



PART THREE
THE ROLE OF GOVERNMENT
AND KEY AGENCIES

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3.1 OVERVIEW

The rehabilitation of mines, and the financial mechanisms that ensure that rehabilitation occurs, are mandated by legislation. This Inquiry must therefore consider the legislative framework relevant to mining in Victoria generally, and the Latrobe Valley coal mines in particular.

This Part outlines the complex and multilayered legislative framework that governs the establishment, operation and rehabilitation of mine sites in Victoria.

The Victorian statutory regime governing coal mining is complex and has evolved considerably over time. Recently, regulatory change has seen a shift from prescriptive requirements to assessing and managing potential risks. Some of these changes are a result of the 2014 Hazelwood Mine Fire Inquiry, which led to increased recognition on the part of the mining industry and the State of the need to identify and mitigate risks, particularly concerning fire.¹

The key legislation governing coal mining in Victoria is the *Mineral Resources (Sustainable Development) Act 1990* (Vic). The Mineral Resources (Sustainable Development) (Mineral Industries) Regulations 2013 (Vic) provide further detail relevant to the Act and its implementation.

Water is an integral part of coal mining and power generation in the Latrobe Valley. The existing power stations require large volumes of lower quality water for cooling, as well as a small volume of high quality water for boilers and on-site water use. Low quality water is also required at the mines for fighting fires, dust suppression, ash disposal, and washing down conveyors and equipment.² The principal Victorian legislation relating to water use is the *Water Act 1989* (Vic).

Other Victorian legislation relevant to the Latrobe Valley mines includes the *Occupational Health and Safety Act 2004* (Vic) and the *Environment Protection Act 1970* (Vic).

The Commonwealth has a limited role in regulating Victorian coal mines. Commonwealth legislation most relevant to Victorian coal mining is the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

3.2 MINERAL RESOURCES ACT AND MINERAL INDUSTRIES REGULATIONS

The State Minister for Energy and Resources is responsible for administering the *Mineral Resources (Sustainable Development) Act 1990* (Vic) (Mineral Resources Act) and the Mineral Resources (Sustainable Development)(Mineral Industries) Regulations 2013 (Vic) (Mineral Industries Regulations).³ The Earth Resources Regulation Branch in the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) is responsible for the regulation of mines in Victoria.⁴ In this report, the Earth Resources Regulation Branch and its various predecessors are referred to as the 'Mining Regulator' (noting that other government departments and agencies also have responsibility for aspects of mine regulation in Victoria). The Secretary of DEDJTR is referred to in this report as the 'Department Head'. The Minister for Energy and Resources is referred to in this Part as 'the Minister'.

The regulatory oversight of coal mines in Victoria has changed since the privatisation of the Latrobe Valley mines in 1996 and 1997. From the time that the mines' licences were granted until 4 December 2002, the Department of Natural Resources and Environment (DNRE) was responsible for regulation of the Latrobe Valley mines. From 5 December 2002 to 30 June 2013, the responsibility fell to the Department of Primary Industries (DPI). From 1 July 2013 to 31 December 2014, the Department of State Development, Business and Innovation (DSDBI) was responsible for regulating the Latrobe Valley mines. From 1 January 2015, regulatory oversight has been undertaken by DEDJTR.⁵ Figure 6 summarises these changes.

Figure 6. Regulatory oversight of mines⁶

The stated purpose of the Mineral Resources Act is ‘to encourage mineral exploration and economically viable mining and extractive industries which make the best use of, and extract the value from, resources in a way that is compatible with the economic, social and environmental objectives of the State.’⁷

To achieve this purpose, one of the Act’s objectives is to ‘establish a legal framework aimed at ensuring that land which has been mined or from which stone has been extracted or removed is rehabilitated.’⁸

Mining licences and work plans are the primary instruments through which the purpose and related objectives of the Mineral Resources Act relevant to coal mining are fulfilled.⁹ Licences allocate Crown rights to resources, such as coal, to the licence holder, while work plans regulate the operation of a mine under that licence.¹⁰

3.2.1 MINING LICENCES

Subject to certain exemptions that are not relevant to this Inquiry, under s. 8(1)(a) of the Mineral Resources Act, a person cannot carry out mining in Victoria without obtaining a mining licence from the Minister. An applicant for a mining licence must satisfy the Minister that it can meet the requirements set out in s. 15(6) of the Mineral Resources Act, including the requirement that the applicant is likely to be able to finance the rehabilitation of land.¹¹

The Minister can vary licence conditions, either at the request of the licence holder, or if the Minister considers it necessary, including for reasons relating to the mine’s rehabilitation or land stability.¹² The Minister may impose conditions on a mining licence including conditions about:

- rehabilitation of the land
- risks to the environment, public, land, property or infrastructure
- environmental offsets on the land or any other land
- work undertaken under a licence
- protection of community facilities.¹³

Under s. 38 of the Mineral Resources Act, the Minister may cancel a licence on a number of grounds, including if the licence holder fails to substantially comply with its obligations under the Mineral Resources Act or the Mineral Industries Regulations, or any conditions of the licence or work plan. The Minister is required to give 28 days’ notice of his or her intention to cancel the licence.¹⁴ The Minister is otherwise entitled to serve a notice requiring the licence holder to stop work due to a contravention or likely contravention of the Mineral Resources Act or the licence conditions, and require the contravention to be remedied within a specified period. Failure to comply with such a notice may result in a penalty of 2500 units for a corporation (currently approximately \$380,000) and a court order for rectification.¹⁵

Mining licences for the Latrobe Valley’s three coal mines were granted pursuant to s. 47A of the *Electricity Industry Act 1993* (Vic) (Electricity Act) under an Order in Council.¹⁶ The processes for licensing and work plans under the Electricity Act differed from the approval processes now in effect in Victoria. Operators of the Latrobe Valley mines were not originally required to meet certain obligations that exist under the current regulatory framework, such as undertaking an Environment Effects Statement assessment, public consultation regarding community concerns, or applying for planning approval.¹⁷ However, all other requirements of the Mineral Resources Act—such as the application of licence conditions, the need for authority to commence work, the need for a work plan (including a rehabilitation plan), and specifying the amount of the rehabilitation bond—were applicable to the mines at the time they were privatised and were included in the Order in Council.¹⁸

3.2.2 WORK PLANS

On its own, a mining licence does not authorise mining activities. Under s. 40 of the Mineral Resources Act, a licence holder must also have a work plan approved by the Department Head.¹⁹ A licence holder may also apply for a variation to its work plan, which requires approval by the Department Head.²⁰ Under s. 41AAB of the Mineral Resources Act, the Department Head has discretion to approve an application to vary a work plan.²¹

Section 40(3) of the Mineral Resources Act provides that a work plan must:

- a. be appropriate in relation to the nature and scale of the work proposed to be carried out; and
- b. identify the risks that the work may pose to the environment, to any member of the public, or to land, property or infrastructure in the vicinity of the work; and
- c. specify what the licensee will do to eliminate or minimise those risks as far as reasonably practicable; and
- d. if the licence is a mining licence or prospecting licence, in relation to the mining activities proposed to be carried out under the licence, include a plan for consulting with the community that demonstrates that the licence holder will use appropriate and effective measures to consult with the community throughout the period of the licence and is prepared in accordance with the regulations and any guidelines issued by the Minister relating to such plans (*a community engagement plan*); and
- e. if the licence is a mining licence or a prospecting licence, under which mining activities are proposed to be carried out, include a rehabilitation plan for the land proposed to be covered by the licence; and
- f. if the licence is a mining licence relating to a declared mine, contain the prescribed mine stability requirements and processes; and
- g. contain any other matters required by the regulations.²²

Mines are 'declared' if there are geotechnical or hydrogeological factors within the mine that pose a significant risk to public safety, the environment or infrastructure.²³ Operators of declared mines are required to report regularly on the management of those risks.²⁴ The Latrobe Valley coal mines are declared mines.²⁵

Regulation 32 and Schedule 15 of the Mineral Industries Regulations specify that work plans for a coal mine must address matters such as:

- a description of work
- the identification of mining hazards arising from each phase of work, including rehabilitation and closure
- the identification and assessment of risks to the environment, members of the public, land, property or infrastructure
- a risk management plan, specifying control measures to eliminate or minimise identified risks associated with mining hazards
- a rehabilitation plan, including concepts for the end utilisation of the site, and proposals for progressive rehabilitation, final rehabilitation and closure of the site
- a community engagement plan
- for 'declared mines' such as the Latrobe Valley mines, information on mine stability
- a fire risk management plan, prepared with the input of an independent expert with appropriate expertise in mine safety and fire prevention, mitigation and suppression.²⁶

The Department Head may impose conditions on a work plan (or work plan variation).²⁷

Recent amendments to the Mineral Resources Act require that details regarding risk management are included in a work plan.²⁸ These amendments were originally due to come into effect on 31 December 2016.²⁹ However, following the recommendations of the 2014 Hazelwood Mine Fire Inquiry, the commencement date was brought forward to 8 December 2015.³⁰

Further to the amendments to the Mineral Resources Act, Schedule 15 of the Mineral Industries Regulations has also been amended and prescribes that a risk management plan must include control measures to eliminate or minimise identified risks, and specify the criteria against which the control measures for the risk will be assessed. For coal mines, a fire risk management plan is required. This plan specifies procedures for regular testing of control measures and emergency procedures that will be implemented to manage fire risk.³¹

These amendments to the Mineral Resources Act and Mineral Industries Regulations do not apply retrospectively to the current Latrobe Valley work plans. However, as a result of the 2014 Hazelwood Mine Fire Inquiry recommendations, in January 2015, the Minister varied each of the Latrobe Valley mines' licence conditions, requiring the mine operators to prepare and implement a Risk Assessment and Management Plan.³² The purpose of such a plan is to:

comprehensively assess risks to the environment and public safety arising as a result of operation of the mine and [to] describe how the licensee will manage the risk. Risk assessment must have regard to fire risks, particularly to controls for prevention, mitigation and suppression of fire, irrespective of the source and location of a fire.³³

Each of the mine operators in the Latrobe Valley has completed a Risk Assessment and Management Plan. The Mining Regulator, with the assistance of independent fire risk experts, is currently assessing these plans.³⁴ Mr Luke Wilson, Lead Deputy Secretary of Agriculture, Energy and Resources at DEDJTR, advised the Board that the Risk Assessment and Management Plans are 'likely to result in changes to operations at the mines as well as the mine rehabilitation plans.'³⁵

REHABILITATION PLANS

Section 78(1) of the Mineral Resources Act requires a licence holder to 'rehabilitate land in accordance with a rehabilitation plan approved by the Department Head.'³⁶

Section 79 of the Mineral Resources Act states that a rehabilitation plan must:

- a. take into account
 - i. any special characteristics of the land; and
 - ii. the surrounding environment; and
 - iii. the need to stabilise the land; and
 - iv. the desirability or otherwise of returning agricultural land to a state that is as close as is reasonably possible to its state before the mining licence...was granted; and
 - v. any potential long term degradation of the environment.³⁷

Schedule 15 of the Mineral Industries Regulations requires that a rehabilitation plan address concepts for the end use of the site and include proposals for:

- progressive rehabilitation, stabilisation and revegetation of the land affected by mining
- landscaping to minimise the visual impact of the mine site
- final rehabilitation and closure of the site, including security of the site.³⁸

Licence holders must, as far as practicable, complete rehabilitation during the period of the licence.³⁹ If a licence holder breaches its obligation to complete progressive rehabilitation, the Mining Regulator is entitled to issue a notice under s. 110 of the Mineral Resources Act, requiring the licence holder to comply with its obligations, resulting in a fine if it fails to do so (as outlined in Part 3.2.1).⁴⁰

The licence holder has an obligation to rehabilitate land in accordance with its rehabilitation plan under s. 78 of the Mineral Resources Act. If rehabilitation of the land has not been completed before the licence expires, the licence holder must complete it as 'expeditiously as possible', and during the period that rehabilitation is being completed, continue to employ a manager to 'control and manage' the site.⁴¹ There is a fine of 20 penalty units for a failure to comply with this obligation (currently approximately \$3000).⁴² Further, under s. 83 of the Mineral Resources Act, the Minister may take action to rehabilitate land if she or he is satisfied that rehabilitation has not been completed in accordance with the (former) licence holder's obligations under s. 78.⁴³

Licence holders are required to report annually on rehabilitation works.⁴⁴ They do this through an Annual Activity and Expenditure Return (Annual Return), which must include all of the information set out in Schedule 19 of the Mineral Industries Regulations.⁴⁵ Item 11(e) of Schedule 19 requires that the mine operator provide 'an estimate of the current rehabilitation liability for the licence area.'⁴⁶ 'Rehabilitated' is defined in a note to Schedule 19 as 'landforming complete and planting undertaken. Further land management may be required.'⁴⁷

COMMUNITY CONSULTATION

Section 39A of the Mineral Resources Act requires licence holders to consult with the community by sharing information about 'any activities authorised by the licence that may affect the community' and providing members of the community with a 'reasonable opportunity to express their views about those activities.'⁴⁸

Under s. 40(3)(d) of the Mineral Resources Act, a work plan must contain a plan for community consultation. Under Schedule 15 of the Mineral Industries Regulations it is necessary that a plan:

- a. identifies any community likely to be affected by the mine operations; and
- b. in relation to the mine operations, includes proposals for—
 - i. identifying community attitudes and expectations; and
 - ii. providing information to the community; and
 - iii. receiving feedback from the community; and
 - iv. analysing community feedback and considering community concerns or expectations; and
- c. includes a proposal for registering, documenting and responding to complaints and other communications from members of the community in relation to the mine operations.⁴⁹

3.2.3 ROYALTIES, RENTS AND LEVIES

Each of the Latrobe Valley mine operators is required to pay royalties to the State each financial year in accordance with the prescribed rate, being either the base amount per gigajoule unit of lignite produced (that is, the energy content of the coal), or the amount prescribed in the Mineral Industries Regulations.⁵⁰ The licensee must send an annual report to the Department Head that describes the information used to calculate the royalty, including the quantity of coal produced and the energy content of that coal.⁵¹

Each of the mine operators is required to pay rent in relation to the land covered by its licence in accordance with the Mineral Industries Regulations.⁵² For the period 1 July 2015 to 30 June 2016, the rent is calculated at 12.1 fee units per 10 hectares.⁵³ The Mineral Resources Act also requires each of the Latrobe Valley mine operators to pay a mine stability levy to the Minister 'for the purpose of providing measures designed to decrease geotechnical and hydrogeological risks to mine stability' in relation to the Latrobe Valley mines.⁵⁴ In the Mineral Industries Regulations, the mine stability levy is set at 34,868 fee units, which amounts to \$474,204.80 for the period from 1 July 2015 to 30 June 2016.⁵⁵ The mine stability levy is payable each financial year.⁵⁶

The amounts paid by each mine operator for the period from 1 July 2014 to 30 June 2015 are shown in Table 2.

Table 2. Royalties, rents and levies paid by the Latrobe Valley mines, between 1 July 2014 and 30 June 2015⁵⁷

Mine	Rent \$	Royalty \$	Levy \$	Total \$
Yallourn mine	234,705	6,746,531	447,705	7,428,941
Hazelwood mine	144,021	9,835,777	447,705	10,427,503
Loy Yang mine	211,633	16,147,597	447,705	16,806,935
Total	590,359	32,729,905	1,343,115	34,663,379

3.2.4 REHABILITATION BONDS

Section 80(1) of the Mineral Resources Act requires a licence holder to 'enter into a rehabilitation bond for an amount determined by the Minister.' The Mining Regulator describes a rehabilitation bond as 'a financial security which must be provided by [a licence holder] prior to work commencing to ensure that rehabilitation can be undertaken by [DEDJTR] should the [licence holder] be unable to meet their rehabilitation obligations.'⁵⁸ If the licence holder fails to rehabilitate the mine consistent with its obligations under the Mineral Resources Act,⁵⁹ the Minister may take steps to rehabilitate the mine site.⁶⁰ The bond can then be used towards costs incurred in undertaking rehabilitation.⁶¹ If the rehabilitation costs exceed the bond amount, the State can recover that excess from the licensee.⁶² The State's submission to the Board notes that bonds 'provide an incentive for licensees to comply with their rehabilitation obligations.'⁶³

To determine or review the amount of a rehabilitation bond, the Minister may require the licence holder to undertake an assessment of its rehabilitation liability under s. 78 of the Mineral Resources Act.⁶⁴ Such assessments must be undertaken 'in a manner and form determined by the Minister' and take into account the work necessary to rehabilitate the land in accordance with the licence holder's obligations under s. 78.⁶⁵

Pursuant to s. 79A(3) of the Mineral Resources Act, the Minister may also require the licensee to engage an auditor to review a rehabilitation liability assessment. Section 77U defines an 'auditor' by reference to s. 53S of the *Environment Protection Act 1970* (Vic) (Environment Protection Act), which provides authority for the appointment of 'environmental auditors'. Environmental auditors are discussed further in Part 3.4.2.

The Minister may also review the amount of a rehabilitation bond based on the information contained in the mine operator's Annual Return, to determine whether the amount is sufficient.⁶⁶ The Minister may, after consultation with the licence holder, require the licence holder to enter into a further rehabilitation bond.⁶⁷ It is an offence to fail to comply with such a requirement.⁶⁸ The Minister may prohibit a licensee from doing any work until it has entered into the further rehabilitation bond.⁶⁹

Once the Minister is satisfied that the land has been rehabilitated and that the rehabilitation is 'likely to be successful', the Minister must return the bond to the licensee as soon as possible.⁷⁰ For mining licences on private land, this can only occur after consultation with the local council and land owner.⁷¹ As a condition of returning the bond, the licence holder may be required to enter into a further rehabilitation bond 'if any land or part of the land to which the bond relates has not been rehabilitated, or requires further rehabilitation.'⁷²

Rehabilitation bonds are discussed in more detail in Parts 7 to 9 of this report.

3.3 WATER ACT

Under the *Water Act 1989* (Vic) (Water Act), the State retains the overall right to the use, flow and control of all surface water and groundwater in Victoria.⁷³ The Minister for Environment, Climate Change and Water administers the Water Act, with the assistance of the Water and Catchments Group within the Department of Environment, Land, Water and Planning (DELWP).⁷⁴ DELWP works in partnership with water corporations and catchment management authorities in managing the allocation of water resources pursuant to the Water Act.⁷⁵ In the Latrobe Valley area these authorities include Southern Rural Water, Gippsland Water and the West Gippsland Catchment Management Authority.⁷⁶

The Minister for Environment, Climate Change and Water issues the following water entitlements:

- bulk entitlements
- environmental entitlements
- water shares
- s. 51 licences to take and use water (referred to as 'groundwater licences' in this report).⁷⁷

Of these entitlements, the Latrobe Valley mine operators and their associated power stations have access to water through bulk entitlements and s. 51 licences to take and use groundwater (referred to as 'groundwater licences' in this report).

The Minister for Environment, Climate Change and Water has appointed Southern Rural Water as a 'Resource Manager', which requires it to act as the Minister's 'representative in the Latrobe basin and to monitor the entitlement holders' compliance with their [water] entitlements.'⁷⁸ Southern Rural Water is also the appointed 'Storage Manager' for the Latrobe Valley pursuant to the Water Act.⁷⁹

3.3.1 BULK ENTITLEMENTS

The Minister for Environment, Climate Change and Water may issue bulk entitlements to water to an 'authority'.⁸⁰ An authority is defined in s. 34 of the Water Act, and can include water corporations (for example, Southern Rural Water) and 'generation companies' within the meaning of the Electricity Act.⁸¹

A bulk entitlement is a right to take, use and supply water in a waterway, water in storage works of a water corporation, and groundwater.⁸² A bulk entitlement holder is required to comply with the conditions and obligations of its bulk entitlement, including the volume of water that can be taken.⁸³

Dr Sharon Davis, Executive Director of the Water Resources Division, Water and Catchments Group at DELWP, advised the Board that bulk entitlements issued to the Latrobe Valley coal mines do not have explicit conditions attached about what the water should be used for, 'other than to "supply electricity generation works". The bulk entitlements do not define what constitutes electricity generation works.'⁸⁴

The Water Act provides that a bulk entitlement can be assigned or transferred by an Authority to any person, after approval from the Minister for Environment, Climate Change and Water.⁸⁵ Examples of this are the water supply agreements between Gippsland Water and GDF Suez for the transfer of part of Gippsland Water's bulk entitlement (discussed further in Part 4 of this report).⁸⁶

3.3.2 GROUNDWATER LICENCES

The Minister for Environment, Climate Change and Water may issue a licence to take and use water to a person upon an application under s. 51 of the Water Act. Southern Rural Water administers the groundwater licences that have been issued to the Latrobe Valley mine operators.⁸⁷

A groundwater licence is a right to take and use water from sources including groundwater.⁸⁸ These licences are subject to conditions and obligations, including the volume of water that can be taken and how the water can be used.⁸⁹

When a groundwater licence is issued to a 'generation company' within the meaning of the Electricity Act in order to take and use groundwater for 'purposes associated with an open cut coal mine', the licence may be issued for a period of up to 30 years, subject to any special conditions.⁹⁰ In other cases, groundwater licences are limited to a period of up to 15 years.⁹¹

Section 58 of the Water Act provides that a licence can be renewed by an application made to the Minister for Environment, Climate Change and Water before the licence expires.⁹² In determining whether to renew a licence, the Minister must have regard to the matters mentioned in s. 53 of the Water Act. For example, this could include advice received from a relevant catchment management authority and the report of any panel constituted under s. 50; and 'the existing and projected availability of water in the area'.⁹³ Once the Minister has complied with the consultation requirements set out in the Water Act, the Minister must renew the groundwater licence 'unless, in the opinion of the Minister, there are good reasons not to do so.'⁹⁴ The renewal may be subject to amended or further conditions.⁹⁵

A groundwater licence may only be renewed for a period of 15 years, although further renewal applications can be made.⁹⁶ The Minister for Environment, Climate Change and Water may revoke a groundwater licence for a number of reasons, including if the licence holder has failed to comply with licence conditions.⁹⁷

3.4 OTHER STATE LEGISLATION RELEVANT TO MINING

3.4.1 OCCUPATIONAL HEALTH AND SAFETY ACT

The *Occupational Health and Safety Act 2004* (Vic) (OHS Act) and the Occupational Health and Safety Regulations 2007 (Vic) (OHS Regulations) place obligations on all Victorian workplaces to secure, and eliminate risks to, the health, safety and welfare of employees and other persons at work.⁹⁸ The OHS Act also aims to 'ensure that the health and safety of members of the public is not placed at risk by the conduct of undertakings by employers and self-employed persons.'⁹⁹

Part 5.3 of the OHS Regulations creates a range of specific additional obligations with respect to mines. In particular, rr. 5.3.7 to 5.3.9 are intended to reflect the way in which the statutory duties under ss. 21 and 23 of the OHS Act (relating to the duties owed by an employer to employees and members of the public to provide a safe environment) are to be performed by mine operators. Regulation 5.3.7 deals with the identification and assessment of risks to health and safety associated with all 'mining hazards', which includes risks such as ground control, slope stability, flooding and mine fires.¹⁰⁰ Regulation 5.3.8 deals with the adoption of risk control measures to eliminate or reduce those risks. Regulation 5.3.9 requires the mine operators to carry out reviews of their identification and assessment of risks, together with the control measures for countering those risks on a regular basis and after any incident involving a 'mining hazard'.

Importantly for the purposes of this Inquiry, the obligations imposed by the OHS Act and Regulations are not limited to the period during which a mine is operational. They extend to the period during which a mine site is being rehabilitated.¹⁰¹

WorkSafe administers and enforces the OHS Act and Regulations.¹⁰²

3.4.2 ENVIRONMENT PROTECTION ACT

The Environment Protection Authority (EPA) is the statutory authority charged with administering the Environment Protection Act and Regulations.¹⁰³ The purpose of the Environment Protection Act is to 'create a legislative framework for the protection of the environment in Victoria having regard to the principles of environment protection.'¹⁰⁴

The EPA's role includes:

- administering the Act and any Regulations and orders made under it
- regulating waste discharge activities, industrial waste, noise and pollution
- recommending State environment protection policies and waste management policies as Victorian statutory policy
- implementing National Environment Protection Measures
- issuing works approvals, licences, permits and remedial notices
- recommending Regulations be made
- enforcement action for breaches of the Act.¹⁰⁵

ENVIRONMENTAL AUDITORS

Section 53S of the Environment Protection Act empowers the EPA to 'appoint any person to be an environmental auditor for the purposes of this Act.'¹⁰⁶ The Environment Protection Act specifies that the function of an environmental auditor is:

- a. to conduct environmental audits; and
- b. to prepare environmental audit reports; and
- c. if requested, to issue certificates of environmental audit or statements of environmental audit; and
- d. any function conferred on an environmental auditor under this or any other Act.¹⁰⁷

The EPA describes the benefits of using an appointed environmental auditor as ensuring the receipt of reliable information on the condition of the environment and any risks posed, by:

- detecting actual or potential environmental impacts
- assessing compliance with regulations
- assessing the nature of harm, or risk of harm to the environment caused by an industrial process or activity
- understanding significant environmental issues.¹⁰⁸

Part 8.5.3 of this report discusses environmental auditors further.

FINANCIAL ASSURANCES

Following a number of business failures resulting in environmental clean-up incidents, the EPA introduced the financial assurances scheme as a mechanism to ensure that appropriate funds are available in the event that a clean-up is required.¹⁰⁹

Sections 21, 31A and 53F of the Environment Protection Act empower the EPA to require financial assurances. Pursuant to s. 21(1)(ba), in some circumstances the EPA may issue a works approval or licence, or amend a licence, on the condition that a financial assurance is provided.¹¹⁰ Section 31(2A) empowers the EPA to issue a pollution abatement notice requiring the recipient to provide a financial assurance to the EPA.¹¹¹ Additionally, under s. 53F(5), the EPA may refuse to issue or transfer a permit to transport prescribed waste or prescribed industrial waste unless it is first provided with a financial assurance.¹¹²

Historically, financial assurances have been required in the form of a bank guarantee.¹¹³ However, s. 67B prescribes other forms of security and also allows the EPA to accept any form of security that it considers appropriate.¹¹⁴ The EPA is currently considering expanding the range of financial assurances that it will accept to include:

- bank guarantee
- letter of credit
- guarantee (by deed poll)
- certificate of title
- mutual fund
- bond
- accumulating trust fund
- insurance.¹¹⁵
- controlled bank account

A financial assurance is not required for EPA licence holders that operate within the mining industry or power stations.¹¹⁶ However, a financial assurance is required for certain types of landfills.¹¹⁷ The mine operators each hold EPA licences that require them to maintain a financial assurance in relation to certain landfills that they operate. However, despite ongoing negotiations between the mine operators and the EPA, financial assurances have not been provided by any of the mine operators.¹¹⁸

3.5 COMMONWEALTH REGULATORY FRAMEWORK RELEVANT TO MINING

The Commonwealth Government has a minor role in regulating coal mining through the administration of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (Commonwealth Environment Act). Section 24D of the Commonwealth Environment Act requires ministerial approval of certain developments with a significant impact on water resources. Section 24D will only apply if a 'constitutional corporation, the Commonwealth or a Commonwealth agency' takes an 'action' that involves 'coal seam gas development' or 'large coal mining development' and the action has, will have or is likely to have 'a significant impact on a water resource'. The expression 'large coal mining development' is defined as 'any coal mining activity that has, or is likely to have, a significant impact on water resources'.¹¹⁹ Under s. 528 of the Commonwealth Environment Act, each licensee meets the definition of a constitutional corporation.

Section 16 of the Commonwealth Environment Act makes similar provision for an 'action' by a 'person' that has, will have, or is likely to have a 'significant impact on the ecological character of a declared Ramsar wetland'.¹²⁰ The Board notes the submission by Environment Victoria that the 'Gippsland Lakes are an internationally significant wetland' and would meet this description.¹²¹

It is possible that the operation of ss. 16 and 24D of the Commonwealth Environment Act could be triggered by the 'action' of filling a mine pit with water after coal mining ceases, on the basis that this is a coal mining activity that will impact significantly on water resources.¹²² However, the Board notes that the Commonwealth Department of Environment's guidelines concerning the meaning of actions relating to 'large coal mining development' under the Commonwealth Environment Act suggest that these are limited to the extraction of coal.¹²³ This may well exclude activities, such as mine filling, which necessarily occur after extraction has concluded.¹²⁴

3.6 OTHER AGENCIES INVOLVED IN MINE REHABILITATION

In addition to the Minister for Energy and Resources, DEDJTR, DELWP, WorkSafe and the EPA, a range of other agencies and organisations are involved in the regulation and implementation of mine rehabilitation.

3.6.1 COAL RESOURCES VICTORIA

Since privatisation of the Latrobe Valley mines, the State has had a role in the strategic planning of Victoria's coal resources, primarily through Coal Resources Victoria (formerly Clean Coal Victoria). Coal Resources Victoria was established in 2008 to undertake strategic planning on behalf of the State for the future development of Victoria's coal resources.¹²⁵ Its role includes strategic resource planning, regional environmental planning, coal research, and engaging with key stakeholders with an interest in coal development.¹²⁶

Since December 2013, Coal Resources Victoria has been staffed by one Director (currently Ms Jane Burton).¹²⁷ The Director's role is to 'provide advice on resource planning and stakeholder engagement regarding the Victorian Government's coal resource'.¹²⁸

On 18 November 2015, the State announced an independent review of past coal development programs to plan for the future of Victoria's coal resources and develop a new coal policy.¹²⁹ This new coal policy will 'consider the economic, social and environmental factors, to give the community and industry certainty into the future.'¹³⁰ The review coincides with public announcements by AGL and GDF Suez that they will not be investing in new conventional coal-fired power stations.¹³¹

3.6.2 TECHNICAL REVIEW BOARD

The Technical Review Board was established in 2009 under Part 4A of the Mineral Resources Act.¹³² Its establishment was an outcome of the Mining Warden's Inquiry into the 2007 Yallourn northern batter collapse.¹³³ The batter collapse is discussed in Part 4 of this report.

The State advised the Board of Inquiry that the overall aim of the Technical Review Board is 'to improve geotechnical and hydrogeological performance and knowledge within the Victorian mining industry.'¹³⁴ The Technical Review Board is an advisory panel comprised of a team of four experts, chaired by Professor Jim Galvin.¹³⁵

The role of the Technical Review Board is to provide independent advice to the Minister for Energy and Resources and to DEDJTR, on issues related to mine and quarry stability. This includes advice on the State's strategies, guidelines and regulatory approaches, as well as new technology related to mine stability and geotechnical issues.¹³⁶

The Technical Review Board provides annual reports to the Minister, who can then release the reports to DEDJTR and the mining industry.¹³⁷ The Technical Review Board's Annual Reports from 2011–12 to 2014–15 are available on the Mining Regulator's website.¹³⁸

The Technical Review Board's original terms of reference did not have a specific focus on mine rehabilitation; however the Board did provide advice to the State on rehabilitation issues and its concerns about the Latrobe Valley mines' rehabilitation plans in its annual reports, and other direct advice to DEDJTR between 2011 and 2015.¹³⁹

In August 2015, the State included 'rehabilitation' in the Technical Review Board's terms of reference. The Technical Review Board now provides advice and guidance to DEDJTR on issues such as progressive and final mine rehabilitation. The State appointed Ms Corinne Unger, who is a specialist in rehabilitation policy and procedures, to the Technical Review Board in September 2015.¹⁴⁰

The current Technical Review Board members are appointed until the end of June 2016, with Professor Galvin advising the Board that this term was fixed 'to align with the reform work that's going on within [DEDJTR]', and that 'the Minister has set the end of the financial year as the review point for whether the Board goes forward.'¹⁴¹

3.6.3 GEOTECHNICAL AND HYDROGEOLOGICAL ENGINEERING RESEARCH GROUP

The Geotechnical and Hydrogeological Engineering Research Group (GHERG) is a research and development program initially established at Monash University's Gippsland campus in 2009, and now operated through Federation University Australia.¹⁴² It is funded by the State to undertake geotechnical and hydrogeological research¹⁴³ 'to advance understanding of ground movements associated with the Latrobe Valley brown coal mines.'¹⁴⁴ GHERG's objectives include:

- undertaking geotechnical and hydrogeological research and development to address the issue of insufficient expertise and skill shortages
- fostering research and innovation in coal geotechnical and hydrogeological engineering
- providing support to the Technical Review Board
- developing training programs for mine staff.¹⁴⁵

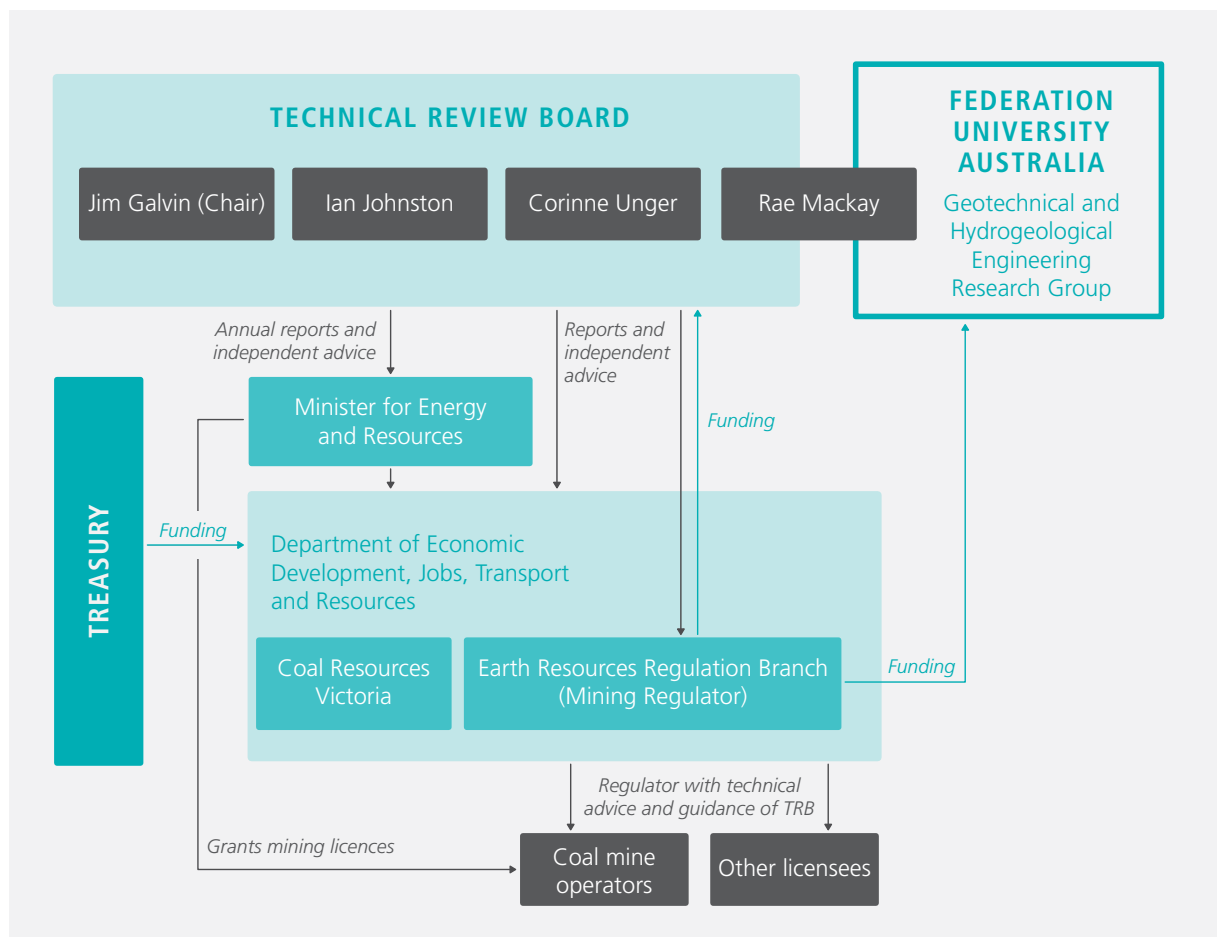
The State renewed funding for GHERG in September 2014, allocating \$2.47 million for GHERG to continue its work up to 30 June 2019.¹⁴⁶

GHERG currently plays a key role as a knowledge repository in relation to geotechnical and hydrogeological engineering for the Latrobe Valley mines. A database containing historical information, photographs and construction drawings, as well as the past research results of the State Electricity Commission of Victoria, is available to approved researchers and the mine operators.¹⁴⁷ Research undertaken by GHERG has extended knowledge about the properties and movement of the coal and groundwater, as well as mine rehabilitation. It has also established an education and training program.¹⁴⁸

GHERG interacts directly with the Technical Review Board. The Director of GHERG, Professor Rae Mackay, is also a board member of the Technical Review Board.¹⁴⁹ Professor Mackay stated that there is a measure of independence between the two organisations. He is required to obtain consent from the mine operators to use any documents obtained through the Technical Review Board for his work with GHERG.¹⁵⁰

Figure 7 shows the relationship of the Technical Review Board to GHERG, the State and the mine operators.¹⁵¹

Figure 7. Relationship of the Technical Review Board and GHERG to key stakeholders





Conveyor system at the Loy Yang mine
(source: Department of Economic Development, Jobs, Transport and Resources)



PART FOUR
THE LATROBE
VALLEY MINES

PART 4 THE LATROBE VALLEY MINES

4.1 OVERVIEW

The Latrobe Valley mines are ‘large and complex structures.’¹ While the mines have common elements, each also has unique features, which inform how they are mined and rehabilitated. This Part details the features of each mine—such as their location, size and scale of operation—to provide the context for considering rehabilitation options.

Previous incidents at the mines, such as mine collapses and fire incidents, are part of this context and have affected mine operations, the community and the environment. These incidents, and the responses to them, have significantly informed how mines and the Mining Regulator operate today. They also highlight the need for an active approach to both preventing and mitigating risk during mining operations, and to progressive and final rehabilitation of the mines.

This Part summarises the licence and work plan parameters relevant to each mine. As outlined in Part 3 of this report, rehabilitation plans are a mandated part of work plans. An overview of the rehabilitation plan for each mine is included in this Part. Part 4 also includes an overview of current water licensing arrangements in the Latrobe Valley. While this Part refers to the power stations located at each of the Latrobe Valley mines, under the Terms of Reference of this Inquiry, the focus of this report is on the operation and rehabilitation of the mines, not the power stations.

Table 3 contains a summary of some of the relevant details about the Latrobe Valley mines.

Table 3. Summary of Latrobe Valley mines

	Yallourn	Hazelwood	Loy Yang
Licensee	EnergyAustralia	GDF Suez	AGL Loy Yang
Location of ultimate holding company	Hong Kong	France Japan	Australia
Mine location	Northwest of Morwell	South of Morwell	Southeast of Traralgon
Mining licence number	5003	5004	5189
Date licence granted	9 April 1996 ²	10 September 1996 ³	6 May 1997 ⁴
Production rate (per annum)	18 Mt	16 Mt	30 Mt
Term of licence	30 years ⁵	30 years ⁶	40 years ⁷
Planned closure	2032 ⁸	2033 ⁹	2048 ¹⁰
Total annual water allocation (2015)	41.985 GL	36.484 GL	62.996 GL
<i>Groundwater licence</i>	3.285 GL ¹¹	22.484 GL ¹²	19.996 GL ¹³
<i>Bulk entitlement</i>	36.5 GL ¹⁴	–	40 GL ¹⁵
<i>Water supply agreement</i>	2.2 GL ¹⁶	14 GL ¹⁷	3 GL ¹⁸

4.2 YALLOURN MINE

4.2.1 OVERVIEW AND OWNERSHIP

Yallourn is the oldest of the three Latrobe Valley mines. The Yallourn mine is situated northwest of Morwell, at the junction of the Latrobe and Morwell Rivers and close to the railway line.

The Yallourn North Open Cut mine was opened in the late 1800s, and the Yallourn Open Cut (now known as the Yallourn mine) commenced operation under the authority of the State Electricity Commission of Victoria (SECV) in 1924.¹⁹

EnergyAustralia Yallourn Pty Ltd currently operates the mine on behalf of the licence holder, Yallourn Energy Pty Ltd.²⁰ EnergyAustralia Holdings Limited is the holding company of EnergyAustralia Yallourn Pty Ltd,²¹ and is wholly owned by the Hong Kong-based company CLP Holdings Ltd.²² In this report, the mining licence holder and its predecessors are referred to collectively as EnergyAustralia.

EnergyAustralia operates the Yallourn mine and adjacent power station (the Yallourn W power station). The power station is comprised of two 360 megawatt and two 380 megawatt units, which supply approximately 22 per cent of Victoria's base load electricity.²³

EnergyAustralia has three mining licences relevant to its Yallourn operation—Mining Licence 5003 (MIN5003), MIN5216 and MIN5304. Coal mining is exclusively carried out under MIN5003, with the smaller licences required for associated infrastructure.²⁴

MIN5003 was granted on 9 April 1996. A standard schedule of conditions is attached to the mining licence—including the requirement for minimising surface disturbance; obtaining a groundwater licence and monitoring groundwater levels; controlling erosion; establishing buffer zones and visual screening; conducting progressive rehabilitation and final rehabilitation; and lodging a rehabilitation bond.²⁵ In January 2015, a new condition was added (1A Risk Management) to MIN5003, requiring the licensee to submit a Risk Assessment and Management Plan by 31 August 2015.²⁶

4.2.2 KEY FEATURES AND SETTINGS

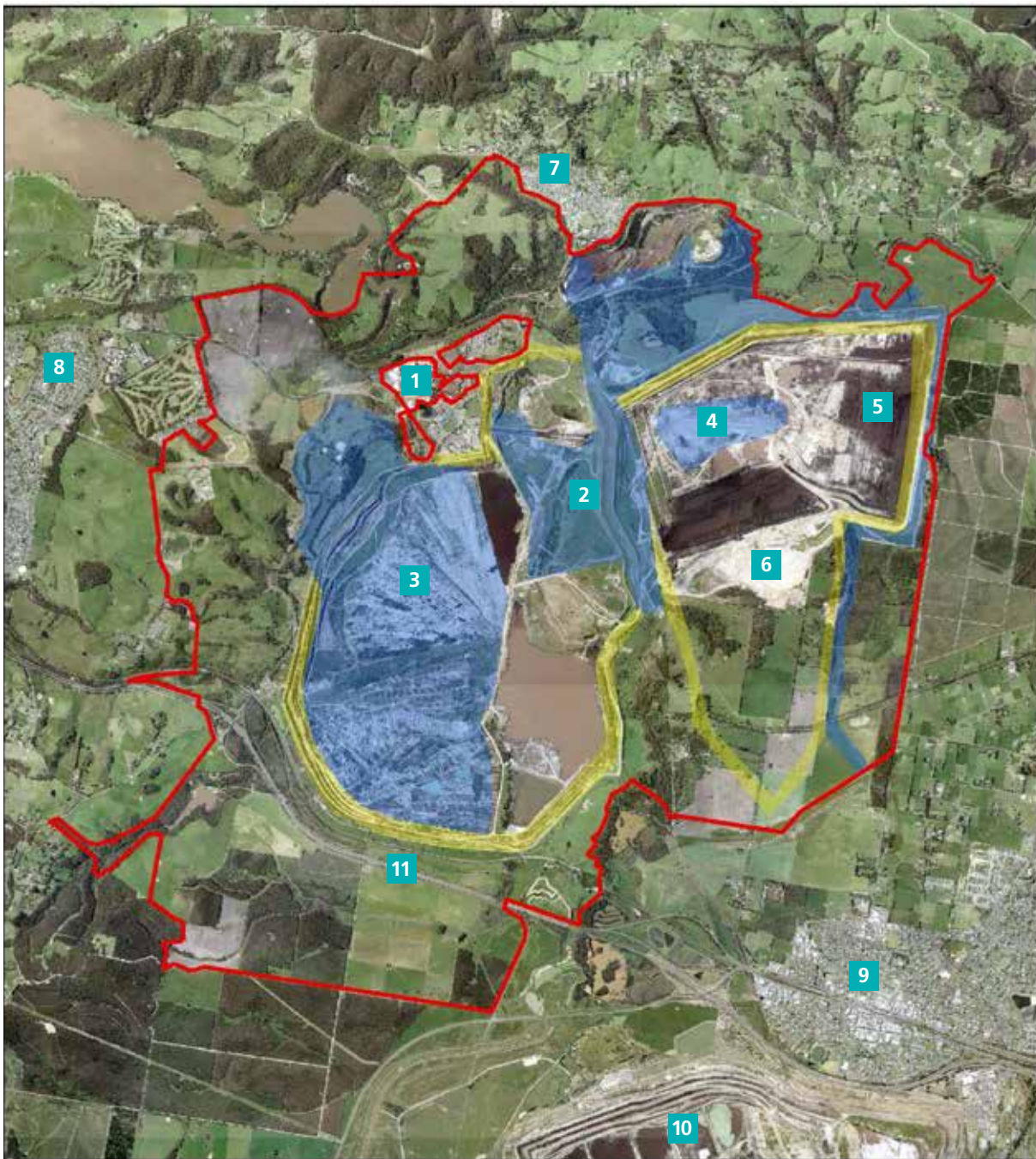
The mine is currently eight kilometres wide at its widest point, with a perimeter of 26 kilometres.²⁷ It is the shallowest of the Latrobe Valley mines, with a depth of approximately 95 metres below ground level at its lowest point.²⁸ As at July 2015, 1,769 hectares of the mine site had been disturbed by mining operations.²⁹

Since mining began in 1924, over one billion tonnes of coal and over 293 million cubic metres of overburden have been mined.³⁰

The mine comprises four coalfields—Township Field, East Field, East Field Extension and Maryvale Field (shown in Figure 8). Coal is mined exclusively from what is known as the Yallourn coal seam.³¹ The Yallourn seam is between 40 to 90 metres thick and is covered by between 8 to 46 metres of overburden.³² The coal seam is 60 metres in Township Field and 85 metres in Maryvale Field.³³ The coal seam at the Yallourn mine has a high moisture-content (generally around 65 per cent).³⁴

The expansion of the coal mining activities into the East Field and the Maryvale Field at the Yallourn mine were the subject of an Environment Effects Statement assessment between 1999 and 2001. In 2005, the expansion led to the construction of the Morwell River Diversion. The Morwell River Diversion is an earthen embankment that carries the river across the Yallourn mine until it joins the Latrobe River.³⁵

Figure 8. Map of the Yallourn mine and power station³⁶



Legend

- Mining Licence Boundary
- Rehabilitation - past
- Rehabilitation - future

Coordinate System: GDA 1994 MGA Zone 55
 Projection: Transverse Mercator
 Datum: GDA 1994



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 Earth Resources Information Centre
 Date: 30/07/2015



- | | |
|----------------------------|---------------------|
| 1. Power Station | 7. Yallourn North |
| 2. Morwell River Diversion | 8. Newborough |
| 3. Township Field | 9. Morwell |
| 4. East Field | 10. Hazelwood Mine |
| 5. East Field extension | 11. Princes Freeway |
| 6. Maryvale Field | |



The closest aquifer is 40 to 50 metres below the floor of the Yallourn mine.³⁷ EnergyAustralia has only had to undertake limited dewatering of the aquifer since mining operations expanded into East Field in 2008 and Maryvale Field in 2015.³⁸

The design of the Yallourn power station has been guided by the properties of the coal seam. The moisture content of the coal seam requires it to be partially dried prior to being blown into the power station's furnace.³⁹ Coal from other mines can only be burnt in the Yallourn power station provided it is sufficiently blended with the coal from the Yallourn mine.⁴⁰

4.2.3 WORK PLAN AND REHABILITATION PLAN

At the time the Yallourn mine was privatised, the rehabilitation plan envisaged the creation of a recreational lake as the final land use. The plan was to flood the mine pit to a high final water level just below the crest of the mine (known as relative level or RL +38m), and stabilise and landscape the batters and banks above the water level. The batters below RL +38m were to be progressively rehabilitated in readiness for flooding. This final landform and land use remains the rehabilitation outcome planned for the mine.⁴¹

Since privatisation of the mine, the Department Head has approved four work plan variations, the most significant of which were in 2002 and 2011.⁴² All work plan variations are to be read in conjunction with the original work plan.

The January 2002 work plan variation included an update to the mine rehabilitation master plan to reflect the addition of the Morwell River Diversion and the change in use of the Yallourn North Open Cut.⁴³ The variation specified the following rehabilitation requirements and final land use:

- Stabilise and rehabilitate the perimeter batter area above the future lake level to no steeper than 1v:3.5h.⁴⁴
- Overburden batters to be covered by a minimum of 100 millimetres of topsoil and revegetated.⁴⁵
- Edge protection around the future lake margin to minimise the risk of erosion by wave action, through a combination of flattening, beaching, compaction and revegetation.⁴⁶
- Maximum slope angle of 1v:3h in coal and overburden, particularly for slopes 30 to 40 metres in length.⁴⁷
- Overburden and waste coal to be placed in the mined out areas of the pit to minimise the risk of unstable conditions.⁴⁸
- Yallourn North Open Cut to be used for the disposal of fly ash from the power station, with the batter slopes for rehabilitation to vary between 1v:4h to 1v:6h, based on a history of slope instability at the site.⁴⁹
- Final mine flooding to form a large lake system connected to the local rivers (assumes eventual filling of the mine pit to spilling level).⁵⁰ See Figure 9 for a representation of the landform.
- Yallourn North Open Cut return water pond to be relocated to the northeast of the pit.⁵¹
- Adjacent mine areas (including the batters) to have multiple potential uses such as conservation, grazing, recreation, forestry, drainage corridors and industrial uses.⁵²

Figure 9. Yallourn mine's approved final landform⁵³



The 2002 mine rehabilitation master plan identified a number of environmental issues requiring further investigation to ensure the successful completion of the master plan. These related to water, land, air quality, and flora and fauna, and have in part already been addressed by studies completed to date by EnergyAustralia.⁵⁴ Of particular significance are the studies about water. EnergyAustralia identified key issues as:

- how the lake will be filled
- whether the water level is sustainable
- the likely impact on water quality (both surface and groundwater)
- the stability of the lake perimeter areas.⁵⁵

In the 2002 mine rehabilitation master plan, the water balance assessment estimated it will take 65 years to fill the Yallourn mine by rainfall only. Consequently, it proposed that water from either or both of the adjacent Morwell and Latrobe Rivers be diverted to fill the pit more quickly. EnergyAustralia estimated it will take 10 years to fill the mine by diverting an average of 10 per cent of the Latrobe River flow.⁵⁶

CURRENT YALLOURN WORK PLAN

In 2011, EnergyAustralia submitted a work plan variation to the Mining Regulator. The 2011 work plan variation incorporates changes to the Yallourn mine resulting from the 2007 northern batter collapse and the re-design of the Maryvale Field footprint.⁵⁷ The rehabilitation requirements and final end use have not changed from the 2002 rehabilitation master plan, with the final pit area comprising twin lakes dissected by the elevated Morwell River Diversion embankment.⁵⁸

The Mining Regulator approved the 2011 work plan variation subject to seven conditions relating to mine stability, native vegetation offsets and rehabilitation.⁵⁹ Condition 7 of the work plan variation requires that:

The Yallourn Mine Rehabilitation Plan is to be reviewed regarding the feasibility of the flooded mine scenario versus other alternatives within 12 months of the approval of this Mine Work Plan Variation. The review should include as a minimum:

- a. long-term water balance studies
- b. how to form safe and stable rehabilitated batters, including for the non-flooded mine scenario
- c. how to minimise mine floor heave, including for the non-flooded mine scenario
- d. strategic use of overburden in flooded and non-flooded mine scenarios
- e. advantages and disadvantages of the flooded and non-flooded mine scenarios regarding progressive rehabilitation opportunities.⁶⁰

In response to Condition 7, EnergyAustralia reviewed its mine rehabilitation master plan, which involved consideration of three final landform options—a fully flooded, partially flooded or non-flooded mine pit.⁶¹ In 2012, EnergyAustralia retained GHD to prepare a geotechnical peer review of the flooding options at Yallourn, titled *Report for Yallourn mine rehabilitation: Geotechnical assessment of flooding options*. The GHD review assessed the stability implications of each of the flooding options in the mine rehabilitation master plan.⁶² A summary of GHD's findings is presented in Table 4 below.⁶³

The GHD review confirms that the flooding to RL +37m (slightly adjusted from the previous RL +38m), approximately one metre below crest height, is the preferred option,⁶⁴ and that 'the majority of batters within the Yallourn mine will need minimal stabilisation work prior to the void being flooded.'⁶⁵ GHD also concludes that batter stability can vary dramatically during flooding, in which case 'additional significant stabilising works will be required regardless of which option is selected.'⁶⁶

Table 4. Summary of flooding options for the Yallourn mine, adapted from GHD⁶⁷

Factors	Option 1: Fully flooded RL +37m	Option 2: Partially flooded RL +20m – Yallourn Township Field only	Option 3: Un-flooded
Batter stability	Generally most favourable stability conditions apply. Lowest likelihood of major coal bench movements. Monitoring may manage risks sufficiently during filling to minimise interim stabilisation measures.	Lowest stability conditions within Yallourn Township Field. Adverse Permanent stabilisation of the Yallourn Township Field western batters required. Ongoing management and control of conditions or major stabilisation of berms in Yallourn East Field, Yallourn East Field Extension and Maryvale Field required.	Favourable stability conditions apply across most of the site, however ongoing management and control of groundwater conditions must apply. Otherwise major stabilisation berms in Yallourn East Field, Yallourn East Field Extension and Maryvale Field required.
Deep aquifer – floor stability	Best protection against floor heave in Maryvale Field. Negates need for full internal dump across Maryvale Field. Minimises risk of heave causing aquifer interconnection.	Insufficient protection against floor heave if deep aquifer recovers to RL +25m. Internal dump required across Maryvale Field to augment stabilising requirement.	Continued aquifer pumping may be required in Maryvale Field or placement of widespread internal dump.
Residual geotechnical risks	Best chance to minimise residual risks.* Minimise the impact of variable groundwater levels across the site without undertaking widespread stabilisation works.	Least favourable of flooding options. Significant stabilising works likely to ensure long term stability.	Most extensive landform modifications required.
Morwell River Diversion	May require additional stabilising measures implemented along the embankment role.	Best of flooding options. No flooding of the Morwell River Diversion toe anticipated.	Status quo.

* Residual risk is defined as the risks remaining after all mitigation measures have been applied

Contrary to the 2002 master rehabilitation plan, the GHD review concludes that it would take approximately 81 years to fill the pit through rainfall and run-off from the adjacent catchment area. The time to fill the pit could be significantly reduced (to a best case of five years) with the addition of water from Yallourn's bulk entitlement, and overflows from the Latrobe and Morwell Rivers during flood events.⁶⁸

In June 2012, EnergyAustralia submitted its response to Condition 7 to the Mining Regulator, indicating that the issues relating to sourcing water needed to be resolved.⁶⁹ The Mining Regulator's response is discussed in Part 10.3.1 of this report.

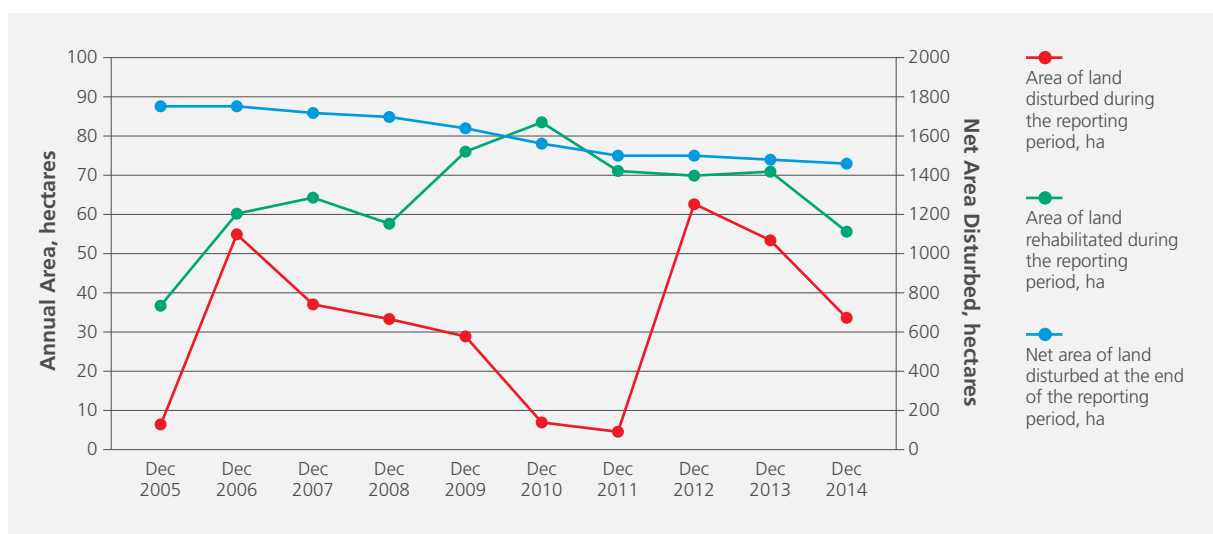
OVERVIEW OF PROGRESSIVE REHABILITATION

Since the 1990s, the Yallourn mine has been progressively rehabilitated towards the planned final landform of a fully flooded lake interconnected with the regional waterways.⁷⁰ Rehabilitation works to date can be divided into areas above or below the final lake level (RL +37m).

Above the final lake level, the focus has been on forming (and stabilising) final landforms, covering with overburden and topsoil, and revegetating with grasses (to stabilise the soil) and woodland corridors.⁷¹ Below the final lake level, the focus has been on covering exposed coal with overburden using conveyors, stackers (large machines that pile coal onto conveyors) and mobile plant to manage fire risk, dust, erosion, mining emissions and impacts on neighbouring landowners.⁷² Following placement in the mine pit, the overburden will be shaped and revegetated as grasslands, woodlands or wetlands, accompanied by internal lakes.⁷³ Mr Ronald Methner, Mine Manager at EnergyAustralia, indicated to the Board that EnergyAustralia has dumped overburden into 85 per cent of the mine.⁷⁴

Progressive rehabilitation has exceeded the rate of disturbance through mining, resulting in a steady net decrease of land disturbed over the last decade, as shown in Figure 10.⁷⁵ The green line demonstrates that EnergyAustralia is rehabilitating more land annually than it is mining (depicted by the red line). As a result, the overall balance of disturbed land is decreasing (shown by the blue line).

Figure 10. Balance of disturbed and mine rehabilitated areas, Yallourn mine⁷⁶



4.2.4 WATER

Currently, the Yallourn mine and power station have a total annual water allocation of 41.985 gigalitres. This is a combination of groundwater (pursuant to a groundwater licence), surface water (through a bulk entitlement sourced from Blue Rock Reservoir and Lake Narracan) and a volume of low and high quality water (through a water supply agreement with Gippsland Water).⁷⁷

The groundwater licence is valid for 30 years from 1 September 1995. The groundwater licence entitles the licence holder to take and use groundwater to 'facilitate mining for coal and generation of electrical energy' and incidental purposes. The volume of permitted groundwater for each year is included in the groundwater licence. In 2015, the permitted volume was 3.285 gigalitres. The permitted volume will decrease over time, and will reduce to 1.278 gigalitres in 2025.⁷⁸

EnergyAustralia's bulk entitlement was conveyed pursuant to the Bulk Entitlement (Latrobe-Yallourn) Conversion Order 1996. The bulk entitlement has no expiry date. It provides that EnergyAustralia can access percentage shares of the Blue Rock Reservoir and Lake Narracan, up to a maximum volume of 36.5 gigalitres per annum.⁷⁹

EnergyAustralia's water supply agreement with Gippsland Water is for the supply of water to support the Yallourn power station's operations. It expires when the power station ceases operating, and does not extend to the mine rehabilitation process. Gippsland Water provides EnergyAustralia with a maximum of 2.2 gigalitres of potable water each year.⁸⁰

4.2.5 MAJOR MINE INCIDENTS IN THE PAST DECADE

YALLOURN NORTHERN BATTER COLLAPSE

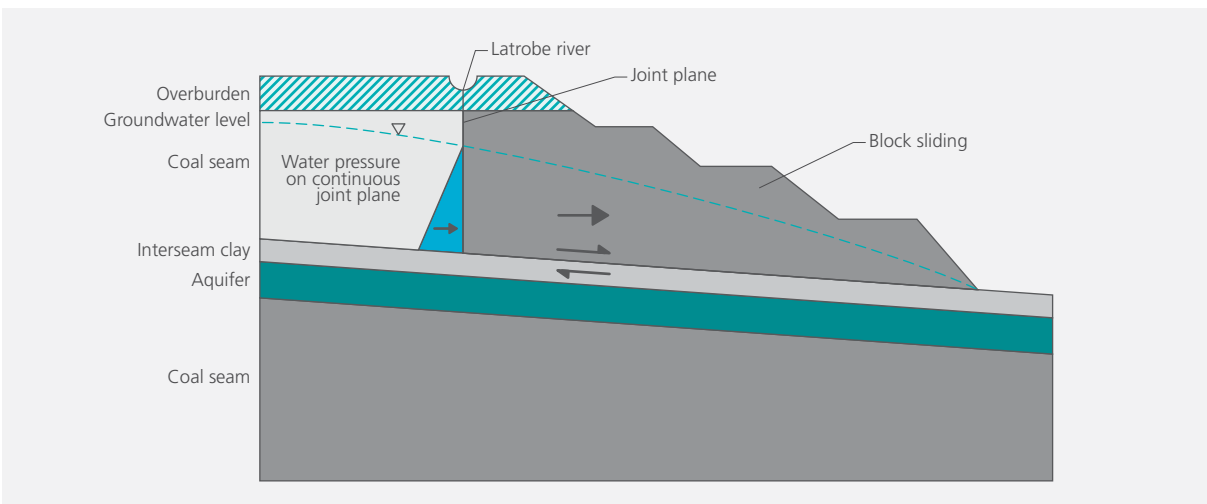
In late 2007, the northeast batter of the Yallourn mine’s East Field was nearing the end of mining, having almost reached the permissible extent of coal extraction. On 14 November 2007, a section of the batter collapsed, resulting in a block of coal slipping into the pit (as shown in Figure 11). The block comprised an estimated six million cubic metres of material over a length of 500 metres, with a face height of 80 metres. The collapse resulted in the Latrobe River flowing into the mine, and the disruption of critical mine infrastructure, affecting coal supply to the Yallourn power station.⁸¹

Figure 11. Yallourn northern batter collapse



The collapse was a result of ‘block sliding’, where a large block of coal slides horizontally across the mine floor. This was caused by a build-up of water pressure in a joint along the rear of the block. The joint was hydraulically connected to the Latrobe River. Water pressure built up in the interseam clays underlying the block of coal. These water pressures caused a buoyancy effect on the block of coal, which reduced its resistance to sliding along its base. A diagram of the mechanism of block sliding is at Figure 12. Findings and recommendations about the Yallourn batter failure are documented in the report titled, *Mining Warden Yallourn Mine Batter Failure Inquiry*, prepared by Adjunct Professor Timothy Sullivan.⁸²

Figure 12. Example of block sliding⁸³



MORWELL RIVER DIVERSION FAILURE

In June 2012, the Morwell River Diversion was close to capacity due to significant rainfall and flooding in the Latrobe Valley.

On 6 June 2012, a section of the embankment of the Morwell River Diversion collapsed, and the river flooded the worked out Township Field (shown in Figure 13). This also caused partial flooding of the active East Field when the river flows exceeded the mine's pumping capacity. Consequently, coal supply to the Yallourn power station was disrupted, reducing the power station's generating capacity to a quarter of its usual capacity.⁸⁴ As an interim measure, works were undertaken to manage water flows across the mine, pump water out of the mine, and pipe water from the Morwell River directly into the Latrobe River. In October 2013, river flows were returned to the Morwell River Diversion, and by January 2014, the Diversion was fully restored.⁸⁵

The Mining Regulator's Lead Investigator and an independent geotechnical expert carried out an investigation into the failure. They found that a key cause of the failure was the manner of construction of the Morwell River Diversion's embankment. Findings of the investigation are contained in a report titled *Review of failure of Morwell River Diversion* released by the Department of Primary Industries (now known as the Department of Economic Development, Jobs, Transport and Resources).⁸⁶

Figure 13. Morwell River Diversion failure



4.3 HAZELWOOD MINE

4.3.1 OVERVIEW AND OWNERSHIP

The Hazelwood mine was established in 1949 by the SECV, and privatised in 1996.⁸⁷

The Hazelwood Power Partnership operates the Hazelwood mine and power station on behalf of the licence holder, Hazelwood Power Corporation Pty Ltd. Various partners have holding interests in the Hazelwood Power Partnership. The primary holding companies are:

- French-based Engie SA (previously known as GDF Suez SA)
- Japanese-based Mitsui & Co Ltd.⁸⁸

In this report, the mine operator and licence holder of the Hazelwood mine, including their predecessors, are referred to collectively as GDF Suez.

The Hazelwood power station is comprised of eight 200 megawatt units, and supplies approximately 25 per cent of Victoria's base load electricity.⁸⁹ Engie SA also owns and operates the 1,000 megawatt Loy Yang B power station.⁹⁰

The Mining Licence 5004 (MIN5004) was granted on 10 September 1996.⁹¹ A standard schedule of conditions is attached to the mining licence—including the requirement for minimising surface disturbance; obtaining a groundwater licence and monitoring groundwater levels; controlling erosion; establishing buffer zones and visual screening; conducting progressive rehabilitation and final rehabilitation; and lodging a rehabilitation bond.⁹²

In July 2006, additional Mining Licences 5449, 5450, 5451 and 5452 were incorporated into MIN5004.⁹³ The Minister for Energy and Resources varied MIN5004 on 20 January 2015. A new condition was added (1A Risk Management), requiring the licence holder to submit a Risk Assessment and Management Plan by 30 June 2015.⁹⁴

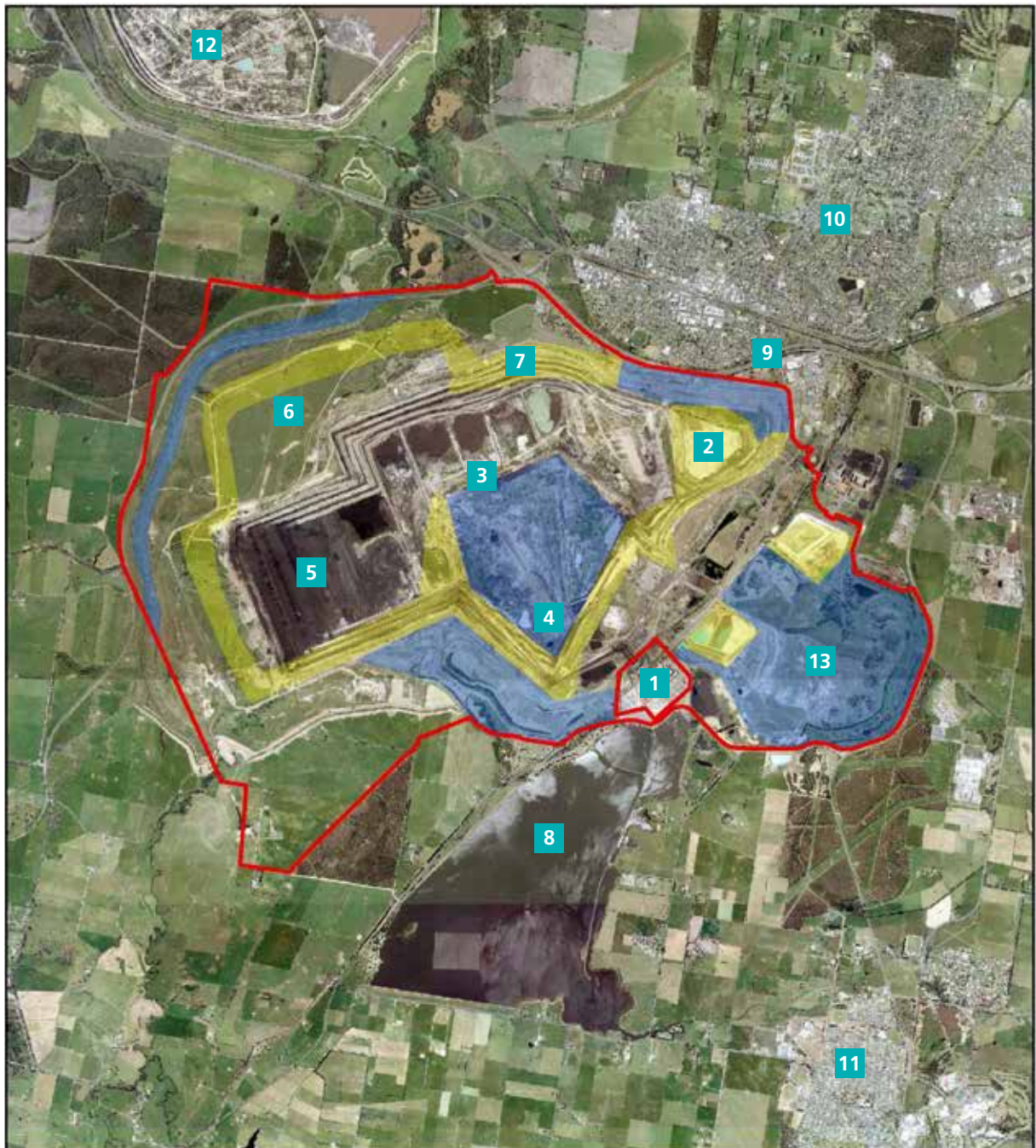
4.3.2 KEY FEATURES AND SETTINGS

The Hazelwood mine is located south of Morwell across the Princes Freeway. The mine has a perimeter of approximately 18 kilometres, with a depth of approximately 120 metres below ground level at its lowest point.⁹⁵

Since mining began, over 720 million tonnes of coal and 175 million cubic metres of overburden have been removed from the mine. Mining operations have disturbed 2,543 hectares of land, with 557 hectares of that land already rehabilitated.⁹⁶

It has been progressively mined from East Field (1955 to 1975), to South West Field (1975 to mid-1990s), then South East Field (mid-1990s to mid-2000s). Since the mid-2000s, GDF Suez has been mining West Field.⁹⁷ Mining is scheduled to commence in the North Field in 2016.⁹⁸ Figure 14 shows the mine licence boundary, the mining history and location of the power station.

Figure 14. Map of the Hazelwood mine and power station⁹⁹

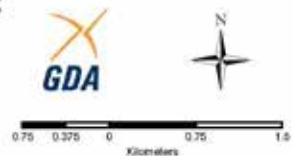


Legend

- Mining Licence Boundary
- Rehabilitation - past
- Rehabilitation - future

Coordinate System: GDA 1994 MGA Zone 55
 Projection: Transverse Mercator
 Datum: GDA 1994

Produced by
 Earth Resources Information Centre
 Date: 30/07/2015



- | | |
|---------------------|------------------------------|
| 1. Power Station | 8. Hazelwood Pondage |
| 2. East Field | 9. Princes Freeway |
| 3. South West Field | 10. Morwell |
| 4. South East Field | 11. Churchill |
| 5. West Field | 12. Yallourn mine |
| 6. North Field | 13. External overburden dump |
| 7. Northern batters | |



The Hazelwood mine's coal has a moisture content of 62 per cent and a density between 1.11 to 1.14 tonnes per cubic metre. The coal typically has moderate to low permeability (the ease with which water flows through it), and does not have structural defects (such as fractures and joints). However, mining has exposed a number of structural defects in the seam in East Field, including eroded surfaces, faulting, cracking and a zone of intense jointing.¹⁰⁰

4.3.3 WORK PLAN AND REHABILITATION PLAN

When the Hazelwood mine was privatised, the initial 1996 rehabilitation plan envisaged fully flooding the mine pit to form a lake after removing operational infrastructure such as conveyors, power lines and sludge ponds to allow for beneficial community land uses. The 1996 work plan flagged the possible need for further studies to inform decision-making during rehabilitation—in particular, further investigation of the potential effects of flooding the mine pit relating to cost, timing, batter stability, water quality and groundwater impacts.¹⁰¹

Following privatisation, the Department Head approved seven work plan variations, the most significant of which was in 2009.¹⁰² These work plan variations are to be read in conjunction with the 1996 work plan.¹⁰³

The current 2009 Hazelwood work plan variation was developed after an Environment Effects Statement assessment was completed in 2004.¹⁰⁴ The requirement for an Environment Effects Statement assessment was triggered by the proposal to expand the footprint of the mine by 1.5 kilometres to the west, which required the diversion of the Morwell River and realignment of the Strzelecki Highway.¹⁰⁵ The 2009 work plan allows for mining to be expanded into the West Field of the mine.¹⁰⁶

MINE REHABILITATION REQUIREMENTS AND PRINCIPLES

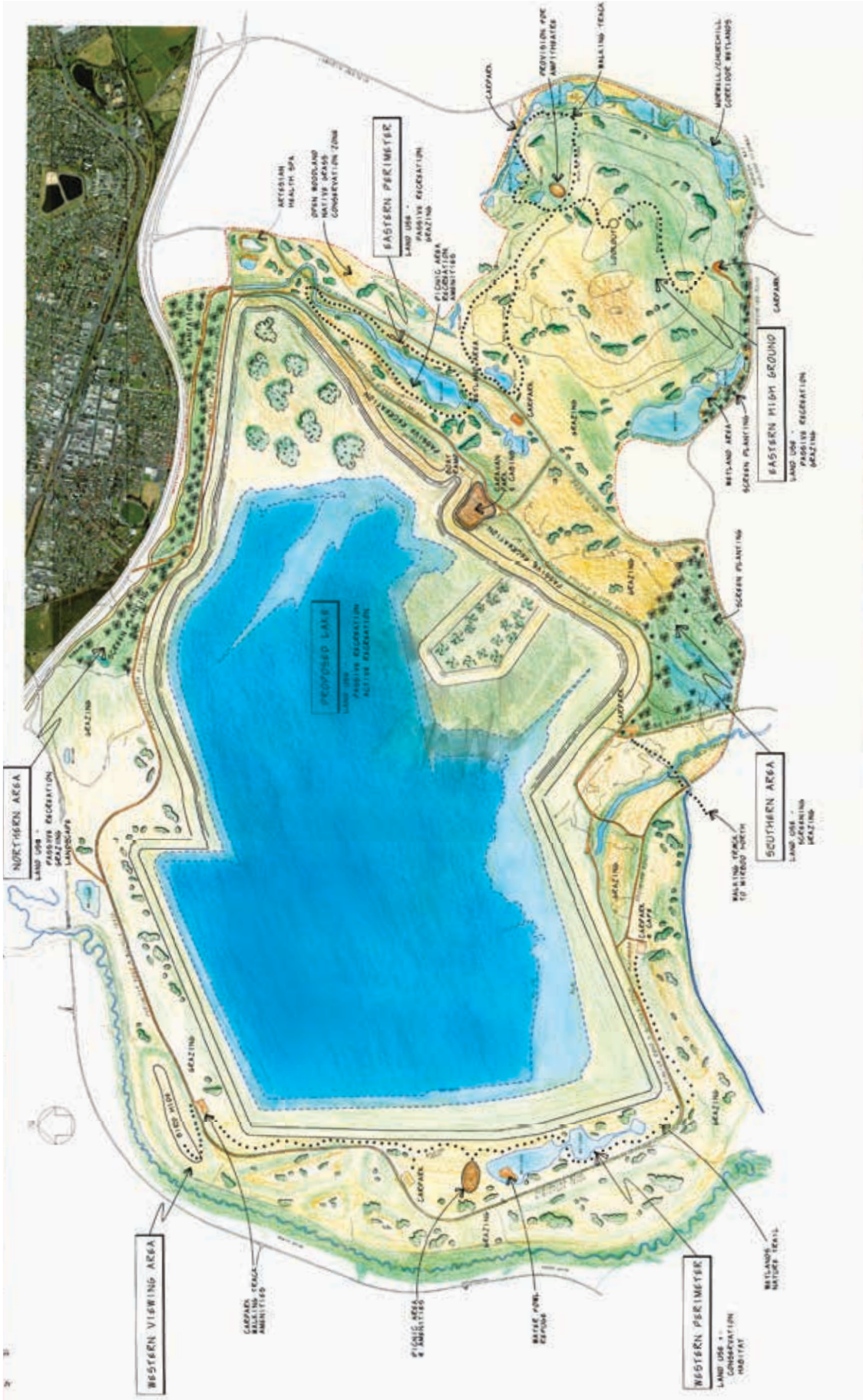
A re-examination of the mine rehabilitation requirements was undertaken as part of the Environment Effects Statement assessment, and the findings incorporated into the 2009 work plan variation.¹⁰⁷

Key aspects of the 2009 rehabilitation plan include the following:

- Allowing the pit to fill with water to create a lake. It is estimated that a fill level to RL -22m (weight balance level) would provide enough weight to stabilise the batters. Aquifer depressurisation pumping would continue until this fill level was achieved. The final lake level is estimated to be at RL +8m.
- Overburden faces to be battered off to no steeper than 1v:3h, covered with topsoil and revegetated with native species.
- Permanent coal faces to be battered off to no steeper than 1v:2.5h and preferably 1v:3h, covered with topsoil and seeded.
- The area where ash is disposed is to be separated from the lake by an embankment.¹⁰⁸

See Figure 15 for a representation of the proposed final landform.

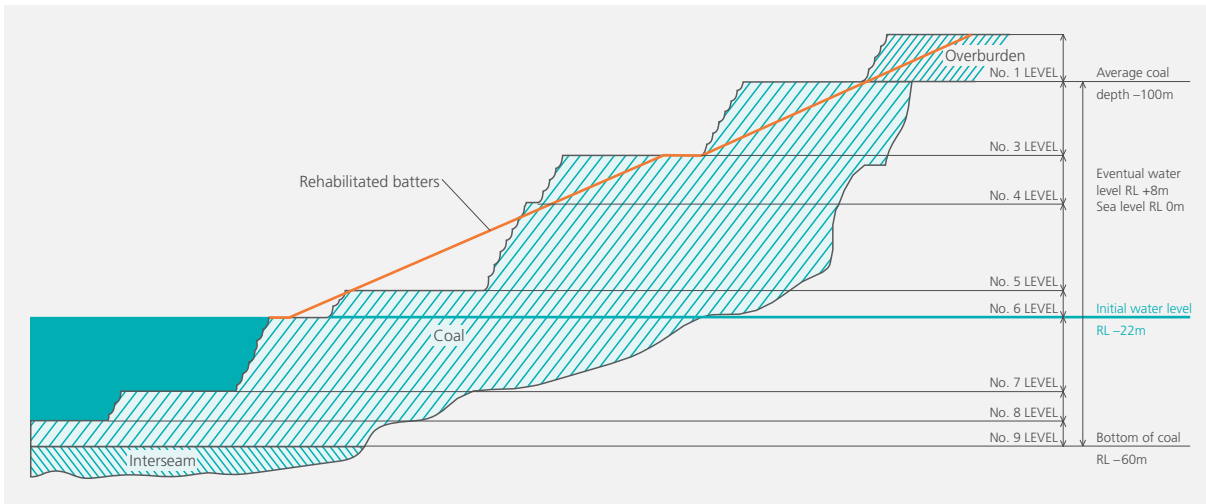
Figure 15. Hazelwood mine final rehabilitation concept plan¹⁰⁹



Mr James Faithful, Technical Services Manager – Mine, GDF Suez notes that a lake level of RL -22m will be approximately 38 metres deep or approximately one third of the depth of the mine pit. A lake level of RL +8m will be approximately 68 metres deep or approximately 50 to 60 per cent of the depth of the mine pit.¹¹⁰

As the current work plan envisages that the lower levels of the coal seam will be submerged by the future lake, only the exposed coal above the final fill level in the pit will be rehabilitated in the manner described below (Figure 16).¹¹¹ Modelling presented in the 2004 Environment Effects Statement predicted it would take six years to achieve a fill level of RL -22m, and 500 years to achieve RL +8m.¹¹²

Figure 16. Future water level of Hazelwood mine lake¹¹³



In 2015, GDF Suez retained GHD to undertake new modelling of predicted fill times based on a fill volume of 117 gigalitres to reach a revised depth of RL -20m (weight balance level). In its report titled *Hazelwood groundwater modelling report*, GHD found that, based on the most optimistic scenario, the mine pit could be filled to weight balance level within seven years. To fill the mine in this time would require:

- rainwater, groundwater seepage and groundwater pumping at a rate of 9.16 gigalitres per annum for the 2033–2034 period, and 6.47 gigalitres per annum for the 2035–2038 period
- 25 gigalitres from the Hazelwood Pondage
- ongoing run-off from the Hazelwood Pondage, at an estimated volume of 8.38 gigalitres per annum.¹¹⁴

Other scenarios indicated it would take between 160 and 200 years to reach weight balance level.¹¹⁵

PROGRESSIVE REHABILITATION

The sequence of progressive rehabilitation, to be undertaken between 2010 and 2031, is included in the 2009 work plan variation. Progressive rehabilitation corresponds with the stage of development of the mine; however it only includes areas which do not contain ‘critical infrastructure, safety and the mine’s operations’. The remaining areas will be rehabilitated after mine operations have ceased and as part of ‘final rehabilitation works’.¹¹⁶

Mr Faithful told the Board that the timing and sequencing of progressive rehabilitation is affected by the availability of suitable material and the proximity of that material to large-scale earth moving infrastructure.¹¹⁷

PLANNED 2016 WORK PLAN VARIATION

Mr Faithful indicated to the Board that GDF Suez is in the process of developing a work plan variation application, to be submitted in 2016. It will propose a variation in the sequence and timing of mining operations up until closure.¹¹⁸ This in turn will result in changes to the staging of rehabilitation activity. Under Schedule 15 of the Mineral Resources (Sustainable Development)(Mineral Industries) Regulations 2013 (Vic), GDF Suez will also be required to revise its rehabilitation plan, environmental management plan, closure concept and community engagement plan.¹¹⁹

Mr Ross McGowan, Executive Director of the Mining Regulator, advised the Board that it can be expected that approvals of future work plan variations, such as the proposed 2016 Hazelwood work plan variation, will have a series of conditions imposed upon them, similar to the conditions imposed on the approval of the 2015 Loy Yang work plan variation (see Part 4.4.3 of this report).¹²⁰

4.3.4 WATER

The Hazelwood mine and power station's current total annual water allocation is 36.484 gigalitres. This allocation is a combination of groundwater (held under a groundwater licence) and low and high quality surface water (through a water supply agreement with Gippsland Water).¹²¹

GDF Suez's groundwater licence is valid for 30 years from 1 September 1995. The groundwater licence entitles the licensee to take and use groundwater to 'facilitate mining for coal and generation of electrical energy' and incidental purposes. The volume of permitted groundwater for each year is described in the groundwater licence. The permitted volume in 2015 was 22.484 gigalitres, which will incrementally reduce to a permitted volume of 20.48 gigalitres in 2025.¹²²

GDF Suez's water supply agreement with Gippsland Water is for the supply of water to support the Hazelwood power station's operations to a maximum of 14 gigalitres of water each year.¹²³ The current agreement is for a term of 25 years, with provision for further terms of five years.¹²⁴ It expires when the power station ceases operating, and does not extend to the mine rehabilitation process.¹²⁵

GDF Suez also has a s. 51 licence to take and use 20 gigalitres of water for the Loy Yang B power station.¹²⁶

4.3.5 MAJOR MINE INCIDENTS IN THE PAST DECADE

HAZELWOOD NORTHERN BATTER INSTABILITY AND CLOSURE OF THE PRINCES FREEWAY

On 5 February 2011, following heavy rainfall in the Latrobe Valley, 'small but significant movement' occurred in the northern batters of the Hazelwood mine. This resulted in cracks appearing across the surface of the Princes Freeway and the adjoining area at the end of Hazelwood Road in southern Morwell. A section of the Princes Freeway between the mine and the Morwell township was closed pending further investigation.¹²⁷

A number of remedial actions were immediately taken to relieve water pressure in the coal, which is known to cause ground movement. Fifty horizontal bores were drilled into the coal to release the water from the area of instability, and an extensive system of highly sensitive monitors was placed both in the mine and along the freeway to measure ground movement. A land movement survey of residential areas was conducted within Morwell, to allow management of potential future hazards, and to provide a reference for checking any significant changes. Significant engineering works were also undertaken to prevent further water infiltrating the coal and northern batter. This included lining the median strip on the Princes Freeway and the Morwell Main Drain with a geomembrane (a layer of waterproof bitumen).¹²⁸

On 21 September 2011, the Princes Freeway was re-opened.¹²⁹

HAZELWOOD MINE FIRE

Victoria experienced one of its hottest and driest summers on record in 2014. The Hazelwood mine fire that began on 9 February 2014 was the largest and longest burning mine fire that has occurred in the Latrobe Valley to date. The fire was caused by embers spotting into the Hazelwood mine from bushfires burning in close proximity to the mine. The mine fire burned for 45 days. One of the reasons that the fire burned for so long was that there was a large amount of exposed coal. The areas within the Hazelwood mine that were either rehabilitated or contained fire services infrastructure did not burn.¹³⁰ Further discussion about the Hazelwood mine fire is contained in the Hazelwood Mine Fire Inquiry Report 2014.

Figure 17. Burning batters during Hazelwood mine fire

Source: Keith Pakenham, CFA Pix

4.4 LOY YANG MINE

4.4.1 OVERVIEW AND OWNERSHIP

In 1974, the SECV commenced planning for an open cut mine and two power stations at Loy Yang. The mine is currently owned by the AGL Loy Yang Partnership through a consortium of licence holders (AGL LYP 1 Pty Ltd, AGL LYP 2 Pty Ltd, AGL LYP 3 Pty Ltd and AGL LYP 4 BV).¹³¹ AGL Energy Limited is the ultimate holding company for the mine, and has been listed on the Australian Securities Exchange (ASX) since 12 October 2006.¹³² The mine operator and ultimate holding company are collectively referred to as AGL Loy Yang in this report.

AGL Loy Yang also owns and operates the 2,200 megawatt Loy Yang A power station.¹³³ As noted above, Engie SA (the ultimate holding company of the Hazelwood mine and power station) owns and operates the 1,000 megawatt Loy Yang B power station.¹³⁴ Contractual arrangements are in place for AGL Loy Yang to provide coal, ash and saline water management, disposal services and transport services to Loy Yang B.¹³⁵ The Loy Yang mine supplies coal for the generation of approximately 50 per cent of Victoria's base load electricity.¹³⁶

The Loy Yang mine operates wholly under Mining Licence 5189 (MIN5189), which was granted on 6 May 1997 for a period of 40 years. The standard schedule of conditions is attached to the licence—including the requirement for minimising surface disturbance; obtaining a groundwater licence and monitoring groundwater levels; controlling erosion; establishing buffer zones and visual screening; conducting progressive rehabilitation and final rehabilitation; and lodging a rehabilitation bond.¹³⁷

The Minister varied MIN5189 in January 2015. A new condition (1A Risk Management) was added, requiring the licensee to submit a Risk Assessment and Management Plan (including in relation to fire risk and management) by 31 October 2015.¹³⁸

4.4.2 KEY FEATURES AND SETTING

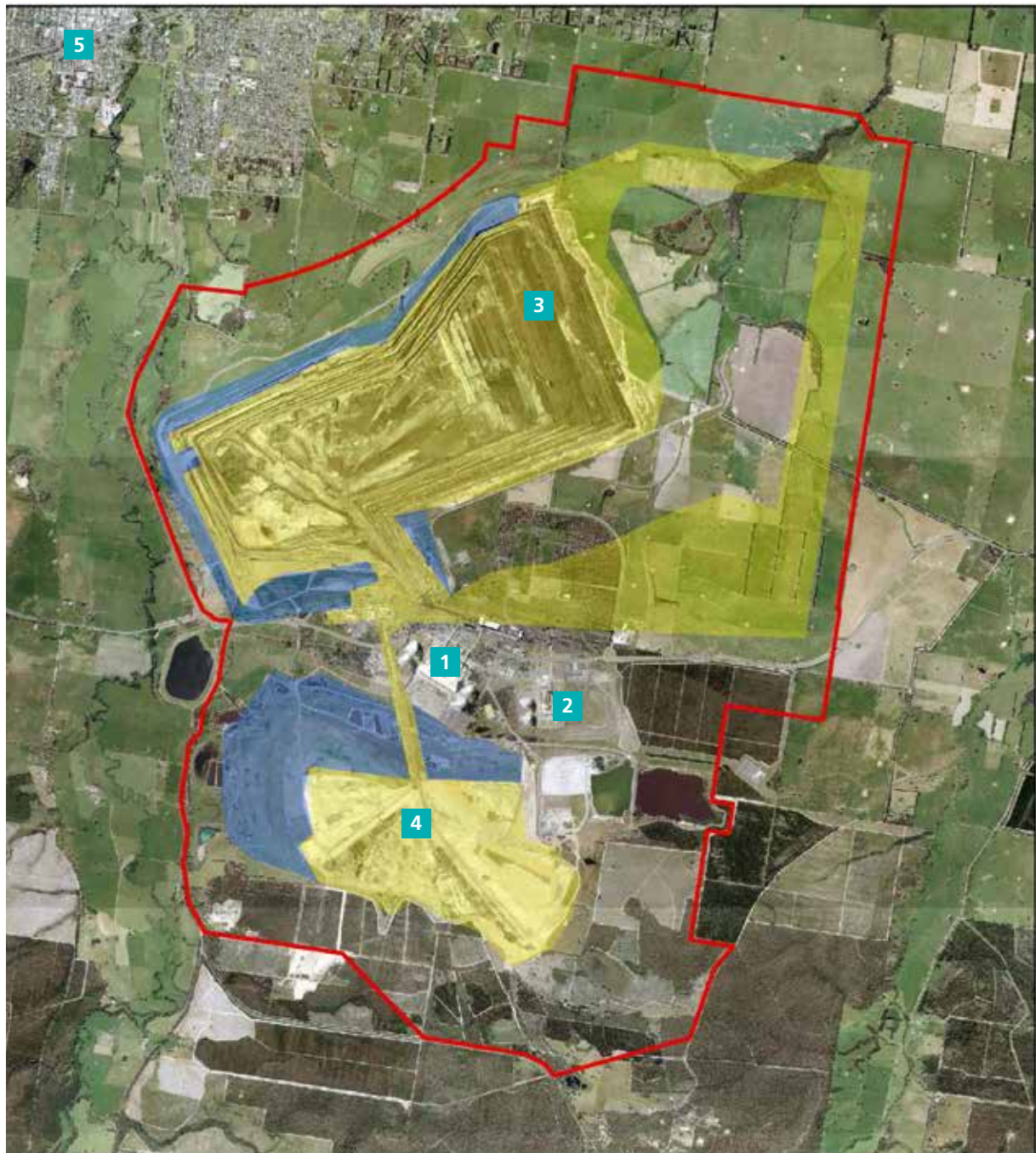
The Loy Yang mine is situated approximately four kilometres southeast of Traralgon, between the north-flowing Traralgon and Flynn's Creeks on undulating farm land.¹³⁹

The Loy Yang mine is currently four kilometres long and 2.5 kilometres wide at its widest point, with a planned completion size of six kilometres long and 4.5 kilometres at its widest point. The mine is approximately 175 metres deep at its lowest point. The final area of the mine will be approximately 2,200 hectares.¹⁴⁰ Mining operations have disturbed approximately 1,200 hectares of land, with 250 hectares of that land already rehabilitated. Figure 18 shows the mining licence boundary, the mining history and the location of the power station.

Mining commenced at Loy Yang in 1982, with the use of equipment such as bucket wheel excavators, stackers, mobile plant, and conveyor systems transporting coal to the power station and waste material to the external overburden dump. The pit was initially opened up in the southern area of the mine and proceeded in a north easterly direction. Development is now proceeding in an easterly direction before moving south.¹⁴¹

Between 1982 and 30 June 2014, 730 million tonnes of coal and 158 million cubic metres of overburden and interseam materials have been removed from the mine.¹⁴² The coal mined at Loy Yang has an average moisture content of 59.5 per cent.¹⁴³

Figure 18. Map of the Loy Yang mine and power stations¹⁴⁴



Legend

- Mining Licence Boundary
- Rehabilitation - past
- Rehabilitation - future

Coordinate System: GDA 1994 MGA Zone 55
 Projection: Transverse Mercator
 Datum: GDA 1994

Produced by
 Earth Resources Information Centre
 Date: 30/07/2015

1. Loy Yang A Power Station
2. Loy Yang B Power Station
3. Operating face
4. External overburden dump
5. Traralgon



4.4.3 WORK PLAN AND REHABILITATION PLAN

When the Loy Yang mine was privatised, the 1997 rehabilitation plan stated that at the end of mining operations, the intent was to gradually flood the pit to 'form a lake for community recreation purposes' and revert the overburden dump to 'grazing land and recreational areas'.¹⁴⁵ The plan did not contain details regarding batter angles, long-term stability, time needed to fill the pit with water, or treatment of the batters. Instead, the plan refers to other documents, such as the *Rehabilitation practices manual for open cuts and overburden*.¹⁴⁶

The Loy Yang mine operated under its original 1997 work plan until recently, when a revised and wholly updated work plan variation was approved by the Mining Regulator in November 2015.¹⁴⁷ Prior to that, the Department Head approved five minor work plan variations.¹⁴⁸

The 2015 Loy Yang work plan variation details progressive mine rehabilitation plans for the life of the mine and a concept for the final end use of the mine site. The 2015 work plan variation also sought approval to begin placing overburden into the mine pit.¹⁴⁹

The Mining Regulator approved the work plan variation subject to conditions, which prescribe a number of requirements including:

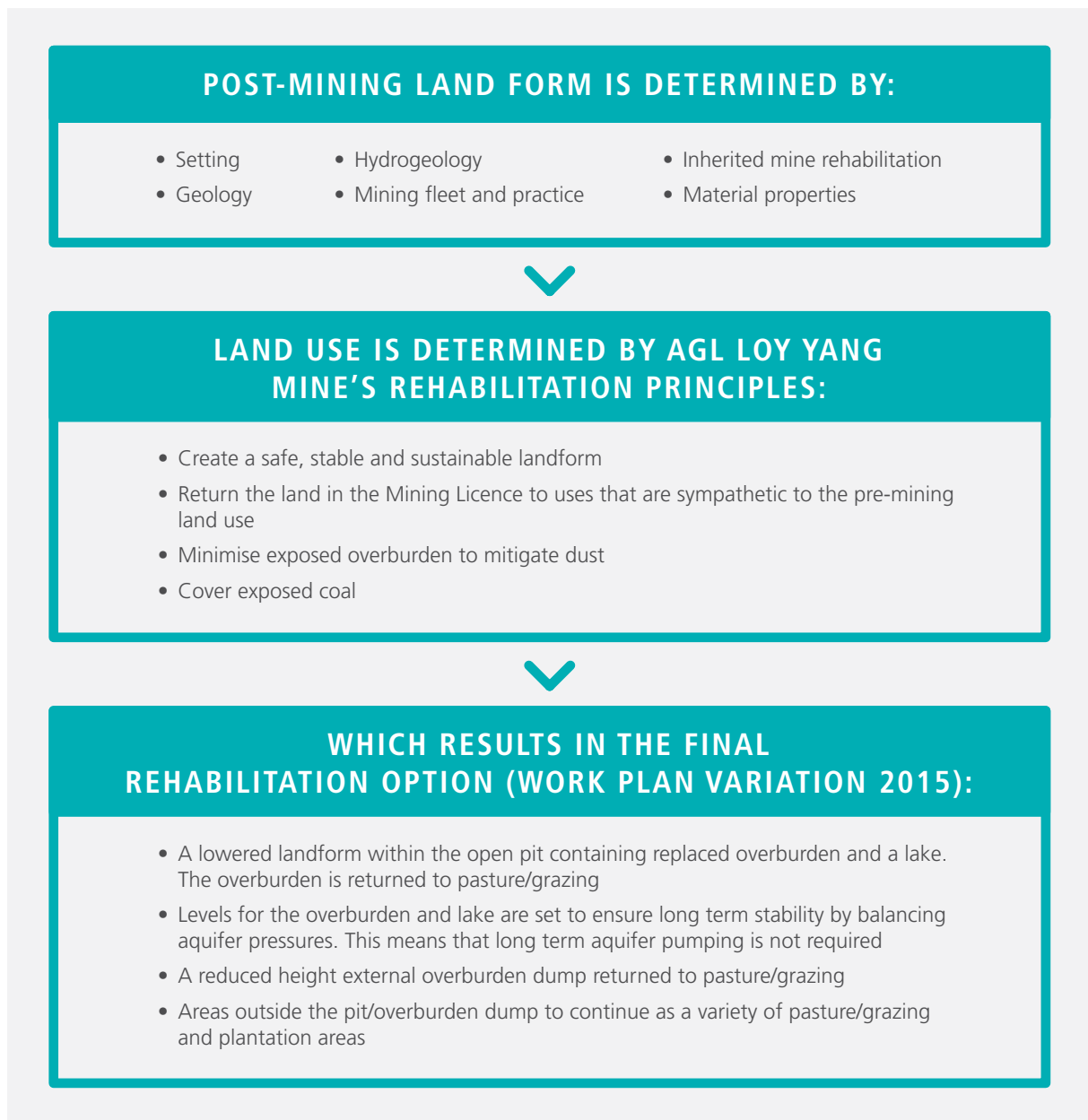
- operating within the approved extraction limit of the coal extraction area
- providing detailed schedules of works prior to the conclusion of each of the rehabilitation stages (see timing of stages below)
- updating risk assessment and management plans
- producing and reviewing ground control management plans
- preparing and maintaining a mine stability risk register
- designing and implementing a stability monitoring program
- completing a mine rehabilitation risk review
- developing a water resources risk assessment
- providing a final fire risk management plan.¹⁵⁰

Of particular note is the requirement that all exposed coal be covered by non-combustible inert material within 15 years of the cessation of coal mining, and the requirement to obtain 'the necessary licences and/or contracts for the quantity of water' needed to complete rehabilitation by no later than the end of 2023.¹⁵¹

Mr Luke Wilson, Lead Deputy Secretary, Agriculture, Energy and Resources at the Department of Economic Development, Jobs, Transport and Resources (DEDJTR), explained to the Board that these conditions reflect the Mining Regulator's shifting approach to risk-based work plans,¹⁵² under which the mine operator is required to identify risks and report them to the Regulator.¹⁵³ Under the conditions to which the approval is subject, timeframes are set, although they are broad and, for the most part, approximate.¹⁵⁴

MINE REHABILITATION REQUIREMENTS AND PRINCIPLES

In the 2015 work plan variation, AGL Loy Yang describes a rehabilitation design process, as shown in Figure 19.

Figure 19. AGL Loy Yang mine rehabilitation design process¹⁵⁵

Mr Stephen Rieniets, General Manager of AGL Loy Yang, stated that under the 2015 work plan variation, the 'end use concept is to partially flood the final open cut to form a lake and return the remaining land to agricultural use.'¹⁵⁶ This differs from the 1997 rehabilitation concept of a recreational lake.¹⁵⁷ AGL Loy Yang specifies the rehabilitation requirements necessary to achieve its current concept as follows:

- Permanent batters to be battered off to no steeper than 1v:3h or flatter, as measured from the top of mine crest to the base of mine.
- Internal dumping of overburden on the pit floor.
- Exposed coal on the permanent batters are to be covered and maintained to reduce the risk of fire, dust and erosion from water shedding above the 15 year fill mark.¹⁵⁸

AGL Loy Yang plans to continue groundwater dewatering after mining ceases. The pit will be flooded, with AGL Loy Yang estimating that the weight balance level of RL -22.5m will be reached within 10 years, based on the most optimistic scenario. This will be approximately 60 metres from the mine crest.¹⁵⁹ Water modelling conducted by GHD predicts that the lake will reach a final level of RL 0m, which it estimates will occur within 70 years, based on the most optimistic scenario.¹⁶⁰ This is further discussed in Part 6.

PROGRESSIVE REHABILITATION

AGL Loy Yang advised the Board that progressive rehabilitation will occur in stages, from 2014 to the end of mining operations and closure of the mine. These stages are detailed in the 2015 work plan variation as:

- Stage B—All progressive rehabilitation undertaken to date (to July 2015)¹⁶¹
- Stage C—Progressive rehabilitation to be undertaken to approximately 2023¹⁶²
- Stage D—Progressive rehabilitation to be undertaken to approximately 2030¹⁶³
- Stage E- to E—Progressive rehabilitation to be undertaken to the end of mining¹⁶⁴
- Closure—Closure plan depicting the current end use concept (Figure 20).¹⁶⁵

Figure 20. Loy Yang mine rehabilitation stage plan at mine closure (2015 work plan variation)¹⁶⁶



Similar to other Latrobe Valley mines, progressive rehabilitation at Loy Yang has been undertaken on areas that do not impact on coal production (for example, areas supporting conveyors, pumps, pipelines or active mining).¹⁶⁷ To date, 2,070 hectares of land have been disturbed by mining operations, with 530 hectares successfully rehabilitated and 630 hectares available for rehabilitation.¹⁶⁸ A breakdown of the areas progressively rehabilitated in the main pit and the external overburden dump is provided in Table 5.

Table 5. Progressive rehabilitation undertaken at Loy Yang mine to Mining Stage B (2015)¹⁶⁹

Area	Main pit (ha)	External overburden dump (ha)
Total area disturbed by mining operations	877	531
Rehabilitated	45	222
Rehabilitation in progress	70	309

4.4.4 WATER

Currently, the Loy Yang mine and the Loy Yang A power station have a total annual water allocation of 63 gigalitres. This is a combination of groundwater (held under a groundwater licence),¹⁷⁰ surface water (through a bulk entitlement sourced from Blue Rock Reservoir and Lake Narracan),¹⁷¹ and a small volume of high quality water (through a water supply agreement with Gippsland Water).¹⁷² The Loy Yang B power station (owned by Engie SA) also holds a bulk entitlement of 20 gigalitres.¹⁷³

AGL Loy Yang's groundwater licence is valid for 30 years from 1 September 1996.¹⁷⁴ The groundwater licence entitles the licensee to take and use groundwater to 'facilitate mining for coal and generation of electrical energy' and incidental purposes. The volume of permitted groundwater for each year is described in the groundwater licence. The permitted volume in 2015 was 19.996 gigalitres. The permitted volume in 2025 is 19.302 gigalitres.¹⁷⁵

AGL Loy Yang has a bulk entitlement conveyed pursuant to the Bulk Entitlement (Latrobe-Loy Yang A) Conversion Order 1996. The bulk entitlement has no expiry date. It provides that AGL Loy Yang can access percentage shares of the Blue Rock Reservoir and Lake Narracan up to a maximum volume of 40 gigalitres.¹⁷⁶

AGL Loy Yang's water supply agreement with Gippsland Water is for the supply of water to support the two Loy Yang power stations' operations. The water is supplied to Loy Yang A power station, which on-supplies the water to Loy Yang B power station through an infrastructure supply agreement.¹⁷⁷ The water supply agreement expires when the power stations cease operating, and does not extend to the mine rehabilitation process. Gippsland Water provides AGL Loy Yang with a maximum of three gigalitres of raw water each year.¹⁷⁸



Morwell River wetlands at the Yallourn mine
(source: *EnergyAustralia*)