

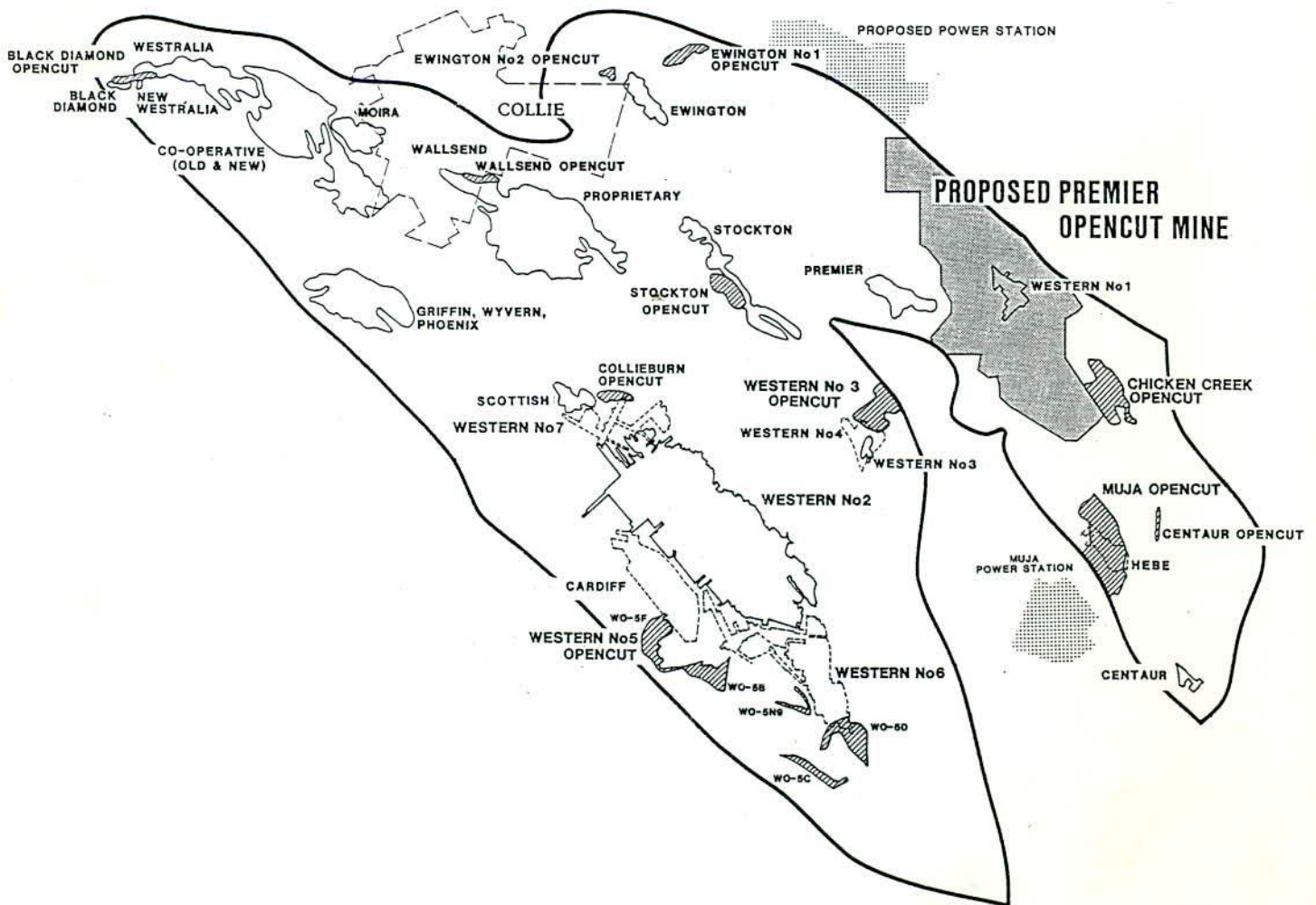
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CONSULTATIVE ENVIRONMENTAL REVIEW

PREMIER MINE EXPANSION



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CONSULTATIVE
ENVIRONMENTAL REVIEW

PREMIER MINE EXPANSION

JUNE 1991

PREMIER COAL MINE EXPANSION

This report has been produced by Western Collieries Limited (WCL) with the assistance of consultants, particularly the Principal of Dinara Pty Ltd., W.H. Butler.

Environmental management by WCL is an existing, ongoing process subject to the conditions applicable for the mining lease (ML 12/262 SA) granted under the terms of a government-ratified agreement, namely the Collie Coal (Western Collieries) Agreement Act 1979.

The Premier Coal Mine expansion is thus subject to accepted environmental management strategies addressing a full range of issues including flora, fauna, ethnography, water resources, rehabilitation and land-use.

The proposed development of the coal resources in the Premier area of lease 12/262 SA is in full accord with the prime objectives set for the Collie Basin by the Collie Basin Land-use Working Group in 1987.

This document is produced as a complement to approved environmental management procedures detailed in WCL's government agreement. The facts and conclusions presented are considered statements based on the long history of mining and environmental management by WCL at Collie, and the proven and accepted record of performance by the Company in its coal-mining operations.

Any changes to the existing strategies must take into account the ratified government Agreements and be seen to apply equally to all coal mining in Collie.

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**CONSULTATIVE ENVIRONMENTAL REVIEW
PREMIER COAL MINE EXPANSION**

1.0 SUMMARY

1.1 Introduction

Collie has been chosen as the preferred location for a new power station to meet increased electrical-energy demand in Western Australia.

The "Mitsubishi-Transfield Collie Power Station Joint Venture" (MTJV) successfully tendered to the State Energy Commission of Western Australia (SECWA) to build and operate this power station.

The proponents of the Premier Coal Mine Expansion proposal, Western Collieries Ltd., will supply coal from the Premier Deposit in the Shotts Sub-basin which has been selected as the optimum reserve for development.

Coal production from the mine will be approximately two million tonnes (Mt) per annum for the power-station contract period of 30 years but an additional 1Mt to 3Mt per annum could be produced if required to meet other commitments.

The Collie Basin primary land-use is designated as coal extraction and this mine development is considered a natural and logical progression in systematic utilisation of the State's resources.

Although mining necessarily impacts on the biophysical environment, it is believed that on balance this project is of a very positive benefit to Collie and Western Australia.

The Environmental Protection Authority (EPA) has requested this Consultative Environmental Review (C.E.R.) which addresses the existing environment, likely impacts from this project and WCL's planned management strategies.

1.2 The Proposal

The Premier Coal Mine Expansion is to supply approximately 2Mt of coal per annum to the Mitsubishi-Transfield Collie Power Station.

This new power-station project was commissioned by SECWA in response to their forecasted requirement for a new base-load generating capacity by 1996.

In addition to satisfying this need, the Premier Coal Mine will have the capacity to meet

an expansion of this power station as well as demand from existing and future WCL customers.

The proposal involves a number of stages, namely:

- * Pre-development - consultation with various concerned private and government bodies to ensure orderly development with minimum disturbance
- * Development - including detailed environmental planning, mine-development drilling, groundwater drilling, dewatering, detailed mine planning, infrastructure establishment and initial clearing
- * Operational - continued dewatering, clearing in advance, pre-stripping of topsoil and laterite, stripping of subsoil, overburden removal, coal extraction, coal preparation, coal delivery and concurrent rehabilitation
- * Decommissioning - removal of all infrastructure and equipment, dismantling of power lines and telecommunications, and, if required, stabilization and rehabilitation of final land form.

1.3 Existing Environment

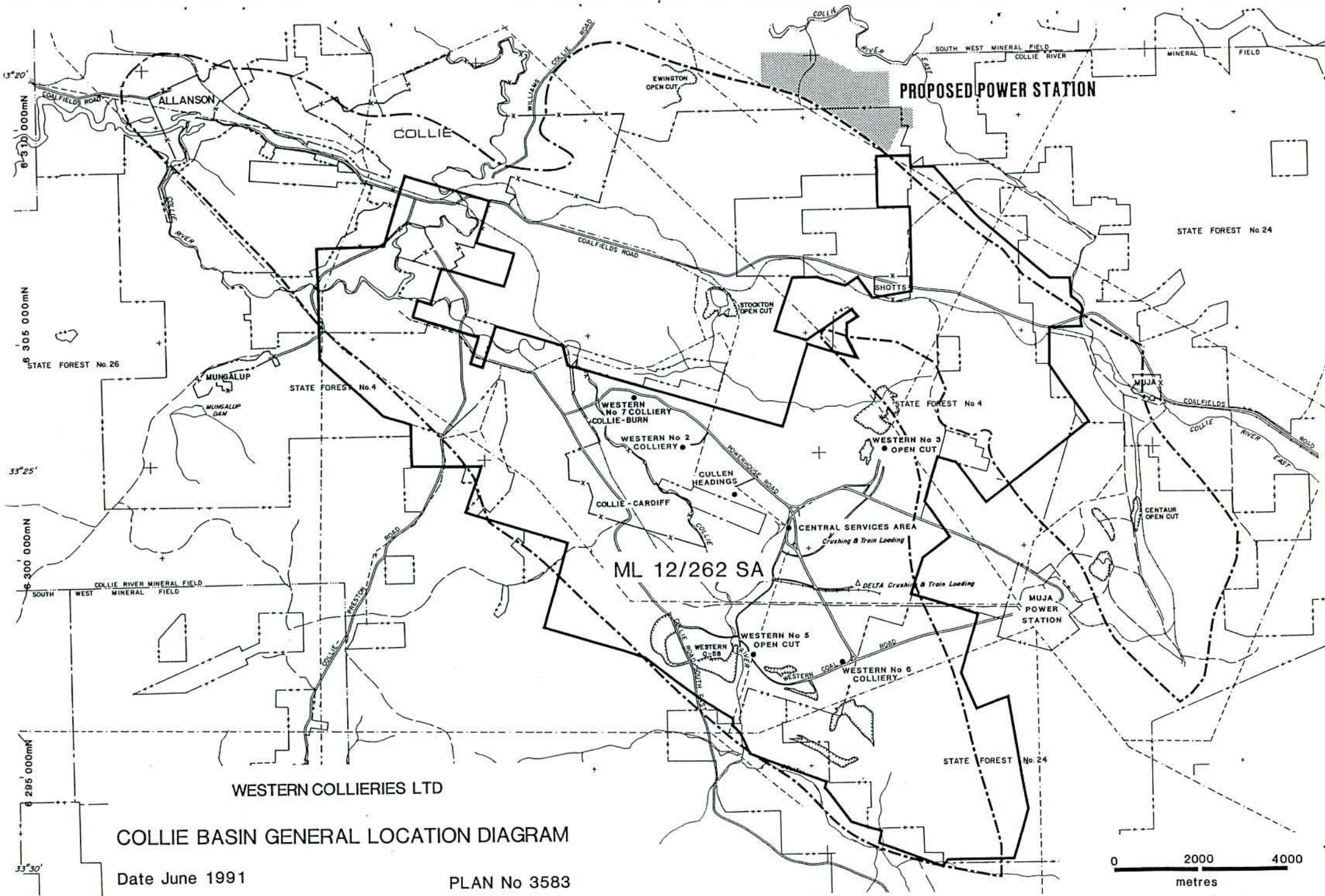
The Premier Mine will be an expansion of existing coal-mining activities within the Collie Basin which is located approximately 160km south-southeast of Perth and 55km east of Bunbury.

The Collie Basin is comprised of two downfaulted blocks of Permian coal-bearing sediments confined by Archaean granites and metabasics.

The interburden sediments are largely porous and saturated with good-quality water which is another necessary commodity in power generation. Surficial waters are typically highly saline due to clearing and farming activities.

The Collie Basin falls within the Darling Plateau in the South West Physiographic Division. The surrounding country is generally gently rolling with laterite-capped hills and broad, flat, sandy valleys. The Collie rivers are prominent features flowing through the basin.

The climate of Collie is described as Mediterranean with hot, dry summers and cool, wet winters.



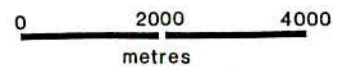
COLLIE BASIN GENERAL LOCATION DIAGRAM

Date June 1991

PLAN No 3583

WESTERN COLLIERIES LTD

415 000mE 420 000mE 425 000mE 430 000mE 435 000mE 440 000mE



Flora and fauna within the area has been largely disturbed by mining, farming and timbering activities over the past century. Remaining forest land at Premier is jarrah-dominated with lesser marri and banksia species. This area has been logged a number of times with mainly poor-quality stands remaining.

Fauna in the Premier area is also typical of the Collie Basin being represented by a range of mammals (with a high incidence of introduced species), reptiles (mainly snakes and lizards) and aquatic species (dominated by frogs and fish). The area has been invaded by feral species such as pigs, cats, rats, mice, rabbits, foxes and bees.

Archaeological and ethnographical studies have confirmed there are no sites of traditional or cultural significance in the proposed Premier development area.

The coal-mining town of Collie, population approximately 10,000, is in the centre of a mixed farming-forest district and is over 7km from the Premier Mine. Small local communities exist at Shotts and Buckingham (see Plan No. 3583).

1.4 Impacts and Management Programmes

Employment

The Premier Mine will employ approximately 250 personnel including skilled and unskilled positions. This will assist in stabilising, then boosting, the regional economy.

Land-use

Approximately 80% of the Premier Lease area is covered by State Forest which has been logged several times.

Ongoing rehabilitation, with indigenous floral species capable of self-generating survival, will minimise the impact of clearing for mining purposes.

WCL owns the bulk (86%) of freehold land in the Premier lease area. The remaining 14% should not be directly affected by mining activities.

Land Form

Topography will necessarily be altered by mining but the effect will be minimised by restricting out-of-pit dumps through back-filling whenever practicable and by conforming the final land surface to existing topography.

Spoil dumps will be designed to conform with existing topography. Final outcrops will be constructed at less than 14 degrees to minimise erosional and visual impacts.

The final void will either fill with water naturally or could be made part of the Collie River East Branch. Both possibilities provide future scenic and recreational benefits.

Surface Water

The Collie River East Branch is beyond the mining area and has a highly saline nature.

Drainage within the proposed active mine area is ephemeral indicating mainly vertical infiltration of precipitation.

Surface runoff during mining operations will be controlled through adequate dump design and the use of sumps and settling ponds to prevent erosion, turbidity and pollution by spoil.

Water discharges will be in accordance with EPA-licence conditions.

Groundwater

Dewatering will be necessary to allow safe and efficient mining as well as provide water for the power station. Significant draw-down will be achieved, particularly in deeper aquifers, but extensive planning and monitoring will be done to minimise abstraction. Domestic water supplies in the Shotts area may be affected by draw-down around the mine void.

Air Quality

Gaseous emissions from the Premier operation will have little detrimental effect on the existing environment and WCL will comply with government emission standards.

Dust generation will be minimised by proven, existing suppression techniques including watering of unsealed roads and stockpiles.

Noise and Blasting

The Premier Mine area is in a sparsely populated area over 7km from the Collie townsite. Noise emissions will be controlled in accordance with government regulations by setting acceptable limits on all mining equipment purchased. Monitoring will be done to ensure impacts on local residents are minimised.

Blasting will be done in accordance with Mines Department regulations to ensure damage does not occur and disturbance is minimised.

Wastes

Mining-generated wastes include spoil, domestic-type garbage and similar non-toxic wastes, oil, lubricants, sewage and coal fines.

Where possible and practicable, wastes will be recycled e.g. oils, lubricants, metals, etc. Spoil, as well as non-toxic and coal wastes, will be used as landfill. Hazardous wastes will be disposed of in accordance with government regulations.

Jarrah Dieback

Jarrah dieback commonly occurs in valley regions and will need to be contained by an ongoing hygiene programme designed in consultation with the Department of Conservation and Land Management (CALM).

Weeds

Weeds already exist in the project area due to farming and access ways. Further proliferation may be controlled by a variety of techniques including hand pulling and the use of approved herbicides.

Feral Animals

Numerous feral-animal species are already present in the project area. Correct waste disposal and hygiene will discourage further proliferation.

End Land-use

The final topography will be compatible with adjacent land forms and capable of supporting the same land-uses as now. Reafforestation to compatible bushland will be done in accordance with the existing government agreement. A final void is inevitable in the area and this could provide a variety of recreational and practical uses such as marron or fish farming.

1.5 Environmental Commitments

WCL has already accepted environmental constraints and commitments as part of its Mining Lease agreement (12/262 SA) with the State Government. Formal reporting procedures are in place which will notify government of monitoring, rehabilitation progress and research findings.

Environmental management will be supported by a team of professional staff in consultation with the relevant government authorities and consultants when necessary.

WCL is already committed to an integrated mining and rehabilitation programme which is acceptable to government and which will meet the requirements of this development.

1.6 Conclusion of Environmental Acceptability

WCL is confident that the management of environmental impacts, as described in this review, is achievable. The environmental management strategies in this proposal are consistent with existing WCL operations in the basin. The project is a logical extension of the Company's coal-mining operations to meet the State's electrical-power needs whilst ensuring the maintenance of alternative land-uses and resources for the future.

2.0 INTRODUCTION

2.1 Proponent Details

The proponent of this mining project is Western Collieries Ltd., a wholly-owned subsidiary of Wesfarmers Limited. WCL is a long-established mining company with a 40-year history of supplying coal to the State Energy Commission of Western Australia for power generation and to private companies for various industrial uses.

WCL has a major commitment to coal mining in Collie and the competitive supply of energy to Western Australia.

Public contact with WCL can be made through the following personnel:

Head Office Perth

Mr. M. Pegrum
Marketing and Business Development Manager
40 The Esplanade (G.P.O. Box X2231)
PERTH W.A. 6000
Telephone: (09) 327 4511
Facsimile: (09) 327 4519

Collie Office

Mr. K. Pitts
44 Wittenoom Street (P.O. Box 21)
COLLIE W.A. 6225
Telephone: (097) 340 222
Facsimile: (097) 912 684

2.2 Aim of Consultative Environmental Review Document

The Environmental Protection Act 1986 has made the Environmental Protection Authority responsible for assessing projects which may have a significant effect on the environment.

The level of assessment is set by the EPA depending on the significance of the environmental impact.

In the case of the Premier Mine development a Consultative Environmental Review was considered appropriate by the EPA (see Appendix 1).

The review document is designed to facilitate assessment, by government departments and directly interested or affected parties, of the project's possible impact on the existing

social and physical environment, as well as detail the proposed management strategies to minimise impacts and safeguard the environment.

This C.E.R. is made available to the EPA for comment prior to governmental assessment of the environmental implications. Public review is planned for a two week period, during which time copies can be either obtained at a nominal cost or examined at the following locations:

- * Environmental Protection Authority
Reading Room, Ground Floor
1 Mount Street
PERTH W.A. 6000
Telephone: (09) 222 7000
- * WCL Perth Office
- * WCL Collie Office
- * Collie Library.

2.3 Project Objectives

The primary project objective is to provide coal for a new power station in the Collie region.

Long-term planning by SECWA identified the need for the construction of a new power station capable of producing 600 MW of electricity by 1996.

The first stage of this power station will require on average 2Mt of coal per annum but SECWA anticipates a doubling of the station's required capacity post the year 2000.

Providing the necessary government criteria are met, this power station will be located 10km east of the Collie townsite and the Mitsubishi-Transfield Collie Power Station Joint Venture will be responsible, as owners, for construction and operation.

Coal will be supplied by WCL from the Premier Deposit which is less than 2km southeast of the proposed power station. WCL has detailed a coal resource of 378.6Mt in the Premier area, of which 144Mt is currently classified as "Mineable".

WCL has planned to develop the Premier Deposit in such a way as to maximise the State's coal resource at the same time as minimising the physical and social environmental impact.

2.4 Approval Processes

Consultation and approval processes will be conducted with the following responsible government authorities ensuring that all legislative and regulation requirements are met:

- * Environmental Protection Authority (EPA)
- * Department of Conservation and Land Management (CALM)
- * Western Australian Department of Mines (Mines Dept.)
- * Water Authority of Western Australia (WAWA)
- * Collie Shire Council
- * Main Roads Department
- * Westrail
- * State Energy Commission of Western Australia (SECWA)
- * Department of State Development (DSD)
- * Agricultural Protection Board (APB)
- * Western Australian Department of Agriculture (WADA).

3.0 THE PROPOSAL

3.1 Need for Proposal

The State Energy Commission of Western Australia is responsible for the planning, production and supply of electricity to the State.

SECWA considers that an installed capacity of approximately 30% in excess of peak demand is essential to maintain a reliable service. The 1988/89 period had a reserve capacity of only 21%. Although annual peaks can be catered for over the next six to eight years with strategically located, small, gas-turbine installations, SECWA forecasts a requirement for a new, base-load power station by about 1996.

The Mitsubishi-Transfield Collie Power Station Joint Venture was selected by SECWA as the preferred developer and owner of the next coal-fired power station at Collie, and WCL successfully tendered for the total coal-supply contract.

This proposed power station will meet the needs of the projected base-load electricity requirements and has the provision for expansion to meet post-year-2000 power projections.

The total lead time, from project approval through to station commissioning, is up to six years. Consequently, action has to be initiated now to meet the State's future power-production requirements by 1996.

To ensure coal supply to this power station, WCL must gain approvals from various governmental authorities and this document is a required part of that approval process.

3.2 Relevant Government Policies

The following policy documents and policies have been considered in formulating this Consultative Environmental Review:

1. Collie Coal (Western Collieries) Agreement 1979 and Amendments
2. Collie Basin Land-use Working Group 1987
3. Conservation Strategy for Western Australia
4. Proposed Collie Power Station ERMP SECWA 1990
5. Collie Coal Basin Water Resources Management Strategy WAWA 1988
6. Western Australian Power Generation Options SECWA 1991
7. SECWA Corporate Plan 1990-1993
8. CALM - Forestry Management
9. South West Development Plan.

3.3 Alternatives Considered

WCL currently operates two open-cut and three underground coal mines in the Collie Basin.

These mines are currently committed to meet existing SECWA and private coal contracts.

Part of the agreement to proceed with a new power station in Collie was contingent upon a reduction in WCL's existing SECWA contract tonnage and price.

In the main, this reduction would come from underground operations which as yet do not provide an alternative, viable, economic coal source with currently used technology.

The existing open-cut mines have limited resources, are structurally more confined than the Premier Deposit and would also not adequately meet this project's requirements.

Other potential open-cut deposits on WCL's leases have similar restrictions and are thus economically and strategically less attractive than the Premier Deposit which has the additional advantages of proximity to the proposed power station and adequate reserves to meet the full coal supply.

3.4 Proposal Description

The Premier Mine project can be divided into a number of stages which this proposal addresses on environmental grounds.

3.4.1 Pre-development Stage

Discussion will be held with the following concerned parties to facilitate the orderly development of the proposal and ensure that legislative and regulation requirements are met:

- | | |
|------|---|
| EPA | - re C.E.R., water discharges, waste disposal, noise, other environmental requirements |
| CALM | - re clearing, dieback hazards and controls, dumps, reforestation, soil stabilization and restoration, fire control |
| APB | - re weeds and feral-animal control |
| WAWA | - re dewatering, water quality, draw-down, surface drainage impacts, pollution protection, silt control, final void, clearing permits |
| WADA | - re clearing |

- SECWA - re taking of early and later water for power-station usage, the Shotts Borefield, moving power lines, initial power supply, potential spoil locations on their properties
- WESTRAIL - re relocation of the coal-supply rail line
- MAIN ROADS DEPT. - re relocation of the Darkan Road
- MINES DEPT. - re C.E.R. and mine plan approval
- RESIDENTS/LANDOWNERS - re likely impacts, protections
- COLLIE SHIRE - re local planning, disturbance of Shotts Road and dirt roads
- DEPARTMENT OF STATE DEVELOPMENT - re resource development
- mitsubishi-transfield JV - re contract requirements
- COMBINED COAL MINING UNIONS - re jobs, future implications.

3.4.2 Development Stage

Initial development will require detailed environmental planning and consultation to ensure adequate procedures, research and monitoring provisions are established.

Prior to operation, WCL will need to conduct extensive drilling and testing programmes to provide detailed mine-planning data (e.g. for accurate seam sub-crop, fault and coal-quality control) and hydrogeological parameters.

Mine planning is an iterative and ongoing procedure but, by necessity, plans for start-up and the medium-term will need completion during the Development Stage.

Groundwater drilling and testing needs to be finished at least two to three years before mining commences to allow for pre-drainage. Some work may be necessary in the near future to delineate adequate water volumes of suitable quality for power-station requirements.

Pre-production dewatering bores will need electrical-reticulation access and pipeline access.

Pit optimisation and coal-quality scheduling will require details gained from a major drilling programme over the next three to four years. Access and clearing for this requires approval from the responsible government authorities.

Clearing and base establishment for the initial out-of-pit dump and stockpile areas will be in accordance with the mine plan and schedules.

Pre-production clearing will be minimised by restriction to the annual (or minimum practical period) extraction requirement.

Infrastructure establishment will be left to as late in the Development Stage as practicable.

3.4.3 Operational Stage

WCL proposes to mine approximately 2Mt of coal per annum from the Premier Deposit as fuel for the approved, new power station. This will require the removal of, on average, 15 million bank cubic metres of overburden/interburden per annum for the contract period of 30 years.

WCL will also extract a further 1Mt to 3Mt of coal per annum, at a similar overburden ratio, from the Premier Deposit to meet other current, contractual commitments from Year 2000 to 2010 and for any extensions of existing contracts or new contracts that are negotiated.

It is during the Operational Stage that anticipated environmental impacts will be greatest. The mining operation will require clearing and will generate additional noise, dust, gaseous emissions and vibrations which can all be minimised by good mining and maintenance practices.

The impacts and management of these are discussed more fully in Section 5, whereas the mining process is reviewed in this section.

Pre-stripping of overburden will be done using dozers, hydraulic shovels, front-end loaders and trucks. Where lateritic cap-rock occurs, drilling and blasting may be required.

Laterite and topsoil will be stockpiled and/or spread for road aggregate and rehabilitation respectively. Topsoil management is recognised as an integral component of successful rehabilitation.

Where possible, topsoil will be immediately used but in the event of stockpiling it will be stored in low heaps and protected from erosion and weed growth. Temporary revegetation may be considered if necessary.

Neutral subsoil will be either directly used as a blanket to undifferentiated spoil or where necessary will be stockpiled for future application.

The remaining overburden and interburden will be removed by hydraulic-shovel excavators and large front-end loaders, then carted by trucks. Initial dumping of overburden will be out of pit, followed as soon as practicable by in-pit backfilling.

The location and design of out-of-pit dumps will be such as to minimise environmental impacts. Prior to spoil placement, laterite and topsoil will be removed for ongoing use in proposed dump rehabilitation and roads respectively.

Coal surfaces will be cleaned using graders, with coal subsequently removed generally by continuous surface miners to minimise diluent effects.

Coal will be trucked from the pit to a crushing plant, stockpiled and then conveyed to the power station.

The use of in-pit crushing, conveying and stacking may be required as the mine depth increases, but this will depend very much on the relative economics in the later stages of the project.

3.4.4 Infrastructure Requirements

Site infrastructure will be positioned to protect access to coal resources and optimise travelling distances. Disturbance around the infrastructure will be minimised and environmentally sensitive locations will be avoided.

Prior to infrastructure establishment, adequate light-vehicle access to the site will be required. To minimise dust generation it is envisaged that the main access would be a tar-sealed roadway because of higher traffic load. Other road access to the site area would most likely be unsealed with a lateritic-gravel surface. Access roads will also be designed where practicable to minimise visual and noise impacts as well as limit earthwork requirements. Adequate drainage will be designed to control and dissipate runoff.

Maintenance and office facilities will be required on site.

Workshops will need to cater for a mining-equipment fleet including:

- shovel excavators
- surface miners
- dozers
- front-end loaders
- haul trucks
- graders
- coal trucks
- light vehicles
- miscellaneous machinery, e.g. cranes and backhoes.

The workshop area will incorporate washdown facilities with adequate traps to capture industrial wastes.

Office accommodation will be required for statutory management as well as maintenance, technical and administrative staff. Messing and ablutions will be incorporated in this building complex.

Provision of sewerage for the mess, ablutions and lavatories will be made during this phase.

A small number of hazardous substances may be required by the operation but the necessary safe transport and storage provisions will be made in compliance with the appropriate legislations and regulations.

The coal-preparation plant will consist of a crushing plant with an 80,000-tonne reclaiming-stockpile facility for blending. Runoff, which may contain coal fines, will be directed through sumps or silt traps. A covered conveyor will be used to transport coal to the power station.

All infrastructure will require power reticulation and a supply of up to 5 MW/hr is predicted as necessary.

Water for domestic and industrial usage will be mainly supplied by dewatering activities. Some treatment may be required for shower and drinking water.

3.5 WCL Environmental Policy

WCL has developed an environmental and rehabilitation programme, over a long period of coal mining in the Collie Basin, which has been accepted by the relevant authorities. The Company, in respect of its Mining Lease agreement, namely the Collie Coal (Western

Collieries) Agreement Act 1979, is committed to protection and management of the environment. This includes a continuous programme of investigation and research, including monitoring to verify the effectiveness of the programme in protecting and rehabilitating the environment. Annual interim and triennial reports are submitted to government in compliance with the requirements of the Act.

The Company policy is summarised as follows:

- * Whilst coal mining is designated as the prime land-use of the Collie Basin the Company recognises that all land resources should be protected.
- * Rehabilitation of mining areas is done to ensure subsequent, alternative land-uses are not jeopardised, and that the area and surrounds are left compatible with existing topography, land-uses and floral and faunal communities.
- * As far as possible, those areas of the environment which are regarded as of particular significance or irreplaceable will be avoided in development programmes, e.g. aboriginal heritage sites.
- * Development programmes are designed to minimise, within practical constraints, the impact on the immediate and adjacent environments.
- * Rehabilitation and environmental management programmes have as their criteria:
 - the protection of the environment
 - the interests of existing local residents
 - the interests of State development and protection
 - the lowest cost consistent with sound engineering and best modern practice
 - the interests of the product consumers
 - the government land-use objectives.

Detailed objectives of the Company policy include the following:

- control of water and wind erosion on disturbed areas
- control of turbid runoff

- control of dust generation
- control of waste-water quality (viz. acidity, salinity) and turbidity
- preservation or enhancement of landscape and loss minimization of aesthetic value
- maintenance and/or¹ re-establishment of floral species, indigenous or compatible with the original and surrounding areas, that are capable of self-generating survival
- provision of a near-natural habitat for native fauna
- industrial and domestic waste disposal in accordance with relevant Acts
- monitoring of management programmes and verification of effectiveness
- achievement of prime land-use objectives
- minimisation of disturbance to social environment
- progressive, concurrent rehabilitation of completed mining and associated areas
- solicitation, where and when necessary, of outside professional consultation to achieve the overall objectives (Dinara Pty Ltd [Principal, W.H. Butler] has been retained by WCL for over a decade to conduct ongoing reviews and make recommendations concerning the Company's current and future operations).

3.6 Spoil Disposal

WCL proposes to progressively construct dumps in a way such as to enable rapid, ongoing rehabilitation. This will minimise visual impacts as well as loss of faunal habitat, erosion, water runoff contamination and dust generation.

Some out-of-pit dumping is required initially but the objective is to maximise in-pit dumping.

Dumps will be designed such that the far final edges are developed first to facilitate early rehabilitation and to minimise surface flow over "raw" dumps.

3.6.1 Out-of-Pit Disposal

Out-of-pit dumps will be designed to satisfy the following criteria:

- * minimal disturbance
- * minimal sterilization of coal reserves
- * controlled major runoff to waterways
- * final land form and drainage compatibility
- * cost effective handling, i.e. shortest possible haul distances.

The dump-generation method may vary from place to place but the general concepts are outlined below.

Generally, undisturbed surfaces for out-of-pit dumps will be cleared of vegetation prior to topsoil removal. Laterite and subsoil horizons may also be removed for use in roadmaking or blanketing respectively.

Spoil emplacement will commence at the outer dump edge and will be done in a series of layers with each layer being approximately 20m high. Scheduling will endeavour to ensure undifferentiated spoil is at the base or at the lowest possible level in the dump.

This material will then be covered with about 2m of inert overburden or subsoil and finally veneered by 0.15m to 0.30m of topsoil. A cyclic plan should, in most instances, avoid double handling of subsoil and soil and allow for immediate regeneration of vegetation.

Because of the existing topographic shape, the dumps may have a variable thickness and take an extended time to achieve final land form.

It may be necessary to have more than one active dump area which would also extend dump completion and rehabilitation times.





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Based on DLAS Muja Sheet No 2131-II SW & NW Cadastral Edition.

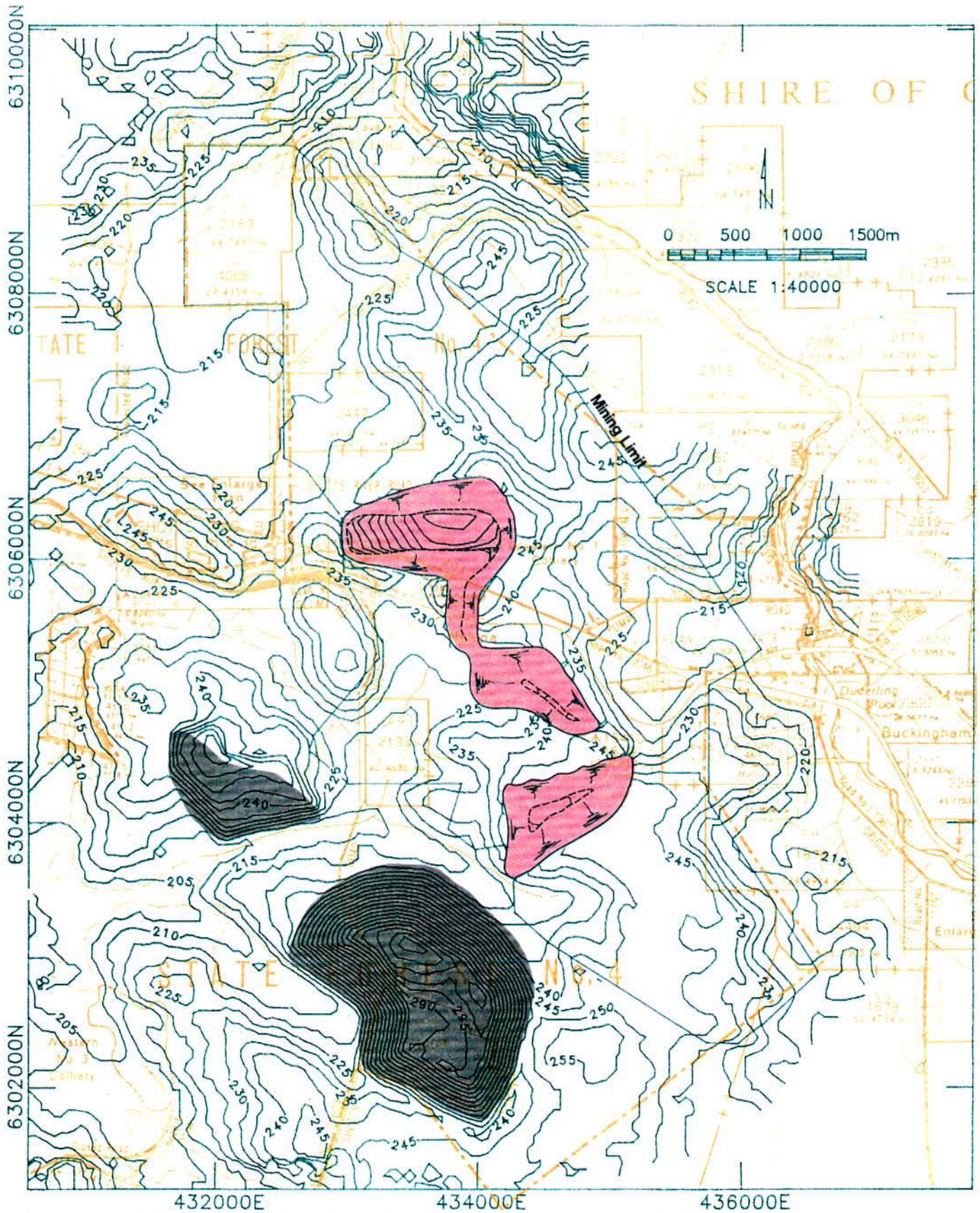
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MINE LAYOUT PROJECT YEAR 5

-  DUMP AREA
-  PIT CREST AND TOE
-  MINING LIMIT
-  TOPOGRAPHIC AND PIT FLOOR CONTOURS

Date June 1991





PLAN No 3575



Based on DLAS Muja Sheet No 2131-II SW & NW Cadastral Edition.

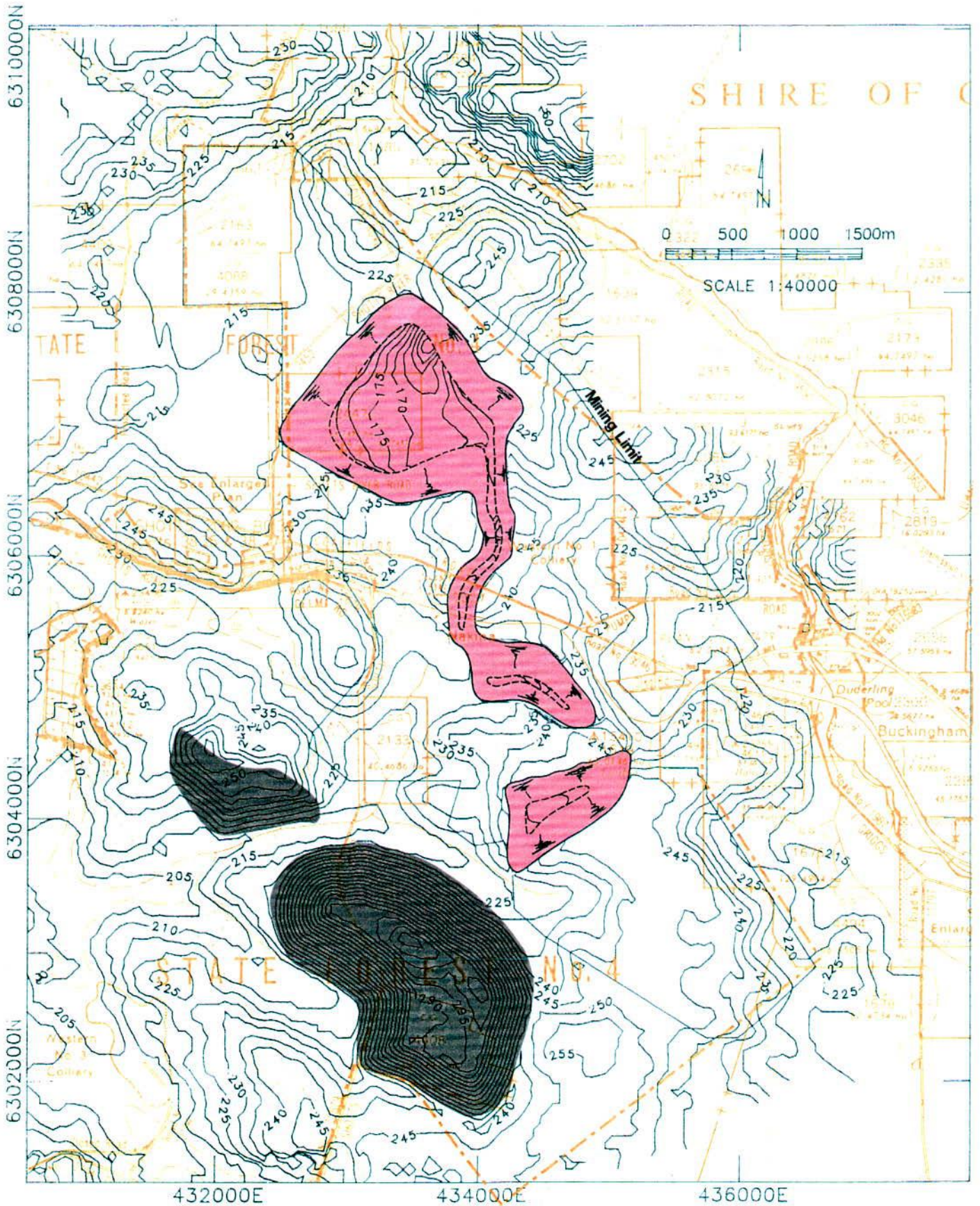
WESTERN COLLIERIES LTD

MINE LAYOUT PROJECT YEAR 10

-  DUMP AREA
-  PIT CREST AND TOE
-  MINING LIMIT
-  TOPOGRAPHIC AND PIT FLOOR CONTOURS

Date June 1991

PLAN No 3576



Based on DLAS Muja Sheet No 2131-II SW & NW Cadastral Edition.

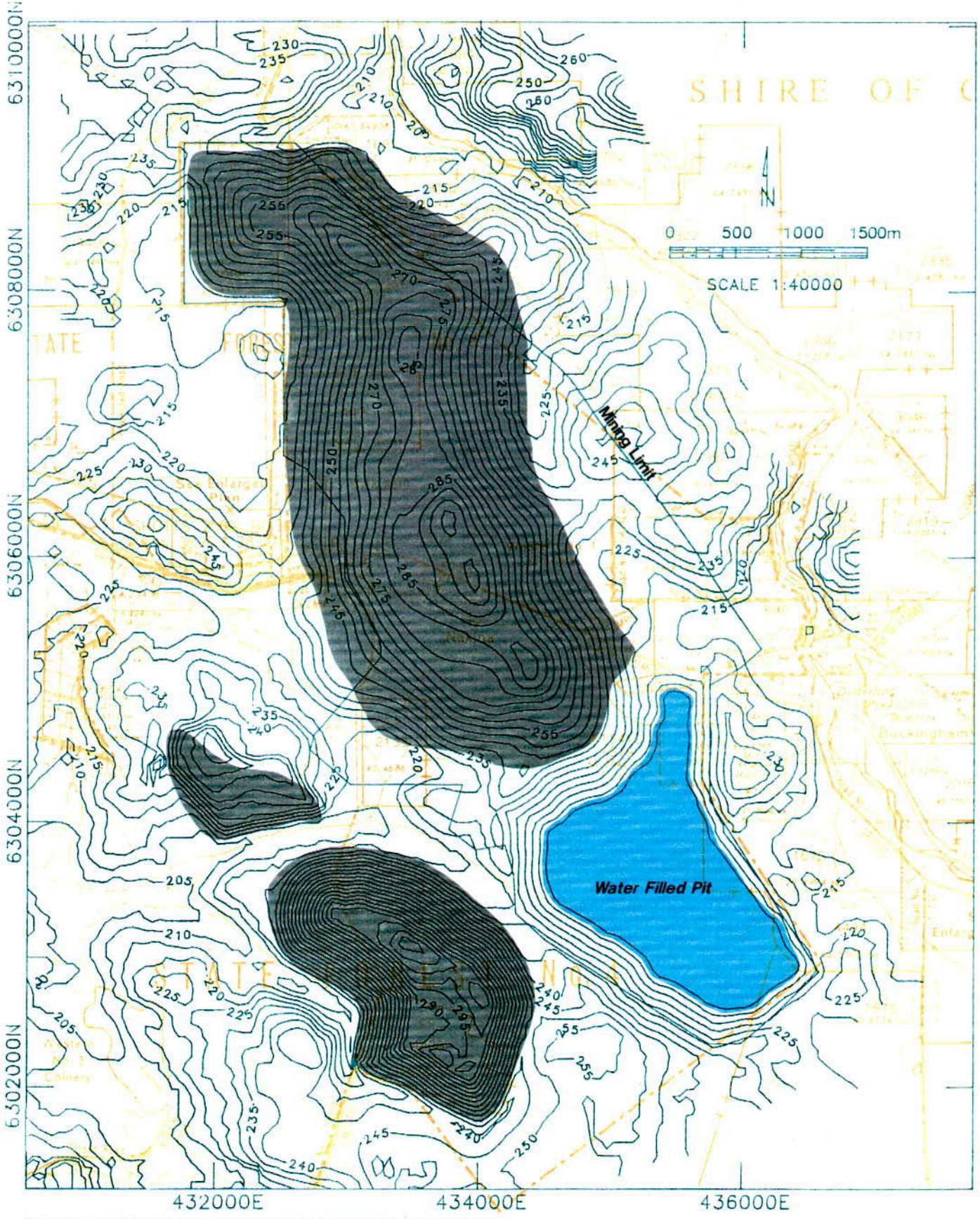
WESTERN COLLIERIES LTD

MINE LAYOUT PROJECT YEAR 15

-  DUMP AREA
-  PIT CREST AND TOE
-  MINING LIMIT
-  TOPOGRAPHIC AND PIT FLOOR CONTOURS

Date June 1991




PLAN No 3577



Based on DLAS Muja Sheet No 2131-II SW & NW Cadastral Edition.

WESTERN COLLIERIES LTD

END OF MINE TOPOGRAPHY AND FINAL VOID

-  DUMP AREA
-  PIT CREST AND TOE
-  MINING LIMIT
-  TOPOGRAPHIC AND PIT FLOOR CONTOURS

Date June 1991

PLAN No 3578

It is considered that without treatment any recreational facility would be restricted to surface-water activities such as currently undertaken in other abandoned and flooded open-cuts.

Another option is to divert the Collie River East Branch through the final pit. This would improve overall water quality of the river and the Wellington Dam, and assist flood mitigation by creating a compensation basin.

Considerations regarding the final void are given as concepts only because of the project duration which is in excess of 50 years.

3.8 Rehabilitation Methods

WCL has an approved environmental plan as part of the Collie Coal (Western Collieries) Agreement Act 1979.

In satisfying this, the return to compatible bushland will be undertaken as an integral part of the mining operations whilst peripheral areas will be left intact, so providing a source of rehabilitation fauna and to a lesser extent flora. Thus rehabilitation is regular and ongoing throughout the life of the project and subject to WCL's existing environmental commitment.

On temporary dump surfaces, ryecorn, clover or other applicable cover crops may be used in addition to native ground cover and shrubs to prevent soil erosion.

Topsoil will be placed directly, or as soon as possible, on finalised surfaces to maximise viable components including seeds, compost and micro-organisms. A native seedmix, suitable to the habitat of each site, will be broadcast and harrowed to supplement the topsoil. Some seed may be purchased from a recognised trader or CALM, but where possible seed will be gathered locally, on the lease, to maintain genetic integrity.

Normally seeding is best done in wetter periods, usually Autumn. If necessary, pre-nurtured seedlings will be planted to supplement seeding operations, and fertilizers may be used to maximize growth rates.

Where soil has been stockpiled for long periods (more than three months) supplementary fertilisers of a proven type may be used.

Unburnt vegetation may be spread back over seeded areas to create faunal habitat consistent with normal forest litter. Such material also provides wind and heat breakers and inhibits third-party access to finalised areas.

3.9 Decommissioning of Infrastructure

At the end of mining, all infrastructure facilities and equipment will be removed from site and the remaining available area rehabilitated to compatible bush land. Rehabilitation will require deep ripping of compacted areas to facilitate vegetation establishment.

Access roads will either be removed or closed to prevent unwanted public entry. Consideration will be given to possible future required usage by landholders or government instrumentalities.

Power lines and telecommunication installations will be dismantled if required and disturbed areas rehabilitated.

3.10 Contingency Planning

WCL has an Emergency Preparedness Policy which will also cover the Premier operations.

WCL is dedicated to providing highly competent emergency services and equipment throughout its coal-mining operations. WCL rescue teams are trained in the use of closed-circuit breathing apparatus, open-circuit breathing apparatus, fire-fighting techniques, medallion-level first aid, gas analysis and detection of gases, motor-vehicle accident handling, rescue from height and depth, chemical spillages etc.

Specifically, the rescue-team members attend eight full days of training per year as well as selective, voluntary training for competitions etc. All team members are chosen from volunteers out of the workforce and conform to standard entry conditions as set by the Coal Industry Rescue Committee.

Rescue personnel are on 24 hour call and report to the Mines Rescue and Safety Officer.

Rescue-team activities are supported throughout the Company from the Managing Director through to the level of Miner.

In addition, WCL has an inter-relationship with CALM to provide water trucks, dozers and front-end loaders in the event of major fires. WCL also supports, and is supported by, the Collie Volunteer Bush Fire Brigade.

3.11 Occupational Health and Safety

WCL is committed to protecting all its resources including employees and physical assets.

The Company does, and will, provide a safe and healthy working environment consistent and in compliance with acceptable industry standards. Requirements according to the Coal Mines Regulation Act will be maintained and policed by Company personnel and the Mines Department.

The Company will strive to identify and eliminate hazards which may result in personal injury, illness, fires, security losses or property damage, as well as provide adequate equipment and facilities to cater for potential problems.

Jobs performed properly, in accordance with established procedures and operating philosophies, will reduce risk.

Employees are, and will be, expected and encouraged to minimise accidents by following job practices and procedures as defined by Deputies, Foremen, Under-managers, Managers and Safety Officers. The active involvement of, and acceptance of responsibility by, employees will be critical to accident and loss prevention.

3.12 Jarrah Dieback Control

Jarrah dieback control will be a continuing process from Pre-development through Operational and Decommissioning Stages. A management programme to control dieback during these phases will be prepared in consultation with CALM as the detailed planning evolves. It is assumed that this programme will be an extension of existing procedures in other WCL operating areas.

The programme will contain a minimum-disturbance approach as well as hygiene procedures recommended by CALM.

3.13 Miscellaneous Controls

3.13.1 Weeds

Weeds, which may be either introduced species or native plants in unnatural abundance or settings caused by human interference, can cause the following problems:

- * competition with, and/or replacement of, local native species
- * increased disease or insect-pest risk
- * fire hazards.

Weeds already exist in the project area due to the main roads, numerous tracks, farms, residences and the railway access. Current information is that weeds are not a significant threat to native populations.

Threats through proliferation will be monitored to ensure levels do not cause problems. Remedial action could involve hand pulling or the use of environmentally acceptable and approved herbicides, as well as soil and seed manipulation to reduce invading species.

3.13.2 Feral Animals

Feral or introduced animals compete with, and prey upon, existing fauna. The project area already contains cats, rats, pigs, mice, rabbits, foxes and bees.

Waste disposal and messing hygiene will be adequate to ensure that existing feral animals are not encouraged or facilitated in survival and proliferation.

The Agricultural Protection Board will be consulted in the event of problems and action taken according to their advice.

4.0 EXISTING BIOPHYSICAL ENVIRONMENT

4.1 General Setting

The Collie Basin is situated nearly 160km south-southeast of Perth and is 27km long and 13km wide, covering an area of approximately 274 square km (see Plan No. 2954).

The Basin is one of a number of structural remnants within the Darling Plateau which is an uplifted physiographic feature running adjacent to the Perth Basin. The Collie area is weakly dissected by the bifurcating Collie River, with the East Branch skirting the northeastern boundary of the coal measures.

The Collie Basin has been an active coal-mining centre since 1898 and is still the only commercial coalfield in Western Australia. The area has been aggressively explored for the past 25 years with coal reserves delineated to sustain existing and proposed production to well beyond the year 2050.

Extensive, natural vegetation is confined to State forests, specifically the Northern Jarrah Forest in the Collie region.

The region supports a variety of land-uses, other than the dominant coal-mining component, including agriculture, hardwood milling, pine plantations, wildflower harvesting (especially boronia), seed collection, water catchments, apiculture, recreation, conservation holdings, power production, tourism, quarrying, light industry and townships.

The climate is classified as Mediterranean with cool to mild, wet winters and dry, hot summers.

4.2 Geomorphology

The Darling Plateau forms a large proportion of the South West Physiographic Division and is an ancient, erosional surface activated during the mid-Tertiary.

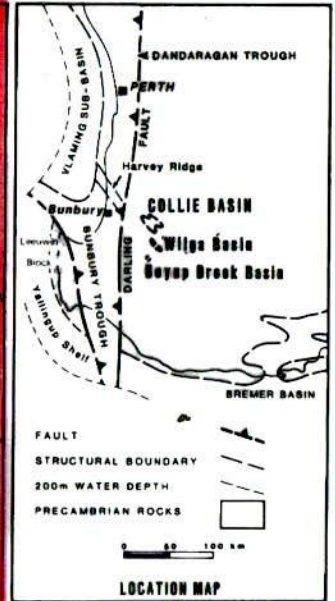
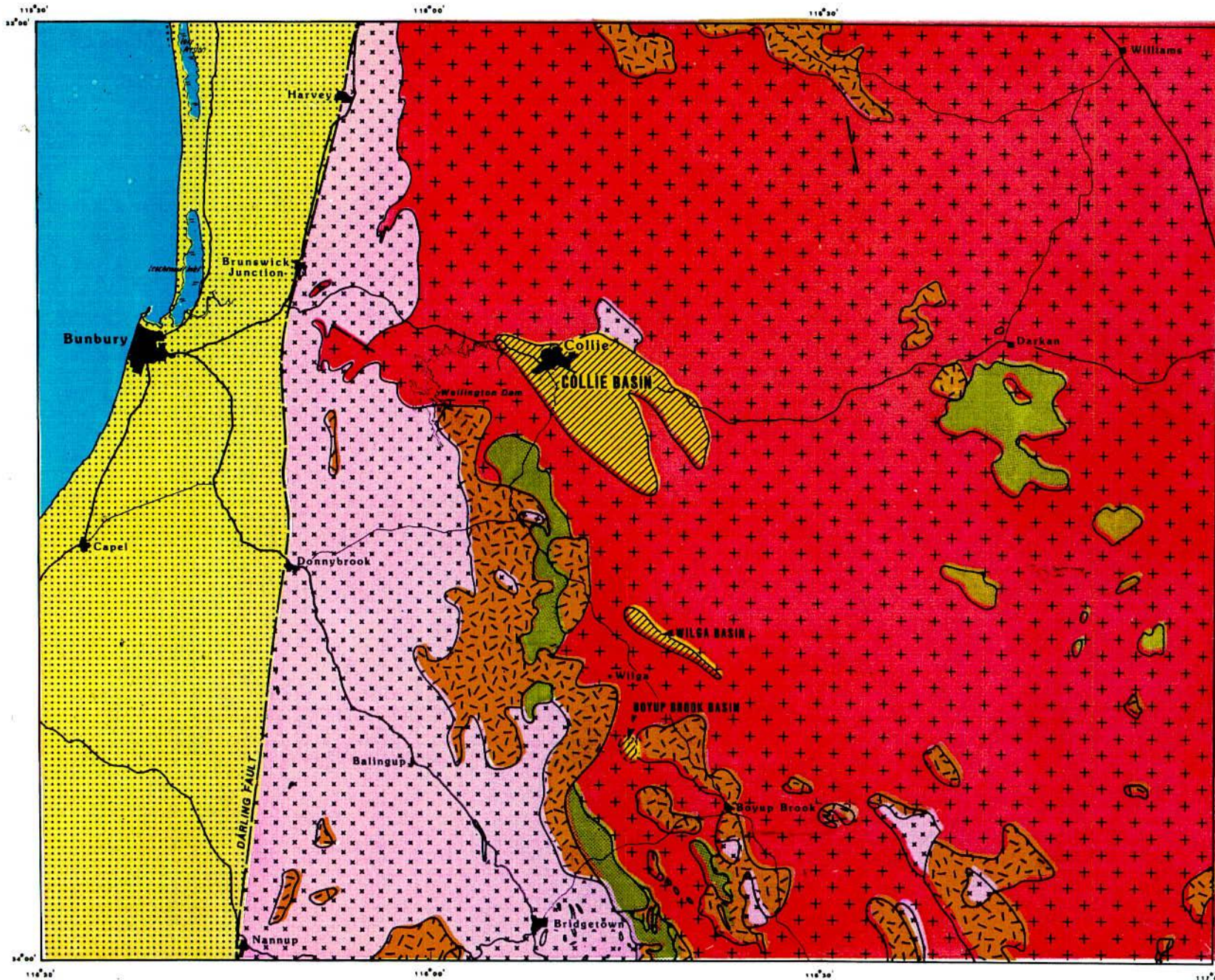
Extensive lateritization is a feature of the plateau with laterite-capped hills commonplace in the more dissected areas.








The Collie Basin is a depression within the Archaean basement containing softer Permian sediments of similar chemistry to the surrounding Archaean bedrock. Consequently, lateritic cap-rock is also common throughout the Collie Basin.


Although the Collie region falls within the Darling Range geomorphological division, which is characterised by deeply incised valleys from oceanward drainage systems, the basin and land eastwards of town is more typical of the Collie-Kalgan slopes, being gently sloping granitic/gneissic terrains with lateritic cappings.

Scale ~1:650000

Map Ref. No. 2949, PLAN No. 2954



- MESOZOIC 
- PERMIAN COAL MEASURES 
- GRANITE 
- MIGMATITE 
- GNEISS 
- QUARTZ MONZONITE 
- ULTRAMAFIC DYKES AND SILLS 


 WESTERN COLLIERIES LTD
**SOLID GEOLOGY OF THE
 COLLIE AREA**



However, the Collie River tributaries are major features of the basin. Deeply incised, Archaean terrain is found along the river between the Collie townsite and Allanson, whereas wide, alluvial flats are more typical within the basin.

The Premier Mine area is similar to other mining areas within the Collie Basin having a dominance of gently undulating uplands with lesser broad, shallow, adjacent valleys. A very small, intermittent marsh-land is located on farming property towards the northwestern edge of WCL's lease holding.

4.3 Topography

The Darling Plateau has an average elevation of 300m above sea level. Collie Basin topography varies between a low of 180m in river-valley environments to 260m in hilly, laterite-capped terrains.

The Premier Mine area has a similar topographic range between 208m and 250m (see Plan No. 3582).

4.4 Geology

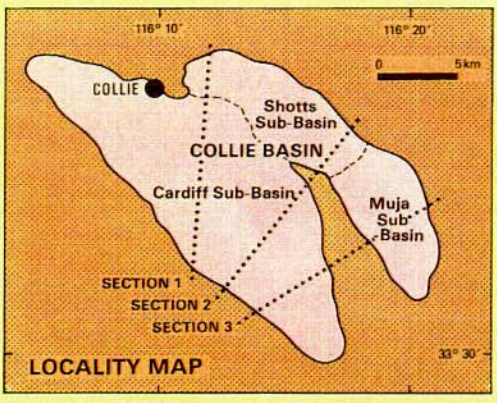
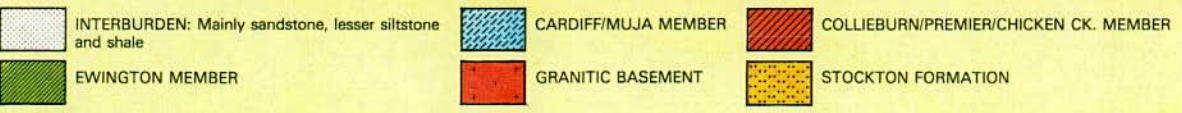
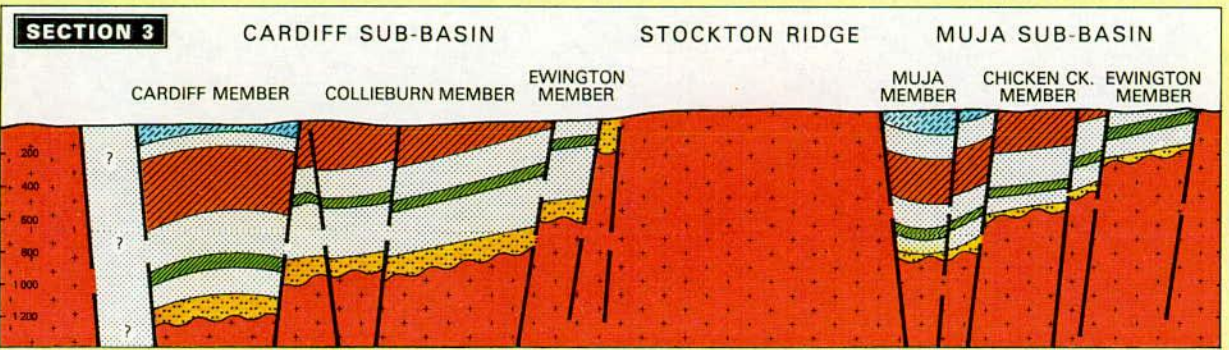
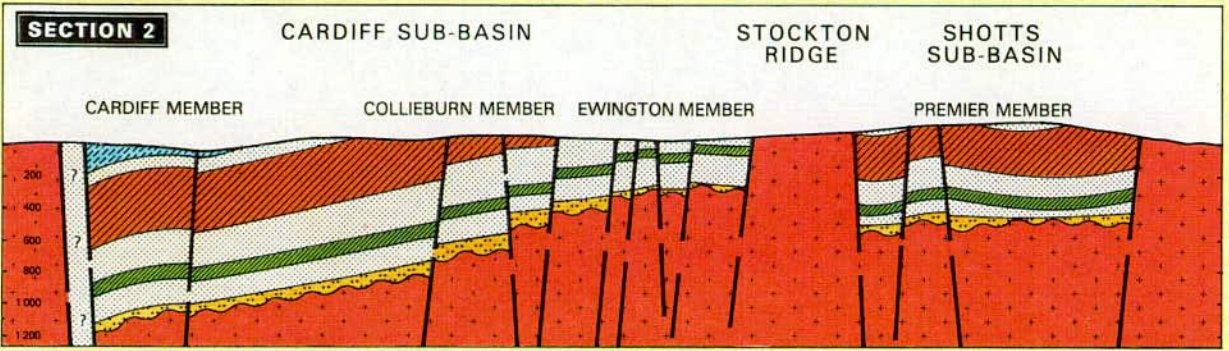
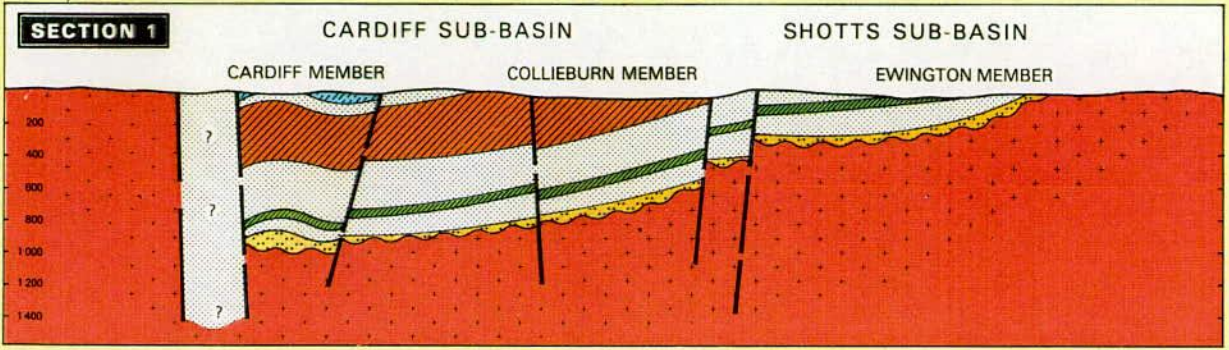
The Collie Basin is a northwest to southeast trending, elongated rift structure bounded to a large degree by major faults, with a maximum throw possibly in excess of 2,000m (see Plan No. 3412). The basin is thus subdivided into three depressions, namely the Cardiff, Muja and Shotts Sub-basins.

The coal-bearing sequence, of Sakmarian to late Permian age, is approximately 1,200m thick and is confined by Archaean rocks dominated by granite and granite-gneiss.

The Permian sequence commences with glacial deposits and then contains three main coal-bearing members in which coal comprises less than 5% of the material (see Plan No. GEN-300-004). Mining at Premier would be confined to the Premier Member (equivalent to the Chicken Creek and Collieburn Members) which has 15 major seams (greater than 2.0m thick) and numerous smaller seams and seam splits.

The proposed mine plan includes the extraction of Premier No. 1 Seam to the Eros Seam, a current "Mineable Reserve" of 144Mt.

Interburden is dominated by fine to very coarse-grained, porous sandstones with lesser interbeds of siltstone and shale. The sequence is variably overlaid by the Cretaceous-aged Nakina Formation which contains reworked Permian sediments. The high proportion of sandstone in the sequence makes the Collie Basin a major reservoir of groundwater.

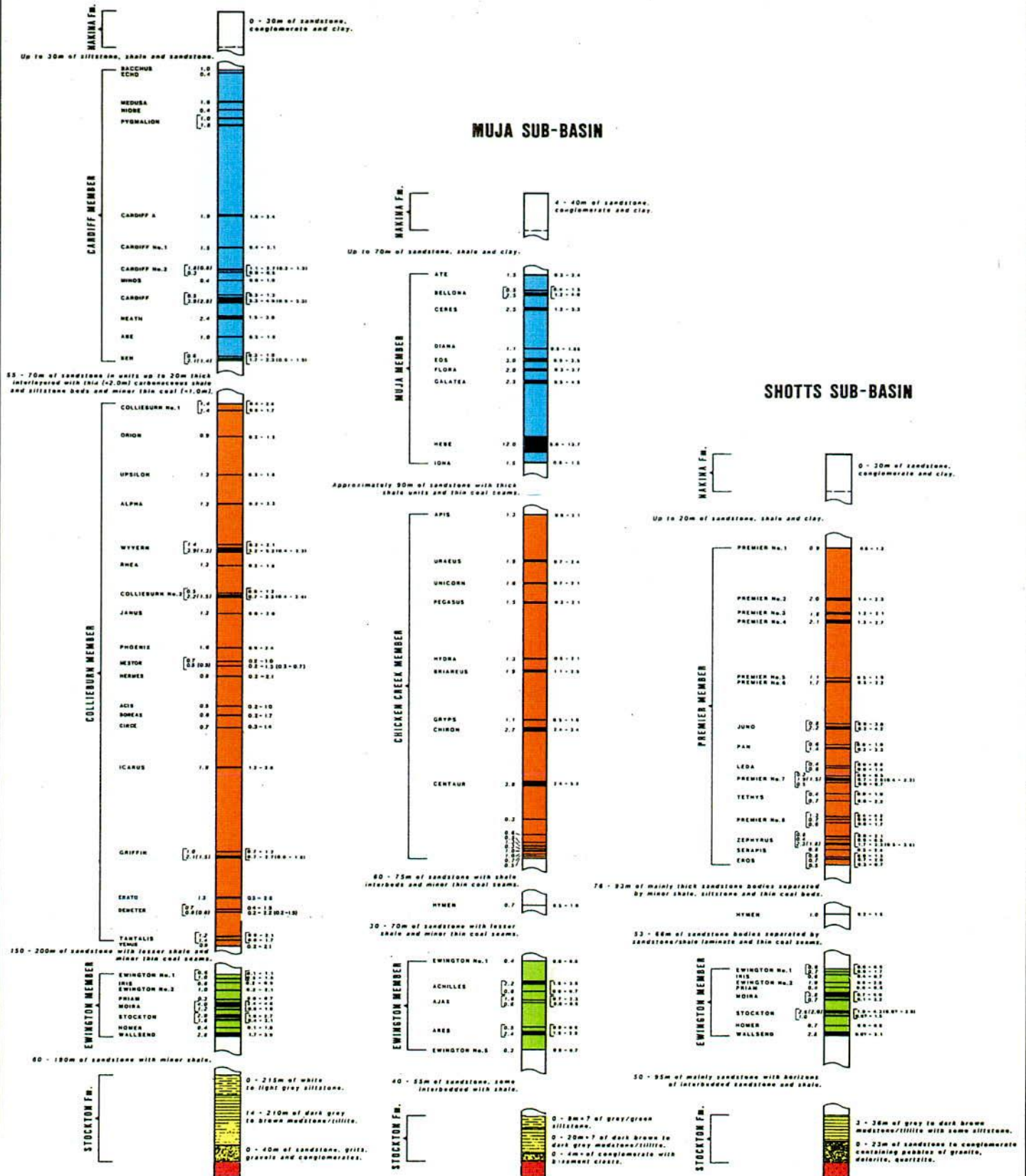


IDEALIZED SECTIONS THROUGH THE COLLIE BASIN

CARDIFF SUB-BASIN

MUJA SUB-BASIN

SHOTTS SUB-BASIN



NOTE: VALUES IN ROUND BRACKETS ONLY APPLY WHEN SEAM IS SPLIT.

SCALE=1:3000

Figure 2.3

STRATIGRAPHIC CORRELATION DIAGRAM FOR THE COLLIE BASIN

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Geology - Collie Basin	
Geology	Collie
STATIGRAPHIC CORRELATION DIAGRAM FOR THE COLLIE BASIN	
Scale	1:3000
Project No.	GEN-300-004

Tertiary lateritization has produced extensive cap-rock throughout the Premier Mine area and recent sedimentation has developed thin veneers of silt and sand adjacent to creek systems.

The Premier Deposit is essentially a broad, shallow basin with dips of between 3° and 8°. Only minor internal faulting is known with throws up to 20m recorded.

4.5 Climate and Meteorology

The Collie region is described as having a humid, mesothermal climate. Bureau of Meteorology statistics show that Collie experiences cool (some frosts) to mild, wet winters and hot, dry summers.

Rainfall isohyets trend generally north-south and increase in magnitude towards the west coast. The area is noted for marked rainfall differences over short topographic distances.

Collie has a long-term average annual rainfall of 973mm (see Table No. 1) and the Premier Mine area falls between the 800mm and 1,000mm rainfall isohyets. Collie has an average of 143 wet days per year (see Table No. 2) and 90% of the rainfall occurs in winter (April to October). Evaporation exceeds rainfall for seven months of the year (between September and May) and Collie sits near the 1,400mm isopleth.

The mean maximum summer temperature is 31.1°C whilst the mean minimum summer temperature is 12.3°C. The mean maximum winter temperature is 16.5°C and the mean minimum winter temperature is 4.7°C (see Table No. 2).

Collie Post Office wind records show that the most common winds are southeasterlies which are more frequent in summer. West to southwest winds occur during the advent of cold fronts, with a greater frequency during winter.

TABLE 1
COLLIE ANNUAL RAINFALL STATISTICS (mm)

1984	1985	1986	1987	1988	1989	Average	Long Term Average
1040	812	753	638	620	759	770	973

Source: Western Australian Year Book
No. 27 - 1990

TABLE 2

COLLIE TEMPERATURE AND RAINFALL STATISTICS

CHARACTERISTIC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	YEAR
Mean max °C	31.1	30.6	27.7	22.4	19.1	16.5	15.6	16.3	18.0	21.3	24.8	28.9	22.7
Mean min °C	14.2	14.1	12.3	9.5	7.1	6.2	4.7	4.7	6.1	7.8	10.2	12.6	9.1
Highest max °C	44.4	43.4	40.8	36.7	30.4	24.4	22.8	26.1	30.3	36.3	38.8	41.7	44.4
Lowest min °C	3.2	1.8	0.2	-1.3	-2.2	-4.0	-3.9	-3.2	-2.2	-0.6	0.3	1.7	-4.0
No. of days 30° and over	19	15	10	2	-	-	-	-	-	1	5	13	63
No. of days 40° and over	1	-	-	-	-	-	-	-	-	-	-	-	2
No. of days 2° and under	-	-	-	1	3	5	6	8	4	1	-	-	28
Rainfall (mm)													
Average	16	15	24	50	129	187	182	142	100	68	32	16	961
Highest	243	178	105	183	270	474	440	414	249	213	106	81	1467
Lowest	-	-	-	0	15	56	52	31	15	2	1	-	598
Highest 1 day	74	106	84	63	62	91	69	73	58	49	48	32	106
Wet days - ave	3	3	5	9	17	20	22	20	17	14	8	5	143

Source: Western Australian Year Book

No. 27 - 1990

4.6 Flora and Fauna

4.6.1 Flora

The Collie region is on the boundary between the Dale and Menzies Subdistricts within the Darling Botanical District (over 85% of this area is reserved for forestry under the control of CALM). The region is estimated to contain approximately 5,000 species of plants.

The typical Dale Subdistrict vegetation probably best describes the Collie region being an open, hardwood forest formation of indigenous jarrah (Eucalyptus marginata) on lateritic profiles with more sandy and granitic terrains hosting a mixed jarrah and marri (E. calophylla) alliance. Wandoo (E. wandoo) is more prominent over basic intrusives and dryer areas to the east.

Pine plantations are common in the Collie Basin.

The eastern side of the lease area at Premier is bordered by farms along the Collie River East Branch. These farms contribute to the 2.5% of private, developed land in the project area. The farms are largely cleared with remnants of jarrah forest on the ridges and mid slopes, and jarrah with wandoo on the lower slopes and valleys.

There are other farms to the north and three WCL-owned, virtually fully cleared farms within the lease area.

Apart from the inhabited section of the Shotts townsite on the lease (less than 0.05% of the Premier lease area) the remaining 80.0% is State Forest including sealed and dirt roads, a railway line and power lines.

Most of the forest is jarrah-dominated woodland similar to the surrounding forest outside the coal basin but of smaller stature due to repeated cutting. The lease area is of the same floral composition as the remainder of the Collie Basin.

On lateritic ridges the jarrah, with associated marri, forms dense stands of regrowth forest within the open stands of older trees declining in vigour. These stands have an understorey of banksia (Banksia grandis) with occasional sheoak (Allocasuarina fraseriana) in the sandier areas and a ground cover of low, grassy species and shrubs. The forest gradually becomes more open down the slopes with sheoak increasing and then banksia (B. attenuata) occurring as the forest becomes more open.

The wider, flat, sandy valleys have even more open woodland having only

scattered jarrah and marri, with banksia (B. attenuata) becoming the main species accompanied by paperbark (Melaleuca preissiana) and banksia (B. littoralis) in damper locations. Understorey grassland continues into the valleys with patches of heathland.

Along creek verges there is dense swamp vegetation with sedges, paperbacks and ti tree dominated by flooded gum (E. rudis) with isolated cases of wandoo and/or blackbutt (E. patens) merging with the jarrah further up-slope.

Often the valleys are severely infected by jarrah dieback (Phytophthora cinnamomi) which has killed many of the original species leaving a few scattered trees and a grassy groundcover of sedges and Conostylis species.

The lease area has been cut over for timber and sleepers a number of times and there appears to be mainly low-quality timber remaining.

There are no recorded occurrences of rare or endangered plants in the Premier development area.

4.6.2 Fauna

General information on faunal distribution in the Collie Basin and surrounding areas exists in the literature. Natural habitats have already been disturbed by the following activities:

- timber cutting
- water catchment
- mining
- exotic silviculture
- residential development
- agriculture
- animal farming
- periodic controlled burning
- introduction of feral animals
- introduction of plants
- recreational activities
- hunting.

A total of 36 mammal species was identified in field surveys by naturalist Mr. W.H. Butler. The assemblage was notably modified by man's intrusion into the natural habitat and a high incidence of introduced species was recorded.

The surveys also identified 121 bird species occupying a variety of habitats from forest to developed land.

A total of 40 reptile species (lizards, snakes and turtles) was recorded in a similar habitat range.

Native aquatic fauna are sparse but 21 vertebrate species, dominated by frogs and fish, have been identified. Invertebrates, such as marron, gilgie, coonac, freshwater insects, mussel and small shrimps are found in the aquatic areas.

Insects, arachnids (spiders, scorpions), myriapods (centipedes, millipedes), isopods, worms, snails and Peripitus have also been observed in the lease area.

Recent studies, by WCL-sponsored researchers, have concentrated on aquifauna and ants.

Current evidence, from independent research and CALM field studies, suggests that ecosystem changes and the onset of feral animals have reduced the smaller native fauna to very low levels.

The Premier area is considered typical of the Collie Basin in its range of faunal habitats. Within the area there are no known occurrences of rare and endangered faunal species, nor are they expected because of the abovementioned interferences and the similarity of the area to less-disturbed forest surrounds.

4.7 Cultural and Heritage Features

4.7.1 Historical Sites

History of the Collie Basin is dominated by the mining industry. Coal was discovered in the Premier area in late 1907. Development of the Premier underground mine commenced in 1910 and, after a checkered life, closed in 1927 having produced nearly 0.48 million tonnes of coal.

Little recorded exploration occurred after this time until the Goldfields Coal Syndicate commenced prospecting near the old Premier Mine in 1947.

By 1949, Western Collieries Ltd. was formed from this syndicate to mine at Western No. 1, 1.5km east of the old Premier Mine. Underground mining commenced in 1952 and 0.34 million tonnes were extracted by closure in 1958.

Both these mines occur within the operating area of the future Premier Mine but a number of other mines are also in close proximity (see Table No. 3 and Plan No. 3411A).

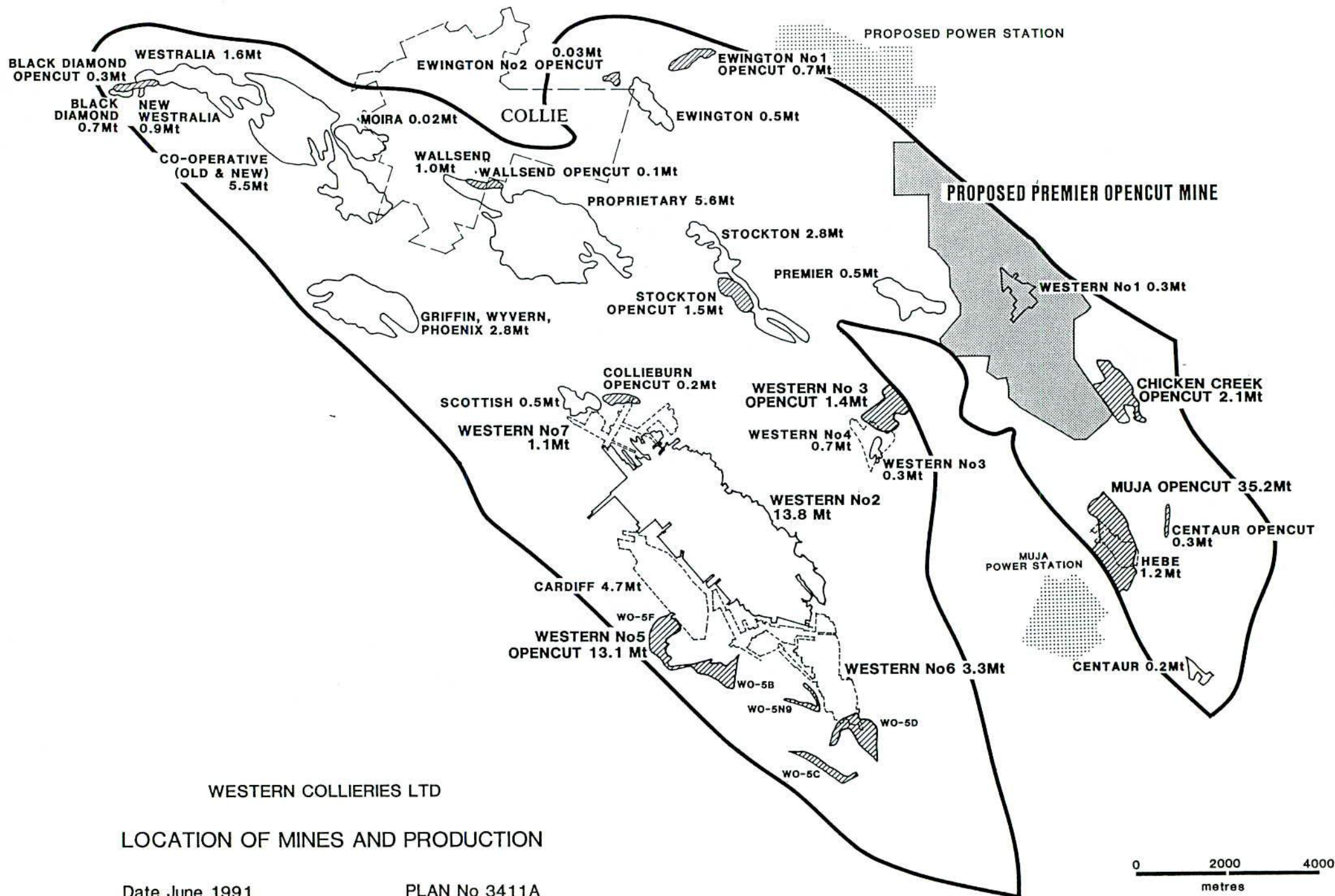


TABLE 3
ADJACENT MINES TO PREMIER AREA

Mine	Opened	Closed	M Tonnes to 31/5/91	Location
Chicken Creek	1981		2.10	3.0km SE
Stockton O/C	1943	1957	1.55	4.5km W
Stockton U/G	1927	1960	2.75	4.5km W
Western No. 3 (old)	1954	1958	0.23	3.0km SSW
Western No. 3 (new)	1987		1.39	3.0km SSW
Western No. 4	1958	1969	0.74	3.5km SSW
Muja	1953		35.24	5.0km SE

European settlement in the area commenced with pastoral and possibly timber activities but the discovery of coal in 1883 led to rapid development and the declaration of a township by 1898. Although there are several historic buildings in Collie, there are no sites of European heritage value in the Premier area.

4.7.2 Archaeological and Ethnographical Sites

WCL commissioned investigations of its Collie Basin lease area, one of which was specific to the Premier region, by archaeologist R.H. Pearce in consultation with the Western Australian Museum.

It should be noted that the indigenous aboriginals of this area are now considered extinct.

Most archeological sites discovered by Pearce were described as "casual stopping places" but some were considered worthy of further investigation. Those studied were found to be of low-artefact intensity and/or disturbed by logging, farming, quarrying and road formations.

In the main, discoveries were categorised as having no significant archaeological interest. The fact that excavated sites had low-artefact density is consistent with other recorded findings for the Collie area.

It appears that the Collie Basin was intermittently occupied during the Holocene (last 10,000 years) and that the jarrah forest was used extensively but only by a small population of aborigines.

During 1983, a survey was conducted in the Premier Mine area as part of a mining feasibility study. The study included ethnographical and archaeological components and confirmed that the proposed mining area has no sites of traditional significance for occupational or mythological reasons. Of the twelve archeological sites discovered in the survey, five were considered to be in the proposed, active-mining area. The Minister for Aboriginal Affairs granted permission to disturb these sites as each contained less than twelve artefacts, bearing in mind that nearby sites, that would not be disturbed by mining operations, contained more artefacts.

The ethnological survey confirmed previous work also in that the local aboriginal community has no traditional usage of the area and no knowledge of places of traditional or archaeological significance.

4.8 Water Resources

4.8.1 Surface Waters

The Collie Basin represents less than 8% of the Wellington Dam catchment area and is dominated by the Collie River tributaries.

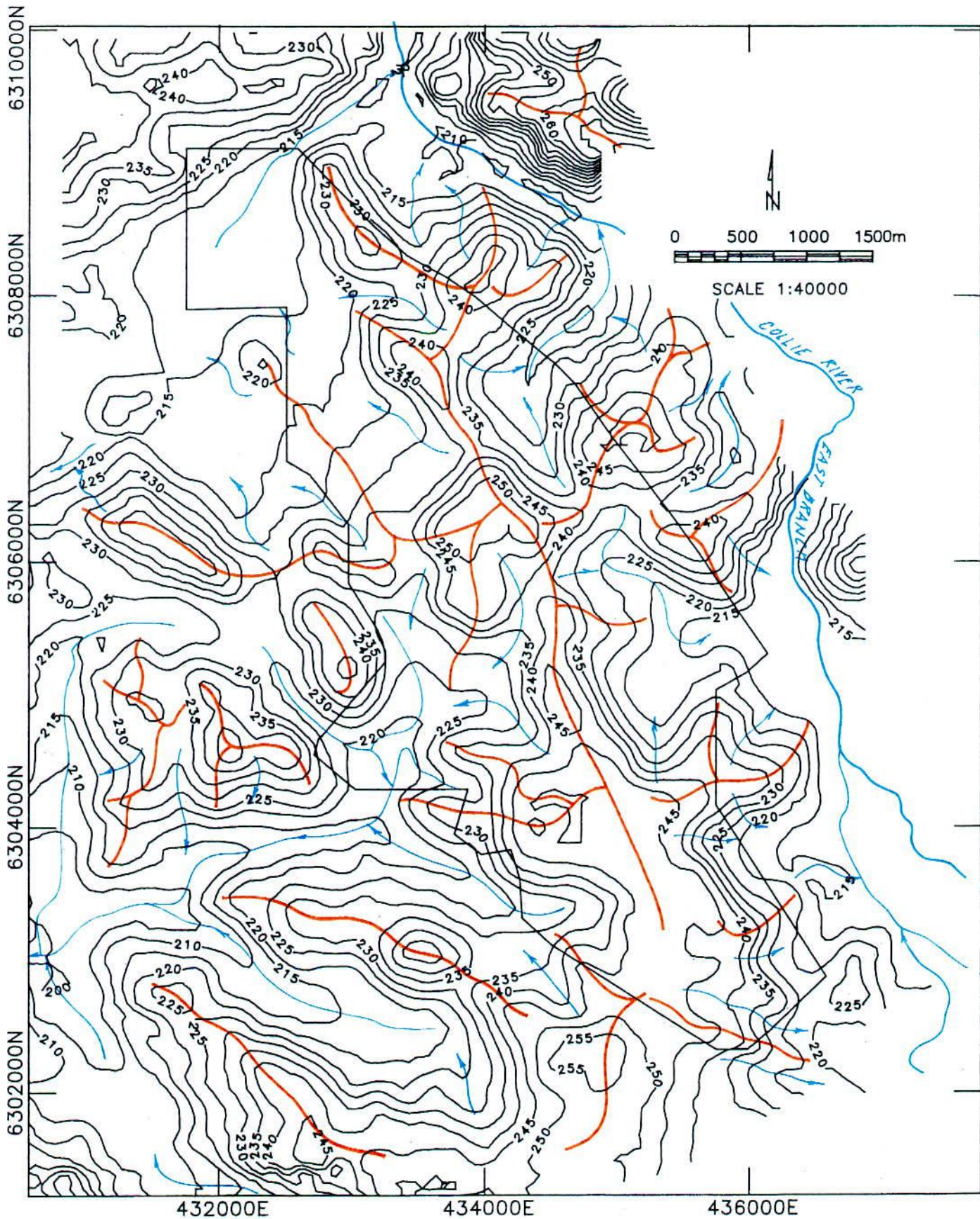
The Premier Mine area is flanked to the north by the Collie River East Branch which flows westward, joins the Collie River, then debouches into the Wellington Dam.

The East Branch catchment is largely occupied by farmlands which has resulted in high salinity levels in the river.

WAWA monitoring station 612001 (Coolangatta) has operated since 1968 and is downstream from the Premier Mine site. The river at this station has a 24 year (to 1990) flow-weighted average for Total Soluble Salts (TSS) of 1,798 mg/L.

The river above where the Griffin Coal Mining Company Limited discharges mine water has a nine-year (to 1990) flow-weighted average TSS of 3,047 mg/L. It is known that the mine discharge has a positive effect on river quality.

Summer and autumn flow is minimal at which time the river exists as a series of pools. In winter, flows of up to 64 million cubic metres/month have been recorded but the average maximum monthly flow, to 1990, is approximately 18 million cubic metres.



-  TOPOGRAPHIC CONTOURS
-  DRAINAGE DIVIDES
-  DRAINAGE LINES
-  MINING LIMIT

WESTERN COLLIERIES LTD

TOPOGRAPHY, DRAINAGE DIVIDES AND DRAINAGE LINES

Date June 1991

PLAN No 3582

The maximum, recorded annual discharge for the East Branch is 152 million cubic metres whilst the average, to 1990, is 42 million cubic metres.

Drainage channels from the Premier area into the East Branch are indistinct, indicating an ephemeral nature and mainly vertical infiltration of precipitation through surface soils (see Plan No. 3582).

The only regularly standing surface water is in a seasonal side drainage occurring in the far northwest of the lease holding which is considered to be spring related having an associated swampy land. This appears to be activated by seasonal fluctuations in groundwater levels and is thus more prominent in winter months, possibly because of the cleared nature of the land for agricultural use.

4.8.2 Groundwater

The Collie Basin sedimentary strata contains a series of major aquifers. Porous, water-bearing sandstone bodies are separated by low-permeability clays, shales and coal seams, termed aquicludes.

Based on bore information, the water table at Premier varies between 8m and 20m below the ground surface.

Perched water tables above the main water table have been observed and are attributed to the overlying Nakina Formation.

Seasonal water-table fluctuations have been observed in some areas whilst other areas appear fairly static.

For deeper aquifers the piezometric water levels decrease with increasing depths, indicating that aquifers are confined and are recharged from lower elevations than the shallow aquifers.

These deeper aquifers are currently being exploited by SECWA via the Shotts Borefield, with water extracted used for power-station requirements and for domestic backup to the Shotts townsite.

Groundwater is of good quality, typically as follows:

TDS	100	-	350 mg/L
IRON	1	-	11 mg/L
SULPHATE	5	-	25 mg/L
SiO ₂	2	-	15 mg/L
Na	30	-	80 mg/L
CL	60	-	180 mg/L
PH	4	-	6

Source: Data from WCL Pump Tests
and the Shotts Borefield

4.9 Air Quality

Little current data exists except for work done by SECWA.

Major local sources of emissions are the Muja Open-cut, Chicken Creek Open-cut, Western No. 5 Open-cut, Western No. 3 Open-cut, Muja Power Station, Collie townsite and the Worsley Alumina refinery and power station, all of which are within a 25km radius.

Expected pollutants include SO₂ and NO_x from the refinery and power stations, NO_x and hydrocarbons from motor vehicles and particulates from the power stations and open-cut mines.

The above sources are not expected to have any significant impact on air quality in the Premier Mine area.

The Premier operation will add to these emissions through plant and vehicular exhausts as well as through blasting gases. It is calculated that the operation will only contribute a minor and not significant percentage to the current air quality.

4.10 Land Tenure and Use

The total land area held under mining title (Mining Lease 262 SA) by WCL in the Premier area is approximately 2,602Ha. WCL has held title to this area since 1949.

The dominant present land-use is State Forest, namely the Shotts Block of State Forest No. 4. This resource, including roads, railways and powerline access, accounts for 80% of the present land-use.

Private property, generally farmland cleared and used for grazing, is mainly owned by WCL and is the next largest land-usage accounting for 17.5% of the area.

The remaining 2.5% contains forest leases, miscellaneous reserves, part of the Shotts townsite and a small pine plantation (see Table No. 4). Plan No. 3573A shows the location of private properties in the Premier area.

The Collie Basin Land-use Working Group (1987) listed the primary land-uses in the Collie Basin, in order of priority, as: coal mining, energy infrastructure, water protection/supply, urban, recreation, conservation, forest products, agriculture and quarrying.

The State Forest in the Shotts area is classified for multiple usage including timber products, floral and faunal conservation, water-catchment protection, recreation and apiculture.

The area sees limited usage for recreation (some hunting and trail bike and horse riding), apiculture, gravel and sand extraction; however, timber production has recently been prominent. The adjacent river is used for swimming, marroning and perch fishing.

The landscape value is not rated highly, being typical of the Collie Basin, in general containing gently sloping, rounded hills accompanied by wide, shallow gullies with indistinct drainage ways.

4.11 Local Communities

The Collie township is about 7km from the Premier Mine site and contains an extremely stable population (approximately 10,000) established upon a long history of coal-mining activities.

The town is well serviced by modern shopping complexes and numerous sporting and recreational facilities. The town has two established Doctor's Surgeries, an 83-bed hospital and an extensive (approximately 50-bed) frail-aged residence. There are a number of preschools/kindergartens, five primary schools, two high schools, a TAFE complex and an extension school of the Curtin University of Technology (Collie School of Mines).

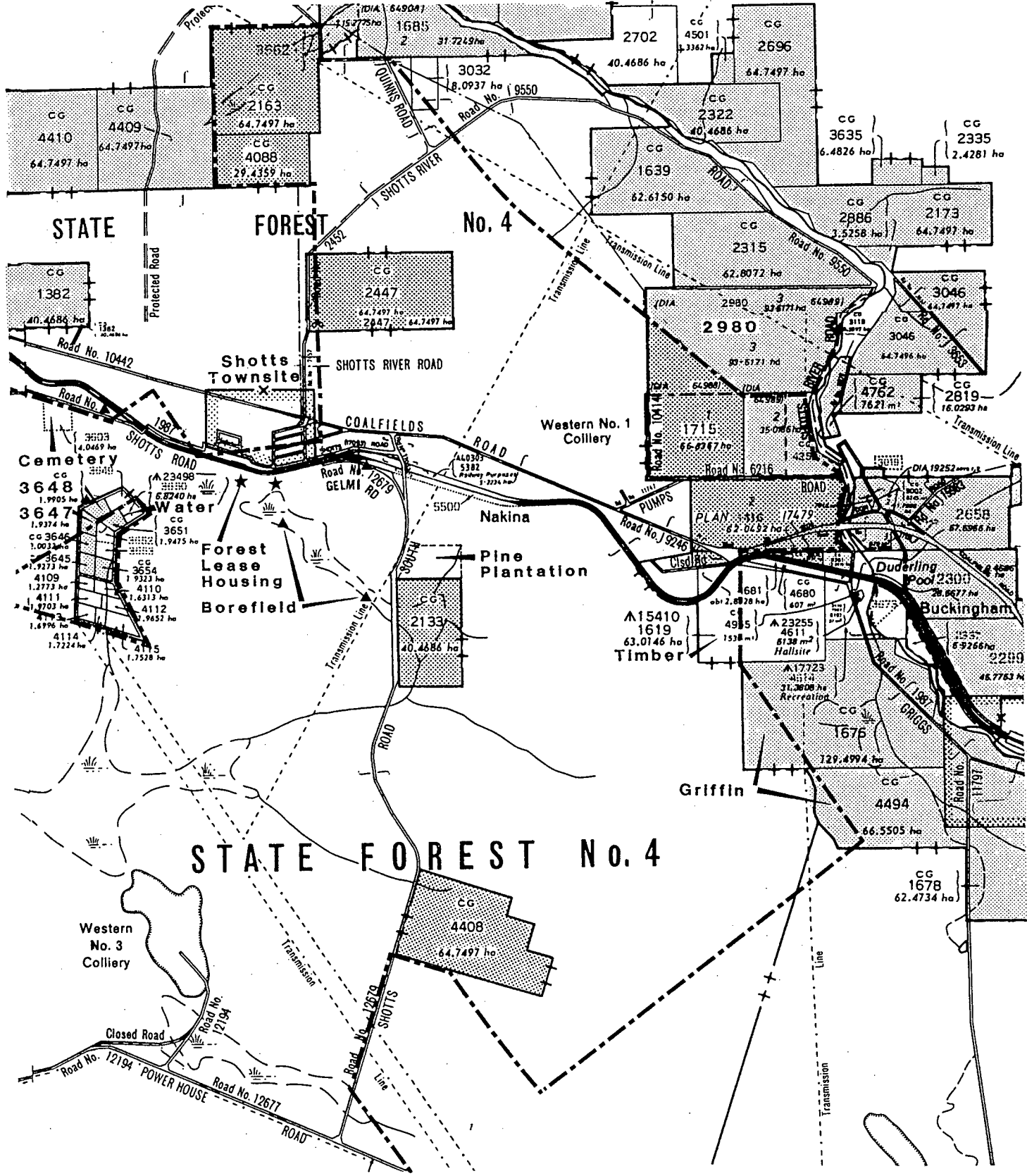
Within 5km of the WCL lease boundary in the Shotts Sub-basin are 35 registered landowners but not all of their properties have dwellings.

The Buckingham ("Bucks") area has 15 landowners and a small community of six houses adjacent to the river.

The Shotts townsite has a similar-sized community with eight inhabited dwellings, and further southwest is a small rural settlement containing six dwellings of which five are currently occupied.

TABLE 4
PREMIER AREA LAND-USE

Land-use Category	Description	Area (Ha)	%
State Forest	Shotts Block		
	State Forest No. 4	2076.0	80.0
WCL Properties	Grazing Land	396.0	15.0
Private Properties	Griffin	28.0	
	Loc 2980 (Weisse)	35.0	
	Loc 3647, 3648	2.0	
	Total	65.0	2.5
Other Reserves	Timber	29.0	
	Water	1.5	
	Cemetery	4.0	
	Townsite	7.5	
	Total	42.0	1.6
Forest Leases	Telephone	0.1	
	Borefield	11.0	
	Housing	1.9	
	Total	13.0	<1.0
Pine Plantation		10.0	<1.0
GRAND TOTAL		2602.0	100.0

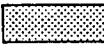






BASED ON D.L.A.S. MUJA
SHEET 2131-11 SW & NW
CADASTRAL EDITION

WESTERN COLLIERIES LTD

LOCATION OF PRIVATE PROPERTY

1:40 000

-  WCL owned property
-  Private property
-  State Forest
-  Boundary of Mining Lease
-  Boundary of Mining Lease Applied For

5.0 ENVIRONMENTAL IMPACTS AND MANAGEMENT

5.1 Social Impacts

5.1.1 Employment

The development of the Premier Mine will require the employment of approximately 250 people, providing job opportunities for both skilled and unskilled workers. This will assist in compensating for the government initiative to reduce energy costs to the State which will result in the shedding of up to 315 people from the current mine workforce in Collie and also the potential closure of underground mines unless significant productivity improvements are achieved.

This new development will have a great impact on future employment for local people and on generations to come. The mine will assist economic stability in the region, providing confidence for existing and future local business concerns. The power station itself will provide a further 1,100 jobs during construction (approximately 490 local component) and 208 during operations (approximately 100 local component).

The net result is a long-term direct increase of over 140 jobs with additional employment created by the multiplier effect.

The overall decline in rural sector stability has led to a drift of youth to the cities seeking employment. This project should alleviate this problem for the Collie region in the foreseeable future.

5.1.2 Local Residents

The following issues are considered to be of particular interest to local residents:

Dust

Mining operations unavoidably generate dust but this will be controlled by:

- * minimising face extensions
- * reducing dump exposures and other temporary work areas by early implementation of rehabilitation work
- * application of proven dust-suppression practices in hot, dry conditions including watering unsealed mine roadways using trucks equipped with spray bars. Significant dust transport beyond the mine workings is not expected as it is not a problem with existing mines.

- * use of water sprays to control dust generated in and around coal dumping, crushing and loading facilities
- * use of covered coal conveyors.

Exhaust Emissions

WCL is committed to compliance with government emission standards.

Exhaust emissions, from earthmoving and haulage equipment operating in and around the mine area, are not expected to reach harmful or significant proportions in the atmosphere.

WCL will consume an additional 12ML of diesel fuel per annum during operation of the Premier Mine. During the period 1988-1989, automotive diesel consumption in Western Australia was 1,840ML. The Premier Mine operation will probably consume less than 0.5% of the projected State-diesel consumption.

The additional consumption of diesel by WCL will annually generate approximately 25,000 tonnes of CO₂, 70-150 tonnes of CO, 350-500 tonnes of NO and 70-100 tonnes of NO₂.

The project will also use ammonium-nitrate-based explosives at an anticipated maximum rate of 3,000 tonnes per annum. This will generate 519 tonnes of CO₂, 993 tonnes of N₂ and 1,488 tonnes of H₂O per annum.

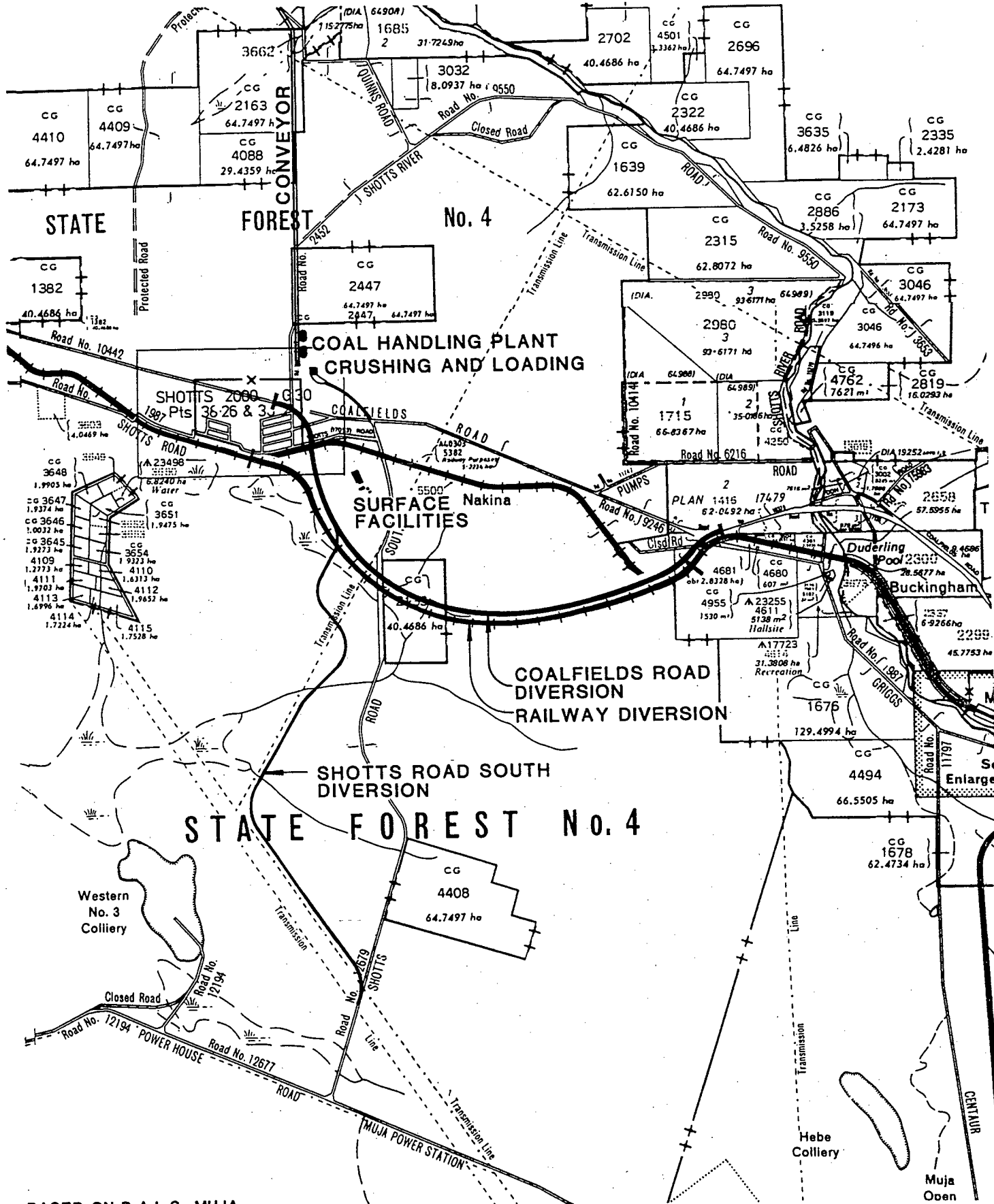
Traffic Alterations

Additional general road traffic and a change in traffic patterns will be created by the mining operation. The Darkan Road will be the main public artery affected and is considered adequate to meet the traffic increase.

The impact of this extra traffic should be negligible except perhaps at Shotts, in which event the effects could be minimised by traffic speed limits to reduce noise and enhance safety, and by the building of noise barriers to deflect traffic noise over the town area.

Post the year 2003 it will be necessary to relocate a section of the Darkan Road but this will not bring it closer to the Shotts community.

It is intended that the road be relocated over mined-out areas on specially prepared dumps that have been built in low lifts to aid compaction (see Plan No. 3584).



BASED ON D.A.L.S. MUJA
SHEET 2131-11 SW & NW
CADASTRAL EDITION

WESTERN COLLIERIES LTD
ROAD/RAIL DIVERSIONS

1:40 000

Date June 1991

PLAN No 3584

Railway

In 1990, the abandoned railway line to Newdegate and Hyden, which passes through the Premier area, was revamped between Collie and Buckingham and a spur added to take coal from the Chicken Creek Mine.

At the same time as the road relocation is planned, part of this railway will be relocated away from the Shotts community. Again, the move will be over mined-out areas on specially prepared dumps (see Plan No. 3584).

Domestic Water Supplies

Shallow surface bores may be affected by induced draw-down around the mine void. WAWA has been requested to review this situation for WCL.

Noise Levels

The Premier Mine will be developed in a sparsely populated area. The mining operation, being at it's closest over 7km from the Collie townsite, will not generate a noise problem for this centre of population.

At various points in the mine's development, local residents at Shotts and Buckingham will be within 3km of the actively worked area. Operations at Chicken Creek and WO-5 are also within this distance of residential areas, namely, Buckingham and Cardiff respectively.

Noise emission will be controlled by setting acceptable limits on mining equipment purchased and then by adequate maintenance procedures.

WCL will monitor noise emission from the Premier Mine and associated infrastructure, ensuring adherence to the relevant noise-level regulations.

Blasting

Blasting produces ground and air shock waves which can cause vibration in structures resulting in damage and personal disturbance.

The observance of Mines Dept. limits ensures damage to structures does not occur and the disturbance to residents is minimised.

WCL will abide by these limits and minimise ground and air-vibration effects by:

- * optimising blast geometry designs
- * firing, when practical, in normal daylight hours

- * using noiseless initiation systems and delays in detonation
- * minimising energy losses to atmosphere by good practices
- * minimising the amount of explosives used as well as the maximum instantaneous charge. Continuous surface miners will preclude much of the usage of explosives in coal-mining activities. However, blasting may become an every day event when the mine depth increases and sediments are harder
- * consideration of not loading shots if weather conditions are unfavourable
- * keeping in contact with the community, particularly in the event of procedural changes.

WCL will monitor blasting-induced vibrations and noise from the Premier Mine.

5.2 Floral and Faunal Impacts

During mining, the expected maximum area of cleared land will be 700Ha including the pit, unrehabilitated dumps, roads and infrastructure. Clearing will be kept to a minimum to meet coal-production requirements. This will be managed by close supervision of operators and appropriate equipment selection.

WCL is committed to the re-establishment of land form as well as floral species which are indigenous to, or compatible with, the surrounding area. Selected species will be capable of self-generating survival without long-term, ongoing management. This will provide an as-near-as-possible natural habitat for native fauna.

The general procedure to restore the environment will be as follows:

- * topsoil will be stripped separately and directly used or stockpiled. Stockpiles will be kept to a minimum to maximise survival of biologically active components
- * inert overburden/interburden will be used to cover undifferentiated overburden which may be more acid or saline
- * where practicable, undifferentiated overburden will be backfilled into the lowest available void levels, concurrent with present mining practice, and then finally covered by inert material to stop acid material entering the surface environment

- * stockpiled topsoil will be placed over inert material. Total cover of undifferentiated material will be greater than 2m including 0.15m to 0.30m of topsoil
- * after topsoiling, the area will be contour ripped to encourage water infiltration and root growth. If necessary, brush may be respread and the soil seeded, planted and fertilised
- * out-of-pit dumps will be designed to blend with the existing landscape in profile and vegetation. The height, dimensions and final conformity of the dumps will relate to water-shed catchment and will occupy the heads of low-catchment valleys. The final height may exceed existing maximum topographic heights in the area but not the maximum regional height. Final dump out-slopes will be less than 14° and the dump shape and surface will be designed to give optimum slope stability and permit accurate control of surficial water, inducing runoff to appropriate locations via formed drain systems and through silt traps where necessary.

Dirt movement, especially topsoil, will take particular cognizance of jarrah-dieback hygiene requirements.

Groundwater abstraction has been a common feature of coal mining at Collie over the past 100 years and no long-term deleterious effects on vegetation are known.

Noise and vibration generated by mining activities is expected to have a minimal effect on fauna in the region. Evidence from existing mining operations shows that resident species quickly adapt to mining acoustics.

It is unlikely that adverse impacts will occur due to atmospheric emissions including dust.

5.3 Land-usage

The dominant present land-use is forest reserve (80%). WCL will endeavour to restore the mine area to forestry applications by rehabilitating to compatible bushland with suitable species enrichment, if applicable, in consultation with CALM.

Existing agricultural land could be restored or there may be advantages in rehabilitating these areas to bushlands, thus simplifying the land management. Landowners' requirements and government policies will be considered in the final decision.

5.4 Visual Impacts

Open-cut mining activities necessarily produce temporary disturbance of the earth's surface. Associated negative visual impacts will be minimised by ongoing rehabilitation. At the same time it should be remembered that such man-made operations provide a tourist attraction and this aspect could be facilitated by appropriate lookouts and/or tours.

The location of surface infrastructure will be chosen to minimise the visual impact on the environment to the public, and to provide a pleasant and safe surrounding for the workforce.

Indigenous trees and other plant life around these facilities will be retained where possible and will be supplemented by landscaping, partly for aesthetic reasons, partly for noise and dust suppression and partly for visual screening.

5.5 Waste Disposal

Mining-generated wastes will be disposed of as landfill in backfill areas. Such land-disposed wastes will include solid industrial wastes, domestic-type garbage and other similar non-toxic wastes as well as interburden and overburden.

Liquid industrial wastes, such as oils from runoff in workshop areas, will be collected in traps to allow for separation prior to disposal. Used oils and lubricants will be collected in tanks and re-cycled or disposed of by an approved method.

Any hazardous wastes will be disposed of in accordance with the relevant government Acts.

Domestic sewage from the mine and surface facilities will be treated through septic tank systems, with effluent disposed of in accordance with the relevant government Acts and regulations.

Runoff from the crushing and stockpile facilities may be contaminated with fine coal particles in suspension. Such runoff will also be directed through sumps and silt traps.

5.6 Impact on Water Resources

5.6.1 Surface Waters

To put possible impacts in perspective it should be noted that the Collie Basin (274 square km) represents less than 8% of the Wellington Dam catchment area, and the Premier area (21 square km) represents approximately 0.6% of the catchment area.

Surface runoff emanating from rainfall in the mine area will be controlled to prevent erosion, turbidity and acid pollution by spoil. Dumps will be designed with contoured drains to minimise erosion and contamination and so that runoff will be directed through sumps or, in the majority of cases, the mine void. Use will be made of contoured banks, settling ponds, silt traps and vegetation-stabilised drains to avoid scouring. Pondered water off temporary dump configurations will be tested and treated if necessary prior to discharge. Such runoffs could be incorporated with the power-station supply.

If water quantities off active mining areas are in excess of needs, discharges into the natural drainage system will at all times be in accordance with dieback-hygiene requirements and EPA-licence agreements. It is considered that any discharge of mine water into the highly saline Collie River East Branch could only have an advantageous effect on river-water quality.

Changes in final local flows within the lease will not be significant in view of the seasonal flow variability in this area, which is dependent upon rainfall rather than springs. The general restoration of existing drainage patterns will minimise impacts.

The void itself, at any one time, will form a relatively small catchment for rainfall and runoff. On an average daily basis approximately 1.7ML will accumulate due to rainfall, and mine planning will necessarily account for much higher sump capacity in the order of 10 ML to 20ML. If necessary, in-pit water, not supplied to the power station, will be tested and treated prior to discharge to conform with EPA-licence conditions.

5.6.2 Groundwater

Dewatering is an unavoidable component of mining coal, particularly at Collie.

Hydrogeological studies have defined a need to advance dewater and depressurise strata in the Premier Deposit to generate safe and efficient mining conditions.

Groundwater abstracted will be made available for power-station consumption. In the event of excess mine water, discharge into the natural drainage system will be done in accordance with EPA requirements.

Mine dewatering will produce significant draw-downs in SECWA's nearby Shotts Borefield, perhaps reducing capacity by up to 50%. However, all dewatering discharge can be made available for power-station usage.

Groundwater discharge rates vary, according to the mining schedule, between 10 ML and 60 ML/day, but an extended dewatering programme is planned to produce 25 ML to 35 ML/day to meet the new power-station requirements. The existing Shotts Borefield has a design capacity of 14 ML/day and thus a 50% reduction in borefield capacity may be met within the water-abstraction plan.

Groundwater in the Premier Deposit is a Na - CL type with low Total Dissolved Solids (TDS) content and low P.H. Details on the deepest aquifers are not complete, but overall the water is considered eminently suitable for power-station utilisation.

Dewatering will cause a local lowering of groundwater, limited by major hydrological and geological features such as:

- * aquifer and sediment outcrops
- * Archaean bedrock contacts
- * faults
- * topographic constraints
- * existing dewatered sequences.

To the northwest the shallower, near-surface aquifers, being unconfined, may be lowered by up to 5m, but probably no further than 1.5km from the deposit due to groundwater divides caused by topographic features.

Southeasterly, draw-down can only extend as far as the Muja and Chicken Creek Mines where the near-surface aquifer has already been dewatered.

The deeper, confined, Permian aquifers will experience greater draw-down but will be limited to the northwest by sub-crops and to the southeast by the Muja and Chicken Creek Open-cuts. Lateral draw-down across the basin is confined by the granite contacts. However, draw-down will affect the Shotts Borefield reducing, at the same time as replacing, its potential abstraction. Plan No. 3574 shows the anticipated limits of dewatering effects.

There have been 35 mines operating in the Collie Basin over the last 100 years of which seven are currently producing coal. Various degrees of dewatering have occurred with all these mines altering the primitive groundwater equilibrium. All existing mines are dewatering adjacent strata. There have been no observed long-term effects of this dewatering on vegetation.

The Premier Mine development is already within a highly active water-abstraction regime including operations at Muja Open-cut, Chicken Creek Open-cut and the Shotts Borefield.

WCL will conduct extensive planning and monitoring of groundwater abstraction to quantify and manage the dewatering requirements and progress.

5.7 Management Commitment

WCL is committed to the integration of its mining and environmental-control programmes.

The development of the mine, from site clearing through coal extraction, overburden replacement, rehabilitation and environmental monitoring, will be the responsibility of the Mine Manager.

The Mine Manager will be supported by a team of professionals to assist in environmental planning, monitoring and rehabilitation: including engineers, an environmental officer, geologists and a chemist. Independent consultants may be called upon for specialist and review tasks.

WCL operates its own laboratory, registered with the National Association of Testing Authorities (NATA), which is equipped to undertake the necessary soil, groundwater, water discharge, gas, atmosphere and dust analyses.

Built into the Collie Coal (Western Collieries) Agreement Act 1979 is a formal commitment to the protection and management of the environment.

This includes annual interim and triennial reports to government detailing the results of monitoring, investigations and research.

5.8 Summary of Environmental Impacts and Management Strategies

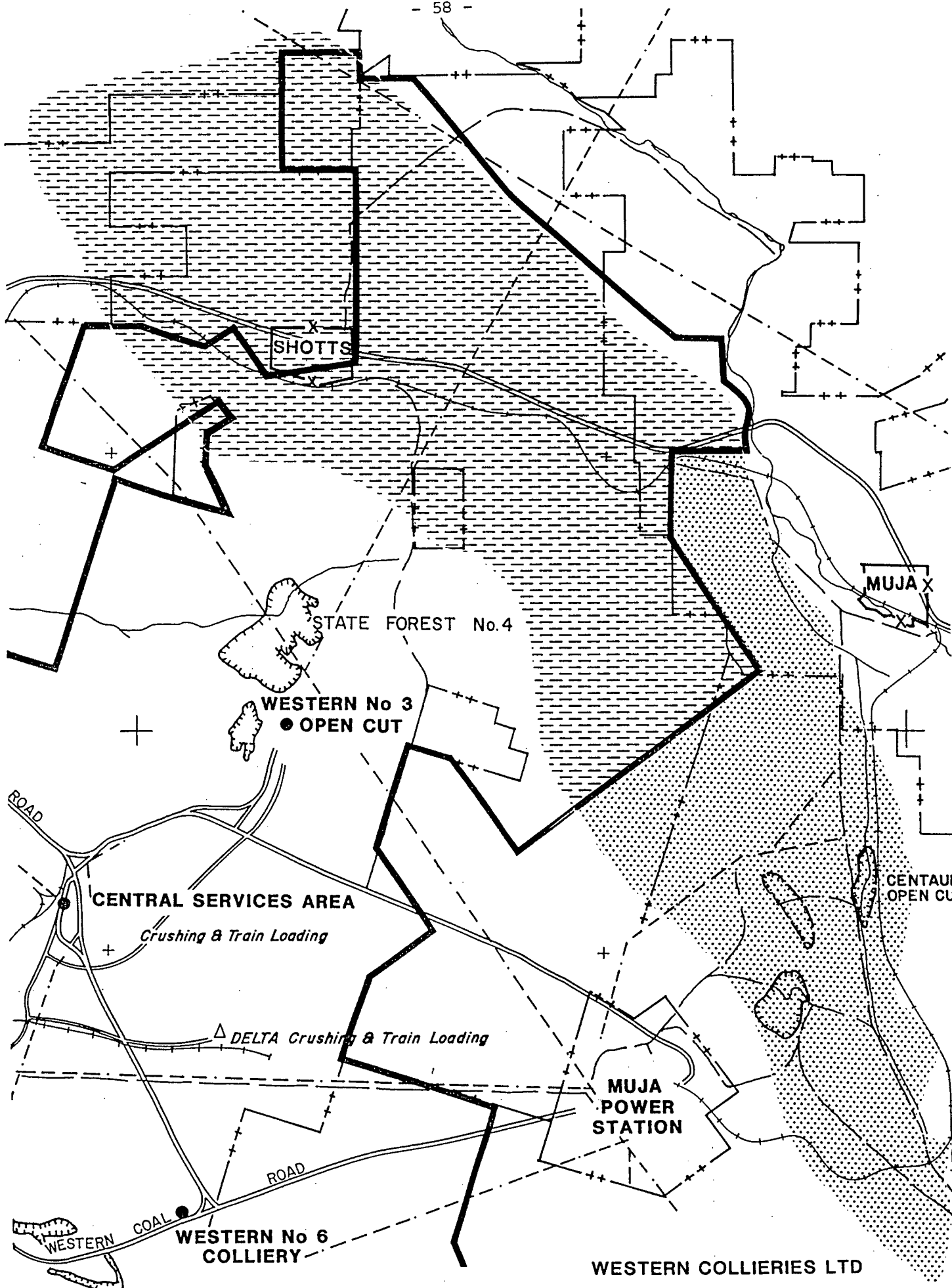
Table No. 5 identifies the potential environmental impacts and the intended management strategies.

5.9 Summary of Overall Impact

Table No. 6 summarises the major positive and negative impacts of the Premier Mine development. It is believed that the overall impact is positive and that the project will make a very substantial contribution to the State's development.

5.10 Listing of WCL Commitments

Table No. 7 is a listing of commitments by WCL contained in this C.E.R.



WESTERN COLLIERIES LTD
**EXPECTED LIMITS
 OF DEWATERING EFFECT**

1:50 000

Date June 1991

PLAN No 3574/A

TABLE 5

SUMMARY OF ENVIRONMENTAL IMPACTS AND MANAGEMENT

ASPECT	IMPACT	MANAGEMENT
FLORA	Clearing required in advance of mining.	Clearing kept to a minimum & authorised by Senior Management only. Prior vegetation survey. Environment awareness programmes. Rapid rehabilitation with indigenous/compatible species.
DIEBACK	Potential for - spread to other areas - introduction.	Liaison with CALM. Produce dieback hazard map. Restrict access to problem zones. Institute necessary washdown procedures.
DUST	Caused by clearing, mining, crushing and stockpiling coal, vehicular traffic.	Standard use of water trucks with sprays. Water sprays for crushers and stockpiles. Initiate early rehabilitation. Monitor by passive dust samplers.
LAND FORM	Dumps, final void, visual, final land form, final use.	Minimised by topographic blending and limiting dump heights. Final land form will match regional landscape average. Progressive rehabilitation and restoration to specified functionality. Void will fill by rainfall and groundwater inflow to water table.
SURFACE WATER	Potential for reduced quality, i.e. acidity and turbidity.	Dump designed to minimise problems. Runoffs controlled by vegetation-stabilized drains, contoured banks, settling ponds and silt traps. Testing and treatment as required. Conform with EPA-discharge and WAWA-licence agreements.
GROUND WATER	Volume reduction and potential interference with other current users.	Significant draw-down necessary for mining. Water to go to power stations as required. Monitoring to ensure dewatering not excessive. Excess ground/pit waters treated to licence standard prior to discharge. Currently licensed users being checked by WAWA.
MINE WASTES	Workshop runoffs, e.g. oils. Solid wastes and garbage (non toxic). Used oils, lubricants, hazardous wastes. Domestic sewage.	Trapped, separated and collected. Disposed of as landfill in-pit. Collected and recycled (if possible). Otherwise disposed of per statutory requirements. Septic tank system.

TABLE 5
(Cont'd)

SUMMARY OF ENVIRONMENTAL IMPACTS AND MANAGEMENT

ASPECT	IMPACT	MANAGEMENT
BLASTING	Noise and vibrations.	Restriction to Mines Dept. regulations. Minimise use of explosives. Use of noiseless initiation systems. Blast when possible in normal awake hours & suitable weather conditions. Liaise with local residents.
MINING PLANT AND EQUIPMENT	Noise emission.	Levels to be kept per regulations. Practical limits set on equipment purchases. Setting of practical speed limits. Use of acoustic deflectors if necessary and practical.
FIRES	Danger to operation and surrounding areas.	Reduce accident potential at site by education. Installation of appropriate vehicle suppression equipment. Fire-fighting equipment strategically located on site and in vehicles. Fire breaks. CALM controlled burn-offs. Mine-trained fire crews. Control of stockpiles - spontaneous combustion.
FAUNA	Displacement or possible loss of species.	Minimise disturbance and initiate rapid rehabilitation. Faunal studies on general area to be extended to Premier region.
FERAL ANIMALS	Possible introduction or proliferation of species.	Minimise potential introduction or growth in existing feral population. Provide adequate refuse disposal and hygienic environment. Liaise with APB.
WEEDS	Possible introduction, spreading or competition with native species.	Minimise impact by hand pulling, herbicides, planting competitive native species. Liaise with CALM and APB.

TABLE 6
OVERALL IMPACT OF PREMIER DEVELOPMENT

POSITIVE IMPACTS	NEGATIVE IMPACTS
<ol style="list-style-type: none">1. Fulfillment of projected power needs.2. Centralized power supply.3. Utilization of existing community and mining infrastructure.4. Expansion of employment opportunities.5. Provision of confidence and expansion of local businesses and organizations.6. Conservation of gas and oil supplies which have broader applications.7. Rational use of existing resources.	<ol style="list-style-type: none">1. Short-term removal of bushland.2. Disturbance of some faunal communities.3. Possible disturbance of some residents and landholders.4. Interim reduction in groundwater levels and volumes.5. Temporary change in present land form.

TABLE 7

LIST OF ENVIRONMENTAL COMMITMENTS

NO	CONCERN	COMMITMENT	WHEN DONE	IN COMPLIANCE WITH
1	Lease Conditions	To comply with environmental commitments in the Collie Coal (Western Collieries) Agreement Act 1979 and Amendments.	Life of Agreement.	WCL Government Agreement.
2	Detailed Procedures	Undertake detailed environmental planning and establish procedures for this project.	Initially during Development Stage. Ongoing review.	WCL Government Agreement, EPA, CALM, WAWA.
3	Statutory Approvals	Seek statutory approvals for project.	Pre-development Stage.	EPA, CALM, WAWA, Mines Dept., DSD.
4	Consultation	Communication will be held with concerned private and government parties to facilitate orderly development (namely EPA, CALM, WAWA, SECWA, Westrail, Main Roads Dept., Mines Dept., landowners, residents, Collie Shire, DRD, Mitsubishi-Transfield, Combined Mining Unions, APB).	Pre-development Stage. Ongoing as necessary.	EPA.
5	Groundwater Testing	Drilling to test water quality and volumes. Install monitoring bores.	Development and Operational Stages.	EPA, WAWA.
6	Groundwater Monitoring	Monitoring will be done to determine abstraction and to test for groundwater quality changes.	Operational Stage.	EPA, WAWA.
7	Groundwater Discharge	Groundwater will be made available for power-station usage whenever possible. Excess water treated if necessary prior to discharge into natural system.	Development and Operational Stages.	EPA, WAWA, SECWA, Mitsubishi-Transfield.
8	Groundwater Production	Liaise, in reasonable time, with SECWA re Shotts Borefield. Liaise with WAWA re regional effects.	Development and Operational Stages.	WCL Government Agreement, SECWA, WAWA.
9	Surface Water	Adequate controls in dump design. Use of controls such as settling ponds, silttraps, vegetation-stabilised drains. Testing and treatment as required.	Development and Operational Stages	EPA, WAWA, Mines Dept.

TABLE 7
(Cont'd)

LIST OF ENVIRONMENTAL COMMITMENTS

NO	CONCERN	COMMITMENT	WHEN DONE	IN COMPLIANCE WITH
10	Dumps	Out-of-pit dumps minimised. Backfill as soon as possible. Top soil and required amount of neutral subsoil removed from planned dump sites for later rehabilitation usage. Designed to blanked more acid waste. Designed to facilitate ongoing rehabilitation. Located not to sterilise coal reserves. Designed to minimise major runoff, erosion & contamination. Designed to have final land form & drainage compatibility.	Operational Stage.	WCL Government Agreement.
11	Final Land Form	Match regional landscape by topographic blending. Short-term impacts minimised by ongoing rehabilitation. Final void subject to natural filling.	Operational & Decommissioning Stages.	WCL Government Agreement, EPA, WAWA, Mines Dept.
12	Final Land-use	Forest areas returned to compatible bushland. Freehold areas subject to landowners' requirements.	Operational & Decommissioning Stages.	WCL Government Agreement, EPA, CALM.
13	Progressive Rehabilitation	Rehabilitation will be ongoing as for other areas in the coal lease.	Operational and Decommissioning Stages.	WCL Government Agreement, EPA, CALM.
14	Decommissioning Rehabilitation	All infrastructure and equipment removed. Area rehabilitated to compatible bushland.	Operational Stage.	WCL Government Agreement, EPA.
15	Visual Impact Control	Visual impact minimised by topographic blending of dumps and ongoing rehabilitation.	Operational Stage.	WCL Government Agreement, EPA.
16	Road Access	Internal roads designed to cost effectively minimise visual impact, noise, dust and erosion.	Development and Operational Stages.	EPA.
17	Flora	Clearing to be minimised and controlled by Senior Management. Indigenous floral species re-established will be capable of self-generating survival. Top soil managed to maximise life of active components within practical constraints.	Development Stage to Decommissioning Stage.	WCL Government Agreement, EPA, CALM.

TABLE 7
(Cont'd)

LIST OF ENVIRONMENTAL COMMITMENTS

NO	CONCERN	COMMITMENT	WHEN DONE	IN COMPLIANCE WITH
18	Fauna	Disturbance minimised, particularly in adjacent areas. Rapid rehabilitation to expedite recolonization.	Development Stage to Decommissioning Stage.	WCL Government Agreement, EPA, CALM.
19	Jarrah-dieback Control	Present procedures to be confirmed with CALM which will include necessary access restrictions and hygiene controls.	Pre-development Stage to Decommissioning Stage.	CALM.
20	Weed Control	Liaise with CALM and APB. Minimise by hand pulling and selective herbicides.	Development Stage to Decommissioning Stage.	CALM, APB, EPA.
21	Feral Animals	Liaise with APB. Provide adequate refuse disposal and hygienic work environment.	Development Stage to Decommissioning Stage.	APB, EPA.
22	Non-toxic Wastes	Disposal as landfill in mine void e.g. solid industrial waste, domestic-type waste, interburden, overburden. Recycled if relevant.	Development Stage to Decommissioning Stage.	EPA.
23	Hazardous Wastes	Transport, storage, usage and disposal according to appropriate government legislations. Oils and lubricants collected for recycling where relevant.	Development Stage to Decommissioning Stage.	Government regulations.
24	Sewage	Septic tank system to be used.	Development Stage to Decommissioning Stage.	Government regulations.
25	Waste Traps	Workshop and washdown runoffs to be trapped and wastes collected and disposed of appropriately.	Development Stage to Decommissioning Stage.	Government regulations.

TABLE 7
(Cont'd)

LIST OF ENVIRONMENTAL COMMITMENTS

NO	CONCERN	COMMITMENT	WHEN DONE	IN COMPLIANCE WITH
26	Dust Control	Use of water trucks and sprays for roads and coal preparation area. Initiate early rehabilitation. Monitor levels and consider alternatives if levels are excessive.	Operational Stage.	Government regulations, EPA.
27	Exhaust Control	Compliance with government emission standards.	Development Stage to Decommissioning Stage.	Government regulations, EPA.
28	Noise Control	Compliance with government noise emission standards.	Operational Stage.	Government regulations, EPA.
29	Blast Control	Compliance with government regulations. Minimum use of explosives. Use of noiseless initiation systems. Blast in normal awake hours. Liaise with local residents.	Operational Stage.	Mines Dept.
30	Occupational Health	Compliance with Mining Act.	Development Stage to Decommissioning Stage.	Mines Dept.
31	Contingency Planning	Facilities maintained to handle emergency situations. Continued training of rescue teams. Liaise with CALM and Collie Volunteer Bush Fire Brigade.	Development Stage to Decommissioning Stage.	Mines Dept.

6.0 CONSULTATION ACTIVITIES

Consultation and agreements with relevant regulatory and management authorities forms a significant part of the Pre-development Stage of this proposal. Details of requirements are noted in sections 2.4 and 3.4.1 of this document, some of which have been attended to for this review and are discussed below.

6.1 Public

A letter was sent, prior to C.E.R. release, to all landowners and residents within a reasonable distance of the proposed Premier Mine.

The letter gave details of the proponents and a brief outline of the proposal and timing, ending in an invitation for concerned parties to contact WCL for further consultation if required.

The public will also have the opportunity to discuss the project over the EPA's two-week review period, during which time an open-day will be conducted by an EPA officer in Collie.

WCL has a policy of maintaining community awareness and is committed to consultation with any concerned party with a vested interest in the Company's area of activities.

6.2 Government and Regulatory Authorities

At this stage consultation and/or agreement has been achieved with the following authorities:

- EPA - WCL provided a draft copy of this C.E.R. to EPA for review. WCL then met with the EPA to discuss their concerns and suggestions. The conclusions of this consultation were then incorporated in this C.E.R. document
- MINES DEPT. - Mines Dept. staff were given a preview of the C.E.R. and an overview of the mining project
- WAWA - The proposal was presented to WAWA and a Geological Survey hydrologist who raised no objections to the strategies put forward
- SECWA - Discussions were held with SECWA regarding their taking of water abstracted during Development and Operational Stages. The issue of the Shotts Borefield has been reviewed with SECWA

- WESTRAIL - The relocation of the railway line was discussed with WESTRAIL who indicated no problems with the proposed route
- MAIN ROADS DEPT. - The relocation of Darkan Road was reviewed with the Main Roads Dept. who have no problems with the proposed route but have requested further details on topography and the mine plan
- CALM - Discussions were held with CALM including clearing, jarrah dieback, dumps, drainage, final void, the mine schedule, weeds, rehabilitation options and our existing government agreements. CALM did not perceive any changes to our existing arrangements and conditions with their department
- COLLIE SHIRE - A meeting was held with the Collie Shire executive to discuss this C.E.R. and the Premier Mine development
- MITSUBISHI-TRANSFIELD - Ongoing discussions and data transfer have been had with the power-station consortium. Prime considerations to date have included the mine plan and water supply
- DRD - WCL met with the DRD to review a draft copy of this C.E.R.

LIST OF REFERENCES

ASHTON P.J., et. al. - September 1986, The Geology and Mining Activities of the Collie and Wilga Basins.
WCL Report No. 100.

BUTLER W.H., Fauna of WCL Premier Area.
Unpublished notes.

CHAPMAN D.G. and MATTHEWS R., 1984, Premier Member Deep Reserves.
WCL Report No. 63.

CHAPMAN D.G., January 1989, Western Collieries and Dampier Pty. Ltd. Geology Progress Report 1985 - 1988 Inclusive.
WCL Report No. 113.

CHAPMAN D.G., May 1991, Western Collieries Pty. Ltd's. Mining Lease 262 SA.
WCL Internal Report.

CRAWFORD D.I., August 1988, Environmental Awareness.
WCL Internal Report.

DAMES AND MOORE, May 1990, The Hill River Project, Environmental Review and Management Programme, Coal Mine and Coal-fired Power Station.
Canning Resources/Hill River Power Development Company.

EPA, Sept. 1989, Review of Environmental Impact Assessment Administrative Procedures.
EPA Bulletin 402.

EPA, November 1990, Proposal Collie Power Station, State Energy Commission of Western Australia and Comment on Energy Issues for W.A., Report and Recommendations of the Environmental Protection Authority.
EPA Bulletin 472.

FORESTS DEPARTMENT OF W.A., 1985, Vertebrate Fauna in the Southern Forest of Western Australia.
Forests Department Bulletin 1985/94.

G.S.W.A., 1975, The Geology of Western Australia.
G.S.W.A. Memoir 2.

LIST OF REFERENCES
(Cont'd)

HAMMOND G., et. al., December 1983, WCD Smelter Tonnage Development Study, Part II, Geotechnical and Hydrological Investigations.
WCL Report No. 50.

MASLAN M., September 1974, Environmental Assessment of Mining Coal at Collie - Western Australia.

MATTHEWS R. and CHAPMAN D.G., December 1983, Geological Report Western Collieries and Dampier area.

PEARCE R.H., 1983, Survey for Aboriginal Sites near Collie.
Report for WCL.

PINK B.N., 1990, Western Australian Year Book (No. 27).
Australian Bureau of Statistics, Western Australian Office.

PUBLIC WORKS DEPARTMENT OF W.A., 1984, Stream Flow Records of Western Australia to 1982, Vol. I, Basins 601 - 612.
PWD Publication.

ROBINSON R. et. al., Feb. 1990, Toxic Emission Levels from Coal Mine Diesel Engines as to Diesel Fuel Quality.
NERDDP End of Grant Report No. 898.

SEARLS R.J., et. al., July 1989, Reduction of Greenhouse Gases by Combustion Catalysis. Mineral Fuel Alternatives and the Greenhouse Effect.
AIMM.

SECWA, March 1990, Proposed Collie Power Station Environmental Review and Management Programme.
SECWA Report No. BD 90/12.

VOGWILL R.I.J., April 1990, Estimated Dewatering/Depressurisation Requirements, Premier Deposit, for Western Collieries Ltd.
GRC-Dames and Moore Report No. 384.

WALKER I.W. and WILDE S.A., 1982, Collie, Western Australia 1:250,000 Geological Series - Explanatory Notes, SI50-6 International Index.
Dept. of Mines Publication.

**LIST OF REFERENCES
(Cont'd)**

WARD S. and WARREN R.P., 1989, Mine Rehabilitation Handbook.
Australian Mining Industry Council Publication.

WAWA, 1991, Computer printouts for Gauging Stations 612001 and 612025.

WCD, May 1985, Phase II - Coal Supply for Proposed Aluminium Smelter Development,
Variations Volume.
WCL Report No. 94.

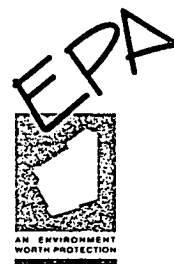
WCL, December 1980, Planned Development of the Western Collieries Ltd. Coal Mining
Lease at Collie, Western Australia.
WCL Internal Report.

Western Australian Government, 1979, Collie Coal (Western Collieries) Agreement.

Western Australian Government, 1985, Collie Coal (Western Collieries) Agreement
Amendment Act 1985.

Western Australian Government, 1981, Collie Coal (Western Collieries) Agreement
Amendment Act 1990.

APPENDIX



Mr M W Pegrum
Manager
Western Collieries Ltd
GPO Box X2231 PERTH WA 6001

Your ref:
Our ref:
Enquiries:

100/77/1
Jim Treloar

Handwritten signature and date: 16/5/91

Dear Mr Pegrum,

PREMIER COAL MINE EXPANSION, COLLIE

The Environmental Protection Authority, in consultation with other government agencies, has finalised a set of guidelines for the Consultative Environmental Review on the above proposal. The attached guidelines are as comprehensive as possible but it is the proponent's responsibility to identify all relevant issues relating to the proposal. The contact officer for the Authority is Mr Jim Treloar and you are advised to liaise with him on matters relating to the environmental assessment process.

A draft of the Consultative Environmental Review should be submitted for informal review prior to being formally distributed to the agencies identified by the Environmental Protection Authority.

Yours faithfully

Handwritten signature: F. Batini

Frank Batini
ACTING DIRECTOR
EVALUATIONS DIVISION

07/05/91

Enc guidelines

coal guidelines 07/05/91jtr

Environmental
Protection Authority

1 Mount Street Perth
Western Australia 6000
Telephone (09) 222 7000
Facsimile (09) 322 1598

GUIDELINES FOR THE CONSULTATIVE ENVIRONMENTAL REVIEW ON THE PREMIER COAL MINE PROPOSAL AT COLLIE

The Consultative Environmental Review should be comprehensive enough to allow assessment authorities to fully understand the proposal, the environment it impacts upon, the short and long term impacts and the proposed management methods to address those impacts. The attached guidelines are as comprehensive as possible but it is the proponent's responsibility to consult with all relevant authorities and to identify the issues and compile an appropriate report on the proposal. Maps and diagrams should be used to illustrate the report where appropriate.

The Consultative Environmental Review should facilitate review of the key environmental issues but is intended to be a brief document. Its purpose should be explained in the introduction and the contents should be concise and accurate. It may be appropriate to include detailed, lengthy, technical information in appendices.

1. Summary

The Consultative Environmental Review should contain a brief summary of the proposal, surrounding environment, impacts/major issues, management programmes and the proposed safeguards and environmental commitments.

2. Introduction

- identify the proponent, including contact names and addresses;
- briefly describe the objectives of the proposal, the location and the basic outline of the proposal including the scope and timing; and
- identify the responsible government authorities and the assessment and approval processes that are required and the aims of the Consultative Environmental Review.

3. The Proposal

- the Consultative Environmental Review should examine the need for the proposal and the alternatives considered for the various components of the preferred proposal; the relationship of government policy on such matters as energy policy, the Greenhouse effect, south-west development, etc, should be examined;
- the costs and benefits at local and regional levels should be discussed;
- the important components of the entire proposal (from mining to transport of the product) should be described including construction and operational phases, infrastructure requirements, anticipated impacts (noise, wastewater, air emissions, relocation of public road), management procedures, rehabilitation, decommissioning and contingency planning; and
- quantify the various aspects of the proposal as much as possible, particularly those aspects which relate to potential environmental impacts.

4. Existing Environment

- describe the biological and physical environment of the area and also the region; but particularly the project area, which should be described in sufficient detail so that the specific biological and physical parameters of the area can be understood in the regional context;
- describe the cultural and heritage values of the area including any archaeological or ethnographical interest in the area;
- other aspects of the human environment (local communities, nearest residents, background noise levels, landscape values, etc) should be described; and
- describe the present and any proposed land uses and any other aspects of the environment which are important in relation to the proposal.

5. Environmental Impacts and Management

- identify the direct and indirect impacts arising from all phases and components of the proposal, with quantification if possible and necessary; any criteria used for making conclusions about the significance of the impacts should be described;
- particular assessment of the impacts related to surface drainage control, overburden management, groundwater drawdown, noise, wastewater management, air emissions, hazard/risk management, dieback control and effect on the forest values should be made;
- identify the social impacts related to the proposal; the public consultation activities that occurred during the planning of the proposal and preparation of the report should be described; this should outline the activities, the objectives of the activities and the groups and individuals involved; a summary of concerns raised should be documented along with how each of these concerns has been addressed;
- describe the management techniques, operational constraints and other methods proposed to address the impacts;
- indicate the consultation and negotiation agreements reached with relevant regulatory and management authorities;
- summarise the overall environmental impact of the proposal; and
- detail the environmental management and rehabilitation methods proposed to address and monitor the impacts.

6. Appendices

- specific commitments should be made to manage the impacts and a numbered list of these commitments provided in the Consultative Environmental Review;
- references; list and provide appropriate documentation of authorities consulted, literature referred to in the text and whatever maps and figures are used;
- guidelines; a copy of the guidelines should be included in the Consultative Environmental Review; and
- appendices; any detailed, technical information which is essential to the proposal and the assessment process should be appended.