



**EnergyAustralia**

**MINE  
FIRE CONTROL  
MANAGEMENT PLAN  
(FCMP)**

**Version No. 1**

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# 1 INTRODUCTION

## 1.1 Background

EnergyAustralia Yallourn Pty Ltd is the private owner and operator of the Yallourn W Power Station and the adjacent Yallourn Mine which are located in the Latrobe Valley some 150 km's east of Melbourne. EnergyAustralia Yallourn's operations are located within the City of Latrobe. The power station, mine and buffer zones cover some 5,500ha's.

The history of both mining and power generation operations at Yallourn date back to the formation of the former State Electricity Commission of Victoria (SECV) when operations commenced in 1921 at the Yallourn North Mine and shortly after at the Yallourn Mine, with first coal production in 1924.

Mining operations are based on the open cut mining method, involving slope mining operations utilising dozers and feeder breakers to excavate and load coal onto conveyors. The coal is then transported by a series of conveyors to a 35,000 tonne raw coalbunker, which provides approximately 12 hours of coal reserves for the power station. Due to this limited stockpiling capability of the coal for the power station, the mine operates 24 hours per day, 365 days per year.

Overburden operations consist of both auxiliary plant and a dredger to excavate the overburden. A series of conveyors are used to transport the overburden material to an internal dump located within a worked out section of the mine.

Mining operations are currently based within the Maryvale Field area of the Yallourn Mine, following the completion of coal mining operations in the East Field area of the mine in January 2015. Both the Township Field and East Field areas of the Yallourn Mine are now worked out areas of the Yallourn Mine. Within the Township Field area of the mine, overburden material from both the Township Field and East Field mines were deposited within this area of the mine. Overburden operations have now been transferred to the East Field area of the mine, where today, Maryvale Field overburden material is excavated and transported to the now worked out area of the East Field mine.

Due to the methods employed for the mining of the brown coal within the mine, large areas of brown coal are generally exposed in the operating faces, permanent batters and floor of the mine. These areas of exposed coal can exist in both the operating and non-operating areas of the mine, representing a large area of potential risk to fire. Whilst the coal in its raw state is a high moisture fuel and difficult to burn, it weathers, dries and readily degrades to a fine dust which ignites easily under the right conditions.

The Latrobe Valley Region is an area of high fire risk. **Figure 1** below provides details of the bushfire history for the Yallourn area between 1923 to 1983 and highlights the significant risk that fires present. While many fires commence outside the mine area, and present a risk to the mine, fires can also start from within the mine. Depending upon the severity of a fire and the prevailing meteorological conditions, significant impacts to employee and public health and safety, the environment and continuity of mining operations can result.

The Hazelwood mine which started on the 9<sup>th</sup> February 2014 and which burned out of control for some 45 days, provides recent evidence of the risks that a mine fire can present to public safety and the environment and also employee safety and continuity of mine operations.

This Fire Control Management Plan (FCMP) replaces the now obsolete Mine Fire Services Policy and Code of Practice and provides a systematic and pro-active approach to the management of fire hazards for mine fires that may be initiated from both within the mine and also external to the mine.

### 1.2 Regional Setting

The Yallourn power station and mine is located in the Latrobe Valley, and is located approximately 1.5km's southwest of the township of Yallourn North and 3.5 km's east of the township of Moe. The Latrobe River runs to the north of the power station and East Field mine and the Morwell River runs through the mine via a man-made diversion channel where it joins the Latrobe River north of the power station and mine.

The region features undulating terrain that rises over 300m in the Strzelecki Ranges to the south from the Latrobe Valley floor. Within the mining licence area lands contains sparse vegetation dominated by planted, exotic or highly modified vegetation it also includes small amounts of native vegetation in some parts.

Beyond the EnergyAustralia mining licence area, there are areas of remnant vegetation along waterways, particularly around the Latrobe and Morwell rivers.

Public infrastructure in the adjacent area to the mine includes the Latrobe Road to the east and Brown Coal Mine to the north. The Princess freeway runs through the mining licence area to the south-west of the Township Field mine. The V/Line railway line runs parallel to the Princess Freeway.

The region's climate is characterised by mild to warm summers and cool winters. In summer, the average temperature ranges from 24° C to 27° C and the minimum temperature ranges from 11° C to 13° C. In winter, the average maximum temperature ranges from 14° C to 15° C and the minimum temperature range is around 4° C. The average annual rainfall is 725mm with an average of 166 rain days per year. September is usually the wettest month with an average rainfall of 78mm, with an average of 17 rain days in the month. The lowest monthly rainfall on average is February, with a mean monthly rainfall of 40mm over 8 rain days.

### 1.3 CFA Fire Rating

The Yallourn power station and mine are located within CFA District 27 Region, which was established on the 1<sup>st</sup> April 2015. The establishment of CFA District 27 was the first CFA district to be established in some 53 years and was formed not as a direct response to the Hazelwood mine fire of 2014, but as a secondary effect to the resulting inquiry. District 27 is the umbrella organisation of 23 brigades spanning the Latrobe City's boundaries, with its headquarters based in Morwell.

In accordance with the Electrical Safety Act: 1998, Clause 80: Fire Hazard Rating, the CFA have assessed the Yallourn Mine as being a "high fire hazard". The CFA's assessment is contained in a DVD titled: "fire hazard ratings for the electrical safety act 1998 - Edition 2009".

**Figure 1** below provides the history of bushfire activity within the Yallourn area for the period 1923 - 1983.

**Figure 2 to Figure 5** below provide photos of fires that have historically impacted on Yallourn Mine.

The CFA have provided the following assessment of bushfire behaviour as it relates to the Yallourn Mine:

*"At a landscape scale, having consideration of vegetation, weather and topography there is a real and significant threat of high intensity bushfires reaching the Yallourn Mine.*

*North to north-westerly influenced weather patterns are associated with the most adverse conditions possible in Gippsland. With adverse conditions the likely forms of bushfire attack in the area would include ember attack and spotting into the area.*

*There is potential for spot fires to form ahead of the main fire front impacting on the area from various directions. Also, if the main fire front impacted on the area there is potential for other forms of bushfire attack including, radiant heat and direct flame contact.*

## Fire Control Management Plan

*Fires may emerge from the forest and could travel through existing vegetation, plantations and grasslands located around the township of Yallourn North and in locations such as Purvis Road and Latrobe River road, regenerating fire intensity relevant to the vegetation.*

*This could result in direct flame contact and radiant heat impacts to the Yallourn Mine site and EnergyAustralia estate, particularly from the northern aspects.*

*Historically, bushfires have frequently occurred in these areas. The years 1997/1998, 1999, 2001, 2004 and 2006/2007 have all seen bushfires occur in the heavily forested land within the northerly aspects of the Yallourn Mine. South-easterly wind changes also associated with adverse conditions in Gippsland have the potential to influence bushfire behaviour impacting on Tyers. Fire may spread across farmland, hardwood and softwood plantations in locations to the south east of the Yallourn Mine with fire emerging and impacting on the mine and associated assets. Bushfires of this nature occurred in 2014.*

*In a more extreme fire event, there is a potential for a convection driven fire (convection column over the Boola Boola or Tanjil State Forests) to move in from the north and west. This type of fire would move through the landscape in a manner, unaffected by local conditions (including weather, topography). When fires of this nature reach areas of lower fuel (for example: small acreage property's in the areas north of the Yallourn Mine) generally the convection column would "collapse" showering embers across the landscape and generating excessive winds (for example: 75 k.p.h)".*

Fire Control Management Plan

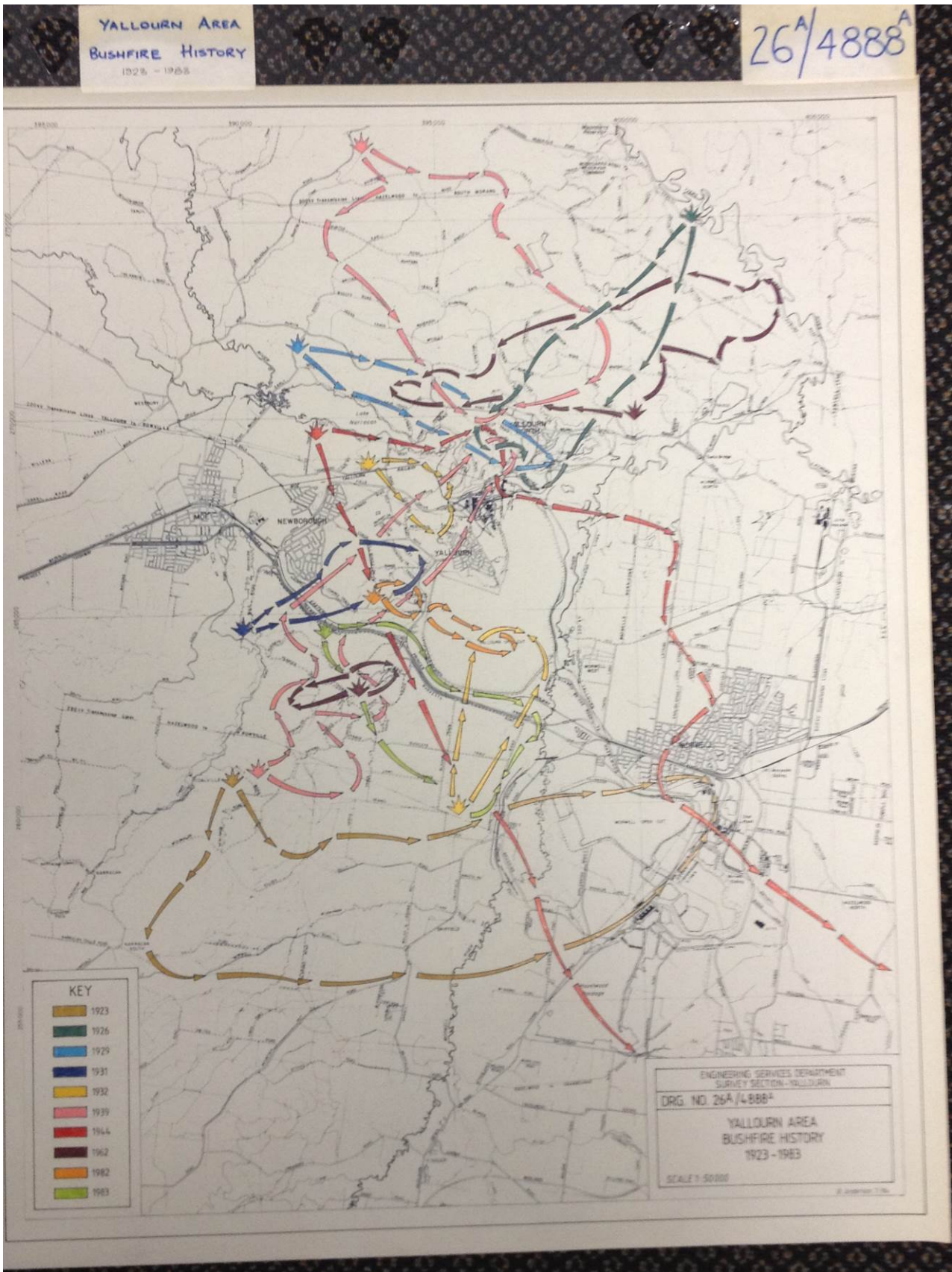


Figure 1 - Yallourn Mine - Bushfire History





Figure 2 - Open Cut Fire - 1929



Figure 3 - Open Cut Fire - 1933





Figure 4 - Hernes Oak Fire - February 2014



Figure 5 - Mine Fire - February 2014

## Fire Control Management Plan

### 1.4 Mining Operations

The potentially hazardous nature of open cut mining requires the application of sound fire management practices from mine management, to ensure a safe mining environment is both established and maintained.

Whilst fires within the mine can pose a significant risk to both public safety and the environment, a mine fire can also provide a risk to people within the mine and also mine related assets and impact on mine operations.

Due to the methods employed for the extraction and use of coal within the mine, large areas of brown coal are generally exposed in the operating faces, permanent batters and floor of the mine. These areas of exposure can exist in both the operating and non-operating areas of the mine, potentially representing a large area of risk to fire. Whilst the coal in its raw state is a high moisture fuel and difficult to burn, it weathers, dries and readily degrades to a fine dust which ignites easily under the right conditions.

Brown coal fires are best suppressed by the application of water, foam spray and also the use of earth moving equipment to apply material cover to smother the fire. Wetting of the coal settles the coal dust, and helps to extinguish the fire and prevent it spreading. Depending on the severity of a mine fire, large quantities of water may be required to extinguish deep seated fires and often when burning coal is wetted, and sufficient heat remains to dry out the surface again and to allow the fire to re-establish. Therefore, special fire suppression techniques are required to deal successfully with brown coal fires.

As most mine instability issues at Yallourn are water driven, and the suppression of mine fires often requires large volumes of water, where the firefighting water can enter surface cracks and coal joints causing a further hazard related to geotechnical instability. Geotechnical inspections may be required during both the response to the fire and also at the conclusion of the fire incident, to enable any actual or potential instability risks to be identified and corrective actions to be developed and implemented in a timely manner to ensure safe and stable mine conditions are maintained.

The impact of fire on mine stability can result in critical controls either being comprised or lost, including damage to or loss of surface drainage systems and monitoring infrastructure.

### 1.5 Fire Control Management Plan

This Fire Control Management Plan (FCMP) forms an integral component of EnergyAustralia Yallourn's SHE Management System and provides the framework, procedures and processes to effectively manage fire related hazards. The FCMP forms an essential component of the overall mining and fire management strategies to address design and operational issues. This plan is intended to provide the tools and processes necessary to help monitor, anticipate, modify designs, plan remedial works and either deal with or minimise the likelihood of "surprise" events.

The MRSD Act 1990, the OH&S Act: 2004, the CFA Act: 1958 and the Electrical Safety Act: 2004 require that EnergyAustralia Yallourn is able to demonstrate that it has adopted "sound practice" in the field of fire management as applied to mining to ensure that a safe working environment is maintained. The use of "sound practice" means that practices and methods will evolve and improve continually. EnergyAustralia Yallourn recognises that a well-managed FCMP is an essential component of a successful mining operation at Yallourn Mine.

Whilst brown coal mining operations at Yallourn have been carried out since the early 1920's, inherent fire hazards both internal and external to the mine pose a risk to employee safety, the safety and health of the public, the environment and continuity of operations.

These fire hazards must be effectively identified and controlled to ensure that a safe environment is maintained for both the public and employees and the surrounding environment.

## Fire Control Management Plan

This FCMP describes the procedures and processes for the effective management of fire related hazards.

The FCMP is a “live” document and is to be reviewed and revised on an “as needs basis”, and the resulting subsequent revisions to the plan are to be authorised prior to issue.

Fire protection in the mine is based on the following objectives:

- Define and continually evaluate mine fire safety programs, goals and objectives. Formulate and revise emergency response/recovery plans and fire instructions;
- Ensure fire prevention and suppression works are pre-planned and co-ordinated with neighbours and relevant agencies likely to be affected by mine activities;
- Integrate fire safety procedures into all work activities and planning in the mine;
- Provide and maintain an adequate communications system to mobilise and co-ordinate firefighting facilities;
- Provide adequate water supplies, reticulation systems and spray systems, together with the trained personnel necessary for the operation of these systems, to prevent or suppress fires;
- Provide adequate training, facilities and exercises (including participation with other relevant agencies) to ensure that each employee understands the appropriate techniques and mine procedures for fighting brown coal fires and undergoes refresher training sessions at regular intervals;
- Maintain appropriate design measures and good housekeeping practices to minimise loose dry coal build up in the mine, conveyors and coal bunker areas;
- Where practicable, maintain effective control of ignition sources such as cutting and welding, mobile equipment, motor vehicles and safe storage of potentially inflammable materials;
- Maintain effective land use planning controls and management of forested, wooded or grassed areas internal and external to the mine to inhibit the progress and effect of an external fire;
- Provide and maintain adequate back-up facilities to fight and control any fire;
- Continually monitor changing fire protection codes and standards, especially nationally recognised documents that set benchmarks for mining; and
- Monitor and evaluate all mine fire incidents and losses, and monitor experience in other mining operations to identify and address loss potential.

In order to properly protect all parts of the mine, the fire service pipe work, sprays and other facilities are to be installed as laid down in this FCMP and associated procedures.

### 1.6 Objectives of the Fire Control Management Plan

The objectives of this FCMP are to ensure that effective processes and procedures are established, implemented and maintained to enable the effective management of fire related hazards at Yallourn Mine.

In particular, a key objective of this FCMP is to control and minimise any impact from a mine fire on the environment and public and employee safety and health, mine assets and continuity of coal supply.

In summary, the key objectives include:

- Provide the systems and processes to effectively manage the risk associated with a mine fire that could be sourced from either within the mine or external to the mine;
- Ensure public safety and health is effectively maintained;
- Minimise the impact of fire on the surrounding environment;
- Ensure public infrastructure is not adversely impacted including for example: roads, railway lines, rivers, power infrastructure, etc.;
- Maintain a safe working environment for all employees, contractors and stakeholders;
- Maintain continuity of operations, including infrastructure associated with coal supply and overburden removal;
- Comply with all relevant legal and other requirements;
- Maintain an environment of continuous improvement.

### 1.7 Scope of the Fire Control Management Plan

This FCMP applies to all EnergyAustralia Yallourn land located within the mining licence area.

**Figure 6** below provides a plan of the mine licence area.

This includes but is not limited to both the operating areas of the mine and also to the previously worked out areas of the Yallourn Mine and extends to the inlet at the top of the RCB. Below the inlet at the top of the RCB, the power station is responsible for the control of fire hazards.

The FCMP defines the overall framework for the systematic and proactive approach to the management of fire hazards for the Yallourn Mine.

In particular, the FCMP provides a systematic approach to the identification, evaluation and control of fire hazards, monitoring, measurement, analysis and reporting of performance and the continual review of processes required to further improve performance.

The FCMP describes the structure, responsibilities, processes, expectations and operational parameters to enable the effective management of fire hazards, to ensure that the Yallourn Mine:

- fully complies with all relevant legal and other requirements;
- does not impact on public health and safety;
- does not adversely affect the surrounding environment from the impact of fires; and
- maintains a safe working environment for personnel.

**Figure 7** below provides a plan of EnergyAustralia Yallourn and the surrounding environment and shows key assets within the mine and surrounding area.



Fire Control Management Plan

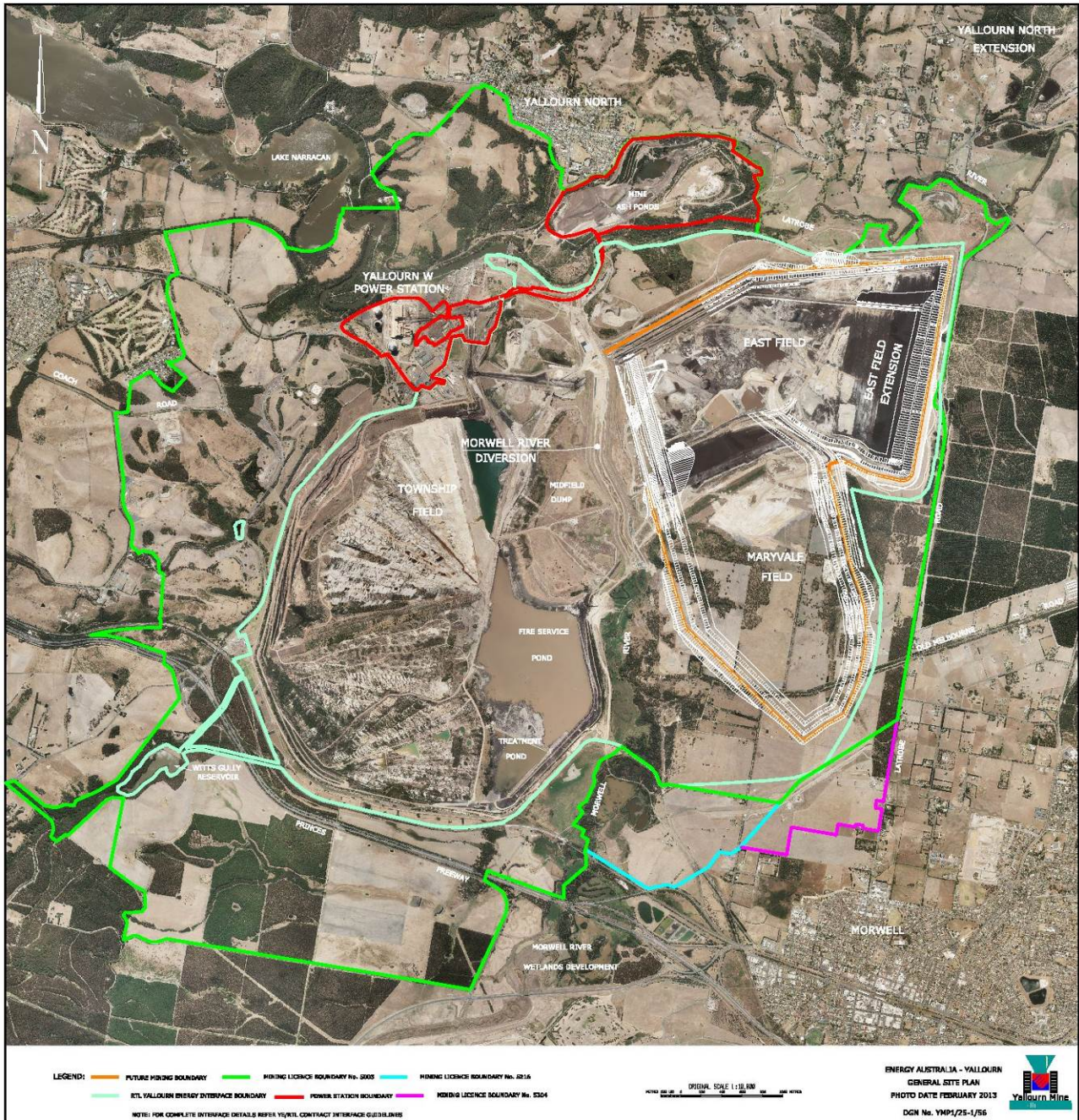


Figure 6 - Plan of Yalourn Mine Licence Area  
(Mine Drawing No. YMP1/25-1/56)



## Fire Control Management Plan



Figure 7 - EnergyAustralia Yallourn Mine and Surrounding Area

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## Fire Control Management Plan

The FCMP comprises this core document and refers to other fire related procedures and supporting documents. The key points from these procedures are summarised in this FCMP core document for reference only. The procedures provide the official documentation for the management of each aspect of fire hazard management, which are accessible and printable to all employees as “read only” documents from the company’s intranet.

**Figure 8** - provides details of a Management System model, which demonstrates the emphasis on continuous improvement.

**Figure 9** - provides an overview of the relationship between the various FCMP system elements and how the system maintains an environment of continuous improvement.

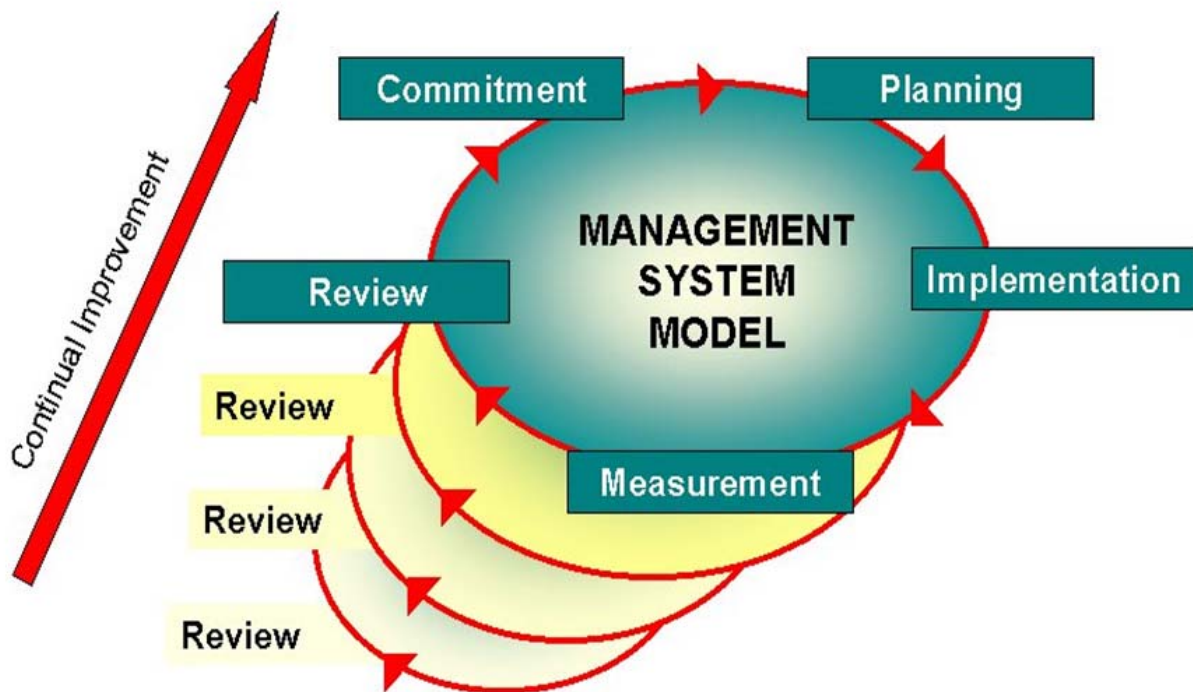


Figure 8 - Management System Model



# EnergyAustralia Yallourn



Figure 9 - Fire Control Management Plan Overview

## 1.8 Review of Fire Control Management Plan

The FCMP is a “live” document and in accordance with the MRSD Act: 1990 and the revised mining licence condition 1A (Risk Management) as advised by the Executive Director, Earth Resources Regulation in their letter dated 7<sup>th</sup> May 2015, the Fire Hazards Register (Risk Assessment) and this Fire Control Management Plan (Management Plan) shall be reviewed in accordance with Condition 1A.8, which requires:

- (a) Every 3 years on or before 31<sup>st</sup> August;
- (b) When requested to do so by the department head; or
- (c) Within 3 months of a Reportable Event described in section 41AB of the MRSD Act whichever is the earlier.

## 2 POLICY

### 2.1 EnergyAustralia Yallourn's SHE Policy - General

The Safety Health and Environmental (SHE) Policy is a key document as it establishes EnergyAustralia Yallourn's commitment to Safety Health and Environment, including certain actions that will be taken to achieve specified objectives. The SHE Policy is a public document and therefore represents a public commitment to achieve specified SHE outcomes.

In accordance with its SHE Policy, EnergyAustralia Yallourn is committed to carrying out its business operations with due regard to Safety, Health and Environmental regulatory requirements, community and employee expectations and the standards and codes of practice which underpin modern safety, health and environmental management.

EnergyAustralia Yallourn's SHE Policy, is a document of fundamental importance to the company, as it defines the company's SHE objectives and the processes for achieving these objectives.

A copy of EnergyAustralia Yallourn's SHE Policy: [SHEMS01-SHE-01 - Safety Health & Environment Policy](#) can be accessed via Fingertips and is available via 80-20 REF-116351

### 3 PLANNING

#### 3.1 Fire Hazards Register

##### 3.1.1 Introduction

EnergyAustralia Yallourn maintains a Fire Hazards Register which is located on fingertips under the Mine / Fire Control Management Plan.

The Fire Hazards Register is a key planning document in the identification and management of fire hazards for those fires that could be initiated from both within and external to the Mine.

The Fire Hazards Register considers those fire hazards that exist within the mine licence area that pose a risk to public safety and health, the environment, employee safety and mine operations.

The Fire Hazards Register records the assigned current level of inherent risk to each of the identified fire hazards and for those hazards which have an “unacceptable” level of current risk, the proposed additional controls to be implemented are determined so as to reduce the current level of inherent risk, down to an “acceptable” level of residual risk. At present, “unacceptable” risks are where the current level of risk is determined to be greater than “medium”. To reflect an environment of continuous improvement, progressively over time, the level of acceptable risk will be reduced to “medium”.

##### 3.1.2 Process

In order to identify the various fire hazards for the mine and the surrounding area, the risk assessment has been structured to consider each of the key mine fire domains as a means of structuring the risk assessment to identify the hazard and subsequently identify existing controls and current level of risk.

**Table 1** below provides a description of the key mine fire domains.

**Table 1 - Key Mine Fire Domains**

Area No.	Domain Description
1	Working area of the mine
2	Worked out area of the mine
3	Associated mining operations (monitoring and access)
4	Areas where work is still yet to be done
5	Perimeter Areas located outside the mine area.

**Figure 10** below provides a plan of the key fire domains.

**Figure 11** below provides details of the risk assessment process.

**Figure 12** below provides a description of the “cause and outcome” bow-tie model used in the risk workshops to review and update the Fire Hazards Register.

The bow-technique relies upon a **cause / outcome** scenario dynamic diagram. The diagram identifies and positions each known cause and contribution into pathways (types really) that may lead to a loss of control.

This loss of control may then lead to several outcome pathways (again, just types), and these are each identified and positioned.

## Fire Control Management Plan

The resulting diagram allows the identification of risk controls, which are identified as preventative controls (prior to the loss of control - i.e. able to prevent the loss of control) or mitigating controls (after the loss of control - i.e. only able to limit the level of consequence, but not able to stop the loss occurring).

The basic bow-tie shows the passage of events from left to right, starting with causes, and flowing through the loss of control, leading to outcomes (consequences).

The initial development of the Fire Hazards Register has been via facilitated risk assessment workshops which comprised a cross section of personnel with both expertise and experience in fire management and risk assessments. The risk assessment workshop also comprised experts independent of EnergyAustralia Yallourn, to assist in both the risk assessment process and the development of the subsequent management plan. The independent experts appointed had appropriate expertise in all facets of the risk assessment and management including mine safety and fire prevention, mitigation and suppression.

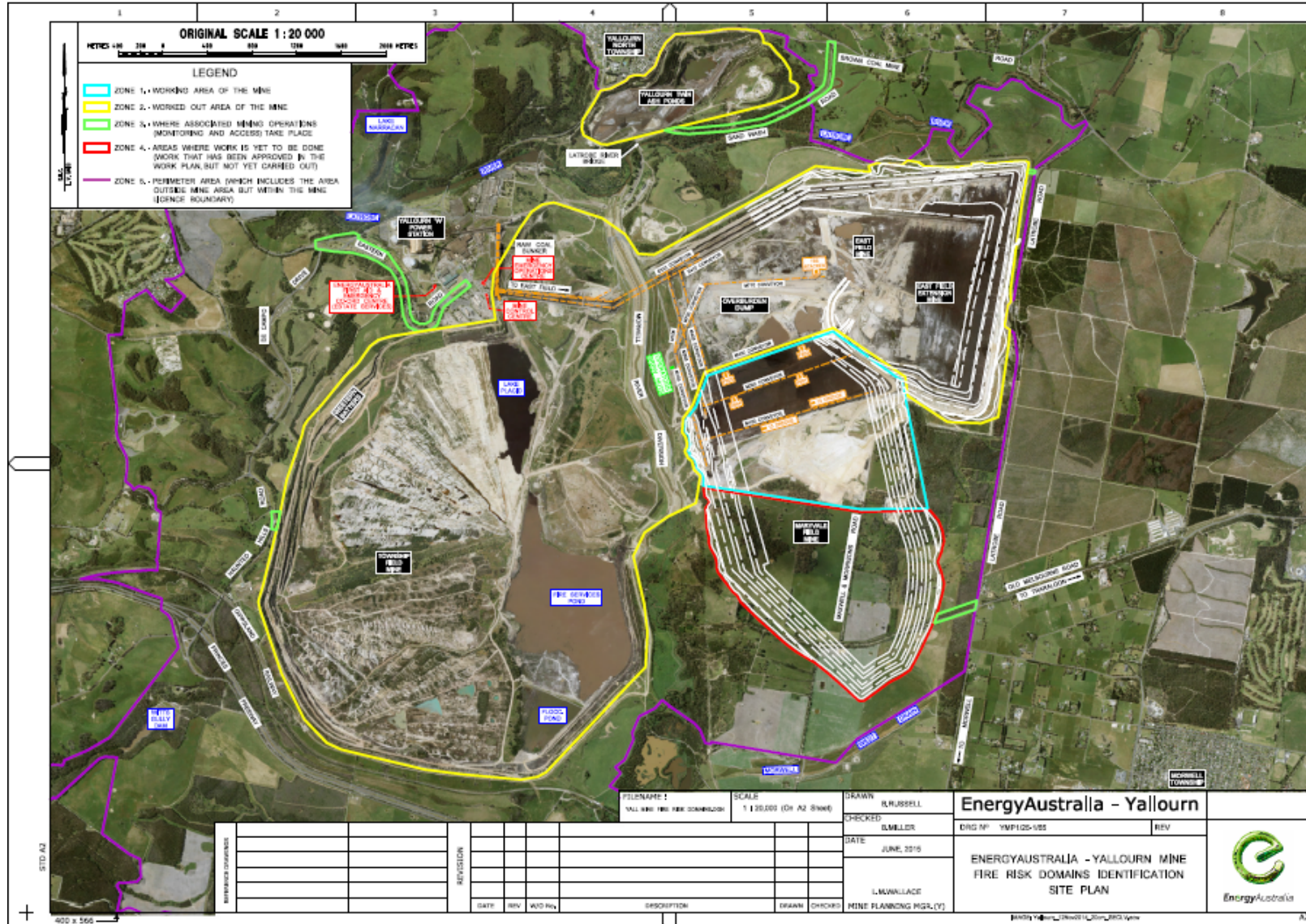
The primary objectives of the risk workshop are to:

- determine those fire hazards associated with fires that could potentially be sourced from both within and external to the mine;
- identify the potential hazards to the environment and public safety and health;
- determine the current inherent level of risk associated with the identified hazards;
- for those hazards where their current level of inherent risk is determined as being “unacceptable”, determine the additional controls required to reduce the current level of inherent risk to an acceptable residual level of risk;
- document the objective, targets and management plan for the implementation of the additional controls proposed to reduce the current level of risk
- document the findings of the risk workshop.

The Fire Hazards Register can be used as an input to the business planning processes to ensure that adequate resources are identified to enable fire hazards to be effectively managed and controlled. Fire hazards that are ranked as higher than “*medium*” are to be prioritised in implementing additional controls to reduce their current level of risk.



# Fire Control Management Plan



**Figure 10 -- Mine Fire Domains**  
 (Mine Drawing No. YMP1/25-1/65) (REF-193498)

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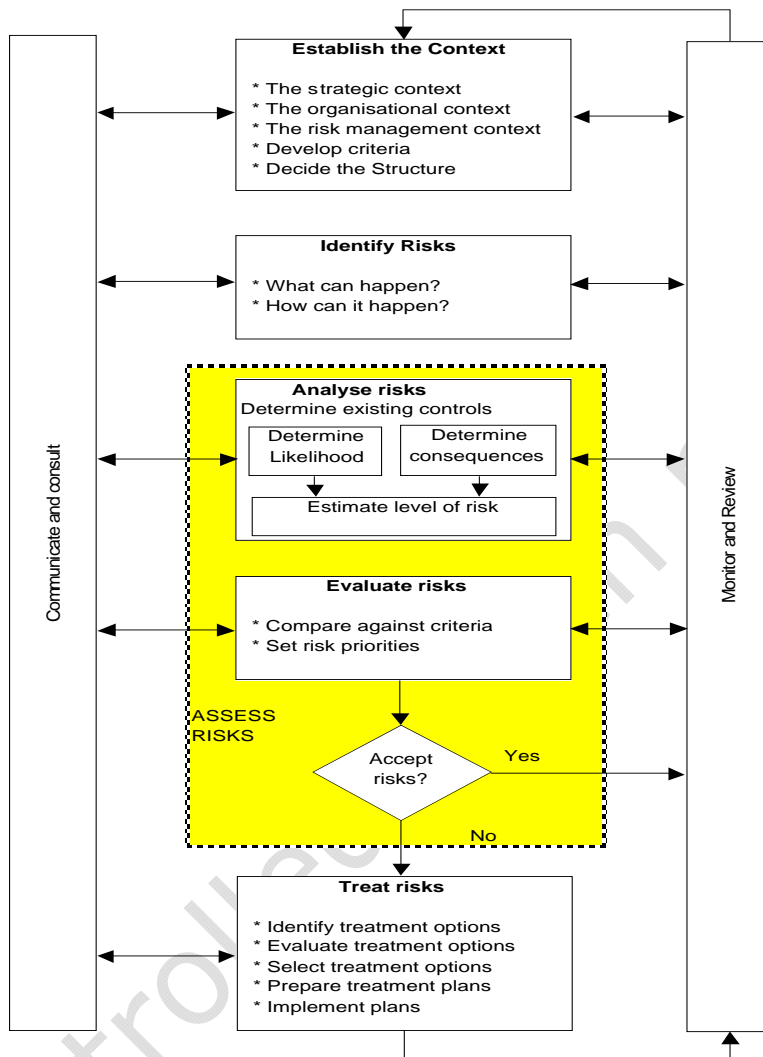
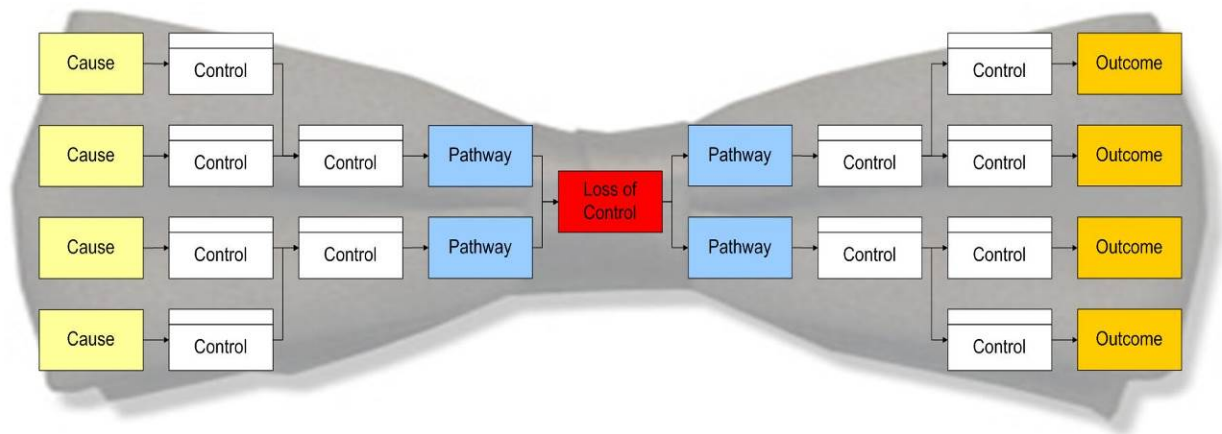


Figure 11 - Risk Process Diagram

## Fire Control Management Plan



**Figure 12 - Generic Bow-Tie Scheme**

The risk assessment process is based on the Team Based Risk Assessment process and is described in the YMA Procedure - [YMA-OPS-PR-0313 - Risk Assessment Process](#) (REF-137299); and YMA form - [YMA-OPS-FO-0312 - YMA Risk Assessment Template](#) (REF-137015)

The risk assessment process is to be consistent with the “step-by-step” approach described in the Australian Standard AS/NZS ISO 31000: 2009 - Risk Management - Principles and Guidelines.

The initial fire risk assessment process that was completed in June - July 2015 included an independent expert, who had expertise in the risk assessment process and also in fire prevention, mitigation and suppression.

The risk calculation is based on:

$$\text{Risk Score (R)} = \text{Probability (P)} \times (\text{Severity (S)} + \text{Exposure (E)})$$

**Table 2** below provides details of the risk category, and corresponding risk score used in the risk assessment process.

**Table 2 - Risk Scores**

Category of Risk	Risk Score R (Points)
Very Low	<15
Low	16 - 39
Medium	40 - 99
High	100 - 399
Very High	400 - 599
Extreme	> 600



## Fire Control Management Plan

The risk assessment process considered:

- those hazards that could potentially impact on public safety and / or the environment;
- fires that could be initiated from outside the mine and subsequently enter the mine, and also fires that are initiated from within the mine;
- the controls for prevention, mitigation and suppression, irrespective of the source and location of the fire.

The risk assessment considered the following domains within the mine licence boundary:

1. Working area of the mine;
2. Worked out area of the mine;
3. Where associated mining operations (monitoring and access) take place;
4. Areas where work is still yet to be done (work that has been approved in the work plan, but not yet carried out); and
5. Perimeter area (which includes the area outside the mine area, but within the mine licence boundary).

Refer to **Figure 10 -- Mine Fire Domains** above.

**For the Environment:** the risk assessment considered the geography, topography, biological, climate, socio-demographic, geological and hydrological factors for the mine and the surrounding locality. Particular attention was given to identifying environmental receptors that could be harmed from a single event or gradually over a period of time as a result of the mining operation.

**For Public Safety:** the safety of all people who are not engaged through employment or contracts to provide services to the mine irrespective of whether they are within the area of the mining licence or the surrounding locality.

Controls can include physical, system and behavioural controls.

The risk controls that are identified to reduce the current level of risk, where practicable are to be quantifiable risk control standards. This also applies to the existing controls, where practicable.

Where the assessed current level of risk is assessed as being “unacceptable”, additional controls in the form of objectives, targets and programs (Safety Health and Environmental Management Plans - SHEMP's) are identified, developed and implemented, to reduce the current level of risk to as low as reasonably practical (ALARP).

Upon the completion of the SHEMP, to implement the additional controls, the residual risk can then be calculated to confirm that the risk level has been reduced to an acceptable level. The planning processes ensure that higher risk areas are prioritised and their current risk level is reduced to an acceptable level, thereby fostering an environment of continuous improvement.

In accordance with DEDJTR's document titled: “Requirements for Compliance with Risk Management Conditions” any hazard(s) that is assessed as having a risk score greater than **medium** (risk score greater than 100) is to have additional controls identified to reduce the current level of risk to an acceptable level.

The reasons why the options that were not selected as the most reasonably practicable action(s) should be provided. In addition the treatment options (controls) for risks rated as medium or lower must be included if they are different from the controls in DEDJTR's guideline on completing a risk-based work plan in DEDJTR's RRAM - Refer **Figure 13** below.

## Fire Control Management Plan

In relation to fire risks, the risk assessment must consider controls for prevention, mitigation and suppression, irrespective of the source and location of a fire.

The selected controls to reduce the risk will be recorded in a Safety Health and Environmental Plan (SHEMP), which records the actions to be taken, timeframe for completion and responsible person(s) for the identified action(s).

### DEDJTR Risk Process

For the purposes of updating the DEDJTR work plan via RRAM, for those hazards that have been assessed as having a risk score greater than medium, then the risk will be re-assessed using the DEDJTR risk assessment process reflected in the DEDJTR RRAM Work Plan Guideline for risk assessments.

**Figure 13** below provides a copy of the DEDJTR RRAM Work Plan Guideline document for risk assessments.

The DEDJTR risk calculation is based on: **Risk Score (R) = Consequence x Likelihood**

### RRAM Work Plan Guideline

Consequence Rating	Public Safety	Community Facilities	Environment
<b>Critical</b>	<ul style="list-style-type: none"> <li>One or more fatalities or life threatening injuries or illness</li> <li>Public exposed to a severe, adverse long-term health impact or life-threatening hazard</li> </ul>	<ul style="list-style-type: none"> <li>Services suspended for an extended (years); period of time</li> <li>&gt;100,000 people being unable to access the service or experiencing disrupted access to the service</li> </ul>	<ul style="list-style-type: none"> <li>Irreversible widespread damage to:                             <ul style="list-style-type: none"> <li>Local species (Biodiversity)</li> <li>Groundwater Dependent Ecosystems</li> <li>Groundwater and surface water quality</li> </ul> </li> <li>Significant capability to mitigate environmental pollution events</li> <li>Damage will require Government to assume control of the risk, support, provision of significant resources including specialist equipment and resources from Government agencies</li> </ul>
<b>Major</b>	<ul style="list-style-type: none"> <li>One or more injuries or illness requiring surgery or hospitalisation</li> <li>Public exposed to a hazard that results in surgery or permanent displacement</li> <li>Hospitalisation for extensive treatment (minor injury or illness &gt; 4 weeks)</li> </ul>	<ul style="list-style-type: none"> <li>Services suspended for a major (months) period of time</li> <li>50,000 – 100,000 people being unable to access the service or experiencing disrupted access to the service</li> </ul>	<ul style="list-style-type: none"> <li>Extensive, reversible and long term remediation (but longer than 3 years); or irreversible and localised damage:                             <ul style="list-style-type: none"> <li>Local species (Biodiversity)</li> <li>Groundwater Dependent Ecosystems</li> <li>Groundwater and surface water quality</li> </ul> </li> <li>Damage will require provision of specialist equipment and resources from Government agencies</li> </ul>

Consequence Rating	Public Safety	Community Facilities	Environment
<b>Moderate</b>	<ul style="list-style-type: none"> <li>One or more injuries or illness requiring treatment by a physician or hospitalisation</li> <li>Public exposed to a hazard that could cause injuries or health effects requiring treatment by a physician or hospitalisation</li> <li>Hospitalisation (e.g. for observation) for injury or illness &lt; 4 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Services suspended for a moderate (weeks) period of time</li> <li>1,000 – 50,000 people being unable to access the service or experiencing disrupted access to the service</li> </ul>	<ul style="list-style-type: none"> <li>Localised, extended (remediation time &lt; 3 years) and reversible damage:                             <ul style="list-style-type: none"> <li>Local species (Biodiversity)</li> <li>Groundwater Dependent Ecosystems</li> <li>Groundwater and surface water quality</li> </ul> </li> <li>Damage will require provision of specialist equipment from Government agencies</li> </ul>
<b>Minor</b>	<ul style="list-style-type: none"> <li>One or more injuries or illness requiring treatment by a qualified first aid person</li> <li>Public exposed to a hazard that could cause injuries or adverse health effects requiring treatment by a qualified first aid person</li> <li>Medical treatment required for injury or illness (but not resulting in hospitalisation) – not a lost time injury</li> </ul>	<ul style="list-style-type: none"> <li>Services suspended for a minor (days) period of time</li> <li>100 – 1,000 people being unable to access the service or experiencing disrupted access to the service</li> </ul>	<ul style="list-style-type: none"> <li>Localised, temporary (remediation time &lt; 1 year) and reversible damage:                             <ul style="list-style-type: none"> <li>Local species (Biodiversity)</li> <li>Groundwater Dependent Ecosystems</li> <li>Groundwater and surface water quality</li> </ul> </li> <li>Damage will require provision of specialist advice from Government agencies</li> </ul>
<b>Insignificant</b>	<ul style="list-style-type: none"> <li>An injury or ailment that does not require medical treatment by a physician or a qualified first aid person (e.g. minor bruise, cuts, abrasions, etc. involving only local first aid)</li> </ul>	<ul style="list-style-type: none"> <li>Services suspended for a negligible (hours) period of time</li> <li>&lt;100 people being unable to access the service or experiencing disrupted access to the service</li> </ul>	<ul style="list-style-type: none"> <li>Superficial, short term damage with cosmetic remediation required for impacts on:                             <ul style="list-style-type: none"> <li>Local species (Biodiversity)</li> <li>Groundwater Dependent Ecosystems</li> <li>Groundwater and surface water quality</li> </ul> </li> <li>Damage will not require any involvement from a Government agency</li> </ul>

Rating	Description of rating	Indicative combined frequency of exposure and the controls fail	Indicative frequency of exposure	Probability	Historical
Almost certain	Very high probability of the consequences occurring during the project life	One or more events per year	Once a week to daily	Has a > 99% chance of occurring if the activity is not mitigated	Has occurred several times in the past year and in each of the previous 5 years in Victoria
Likely	High probability of the consequences occurring during the project life	At least one event every 2 years	Once a month to weekly	Has a 70-90% chance of occurring if the activity is not mitigated	Has occurred once or twice in the past year and in each of the previous 5 years in Victoria
Possible	Even probability of consequences occurring during the project life	One event per 5 – 10 years	Once a year to monthly	Has a 30-70% chance of occurring if the activity is not mitigated	Has occurred in the past 5 years in the industry, but not in Victoria
Unlikely	Low probability of occurrence during the project life but not negligible	One event per 17 – 50 years	Once in 5 years to annually	Has a 5-30% chance of occurring if the activity is not mitigated	Has occurred once or twice in the industry

Rating	Description of rating	Indicative combined frequency of exposure and the controls fail	Indicative frequency of exposure	Probability	Historical
Rare	Very low probability of the consequences occurring during the project life but not impossible	Less than one event per 50 years	Greater than 5 years	May occur in exceptional circumstances, i.e. less than 5% chance of occurring if the activity is not mitigated	Unheard of in the industry and has not occurred in the past 5 years

Risk Assessment Rating Matrix

Table 7.

Consequence	Likelihood				
	Rare	Unlikely	Possible	Likely	Almost Certain
Critical	Medium	Medium	High	High	Very High
Major	Low	Medium	Medium	High	High
Moderate	Low	Low	Medium	Medium	High
Minor	Low	Low	Medium	Medium	Medium
Negligible	Low	Low	Low	Medium	Medium

Figure 13 - RRAM Work Plan Guideline - Risk Assessment

### 3.2 Legal and Other Requirements

#### 3.2.1 General

For EnergyAustralia Yallourn, legal compliance is not negotiable, it is a given.

It is essential that EnergyAustralia Yallourn understands the applicable legal and other requirements, and in particular how these relevant legal and other requirements specifically apply to EnergyAustralia Yallourn's operations, and what needs to be completed to ensure compliance. Internal EnergyAustralia Yallourn monitoring and measurement processes, inspections, internal auditing processes, etc. are utilised to verify the level of compliance with the relevant legal and other requirements.

A register of SHE legal and other requirements is maintained on EnergyAustralia Yallourn intranet which provides a list of the various legal and other requirements applicable to EnergyAustralia Yallourn's operation.

Developments in Acts and Regulations in the State and Federal jurisdictions are monitored and incorporated into the registers as appropriate.

EnergyAustralia Yallourn maintains a number of SHE Legal Application Registers, which describe in "plain English" how the relevant legal and other requirements specifically apply to EnergyAustralia Yallourn's operations. The SHE Legal Application Registers describe the applicable relevant legal requirements, what EnergyAustralia Yallourn must do to ensure compliance, the responsible officer and the means of confirming compliance. All employees have read only access to the SHE Legal Application Registers which are maintained on EnergyAustralia Yallourn's intranet site called "*Fingertips*".

#### 3.2.2 Principle Legal and Other Requirements

The principle legal and other requirements applicable to the operation and maintenance of the Yallourn Mine include:

##### Legal Requirements:

- Mineral Resources (Sustainable Development) Act: 1990 (MRSDA);
- Mineral Resources (Sustainable Development) (Mineral Industries) Regulations: 2013;
- Mineral Resources (Sustainable Development) (Extractive Industries) Regulations: 2010;
- Environment Protection Act: 1970 and associated SEPP's;
- Occupational Health and Safety Act: 2004 and associated regulations; and
- Water Act: 1989;
- CFA Fire Act 1958 and Regulations: 2014;
- Electrical Safety Act: 1998;
- Electrical Safety (Bushfire Mitigation) Regulations: 2003;
- Electrical Safety (Cathodic Protection) Regulations: 2009
- Electrical Safety (Electric Line Clearance) Regulations: 2010.

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### Other Requirements:

- Mining Licences 5003, 5216 and 5304 and approved Work Plan Variations;
- Environmental Management Plan;
- Rehabilitation Master Plan;
- Conservation Management Plan;
- EPA Accredited Licence No. EM 29213;
- Ground Water Licence No. 2007403, August 1996;
- SRW Licence WLE048339 - Witts Gully Reservoir;
- YMA certified SHEQ Management System;
- EnergyAustralia Yallourn's certified SHE Management System;
- Electrical Safety Management System (ESMS) approved by Energy Safe Victoria (ESV);
- ANCOLD Guidelines for Dam Safety Management

[Appendix No. 1](#) - provides further information on legal and other requirements.

### 3.2.3 Declared Mine Requirements

The Minister for Energy and Resources advised in a letter to EnergyAustralia, dated 20<sup>th</sup> January 2015 of variations and additions to the conditions of Yallourn's mining licence MIN5003. The letter explained the new reporting arrangements to be provided to the department by the 30<sup>th</sup> September each year. The reporting requirements require, as a minimum:

- The area of rehabilitation completed in the reporting period;
- The cumulative area rehabilitated since mining commenced;
- A map showing worked areas, areas cumulatively rehabilitated and areas rehabilitated in the reporting period.

The abovementioned letter from the Minister also contained requirements relating to Risk Management, which requires the licensee to complete certain requirements, including:

- 1A.1 Definitions: The Department Head has the same meaning as that term is defined in section 4(1) of the MRSD Act.
- 1A.2 Conduct a risk assessment and submit a risk assessment and management plan in accordance with Condition 1A.4 by 31st August 2015;
- 1A.3 Appoint an independent expert or independent experts to assist in the preparation of the Risk Assessment and Management Plan;
- 1A.4 The Risk Assessment and management Plan shall:
  - (a) Assess the risk (likelihood and consequence) to the environment and public safety from the work done or proposed to be done under the licence, including but not limited to the prevention, mitigation and suppression of fire entering or breaking out in the licensed area.
  - (b) Review certain documents when preparing the Risk Assessment and Management Plan;

## Fire Control Management Plan

- (c) Detail quantifiable risk control standards to be achieved to protect the environment and public safety;
- (d) Identify the most reasonably practicable effective actions to manage the risk(s) identified under condition 1A.4(a) as the requirements of condition 5 and condition 18 so as to protect the environment and public safety, to the standards listed under condition 1A.4(c)
- 1A.5 The risk assessment and management plan must be to the satisfaction of the Department Head
- 1A.6 No later than 3 months after approval of the Risk Assessment and management Plan, the licensee shall submit to the Department head a work plan variation application in order to incorporate into the work plan any work required by the Risk Assessment and Management Plan.
- 1A.7 provide to the department head a statement of compliance in respect of each 12 month period ending on 30th June within 3 months after the end of the period to which it relates. The statement of compliance must detail the progress in implementing actions in the Risk Assessment and Management Plan, and any other plan. The statement of compliance is to be certified by the CEO (or delegate).
- 1A.8 Review the Risk Assessment and Management Plan:
  - a) Every 3 years on or before 31<sup>st</sup> August;
  - b) When requested to do so by the department head; or
  - c) Within 3 months of a reportable Event as described in Section 41AB of the MRSD Act, whichever is earlier.

### 3.3 Objectives, Targets and Programs

Based on the findings of the risk assessment workshop, in accordance with the Department's RRAM Work Plan Guideline for risk assessments, those risks that are identified as having a current level of risk higher than "**medium**", shall have additional controls identified and implemented to reduce the current level of inherent risk down to an acceptable level of residual risk.

In accordance with DEDJTR's requirements, the controls that were identified in the risk assessment workshop are to be recorded within an Implementation Plan. DEDJTR require that the Implementation Plan should describe the improvements in risk assessments and controls that will be introduced over a three (3) year period.

In accordance DEDJTR's document titled: "Risk Management Conditions for Latrobe Valley Coal Mine Licences" dated 7<sup>th</sup> May 2015, the controls in the risk assessment and management plan should include:

- The risk mitigation purpose (objective) of each control;
- Criteria or measures to be satisfied (standard) to demonstrate the effective operation of each control;
- A description of the selected controls;
- The targeted or residual risk arising from the effective operation of each control; and
- Reference to policies, guidelines, instructions that apply to each control.

All actions arising from the risk assessment and management plan that need to be implemented must have key achievements or events identified as milestones. The key achievements or events must be set out in an implementation plan that details each action. The implementation plan is to form part of the risk assessment and management plan.

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The implementation is to identify (as a minimum):

- The new actions to be introduced;
- The tasks required to introduce the new actions;
- Dates of commencement, milestones and completion.

To facilitate the implementation of the identified additional controls, objectives, targets and programs (Safety Health and Environmental Management Plans - SHEMPs - 80-20 [REF-110767](#)) are to be developed and implemented to facilitate the implementation of the additional controls identified. The development of the SHEMP shall record the actions required, timeframe for completion and responsible officer for the required action.

Upon the completion of SHEMP to achieve the implementation of the additional control(s) identified, the residual risk can then be calculated to confirm that the risk level has been reduced. The planning process ensures that higher “unacceptable” risks are prioritised and the identified risks are reduced to acceptable levels, thereby fostering an environment of continuous improvement.

The setting of objectives and targets may be considered during the planning forums where the Fire Hazards Register is reviewed and updated. Objectives and targets may also be established during the course of a given year based on an identified need.

The development of objectives and targets and SHEMP's shall consider the hierarchy of controls for the management of risk, where elimination is the preferred control - that is:

1. Elimination;
2. Substitution;
3. Isolate;
4. Engineering Controls;
5. Administrative (Procedural) Controls;
6. Personal Protective Equipment (PPE).



## 4 IMPLEMENTATION AND OPERATION

### 4.1 Organisation Structure

EnergyAustralia Yallourn and RTL mining and Earthworks (RTL) have formed a Yallourn Mine Alliance (YMA) contract for the operations, maintenance and development of the Yallourn Mine. The YMA consists of EnergyAustralia Yallourn and RTL personnel.

### 4.2 Resources, Roles, Responsibility and Authority

#### 4.2.1 General

For key positions within the mine, post description forms (PDF's) are maintained which document the key responsibilities associated with the position. For EnergyAustralia Yallourn personnel, these PDF's are located within the EnergyAustralia Yallourn Human Resources system and for RTL personnel they are located within the RTL filing system.

#### 4.2.2 Responsibilities

All personnel are responsible for the following:

- Being alert and on watch for any outbreak of fire and reporting the first sign of fire ;
- Taking action to extinguish any fire immediately it is observed, if safe to do so;
- Reporting all fires to the Mine Control Centre and / or the Fire Service Officer, as soon as possible;
- Assisting other personnel already fire-fighting as directed by the Fire Service Officer;
- Completing work they are assigned in accordance with approved specified mine plans;
- Only performing tasks that they are trained and competent to perform;
- Advising the Fire Service Officer of any fire hoses, fire extinguishers, valves, sprays, hydrants or any other fire-fighting equipment that has been used or damaged so that replacement items can be sourced;
- Not using fire-fighting equipment for purposes other than for firefighting unless authorised by the Fire Service Officer;
- Reporting to the Fire Service Officer any missing, incomplete or malfunctioning firefighting equipment; and
- Complying with Company procedures and processes, in relation to risk of fire mitigation, on the site.

The Manager Mining is responsible for:

- As the registered Mine manager, fulfil the requirements of Mine Manager as described within the Mineral Resources (Sustainability Development ) Act: 1990;
- Ensuring that all legal and other requirements are complied with;
- Ensuring that this FCMP and any subsequent revisions to the FCMP are approved;
- Ensuring that an approved Work Plan Variation is maintained in accordance with regulatory requirements;

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- Ensuring that regulatory authorities are advised of incidents that are classified as being “notifiable incidents”, under legal legislation;
- Via the Business Planning processes, ensuring that adequate resources are allocated to enable the implementation and maintenance of this FCMP;
- Facilitating the review and update of this FCMP, at regular intervals;
- Maintaining fire service related infrastructure for the mine to manage fire risk;
- Overall compliance with this FCMP;
- Ensuring that the Electrical Line Clearance plan is reviewed prior to the Bushfire Mitigation Plan, in accordance with procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100);
- Nominating a responsible person to carry out an audit of the Bushfire Mitigation Plan, in accordance with procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100);
- Providing the necessary resources to enable compliance with this Fire Control Management Plan;
- The Bushfire Mitigation Plan being developed, managed and implemented for the Yallourn Mine as defined within the Bushfire Mitigation Plan;
- Implementing the Mine component of the Bushfire Mitigation Plan as defined within procedure [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100); and
- Ensuring that cathodic protection testing is completed and the resulting test certificates are provided to Energy Safe Victoria, by the testing company. Test certificates provided by Energy Safe Victoria are to be filed within EnergyAustralia Yallourn’s document management system.

**The Mine Manager** is responsible for all fire protection within the Mine and the surrounding area as outlined in this FCMP. Specific responsibilities include:

- Operation and maintenance of the mine and the implementation of the FCMP and associated procedures to minimise fire risk as defined within procedure: [SHEMS11-SHE-P016 - Fire mitigation Strategies for the EnergyAustralia Yallourn Site](#) (REF-187205);
- Ensuring fire service audits are carried out and recommended corrective actions are taken;
- Declaration of Fire Alert Days in conjunction with the Fire Service Officer;
- Notifying the CFA (via. Estate Services) where a fire within the mine has the potential to spread beyond the capability of the site’s fire response capacity or for other fire related emergency situations;
- The operation and maintenance of the mine and the implementation of this FCMP and associated procedures to minimise the bushfire risk in the mine, as defined within the [SHEMS11-SHE-P015-L01 - EnergyAustralia Yallourn Bushfire Mitigation Plan](#) (REF-144347);
- Ensure that all personnel including contractor’s employees are trained and competent to perform their allocated duties as defined within this FCMP and associated procedures;
- Ensure that all relevant legal and other requirements are complied with;
- Ensure that all relevant operational procedures are effectively maintained and authorised for issue;
- Ensure that corrective actions identified via field inspections, etc. are addressed and effectively closed out within agreed timeframes;

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- Ensuring routine fire related inspections are completed and records maintained and resulting actions are recorded and closed out in a timely manner; and
- The fire service system is maintained and extended to reflect the development of the mine in accordance with the requirements of this FCMP.

**The Fire Service Co-ordinator** is responsible for:

- Ensuring this FCMP and associated fire service procedures are maintained and fully implemented;
- Conducting audit(s) of the FCMP and associated procedures;
- Conducting routine checks to ensure approved inspection and monitoring routines are completed and associated records are maintained within the EAY document management system;
- Co-ordinating the preparation and submission of compliance reports to DEDJTR in accordance with regulatory requirements, including an independent audit to verify the level of compliance;
- Facilitating the preparation of the annual fire service development plans to reflect the mine development;
- Ensuring fire service operating and maintenance procedures are maintained;
- Ensuring that fire service coverage complies with this FCMP;
- Ensuring that the Fire Hazards Register is reviewed and updated in accordance with this FCMP;
- Co-ordinating the implementation plan for the development and implementation of the additional controls (SHEMP's) as identified during the fire risk assessment workshop and as provided to DEDJTR in response Condition 1A - Risk Management;
- Monitoring progress in the implementation of the approved SHEMP's and ensure that the SHEMP's are updated to record the action(s) taken;
- Facilitating the annual compliance reporting to DEDJTR as described in Condition 1A.7 - Risk Management, including the independent auditing of the statement of compliance before it is certified by the Chief Executive Officer. Note: The Statement of Compliance is to include evidence of such an audit;
- Reviewing the capacity of the fire service system against the mine development requirements to ensure the fire service system has adequate capacity to meet the requirements of this FCMP;
- Co-ordinating cathodic protection testing of the fire service system and associated reporting to ESV; and
- In accordance with Condition 1A.8 facilitating the review of the Fire Hazards Register and this FCMP:
  - every 3 years on or before 31<sup>st</sup> August, or
  - when requested to do so by the department head; or
  - within 3 months of a Reportable Event as described in Section 41AB of the MRSD Act, whichever is the earlier.

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**The Fire Service Officer** is responsible for ensuring that day to day fire service activities within the mine comply with this Fire Control Management Plan. Specific responsibilities include:

- Monitoring and reporting on the status of the mine in relation to this FCMP;
- The operation and maintenance of the fire protection installations and related services in the mine;
- Firefighting operations;
- Conducting allocated fire service inspections and ensuring corrective actions are developed and implemented to address issues identified;
- Reporting all fires;
- Providing support to the Estate Services Incident Controller and CFA Incident Controller where required, in the event of a fire emergency situation;
- Inspecting and maintaining all firefighting equipment;
- Issuing of hot work permits and defining precautions to be taken when hot works is being done and during the fire watch period after the work has been completed; and
- In conjunction with the Workshop Foreman, approving vehicles for access onto coal areas within the mine.

**Shift Production Supervisors** are responsible for the activities of the Fire Service Officer outside of normal day work hours or until relieved. Specific responsibilities include:

- Maintaining housekeeping standards for mine operating equipment and working areas;
- Reporting all fires to the Fire Service Officer; and
- Ensuring all personnel follow the relevant fire service procedures and processes.

**Project Engineers, Asset Managers and Mine Planners** are responsible for ensuring that all work under their control meets the requirements of this Fire Control Management Plan.

**The Mine Planning Manager** is responsible for ensuring that:

- Fire service infrastructure is designed and constructed in accordance with mine development requirements;
- Mine progress plans are provided to a fire service design consultant to facilitate the development of the fire service plans to reflect the mine development requirements;
- Mine rehabilitation is progressed in accordance with the approved business plan and the approved Rehabilitation Master Plan (RMP);
- Bushfire mitigation plans are completed prior to the declared fire season;
- The lease agreement is managed so as to ensure grass and other vegetation is maintained in a safe condition so as to comply with the requirements of the Bushfire Mitigation Plan, prior to each declared fire season; and
- Depending upon the severity of mine fire, arrange for geotechnical reviews of fire affected batters to ensure their ongoing stability against the impact of fire and firefighting water. This geotechnical review may need to occur both during a fire and also following the containment of the fire.

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**Mine Environmental Engineer** is responsible for:

- As a member of the Wildfire Risk Mitigation Committee assisting in the preparation of the annual Wildfire Risk Mitigation Plan by mid-September and assist in the fuel reduction process during the fire danger period co-ordinate the each year as defined within procedure: [SHEMS11-ESV-P001 - Wildfire Risk Mitigation](#) (REF-139611);
- Updating the Bushfire Mitigation Plan on an annual basis as defined within procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100) and the [SHEMS11-SHE-P015-L01 - EnergyAustralia Yallourn Bushfire Mitigation Plan](#) (REF-144347);
- Arranging for an audit to be conducted of the Bushfire Mitigation Plan to be used to assist in updating the Bushfire Mitigation Plan, and once updated co-ordinate the approval of the new / revised Bushfire Mitigation Plan by the Executive Manager, Yallourn in accordance with procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100). Once approved the revised plan is to be saved into 80-20 as the new version of the controlled [SHEMS11-SHE-P015-L01 - EnergyAustralia Yallourn Bushfire Mitigation Plan](#) (REF-144347);
- The management of vegetation in accordance with the Conservation Management Plan and the Environmental Management Plan in accordance with the [SHEMS11-SHE-L01 - Electricity Safety \(Electrical Line Clearance\) Plan](#) (REF-144276);
- Ensuring that the removal of vegetation is conducted in accordance with procedure: [SHEMS10-SHE-P001 - Removal of Vegetation on the EnergyAustralia Yallourn Site](#) (REF-140771), as defined within with the [SHEMS11-SHE-L01 - Electricity Safety \(Electrical Line Clearance\) Plan](#) (REF-144276);
- Maintaining the hydraulic model for the fire service system to ensure that it meets the Maximum Supply Demand requirements for the fire service system as defined within this Fire Control Management Plan;
- Developing and maintaining the 5 year rehabilitation rolling plan, and the annual rehabilitation plan, including annual key performance indicators for topsoil and land rehabilitation;
- Co-ordinating field rehabilitation activities in accordance with the approved CMP and RMP and the annual business plan; and
- Monitoring and report progress against the approved plans.

**Electrical Engineer Mine** is responsible for:

- The Electrical Asset Management component of the Bushfire Mitigation Plan and the procedure - [YMA-OPS-PR-0374 - Management of LV & HV Overhead Distribution System](#) (REF-140752) as defined within procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100); and the [SHEMS11-SHE-L01 - Electricity Safety \(Electrical Line Clearance\) Plan](#) (REF-144276).
- The management of vegetation near power lines on the Yallourn Site, including
  - Preparation of the Electric line Clearance Management Plan by the 31<sup>st</sup> March each year;
  - Implementation for the Electric Line Clearance Plan;
  - Full implementation of the inspection routine; and
  - Number of defects raised for vegetation clearance near power lines, as defined within with the [SHEMS11-SHE-L01 - Electricity Safety \(Electrical Line Clearance\) Plan](#) (REF-144276);

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**Senior Engineer, Electrical Compliance** is responsible for:

- The effective liaison with ESV and ensuring that the Yallourn Bushfire Mitigation Plan is submitted to ESV by the 1<sup>st</sup> July each year in accordance with procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100);
- Ensuring that the Bushfire mitigation Plan complies with Clause 6 of the Electrical Safety (Bushfire Mitigation) Regulations;
- Providing ESV with a copy of the revised Bushfire Mitigation Plan before the 1<sup>st</sup> July each year in accordance with procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100); and
- Updating the Bushfire Mitigation Plan on an annual basis as defined within the [SHEMS11-SHE-P015-L01 - EnergyAustralia Yallourn Bushfire Mitigation Plan](#) (REF-144347).

**The Management System Specialist** is responsible for:

- Ensuring that a PDF copy of the EnergyAustralia Yallourn Bushfire Mitigation Plan is available for public access on the Yallourn page on the EnergyAustralia internet website, in accordance with procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100).

**The Contract Manager, Estate Services** is responsible for:

- Arranging the CFA total fire ban exemption permit in accordance with procedure: [SHEMS11-SHE-P001 - Applying for CFA Permits & Internal Permits to Carry out Hot Works on Days of Total Fire Ban](#) (REF-136372).

**Estate Services Alliance Manager** is responsible for:

- Chairing the Wildfire Risk Mitigation Committee and overseeing / co-ordinating its role and responsibilities, as defined within procedure: [SHEMS11-ESV-P001 - Wildfire Risk Mitigation](#) (REF-139611);
- The preparation and application of the EnergyAustralia Yallourn Wildfire Risk Mitigation Plan which includes fire hazard removal as well as the preparation of strategic fire breaks to ensure the power station, mine and other critical assets (for example: protected native vegetation areas) are protected against wildfire that occurs on or external to the EnergyAustralia Yallourn property site;
- Ensuring that the Wildfire Risk Committee review the electric line clearance plan at the end of the fire danger period to determine its effectiveness for the preceding fire danger period;
- Ensuring that the CFA are notified of fire and incidents in accordance with procedure: [SHEMS12-ESV-P011 - CFA Notification of Fire and Incidents](#) (REF-123292);
- Effective management of vegetation on the lands outside the mine operational areas as defined within procedure: [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100);
- Implementing the Estate Services component of the Bushfire Mitigation Plan as defined within procedure [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100); and
- Maintaining emergency fire response capability for the site, the management of fuel reduction outside the Mine area, chairing the Wildfire Risk Committee and developing / implementing procedures applicable to Estate Services to minimise bushfire risk, as defined within the [SHEMS11-SHE-P015-L01 - EnergyAustralia Yallourn Bushfire Mitigation Plan](#) (REF-144347).

## Fire Control Management Plan

### OHS&T Co-ordinator is responsible for:

- In consultation with the Mine manager and the Fire Service Officer and Fire Service Co-ordinator identifying fire training needs and developing and delivering competency based training to identified personnel;
- Maintaining training records, including training attendance records and course material for mine employees;
- Incorporating fire training requirements into individual training plans, as appropriate; and
- In consultation with the Mine Manager ensuring that training is provided to all personnel including contractors in accordance with YMA's SHEQ system and procedure - [YMA-OPS-PR-0401 - Training, Competence and Authorisation](#) (REF-140306) to ensure that personnel are trained and competent to perform their duties as they related to the requirements of this FCMP.



### 4.3 Competence, Training and Awareness

#### 4.3.1 YMA

In accordance with YMA's certified SHEQ system, personnel shall be trained and competent to perform their allocated duties, where those duties if not performed in a competent manner could have an adverse impact on safety, health, environment or quality.

The Manager Mining shall ensure that all personnel involved in the implementation of this FCMP are trained and competent to perform their allocated duties.

Competency based training shall be conducted in accordance with the requirements of YMA's SHEQ system and procedure - [YMA-OPS-PR-0401 - Training, Competence and Authorisation](#) (REF-140306)

Fire training is provided on site utilising Estate Services fire and rescue personnel.

The course provides training in firefighting techniques, with a focus on fighting coal fires.

The firefighting training is provided every 3 years.

Training records are maintained by the YMA's OHST Co-ordinator.

#### 4.3.2 Competency Based Training

Competency based training shall consider the process for confirming competence, which may include for example:

- a formal examination at the conclusion of the training to confirm the level of understanding and therefore competence; and
- observing personnel performing their duties to confirm their competence.

Operator awareness is also achieved via the completion of toolbox training and specific queries raised with their supervision and the mine planning section.

Training requirements including training records which are to be maintained in accordance with the requirements of the YMA's certified SHEQ system.

#### 4.3.3 Estate Services

Estate Services man the Yallourn Fire Station located on the south side of the Yallourn W Power Station and is the operational centre for the following, but not limited to:

- Firefighting;
- Industrial Rescue;
- Security;
- First Aid and Health & Wellbeing;
- Maintenance of fire and security systems and physical assets;
- Training for onsite staff; and
- Fire Mitigation.

The Fire Station control room is manned on a 24/7 basis and contains video surveillance and incident control equipment. Approximately 300 metres to the East of the Fire Station is an established Incident Control Centre (ICC) should a major incident occur (Level 3 incident).

## Fire Control Management Plan

The Estate Services Emergency Services Department comprise of a Team Leader who is the onsite Emergency Commander and qualified level 2 incident controller. The Team Leader is supported by a minimum of two (2) Emergency Services Officers, a Control Room Operator and a Security Officer.

All Estate Services Emergency Services Officers commence as a Grade 1 and are qualified to Country Fire Authority minimum skills, confined space rescue, breathing apparatus, medium rigid drivers licence and basic first aid skills. All future promotions within Estate Services are determined by the qualifications listed in the Programmed Maintenance Services / CFMEU EnergyAustralia workplace agreement. Skills and qualifications are maintained under the provision of the [Emergency Services Officers Skills Matrix](#) (REF-178417)

Estate Services conduct Fire, First Aid, Warden and Breathing Apparatus Training for onsite personnel.

### 4.4 Communication

#### 4.4.1 General

An essential component of this FCMP is the requirement for effective communication processes regarding fire management control issues with relevant personnel, both internal and external to EnergyAustralia Yallourn.

[Appendix No. 2](#) - provides details of the various internal communication processes.

#### 4.4.2 DEDJTR, WorkSafe and CFA Liaison

EnergyAustralia Yallourn is committed to an open, timely and forward looking approach in its interactions with both DEDJTR and the WorkSafe Authority.

Liaison with DEDJTR, CFA and WorkSafe occurs on both a formal basis and also on as needs basis when dealing with any specific OHS issues.

The DEDJTR is advised of reportable incidents in accordance with the DEDJTR's Reportable Incident Notification requirements.

#### 4.4.3 Community Liaison

A condition of the Mine Licence is that EnergyAustralia Yallourn establishes and maintains a communications forum with the community. EnergyAustralia Yallourn achieves this requirement via the Environment Review Committee (ERC). The ERC is a review and comment body, which has been established to facilitate the following obligations:

- To meet mining licence conditions in accordance with the Mineral Resources (Sustainable Development) Act: 1990 (MRSDA);
- To fulfil community consultation expectations of an EPA Accredited Licensee; and
- To comply with EnergyAustralia Yallourn's commitments to community consultation in accordance with its SHE Policy, and EnergyAustralia Yallourn's decision to communicate with external bodies regarding its significant environmental aspects.

The ERC is independently chaired and comprises community representatives, government agencies and EnergyAustralia Yallourn / YMA representatives.

The ERC's primary function is to review EnergyAustralia Yallourn's environmental performance and enhance communication between industry, government agencies and the community.

### 4.5 Documentation

Documentation consists of both **internal** and **external** documents.

#### 4.5.1 Internal Documents

Internal documents are those documents produced internally by EnergyAustralia Yallourn.

The FCMP is a “live” document and is to be reviewed as defined within this document. Any resulting subsequent revisions to the plan shall be authorised prior to issue.

The FCMP defines the overall framework for the systematic and proactive approach to the management of fire hazards both within and external to the Yallourn Mine.

The FCMP comprises this core document and other fire related procedures referred to in the FCMP. The key points from these procedures are summarised in this FCMP core document for reference only. The procedures provide the official documentation for the management of each aspect of fire hazard management, which are accessible and printable to all employees as “read only” documents from the company’s intranet.

**Figure 14** below provides an overview of the FCMP documentation hierarchy.

The management of fire across the site is achieved through a series of management policies and instructions.

Each of these documents outlines processes and identifies procedures which are applied to various circumstances to manage the risk of fire across the site and more specifically the Mine.

Underpinning these high level documents are various procedures, forms and checklists dealing with specific areas and issues, as described within this FCMP.

EnergyAustralia Yallourn’s fire service related procedures are maintained on Yallourn’s intranet system and read only access is available to all Yallourn employees and Mine Alliance supervisory personnel and key operating personnel.

**Table 3** below provides a listing of the key procedures.

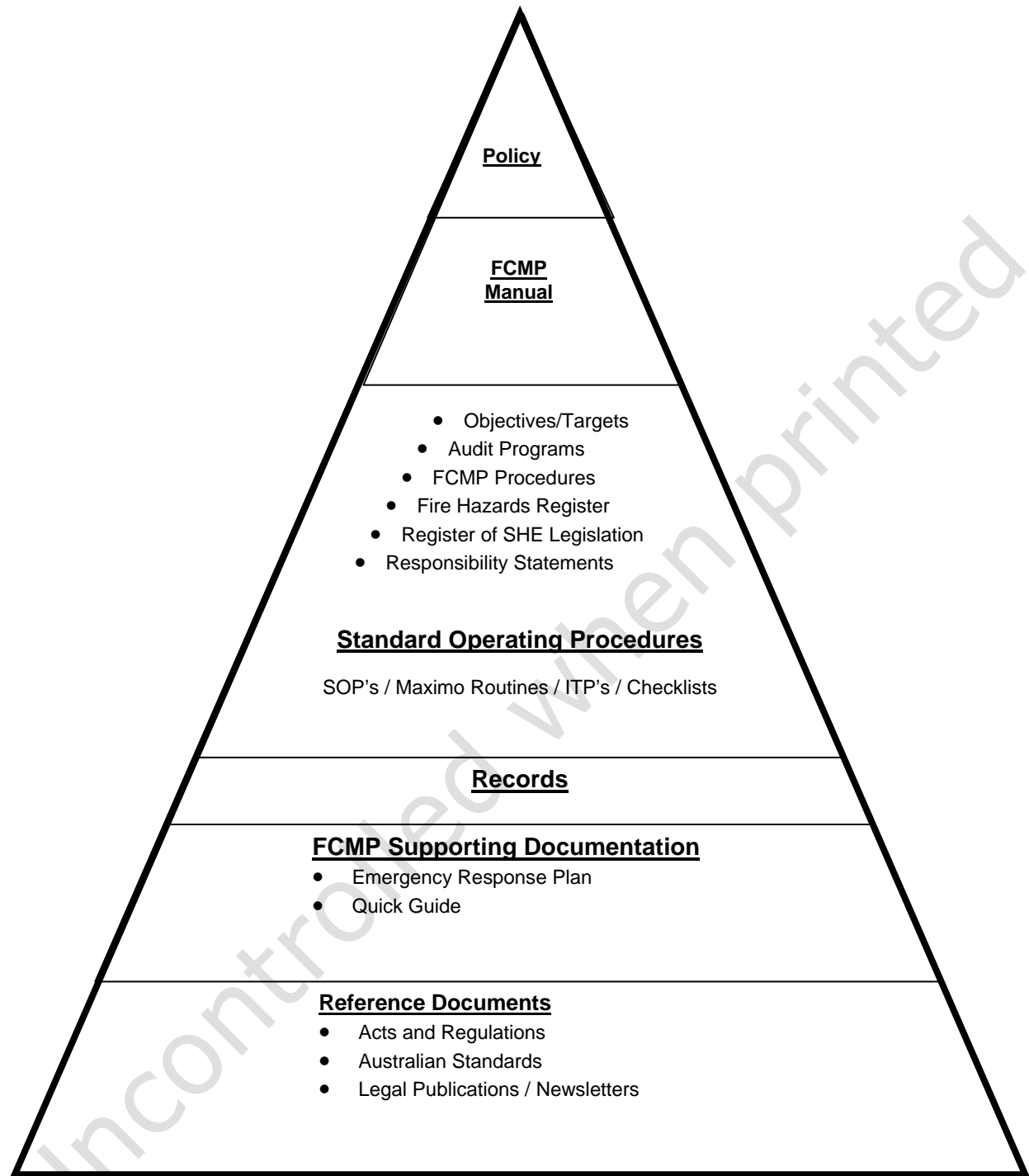


Figure 14 - FCMP Document Hierarchy

## Fire Control Management Plan

**Table 3 - List of key Fire Service related Procedures**

No.	Reference	Description	80-20 REF
<b>EnergyAustralia Yallourn Procedures</b>			
1	SEMS06-SHE-P110	Training and Competence Records	<a href="#">REF-115130</a>
2	SEMS10-SHE-P001	Removal of Vegetation on the EnergyAustralia Site	<a href="#">REF-140771</a>
3	SEMS11-ESV-P003	Hose Tower	<a href="#">REF-116139</a>
4	SEMS11-ESV-P001-I02	Opening of Total Fire Ban Boards and Placement of Total Fire Ban Flags	<a href="#">REF-137344</a>
5	SEMS11-ESV-P001	Wildfire Risk Mitigation	<a href="#">REF-139611</a>
6	SEMS11-SHE-P015	Management of the Bushfire Management Plan	<a href="#">REF-149100</a>
7	SEMS11-SHE-P015-L01	Bushfire Management Plan	<a href="#">REF-144347</a>
8	SEMS11-SHE-P016	Fire Mitigation Strategies of the EnergyAustralia Yallourn Site	<a href="#">REF-187205</a>
9	SEMS11-SHE-P502	Management of Electrical Work on the Yallourn Site	<a href="#">REF-140772</a>
10	SEMS11-SHE-L01	Electrical Safety (Electrical Line Clearance) Plan	<a href="#">REF-144276</a>
11	SEMS11-ESV-P001-I01	Preparedness for Extreme Fire Danger and Total Fire Ban Days	<a href="#">REF-124193</a>
12	SEMS11-SHE-P001	Applying for CFA Permits and Internal Permits to carry Out Hot Works on Days of Total Fire Ban	<a href="#">REF-136372</a>
13	SEMS12-SHE-L01	Emergency Response Plan	<a href="#">REF-123453</a>
14	SEMS12-SHE-L01-A07	Emergency Response Plan - Appendix 07 - Fire in the Mine	<a href="#">REF-190743</a>
15	SEMS13-SHE-L03	Ground Control Management Plan (GCMP)	<a href="#">REF-134669</a>
<b>Estate Services Procedures</b>			
16	SEMS12-ESV-P011	CFA Notification of Fire and Incidents	<a href="#">REF-123292</a>
17	SEMS12-ESV-P001- I01	Management of VESDA During Periods of Heavy Smoke Pollution	<a href="#">REF-125014</a>
18	SEMS12-ESV-P001	Responding to Fire Alarms	<a href="#">REF-123473</a>
19	SEMS12-ESV-P004	Emergency Response - Control Room	<a href="#">REF-116115</a>
20	SEMS14-ESV-P003	Fire Hoses - Pressure Cleaning	<a href="#">REF-116141</a>
<b>Yallourn Mine Alliance (YMA) Procedures</b>			
21	YMA-OPS-SOP-0374	Management of LV & HV Overhead Distribution System	<a href="#">REF-140752</a>
22	YMA-OPS-WI-0129	Carrying Out Works on Days of Total Fire Ban (Yallourn Mine)	<a href="#">REF-137313</a>
23	YMA-OPS-PR-0343	Hot Works Procedure	<a href="#">REF-138657</a>
24	YMA-OPS-PR-0425	Cathodic Protection of Mine Assets	<a href="#">REF-140408</a>
25	YMA-OPS-PR-0401	Training, Competence and Authorisation	<a href="#">REF-140408</a>
26	YMA-OPS-PR-0313	Risk Management Process	<a href="#">REF-137299</a>
27	YMA-OPS-PR-0312	YMA Risk Assessment Template	<a href="#">REF-137015</a>
28	YMA-OPS-PR-0383	RCB Deluge System Testing and Cleaning	<a href="#">REF-138943</a>
29	YMA-OPS-PR-0100	Fire Procedure	<a href="#">REF-137126</a>
30	YMA-OPS-PR-0239	Management Instruction Fire Services	<a href="#">REF-140753</a>
31	YMA-OPS-PR-0281	Immediate Incident Reporting	<a href="#">REF-137956</a>
32	YMA-OPS-PR-0217	Control Centre Fire Alert	<a href="#">REF-177675</a>
33	YMA-OPS-PR-0154	Fire Precautions	<a href="#">REF-136434</a>
34	YMA-OPS-PR-0101	Fire extinguisher Replacement	<a href="#">REF-137128</a>

Authorised by: Head of Yallourn

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Doc No. SEMS13-SHE-L04

Ref: REF-192027 - SEMS13-SHE-L04 - Mine Fire Control Management Plan (FCMP)

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No.	Reference	Description	80-20 REF
35	YMA-OPS-PR-0151	Water Truck	<a href="#">REF-137300</a>
36	YMA-OPS-PR-0420	Job Safety Observation	<a href="#">REF-140632</a>
37	YMA-OPS-PR-0401	Training, Competency and Authorisation	<a href="#">REF-140306</a>
38	YMA-OPS-PR-0238	Job Safety and Environmental Analysis	<a href="#">REF-141264</a>
39	YMA-OPS-PR-0061	Management of OB Dumping in YEF	<a href="#">REF-175747</a>
40	YMA-OPS-PR-0099	Management of Water Systems Flocculation Pond Waste Water Treatment	<a href="#">REF-142264</a>
41	YMA-OPS-PR-0160	The Treatment of Noise in Mine	<a href="#">REF-178460</a>
42	YMA-H&S-PR-0247	Mine Dust Emissions Control	<a href="#">REF-138655</a>
43	YMA-OPS-PR-022	Management of Public Complaints Regarding Environmental Concerns	<a href="#">REF-135903</a>
44	YMA-Q&S-PR-0509	YMA Document and Record Management	<a href="#">REF-187201</a>
45	YMA-OPS-PR-0237	Enquiry and Complaint Management	<a href="#">REF-183338</a>
46	YMA-OPS-PR-0149	Waste Management	<a href="#">REF-136228</a>

### 4.5.2 External Documents

External documents are those documents that are generated by external agencies, authorities, consultants, etc., and include for example licences, approved work plan variations, permits, letters, reports, drawings, etc.

Reports, reviews etc. prepared by consultants should be obtained in both hard copy and electronic format.

## Fire Control Management Plan

### 4.6 Control of Documents

Documents required by this FCMP, including procedures, forms, checklists, manuals, etc. shall be approved for adequacy prior to issue and shall be controlled.

[SHEMS13-SHE-L04-F01 - FCMP Issue - Document Receipt Acknowledgment Form](#) (REF-193496)

To ensure the effective control of documents, documents shall be:

- Approved for adequacy prior to issue;
- Reviewed and updated as necessary and re-approved for issue, with the changes and the current revision status of documents clearly identified;
- Only currently approved documents shall be accessible to employees;
- Employees shall have “read only” access to approved documents;
- Obsolete documents shall be promptly removed from circulation; and
- Legible and readily identifiable.

Controlled copies of documents shall be clearly labelled in red “Controlled Copy”. The number of controlled copies shall be kept to a minimum, with access to the FCMP being via Yallourn’s intranet (Fingertips), to facilitate easier review and update of the FCMP. Where controlled copies are issued, a distribution list shall be maintained recording those personnel who have been issued a controlled copy. Where a revision is subsequently made to a controlled copy of a document, the issue of the revised document shall include the recall of the obsolete copy of the controlled copy and the issue of the revised copy of the controlled document. The obsolete copy of the controlled copy of the document shall be either clearly labelled “obsolete” and removed from circulation or destroyed.

Employees shall have “read only” access to those documents required by this FCMP via EnergyAustralia Yallourn’s intranet (Fingertips).

Documents held on EnergyAustralia Yallourn’s intranet (Fingertips), and where appropriate the Thies Management System, shall be controlled when viewed on the screen, but uncontrolled if subsequently printed and should be destroyed once their intended use has been completed. Copies of documents should not be retained for subsequent use to avoid the potential use of obsolete documents.

Obsolete documents shall be promptly removed from circulation and either labelled obsolete or destroyed, to prevent their unauthorised use.

External documents including licences, permits, work plan variations etc. shall also be controlled to ensure that access is to only current approved documentation.

External documents that are relevant to the FCMP are to be identified and their distribution controlled to ensure that only current revisions of external documents are used for the planning and operation of the FCMP.

Where appropriate, employees shall have read only access to external document as necessary.

Consultant reports, letters, etc. shall be registered and a copy filed on EnergyAustralia Yallourn’s Document and Records Management System, 80-20, as appropriate.

### 4.7 Operational Control - Management of Fire Hazards

#### 4.7.1 Overview

The necessarily large area of exposed coal requires an extensive reticulation/spray network and water supply system. The water supply and fire protection measures described within this FCMP are those considered to provide the necessary level of protection with due regard to cost and operational requirements. Fire protection in the mine is based on the following principles:

- An organised approach to prevention and suppression of fire and the formulation of emergency response plans and fire instructions;
- The use of an adequate communications system to mobilise and coordinate firefighting facilities;
- The provision of water supplies, reticulated water and spray systems together with the trained personnel necessary for the operation of these systems to prevent or suppress fires;
- The provision of adequate training sessions and exercises to ensure that each employee understands the appropriate techniques and mine procedures for fighting brown coal fires and undergoes refresher training sessions at regular intervals;
- The reduction of loose dry coal in the mine, conveyors and coal bunker areas, by the application of appropriate design measures and good housekeeping practices;
- The conduct of fuel reduction of other fire risk fuels such as grasses in disused areas of the mine;
- A mine perimeter access road will be maintained around both the operating and worked out areas of the mine, to provide access to plant and equipment for both mine operational requirements and also firefighting purposes. The perimeter access road will also provide a limited fire break to both assist in containing a fire within the mine from escaping to the external environment or to reduce the likelihood of an external grass fire from entering the mine;
- The control of sources of ignition such as cutting and welding, mobile equipment and motor vehicles and the safe storage of potentially inflammable materials;
- The effective limitation and management of forested, wooded or grassed areas external to the mine to inhibit the progress and effect of an external fire;
- The provision and maintenance of back-up facilities to fight and control any fire;
- Use of detection and protection on critical conveyor drive units to limit damage and reduce likelihood of fire spread;
- Use of real-time CCTV monitoring across mine operations areas; and
- Covering exposed coal within the disused areas of the mine with clay or water, where practicable.

**Figure 15 to Figure 17** below provide plans showing the fire control infrastructure maintained within the mine and surrounding areas.

The effective management of fire hazards comprises a combination of:

- System controls;
- Behavioural controls; and
- Physical controls;

or a combination of all three.

Fire Control Management Plan

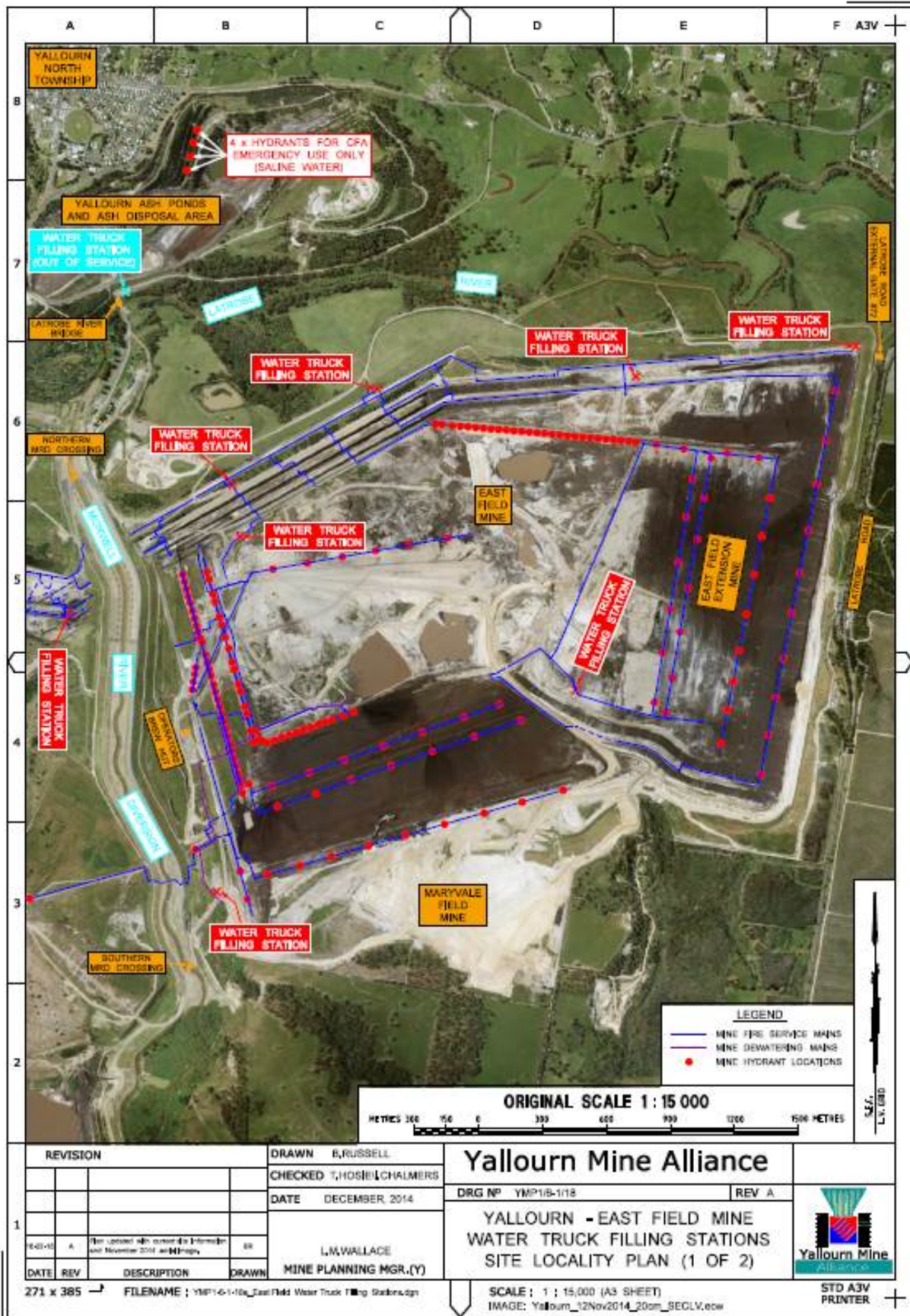


Figure 15 -Yallourn East Field Mine - Water Truck Filling Stations - Site Locality Plan (Page 1 of 2)  
(Mine Drawing No. YMP1/8-1/18 Rev A) (REF-193501)



Fire Control Management Plan

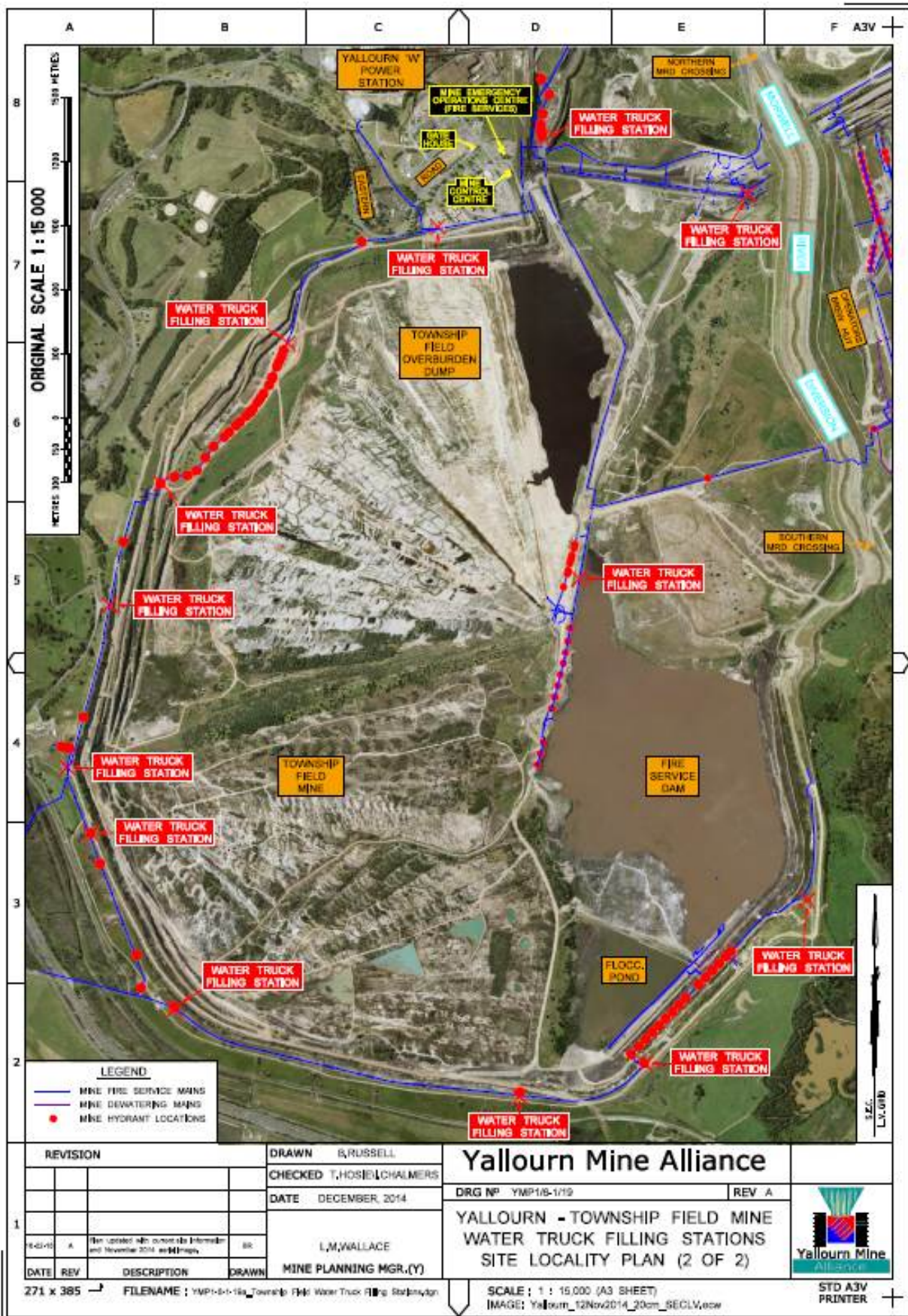
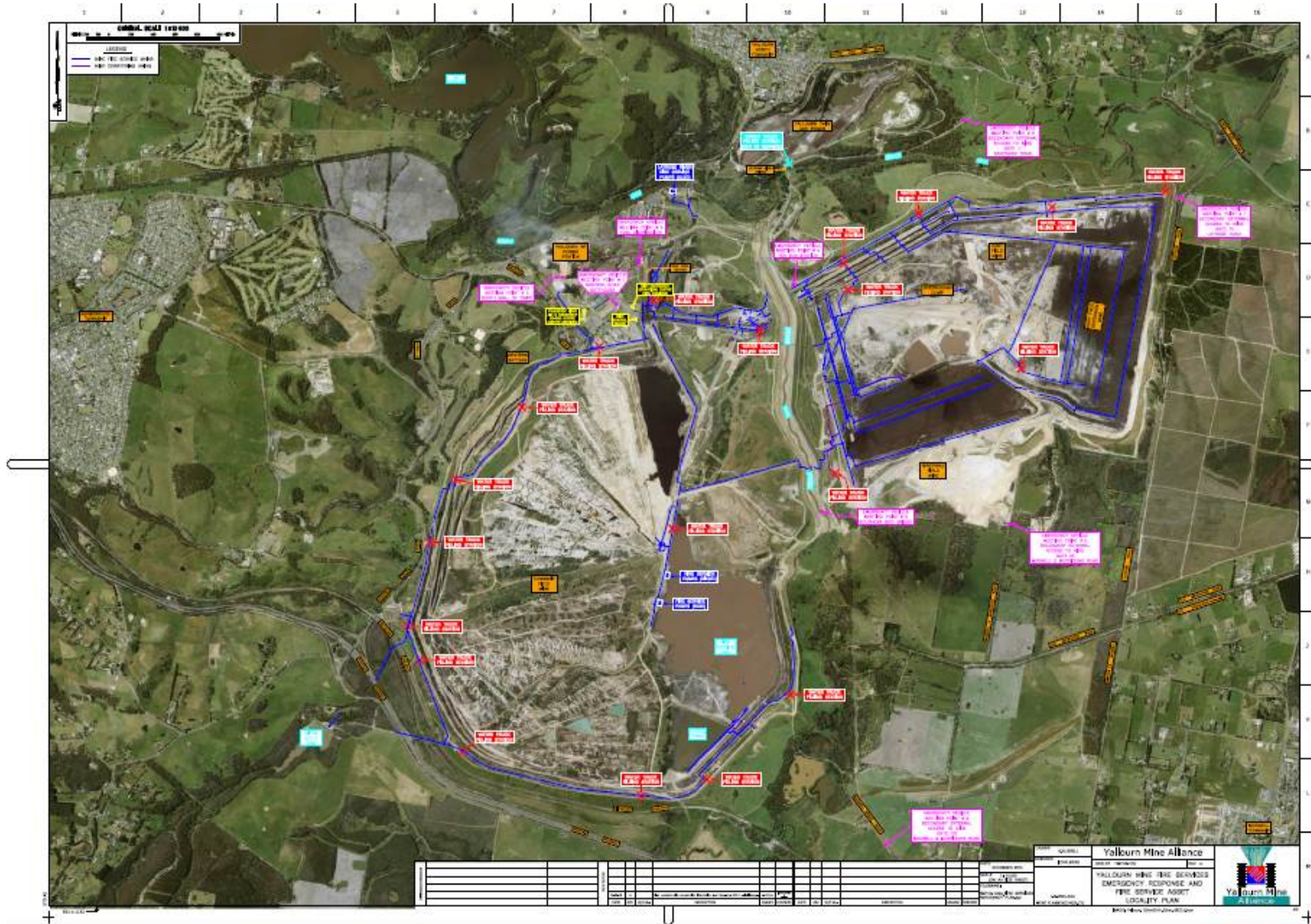


Figure 16 - Yallourn East Field Mine - Water Truck Filling Stations - Site Locality Plan (Page 2 of 2)  
 (Mine Drawing No. YMP1/8-1/19 Rev A) (REF-193499)



# Fire Control Management Plan



**Figure 17 - Yallourn Mine Fire Services - Emergency Response and Fire Service Asset Locality Plan**

(Mine Drawing No. YMP1/6-1/20 Rev A) (REF-193500)

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**Ref:** REF-192027 - SHEMS13-SHE-L04 - Mine Fire Control Management Plan (FCMP)

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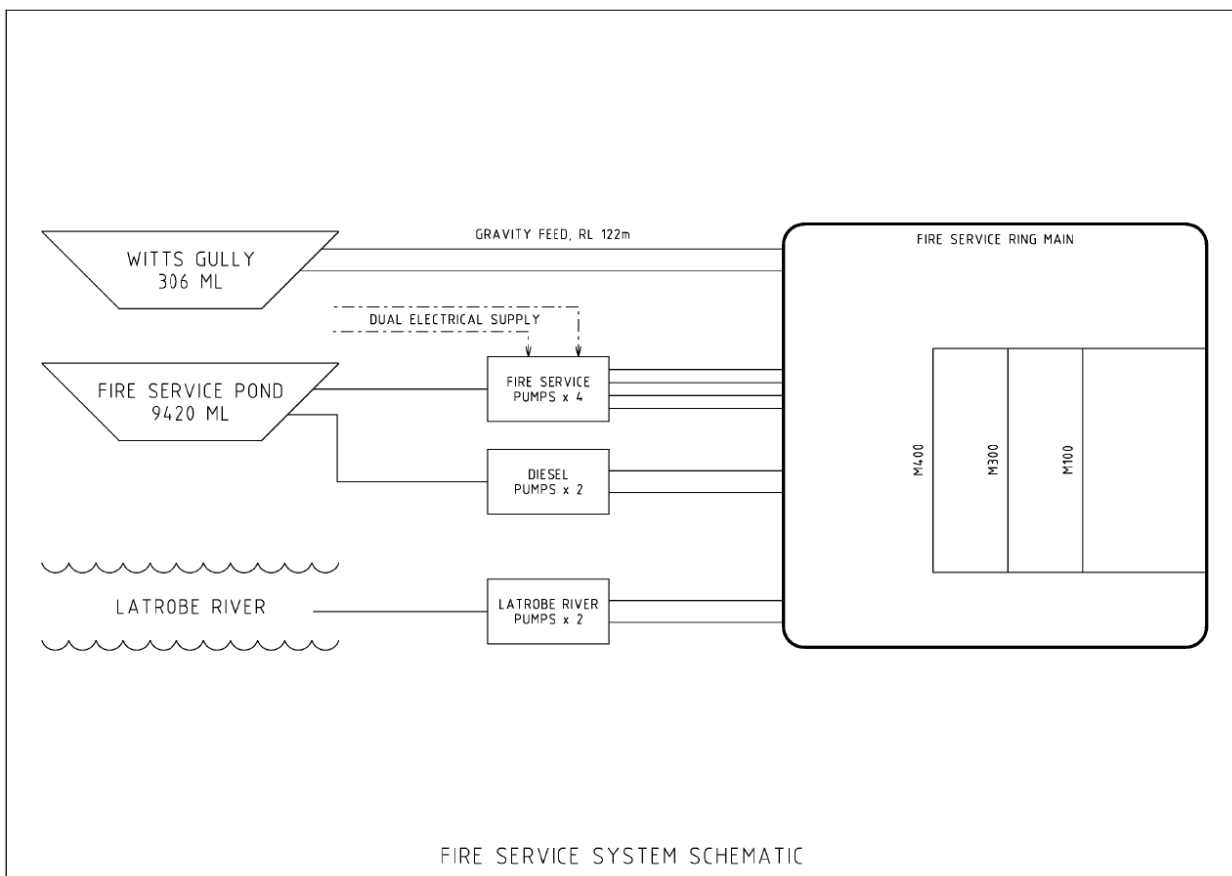


# Fire Control Management Plan

## 4.7.2 Fire Protection Infrastructure

### 4.7.2.1 Fire Service System - Overview

The fire services system consists of a ring main pipe network to provide water coverage for fire prevention and suppression and dust control. Fixed sprays and hydrants are installed for the conveying systems, coal benches and large mine machines and worked out areas of the Mine. The primary water source is the Witts Gully Reservoir high level storage reservoir which has 306 ML capacity which is sufficient for approximately four days supply at maximum demand without replenishment. Additional water reserves are held in the Township Field Fire Service Pond (9,420ML), the Latrobe River or the Power Station cooling towers in an emergency.



**Figure 18 - Fire Service System Schematic**

Figure 27 below provides a copy of drawing: EnergyAustralia Yallourn Drawing LV62/1-3/113 - Yallourn Mine Fire Service & Dewatering, Piping and Instrument Arrangement Schematic Diagram provides an overview of the key features of the fire service system.

**Witts Gully Reservoir** - Primary source of water supply. High level storage dam with 306 ML capacity at RL 122.5m. Supplies the ring main via two separate pipe lines.

## Fire Control Management Plan

### Fire Service Pumps and Dual Electrical Supply

- Four electric pumps mounted on two individual floating pontoons;
- Nominal performance of each pump is 450L/s at 140m head pressure; and
- The fire system has a dedicated "Fire Pump Master Controller" PLC which controls the automatic start/stop of the Fire Service Pumps. The starting of each respective pump is determined by monitoring the water level of the Witts Gully Reservoir, the fire service pond, and the amount of water flowing into and out of the Witts Gully Reservoir. The pumps may also be started manually by an operator using the local controls.

#### Fire Service Pump Start Conditions:

- a. Witt's Gully level falls to below low; or
- b. Witt's Gully outflow exceeds 300 l/second and Witt's Gulley is below High; or
- c. Witt's Gully outflow exceeds 300 l/sec. after 10 minutes from when the previous pump was started on outflow.

#### **Notes:**

- i. If a fire service pump "fails to start" or "fails in service", the next fire service pump is started immediately (provided no other pump was started or stopped during the previous 60 seconds).
- ii. Starting sequence is always in the order F1, F2, then F3, F4, depending on the next available pump. The sequence can start anywhere in the series depending on the last pump started before they were all stopped.  

In order to share duty cycle on these pumps it is necessary to switch one of the pumps to the "OFF" position periodically and the master controller will then start the other available pumps based on their duty cycle.
- iii. Pumps cannot be started on flow if Witt's Gulley level is above "E/ High".
- iv. A topping request will start 2 or 3 available pumps, if Witt's Gully reservoir is below Low or below Emergency Low respectively.

#### Fire Service Pump Stop Conditions:

Fire Service pumps are stopped under normal operating conditions if:

- a. the pumps were started for topping up purposes, and Witt's Gully level rises to above "High" the pumps will stop;
- b. a pump was started for flow reasons and Witt's Gully inflow exceeds 150 l/sec, one pump will stop after 5 minutes;
- c. inflow to Witt's Gully still exceeds 150 l/sec after 60 sec from when the previous pump was stopped on inflow then another pump will be stopped;
- d. Witt's Gully level reaches "E/High" or above "High" (for 120mins), one pump will stop every 60 seconds until the outflow exceeds 300 l/sec. This outflow in excess of 300 l/sec will be maintained until the water level drops below "E/High" or "High" respectively; and
- e. fire service pond level falls below "E/Low", all pumps will stop at 60 second intervals.

## Fire Control Management Plan

### Notes:

- i. If pumps were started for topping up reasons, they will continue to run regardless of inflow until Witt's Gully level rises to above "High";
- ii. If a pump was started for flow reasons, it will NOT be stopped until Witt's Gully level rises to above "High".
- iii. Stopping sequence is always in the order in which pumps were started (i.e., the longest running pump is always the next pump to be stopped).

### Diesel Pumps

Two skid mounted diesel pumps are available in reserve to the Fire Service Pumps. The diesel pumps are positioned to draw water from the fire service pond and feed direct into the fire service ring main. They are permanently connected and test run weekly.

Additional back up diesel pumps are also kept on site to assist with fire and dewatering activities.

### Latrobe River Pumps

Additional fire service water can be supplied into the fire service ring main from the Latrobe River via two electrical pumps installed in the Latrobe River pump house. The Latrobe River pumps and pipework were refurbished in 2014 to ensure reliable operation and allow dual pump operation when required.

### RCB Booster Pumps

The Fire service ring main supplies water to the upper levels of the Raw Coal Bunker via two electric booster pumps installed at the base of the RCB. The booster pumps and bunker sprinklers are test run weekly.

#### 4.7.2.2 Water Supply Sources

There are four primary sources of fire service water supply for the Yallourn mine. These are:

1. The Witts Gully Reservoir is the primary supply reservoir. It is used for gravity supply for fire service water and has a storage potential for fire service supply of 306 ML. The reservoir has the potential to supply 1500 l/s;
2. The Mine Fire Service Pond has a storage capacity of 9,420 ML and is located at the bottom of the Township Field. The pumping station at the reservoir operates with 4 No. 400 l/s, 140m head pumps.

The Fire Service Pond is a secondary source for fire service water with a storage potential for fire service supply of 9,420ML. The pumps are located on two separate pontoons - namely: Pontoons 1 and 2. Pontoon No. 1 supports two pumps and Pontoon No. 2 supports two pumps. The normal operating levels for the pumps is between -4m and -6m which stores 2,181ML of water.

Both pontoons have separate discharge pipe systems and also separate power supply sources.

Township Water Storage has a storage capacity of 3,400ML's and flows into the Fire Service Pond at the a baseline rate of 28 ML/day, providing additional storage capacity for the Fire Service Pond;

3. Latrobe River Pumps provide an emergency back-up supply to Witts Gully Reservoir, which utilises a maximum 2 off 250 litres per second, 150m head pumps; and
4. Two skid mounted diesel standby pumps which are permanently installed in the fire service system each have a flow capacity of 170l/sec. The diesel pumps are test run on a weekly basis.

## Fire Control Management Plan

The fire service pipe network comprises:

- Ring mains - 900mm diameter;
- Droppers - 600mm diameter;
- Feeders - 600mm diameter;
- Spraylines - 250mm and 300mm diameter.

A Raw Coal Bunker booster pump station is maintained to provide the required level of fire service protection for the Raw Coal Bunker.

The source of fire service water is designed and maintained so that the supply is from a minimum of the four abovementioned systems.

In responding to a fire emergency, in the first instance, the primary source of water would be supplied via the four Fire Service Pond pumps and Witts Gully Reservoir. If the dual power supply to the Fire Service Pond pumps was lost, then the diesel standby pumps would be activated. If additional fire service water was required, then the Latrobe River pumps would be activated. If required, additional water could be provided via the power station's Latrobe River water intake pumps which could be supplied to the mine via Cooling Tower 3 and the drainage system to Township Water Storage.

In responding to a fire emergency it is important that the response is controlled and the application of the firefighting water is managed to ensure safe access for both vehicle and personnel access is maintained. The application of the water also needs to be managed and controlled to ensure batter stability is not impacted.

**Figure 28** below provides details of the fire service pipeline nomenclature.



**Figure 19 - Witts Gully Reservoir**



Figure 20 - Fire Service Pond - Emergency Diesel Pumps



Figure 21 - Fire Service Pond Pumps





Figure 22 - Latrobe River Pumps - Nos 1601 and 1602



Figure 23 - Latrobe River Pumps - Electrical Cubicles





Figure 24 - Latrobe River Pump Building adjacent to the Latrobe River



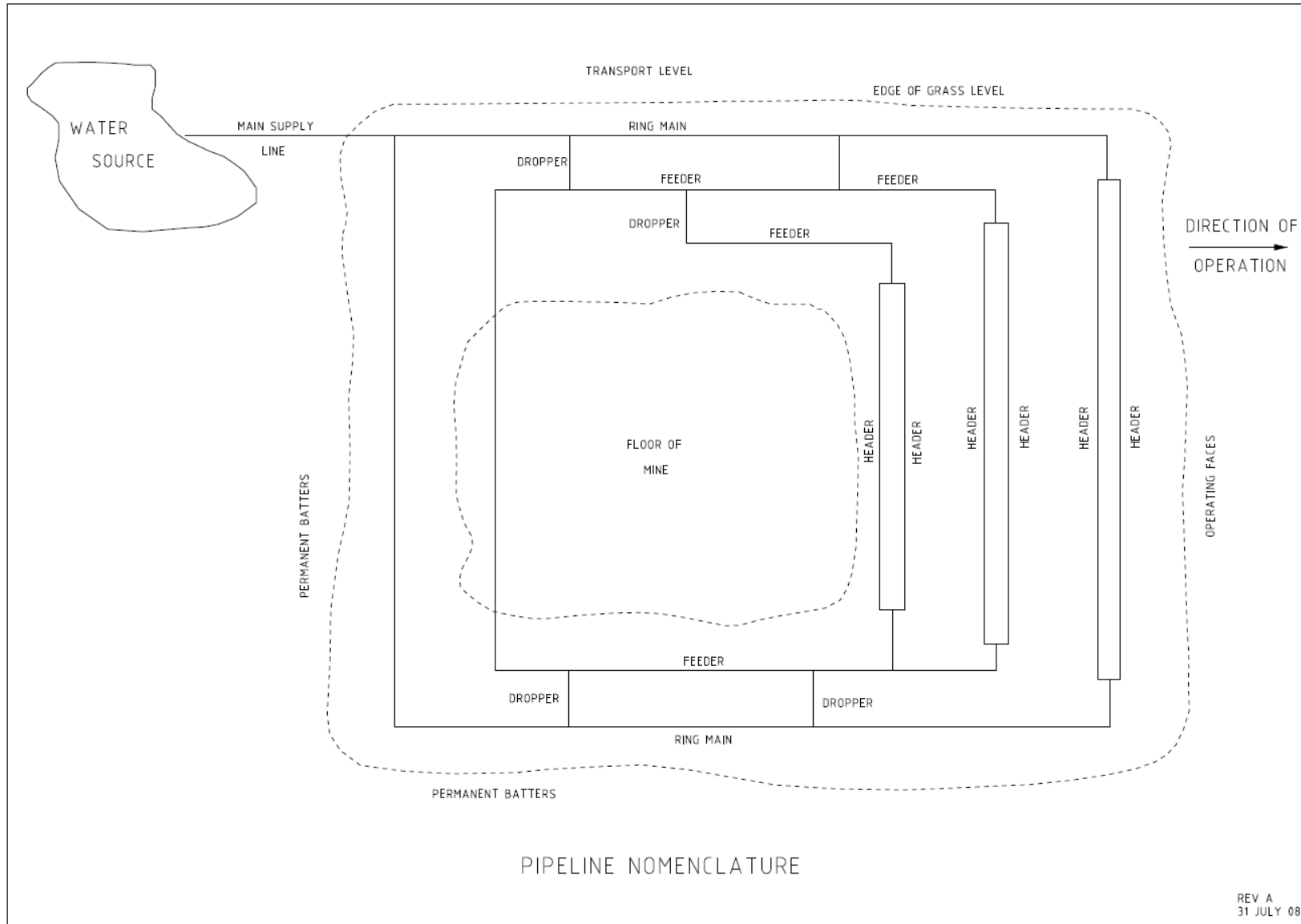
Figure 25 - RCB Booster Pumps



Figure 26 - RCB Booster Pumps



**Fire Control Management Plan**



**Figure 28 - Pipeline Nomenclature**

**Authorised By:** Head of Yallourn

**Version No:** 1.0

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## Fire Control Management Plan

### 4.7.2.3 Fire Service Maximum Supply Demand

In order to properly protect all parts of the mine, pipework and sprays are to be installed as discussed within this Fire Control Management Plan (FCMP).

It must be understood however that a larger water reticulation supply system would be required to run all of the sprays and protection systems simultaneously.

This FCMP provides for diversity in the simultaneous application of the fire protection water supplies and distribution system.

The maximum demand is defined as an allowance of water usage upon which the design of the water supply system is based. The maximum demand rate of water use is considered to be sufficient to meet any likely contingency within the mine. The distribution of this allowance of water usage is reasonably flexible for any situation but the use of more water than allowed for in one area may cause a reduction in the performance of the system.

The maximum demand scenario is defined as:

- A minimum of one header at M100, two headers at M300 and one header at M400 unless completing a track shift;
- An allowance to operate rotary sprays to provide cover to 50% of exposed coal and all machine and conveyor protection sprays on the working bench;
- An allowance to operate three hydrants on one header on each one of the working levels;
- An allowance to operate two hydrants at three conveyor transfer points simultaneously;
- An allowance to operate birdsmouth and rotary sprays protecting one-quarter of two trunk conveyors simultaneously in coal areas;
- An allowance to operate birdsmouth and rotary sprays protecting one-quarter of a trunk conveyor in non-coal areas (i.e. on a clay or equivalent base); and
- An allowance for 5 hydrants to be available in each of Township Field and East Field for rehabilitation, worked out and conservation areas.

**Table 4 and Table 5** below provides details of the various demands to meet the maximum supply demand.

**Table 4 - Maximum Supply Demand**

No.	Area	Demand (Litres/second)
1	Operating Area	1,450
2	Hydrant Requirement	240
3	Trunk Requirement	400
4	Transfer Points	60
5	Worked Out Areas & Rehab	100
6	<b>Total</b>	<b>2,250 (approx.)</b>

## Fire Control Management Plan

In the event of maximum demand, the sum of the components of the combined system would result in some 2,250 l/s.

To meet the maximum supply demand, the required water could be sourced from the following sources

**Table 5 - Maximum Supply Demand - Supply Capability**

No.	Description	Maximum Demand Supply (Litres/second)	Potential Supply (Litres/second)
1	Fire Service Pumps	1,680	1,700
2	Witts Gully	260	1,800
3	Diesel Pumps	Not required	2x170=340
4	Latrobe River Pumps	Not required	1x250
<b>No.</b>	<b>Total</b>	<b>1940</b>	<b>4,090 #</b>

# Total theoretical capacity to meet maximum demand scenario. In practice, approx. 2,500l/sec could be provided.

The above flows are based on the assumption that all pipes are in place as designed and the Fire Service Pumps are operational.

**Figure 29 and Figure 30** below, provides a general arrangement drawing showing the configuration of sprays for a maximum demand scenario.

This FCMP also requires that the supply sources must be designed such that the loss of the larger supply source will not reduce the supply available to below 50% of the designed maximum design scenario for a duration of 2 days.

It should be noted that the mine has further redundancies within fire service system, including:

1. In the event of the loss of tail end supply mains due to a batter failure or pipe failure, the required conditions of a loss of supply mode can be met; and
2. The FCMP states that the reduced demand is for “the loss of the larger supply source”.

The hydraulic analysis identified this as the pumps located within the Fire Service reservoir.

The approach is considered conservative as the pumps are located on two separate pontoons, namely Pontoons 1 and 2. Both pontoons support two pumps each. Both pontoons have separate discharge pipe systems and also have separate power supply sources. Therefore, the loss of both Fire Service pumps systems is unlikely.

EnergyAustralia Yallourn maintains an hydraulic model of the fire service system to check the design capacity of the fire service system. Key outputs to the model are shown in the figures below, which shows compliance with the conditions associated with the maximum demand scenario.

The hydraulic model for the fire service system is reviewed on an annual basis to confirm the capacity of the fire service system meets the maximum demand criteria, prior to the forthcoming fire season.



## Fire Control Management Plan

The hydraulic model is updated accordingly and a revised version of the hydraulic model is approved by the Manager Mining. The hydraulic model is maintained as a controlled document with only authorised person's permitted to modify and run the model.

To validate the model findings, controlled field tests are completed and the results recorded to confirm the integrity of the model's findings..

To meet ongoing mine development requirements, modification or development of the Fire Service System must consider the requirements of the entire coal and overburden infrastructure together with any coal storage facilities.

Effective engineering analysis and assessment is to be adopted wherever possible to analyse the impact of modifications or changes to the integrity to the fire service system, to ensure its ongoing effectiveness.

### 4.7.2.4 Reliability and Redundancy of Water Supply

Gravity supply of water to the pipe network is preferred because of its reliability. Depending on the location within the mine, in some locations it may be necessary to provide pressure reduction systems in order to avoid pressures greater than 115 m head at hydrants and rotary sprays. In other locations within the mine, it may be required to provide pressure boosting systems in the form of pumping stations, to maintain adequate pressures.

Reliability of power supply to pumping stations is critical to the reliability of the fire protection system. Other requirements for the security of electrical supplies are detailed in **Section 4.7.4.14 - Reliability of Electrical Supply** below.

As a general requirement fire service pumping stations should be designed such that the loss of one power supply feeder should still allow the supply of 50% of the pumping station capacity either by the provision of:

- Two or more power supply feeders, or
- A sufficient number of individual pumps such that half the number of pumps supply at least half the required pumping capacity, and
- Systems can incorporate electric/diesel/gravity in order to meet the level of redundancy stated.

To ensure the reliability of the fire service pond pumping infrastructure, dual power supplies are maintained. Refer **Section 4.7.4.14 - Reliability of Electrical Supply** below, for further details.

The reliability of the power supply to the fire service pumping system should be such that any one fault would not reduce the capacity of the system to meet the maximum demand by more than 50%. If the fire service pumps are operating in auto and a supply is lost the master Controller will automatically start the next available pump in sequence within a time delay of approximately 60 seconds.

This level of reliability/redundancy is required for the dedicated fire service pumps, multipurpose pumps with a fire service component and fire service booster pumps.

The level of reliability/redundancy required for other pumping installations such as dewatering pumps and fire service storage replenishment pumps, is that any single fault should not cause a loss of pumping capacity for more than four hours duration. The concept for such installations should take this level of reliability into account in design and operation stages.

### 4.7.2.5 Rate of Precipitation

The spraying equipment on exposed coal is to be able to deliver a minimum precipitation rate of 6 mm/hour over the wetted area.

## Fire Control Management Plan

### 4.7.2.6 Capacity of Storage

Water storage's are to be provided for the following conditions:

- \* Sufficient water for fire services throughout a fire service season in a drought cycle and sufficient additional storage to suppress one major fire within the mine; and
- \* Water reserves for suppressing a major fire is to be made up as follows - 24 hours at maximum demand followed by 24 hours at 50% of maximum demand and an emergency reserve of 8 hours at maximum demand.

### 4.7.2.7 Restoration of Storage

Within 10 days of a major fire there should be adequate water in storage to suppress another major fire. The water reserve required for this specific purpose is defined in above in **Section 4.7.2.6 - Capacity of Storage**.

If water is stored in more than one storage, then the storage which provides the immediate source for the fire service system must be large enough to store the water reserve required to suppress a major fire plus an allowance for siltation and flood regulations.

### 4.7.2.8 Location and Availability of Water Storages

The locations of the storages of water should take account of the reliability of supply and capacity requirements listed above. The storage's should be dedicated to mine use, unless approved by the Manager Mining.

### 4.7.2.9 Water Pressures

For personnel safety reasons, the static pressure in the reticulated water system should be designed to not to exceed 115 m head at hydrants, rotary sprays and other points used for tapping the fire service water.

The pressure must not be lower than the pressure necessary to operate all fire service equipment effectively with a minimum of 20 m head at any tapping point.

### 4.7.2.10 Supply to Headers and Sprays

The mine is designed around head end and tail end connections on face conveyors. As face conveyors are track-shifted, the head end and tail end connections require extension to maintain supply.

Where connections at both locations is not permissible or the pipe header or spray lines have been designed for single end supply, the following provisions must be in place to ensure that all sprays and a minimum of three hydrants can be operated along each pipeline, at 30m minimum head:

- A. The inlet pressure at the supply point is at the required level to ensure that the minimum pressure requirements (30m minimum head) are not compromised; and
- B. If the required pressure cannot be achieved by the pressure head within the supply pipes, then pressure booster pumps must be incorporated at the point of supply to the header and spraylines to achieve the required pressure.

# Fire Control Management Plan

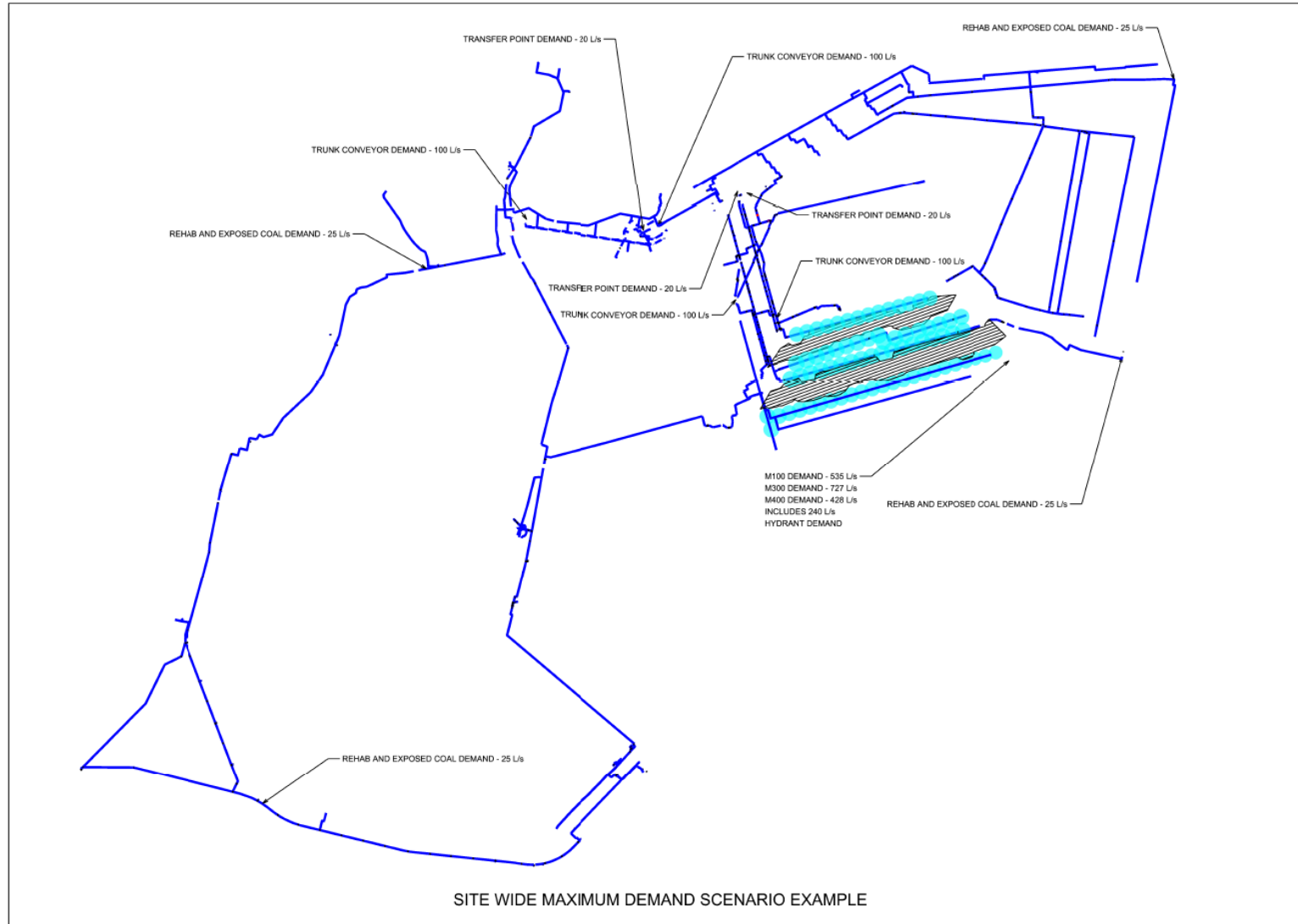


Figure 29 - Site Wide Maximum Demand Scenario Example

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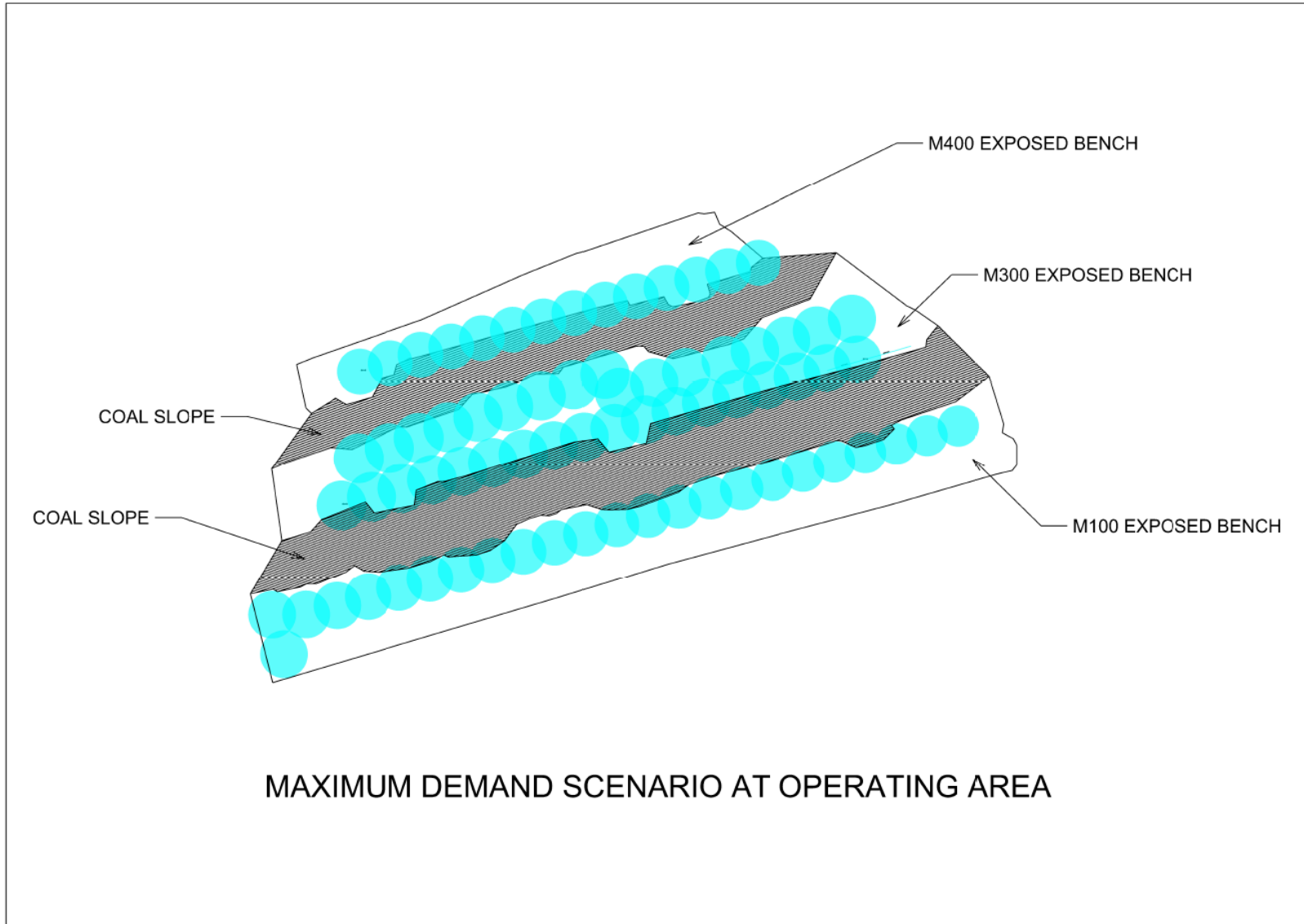


Figure 30 - Maximum Demand Scenario at Operating Face

## Fire Control Management Plan

### 4.7.2.11 Fire Service System - System Monitoring

Sufficient remote monitoring and control equipment is to be installed in the fire service system to allow reliable operation under normal and foreseen emergency conditions.

Alarm signals, pressure, flow rate and status indications may be required at key locations to allow efficient operation of the system under a variety of circumstances.

### 4.7.2.12 Mine Development - Fire Service Requirements

#### Fire Service Development

To meet ongoing mine development requirements, the modification or the development of the Fire Service System must consider the requirements of the entire mine area requirements including the operating areas for the coal and overburden operations and also the non-operating areas of the mine.

Effective engineering analysis and assessment is to be adopted to assess the impact of modifications or changes to the integrity of the fire service system, to ensure its ongoing effectiveness and compliance with the FCMP.

The mine is designed around head end and tail end connections, where practicable for the face conveyor spray lines. As the face conveyors are track-shifted, the head end and tail end connections require extension to maintain supply. The trunk conveyors, together with their fire service feeders are also extended from time to time to reflect the mine development.

Where fire service spray system connections at both locations (head and tail end connections) is not feasible or the pipe header or spraylines have been designed for single end supply, requirements as per Clause 4.7.2.10 shall apply.

#### Fire Service Planning

A 5 year Fire Service Plan is maintained to provide details of the short to medium term fire service infrastructure requirements required to meet the mine development requirements. The 5 year Fire Service Plan is used to determine the annual fire service infrastructure requirements, including pipe routes, pipeline sizes and details of fire service extensions for both budgeting and planning purposes.

To facilitate the development of the abovementioned 5 year Fire Service Plan, the Mine Planning section provide 5 year mine development information to the Fire Service Co-ordinator to enable the 5 year Fire Service Plan to be developed.

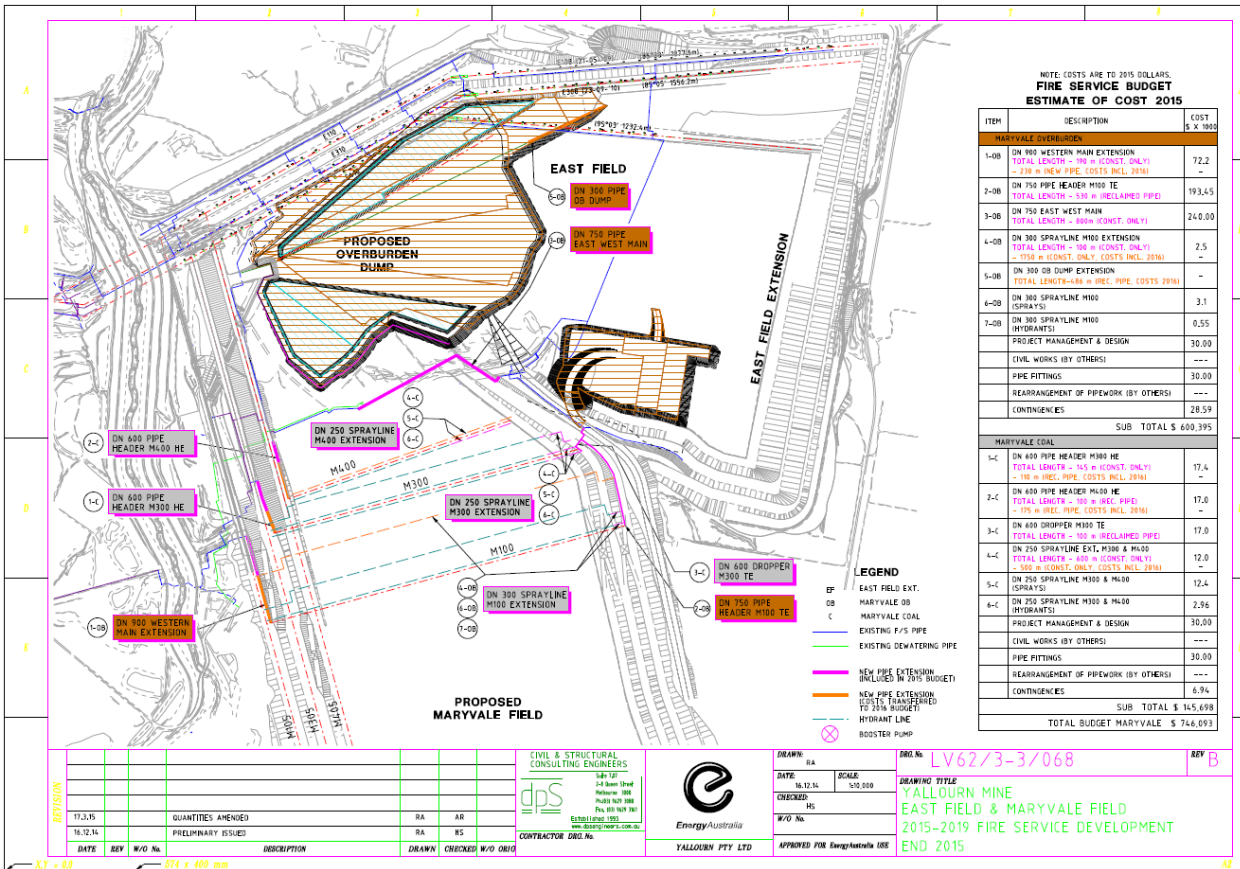
As part of the development of the 5 year Fire Service Plan, hydraulic modelling is completed using the fire service hydraulic model, maintained by the Mine Planning section, to determine the fire service infrastructure requirements, including pipe sizes etc. to ensure that the capacity of the fire service system is maintained.

Based on the 5 year Fire Service Plan, detailed design drawings are produced for the ensuing 12 months.

The fire service extensions are completed by the mine's fire service group, with the work supervised by the Fire Service Officer.

**Figure 31** below provides a copy of a typical fire service development plan

# Fire Control Management Plan



**Figure 31 - Typical Fire Service Development Plan**  
 (Mine Drawing No. LV62/3-3/068 Rev B)

## Survey

The physical location of the fire service assets are surveyed by the Mine Planning section and are recorded in the mine's progress plans.

As face conveyor track shifts are completed, the face conveyor spray lines are also relocated together with the face conveyor to maintain fire service coverage. Other fire service infrastructure including ring mains, droppers and headers, etc. are also extended as required to maintain fire service water supply to the extended mine areas.

Track shifts are completed approximately every three months, depending upon the mine development.

### 4.7.2.13 Fire Service Infrastructure - GIS

A data set of the Fire Service system is made available in our Geographic Information System (GIS). The primary contents relate to the physical pipe work and its geographical location which is provided and maintained by the mine's survey department. Additional data relates to "components" and infrastructure on the pipeline, for example stop vales, hydrants, truck fill points, pipe diameters, sprays, etc. The GIS is progressively being developed and expanded and is accessible on all Yallourn EA computers.

### 4.7.2.14 Fire Service Infrastructure - Labelling

Labelling of key fire service infrastructure is maintained to ensure the safe and effective operation and maintenance of the fire service system.





Figure 32 - Fire Service Infrastructure Labelling

#### 4.7.2.15 Cathodic Protection

To ensure the ongoing integrity of the fire service system, cathodic protection is provided and maintained in accordance with procedure [YMA-OPS-PR-0425 - Cathodic Protection of Mine Assets](#) (REF-140408). The testing contractor shall ensure as part of their scope of work for the testing of the cathodic protection system that the resulting test certificates are provided to Energy Safe Victoria. Test certificates provided by Energy Safe Victoria are filed within EnergyAustralia Yallourn's document management system.

#### 4.7.2.16 Water Reticulation

##### General Requirements

Materials, installation techniques and sighting of pipelines should take into consideration possible earth movement effects, corrosion, accessibility and provision for isolation and drainage.

The whole system of reticulation is to be such as to optimise the hydraulic efficiency with regard to performance and cost.

##### Water Supply Source

As required by **Section 4.7.2.2 - Water Supply Sources** above, each source of supply should have a separate, secure Main Supply Line. The design and location of the Main Supply Lines should take into consideration the importance to the water supply system.

##### Ring Main

A suitably sized perimeter ring main will allow minimal head loss whilst providing system security and redundancy with two supply routes.

## Fire Control Management Plan

### Droppers and Feeders

Droppers and feeders allow water to transition from the ring main to the various conveyors, sprays and hydrant lines within the mine. Droppers and feeders will only supply small sections of the mine and therefore pipe sizes are smaller than the ring main.

### Headers

Headers run alongside conveyor lines, providing the spray and hydrant coverage for safe mine operation. Ideally headers are connected to droppers or feeders at the head and tail end of a conveyor to allow system efficiency and redundancy, however at times only one connection will be achievable.

**Figure 29** above provides a description of the fire service mains, provides an example of the various categories of fire service pipe.

### Tanker Filling Points

Tanker filling points are to be provided at:

- Locations throughout the mine so that tankers are within approximately 5 minutes travel of a tanker filling point;
- For worked out batters in accordance with **Section 4.7.3.4 - Worked Out Batters**;
- On worked out floors in accordance with **Section 4.7.3.5 - Worked Out Floor of Mine**; and
- At grass level around the mine at strategic locations; and
- Tanker filling points shall be compatible with CFA couplings.

**Figure 15, Figure 16 and Figure 17** above, show the locations of the tanker filling points.



**Figure 33 - Typical Tanker Filling Point**

Consideration should be given to ease of access, location and reliability of water supply in the design of filling points - refer to **Section 4.7.3.4 - Worked Out Batters**.

## Fire Control Management Plan

### Hydrants, Hoses, Sprays, Valves and Other Fittings

These should be appropriate for firefighting purposes with due regard being given to interchange ability and use between Yallourn and the CFA.

#### 4.7.2.17 Mobile Water Supply

The mine maintains:

- \* At least two dedicated mobile tanker units (1 - CFA type truck) available during fire danger period with provision for additional back-up mobile water supplies in the event of them being required;
- \* Slip on tankers fitted with hose connections so that they may be filled from a source other than an overhead tanker filling station; and
- \* 5 - 300 litre first response utes / tank pumps for first response capability.

#### Water trucks on-site over summer:

- 1 x 50,000 litre;
- 3 x 30,000 litre;

**Note:** Mobile tanker(s) should be positioned on the conveyor transport level, or within 5 minutes drive of the area when belt shifting is carried out without an adjacent header being charged.

#### 4.7.2.18 Mobile Plant and Equipment

Mobile plant and equipment is to be readily available for emergency use in the mine to maximise firefighting capability, for example: such equipment as excavators, dozers, floodlights, cranes, tractors, pumps, etc.

Other equipment available includes:

- Mine fire response trailer (CO monitors, eye wash station, nozzles, hoses, etc.)
- One crane mounted spray nozzles;
- Large volume lay flat hose, 150mm diameter;
- 20 portable sprays;
- Township Field permanent droppers to lower levels;
- Design progressing to fit spray nozzle onto Manitou (17 metre reach);
- CO Health Monitor located in the Yallourn First Aid Centre; and
- Additional portable CO monitors maintained.
- 5 x Operations Fire Response Trailers (Hoses, branches, foam, etc)

## Fire Control Management Plan

### 4.7.2.19 Personnel

Whilst the primary reason for declaring the Yallourn Mine a smoke free zone was for health reasons, the banning of smoking within the mine reduces or potentially eliminates the risk of a fire in the mine from a smoking relating incident.

- Permanently manned fire station (24 hours x 7 days per week);
- Mine fire Service work team - 1 by 7 shift;
- Additional manning resources - Overburden truck and shovel operations during summer period;
- Level 1 Incident Control centre established for extreme fire danger days;
- Qualified Level II Incident Controllers maintained - 8-off
- 16 AIIMS trained personnel;
- Coach Road Fire Spotting Tower manned on all TFB days;
- Additional security controls maintained on TFB days.

### 4.7.3 Exposed Coal

#### 4.7.3.1 Operating Area

Since the introduction of slope mining within the mine in 2001, the carry dozers operating on the slope mining areas have provided an effective first response capability to the suppression of a coal fire. The carry dozers operating on the sloping face are able to dig out or smother the fire to effectively control the fire hazard.

Some 14 years of slope mining at Yallourn has demonstrated that the slope mining dozers have proven to provide an effective first response capability to controlling a fire. The slope mining operating face is manned on a continuous 24 hour / 7 days per week with operating personnel who are vigilant to the risk of fire.

In addition, the mine maintains portable spray units and hosing infrastructure which can be used in responding to a fire on an operating slope mining coal face. These can be assembled along the adjacent trunk conveyor to be used in response to a fire event.

During the declared fire season, three portable spray units will be located on each coal level, close to the face conveyors.

A reticulated fire service system is maintained at the upper and lower location of each operating slope to provide additional fire suppression capability.

**Figure 34** below, shows an example of this protection.

#### 4.7.3.2 Conveyor Corridors

##### Batters and Slopes

Where practicable, exposed coal on all operational benches within each corridor is to be capable of being continuously wetted using rotary sprays located on the benches above and below each slope.

## Fire Control Management Plan

### Berms

Where practicable all berms within the transport corridor are to be graded so that they shed fretting coal or permit clean up thereof. Alternatively coal berms / benches should be water protected as per benches - refer to **Section *Benches Without Conveyors*** below.

### Benches Supporting Conveyors

Where practicable, benches other than those supporting face conveyors are to be clay covered.

### Benches Without Conveyors

Where practicable all benches without conveyors are to be either clay covered or to come under the protection of the batter and slope rotary spray system. Any additional sprays should be located where practicable so as to provide at least 50% coverage for the wetted area.

#### 4.7.3.3 Service Areas and Corridors

Where practicable, service areas such as power supply corridors, control system corridors, power distribution centres, pumping stations, access roads and escape routes must be protected as follows:

- \* Power supply corridors and control system corridors are to comply with the reliability criteria, clay covering and water protection required for pole lines and cables as outlined in **Section 4.7.4.14 - Electrical Supplies**;
- \* Power distribution centres are to be located on clayed surfaces of a minimum of 75 mm thickness, with at least 5 m of clayed surfaces beyond the perimeter of the power distribution centre;
- \* Pumping stations are to be located on clayed surfaces or a similarly protected surface and comply with requirements for protection of power supply and control systems; and
- \* Access roads internal to and on the perimeter of the mine should be clearly sign posted and kept clear for emergency use.

#### 4.7.3.4 Worked Out Batters

Where practicable, worked out batters are to be protected as follows:

- \* Tanker filling points are to be provided such that a tanker on any part of the worked out batters is within 5 minutes travel of a tanker filling point;
- \* Fixed sprays should be used in conjunction with the droppers for the tanker filling points in order to provide wetted breaks;
- \* Fire break zones extending down to full depth of each batter may be utilised such that the length of exposed coal in any one batter is not greater than 500 m, where possible. These zones can be in the form of gravel vehicle access ramps or clay covering, a minimum of 8 m wide. Note: These fire break zones could consist of a combination of access roads, fire service droppers with spray headers or lay flat fire hoses, to achieve the required performance criteria; and
- \* Regular clean up of loose, dry coal and vegetation regrowth in drains and lower coal batters.

**Figure 35** below, provides an example of this protection.



Fire Control Management Plan

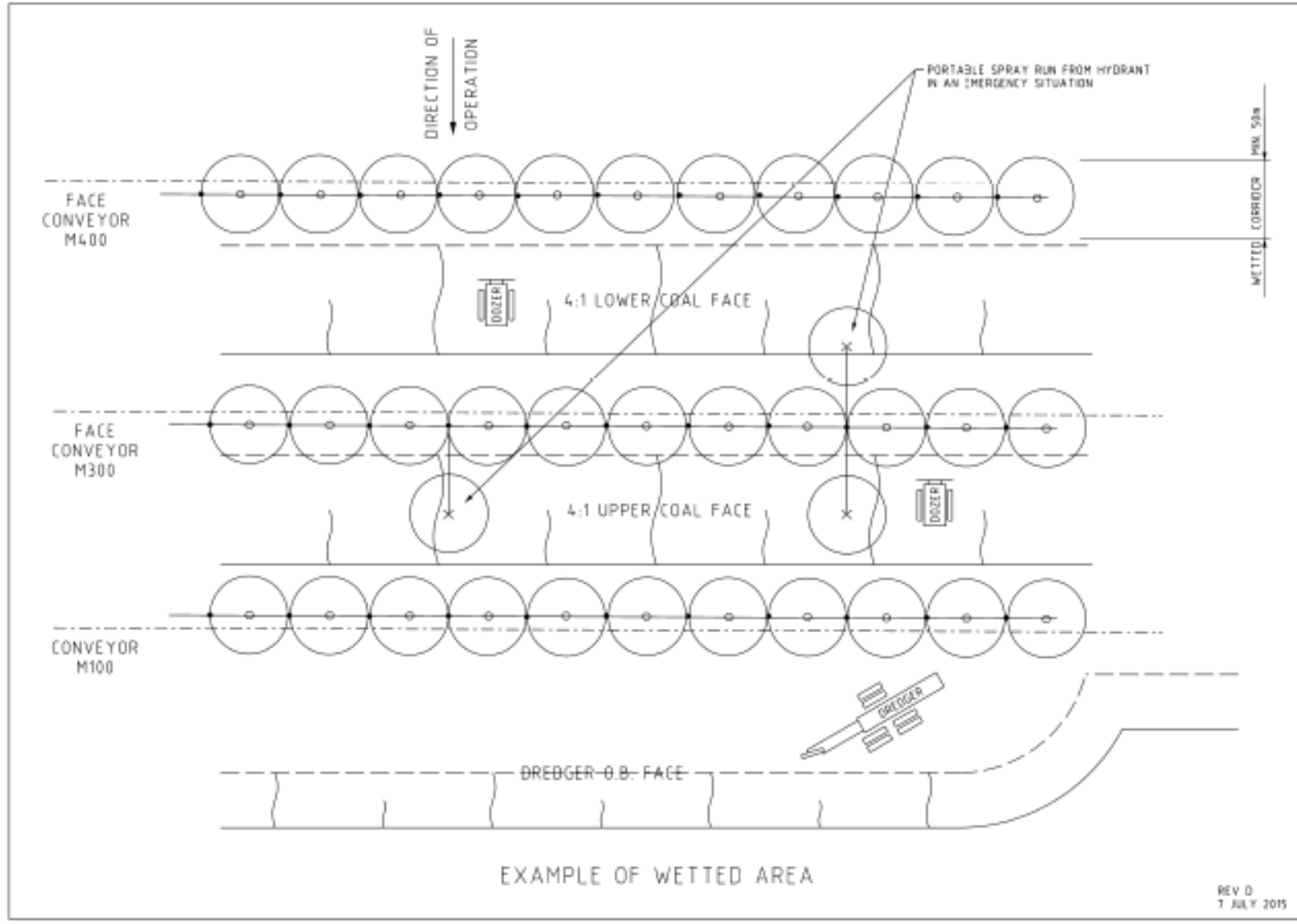


Figure 34 - Example of Wetted Areas

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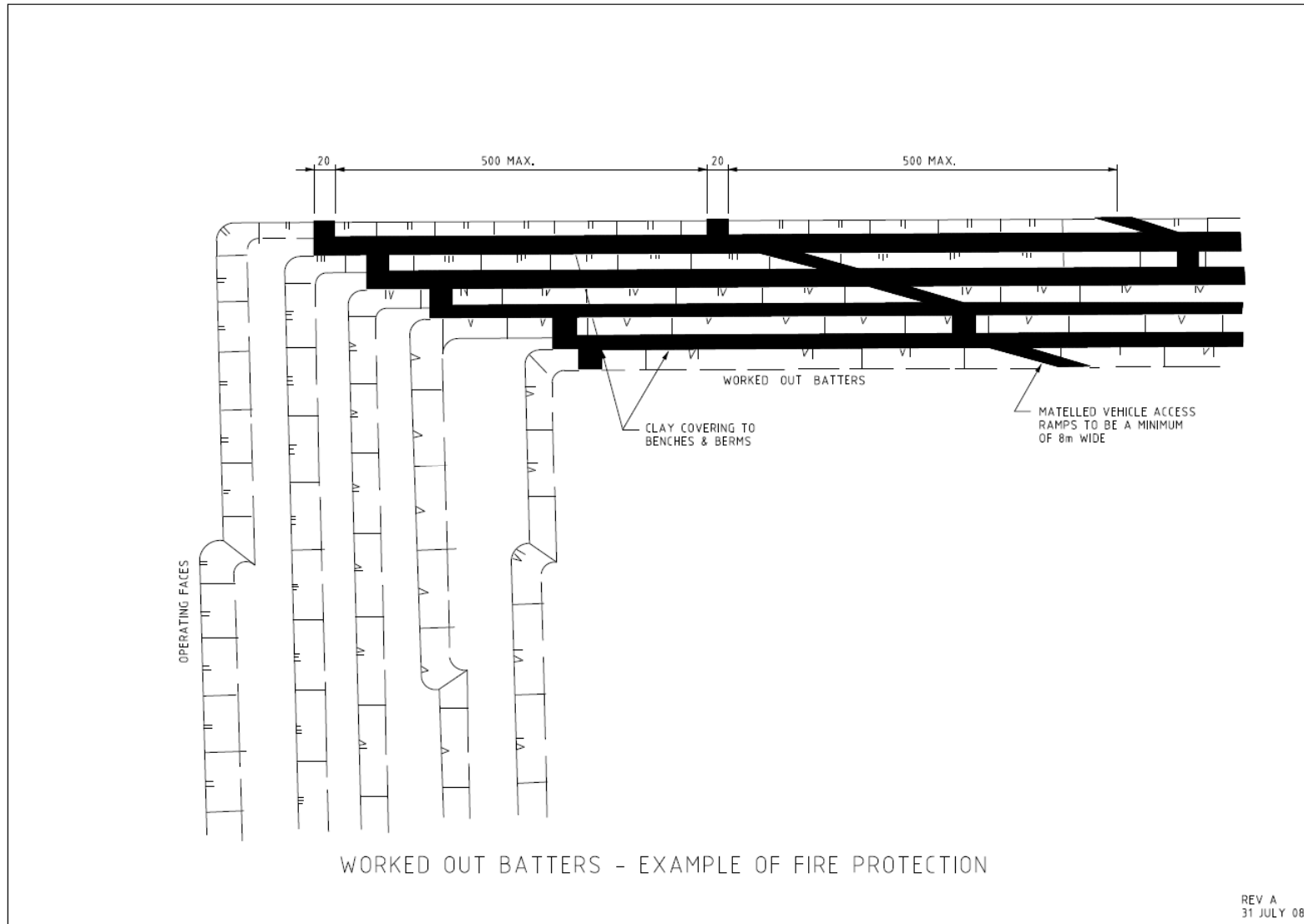


Figure 35 - Worked Out Batters - Example of Fire Protection

### 4.7.3.5 Worked Out Floor of Mine

The worked out floor of the mine as excavated, normally consists of low-grade coal and overburden. Ultimately these areas may be used for overburden disposal or water storage, which reduces fire risk. Whilst exposed, fire protection is based on the provision of intersecting fire break zones across the floor of the mine in the form of clay covering and the provision of tanker filling points as outlined in **Section 4.7.2.16 - Tanker Filling Points**, above.

Where practicable, individual exposed coal areas left by these fire break zones should be provided 50% coverage of the area.

For the period between exposure of the floor and the completion of clay fire break zones or the establishment of ponds or overburden dumps, protection should be by the provision of wetted corridors as required for working levels with the objective of achieving 50% coverage in area.

**Figure 34** above and **Figure 36** below provide examples of the various Mine areas.

### 4.7.3.6 Overburden Dumps

The overburden removed to allow the mining of coal is placed into worked out areas of the mine by dredger/conveyor/stacker equipment and also by truck and shovel operations.

As the overburden removal involves excavation of the contaminated top of the coal seam, procedures are in place to ensure this waste coal material is buried below the overburden surface to minimise future fire propagation in these areas.

The overburden dumps are stabilised progressively with native vegetation in accordance with the Rehabilitation Master Plan, to minimise other risks such as dust emissions once the coal mining operations have advanced sufficiently.

A network of access roads is established and maintained across the overburden dumps to allow for regular maintenance including fire season fuel reduction slashing and emergency access.

The final profile of the overburden dump should cover loose dumped coal with a minimum of 300mm cover of sand / clay material.

### 4.7.3.7 Overburden Batters

The overburden batters are laid back progressively in all new mining areas, then topsoiled and grassed to stabilise these steep slopes.

In old mine areas that preceded privatisation, some of these overburden batters, including some coal batters, have been reshaped, then top soiled and grassed.

These batters are maintained with annual fuel reduction slashing prior to each fire season.

## Fire Control Management Plan

### 4.7.4 Plant and Equipment

#### 4.7.4.1 Dredgers, Stackers & Mobile Slewing Conveyors

The protection of dredgers and other large machines is based on the principle of protecting each machine where it stands. Where practicable, the protection is provided as follows:

- A charged water supply of adequate capacity adjacent to the machine on its operating level. When unattended or non-operational, machines are connected to this supply;
- The maximum spacing of connection points on the supply headers for machines is no more than 200 metres. A minimum pressure of 40 m head at each rotary spray (or sufficient head to operate each rotary spray adequately, whichever is greater) is provided for effective operation when all machine water outlets are operating, or in an emergency supply situation;
- Sufficient number of sprays and portable skids to provide a spray curtain to protect the machine against airborne combustibles. The stacker which is not exposed to airborne combustibles is exempt from this requirement;
- Such additional sprays to the above as required to provide a saturated island for the machine to stand on. Stackers or other major plant which operate on a clayed area are exempt from this requirement;
- All rotary sprays are to be capable of being operated from ground level;
- A spray system and equipment to protect the machine from fires occurring within the machine including:
  - a) Trunk conveyors have spray protection to conveyors with Birdsmouth Sprays or hydrant line, on each side of and spaced along the entire length of the conveyor;
  - b) A suitable heat detection system that activates a deluge system and provides early warning should temperatures increase to unacceptable levels;
  - c) Fire hose reels conveniently located throughout the machine;
  - d) On dredgers, an adequately sized water storage tank capable of providing a supply to the hose reels when the machine is not connected to the charged water supply; and
  - e) Portable extinguishers of appropriate type conveniently located throughout the machine.
- Protection of power supply system by locating the machine within a clayed or wetted corridor.

Inspection and maintenance of the installed firefighting equipment on the machines is managed under the Safety Device Testing (SDT) program.

**Table 6** below, provides a copy of the Safety Device Testing Program Summary

Table 6 - Safety Device Testing Program Summary

No.	Plant item	Monthly	Six Monthly	Annual
1	Dredger 12	✓	✓	✓
2	Dredger 13	✓	✓	✓
3	TS 3	✓	✓	✓
4	S95	✓	✓	✓
5	Fire Protection Deluge System	✓	-	-
6	Remote Deluge Valves	✓	-	-

The firefighting equipment inspected on the machines includes:

- Fixed pipework and valves;
- Rotating sprays;
- Birds mouth sprays;
- Portable fire extinguishers;
- Hoses and hose reels; and
- Fire Water Tank.

Records of the SDT testing history are kept in Maximo

#### 4.7.4.2 Feeder Breakers and Hopper Cars

The protection of Feeder Breakers and Hopper Cars is based on the principle of protecting each Feeder Breaker and Hopper Car where they stand. Where practicable, the protection is provided as follows:

- \* A charged water supply of adequate capacity adjacent to the Feeder Breakers and Hopper Cars with appropriately spaced connection points to enable the Feeder Breakers and Hopper Cars to be connected wherever they are working along the length of the conveyor;
- \* Feeder Breakers and Hopper Cars are connected to their water supply at all times;
- \* Sufficient number of rotary sprays along the length of the conveyor to provide water coverage around the Feeder Breakers and Hopper Cars; and
- \* A suitable heat detection system that activates a deluge system and provides early warning should temperatures increase to unacceptable levels.



## Fire Control Management Plan

### 4.7.4.3 D11 Dozers

The protection of D11 Dozers is based on the principles of protecting each Dozer in the operational mode and when parked. Where practicable, the protection is provided as follows:

When Operational:

- \* An Aqueous Foam Filled Fire Suppression system (AFFF) that detects fires and automatically discharges the system and shuts down the engine, or can be manually discharged by the operator;
- \* An on-board water deluge system that can be connected to a charged water supply;
- \* Charged water supply lines of adequate capacity in close proximity to the Dozer's working areas to enable them to be connected to a water supply; and
- \* Routine cleaning/flushing to prevent coal build-up.

When Parked:

- \* An on-board water deluge system that can be connected to a charged water supply to extinguish fires;
- \* Charged water supply lines of adequate capacity to enable all D11 Dozers to be connected to a water supply when not working; and
- \* Where practicable, D11 Dozers are to be connected to a water supply at all times when not working.

*Note: In fire emergency situations, D11 Dozers can be used as firefighting equipment or they can be parked on clayed or sanded areas to further reduce the risk of fire.*

### 4.7.4.4 Conveyors

**Figure 36** below provides a diagrammatic layout of the conveyor system

#### Face Conveyors

The protection of face conveyors is based on the principle of providing a wetted corridor along the conveyor.

Where practicable, the wetted corridor is provided as follows:

- Inbuilt birdsmouth spray systems and other protective equipment on the drive unit and trailing frame;
- A suitable heat detection system for the drive unit and lead up section, that activates a deluge system and provides early warning should temperatures increase to unacceptable levels;
- Rotary sprays supplied from a charged header and spaced to give a continuous wetted corridor along the conveyor, and be capable of protecting the Head & Tail End units; and
- Hydrants supplied from a charged header and spaced at not greater than 55 metre intervals along both sides of the face conveyor. Rotary sprays must be capable of being operated from either end of the transport level to allow management of water usage during wetting down and firefighting activities. If remote control is used, the failure mode must be to an open position.

The Mine Manager and the Fire Services Officer ensure that special precautions are taken during belt-shifts, fire main rearrangements or maintenance of pipework.

## Fire Control Management Plan

### 4.7.4.5 Trunk Conveyors Below Grass Level

The protection of trunk conveyors below grass level is based on the principle of locating the conveyor on a clayed surface and in a wetted corridor along its full length. Where practicable, the wetted corridor is provided, as follows:

- Benches clayed and protected as per **Section 4.7.3.2 - Conveyor Corridors** above;
- Rotary sprays supplied from a charged header and spaced to give a continuous wetted corridor along the conveyor;
- Hydrants supplied from a charged header and spaced at not greater than 55m intervals along both sides of the conveyor;
- Birdsmouth sprays or Hydrant lines on at least one side of the conveyor for its full length; preferably on the north or west side of the conveyors. Birdsmouth sprays and hydrant lines are controlled by clearly marked valves spaced not more than 200m apart and accessible from both sides of the conveyor;
- Inbuilt birdsmouth spray systems on drive and tail end units; and
- A suitable heat detection system for the drive unit and lead up section that activates a deluge system and provides early warning should temperature increase to unacceptable levels.

**Figure 37** below provides an example of this protection.

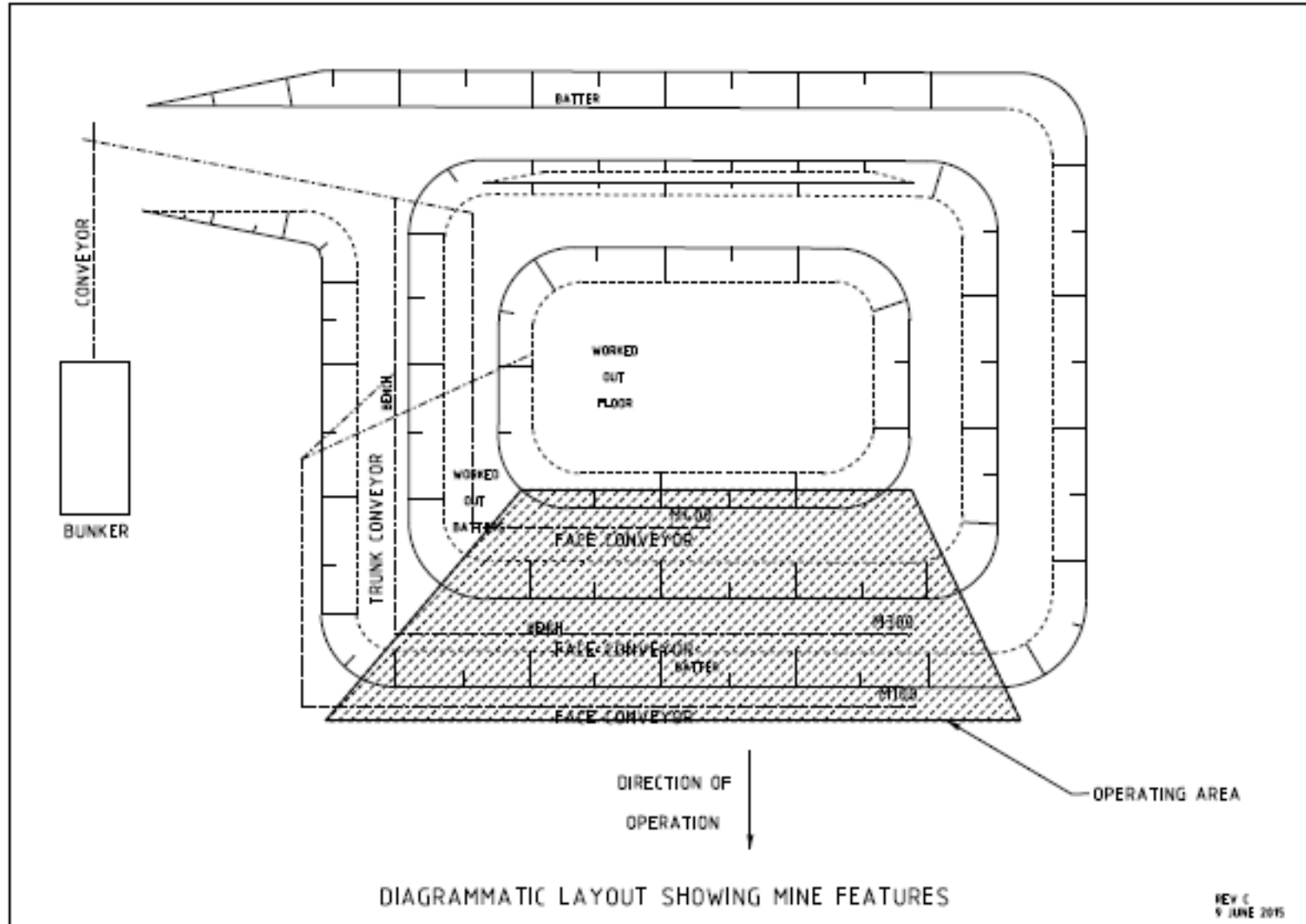
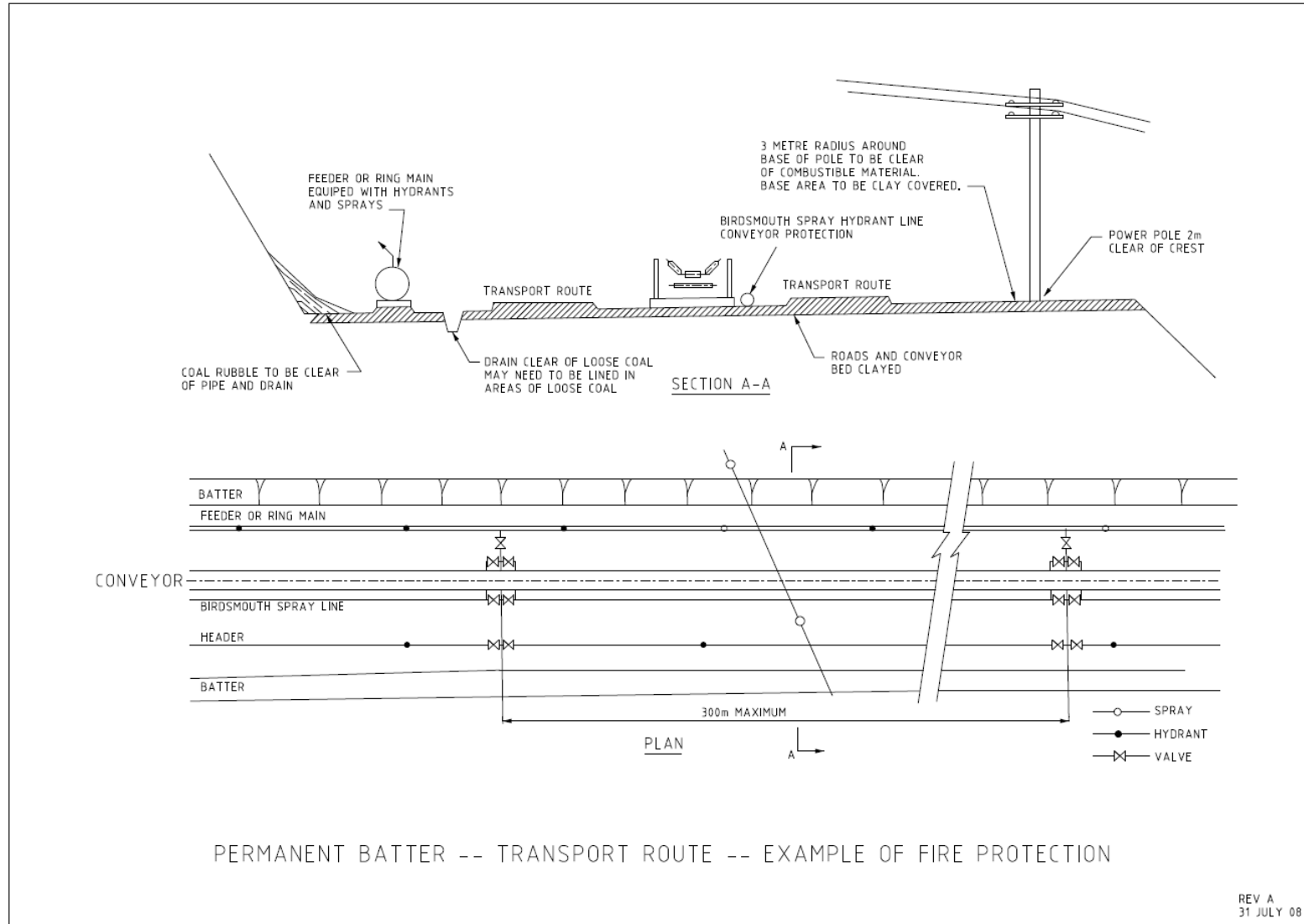


Figure 36 - Diagrammatic Layout showing Key Mine Features

**Fire Control Management Plan**



**Figure 37 - Permanent Batter - Transport Route - Example of Fire Protection**

Authorised By: Head of Yallourn

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Doc No. SHEMS13-SHE-L04

Ref: REF-192027 - SHEMS13-SHE-L04 - Mine Fire Control Management Plan (FCMP)

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### 4.7.4.6 Overburden Dump Conveyor

The protection of the overburden dump conveyor is based on the principle of providing a wetted area for the head end and tail end units, and hydrant supplies along the full length of the conveyor. Where practicable this is achieved by provision of the following:

- \* Hydrants supplied from a charged header line and spaced at not greater than 55m intervals on one side of the conveyor and capable of supplying protection for the conveyor, tripper and stacker; and
- \* Inbuilt birds mouth spray systems on drives and tail end units.

### 4.7.4.7 Elevated Conveyors

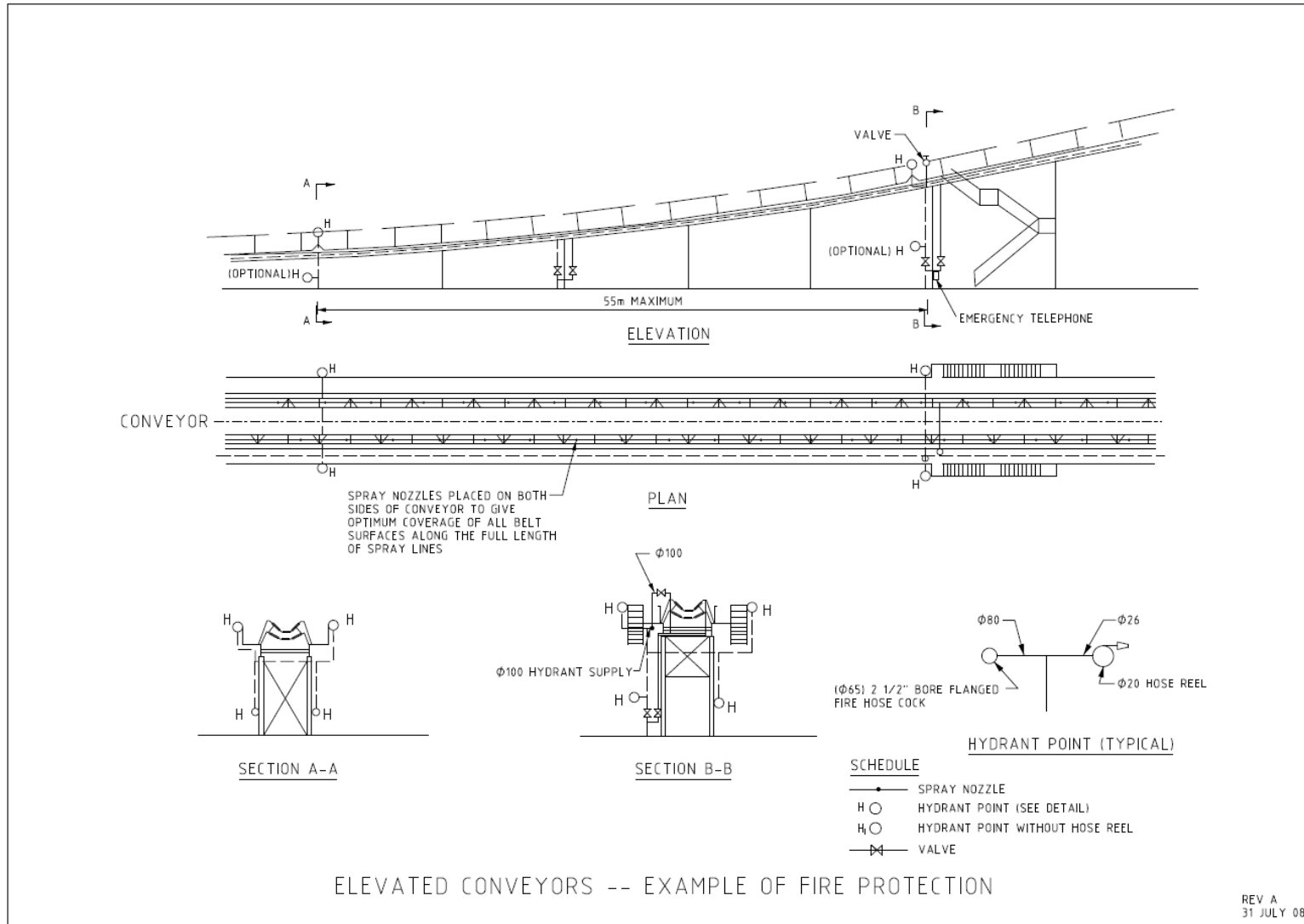
The protection of elevated conveyors is based on the principle of minimising coal spill by appropriate plant design, cleaning away coal build up and the use of a spray system capable of wetting the conveyors and support structure. Where practicable, this is achieved by provision of the following:

- \* A dust and coal spill clean-up system;
- \* Spraying and wetting down facilities to restrict the spread of fire with clearly marked control valves that are accessible from both the conveyor level and ground level;
- \* Clearly marked access points and escape ways no more than 100m apart;
- \* Fire hydrants at conveyor level spaced at not greater than 55m intervals, and at conveyor and ground level located adjacent to all access points and escape ways;

**Figure 38** below provides an example of this protection.



**Fire Control Management Plan**



**Figure 38 - Elevated Conveyors - Example of Fire Protection**

**Authorised By:** Head of Yallourn

**Version No:** 1.0

**Doc No.** SHEMS13-SHE-L04

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### 4.7.4.8 Multiple Transfer Areas

The protection for these areas is based on the principle of minimising coal spill by appropriate plant design, regular clean-up of coal spill and the use of a spray system capable of wetting the conveyor system and support structure. Where practicable, this is achieved by the provision of the following:

- \* A dust and coal spill clean-up system;
- \* Spraying and wetting down facilities to restrict the spread of fire with clearly marked control valves that are accessible from both the conveyor and ground level;
- \* Clearly marked access and escape ways;
- \* Fire hydrants at conveyor and ground levels spaced at not greater than 55m intervals, and located adjacent to all access points and escape ways;
- \* Fire hose reels at all hydrant locations; and
- \* A fire break zone at least 25 m width clear of any conveyor.

### 4.7.4.9 Conveyors in Tunnels

The protection for these areas is based on the principle of minimising coal spill and coal dust by appropriate plant design, washing down of coal build up, and the use of a spray system capable of wetting the conveyor and support structure. Within enclosed areas it is important to minimise the amount of coal dust in the atmosphere and the coal dust fall-out on surfaces and to minimise the potential chimney effect. Where practicable, these objectives are achieved by provision of the following:

- \* A dust and coal spill clean-up system;
- \* Spraying and wetting down facilities to restrict the spread of fire with clearly marked control valves located at internal and external locations;
- \* Telephone or a fire alarm system located adjacent to appropriate access points and escape ways; and
- \* Fire hydrants at internal and external locations, spaced at not greater than 55 m intervals and located adjacent to all access points and escape ways.

### 4.7.4.10 Specific Protection of Conveyor Drive Units

Conveyor drive units below grass level in the mine are protected by rotary sprays mounted either on headers or on the drive unit, or by portable rotary sprays such that a saturated island can be achieved under and around the drive unit, while at the same time achieving a spray curtain to protect the full height of the unit.

Protection against fires caused within all drive units is also achieved by live hose reels and by appropriate extinguishers conveniently located on or adjacent to the unit.

Protection of the conveyor belting within drive units is achieved by birds mouth sprays spaced on each side of the conveyor but staggered to give optimum coverage of belt surfaces and idlers.

Hydrants, where practicable are to be located close to each drive unit for ready connection of portable rotary sprays and hosing facilities.

Installation of a suitable heat detection system that activates a deluge system and provides early warning should temperature increase to unacceptable levels.

### 4.7.4.11 Bunkers and Drive Towers

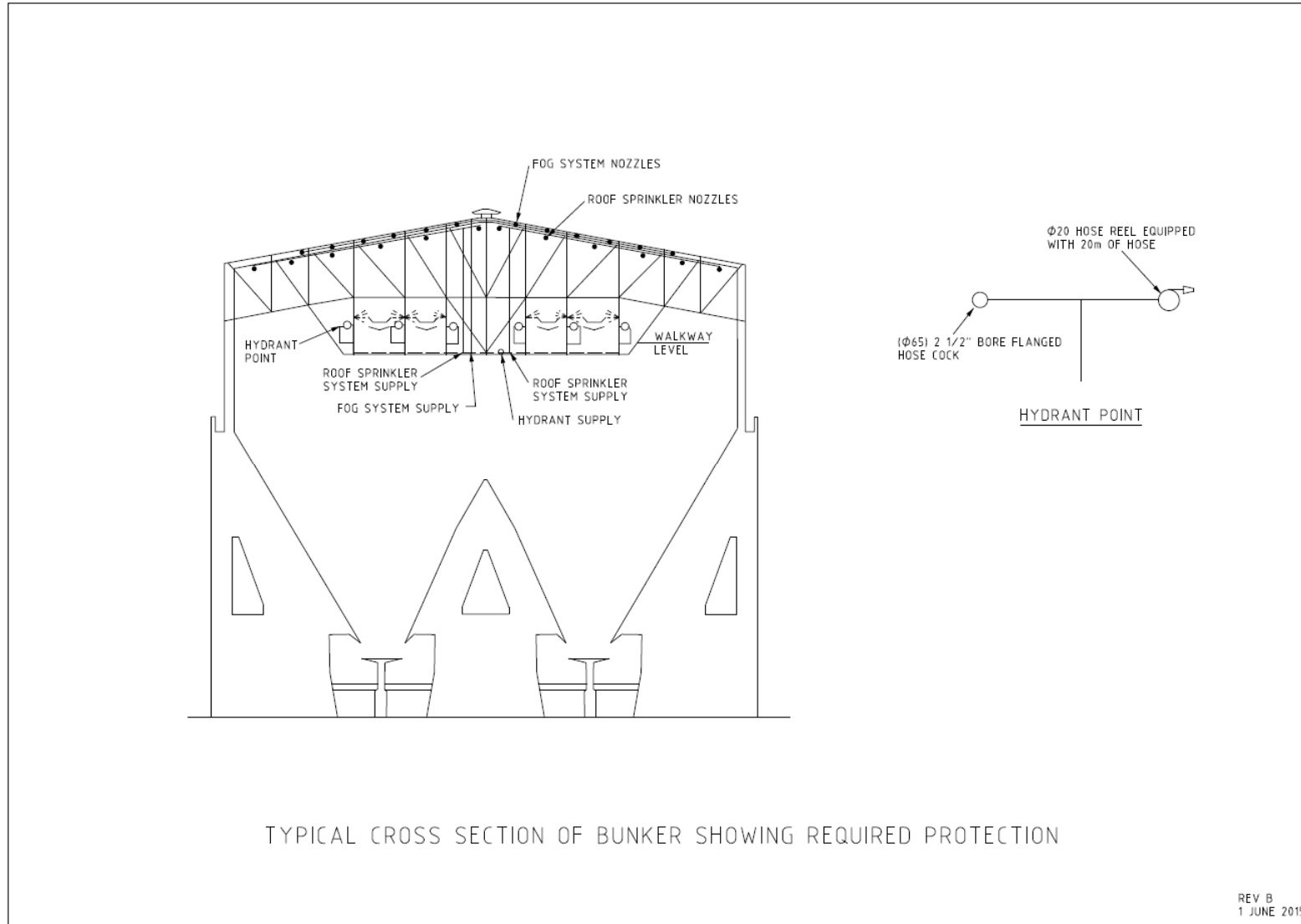
The fire protection for bunkers and drive towers is based on the principle of minimising coal spill and coal dust by appropriate plant design, maintaining good housekeeping practices, and by the provision of fire retarding and firefighting facilities. Within enclosed areas it is important to minimise the amount of coal dust in the atmosphere and the coal dust fall-out on surfaces. Where practicable, these aims are achieved by provision of the following:

- \* Bunker and gallery structures designed to minimise the settling and accumulation of dust;
- \* Internal roof mounted spray systems capable of spraying and keeping clean walls and walkways of coal dust and of spraying coal surfaces to inhibit the spread of fire. Separate spray systems are provided for the bunker and drive tower. The spray systems, where practicable are to be arranged such that they can be activated either from inside or outside the bunker/drive tower. Consideration should be given to supplying automatic detection systems to activate an alarm where practicable, particularly where bunkers and/or galleries are unmanned;
- \* Fire hose reels, hydrants and hoses are provided at readily accessible locations within the bunker and drive tower including all entrance ways;
- \* A dust and coal spill clean-up system;
- \* Ventilation of excess airborne dust;
- \* Birdsmouth sprays to wet the conveyor belts;
- \* Escape facilities and access routes clearly marked;
- \* Lifts and lift wells are located external to the bunker and separated from it by a fire rated door and provided with an escape way; and
- \* A wall between the gallery and bunker to stop draughts and the passage of atmospheric dust, and to impede the progress of a fire from either side of the wall to the other side.



**Figure 39 - RCB Fire Service Valve Station**

**Figure 40** below provides an example of this protection.



**Figure 40 - Typical Cross Section of Raw Coal Bunker showing required Fire Service Protection**

## Fire Control Management Plan

### 4.7.4.12 Auxiliary Machines (Mobile Plant)

The protection of mobile plant from fire and the minimisation of mobile plant as a source of fire when working on coal are based on the following, where practicable:

- \* Routine cleaning and prevention of coal build up;
- \* When mobile plant is operating on coal surfaces, it will be inspected regularly for coal build around working parts, and washed down as required;
- \* Provision of an on-board deluge system that can be connected to a charged water supply;
- \* Carrying of knapsack sprays and/or chemical fire extinguishers as a "first response" measure; and
- \* Machines are parked on clay or sanded areas or provided with water spray protection when not in use.

### 4.7.4.13 Motor Vehicles

Approval must be obtained from the Fire Service Officer or Mine Workshop Foreman before any motor vehicle can be driven on exposed coal areas. An inspection for compliance of the vehicle's braking and exhaust systems is required before approval is given.

YMA form [YMA-OPS-FO-0309 - Vehicle Authorisation Form](#) (REF-139285) is used to complete the vehicle inspection check. The completed inspection is filed in accordance with the YMA records management system.

The protection of motor vehicles from fire and the minimisation of motor vehicles as a source of fire when travelling on coal is based on the following, where practicable:

- \* Routine cleaning and prevention of coal build up;
- \* Provision of an approved exhaust system, braking system and splash plates where required to reduce the risk of starting fires. Approval must be obtained from the Fire Service Officer or the Mine Workshop Foreman before any vehicle can be driven onto exposed coal areas. Vehicles without this approval must not be driven on coal surfaces; and
- \* Carrying of either a knapsack spray or a hose with nozzle, and/or a chemical fire extinguisher as "first response" measures.

In emergencies, tanker escorts must be provided to vehicles not meeting these requirements.

Access to coal levels may be restricted on Fire Danger Days.

### 4.7.4.14 Electrical Supplies

#### Reliability of Electrical Supply

Duplication of supply, geographic separation of feeders and automatic switching is provided so as to achieve the required levels of reliability for power supplies for the mine including associated plant and equipment. Where practicable, duplicate supplies are provided from separate power distribution centres. Automatic fault isolation facilities are provided for all plant connections on feeders supplying fire service pumps.

Where practicable the distribution system is to be flexible enough to supply major items of plant from alternate feeders. Required levels of reliability for pumping stations are listed in **Section 4.7.2.4 - Reliability and Redundancy of Water Supply** above.



## Fire Control Management Plan

### Mine Fire Pumps

The mine fire pumps are supplied from three dedicated 6.6kV power lines, being YSA 631, YSA 642 and YSA 633. These power lines are supplied from substation YSA. The substation which has two 7.5MVA 22/6.6kV transformers is supplied by 2 off 22kV feeders being YCB 213 and YCB 224. Either 22kV supply has sufficient capacity to supply the fire service pumps. In the event that a 22kV supply fails, then bus ties must be manually closed to resume total operation of the four fire service pumps. The current default pumping operation only requires two pumps.

**Table 7** below provides details of the four mine fire pumps.

**Table 7 - Details of Mine Fire Pumps**

No.	Pump Name	Specification	Default Supply
1	FSP01	800kW, 6.6kV	YSA 642, 6.6kV OHL
2	FSP02	800kW, 6.6kV	YSA 633, 6.6kV OHL
3	FSP03	800kW, 6.6kV	YSA 642, 6.6kV, OHL
4	FSP04	800kW, 6.6kV	YSA 631, 6.6kV, OHL

Each 6.6kV supply is protected by its own dedicated circuit breaker located at substation YSA. This ensures that a single fault will only isolate a single power line. The power lines have manually operated section switches and tie switches to allow the fire pumps to be connected to an alternate power line. There is no automatic switching of 6.6kV power lines.

Each pump has its own dedicated HV switchgear (MCC), which ensures a switchgear failure will only affect that respective pump.

The system has a master controller which coordinates the starting of the fire pumps. In the event that an operating pump fails, the master controller will automatically start the next available pump. The master controller is supplied from dual supplies these being YSA 631 and YSA 642 service transformers, which ensures continued automatic operation. In local operation any pump can be operated independently of the master controller.

### Witts Gully Reservoir

The Witts Gully Reservoir is located externally from the mine and provides a head of water to the mine fire systems.

The power supply for Witts Gully instrumentation is provided by a rural 22kV AusNet Services power line. In the event that power is lost to Witts Gully, the mine fire service pumps must be operated in local control as the master controller is dependent on the level and flow signals from Witts Gully Reservoir.

### Latrobe River Fire Pumps

The Latrobe River fire pumps are supplied from a single 6.6kV power line, being YCB 615. This power line is supplied from substation YCB. The substation has two 7.5MVA 22/6.6kV transformers and is supplied by two 22kV feeders being YCB 211 and YCB 222. Either 22kV supply has sufficient capacity to supply its connected mine plant and Latrobe River pumps. In the event that a 22kV supply fails, then bus ties can be manually closed. The current default pumping operation is standby only.

**Table 8** provides details of the two Latrobe River pumps.

## Fire Control Management Plan

**Table 8 - Details of Latrobe River Fire Pumps**

No.	Pump Name	Specification	Default Supply
1	1601	700kW, 6.6kV	YCB 615, 6.6kV OHL
2	1602	700kW, 6.6kV	YCB 615, 6.6kV OHL

In the event that YCB 615 6.6kV supply fails, then it can be manually switched to substation feeder YEA 655. The Latrobe river pumps are operated in local only as there is no automatic start up or remote control and monitoring.

### **RCB Booster Pumps**

The RCB booster pumps are used to provide increased water pressure to the RCB in the event of a fire.

The RCB booster pumps are supplied from two dedicated 6.6kV power lines, being YCB 615, and YCB 624. These power lines are supplied from substation YCB.

**Table 9** below, provides details of the two RCB booster pumps.

**Table 9 - Details of RCB Booster Pumps**

No.	Pump Name	Specification	Default Supply
1	819	240kW, 6.6kV	YCB 615, 6.6kV OHL
2	818	240kW, 6.6kV	YCB 624, 6.6kV OHL

In the event that YCB 615 or YCB 624 6.6kV supply fails, then they can be manually switched to either YCB 615 or YCB 624.

Each pump has its own dedicated HV switchgear (MCC), which ensures a switchgear failure will only affect that respective pump.

The booster pumps automatically start as RCB valves are opened or can be operated in local control.

### **Routing and Type of Supply.**

Preferably, supply down batters is be via overhead lines. However, where an overhead supply would interfere with plant movement, supply by mine power cable or a flexible trailing cable may be provided. (Refer to comments in this section: Cables on coal, Cables down batters, for required protective measures.)

Sighting and protection of poles and cables is based on the following requirements:

- Overhead or underground feeder arrangements, where practicable will provide sufficient physical separation to preclude loss of more than one feeder as a result of a single event;
- For parallel overhead feeders of standard mine construction a minimum of 10 m spacing is to be provided. For field situations where this cannot be achieved, specific approval of reduced spacing is required from the Mine Manager;

## Fire Control Management Plan

- Alternative supply underground feeder cables, where practicable are to be routed separately, or if this is not possible they should be at least 2 metres apart; and
- Cross-overs of overhead lines is to be avoided where possible. If this is not possible then consideration should be given to construction to minimise failure, that is "super" spans, and to minimise interference with other feeders should failure occur. The use of cables, other than extensions of already necessary cables, to overcome crossing difficulties is to be avoided.

### Siting of Poles

With effect as from May 2015, concrete poles, are to be used where practicable, in lieu of timber poles for the maintenance and upgrade works to be electrical infrastructure.

In addition:

- Poles are to be sited at least 2 m from the tops of batters;
- Poles adjacent to the toe of coal batters are to be sited so that the protected area around the pole will remain free from accumulated coal fines; and
- Where practicable poles are to be sited on flat areas.

Poles on Coal:

- Poles are to be protected by a 3 m radius area of compacted sand or clay with a minimum depth of 75mm. For other transmission structures the protected area should extend 3 m beyond the perimeter of the structure; and
- The protective covering is to be inspected and maintained prior to each summer period.

Poles on Other than Coal:

- A 3 metre area around timber poles must be kept clear of combustible material. A clear area may not be required around concrete poles.

### Siting of Cables

Cables on Coal:

- Machine cables are to be laid within the protected area of the rotary sprays;
- Fixed cables on flat surfaces are to be laid on compacted sand or clay mats at a minimum spacing of 0.5 m and with the mat extending 1 m on either side of cables. Alternatively, cables can be run in covered concrete troughing boxes;
- Cables down batters should be run in open concrete troughing boxes or be provided with other equivalent protection. The troughing should be maintained free of accumulated coal fines; and
- The use of racks or catenaries to route cables down batters should be avoided unless a protective spray system or equivalent protective measure is employed. Special attention is to be given to protecting the cables at the top and bottom of the batter.

Cables on Other than Coal:

- Cables are to be laid at a minimum of 0.5 m centres and combustible material kept clear for 1 m on either side of cables;

## Fire Control Management Plan

### 4.7.5 Communications

A fully equipped multi-channel communication system is to be provided in the Mine Control Centre capable of being manned by additional operators in fire emergencies.

Provision is also to be made on-site for a control centre to enable Incident Controllers from external agencies to establish a command centre in the event of an emergency situation.

Communications systems and alarms as described elsewhere in this document are required in bunkers, conveyor transfer areas, on elevated conveyors, near pumping stations and on all major machines.

### 4.7.6 Management of Fire Services in Mine

YMA management instruction procedure [YMA-OPS-PR-0239 - Fire Services](#) (REF-140753), describes the high level processes for management of the fire services within the Mine.

### 4.7.7 Hot Works Procedure

YMA procedure [YMA-OPS-PR-0343 - Hot Works Procedure](#) (REF-138657), describes the processes for conducting hot works related activities within the mine.

A Hot Work permit must be obtained from the Fire Service Officer during normal day work hours, or the Shift Supervisor at other times, before any hot work is carried out. Examples of hot work include:

- Welding, cutting or grinding;
- Use of open flame appliances, for heating and other purposes; and
- Use of portable internal combustion engines.

Hot Work permits will not be issued on Fire Alert Days and Total Fire Ban Days, unless all precautions outlined in the relevant annual CFA permit for performing hot work during the fire danger period have been implemented.

### 4.7.8 Fire Breaks

Provision of appropriate fire breaks and control of grassed and forested areas within the mine perimeter areas are necessary to reduce the hazard from fires external to the mine potentially entering the mine and also internal fires within the mine escaping from the mine into the surrounding community. Priority is placed on the fire approach directions from the north, west and south west.

A mine perimeter access road / haul road will be maintained around both the operating and worked out areas of the mine, to provide access to plant and equipment for both mine operational requirements and firefighting purposes.

The perimeter road / haul road fire break may be complimented by vegetation maintenance with grazing and slashing grassed areas or other means which minimise combustible material within the fire break corridor.

Grassed areas on EnergyAustralia Yallourn land are managed to minimise fire propagation risk, either by grazing or slashing / mulching to a low level of fire hazard during the fire season. Areas which are considered a "high risk" in proximity to the mine are slashed prior to the fire season.

For overburden removal within the Maryvale Field, Yallourn utilises a combination of truck and shovel and dredger to remove and transport overburden material to the overburden dump and to other locations within the mine.

## Fire Control Management Plan

The truck and shovel overburden overheight removal program progresses ahead of the dredger overburden removal program and in doing so creates a significant area of fire break ahead of the Maryvale coal operations. The truck and shovel over height overburden removal is programmed to continue for a further 10 years and provides a significant fire break control to manage fire hazards within the operating area of the mine.

Infrastructure adjacent to the mine including the Princess Freeway, Latrobe Road and the Morwell and Latrobe Rivers provide fire breaks to the mine from potential grass fires that could enter the mine or escape from the mine.

Fire breaks available for managing the risk of fire include:

- Princess Freeway;
- Marrott's Road;
- Latrobe Road;
- BCM Road;
- V/Line Railway Line;
- Latrobe River;
- Morwell River Diversion;
- Township Field Overburden Dump;
- East Field Overburden Dump;
- Maryvale Field Overheight Overburden Removal (Refer Figure above);
- Fire Service Pond; and
- Township Water Storage;

The above fire breaks provide controls to manage the risk of a mine fire "escaping" from the mine into the surrounding environment and also provide controls to manage the risk of an external fire entering the mine.

**Figure 41** below provides an aerial photo showing the area of overburden over height removal operations and the resultant fire break created ahead of coal operations in the operating area of the mine.



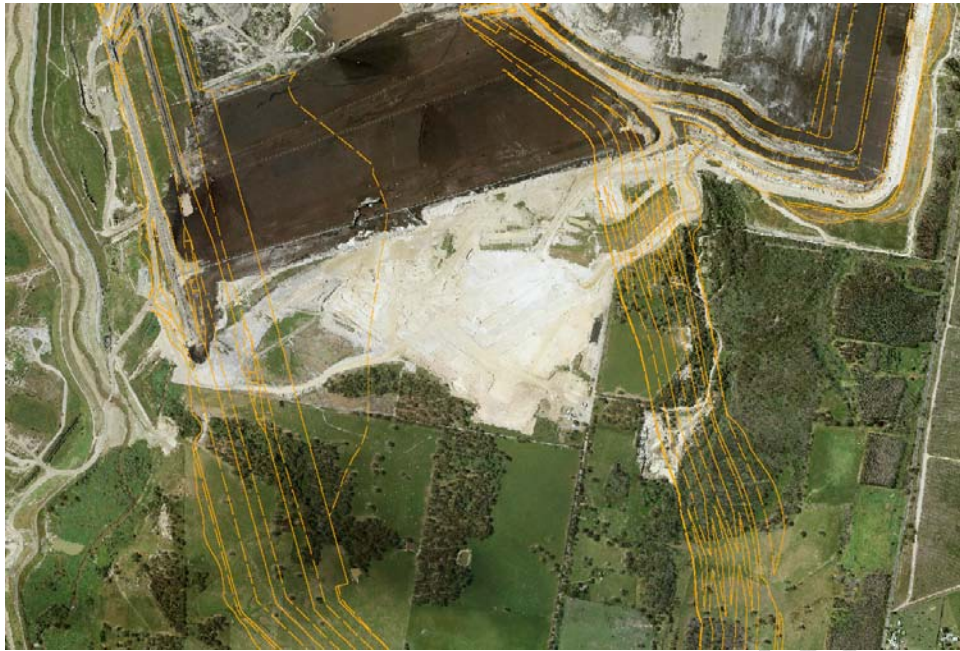


Figure 41 - Typical Area of Overburden Overheight Removal Ahead of Maryvale Field Coal Operations



Figure 42 - East Field Mine - Overburden Dump Operations





Figure 43 - Worked Out Area of the Mine - East Field Batter Rehabilitation



Figure 44 - Morwell River Diversion



Figure 45 - Morwell River Diversion



Figure 46 - Latrobe River

## Fire Control Management Plan

### 4.7.9 Wildfire Risk Mitigation

To manage the impact of the risk of wildfire on EnergyAustralia Yallourn land and to protect adjoining property and public land from wildfire originating on Yallourn's land, EnergyAustralia Yallourn develop and implement a Wildfire Risk Mitigation measures.

EAY procedure [SHEMS11-ESV-P001 - Wildfire Risk Management](#) (REF-139611) describes the Wildfire Risk Mitigation processes.

In referring to the above Wildfire Risk Management procedure, wildfire risk mitigation measures include:

- Fuel reduction by land management techniques, mechanical and chemical fuel reduction, cool burning;
- Assessment of potential threats within the district (for example: tree plantations, public land, etc.) and liaison with the appropriate authorities and committees to negotiate the application of risk mitigation measures;
- Monitoring wildfire risk indicators (for example: weather forecasts, Fire Danger Indices, etc.);
- Maintaining surveillance of the district through manning the fire spotting tower, monitoring CFA radio traffic and conducting patrols throughout the site during periods of extreme fire weather;
- Responding to situations off site where a fire has occurred or there is a likelihood of a fire occurring that has the potential to impact on the EnergyAustralia Yallourn site;
- Liaison with relevant Authorities with respect to wildfire risk mitigation;
- Applying for relevant permits and other approvals to carry out wildfire risk mitigation and other fire related works; and
- Notification to all stakeholders of the timing of the introduction of the fire danger period and the requirements to be observed during this period.

The Estate Services Alliance Manager is responsible for ensuring that the Wildfire Risk Mitigation processes across the site are effectively managed.

In August each year, the EnergyAustralia Yallourn Wildfire Risk Mitigation Committee meet to review the Wildfire Risk Mitigation Plan established for the previous wildfire season and commence development of the new Wildfire Risk Mitigation Plan for the forthcoming wildfire season, which is developed and submitted to the relevant stakeholders by mid-September each year for their review and comment. The Wildfire Risk Mitigation Plan is finalised and submitted to all stakeholders by the 30<sup>th</sup> September each year.

Fire hazard removal works including slashing, mulching, pruning and controlled fuel reduction burns are managed by Estate Services in accordance with the scheduled works program.

The Wildfire Risk Committee review the Wildfire Risk Mitigation Plan on a monthly basis whilst wildfire conditions (fire danger period) exist against the actual conditions and, make and implement amendments to the plan to ensure EnergyAustralia Yallourn site is adequately protected against the risk of wildfire attack.



## Fire Control Management Plan

### 4.7.10 Bushfire Mitigation Plan

EnergyAustralia Yallourn procedure [SHEMS11-SHE-P016 - Fire Mitigation Strategies for the EnergyAustralia Yallourn Site](#) (REF-187205), provides details of the Fire Mitigation Strategies employed at EnergyAustralia Yallourn.

EnergyAustralia Yallourn maintains a Bushfire Mitigation Plan for the Yallourn site. A key objective of the Bushfire Mitigation Plan is to ensure that there are procedures and processes in place to mitigate against the risk of the spread of fire that initiates internally as well as the infiltration of external fires. The procedure also mitigates the initiation of bushfires from “at risk” electrical lines (HV electrical lines).

The Bushfire Mitigation Plan has been developed as part of Yallourn’s ESV approved ESMS. In particular the Bushfire Mitigation Plan has been implemented in order to comply with the Electrical Safety (Bushfire Mitigation) Regulation: 2013. The Bushfire Mitigation Plan must be reviewed annually, updated and checked against the current regulation and then sent to ESV before the 1<sup>st</sup> July each year to ensure compliance with the regulation.

The Bushfire Mitigation Plan provides an integrated set of procedures to manage a controlled reduction in fire risk to and from all site assets, through systems of asset inspection and management, fuel reduction, ignition source containment and control.

The Bushfire Mitigation Plan includes the following:

- Objectives of the Plan;
- Site Responsibilities;
- Preventative Strategies;
- Electrical Asset Management;
- Wildfire risk mitigation during the declared fire danger period;
- Hot works;
- Days of Total Fire Ban;
- Investigations;
- Training and Competence;
- External agencies;
- Fire Management in the Mine;
- Fire Detection;
- Fire Extinguishers;
- Vehicle Modifications;
- Reticulated Water Fire Suppression System;
- Contractors; and
- Monitoring, auditing and reporting.

EnergyAustralia Yallourn procedure [SHEMS11-SHE-P015 - Management of the Bushfire Mitigation Plan](#) (REF-149100) describes the processes for the management of the Bushfire Mitigation Plan.

EnergyAustralia Yallourn document: [SHEMS11-SHE-P015-L01 - EnergyAustralia Yallourn Bushfire Mitigation Plan](#) (REF-144347) provides a copy of the actual Bushfire Mitigation Plan.

## Fire Control Management Plan

The Estate Services Manager is also responsible for the Bushfire Mitigation Plan outside the mine, whilst the Manager Mining is responsible for the implementation of the mine's component of the Bushfire Mitigation Plan.

The Estate Services Manager is responsible for chairing the Wildfire Risk Committee and the management of vegetation on the lands outside of the mine operational areas.

The Mine Environmental Engineer is responsible for ensuring that the Bushfire Mitigation Plan is updated annually. An audit is conducted as part of the process for the annual review and update of the Bushfire Mitigation Plan.

The Electrical Engineer mine is responsible for the Electrical Asset management component of the Bushfire Mitigation Plan and the YMA procedure - [YMA-OPS-PR-0374 - Management of LV & HV Overhead Distribution System](#) (REF-140752).

The Senior Engineer, Electrical Compliance is responsible for the effective liaison with Energy Safe Victoria (ESV) and for ensuring that the Bushfire Mitigation Plan is submitted to ESV by the 1<sup>st</sup> July each year.

The Bushfire Mitigation Plan is developed as part of EAY's ESV approved ESMS and in particular Clause 6 of the Electrical safety (Bushfire Mitigation) Regulations.

The Electrical Line Clearance Plan is linked to the Bushfire Mitigation Plan, in accordance with Clause 6(n) of the Electrical Safety (Bushfire Mitigation) Regulations: 2013. The Electrical Line Clearance Plan is reviewed prior to the annual review of the Bushfire Mitigation Plan. The Manager Mining shall nominate a person to review the Electrical Line Clearance Plan by the 1<sup>st</sup> March each year.

The Manager Mining shall also nominate a person to complete an audit of the Bushfire Mitigation Plan at the commencement of March each year. The audit is to be conducted to meet the requirements of Clause 6(n) of the Electrical Safety (Bushfire Mitigation) Regulation: 2013. The findings and recommendations of the audit shall be considered in the review and update of the Bushfire Mitigation Plan.

### 4.7.11 Electrical Safety (Electrical Line Clearance) Plan

EnergyAustralia Yallourn maintains an [SHEMS11-SHE-L01 - Electricity Safety \(Electrical Line Clearance\) Plan](#) (REF-144276) in order to comply with the Electrical Safety (Electric Line Clearance) Regulation.

The procedure defines the practices for the management of cutting trees in the vicinity of electric lines, minimises the danger of electrical lines causing fire or electrocution and the maintenance of electric lines. The Electric Line Clearance Plan is inter-linked with the Bushfire Mitigation Plan and must be monitored and audited each year to identify any deficiencies in the plan and updated if required, by the 31st March each year. It must be available upon request from Energy Safe Victoria.

In summary, the Electrical Safety (Electrical Line Clearance) Plan includes:

#### Management of Overhead Lines

The management of the sites high and low voltage overhead reticulation system as described in the Mine procedure: [YMA-OPS-PR-0374 - Management of LV & HV Overhead Distribution System](#) (REF-140752)

This procedure describes the requirements for design, maintenance, inspection and operation of the HV and LV overhead lines on the site. The procedure also includes vegetation control, inspections and clearance distances and vegetation management methods for the site to maintain an adequate clearance for overhead lines.

## Fire Control Management Plan

### Vegetation Management

On the Yallourn site, native vegetation is protected under various State and Commonwealth legislation. Dedicated conservation areas have been established to allow native vegetation to prosper.

Trees of significance have been identified and are managed in accordance with the site's Conservation Management Plan and Environmental Management Plan.

The EAY procedure [SHEMS10-SHE-P001 - Removal of Vegetation on the EnergyAustralia Yallourn Site](#) (REF-140771) considers where an exception applies and native vegetation can be removed. In such areas, the Mine Environmental Engineer or delegate is required.

### Management of Vegetation near Power Lines

The Mine Electrical Engineer is responsible for the management of vegetation near power lines on the Yallourn site. The performance measures to assess against the code compliance in the regulation are:

- Preparation of the Electrical Line Clearance plan by 31<sup>st</sup> March each year;
- Implementation of the Electric Line Clearance Management Plan;
- Full implementation of the inspection routine; and
- Number of defects raised for clearance of vegetation near the power lines.

Vegetation control companies inspect the overhead conductors on a twice yearly basis and clear any vegetation approaching the minimum clearance distances. Where vegetation breaches the minimum clearance distance or contact the conductors then the line will be isolated and the clearance work carried out under permit conditions.

Estate Services is responsible for the preparation and application of the Yallourn Wildfire Risk Management Plan. This plan includes fire hazards removal as well as the preparation of strategic fire breaks to ensure the site is protected against wildfire that occur on or external to Yallourn property.

The Estate Services team manages the Wildfire Risk Committee to coordinate the fuel reduction works across the site whilst bushfire risk conditions exist. The Wildfire Risk Committee meet monthly all year round and reviews the conditions on site, monitors the implementation of the Bushfire mitigation Plan and implements the actions to ensure that the Yallourn site is adequately protected against wildfire attack.

#### 4.7.12 AusNet Services Electrical Assets

AusNet Services own, operate and maintain a number of electrical assets that cross the Yallourn Mine site.

The following two drawings provide details of the locations of these AusNet Services assets:

1. Drawing No. LV/5-11-5/009 - Titled: Yallourn Electrical Safety Management System - ESMS - Functional Area Boundaries - Site Plan'
2. Drawing No. LV/5-11-5/010 - Titled: Yallourn Electrical Safety Management System - ESMS - Functional Area Boundaries - Station Enlargement Site Plan

These two drawings are available via fingertips on the ESMS site.

To formalise the site access arrangements Easement Agreements have established for the various types of AusNet Services assets on the EnergyAustralia Yallourn site.



## Fire Control Management Plan

The Easement Agreements are:

1. [Easement for Overhead Electric Lines, dated 30<sup>th</sup> November 1995](#) (REF-192159);
2. [Easement for Overhead and Underground Communications Lines, dated 30<sup>th</sup> November 1995](#) (REF-192161);
3. [Easement for Underground Electricity Lines, dated 30<sup>th</sup> November 1995](#) (REF-192160);
4. [Deed of Licence - Zone Sub-Station Yallourn Central \(YC\), dated 30<sup>th</sup> November 1995](#) (REF-192162); and
5. [Deed of Licence - Zone Sub-Station Yallourn Hernes Oak \(YHO\), dated 30<sup>th</sup> November 1995](#) (REF-192163).

AusNet Services manage their electrical assets on the EnergyAustralia Yallourn site in accordance with their ESMS.

**Figure 47** - provides a plan of the location of AusNet Services assets on the Yallourn site

Fire Control Management Plan



Figure 47 - Plan showing Location of AusNet Services Assets  
 (Mine Drawing No. LV5/11-5/009 Rev B)

### 4.7.13 Total Fire Ban / High Fire Risk Days

The CFA may declare a Total Fire Ban Day based on their assessment of the fire risk within an area or throughout the state of Victoria. The accompanying restrictions apply to the EnergyAustralia Yallourn property and operations.

When severe weather conditions exist that could result in a high risk of fire spreading, the Mine Manager or the Fire Services Officer may declare a Fire Alert within the mine area and enact special precautions for fire watch, hot works, access and wetting down procedures, as defined in the applicable instructions and procedures.

Where the CFA have declared a Day of Total Fire Ban specific procedures are to be complied with as described within procedure - [YMA-OPS-PR-0129 - Carrying Out Hot Works on Days of Total Fire Ban](#) (REF-137313).

On days of TFB, Estate Services open the TFB boards and place total fire ban flags around the site in accordance with EAY procedure: [SHEMS-ESV-P001-I02 - Opening of Total Fire Ban Boards and Placement of Total Fire Ban Flags](#) (REF-137344).

When the CFA declare a day of Total Fire Ban, preparations for the TFB day are managed in accordance with EAY procedure: [SHEMS11-ESV-P001-I01 - Preparedness for Extreme Fire Danger and Total Fire Ban Days](#) (REF-124193)

On a day of Total Fire Ban, EnergyAustralia Yallourn mans the Coach Road Fire Spotting Tower and also operates additional security patrols around the site.

### 4.7.14 Personnel Safety

The principles, upon which the safety of all personnel, including employees is based on:

- \* Maintaining as clean a working environment as is practicable to limit the occurrence of fire;
- \* Controlling sources of ignition such as cutting and welding, mobile equipment and motor vehicles. Potentially inflammable materials such as oil, greases and fuels should be stored and used in a safe manner;
- \* Protecting access and escape ways;
- \* Maintaining safe access for firefighting;
- \* Provision and maintenance of adequate communications equipment and systems;
- \* An organised approach to prevention and suppression of fire and the formulation of emergency response plans and fire instructions;
- \* Training sessions and exercises to ensure that each employee understands techniques and mine procedures for fighting brown coal fires and undergoes refresher training sessions at no greater than three (3) yearly intervals;
- \* Maintaining appropriate monitoring and controls when fighting fires to ensure that personnel are not exposed to unacceptable levels of CO;
- \* Maintenance of effective inspection and monitoring procedures to minimise potential fire sources on plant and within the mining environment; and
- \* Maintenance of effective inspection and monitoring procedures to ensure appropriate fire protection equipment and procedures are established and maintained and complied with.



## Fire Control Management Plan

### 4.7.15 Mine Stability

Depending upon the severity of a fire, large quantities of water may be required to manage and control the fire.

As most mine instability issues at Yallourn are water driven, geotechnical inspections may be required during both the incident response and also at the conclusion of the incident response, to enable any actual or potential ground instability risks to be identified and corrective actions implemented to ensure safe and stable mine conditions are maintained.

For further information please refer to the [SHEMS13-SHE-L03 - Ground Control Management Plan \(GCMP\)](#) (REF-134670).

### 4.7.16 Land Rehabilitation

#### 4.7.16.1 General

The progressive rehabilitation of the mine including final batters and other final worked out areas of the mine is essential in maintaining medium to long term stability of mine batters and controlling fire hazards.

Land rehabilitation includes construction of final batter profiles, drainage systems, top soiling and grassing and tree planting.

In reviewing and establishing the progressive 5 year and annual rehabilitation plans, consideration is to be given to fire hazards and reducing where practical, the area of exposed coal as means of minimising the risk associated with fire hazards.

Progressing this mine rehabilitation work may impact on the integrity of the fire service ring main in the area, resulting in a loss of fire service coverage for a section of batter. In such areas where the rehabilitation work has resulted in a loss of fire service coverage, alternative fire protection may be provided via mobile plant depositing and spreading sand material to control the fire and the use of fire tankers.

To manage the risk of fire, for those areas where rehabilitation work has resulted in the loss of fire protection coverage, then prior to the fire season, the fire service system will be established to ensure that not more than 500 metres of unprotected batter will exist, where practicable.

**Figure 50** below, provides details of the hierarchy of land rehabilitation planning documents.

**Figure 48 and Figure 49** below, show land rehabilitation works conducted in the Yallourn Township Field area of the mine.



**Figure 48 - View of Township Field Land Rehabilitation**



**Figure 49 - View of Township Field Land Rehabilitation**

Land rehabilitation works shall be completed in accordance with the requirements of:

- YMA Guideline: [YMA-OPS-LIB-0060 - Guidelines for Land Rehabilitation Construction](#) (REF-142005).
- YMA Procedure: [YMA-OPS-PR-0192 - Dumping](#) (REF-137121);
- YMA Procedure: [YMA-H&S-PR-0247 - Mine Dust Emissions Control](#) (REF-138655);
- YMA Plan: [YMA-H&S-MP-003-ATT4.01 - PR-0247 - Soil Erosion and Sediment Control](#) (REF-135665);
- YMA Plan: [YMA-H&S-MP-003 - ATT4.06 - Topsoil Management](#) (REF-135668);
- the approved Rehabilitation Master Plan (RMP);
- the approved Conservation Master Plan (CMP); and
- the approved Environmental Management Plan (EMP).

The following EPA publications provide a useful reference for the completion of rehabilitation work:

- EPA Publication: [Rehabilitation and Revegetation - One Module in a series on Best Practice Environmental Management in Mining - June 1995](#) (REF-193538); and
- EPA Publication: [Rehabilitation and Revegetation - One Module in a series on Best Practice Environmental Management in Mining - June 1995](#) (REF-193539).

The progressive rehabilitation of the mine is a mining licence condition and is completed in accordance with an approved Mine Rehabilitation Master Plan (RMP).

## Fire Control Management Plan

### 4.7.16.2 Rehabilitation Master Plan (RMP)

The RMP provides a guiding vision for the progressive rehabilitation of the disturbed mining areas through to mine closure.

The scope of the RMP includes:

- Yallourn North Open Cut ashing area;
- Township Field mine area;
- East Field and Maryvale Field mine areas; and
- Morwell River Diversion.

### 4.7.16.3 Conservation Master Plan (CMP)

The scope of the CMP includes:

- Provision of habitat opportunities in the Morwell River Diversion channel for locally indigenous aquatic species;
- Provision of a permanent water supply to the Morwell West Drain Gully and effective management to ensure conservation, enhancement and re-establishment of Swampy Riparian Forest, Deep Sands Herb Rich Foothills Forest;
- Effective management to ensure conservation, enhancement and re-establishment of local genetic provenance communities; and
- Monitoring the implementation and the effectiveness of the plan.

### 4.7.16.4 Environmental Management Plan (EMP)

The scope of the EMP includes:

- Purpose and scope;
- Authorisation;
- Relevant authorities;
- Other stakeholders;
- Statutory and Policy requirements;
- Responsibilities;
- Integrated work procedures;
- Project environmental controls;
- Emergency preparedness;
- Monitoring, inspection, auditing and reporting;
- Training; and
- Communications.

The completion of land rehabilitation works (top soil stockpiling and land area rehabilitated) is a key performance indicator (KPI) with progress monitored and reported on a monthly basis against the annual plan.



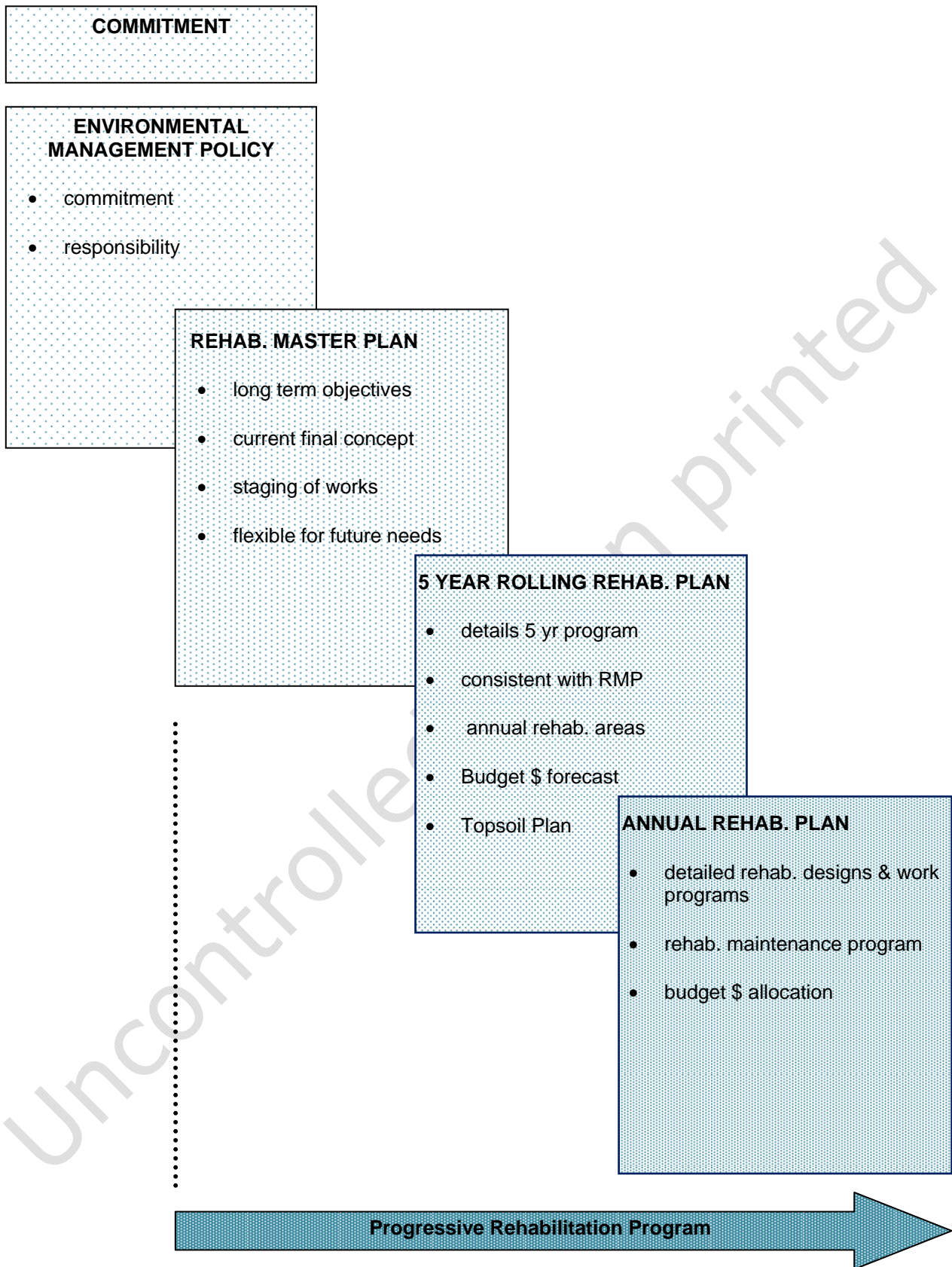


Figure 50 - Hierarchy of Land Rehabilitation Planning Documents

## Fire Control Management Plan

A set of procedures have been developed as determined by the YMA to be necessary to ensure the effective planning, operation and control of geotechnical hazards.

### 4.7.17 Risk Management

The YMA maintains a hierarchy of risk management processes to manage risk in the workplace. The hierarchy of risk management processes consist of:

- Level 1 - Stop, Step Back;
- Level 2 - Job Safety Observation;
- Level 3 - Job Safety and Environmental Assessments (JSEA's);
- Level 4 - Team Baseline Risk Assessments.

[YMA-OPS-PR-0313 - Risk Assessment Process](#) (REF-137299), provides a description of the YMA risk assessment process.

Each of these is discussed briefly below.

#### Level 1 - Stop, Step Back

The Stop Step Back process is the initial risk assessment completed prior to the commencement of the work task. If the Stop Step Back process identifies any potential hazards associated with the task, then a Job Safety and Environmental Assessment (JSEA) is to be completed by the work group prior to commencing the job task.

#### Level 2 - Job Safety Observation Process (JSO)

JSO's are conducted by either an individual or a small work group and observe the work practices of a work party. The process is non-threatening and primarily focuses on the safe working behaviour of the work group.

**Refer:** YMA Procedure: [YMA-OPS-PR-0420 - Job Safety Observation](#) (REF-140632).

#### Level 3 - Job Safety and Environmental Assessments (JSEA's)

JSEA's are conducted by the work group and consider the potential hazards associated with a particular job or task. Where "unacceptable" risks are identified, additional controls are to be identified and the residual risk determined to ensure that the risk has been reduced to as low as reasonably practical to enable the work to be completed safely.

Job Safety and Environmental Assessments (JSEA's) are conducted in accordance with:

**Refer:** YMA Procedure: [YMA-H&S-PR-0238 - Job Safety and Environmental Analysis](#) (REF-141264).

#### Level 4 - Team Baseline Risk Assessments

Team Baseline Risk Assessments are used by a team of personnel, with a variety of relevant backgrounds to determine and assess the risk(s) associated work in a specified area. The risk assessment is based on probability, severity and exposure.

Team Baseline Risk Assessments are conducted in accordance with:

YMA Procedure - [YMA-OPS-PR-0313 - Risk Assessment Process](#) (REF-137299) and also YMA form - [YMA-OPS-FO-0312 - YMA Risk Assessment Template](#) (REF-137015).

### 4.8 Emergency Preparedness and Response

#### 4.8.1 General

An Emergency Response Plan (Reference: [SHEMS12-SHE-L01 - Emergency Response Plan](#) (REF-177762) and associated procedures are maintained for both the power station and the mine. A limited number of “controlled” copies of the company’s Emergency Response Plan are printed and distributed to key personnel, including key combat agencies. All employees have “read only” access to the Emergency Response Plan via EnergyAustralia Yallourn’s intranet (Fingertips).

The Emergency Response Plan is reviewed on a regular basis to ensure that it remains up to date.

The emergency response plan and associated procedures and processes are tested on a regular basis using simulated emergency trial exercises, which may involve external combat agencies including the police, CFA, SES, etc. For each calendar year, Estate Services develop and implement a “Trial Emergency Response Exercise Schedule”, which is monitored on a monthly basis.

Debriefing sessions are conducted following both actual and trial emergency exercises. Follow-up corrective actions are progressed via EnergyAustralia Yallourn’s Near Miss and Environmental Non-conformance System.

In responding to an emergency incident, for example a fire in the mine, the use of large volumes of water can result in additional hazards being introduced, as water enters coal joints and cracks which potentially could result in batter instability and even batter collapse. It is recommended that once the emergency incident has been effectively controlled, an inspection of the batters should be conducted to ensure that no batter instability issues have resulted. Based on the results of the inspections, appropriate remedial action(s) shall be taken to ensure that any resultant actual or potential instability risks are effectively managed.

Depending upon the severity of a fire within the mine and the prevailing meteorological conditions, significant impacts to the community can result.

These impacts can range from the risk of the fire from within the mine “escaping” from the mine and impacting on adjacent residents, fauna and flora and public infrastructure.

A fire within the mine will generate smoke and may impact on public health due to elevated carbon monoxide levels. A mine fire may also result in a disruption to community services including communication and transport systems, power supplies, etc.

The management of these potential community impacts would be managed in consultation with the relevant regulatory authorities as part of the Emergency Response Plan protocols.

The following Estate Services procedures relating to fire response are detailed below:

- EAY Procedure [SHEMS12-ESV-P004 - Emergency Response - Control Room](#) (REF-116115), describes the processes utilised by Estate Services in their control room in response to an emergency incident.
- EAY Procedure [SHEMS12-ESV-P011- CFA Notification of Fire and Incidents](#) (REF-123292), describes the processes used to advise the CFA of a fire.
- EAY Procedure [SHEMS12-ESV-P001 - Responding to Fire Alarms](#) (REF-123473)
- EAY Procedure [SHEMS12-ESV-P001-I01 - Management of VESDA During Periods of Heavy Smoke Pollution](#) (REF-125014)
- EAY Procedure [SHEMS14-ESV-P003 - Fire Hoses - Pressure Testing](#) (REF-116141)
- EAY Procedure [SHEMS11-ESV-P003 - Hose Tower](#) (REF-116139)

## 5 MEASUREMENT

### 5.1 Monitoring and Measurement

#### 5.1.1 Annual Monitoring and Inspection Schedule

The Yallourn Mine maintains an inspection and testing program to ensure that the fire service system is effectively maintained and capable of meeting the fire service system objectives as defined within this plan.

The YMA maintains a series of inspection forms for the purpose of completing the various inspection routines.

Completed inspection forms are filed in accordance with the YMA Records Management System.

**Table 10** below provides a listing of the key inspection forms used.

**Table 11** below provides details of the fire service system maintenance routines

**Table 10 - Details of Fire Service System Inspections**

No.	Ref	Title	80-20 Ref:
1	YMA-OPS-FO-0531	Fire Equipment Inspection Form	<a href="#">REF-192627</a>
2	YMA-OPS-FO-0532	Fire Equipment Inspection Sheet	<a href="#">REF-192626</a>
3	YMA-OPS-FO-0533	Dredger 12 - Fire Equipment Inspection Form	<a href="#">REF-192625</a>
4	YMA-OPS-FO-0534	Dredger 13 - Fire Equipment Inspection Form	<a href="#">REF-192624</a>
5	YMA-OPS-FO-0535	S95 - Fire Equipment Inspection Form	<a href="#">REF-192623</a>
6	YMA-OPS-FO-0536	TS3 - Fire Equipment Inspection Form	<a href="#">REF-192622</a>
7	YMA-OPS-FO-0537	E215 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192621</a>
8	YMA-OPS-FO-0538	E310 Conveyor - Fire Equipment Inspection	<a href="#">REF-192620</a>
9	YMA-OPS-FO-0539	E315 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192619</a>
10	YMA-OPS-FO-0540	E410 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192618</a>
11	YMA-OPS-FO-0541	E415 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192617</a>
12	YMA-OPS-FO-0542	M100 Conveyor - Fire Equipment Inspection form	<a href="#">REF-192616</a>
13	YMA-OPS-FO-0543	M105 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192615</a>
14	YMA-OPS-FO-0544	M106 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192612</a>
15	YMA-OPS-FO-0545	M305 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192613</a>
16	YMA-OPS-FO-0546	M400 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192614</a>
17	YMA-OPS-FO-0547	M405 Conveyor - Fire Equipment Inspection Form	<a href="#">REF-192611</a>
18	YMA-OPS-FO-0548	M700 Head End - Fire Equipment Inspection Form	<a href="#">REF-192610</a>

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No.	Ref	Title	80-20 Ref:
19	YMA-OPS-FO-0549	RCB Hose Reels Fire Equipment Inspection Form	<a href="#">REF-192609</a>
20	YMA-OPS-FO-0550	RCB Extinguishers Fire Equipment Inspection Form	<a href="#">REF-192608</a>
21	YMA-OPS-FO-0551	Portable Subs - Fire equipment Inspection Form	<a href="#">REF-192607</a>
22	YMA-OPS-FO-0552	Hoppers - Fire equipment Inspection Form	<a href="#">REF-192606</a>
23	YMA-OPS-FO-0553	Two Level Yard - Fire Equipment Inspection Form	<a href="#">REF-192605</a>
24	YMA-OPS-FO-0554	CO2 Extinguishers - Fire Equipment Inspection Form	<a href="#">REF-192599</a>
25	YMA-OPS-FO-0555	Foam Inspection Form	<a href="#">REF-192601</a>
26	YMA-OPS-FO-0556	Fire Service Pumps - Fire Equipment Inspection Form	<a href="#">REF-192602</a>
27	YMA-OPS-FO-0557	M710 T/E & H/E Conveyor - Fire Inspection Form	<a href="#">REF-192603</a>
28	YMA-OPS-FO-0558	M300 Conveyor - Fire Inspection Form	<a href="#">REF-192604</a>
29	YMA-OPS-FO-0559	Fire Services Inspection Form Index	<a href="#">REF-192628</a>
30	YMA-H&S-FO-0025	Fire & Dust Suppression Water Spraying Record Sheet	<a href="#">REF-138596,</a>
31	YMA-OPS-FO-0291	900mm Fire Service Valves Northern and Southern Mains MRD Monthly Inspection	<a href="#">REF-144255</a>
32	YMA-OPS-FO-0292	Fire Service Plant Inspection Fire service Pumps (Three Inspections per Week)	<a href="#">REF-180627</a>
33	YMA-OPS-FO-0293	MRD South Fire Service & Drainage	<a href="#">REF-144256</a>
34	YMA-OPS-FO-0294	Raw Coal Bunker Fire Service Alarms	<a href="#">REF-144257</a>
35	YMA-OPS-FO-0305	Fire trailer Inspection Checklist	<a href="#">REF-135343</a>
36	YMA-OPS-FO-0329	SRP - 4x4 Series Fire Alarm Control	<a href="#">REF-181080</a>



## Fire Control Management Plan

**Table 11 - Fire Service System Maintenance Routines**

No.	Maximo PM	Description
1	MD12S006F	D12 Fire Six Monthly Safety Device Testing (12M)
2	MD12S012F	D12 Fire Annual Safety Device Testing (12M)
3	MD13S006F	D13 Fire Six Monthly Safety Device Testing (12M)
4	MD13S012F	D13 Fire Annual Safety Device Testing (12M)
5	MTS3S006F	TS3 Fire Six Monthly Safety Device Testing (12M)
6	MTS3S012F	TS3 Fire Annual Safety Device Testing (12M)
7	MS95S006F	S95 Fire Six Monthly Safety Device Testing (12M)
8	MS95S012F	S95 Fire Annual Safety Device Testing (12M)
9	MFWDR01M	RCB Fire Service Deluge System Checks Online (Weekly)
10	M405R12E	M405 Elec Fire Serve Deluge System Checks Online (6M)
11	MFWDR02M	E215 Fire Service Deluge System Checks Online (1Y)
12	MFWDR03M	E315 / E310 Fire Service Deluge System Checks Online (1Y)
13	MFWDR04M	E415 / E410 Fire Service Deluge System Checks Online (1Y)
14	MLUBR90M	Fire Service Pumps Lubrication Service Routine (12,24W)
15	MWFSR01M	Fire Service Pump Mech Vibration Testing Online (2M)

**YMA procedures:** [YMA-OPS-PR-0383 - RCB Deluge System Testing and Cleaning](#) (REF-138943),  
[YMA-OPS-PR-0425 Cathodic Protection of Mine Assets](#) (REF-140408)

To enable compliance with Condition 1A.7 of the DEDJTR document titled: Risk Management Conditions for Latrobe Valley Coal Mine Licences" dated 7<sup>th</sup> May 2015, monitoring the progress associated the implementation of the SHEMP's shall be monitored on a regular basis. The SHEMP's shall be updated on a regular basis to record the actions taken to implement the identified actions associated with the implementation of the additional controls identified to reduce the current level of inherent risk.

### 5.2 Evaluation and Compliance

#### 5.2.1 Internal Audits

Internal audits shall also be used to verify the effectiveness of the FCMP, including operational controls and the monitoring and measurement processes in the effective management of geotechnical hazards.

Fire procedures and firefighting preparedness must be reviewed prior to the forthcoming fire season each year and updated where required. This annual review will be initiated via a Maximo work order;

An internal audit of all fire service facilities, systems and procedures, to ensure compliance with both Statutory Requirements and the requirements of this Fire Control Management Plan. The Manager Mining must arrange for a formal inspection to be carried out and be issued a report in September to October of each year regarding compliance with this Fire Control Management Plan, action to be taken where non-compliant and the status of fire protection facilities, systems and procedures. The audit report must be distributed to the Manager Mining, Mine Manager, Fire Service Officer and filed within EnergyAustralia Yallourn's document management system;

#### 5.2.2 Monitoring and Measurement Processes

Monitoring and measurement processes, where applicable, shall reference applicable legal and other requirements, including licence limits, (for example: ground water extraction) etc.

Further, analysis of monitoring and measurement data shall compare actual performance trends against the applicable trigger levels (target / alert / critical levels). Where "adverse" trends are observed, if required, the frequency of monitoring may need to be increased to more closely monitor performance trends. In order to address any adverse performance trends, corrective action may need to be initiated. Future monitoring shall confirm the effectiveness of the corrective action taken.

#### 5.2.3 Statement of Compliance

Condition 1A.7 of the DEDJTR document titled "Risk Management Conditions for Latrobe Valley Coal Mine Licences" dated 7<sup>th</sup> May 2015 states:

*"a statement of compliance detailing the progress of implementing the actions identified in the risk assessment and management plan as well as compliance with the licence and approved work plan.*

*The statement of compliance must state whether the milestones within the risk assessment and management plan for the 12 month reporting period have been met. The information should indicate whether the relevant objectives were achieved at each milestone and whether the standards were met in achieving the objectives.*

*It is recommended that the statement of compliance be audited by an appropriately qualified independent auditor before it is certified by the Chief Executive officer (or delegate). Evidence of such an audit should accompany the statement of compliance".*

### **5.3 Incident Reporting, Corrective and Preventative Action**

#### **5.3.1 Fire Hazards and Incidents**

Reporting immediately to the Mine Control Centre and/or Fire Service Officer all individual occurrences of fires that occur within and in the near vicinity of the mine.

The Mine monthly report must include details of all fires that occurred within the mine during the month. A copy of the monthly report will be filed within EnergyAustralia Yallourn's document management system.

Fire related near misses and hazards are to be reported in accordance with the YMA's Near Miss and Non-conformance Reporting procedure. The YMA actively encourages all employees to report near misses and non-conformances to enable appropriate action to be taken to address the issue.

Based on the incident, appropriate corrective action will be taken to address the incident. Depending upon the nature of the incident longer term preventative action may be required to prevent a re-occurrence of the incident.

Depending upon the severity of the incident, an incident investigation may be need to be completed to determine the root cause as to why the incident occurred and to identify appropriate corrective and preventative action necessary to prevent a re-occurrence of the incident.

### 5.4 Control of Records

#### 5.4.1 Records associated with this Fire Control Management Plan

Records associated with the FCMP that are to be maintained include:

- training records;
- incident reports;
- design reports and associated documents;
- management review findings;
- results of audits,
- inspection records;
- calibration records and test certificates;
- emergency response exercises;
- monitoring and measurement schedules;
- monitoring and measurement records;
- working files;
- official correspondence; and
- mine progress plans;

#### 5.4.2 Records Retention Periods

Fire Control Management Plan related records are controlled and shall be maintained for designated periods to ensure compliance with regulatory requirements and corporate requirements.

For those fire management records required by EnergyAustralia Yallourn, these records shall be managed and retained in accordance with the following EnergyAustralia Yallourn procedures:

- [SHEMS09/YQMS09-IDR-P002 - Records Retention](#) (REF-119573);
- [SHEMS09/YQMS09-IDR-P002-R01 - Records Retention Schedule](#) (REF-38544);
- [SHEMS09/YQMS09-IDR-P003- Registering Physical Records](#) (REF-122686);
- [SHEMS09/YQMS09-IDR-P004- Searching for Physical Records](#) (REF-125022);
- [SHEMS09/YQMS09-IDR-P005- Borrowing and Returning Physical Records](#) (REF-123238); and
- [SHEMS09/YQMS09-IDR-P006- Disposal of Physical Records](#) (REF-124236).

### 5.5 Internal Audit

EnergyAustralia Yallourn maintains an annual audit program for the completion of periodic Safety, Health, and Environmental audits.

Audits of the FCMP shall be carried out in accordance with EAY's SHE Management System's procedures.

A specific FCMP audit program shall be established for each calendar year, which shall include the FCMP and also FCMP related procedures and processes.

A primary objective of the audit program is to ensure that the requirements of the FCMP have been effectively implemented and maintained.

The FCMP audit shall be completed utilising an audit protocol based on this FCMP.

The objectives of the FCMP audit program include:

- verify that the FCMP has been effectively implemented and maintained;
- fire hazards are being effectively identified and managed within agreed parameters;
- approved objectives, targets and management plans are being progressed in accordance with the approved program;
- compliance with DEDJTR reporting requirements;
- management of change is being effectively managed;
- monitoring and measurement processes are being effectively implemented, analysed and reported;
- previous audit findings have been effectively closed out within agreed timeframes;
- personnel are trained and competent to perform their allocated duties;
- records management processes are being maintained;
- effective document management processes are being maintained; and
- identify opportunities for further improvement.

As discussed above in Section 5.2.3 - Statement of Compliance, it is recommended by DEDJTR that the *"statement of compliance be audited by an appropriately qualified independent auditor before it is certified by the Chief Executive officer (or delegate). Evidence of such an audit should accompany the statement of compliance"*.



### 5.6 Management Review

EnergyAustralia Yallourn shall review the Fire Control Management Plan (FCMP) at planned intervals to ensure its continuing suitability, adequacy and effectiveness. The reviews shall include assessing opportunities for further improvement and potential changes to the FCMP, including operational controls, monitoring and measurement processes and resourcing. Records of the management reviews shall be retained by the Mine Planning Manager.

Input to the management review of the FCMP may include:

- Results of internal / external audits,
- Results of investigations;
- Results / recommendations resulting from fire management reviews;
- Monitoring and measurement results;
- Communications with regulatory authorities;
- Non-conformances and near misses;
- Performance in achieving approved objectives and targets;
- Status of corrective and preventative actions;
- Status of close out of follow up actions from previous management reviews of the FCMP;
- Changes in legal and other requirements;
- Recommendations for improvement;
- Adequacy of fire management resources (for example: financial, technological, personnel, specialist resources);
- Training;
- Hazard identification / risk control processes / risk profile; and
- Effectiveness of operational controls.

Action plans shall be developed and implemented to address the Management Review findings.

### 6 REFERENCES

- AS/NZS ISO 14001: 2004 - Environmental Management Systems - Requirements with Guidance for Use;
- AS/NZS ISO 14004: 2004 - Environmental Management Systems - General Guidelines on principles, systems and supporting techniques;
- AS/NZS 4801: 2001 - Occupational Health and Safety Management Systems;
- AS/NZS 4804: 2001 - Occupational Health and Safety Management Systems - General Guidelines on principles, systems and supporting techniques;
- AS/NZS ISO 31000: 2009 - Risk Management - Principles and Guidelines;
- Mining Licence No's 5003, 5216 and 5304 and associated approved Work Plans;
- Mineral Resources (Sustainable Development) Act: 1990 (MRSDA);
- Mineral Resources (Sustainable Development) (Mineral Industries) Regulations: 2013;
- Mineral Resources (Sustainable Development) (Extractive Industries) Regulations: 2010;
- Environment Protection Act: 1970 and associated regulations;
- Occupational Health and Safety Act: 2004 and associated regulations;
- Water Act: 1989;
- CFA Act: 1958;
- Electrical Safety Act: 1998;
- Electrical Safety (Bushfire Mitigation) Regulations: 2003;
- Electrical Safety (Cathodic Protection) Regulations: 2009;
- Electrical Safety (Electric Line Clearance) Regulations: 2010; and
- DEDJTR letter dated 7th May 2015 titled: "Risk Management Conditions for Latrobe Valley Coal Mine Licences - addressed to Ron Mether and from Ross McGowan, Executive Director, Earth Resources regulation.

#### Other Requirements:

- Mining 5003, 5216 and 5304 and approved Work Plan Variations;
- Environmental Management Plan;
- Rehabilitation Master Plan;
- Conservation Management Plan;
- EPA Accredited Licence No. EM 29213;
- Ground Water Licence No. 2007403. August 1996;
- SRW Licence WLE048339 - Witts Gully Reservoir;
- YMA Certified SHEQ Management System;
- EnergyAustralia Yallourn's certified SHE Management System;
- Electrical Safety Management System (ESMS) approved by ESV;
- ANCOLD Guidelines for Dam Safety;

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- Letter from the Minister for Energy and Resources dated 22nd January 2015, to Mr Michael Hutchinson regarding Variation and Addition of Licence Conditions; and
- Letter from Executive Director, Earth Resources Regulation, dated 7th May 2014, to Mr Ron Mether titled: Risk Management Conditions for Latrobe Valley Coal Mine Licences.

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## 7 DEFINITIONS

### RESPONSIBLE PERSONNEL

<b>Emergency Services Liaison Officer</b>	The person responsible to ensure proper liaison occurs between EnergyAustralia Yallourn and the external emergency agencies.
<b>Fire Service Officer</b>	The person responsible for the day to day fire service activities within the mine;
<b>EnergyAustralia Emergency Commander</b>	The Estate Services Team Leader who may take control of EnergyAustralia resources if an emergency exists;
<b>Incident Controller</b>	The senior officer of an external agency which may take control of an emergency involving the mine;
<b>Mine Manager</b>	The person responsible for all operational management activity within the mine (Mine Alliance position);
<b>Manager Mining</b>	The person who has the principal management function for the mine (EnergyAustralia position);
<b>Mine Planning Manager</b>	The person responsible for the coordination of geotechnical, mine planning and rehabilitation activities (EnergyAustralia position);
<b>Shift Production Supervisor</b>	The person responsible for fire service activities within the mine outside normal day work hours until such time as the Fire Service Officer or a Senior Officer takes control.

### MINE AREA

<b>Overburden Batters</b>	The individual steeply sloping surfaces between overburden working levels;
<b>Coal Batters</b>	Steeply sloping surfaces (nominally 1:1) at the ends of the coal slopes;
<b>Final Batters</b>	Steeply sloping surfaces (nominally 2:1) left when the coal slopes have been fully worked out;
<b>Coal Slope</b>	Graded coal surface (nominally 1:4) where dozers excavate coal;
<b>Benches</b>	The relatively flat surfaces created by the individual working levels;
<b>Berms</b>	Relatively flat surfaces created in batters between working levels to stabilise the batter or intercept fretted material;
<b>Bunker</b>	A structure used for the short term storage of mined coal prior to its use in a power station;
<b>Exposed Coal Areas</b>	All areas of exposed coal within the mine;
<b>Operating Areas</b>	Those areas where excavation or transport plant operate, including working and access levels, reserve coal areas, regular travel routes for dredgers and slew conveyors, feeder breakers, dozers and service corridors for essential operational services;
<b>Reserve Coal Areas</b>	Those areas of exposed coal between adjacent face conveyors but not

## Fire Control Management Plan

including the conveyor corridor and the excavation plant operational Corridors;

<b>Transport Level</b>	An individual level within the mine on which a face conveyor is located;
<b>Worked Out Batters</b>	Those batters within the mine used for previous coal winning operations and not regarded as being within current operational areas;
<b>Worked Out Floor</b>	Those floor areas within the mine used for previous coal winning operations and not regarded as being within current operational areas;
<b>Working Level</b>	An individual level within the mine from which excavation plant operates;
<b>Plant</b>	The plant within the mine is referred to as follows: <ul style="list-style-type: none"><li>a) Excavation and Dumping - Bucket wheel excavator, Travelling Stacker, Feeder Breaker, Hopper Car, D11 Dozer and Mobile Plant;</li><li>b) Pipeline infrastructure - Main supply lines, ring mains, feeders, droppers, header feeders, headers, sprays and hydrants and supply lines; and,</li><li>c) Conveyors - Face conveyors, Mobile slew conveyors, Trunk conveyors and Rising conveyors; and</li><li>d) Infrastructure - Raw Coal Bunker.</li></ul>
<b>Pipeline Infrastructure</b>	Main supply lines, Ring mains, Feeders Droppers, Headers feeders spray lines and sprays and hydrants;
<b>At risk Electric line</b>	Means an electrical line (other than private electric line) that is above the surface of the land and in a hazardous bushfire risk area;
<b>Bushfire</b>	Bushfire is defined by the CFA Victoria as "A freely burning, uncontrolled and unplanned fire, which needs to be extinguished. It includes fires in wood or forest, mixtures of scrub, bush and grasslands; or plantation or nursery stock"

8 APPENDICES

**FIRE CONTROL  
MANAGEMENT PLAN**

**APPENDICES**

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8.1 Appendix No. 1 - Key Legal and Other Requirements

**FIRE CONTROL  
MANAGEMENT PLAN**

**APPENDIX No. 1**

**KEY LEGAL & OTHER REQUIREMENTS**

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### Compliance with and details of important legislation, regulatory and other requirements

#### 1 Introduction

The mine operations including the batter design and also the dam assets must comply with relevant legislation. These include Guidelines, Acts, Regulations and Standards from government and other technical bodies preparing the regulations and guidelines. EnergyAustralia Yallourn is required to comply with the Acts listed below; however, guidelines such as ANCOLD are not required to be followed by law. The following summarises the most relevant references in the industry, which need to be complied with:

- ▶ Mineral Resources (Sustainable Development) Act 1990 (MRSDA), which includes administrative legal framework for the mining/exploration industries;
- ▶ Occupational Health and Safety Act 2004;
- ▶ Occupational Health and Safety Regulations: 2007;
- ▶ Dangerous Goods Act 1985 (DGA), which includes the manufacture, storage and use of explosives within licensed mining and extractive sites (if used);
- ▶ Water Act, 1989;
- ▶ Resources Development Act: 1990;
- ▶ AS/NZS ISO 31000:2009, *Risk management - Principles and guidelines*.
- ▶ Guidelines from The Australian National Committee on Large Dams (ANCOLD). The relevant guidelines from ANCOLD are listed below:
  - Guidelines on Risk Assessment (2003);
  - Guidelines on the Environmental Management of Dams (2001);
  - Guidelines on Assessment of the Consequences of Dam Failure (2000);
  - Guidelines on Selection of Acceptable Flood Capacity for Dams (2000);
  - Guidelines on Tailings Dam Design, Construction and Operation (1999);
  - Guidelines on Design of Dams for Earthquake (1998); and
  - Guidelines on Dam Safety Management (2003).

Other Requirements:

- ▶ Mining Licences 5003, 5216 and 5304 and approved Work Plan Variations;
- ▶ Environmental Management Plan;
- ▶ Rehabilitation Master Plan;
- ▶ Conservation Management Plan;
- ▶ EPA Accredited Licence;
- ▶ Ground Water Licence; and
- ▶ YMA certified SHEQ Management System.

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Due to the changing nature and updates associated with these key references, it should be clarified that the following information represents a summary of the more geo-technically relevant (i.e., alignment with GCMP) items. Detailed duplication of all related points and clauses is not considered to be of substantial relevance and capturing the key principles is deemed likely to yield enhanced focus and appreciation of the important elements. Where unsure of a critical nature, the references should be referred to separately for details.

The Mineral Resources (Sustainable Development) Act 1990 and the Occupational Health and Safety Act: 2004 and associated regulations cover mining and exploration operations within a mining and/or exploration licence area. Mines Inspectors, by agreement with the Victorian Work Cover Authority (VWA), are appointed as inspectors under the OHS Act for works within an area licensed under the MRSDA or EIDA.

The Occupational Health and Safety Act 2004 and Occupational Health and Safety Regulations: 2007 cover extractive operations within a licensed Work Authority area. Mines Inspectors, by agreement with the Victorian Work Cover Authority (VWA), are appointed as inspectors under the OHS Act for works within a Work Authority area (excluding manufacturing and processing plants). Officers of the VWA administer the legislation dealing with processing plants such as brick pressing, block making and concrete plants.

The Minerals Regulation Branch of DEDJTR is operationally responsible for the delivery of regulatory services for the minerals and extractive industries in Victoria. This involves provision of tenement management and maintenance of health, safety and environmental standards by audit/inspection, investigation, enforcement and education.

## 2 Mineral Resources (Sustainable Development) Act 1990 (MRSDA)

The purpose of this Act is to encourage an economically viable mining industry which makes the best use of mineral resources in a way that is compatible with the economic, social and environmental objectives of the State. Amongst a suite of objectives covered within the Act and legal framework, the aim is to ensure:

- ▶ Consultation mechanisms are effective and appropriate access to information is provided;
- ▶ Land which has been mined is rehabilitated; and
- ▶ The health and safety of people is protected in relation to work being done under a licence.

Further to this, a rehabilitation plan must take into account:

- ▶ Any special characteristics of the land;
- ▶ The surrounding environment;
- ▶ The need to stabilise the land;
- ▶ Any potential long term degradation of the environment;
- ▶ The rehabilitation of land in accordance with the rehabilitation plan approved by the Department Head for the holder of a mining licence; and
- ▶ The rehabilitation of land in accordance with the conditions in the licence for the holder of an exploration licence.
- ▶ As part of the Government's response to the Mining Warden's Yallourn Mine Batter Failure Inquiry, dated 30 June 2008 into the November 2007 Mine batter failure, EnergyAustralia Yallourn has voluntarily agreed to report to the DEDJTR's request to report "reportable events" to the DEDJTR to the District Manager. This requirement will be incorporated into future revisions to existing legislation.

## Fire Control Management Plan

### 3 ANCOLD and Water Act: 1990

ANCOLD provides guidelines and not regulations in the dam industry. However, during the likely issues regarding dam operation and failures, etc, the likely default practice for dams is ANCOLD, as its guidelines are widely used by industry. These guidelines provide the details on the design and construction and risk assessment of various types of dams. Specifically, when a public asset is in risk as a consequence of a dam construction in the upstream, ANCOLD guidelines is highly recommended to be adhered to and the dam design and assessment should follow the ANCOLD requirements.

The Water Act 1989 is the legislation that governs the way water entitlements are issued and allocated in Victoria. It defines entitlements and establishes the mechanisms for managing Victoria's water resources. The Department of Environment and Primary Industries (DEPI) is the lead agency for managing water resources in Victoria. Its portfolio responsibilities include policy development, administration of state water legislation and implementation of institutional government arrangements.

The DEPI also have the responsibility to ensure that the dams owned by the state's Water Corporations meet their statement of obligations under the Water Industry Act 1994. These statements of obligations contain clauses, among other things, related to risk management, asset management, dam safety and emergency response. In the Gippsland area Southern Rural Water (SRW) is the DEPI Licensing agent.

Amendments to the Water Act 1989 now require all farms dams used for irrigation or commercial purposes that were built before 2002 to be registered in accordance with section 51 (A) of the Water Act 1989, or licensed. Although termed farm dams, these amendments apply to all dams not owned by the Water Corporations and include those owned by commercial organisations such as EnergyAustralia Yallourn.

Licences are now required for all new farm dams that take and use water and that are built on waterways. A works licence is required for "farm" dams for public safety reasons (section 67 (1A) of the Water Act 1989. Licence conditions for these dams have obligations of managing the licensing to the Rural Corporations.

The DEPI is also the designated control agency for dam safety incidents pursuant to the requirements of the Emergency Management Act 1986.

The Resource Development Act 1990 is the legislation that is responsible for regulating minerals, petroleum and extractive industries in Victoria and its offshore waters. The management of tailings is covered by these acts. The Minerals and Petroleum Division of the Victorian Department of Economic Development, Jobs, Transport and Resources (DEDJTR) is the responsible group for managing the requirements of these Acts.

The Yallourn Twin Ash Ponds is technically a tailings dam and would be regulated by the DEDJTR. The remainder of the dams and levees would be regulated by the DEPI, through SRW.

### 4 Water Retaining Structures

Commercial dams of a certain height and reservoir capacity (the ICOLD reference dams definition) are required to have a Works license as discussed above. At present, the DEPI have not instigated a review role on the licensees. However, it is understood that the DEPI are intending to implement a program of review on licensed dam owners in the future similar to that currently used on the Water Corporations.

The DEPI recognises ANCOLD guidelines as the current industry position on dam safety management. The DEPI will compare the dam safety management programs of licensees to those recommended by ANCOLD. The DEPI also recognise that ANCOLD "Guidelines on Risk Assessment": 2003 complement and supplements the traditional standards-based approach and provides a sound framework for risk assessment.

### 5 Tailings Dams

The DEDJTR is of the view that, whenever possible, the mining industry should be self-regulatory in its management of tailings. However, it recognises that the community must have confidence in the regulatory system and for this to be possible, periodical audits by the DEDJTR or an independent expert are necessary.

The DEDJTR has issued the "Management of Tailings Storage Facilities" guidelines, 2004. This document references, amongst others, the ANCOLD "Guidelines on Tailings Dam Design, Construction and Operation" 1989, and ANCOLD "Guidelines on Dam Safety Management", 2003 as appropriate documents on which to base a dam safety management program.

Whilst the ANCOLD document is not a formal statute of law, it is widely accepted as providing the accepted industry standards for dam safety management in Australia. It provides recommended management techniques, surveillance frequencies, safety review procedures and other similar guidelines required to sustain a particular dam in a safe condition.

This is in line with the management practice that will be expected of the Dam Safety regulator, the DEPI as discussed above. However, the 1994 ANCOLD Guidelines have been superseded by the 2003 edition of the same name. Important changes to the ANCOLD guidelines that effect the current Yallourn management Instruction are:

- 1 ANCOLD no longer excludes any water retaining structure based on embankment height or reservoir capacity. All water retaining structures should be designed, constructed and managed dependent on the downstream consequences and assigned Hazard Category; and
- 2 Hazard (Consequence) Categories have changed to include Very Low, three levels of High (A, B or C) and Extreme categories; and Inspection and Monitoring frequencies have changed.

### 6 Risk Management

Risk management standards form another relevant obligation that straddles "legal" and "other" requirements as part of the GCMP.

The GCMP outlines the framework, procedures and processes to assist with effective management of geotechnical and related ground management hazards. It forms an essential component of the overall mining and geotechnical strategies to address design and operational issues. This plan does provide the tools and processes necessary to help monitor, anticipate, modify designs, plan remedial works and either deal with or minimise the likelihood of "surprise" events. As a result there are a significant number of associated organisational processes and decisions.

The recent and first international standard (AS/NZS ISO 31000:2009, Risk management - Principles and guidelines) for risk management does include variations to and supersedes the previous AS/NZS 4360:2004, Risk management standard. In particular the principles that organisations must follow to achieve effective risk management have now been made explicit. Yallourn's GCMP and the associated risk management practices in place and undertaken on site are generally considered to be consistent with the 11 principles detailed in the international standard.

Two of these, which require attention, include the following, which are direct extracts from AS/NZS ISO 31000:2009, Section 3 - Principles:

#### ***Risk management is an integral part of organisational processes***

*Risk management is not a stand-alone activity that is separate from the main activities and processes of the organisation. Risk management is part of the responsibilities of management and an integral part of all organisational processes, including strategic planning and all project and change management processes.*

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### ***Risk management is part of decision making***

*Risk management helps decision makers make informed choices, prioritise actions and distinguish among alternative courses of action."*

*Further to this, the following extract is also from AS/NZS ISO 31000:2009, Risk management - Principles and guidelines, "Annex A - Attributes of enhanced risk management":*

#### ***"A.3.3 Application of risk management in all decision making***

*All decision making within the organisation, whatever the level of importance and significance, involves the explicit consideration of risks and the application of risk management to some appropriate degree.*

*This can be indicated by records of meetings and decisions to show that explicit discussions on risks took place. In addition, it should be possible to see that all components of risk management are represented within key processes for decision making in the organisation, e.g., for decisions on the allocation of capital, on major projects and on restructuring and organisational changes. For these reasons, soundly based risk management is seen within the organisation as providing the basis for effective governance."*

A simple risk assessment template consistent with the current Yallourn risk analysis rating system should accompany (and be maintained as part of record keeping) key change management processes, critical decision making and standard forms associated with the GCMP. For example, such an enhancement could be applied and attached to the "Batter Design Change Request Form" and other key approved design documents in order to meet AS/NZS ISO 31000:2009 requirements detailed above.

## **7 OH&S Act**

### **7.1 Risk Assessment and Management**

Identification of mining hazards and assessment of risk is required. The operator of a mine must so far as is reasonably practicable identify all mining hazards at the mine, and assess the risks to health or safety associated with all mining hazards at the mine. Through the assessment process the operator must have regard to:

- a) The nature of the mining hazard;
- b) The likelihood of the mining hazard causing, or contributing to, any harm to any person; and,
- c) The severity of the harm that may be caused.

Risk control measures must eliminate or reduce so far as reasonably practical the risks.

In order to assess the risks associated with major mining hazards, the operator of a prescribed mine must conduct a comprehensive and systematic Safety Assessment, which involves an investigation and analysis of the major mining hazards in order to provide the operator with a detailed understanding of all aspects of risks to health or safety associated with major mining hazards. Major mining hazards must be considered cumulatively as well as individually and use assessment methods (whether quantitative or qualitative, or both) that are appropriate to the major mining hazards being considered.

All aspects of the Safety Assessment are to be fully documented. The operator of a prescribed mine must, in relation to the control of risk associated with major mining hazards, test all risk control measures documented as often as necessary to ensure compliance with the regulations in relation to those hazards.

### **7.2 Emergency Plan**

The operator of a prescribed mine must prepare an emergency plan for the mine in accordance with this regulation and use the emergency plan as the primary means of responding to incidents involving a significant risk of serious injury or death.



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This plan must also be prepared in relation to major mining hazards that could detrimentally affect the health or safety of people in the area surrounding the mine, the municipal council in that area, and tested on an annual basis at least.

### 7.3 Training

The operator of a mine must provide information, instruction and training to employees of the operator at the mine in relation to all mining hazards, the implementation of risk control measures adopted and other strategies developed.

The operator of a mine must ensure that the information, instruction and training provided is monitored, reviewed and, if necessary, revised in order to remain relevant and effective. A record of all training provided to employees must also be made and maintained.

## 8 Mining Licences and Work Plan

The Manager Mining is responsible for reviewing new or revised Legal and Other Requirements and communicating to relevant EnergyAustralia Yallourn and Yallourn Mine Alliance personnel the impact of any changes. The Manager Mining is also responsible for implementing the necessary changes to enable compliance.

**Table 1.1** below summarises EnergyAustralia Yallourn's key obligations in relation to geotechnical matters and the GCMP.

**Table 1.1 - Key Obligations**

Component of the Legislation applicable to EnergyAustralia Yallourn's Operations	Requirements to maintain compliance (including records required)
Surface Disturbance	The area of surface disturbance must be kept to a minimum. Provision for stockpiling of soils is to be made.
Drainage and Discharge Control	Drains, sediment retention structures must be constructed and any discharges from the licence area must be kept to a minimum and meet the requirements of the EPA.
Tailings Dams	Alignment with ANCOLD guidelines and DEDJTR regulations.
Groundwater	Any aquifer dewatering / depressurisation must be carried out in accordance with the Groundwater licence. Monitoring programs consistent with those carried out by the SECV must be maintained.
Erosion	Works are undertaken to ensure land affected by erosion is minimised and practical steps are taken to minimise the effect when it does occur.
Progressive Rehabilitation	Progressive rehabilitation is to be conducted as per the Rehabilitation Plan.
Final Rehabilitation	Final rehabilitation is to be conducted as per the Rehabilitation Plan.

EnergyAustralia Yallourn maintains SHE Legal Application Registers, which are maintained on Fingertips. These registers describe "how" key legal and other requirements specifically apply to EnergyAustralia Yallourn's operations, including mining activities.

8.2 Appendix No. 2 - Key FCMP Responsibilities

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**APPENDIX No. 2**

**INTERNAL COMMUNICATION PROCESSES**

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### Appendix No. 2 - Key Internal Communication Processes

Key internal communication processes include, for example:

- YMA Management meetings;
- YMA Board meetings;
- EnergyAustralia Yallourn management meetings;
- Geotech consultant meetings;
- Monthly Geotech / Geology reports;
- Specific geotechnical related meetings - for example Drainage meetings;
- Safety Alerts;
- SHE Committee Meetings;
- Shift Change Over Meetings;
- Production Planning Meetings;
- Incident Reporting;
- Advice to appropriate personnel of an exceedance of an nominated alert / critical level;
- Internal e-mail;
- Maximo;
- Consultant reports;
- Monitoring performance data; and
- Reports to Regulators - for example: DEDJTR 6 monthly milestone reports, DEDJTR Notifiable Incidents, SRW Groundwater Licence related reporting, etc.

The YMA Board also meets on a regular basis to review a range of mining related issues.

The Manager Mining is a member of the EnergyAustralia Yallourn senior management team which also meet on a regular basis to discuss and review a range of issues.