Wind erosion has been assumed to occur continuously. The various sources of erosion have been characterised by one or more rectangular area sources with no initial spread in the vertical.

Table 3.1: Particle size distribution

	Particle size categories (μm)	
	0 – 10	**10 - 30**
Percentage	58	42
Mean diameter (μm)	5	20

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

3.6 Meteorology

As for the Maryvale Project, meteorological data from the Thoms Bridge station has been used to produce:

(a) Annual, monthly and three-hourly wind roses

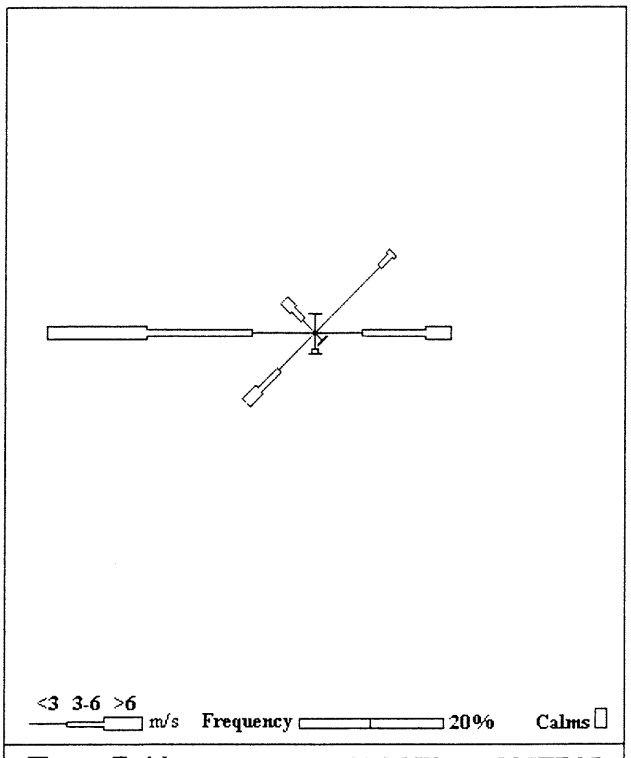
Hourly average wind speed and direction recordings at Thoms Bridge, for three years between 1st October 1994 and 30th September 1997, have been compiled into annual, monthly and three-hourly wind roses.

The annual rose (Figure 3.2(a)) shows that the most frequent winds were aligned along the axis of the Latrobe Valley, with westerlies (37%) and easterlies (19%) occurring for more than half the time. The predominant east-west flow is caused by channelling between the Great Dividing Range to the north and the Strzelecki Range to the south. Dust emissions from mining activities will thus be directed predominantly along the valley, most frequently towards the east. The monthly roses (Figure 3.2(b)) indicate westerlies predominated (30-50%) in all months except January and February, when easterlies prevailed. The three-hourly wind roses (not illustrated) reveal that westerlies were stronger and more frequent during the daytime in the colder semester. Summer easterlies were strongest during the daytime and attained their maximum occurrence around 2100 hours in January and February, indicative of sea-breeze penetration up the valley. Light north-easterlies occur at night, most frequently during Winter, symptomatic of katabatic flow. Recorded calms (which occurred for less than 0.5% of the time overall) were most frequent during the night-time in Autumn.

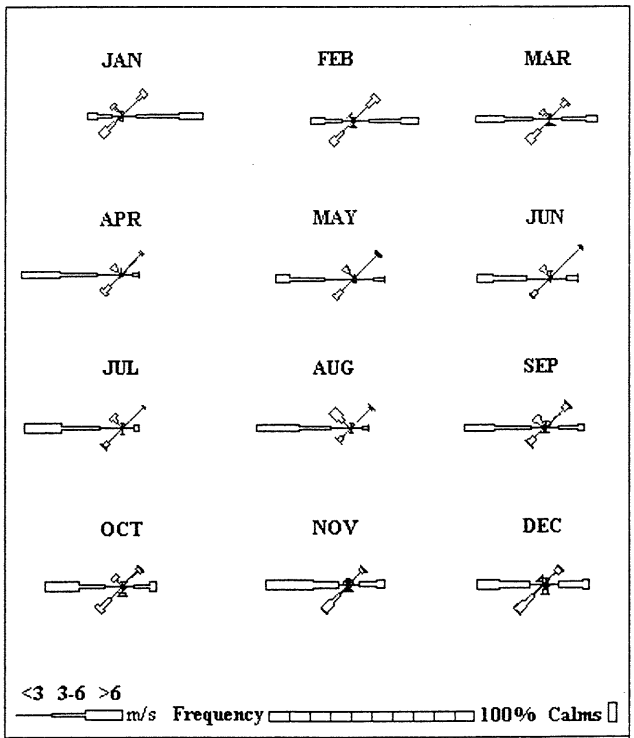
The annual average wind speed was 3.8 m/s. Frequency distributions of wind speed at Thoms Bridge show that speeds exceeded 5.4 m/s, the critical value for dust lift-off, for 28% of the time. Wind data from Thoms Bridge for one year (1995) has been used to determine a relationship between wind speed and wind erosion rates (see Appendix 1 of Maryvale EES - Supplementary Reports Volume 3).

(b) Meteorological data files for the modelling

A meteorological file spanning a full year, and containing hourly values of relevant meteorological variables, is needed for the prediction of the concentration averages required for comparison with the relevant air quality standards and goals. In principle, an existing "AUSPLUME" meteorological file could have been used, however, the most relevant file was originally prepared in 1987 for use in the Latrobe Valley Airshed Study and was based on wind data from Minniedale Road. Consequently, a new meteorological file has been prepared based on meteorological data from Thoms Bridge and spanning the period 1st January to 31st December, 1996.



Thoms Bridge 01OCT94 to 30SEP97
Figure: 3.2a Annual Wind Rose



Thoms Bridge 01OCT94 to 30SEP97
Figure: 3.2b Monthly Wind Roses

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

4. EMISSIONS INVENTORY - "BUDGET YEAR 2001/2002" SCENARIO

The open cut mining operations at the Hazelwood Power mine generate dust from many sources. These include digging, loading and transfer of coal and overburden associated with the dredging and conveyer systems; digging, loading, transfer and unloading of overburden by truck and shovel operation during April and May 2001 and November 2001 to March 2002; wind erosion from stockpiles and exposed areas, rehabilitated overburden dumps and cleared areas; construction and transport movements on access roads; and clearing of vegetation and topsoil.

Each operation produces dust in varying amounts and at varying spatial locations, and emits it into the air at different heights. Small dust particles may remain suspended in the air for a considerable time, while the larger particles fall out within a short distance.

The following steps have been undertaken in order to prepare an inventory for the "Budget Year 2001/2002" scenario:

(a) Source identification

Site inspections have identified the following as possible sources of particulate emissions at Hazelwood Power:

(i) bulldozing / grading of benches, dumping areas and roads,

(ii) excavation of coal and overburden by dredging machines,

(iii) excavation of overburden during April and May 2001 and November 2001 to March 2002 by truck and shovel operations,

(iv) loading of coal / overburden,

(iv) unloading of coal / overburden,

(v) vehicle movements, particularly during overburden removal by truck and shovel,

(vi) vehicle exhaust emissions,

(vii) conveyor transport and transfer of coal,

(viii) wind erosion from disturbed land,

(ix) wind erosion from active stockpiles, and

(x) emissions from the power station stacks.

(b) Determination of source emission rates

Preliminary emission rates from the various operations at Hazelwood Power have been determined using a combination of information obtained during the site inspections; experience with similar open cut mining operations (eg. the Maryvale Project of Yallourn Energy); and published emission factors (eg. USEPA (1985,1998), NERDDC (1988), SPCC (1986) and NPI (1999)) factors.

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

Figure 3.1 illustrates the position and extent assumed for the following sources chosen in each category, when no truck and shovel overburden is being removed:

(a) Mechanically-induced
- South-East Field working benches - dredgers, fire-hole removal, vehicular movements, etc.

(b) Wind erosion
- South-East Field benches, with and without a sprinkler system.
- No. 4 Ash Pond - disturbed land.
- South-West Field pit - wet area and area with clay capping.
- Eastern overburden dump and ash fill area.
- In-pit overburden dump – (eastern section).

Figure 3.1 also illustrates the position and extent assumed for sources associated with the overburden removal by truck and shovel:

(a) Mechanically-induced
- West-Field overburden removal bench - excavator, loading, etc.
- In-pit dumping area (western section) - unloading, bulldozing, spreading, truck movements, etc.
- Overburden removal from region adjacent (south) of the South-East benches - excavator, loading and on-bench truck movements, etc.
- HTA Pond fill area - unloading, bulldozing, spreading, truck movements, etc.
- Haul roads - truck movements, grading, etc.

(b) Wind erosion
- West-Field overburden removal bench.
- Adjacent South-East Field overburden excavation area.
- In-pit dumping area (western section).
- HTA Pond fill area.
- Haul roads.

The following general characteristics have been determined from information provided by Hazelwood Power, together with information obtained for similar operations at the Yallourn Energy mine:

- The following sources of dust at Hazelwood Power have been assigned emission characteristics on the basis of corresponding sources at the current Yallourn Energy site:
  - The main South-East Field working benches for coal and overburden removal by dredger and conveyor operations (mechanically induced and wind erosion);
  - The in-pit dumping area (eastern section) serviced by conveyor and spreader (wind erosion);
  - The remaining in-pit areas of disturbed land, including the South-West Field (wind erosion).

  An emission rate per unit area for each source has been determined from that used for the corresponding source at the Yallourn Energy site, with the location and area of each source estimated from a site plan. In the case of the mechanically induced activities, a scaling based on the relative proportions of coal and overburden removed at the Hazelwood Power and Yallourn Energy sites has been used (Hazelwood Power remove

17.593 M tonnes of coal and 4.157 Mm^3 of overburden by dredger, and 2.023 Mm^3 of over-height overburden by truck and shovel operation; whereas Yallourn Energy remove 18.5 M tonnes of coal and 4 - 5 Mm^3 of overburden, all by dredger).

- 2.5 Mm^3 of overburden is removed by truck and shovel operations from the West Field during April and May 2001 and November 2001 to March 2002. The overburden removal corresponds to the opening of the West Field. The excavation is assumed to be at grass level, with the trucks and haul roads assumed to be within the pit. The haul route is assumed to be via the existing haul road along the West face, down the north face to a dumping area at the Eastern end of the main pit. Return to the West Field overburden excavation area is assumed to be via the same route.
- 0.25 Mm^3 of overburden is removed by truck and shovel operations from the final South-East overburden strip and transported on a new surface haul road to the HTA Pond for construction of a suitable base for the West Field trunk conveyor system. The removal is assumed to occur for the same periods as used for the West Field overburden removal by truck and shovel.
- Wind erosion from the Eastern overburden dumps (from spreaders and truck dumping) and ash fill area; disturbed land in the vicinity of No. 4 Ash Pond; HTA Pond construction area; and the ditch bunker for the interconnecting railway has been assumed to occur on the basis of an uncontrolled emission factor of 0.4 kg/ha/hour (SPCC, 1986).
- The mechanically induced activities associated with the truck and shovel removal of overburden have been assumed to occur for the following time sequence:
  - 5.5 days/week during April and May 2001 and November 2001 to March 2002.
  - 2x9 hour shifts.
- Wind erosion from all sources, including the truck and shovel working areas and haul roads has been assumed to occur continuously.
- The main mechanically induced activities associated with the main working benches of the South-East Field have been assumed to occur only during normal working hours, ie. 0700 to 1700 hours.

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

Tables 4.1 contains the source characteristics and emission rates (for PM-10) for each of the sources input to the ISCST3 model, where the following specific assumptions have been made with respect to the removal, transport and dumping of the overburden material by truck and shovel:

(a) Overburden loading

The approach used for the Maryvale Project has also been adopted here. An uncontrolled emission factor for dust as TSP of 0.01 kg per tonne has been used, together with an 'effective' number of tonnes per hour corresponding to the 'effective' volume of material which is expected to lead to dust emissions. In this case it is assumed that 50% of the overburden is in a form dry enough to emit dust. The resulting emission rates are as follows, where the rate for PM-10 is shown in brackets:

- 8.1 kg/hour (4.7 kg/hour) - West Field
- 0.8 kg/hour (0.5 kg/hour) - South-East Field

(b) Overburden Unloading

An uncontrolled emission factor for dust as TSP of 0.02 kg per tonne, together with the 'effective' number of tonnes per hour, yields the following emission rates for the dumping areas for overburden:

- 16.2 kg/hour (9.4 kg/hour) - Eastern overburden dump
- 1.6 kg/hour (0.9 kg/hour) - HTA Pond

(c) Bulldozing of Overburden

Three bulldozers have been assigned to spread and reposition the overburden dumped, with the following emission rate estimated using USEPA emission factors and apportioned to the dumping areas according to the level of activity:

- 1.0 kg/hour (0.7 kg/hour).

(d) Transport of Overburden

The quantity of material to be transported from the overburden removal areas to the dump areas, together with the number and distribution of truck capacities provide by Hazelwood Power, indicate an average total of 39.7 loads per hour during operating times. These loads have been distributed to the designated haul roads, including sections on the loading and dumping areas, to yield the following total emission rate from haul road transport for two different watering control factors:

- 120.0 kg/hour (69.6 kg/hour): "Normal" control – 0.4 kg/vkt (TSP).
- 30.0 kg/hour (17.4 kg/hour): "Optimal" control – 0.1 kg/vkt (TSP).

It should be noted that the emission factor for "Normal" control has been reduced from that used for the Maryvale Project on the basis of the revised recommendations presented in NPI(1999).

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

(e) Grading of Haul Roads

Two graders have been assigned to the haul roads, with TSP and PM-10 emissions estimated using USEPA factors to yield:

- 5.7 kg/hour (3.5 kg/hour)

The graders have been assumed to operate at an average speed of 8 kph and their resulting total emissions have been apportioned to the roads in proportion to their length.

(f) Exhaust emissions from trucks and shovels

The plant resources (ie. trucks, excavators, etc.), as provided by Hazelwood Power, have been assumed to emit a total of 3.2 kg/hour of PM-10, with emissions being spread spatially according to the level of activity.

Table 4.1: "Budget Year 2001/2002" scenario mine emissions inventory

Activity	PM-10 Emissions kg/hr		Times of Operation
	"Normal" control (0.4 kg/vkt TSP)	"Optimal" control (0.1 kg/vkt TSP)	
• Wind erosion			Continuous – wind speed categories
- SE Bench & adjacent OB loading	7.5	7.5	
- other loading areas	6.7	6.7	
- dumping areas	8.4	8.4	
- roads	0.6	0.2	
- other	4.6	4.6	
• SE Bench			
- Mechanical (Mixed)	12.2	12.2	0700 – 1700 hours
• Loading			RTL schedule
- West Field (Mechanical)	4.7	4.7	
- South-East Field (Mechanical)	0.5	0.5	
• Unloading			RTL schedule
- In-pit dump (Mechanical)	9.4	9.4	
- HTA Pond (Mechanical)	0.9	0.9	
• Grading (Mechanical)	3.5	3.5	RTL schedule
• Bulldozing (Mechanical)	0.7	0.7	RTL schedule
• Haul roads (Mechanical)	69.6	17.4	RTL schedule
• Exhaust emissions (trucks and excavators)	3.2	3.2	RTL schedule
Total PM-10	**132.5 kg/hr PM-10**	**80.0 kg/hr PM-10**	

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

5. DUST IMPACT ASSESSMENT – "BUDGET YEAR 2001/2002" SCENARIO

5.1 Background Dust Levels

The following background dust levels have been used in the current application:

(i) PM-10

- An annual average background value of 13 $\mu g/m^3$.
- The daily-varying values illustrated in Figure 5.1, where the values are concurrent with the 1996 meteorological file.

Following discussions with the EPAV it has been agreed that these levels, as used for the Maryvale Project, are appropriate for use in the current application.

(ii) TSP

- The daily-varying background PM-10 values on the basis that particles in the size range 10-30 microns will settle out and contribute little to the background.

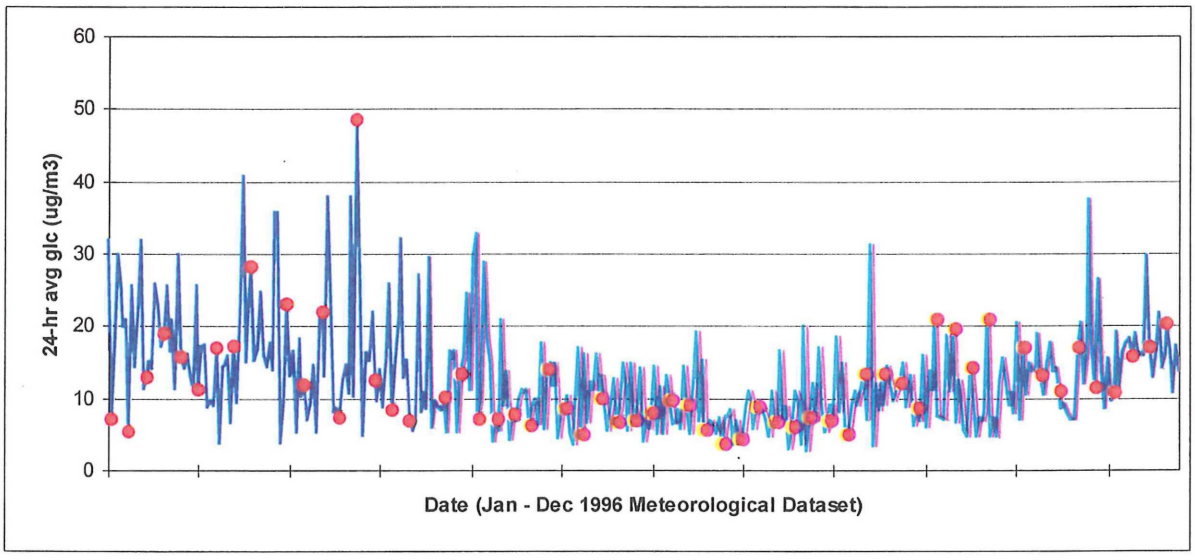


Figure 5.1 Daily-varying background values of PM-10 used in conjunction with the 1996 meteorological data set. The 6-daily observed values, based on those recorded at Minniedale Road and Yinnar South, are indicated with a dot.

5.2 Model Output

Plume dispersion modelling has been conducted with the configuration and inputs described in Section 3 and 4 to determine the following outputs for the "Budget Year 2001/2002" emission scenario:

(a) 7th highest, 24-hour average, ground level concentration of respirable (PM-10) dust.

(b) The annual average ground level concentration of PM-10.

(c) The 99.9th percentile (9th highest), 3-minute average, ground level concentration of TSP.

Contour plots for 24-hour averages of PM-10 are for the 7th highest concentration on the basis that the DHS "Project standard" of 50 $\mu g/m^3$ allows six exceedances per year. The PM-10 results are presented for both the "normal" and "optimal" control options. Contour plots of the 1st highest values have not been included in the report, but are available for comparison on request.

Annual average contour plots are presented in order that a comparison can be made with the DHS "Project standard" of 20 $\mu g/m^3$ for PM-10.

Contour plots of the 9th highest, 3-minute average, TSP concentration allows comparison with the EPAV design glc of 330 $\mu g/m^3$.

5.3 PM-10

24-Hour Average

Figure 5.2(a) plots predicted contours of the 7th highest, 24-hour average, ground level concentration of PM-10, under "normal" dust control conditions. This figure shows the spatial patterns for PM-10 levels of 50 and 100 $\mu g/m^3$, where the upper level has been included to provide an indication of the decrease in concentration with distance from the various sources.

The 50 $\mu g/m^3$ contour can be seen to fall within the current mine site boundary, apart from a small area to the North.

Figure 5.2(b) is a repeat of Figure 5.2(a), under "optimal" dust control conditions for the haul roads. This figure indicates that under these operating conditions the 50 $\mu g/m^3$ contour falls well within the site.

Annual Average

Figure 5.3(a) gives contours of the annual average, ground level concentration of PM-10 for the "Budget Year 2001/2002" scenario with the mine operating under "normal" control conditions. The 20 $\mu g/m^3$ contour level can be seen to fall within the site boundary.

Figure 5.3(b) is a repeat of Figure 5.3(a), with the mine operating under "optimal" dust control conditions for the haul roads. This figure indicates that under these operating conditions the 20 $\mu g/m^3$ contour falls well within the site boundary.

5.4 TSP

3-Minute Average

Figures 5.4 (a) and (b) illustrate contours of the 9th highest, 3-minute average ground level concentration of TSP for the mine operating under "normal" and "optimal" conditions for the haul roads, respectively. These figures indicate that the 330 $\mu g/m^3$ contour falls within the current mine site boundary for both operating conditions.

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

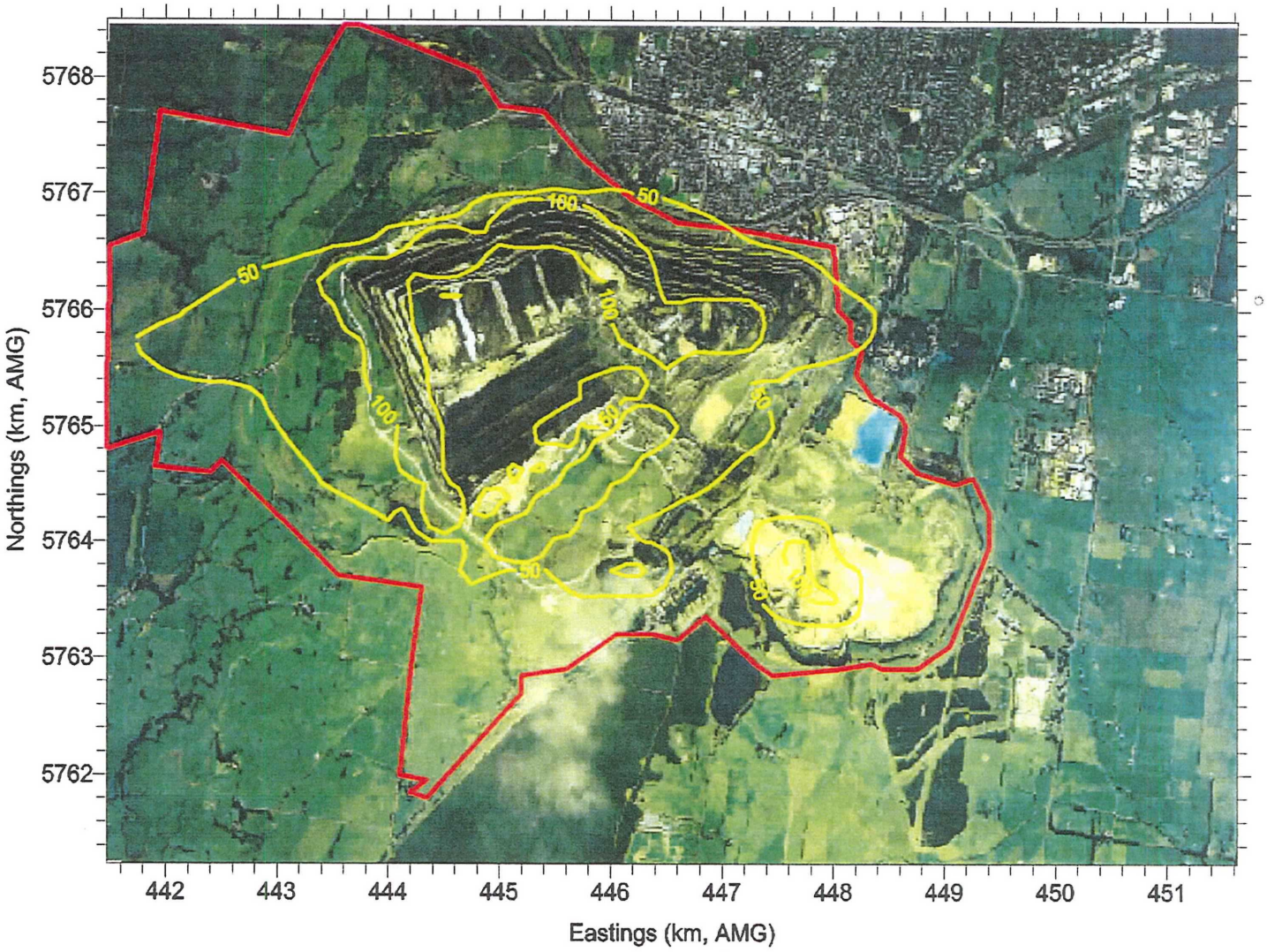


Figure 5.2(a) **Contours of 7th-highest, 24-hour average ground level concentrations of PM-10 for the Year 2001/2002 Scenario Mine Operations with "Normal" dust control conditions. Contour levels:- 50 and 100 μg/m^3. A daily-varying background has been included.**

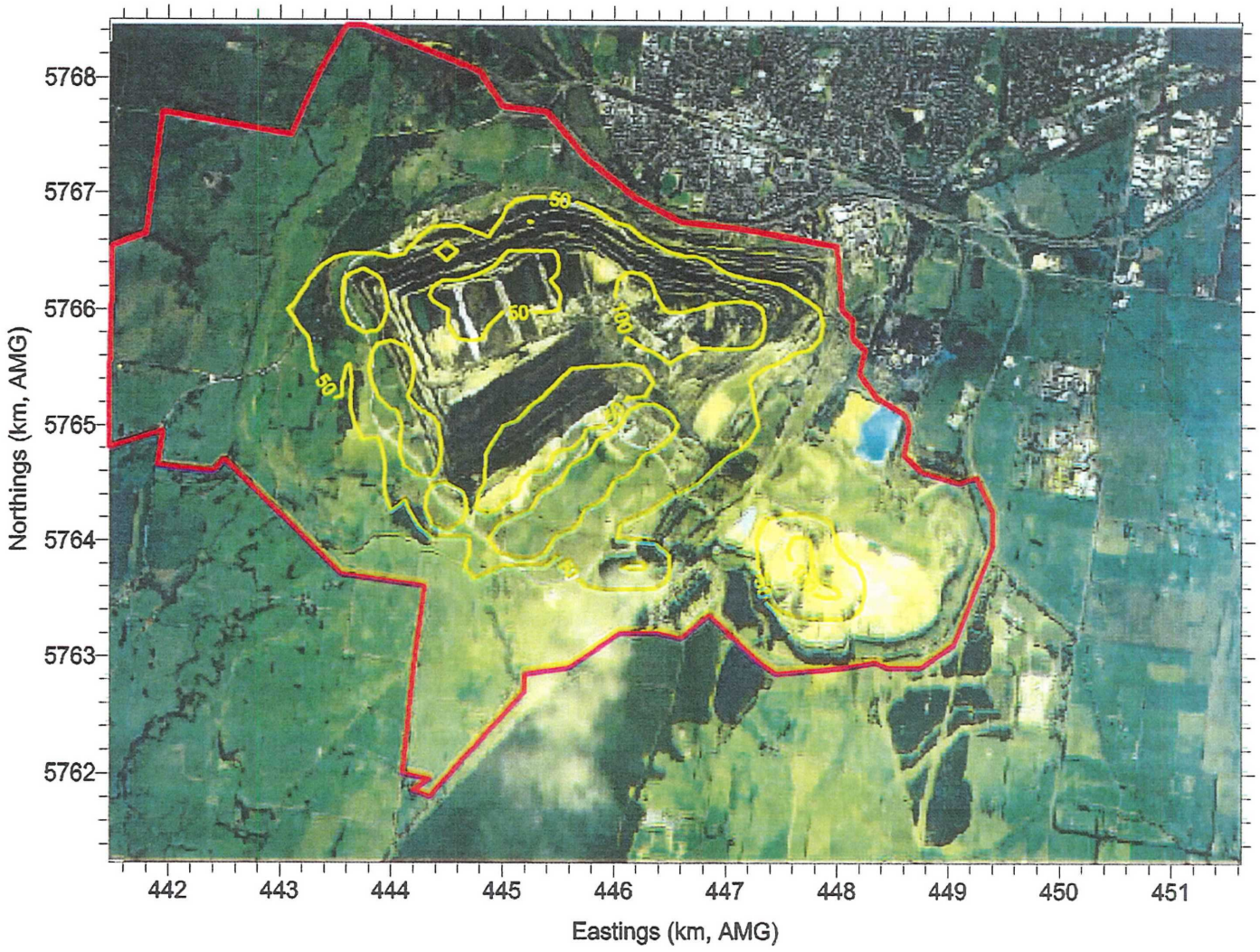


Figure 5.2(b) **Contours of 7th-highest, 24-hour average ground level concentrations of PM-10 for the Year 2001/2002 Scenario Mine Operations with "Optimal" dust control conditions. Contour levels:- 50 and 100 μg/m^3. A daily-varying background has been included.**

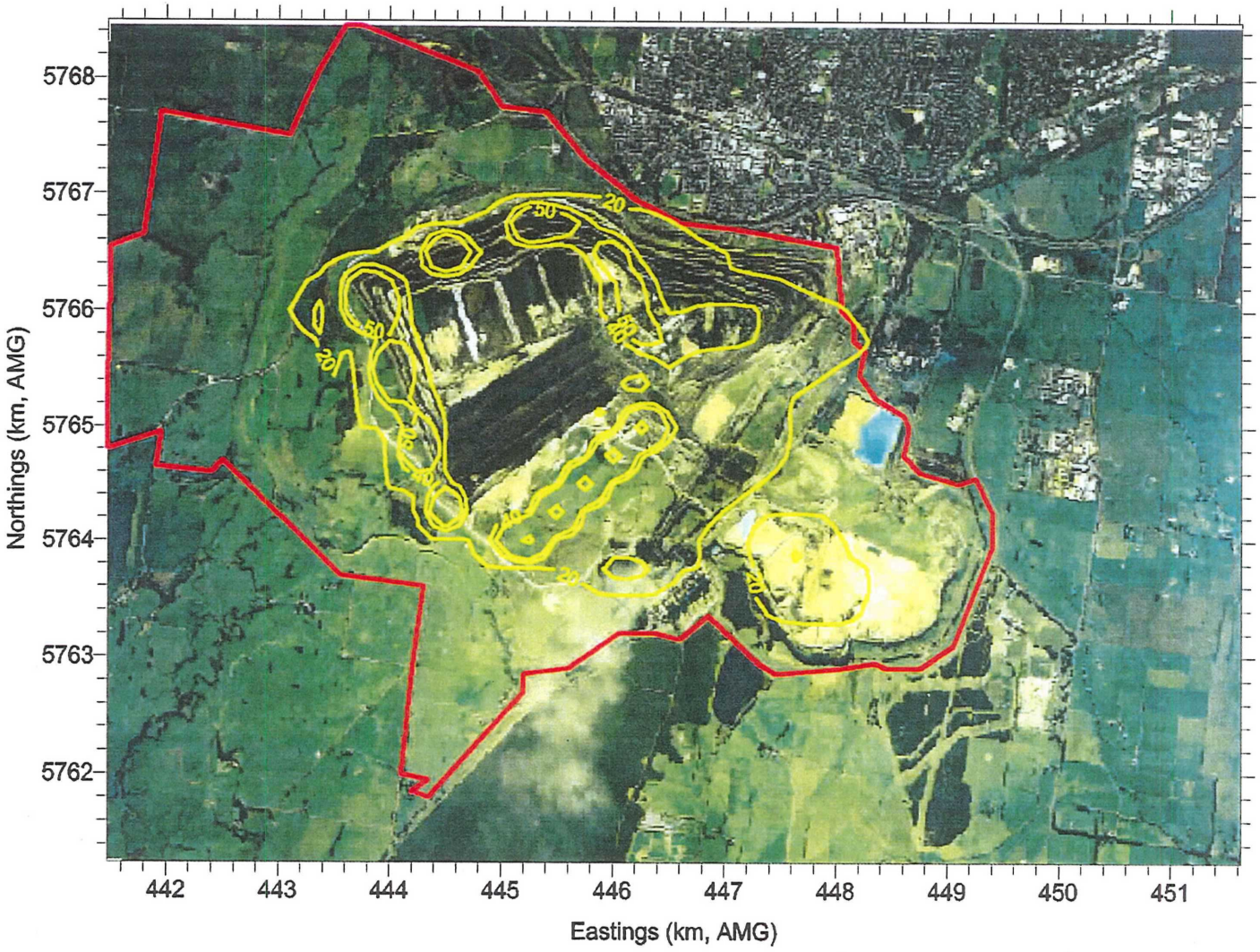


Figure 5.3(a) **Contours of annual average ground level concentrations of PM-10 for the Year 2001/2002 Scenario Mine Operations with "Normal" dust control conditions. Contour levels:- 20, 40, 50 and 100 μg/m^3. An annual average background of 13.0 μg/m^3 has been included.**

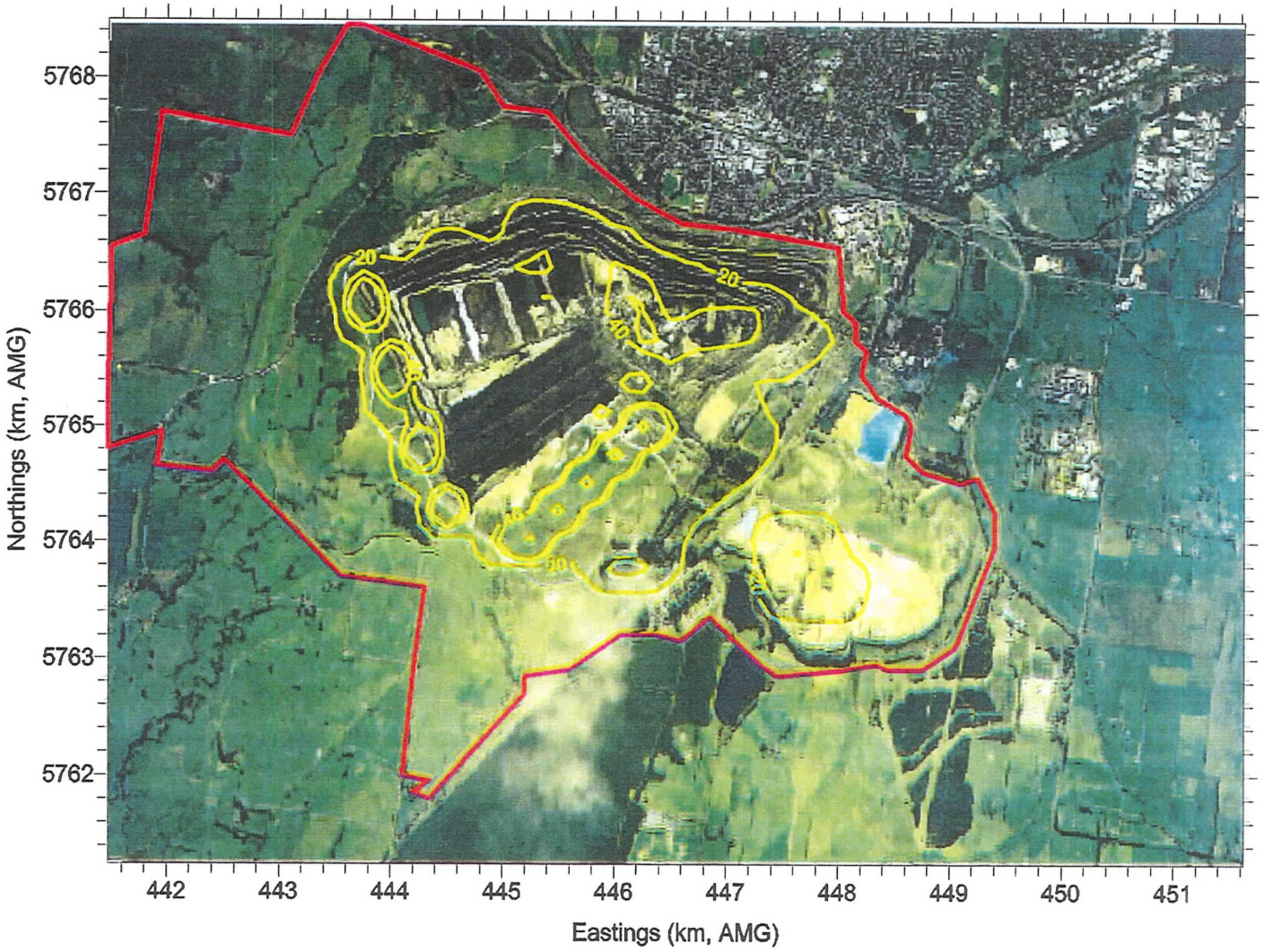


Figure 5.3(b) **Contours of annual average ground level concentrations of PM-10 for the Year 2001/2002 Scenario Mine Operations with "Optimal" dust control conditions. Contour levels:- 20, 40, 50 and 100 μg/m^3. An annual average background of 13.0 μg/m^3 has been included.**

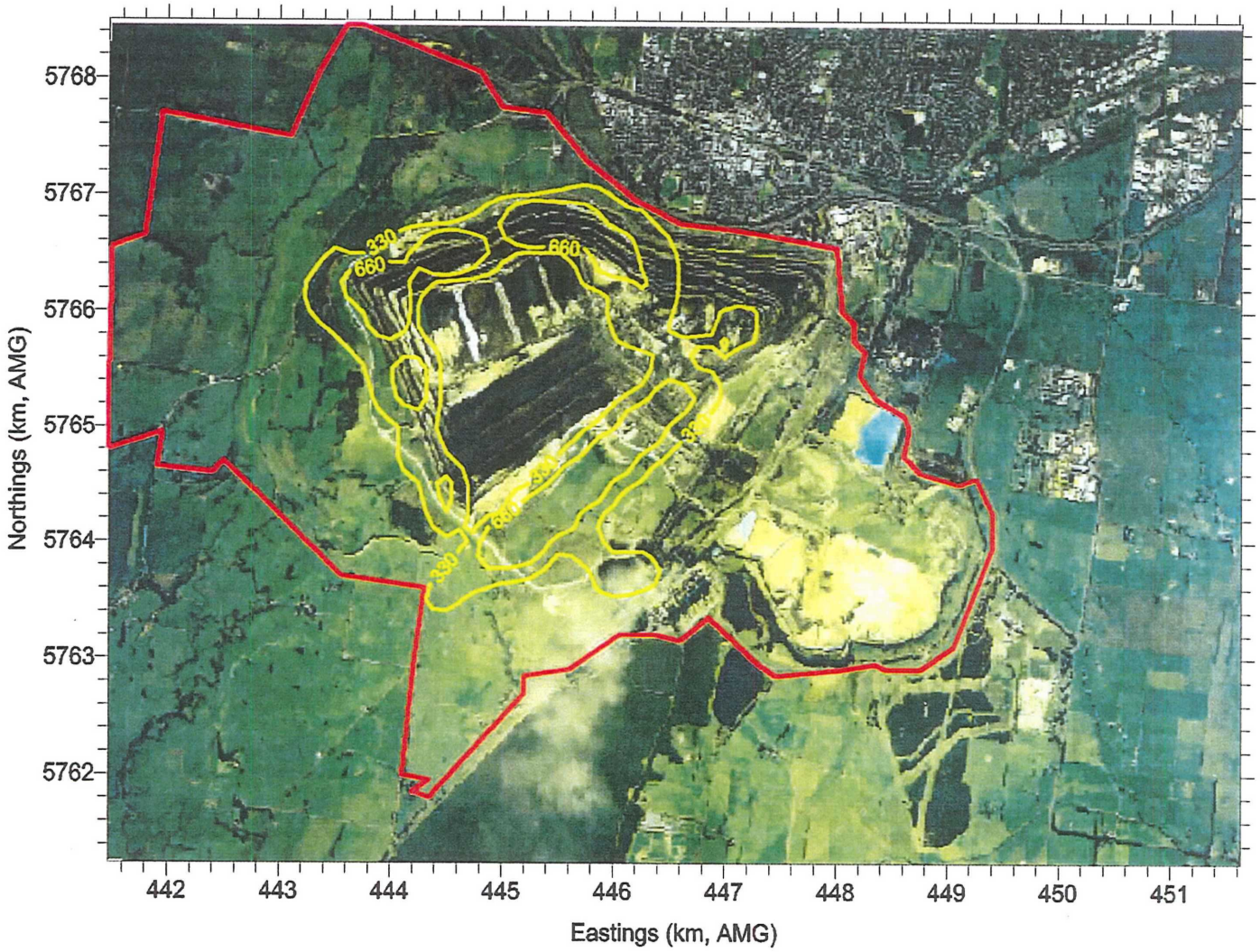


Figure 5.4(a) **Contours of 9th highest, 3-minute average ground level concentrations of TSP for the Year 2001/2002 Scenario Mine Operations with "Normal" dust control conditions. Contour levels:- 330 and 660 μg/m³. A daily varying background has been included.**

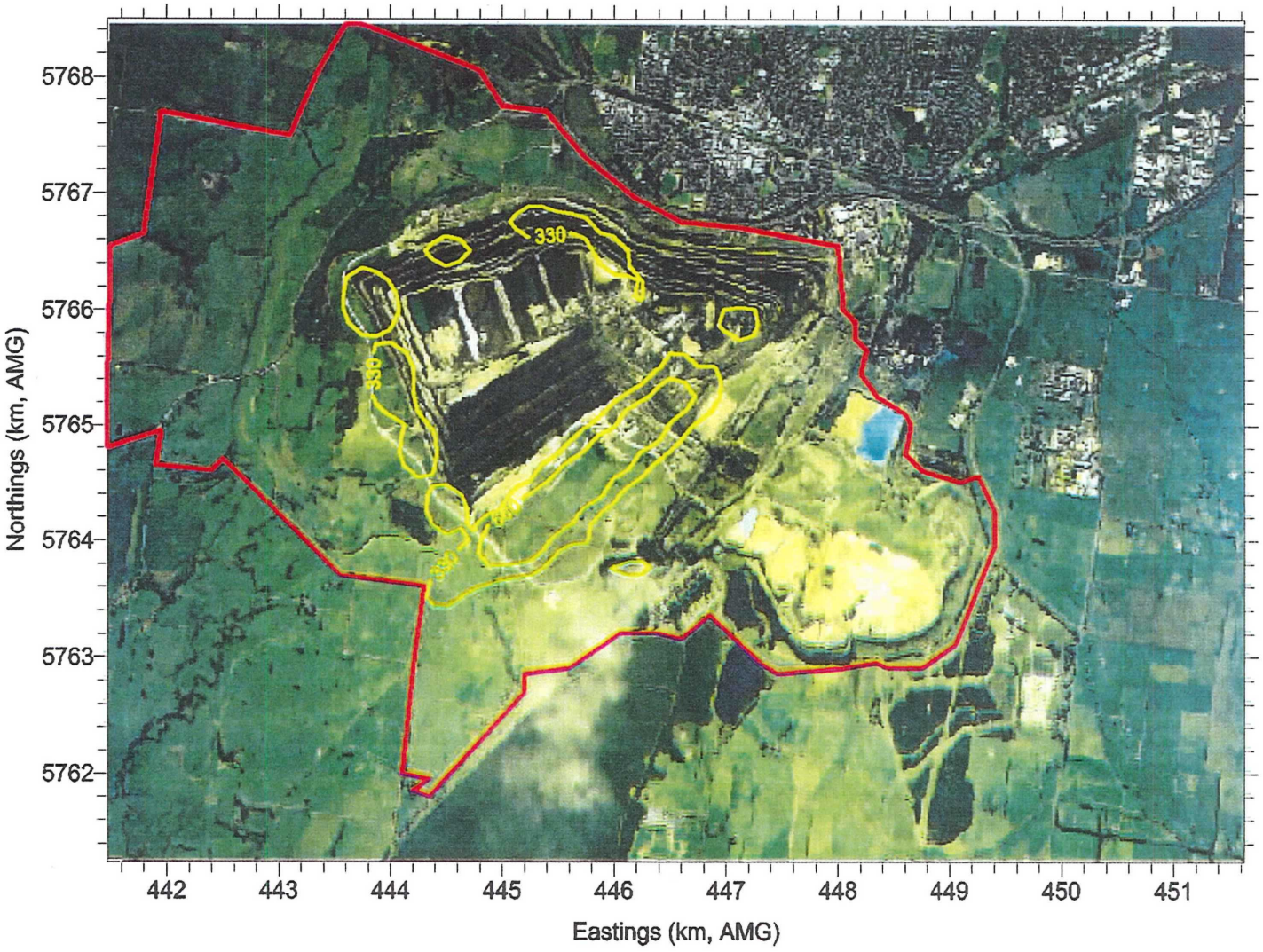


Figure 5.4(b) **Contours of 9th highest, 3-minute average ground level concentrations of TSP for the Year 2001/2002 Scenario Mine Operations with "Optimal" dust control conditions. Contour levels:- 330 and 660 μg/m³. A daily varying background has been included.**

6. CONCLUDING REMARKS

Potential air quality impacts resulting from the Hazelwood Power mine operating as proposed in "Budget Year 2001/2002" (ie. 1st April 2001 to 31st March 2002) have been determined in the area surrounding the site. Dust dispersion modelling using the ISCST3 plume dispersion model has been undertaken to predict the potential impacts for the first year of truck and shovel removal of overburden associated with the opening of the West Field, with the South-East Field operating concurrently under normal conditions.

The emissions data used for modelling has been based on a combination of results obtained from the Maryvale Project of Yallourn Energy, evaluating and calibrating the model using observations from a recent monitoring survey, together with the use of USEPA emission factors and experiences with similar open cut mining operations and construction activities.

Based on the information presented in this report, which is considered to be best available at the time of preparation, the following conclusions can be made:

- The "Project Standards" for respirable dust as PM-10 are complied with outside the current mine site boundary, apart in from a small area to the North for the "24-hour" standard", with the haul roads operating under "Normal" control conditions.
- The "EPAV Design GLC for dust" as TSP is complied with outside the current mine site boundary for both haul road control conditions considered.

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

7. REFERENCES

CAMM (1999)
Hazelwood West Project Air Quality Impact Assessment Study: Phase 1 - Pre-Approvals, Draft Preliminary Report to Hazelwood Power, CAMM Report No. 6/99, November, 1999.

Envirogen (1999)
Ambient Air Monitoring for PM-10 at Kesby Plains. Report to Hazelwood Power, 1999.

NERDDC (1988)
Air Pollution from Surface Coal Mining: Volume 2 Emission Factors and Model Refinement, National Energy Research Development and Demonstration Council, Project 921.

NPI (1999)
Emission Estimation Technique Manual for Mining. National Pollutant Inventory, March 1999.

Ross, D.G. and Lewis, A.M. (1998)
Air Quality Modelling for Proposed PM-10 Emissions from Hazelwood Power Station, Latrobe Valley, Victoria. Final Report to Envirogen Pty. Ltd. Centre for Applied Mathematical Modelling, Monash University, Australia. CAMM Report No. 8/98, January, 1999.

SEPP (AAQ) 1999
State Environment Protection Policy (Ambient Air Quality) 1999. Government of Victoria.

State Pollution Control Commission (1986)
Air Pollution from Coal Mining and Related Developments.
New South Wales State Pollution Control Commission, Sydney. ISBN 0 7240 5936 9.

USEPA (1985)
Compilation of Air Pollution Emission Factors. Fourth Edition. AP - 42.
Quality Planning and Standards, United States Environmental Protection Agency, Research Triangle Park, North Carolina, 27711. USA.

USEPA (1995)
Users Guide for the Industrial Source Complex (ISC3) Dispersion Models. Office of Air Quality Planning and Standards, United States Environmental Protection Agency, Research Triangle Park, North Carolina, 27711. USA. Volume 1 - User Instructions.

USEPA (1998)
Compilation of Air Pollution Emission Factors. Fifth Edition. AP - 42.
Quality Planning and Standards, United States Environmental Protection Agency, Research Triangle Park, North Carolina, 27711. USA.
Volume I: Stationary Point and Area Sources
Volume II: Mobile Sources

Graeme Ross & Associates Pty Ltd A.C.N. 063 931 420 A.B.N. 94 063 931 420
PO Box 292, Ashburton, Vic, Australia. 3147
Tel: (03) 9560 9555, Fax: (03) 9560 9554, Mobile: 0418 371 826, Email: graeme.ross@camm.net.au

Sinclair Knight Merz
ACN 001 024 095
ABN 37 001 024 095
590 Orrong Road
Armadale VIC 3143
PO Box 2500
Malvern VIC 3144
Australia
Telephone: +61 3 9248 3100
Fax: +61 3 9500 1180

Hazelwood Power
PO Box 195
Morwell
VIC 3134

19 September, 2000

ME01721.912

Attention: Mr Richard Polmear

Dear Richard

Hazelwood Mine Development
Noise emissions due to Fire Hole No 8 clearing and Over-height Overburden Removal

Further to your request to develop an estimate of the likely impact of noise on local residents resulting from the clearing of fire hole No 8 and the removal of over-height overburden along the Hazelwood Mine's current perimeter road I supply the following report.

Fire Hole No 8

The closest residence to fire hole No 8 is that of Tony and Donna Lawless' at distance of approximately 1900 metres. The ground between their residence and the fire hole is undulating pasture such that there is a barrier with an equivalent height of 15 metre above the line of sight.

To clear the fire hole I have assumed that it will require a large excavator, D690 bulldozer, 50 tonne dump truck and a 35 tonne six wheel, haulage truck which have been combined to represent point source. I have also assumed that the all the above plant will be in operation and that the spoil will be deposited in the existing open cut with the trucks in such a manner that they move away from the residence.

The Sinclair Knight Merz database for construction equipment has been used to obtain the sound power levels generated by the individual items of plant listed above.

In arriving at the estimate, given below, only attenuations due to divergence and atmospheric absorption have been used. I have also assumed still air conditions and no temperature inversion. Investigations into the excess attenuation due to barrier effect of the undulating terrain was carried out and shows the excess attenuation to be insignificant when compared with those for divergence and atmospheric absorption.

Results

Our estimate of the noise level (sound pressure level) at Tony and Donna Lawless' property due the clearing of fire hole No 8 is **31.9 dB(A)**.

From this it can also be concluded that the noise level at the nearest residence in Driffield will be less than 30 dB(A) due to the extra distance.

Over-height Overburden Removal

For the removal of the over-height overburden a similar method of calculation has been used with the following assumptions.

- Overburden removal will take place from both the northern and southern areas adjacent to the existing perimeter road simultaneously using two teams.
- The southern end team will consist of large excavator, 3 off 50 tonne dump trucks, 2 off D690 bulldozers and a grader. Spoil will be deposited at the Hazellwood Cemetery spoil dump site.
- At the southern removal site the earth moving plant will consist of a large excavator, 50 tonne dump truck, D690 bulldozer and a grader.
- At the Hazellwood Cemetery spoil dump site the earth moving plant will consist of a 50 tonne dump truck, D690 bulldozer and a grader.
- There will be one dump truck on the perimeter road between two sites 1200 metres from Tony and Donna Lawless' residence.
- The southern removal site is 1300 metres from Tony and Donna Lawless' residence.
- The Hazellwood Cemetery spoil dump site is 1400 metres from Tony and Donna Lawless, residence.
- At the northern end removal site the earth moving plant will consist of a large excavator, 50 tonne dump truck, D690 bulldozer and a grader. The spoil will be deposited in the existing open cut with the trucks in such a manner that they move away from Tony and Donna Lawless residence.
- The northern end removal site is 2100 metres from Tony and Donna Lawless' residence.
- Two dump trucks have been allowed for moving into the open cut one at 2500 metres and the other at 3000 metres from Tony and Donna Lawless' residence.

Results

Our estimate of the noise level at Tony and Donna Lawless' property due the removal of over-height overburden along the Hazelwood Mine's current perimeter road are given in the table below

Noise Source	Noise Levels at Tony and Donna Lawless' residence
Southern removal site	36.67 dB(A)
Southern site perim. road dump truck	36.5 dB(A)
Hazellwood Cemetery spoil dump site	34.34dB(A)
Total noise level (Southern Site)	**40.7 dB(A)**
Northern removal site	28.92 dB(A)
Northern dump truck at 2500 metres	25.96 dB(A)
Northern dump truck at 3000 metres	23.4 dB(A)
Total noise level (Northern Site)	**31.4 dB(A)**

From this it can also be concluded that the noise level at the nearest residence in Driffield will be as shown in the table below taking into account the differing distances.

Noise Source	Noise Levels at Driffield residence
Total noise level (Southern Site)	**< 32 dB(A)**
Northern removal site	29.16 dB(A)
Northern dump truck at 2100 metres	28.43 dB(A)
Northern dump truck at 2400 metres	26.5 dB(A)
Total noise level (Northern Site)	**32.9dB(A)**

Comments

Tony and Donna Lawless' property

Set out below is a table from the" Noise Impact Assessment" for the Hazelwood Mine Development Feasibility Study. The table shows zoning levels for a typical rural area adjacent to a mine development in the Latrobe Valley (not necessarily Hazelwood Mine). The Site Noise Limit is the noise level against which noise generated by the operation of the Hazelwood Mine can be compared.

	Day	Evening	Night
Zoning Levels	50	44	39
Background Noise Levels	40	35	35
Background Correction	0	0	0
Site Noise Limit	**50**	**44**	**39**

Using the results given above and on the assumption that operations associated with the clearing of fire hole No 8 and the removal of over-height overburden are all being undertaken simultaneously then the estimated noise level at Tony and Donna Lawless' residence would be 41.7 dB(A).
This noise level is above the Site Noise Limit of 39 dB(A) for night time operation, however this simultaneous operation could be undertaken during the day and evening and be below the Site Noise Limit.

It can be seen from the results tables above that the noise level at Tony and Donna Lawless' residence will be controlled by the noise being emitted by removal of overburden from the southern end of the existing perimeter road. If this work was suspended during the night period then the noise level at the Lawless' due the two remaining parts of the project is estimated to be 34.6 dB(A) which is below the site noise limit for the night period.

The noise level estimates have been calculated using generic sound power levels that are expected to be generated by standard earth moving equipment. If the earth moving equipment that is to be

used for these projects had been treated with acoustic silencing, particularly for the 50 tonne dump trucks, then lower noise level at adjacent residences could be achieved and hence allow 24 hour a day operations.

Noise Levels at Driffield residence

Similar summing of the noise level estimates at the nearest residential sites in Driffield gives levels in the order of 37 dB(A) which is less than the night site limit.

Other options

If 24 hour a day operation is required the early relocation of both the Lawless families or the possibility of dumping the spoil from the removal of overburden from the southern end of the existing perimeter road in the open cut could be considered. This would need to be carried out in such a manner that the dump trucks move away from the Lawless property.

Consideration could be given to establishing a direct communication between your nearest neighbours and the supervisor of these projects such the that if atmospheric conditions prevail causing noise to become a nuisance then work patterns can be altered or work curtailed.

Yours faithfully

Ian Charity

Phone: 9248 3166
Fax: 9500 1180
E-mail: icharity@skm.com.au

APPENDIX K – COPY OF LATROBE CITY PLANNING DISPENSATION

52.17 NATIVE VEGETATION

Purpose

To protect and conserve native vegetation to reduce the impact of land and water degradation and provide habitat for plants and animals.

Permit requirement

A permit is required to remove, destroy or lop native vegetation.

This does not apply:

Scheduled area

- To an area specified in the schedule to this clause.

Site area

- On land which, together with all contiguous land in one ownership, has an area of less than 0.4 hectare.

Dead vegetation

- If the native vegetation is dead.

Emergency works

- If the native vegetation presents an immediate risk of personal injury or damage to property.
- If the removal, destruction or lopping of native vegetation is necessary for emergency access or emergency works by a public authority or municipal council.

Fire

- If the removal, destruction or lopping of native vegetation is necessary for fire fighting measures, periodic fuel reduction burning, or the making of fire breaks up to 6 metres wide.
- To the removal of ground fuel within 30 metres of a building.
- If the removal, destruction or lopping of native vegetation is in accordance with a fire prevention notice under:
  - Section 65 of the Forests Act 1958.
  - Section 41 of the Country Fire Authority Act 1958.
  - Section 8 of the Local Government Act 1989.
- To any action which is necessary to keep the whole or any part of a tree clear of an electric line provided the action is carried out in accordance with a code of practice prepared under Section 86 of the Electricity Safety Act 1998.

Planted vegetation or harvesting

- If the native vegetation has been planted for timber production, agroforestry (the simultaneous and substantial production of forest and other agricultural products from the same land unit), shelter belts, woodlots, street trees, gardens, horticultural purposes or the like.
- To timber harvesting carried out under licence from the Secretary to the Department of Natural Resources and Environment.

Buildings

- To the removal, destruction or lopping of the minimum extent of native vegetation necessary for the construction, use and maintenance of:
  - A dwelling.
  - Any building or works which are ancillary to a dwelling including tennis courts, barbecues, swimming pools, utility services or vehicle accessways.
  - Any building, including utility services or vehicle accessways which are ancillary to the building.
- To the removal, destruction or lopping of native vegetation within 10 metres of a building.

Utility services

- To the removal, destruction or lopping of the minimum extent of native vegetation necessary to maintain public utility services for the transmission of water, sewage, gas, electricity, electronic communications or the like.
- To the removal, destruction or lopping of the minimum extent of native vegetation necessary to continue the activity on land which has previously been cleared where seedlings or regrowth are less than 10 years old and the land is:
  - Within the formation of a road or railway line.
  - On or adjacent to a helipad, airfield or the like.
  - In an existing gravel pit.
  - On crown land or land owned by a public authority or municipal council.

Mineral exploration and mining

- To the removal, destruction or lopping of native vegetation necessary for mineral exploration or mining authorised by an approved work plan and in accordance with an authority to commence work issued under the Mineral Resources Development Act 1990.

Decision guidelines

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate:

- The policy on retention and re-establishment of native vegetation.
- The conservation and enhancement of the area.
- The preservation of and impact on the natural environment or landscape values.
- The role of the native vegetation in:
  - Conserving fauna and flora.
  - Protecting water quality.
  - Providing shade and shelter.
- The role of the native vegetation in preventing:
  - Land degradation, including soil erosion, salinisation, acidity and water logging.
  - Adverse effects on groundwater recharge.
- The need to retain native vegetation:
  - Where ground slopes are more than 20 percent.
  - Within 30 metres of a wetland or waterway.
  - Where groundwater recharge occurs.
  - On land subject to or which may contribute to soil erosion, slippage or salinisation.
  - On land where the soil or sub-soil may become unstable if cleared.
  - In a proclaimed water supply catchment.
  - In areas where removal, destruction or lopping could jeopardise the integrity or long term preservation of any identified site of scientific, nature conservation or cultural significance.
  - If it is rare or supports rare species of fauna or flora.
  - That forms part of a wildlife corridor.

SCHEDULE TO CLAUSE 52.17

Area	Description of native vegetation for which no permit is required to remove, destroy or lop
None specified	