

### **AGL** Loy Yang

# Mine Licence Risk Assessment

30 October 2015





#### **DOCUMENT CONTROL**

| Project Title     | /line Licence - Risk Assessment |  |
|-------------------|---------------------------------|--|
| Client Name       | AGL Loy Yang                    |  |
| Project No.       | 116-10                          |  |
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| Release   | Issue Date      | Reviewed by  | Approved by | Comments         |
|-----------|-----------------|--------------|-------------|------------------|
| Release 1 | 30 October 2015 | Brian Cooper | Elio Stocco | Issued to client |

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#### 1 EXECUTIVE SUMMARY

In January 2015, the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) amended AGL's Mine Licence 5189 [1] ("the mine licence") to include a new licence Condition 1A – Risk Management. This condition specifies that a Risk Assessment and Management Plan is required to address the risks to the environment and public safety for the open cut operations covered by the mine licence.

R4Risk was engaged by AGL Loy Yang Pty Ltd (AGL) to undertake the risk assessment for its Loy Yang Mine ("the mine"). This assessment was conducted to meet the requirements of the risk assessment component within Condition 1A – Risk Management.

The assessment was conducted in two phases:

- Phase 1: Initial Review
- Phase 2: Hazard identification (HAZID) and risk assessment workshop.

The initial review included the review of AGL's existing hazard registers and records of previous assessments to draft a preliminary list of hazards, causes and risk controls. This information was used to develop draft bowtie diagrams. A HAZID and risk assessment workshop was then conducted to review the list of hazards and identify any new potential hazards. Each identified hazard was subsequently assessed using the bowtie approach. A semi-quantitative risk assessment of the hazards was conducted utilising AGL's Fully Integrated Risk Management (FIRM) assessment matrix [2].

The workshop involved key AGL personnel and independent experts with the appropriate level of experience in their respective area of the assessment. Fifteen potential hazards were identified in the HAZID workshop and these were further assessed in the risk assessment workshop. A summary of the potential hazards and the risk assessment is presented in Table 1.

Table 1: Summary of Risk Assessment

| Hazard ID &<br>Hazard                           | Impact Description   | Consequence<br>Rating | Current<br>Risk | Future<br>Risk    |
|---|--|-----------------------|-----------------|-------------------|
| RR-R-00061<br>Impact to Water<br>(Level 1/2)    | Contaminated water discharge with the potential to impact the environment.       | Level 2               | Moderate        | Moderate          |
| RR-R-00062                                      | Contaminated water discharge with the potential to impact the environment.       | Level 3               | Low             | Low               |
| Impact to water<br>(Level 3)                    | Loss in biodiversity: vegetation, habitat destruction, threatened species.       | Level 3               | Low             | Low               |
|   | Loss of water usage downstream   | Level 3               | Low             | Low               |
| RR-R-00063<br>Impact to water                   | Contaminated water discharge with the potential to impact the environment.       | Level 4               | Moderate        | Moderate          |
| (Level 4)                                       | Change in creek grade with the potential to impact the environment               | Level 4               | Moderate        | High <sup>1</sup> |
| RR-R-00064<br>Impact to<br>regional<br>aquifers | Damage to regional aquifers  | Level 3               | Moderate        | Moderate          |
| RR-R-00065<br>Impact to land<br>(Level 1/2)     | Ground movement / land degradation with the potential to impact the environment. | Level 1               | Moderate        | Moderate          |

<sup>&</sup>lt;sup>1</sup> The future development associated with the planned Traralgon Bypass is expected to impact the surface water and mine stability. This development as currently proposed presents a potential *High* risk into the future.

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| Hazard ID &<br>Hazard                   | Impact Description  | Consequence<br>Rating | Current<br>Risk | Future<br>Risk    |
|---|---|-----------------------|-----------------|-------------------|
| RR-R-00066                              | Ground movement / land degradation with the potential to impact the environment.                    | Level 3               | Low             | Low               |
| Impact to land<br>(Level 3)             | Ground movement / land degradation with the potential to impact public safety.                      | Level 3               | Low             | Low               |
|   | Ground movement / land degradation with the potential to impact public safety                       | Level 4               | Moderate        | High <sup>1</sup> |
| RR-R-00067<br>Impact land<br>(4/5)      | Settling Pond dam wall failure induced flood event with the potential to impact public safety.      | Level 5               | High            | High              |
|   | Ground movement / land degradation with the potential to impact the environment                     | Level 4               | Moderate        | High <sup>1</sup> |
| RR-R-00068<br>Fugitive dust             | Fugitive dust emissions with the potential to impact public safety.                                 | Level 2               | Moderate        | Moderate          |
| emissions                               | Loss of amenities due to fugitive dust emissions (visual/nuisance).                                 | Level 3               | Moderate        | Moderate          |
| RR-R-00069<br>Noise emissions           | Noise emissions with the potential to result in nuisance or loss of amenity to the local community. | Level 3               | Moderate        | Moderate          |
| RR-R-00070<br>Visual light<br>emissions | Visual light emissions with the potential to result in nuisance or loss of amenity.                 | Level 1               | Low             | Low               |
|   | Fire risk with the potential to impact public safety.   | Level 5               | N/A             | High              |
| RR-R-00071<br>Post                      | Environmental impacts from unsuccessful rehabilitation - Land, Aquifer and Surface Water.           | Level 3               | N/A             | Moderate          |
| rehabilitation/fire                     | Smoke risk with the potential to impact the public safety   | Level 5               | N/A             | High              |
|   | Environmental risk from smoke with the potential to impact public amenities.                        | Level 3               | N/A             | Low               |
| RR-R-00072<br>Hazardous                 | Contaminated water discharge with the potential to impact the environment.                          | Level 3               | Moderate        | Moderate          |
| chemicals                               | Contaminated land with the potential to impact the environment                                      | Level 2               | Moderate        | Moderate          |
|   | Fire risk with the potential to impact public safety.   | Level 5               | High            | High              |
| RR-R-00073                              | Smoke risk with the potential to impact the public safety   | Level 5               | High            | High              |
| Mine fire                               | Environmental risk from smoke with the potential to impact public amenities.                        | Level 3               | Low             | Low               |
| RR-R-00074 Gas pipelines fire/explosion | Natural gas pipeline leak and associated fire/explosion with the potential to impact public safety  | Level 5               | High            | High              |
| RR-R-00075                              | Criminal related hazard with the potential to impact the environment.                               | Level 3               | Low             | Low               |
| Criminal act                            | Criminal related hazard with the potential to impact the public safety.                             | Level 5               | High            | High              |



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Twenty-seven recommendations were raised to improve the performance of existing controls, or implement additional controls.

The HAZID and risk assessment process conducted has assisted in demonstrating that the environmental and public safety risk associated with the potential hazards of AGL's mine operations as defined in the Mine Work Plan [3].are identified, risk assessed and that reasonable practical actions were identified as required by Condition 1A.

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#### 2 ACRONYMS

| AGL    | AGL Loy Yang Pty Ltd  |
|--------|---|
| DEDJTR | Department of Economic Development, Jobs, Transport and Resources |
| FIRM   | Fully Integrated Risk Management                                  |
| HAZID  | Hazard identification   |
| HSE    | Health, Safety & Environmental                                    |
| RRAM   | Resource Rights Allocation and Management                         |



#### 3 INTRODUCTION

AGL is the licenced operator of the Loy Yang Mine. DEDJTR has amended AGL's mine licence to include a new Condition 1A – Risk Management. For this new condition, AGL is required to undertake a risk assessment and submit a Risk Assessment and Management Plan for the mine to DEDJTR. A Risk Assessment and Management Plan should address the risks to the environment and public safety for the open cut operations covered by the Mining Licence 5189 (mine lease area) [1].

R4Risk was engaged by AGL to assist with the risk assessment component within Condition 1A – Risk Management.

The aim of this assessment was to ensure that the risk associated with the environment and public safety for the operations within the mine lease area are identified, risk assessed (considering the likelihood and consequence) and that reasonable practical actions are identified. This assessment included all work done or proposed to be done as defined in the Mine Work Plan [3].

#### 3.1 FACILITY DESCRIPTION

The mine is situated in the Latrobe Valley approximately 160 km east of Melbourne [4]. It is an open-cut mine that produces 30 million tonnes of brown coal annually for the Loy Yang A & B Power stations. The station provides approximately 50% of the total coal-fired electricity generated in Victoria. The mine is currently about 170 m deep, 4 km long and 2.5 km wide at its widest. Approximately 28 to 32 million tonnes of coal is extracted from the open cut mine each year.

The mine's primary operations includes the excavation of material by bucket wheel excavators (dredgers), transport via conveyors and dumping of waste by tripper stackers. Coal is transported, using belt conveyors to the raw coal bunker for short term storage (less than a day), then onto the crusher for sizing before delivery to the power station bunkers. Mine operations use dredgers, tripper stackers, mobile plant and conveyor systems to dig and transport coal and dispose of waste. The mine operates 24 hours a day, 365 days a year.

The open cut operations are covered by Mining Licence 5189 and the Mine Work Plan. The area covered by the mine lease area is 4,561.4 hectare and is defined as the area in between the purple lines as shown in Figure 1. The Loy Yang A and B Power Stations are located on an area excluded from the mine lease area.

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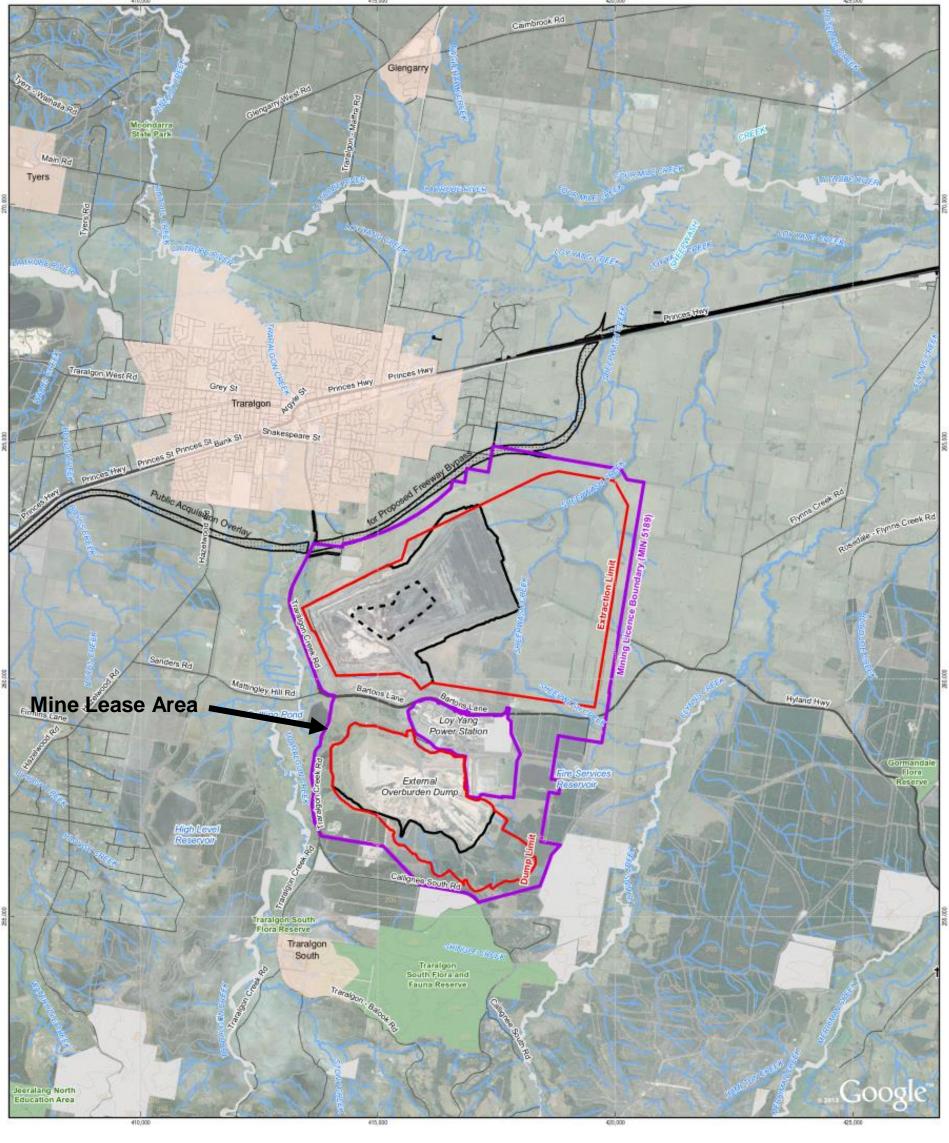


Figure 1: AGL Loy Yang Mine Lease Area [5]

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#### 4 RISK ASSESSMENT METHODOLOGY

This section describes the process undertaken at AGL to comply with the risk assessment component of Condition 1A - Risk Management.

#### 4.1 RISK ASSESSMENT SCOPE, HAZARD DEFINITION AND RISK CRITERIA

This section contains the scope of the risk assessment, the definition of a hazard and the risk tolerability criteria used to assess the risks.

#### 4.1.1 Risk Assessment Scope

The scope of the risk assessment was limited to operations at the mine that may impact the environment and/or public safety within or beyond the mine lease area [1]. This included all activities and/or operations undertaken within the mine lease area, considering the following:

- All worked out areas, current workings and areas yet to be worked within the mine lease area as defined in the Mine Work Plan as per the mining licence;
- Rehabilitation activities post mine closure.

Facilities operated by AGL e.g. the Loy Yang A Power Station, High Level Storage Dam, Settling Pond etc. that may impact the environment and/or public safety were excluded from this assessment. These facilities were excluded as they are located outside the mine lease area. However the assessment included potential hazards that these facilities may pose to the mine.

#### 4.1.2 Hazard Definition

The FIRM risk assessment matrix [2] was expanded to include consequence description ratings for public safety hazards as these had not been previously described on the matrix. A hazard must have the potential to pose a risk to the environment or public safety for it to be included in the scope of this assessment. This is defined using the FIRM risk assessment matrix, as follows:

- Level 1 5 on the environmental consequence scale and;
- Level 2 5 on the public safety consequence scale.

The definitions of the consequence rating are presented in Table 2.



Table 2: AGL FIRM Matrix - Consequence Rating

| Consequence<br>Descriptor | Environment & Community Definition   | Public Safety Definition  |
|---------------------------|--|---|
| Level 1                   | Negligible and short term environmental impact to localised area of negligible environmental value. No impact beyond AGL's operational area. No interest by local community. | No offsite public safety impact   |
| Level 2                   | Small scale and short term environmental impact to localised area of low environmental value.  | Nuisance event to public safety (no medical attention). Minor social or health impacts on local population.   |
| Level 3                   | No impact beyond AGL's operational area.<br>No/minor interest by local community."   | Injury to a member of the public, (requiring medical attention). Members of the public required to take temporary shelter or remain indoors for a short period of time (1-2 hours). Ongoing social or health impact concerns. |
| Level 4                   | Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s).                         | Serious harm to a member or injury to members of the public. Members of the public required to be displaced for a long period of time (days). Ongoing serious social or health impact.  |
| Level 5                   | Significant medium term impact on important environment/habitat and/or widespread local community complaints.  |   |

#### 4.1.3 Risk Assessment Criteria

AGL risk assessment evaluation process was used to determine the risk level categorised as *Extreme, Very high, High, Moderate or Low* on the FIRM risk matrix for each hazard. The tolerability of the risk is dependent on the risk level. The tolerability guidelines for the various risk levels from the matrix, with the respective required actions, are shown in Table 3.



**Table 3: Risk Level Required Actions** 

| Severity  | Required Action   |
|-----------|---|
| Extreme   | Do not proceed with any current (controlled) risk in this category without specialist assistance to further treat/reduce risk including the development of contingency plans and / or transference strategies.  Only the Board can accept current risk at this level. |
| Very High | Do not proceed with any treatment option without clear and timely action plans identified to reduce the risk.  Only the relevant Group General Manager can accept current risk at this level. The ARMC must be notified of acceptance at the next committee meeting.  |
| High      | Remedial action should be identified and implementation commenced with appropriate priority.  Only the relevant Group General Manager (or approved delegate) can accept current risk at this level.   |
| Moderate  | Management should determine whether further remedial action is required and can be cost effectively implemented.  Only the relevant General Manager or their approved delegate can accept current risk at this level.   |
| Low       | Management is expected to review the assessment and controls; and, where controls are not satisfactory, remedial action should be identified and implemented, where practical.  Action should only be taken in consultation with either Group Risk or Group Audit.    |

#### 4.2 **RISK ASSESSMENT WORKSHOP FORMAT**

The workshops involved a multidisciplinary team with considerable knowledge of the mine and independent<sup>2</sup> experts. The workshop team assessed the likelihood and consequences of the hazards. identified and selected the controls and assessed the adequacy of the controls based on their collective knowledge and experience. The workshop format facilitated the attendees to fully present all hazards within their area of expertise.

In assessing the current risks of the mine operations, the workshops team assumed that the performance of the critical safety and environmental management system elements described within AGL's management systems met the following standards:

- The mine was designed and constructed to the appropriate industry standard at that time.
- The mine is operated by trained and competent operators with existing manning levels however the workshop considered that an operator could make an error in the execution of their duties.
- The equipment is in sound operating condition and is regularly maintained as per scheduled maintenance and inspections activities defined within the maintenance system. However the workshop considered failure of mechanical equipment as a potential cause of a hazard.
- Equipment maintenance is performed by appropriately qualified personnel.
- Equipment and materials procured meet their intended specifications.

#### 4.3 **RISK ASSESSMENT APPROACH**

The bowtie approach was selected for the risk assessment. This methodology provides the mechanism of linking potential causes to the respective hazards along with the preventative and mitigative controls for each causal pathway. Within this process, identification of controls can be readily documented, together with potential additional controls, where applicable.

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<sup>&</sup>lt;sup>2</sup> Independent is defined as not an employee of AGL or any of its related bodies corporate as described in "Requirements for Compliance with Risk Management Conditions", Department of Economic Development, Jobs, Transport and Resources.



An example bowtie diagram is shown in Figure 2.

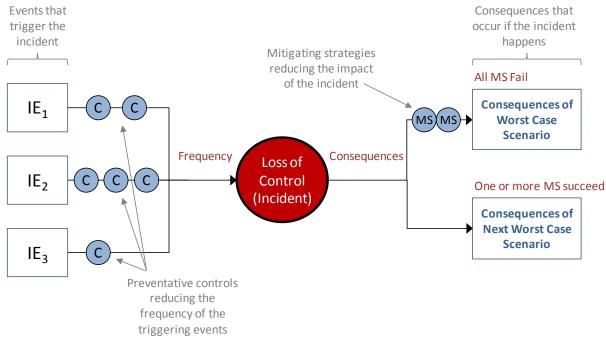


Figure 2: Example Bowtie Diagram

#### 4.4 RECORDING THE HAZID AND RISK ASSESSMENT

The Meercat *Riskview* program was used to record the assessment process. The hazards, causes, outcomes and controls were documented using the software. The software visually represents the information in bowtie diagrams. The bowties are dynamically updated if the underlying risk assessment is revised.

#### 4.5 RISK ASSESSMENT OVERVIEW

This section describes the process undertaken to comply with the risk assessment component of Condition 1A - Risk Management in accordance with the licence amendment. The primary objective of the AGL's Health, Safety & Environmental (HSE) Risk Management system is to establish a mechanism to minimise HSE risks which arise from the operation at the mine.

The risk assessment approach outlined in the AGL procedure *HSE Risk Management Standard Methodology* [6] includes the following main steps:

- Step 1. Identify hazard;
- Step 2. Assess the risk;
- Step 3. Determine controls:
- Step 4. Assign responsibility and timeframes;
- Step 5. Record the findings; and
- Step 6. Review and monitor.

For this assessment, these steps, with exception of steps 4 and 6, were redefined and broadly expanded to align with risk assessment component of Condition 1A – Risk Management. These are described as follows:

- Step 1. Identify hazards and causes that could impact the environment and/or public safety;
- Step 2. Assess the risks arising from those hazards through consideration of their consequences and likelihood



- Step 3. Determine if the hazard can be eliminated, where practicable;
- Step 4. Identify the preventative and mitigative controls;
- Step 5. Assess the effectiveness and adequacy of these controls in preventing or mitigating the risk:
- Step 6. Identify improvement measures to reduce the risks.

Steps 4 and 6 from AGL procedure *HSE Risk Management Standard Methodology* should be addressed in the Management Plan.

#### 4.5.1 Step 1 – HAZID Identification

In identifying hazards that could have the potential impact the environment and/or public safety, aspects for consideration included:

- The types of activities conducted at the mine including hazardous chemicals;
- Consideration of individual events and analysis of common minor occurrences which could combine to cause an impact;
- Previous risk assessments;
- Previous audits and inspections;
- Historical incidents at the mine; and
- Historical incidents at other mining facilities conducting similar operations.

Prior to the workshop, a preliminary list of hazards was developed. This was developed from the hazards and causes from the existing AGL hazard registers [7,8,9,10,11]. The causes were grouped according to the relevant hazard type (e.g. fugitive dust, water contamination, land degradation etc.) and consequence category level to enable simpler review and assessment in the HAZID workshop. Draft bowtie diagrams were developed for each hazard.

A HAZID workshop was scheduled to involve key AGL personnel and independent experts with the appropriate level of experience in the respective area of the assessment. The list that was developed in the pre-work was validated in the HAZID workshop. The workshop then used open brainstorming to identify additional hazards and causes that should be further assessed in the risk assessment step. The output of the HAZID workshop was a listing of potential hazards for the mine with supporting details describing the basis for their classification as an environment and/or public safety hazard (i.e. what the potential consequences could be). Where it was assessed that specific causes could not credibly lead to the hazard and/or where the credible worst-case consequence could not result in a risk to the environment or public safety, these hazards or causes were excluded from further assessment in the risk assessment step. The basis for these decisions was recorded in the HAZID workshop records.

#### 4.5.2 Steps 2, 3, 4, & 5 - Risk Assessment

Following the HAZID workshop, a risk assessment workshop was conducted to assess the hazards and causes identified during the HAZID using the bowtie approach. The existing controls in place to prevent and/or mitigate the hazard were identified by the workshop group. As part of the preparation for the workshop, the controls that were recorded from the existing AGL hazard registers were extracted. These were presented to the workshop group for review and validation. Additional control measures that were identified by the workshop group were added as appropriate. A risk assessment of each hazard, considering the existing controls in place, was conducted utilising the FIRM risk assessment matrix. These steps are described in more detail below.

#### 4.5.2.1 Consequence Assessment

The consequences of each hazard were assessed using the consequence scale on the FIRM risk assessment matrix. In assessing the consequences, the following factors were considered:

- Credible "worst-case" impacts
- Potential receptors of the consequence, i.e. offsite impact on surrounding land and its occupants, and;
- Hazards from mine related activities that could pose a risk to assets outside the mine lease area, which could have an impact to the environment or public safety.



For instances where the workshop team was unable to qualify the consequences of the hazard, e.g. impact of depletion of the regional aquifers, an action was raised to further define the potential impact of this hazard.

#### 4.5.2.2 Likelihood Assessment

The likelihood of each cause was determined qualitatively using the workshop group's professional judgement, historical data and other sources, i.e. drawing examples from other similar facilities. The likelihood scale on the FIRM risk matrix as shown in Table 4, was used as a guide. The likelihood assessment assumes that there are no safeguards in place to prevent the hazard. The basis for the likelihood assessment was documented within *Riskview*.

Table 4: AGL FIRM Matrix - Likelihood Rating

| Likelihood Descriptor | Definition Used   |  |  |
|-----------------------|---|--|--|
| Almost Certain        | Knowledge/evidence either within AGL or externally suggests this event/risk occurs almost all of the time. The occurrence of this risk is common and expected – greater than 1 in 2 chance (greater than 50%). Assumed event frequency: 5 x 10 <sup>-1</sup> per year.  |  |  |
| Likely                | Knowledge/evidence either within AGL or externally suggests this event/risk occurs at regular intervals - between 1 in 10 and 1 in 2 chance (10% to 50%). Assumed event frequency: $1 \times 10^{-1}$ per year.   |  |  |
| Possible              | Occurs either within AGL or known environment on an irregular basis but frequently enough to be more than a remote possibility – between 1 in 100 and 1 in 10 chance (1% to 10%). Assumed event frequency: 1 x $10^{-2}$ per year.  |  |  |
| Unlikely              | Aware that the event has occurred occasionally either within AGL or externally. However, it is not something that would be classed as a common occurrence and would only occur in certain remote circumstances – between 1 in 10,000 and 1 in 100 (0.01% to 1%).  Assumed event frequency: 1 x 10 <sup>-3</sup> per year. |  |  |
| Rare                  | Either is not known to have occurred or has not occurred in many 'exposures' to the potential risk – greater than 1 in 10,000 (less than 0.01%). Assumed event frequency: $1 \times 10^{-4}$ per year.  |  |  |

#### 4.5.2.3 Identify Existing Controls and Control Effectiveness

When considering a single hazard, a large number of existing controls may be identified as contributing to the management of risk associated with that hazard. However, the actual contribution of each control to the management of the risk profile may vary widely. Those controls that have the greatest influence in managing the risk associated with hazard were identified as "critical controls". It is these controls that require subsequent focus to ensure that the risk from the hazards remains at a tolerable level. For this assessment, critical controls have been assigned to:

- Controls used in hazards which have the potential to result in a consequence Level 3 and above for environmental impact and consequence Level 2 and above for public safety impact based on the FIRM risk matrix consequence category and;
- Controls which are considered to be effective in providing significant risk reduction (reduces the likelihood of the hazard occurring and/or significantly mitigates the impacts of the hazard).

The effectiveness of the identified controls in managing the risk associated with the hazards was assessed using a qualitative rating approach. Factors that were considered as part of the controls assessment included the following:



Implemented: The control must be fully implemented, i.e. the control must be in place.

Reliability: The control should be sufficiently reliable, i.e. it should have a low probability of

failure on demand.

Monitored and Audited :

The control should be monitored so that its performance may be established. Systems that manage the performance of the control should be audited to ensure

that the control remains functional and effective.

Applicability: The control must be applicable to the cause. If it functions as designed, it should

prevent the cause or significantly mitigate its consequences.

*Independence:* There should be sufficient independence of the control nominated for a single

cause. There should be no single failure that can disable two or more controls.

In the assessment, the inherent effectiveness of the control was qualitatively assessed, considering the implementation state, reliability level and extent of performance monitoring/auditing. This assessment was represented by allocating an effectiveness rating to each control. In assessing the control effectiveness, four ratings were used:

- Very Good
- Good
- Average
- Assessed.

The maximum level of risk reduction (likelihood reduction) that the control measure is assumed to provide will be dependent on the assigned effectiveness. The control effectiveness ratings assigned will translate to an equivalent likelihood reduction as presented in Table 5.

Table 5: Control Effectiveness - Reduction in Likelihood

| Effectiveness Rating | Equivalent Likelihood Reduction       |  |
|----------------------|---------------------------------------|--|
| Very Good            | 2 orders of magnitude (100 x)         |  |
| Good                 | 1 order of magnitude (10 x)           |  |
| Average              | Less than ½ order of magnitude (~3 x) |  |
| Assessed             | No risk reduction assigned            |  |

Where it was considered that a control may not be able to provide full risk reduction for a specific scenario, or where it was not independent from other controls in the scenario, a reduced applicability factor was applied. This reflects the reduction in effectiveness of the control for that specific scenario. This is described in Table 6.

Table 6: Applicability Factor

| Applicability | Reduction in Control Effectiveness  |  |
|---------------|---|--|
| Full          | The inherent effectiveness of the control is fully applied to the specific scenario.                              |  |
| Partial       | The inherent effectiveness of the control when applied to the specific scenario is reduced by approximately half. |  |
| No            | The control was not considered to be effective or independent for the specific scenario.                          |  |

#### 4.5.2.4 Control Adequacy

A qualitative judgement was made by the workshop as to the overall adequacy of the controls for each hazard. Adequacy was assessed based on the following:



#### The future risk with the controls considered in place.

The risk level is compared with the risk tolerability criteria. The level of risk determines the amount of time, trouble and effort that would be expected to further reduce the risk. The greater the risk, the greater the effort expected.

#### The number of controls that were selected.

A number of different and independent controls are more acceptable than reliance upon a few.

#### The hierarchy, independence and effectiveness of controls selected.

A mixture of different types of controls, such as engineering, administrative, and procedural controls is preferred to reliance upon a single type of control. Also, there is a preference for controls that eliminate or prevent hazards, rather than those that reduce or mitigate the impacts of the hazard (though these are still necessary).

#### 4.5.2.5 Probability Modifiers

In assessing the risks of the hazards, probability modifiers were used to account for the likelihood that the cause would result in the assigned consequence or as a cause contribution adjustment. The following probability modifiers were considered:

- Probability of a cause escalating to the hazard and subsequent consequence, e.g.:
  - An initial fire escalating to a significant fire within or near the mine lease area.
  - Ground movement escalating to the specified impact on the environment
- Cause contribution adjustment to account for cases where only a single causal pathway could result in the consequence, to prevent over-estimation of the risk.

Probabilities were assigned using the expertise and judgement of the workshop team. Probabilities were aligned with the likelihood scale of the AGL risk matrix using an order of magnitude approach as presented in Table 7.

**Table 7: Probability Modifiers** 

| Probability Assessment | Probability |
|------------------------|-------------|
| Almost certain         | 100%        |
| Likely                 | 10%         |
| Possible               | 1%          |
| Unlikely               | 0.1%        |
| Rare                   | 0.01%       |

#### 4.5.2.6 Risk Assessment

The likelihood rating for each consequence was determined from the estimated cause likelihoods with further likelihood reduction (due to the controls in place) and probability modifiers, where applicable. The calculation is performed in the Riskview software. The resulting risk level for each hazard was determined by combining the consequence rating with the estimated likelihood rating using the FIRM risk assessment matrix as shown in Figure 3. The risks were categorised as Extreme, Very high, High, Moderate or Low. The team then considered that the risk of a hazard was only tolerable if the risk was classified as a "Moderate" or "High" and that reasonably practical actions had been defined.

AGL's risk matrix is generally not aligned to DEDJTR's<sup>3</sup> Resource Rights Allocation and Management (RRAM) risk criteria [12]. However, as AGL sets lower thresholds for consequence impacts and risk criteria, the overall risk rating derived from the assessment can be considered to be more conservative than if DEDJTRs risk criteria had been applied directly.

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<sup>3</sup> Approval was provided by DEDJTR for AGL to utilise the FIRM risk matrix for this assessment



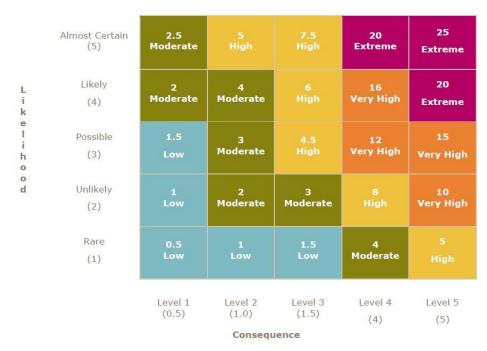


Figure 3: AGL FIRM Risk Assessment Matrix

#### 4.5.3 Step 6 - Risk Reduction

In determining what is "reasonably practicable", the following questions were posed to the workshop team for each hazard:

- Can the causes or the hazard be eliminated?
- Are opportunities for risk reduction available
- Are the risks tolerable for a hazard?
- What gaps exist in the existing controls?
- Can any additional or alternative controls be justified?

During the workshop, these questions prompted the team to consider further improvements, where possible. Recommendations were recorded where there was an opportunity to further improve the performance of existing controls. Additional "proposed" controls were also identified during the workshop where this was considered to be practicable using the "hierarchy of controls" concept (i.e. elimination, substitution, prevention, mitigation). In addition, all relevant codes, standards and industry good practice for each hazard were considered and applied, where relevant.

Where reasonably practical improvements were identified as a result of the review of control measure effectiveness, these were included as recommendations.



#### 5 RESULTS AND DISCUSSION

#### 5.1 HAZID AND RISK ASSESSMENT WORKSHOP ATTENDEES

The HAZID and risk assessment workshop was conducted on the 12 - 14 October 2015 and 16 October 2015. The personnel involved in the workshop are presented in Table 8, with the attendance sheets provided in Appendix A. The experience and qualification of the personnel and independent experts involved are provided in Appendix B.

Table 8: HAZID and Risk Assessment Workshop Attendees<sup>4</sup>

|                  |         |  | Hazard Reviewed                |                              |                                |                                |                               |                             |                               |                            |                 |                           |                              |                        |           |                                 |              |
|------------------|---------|--|--------------------------------|------------------------------|--------------------------------|--------------------------------|-------------------------------|-----------------------------|-------------------------------|----------------------------|-----------------|---------------------------|------------------------------|------------------------|-----------|---------------------------------|--------------|
| Name             | Company | Position   | Impact to water<br>(Level 1\2) | Impact to water<br>(Level 3) | Impact to water<br>(Level 4\5) | Impact to regional<br>aquifers | Impact to land<br>(Level 1\2) | Impact to land<br>(Level 3) | Impact to land<br>(Level 4/5) | Fugitive dust<br>emissions | Noise emissions | Visual light<br>emissions | Post rehabilitation<br>/fire | Hazardous<br>chemicals | Mine fire | Gas pipelines<br>fire/explosion | Criminal act |
| Debbie Nay       | AGL     | Environmental Advisor                                    | •                              | •                            | •                              | •                              | •                             | •                           | •                             | •                          | •               | -                         | -                            | -                      | -         | -                               | -            |
| Barry Cook       | GHD     | Independent Expert - Meteorologist                       | -                              | -                            | -                              | -                              | -                             | -                           | -                             | •                          | •               | -                         | -                            | -                      | -         | -                               | -            |
| Jason Shields    | AGL     | MSS – Site Manager                                       | -                              | -                            | -                              | -                              | -                             | -                           | -                             | -                          | -               | -                         | -                            | -                      | •         | -                               | -            |
| Jon Missen       | AGL     | Environment & Earth Sciences<br>Superintendent           | •                              | •                            | •                              | •                              | •                             | •                           | •                             | •                          | •               | •                         | •                            | •                      | •         | •                               | •            |
| Matthew Anderson | TP6     | Independent Expert - Business<br>Resilience Specialist   | -                              | -                            | -                              | -                              | -                             | -                           | -                             | -                          | -               | -                         | -                            | -                      | -         | -                               | •            |
| Nick Demetrios   | AGL     | Head of Security & Emergency<br>Management               | -                              | -                            |                                | -                              |                               |                             | 1                             | -                          | -               | -                         | -                            | -                      | -         | -                               | •            |
| Paul Barrand     | AGL     | Infrastructure, Civil, Environmental Manager             | •                              | •                            | •                              | •                              | •                             | •                           | •                             | •                          | •               | •                         | •                            | •                      | •         | •                               | •            |
| Rohan Bett       | AGL     | Civil Engineer – Fire Services                           | •                              | -                            | •                              | •                              | ı                             | ı                           | •                             | •                          | -               | -                         | •                            | -                      | •         | •                               | -            |
| Ron Keith        | MSS     | Independent Fire Expert                                  | -                              | -                            | -                              | -                              | -                             | -                           | -                             | -                          | -               | -                         | -                            | -                      | •         | •                               | -            |
| Slavko Kacavenda | GHD     | Independent Expert - Principal<br>Geotechnical Engineer  | •                              | •                            | •                              | •                              | •                             | •                           | •                             | •                          | •               | -                         | -                            | -                      | -         | -                               | -            |
| Wajahat Bajwa    | GHD     | Independent Expert - Principal<br>Environmental Engineer | •                              | •                            | •                              | •                              | •                             | •                           | •                             | •                          | •               | •                         | •                            | •                      | -         | -                               | -            |

<sup>&</sup>lt;sup>4</sup> ● Denotes attendee is present for the hazard reviewed.

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|             |         |                     | Hazard Reviewed                |                              |                                |                                |                               |                             |                               |                            |                 |                           |                              |                        |           |                                 |              |
|-------------|---------|---------------------|--------------------------------|------------------------------|--------------------------------|--------------------------------|-------------------------------|-----------------------------|-------------------------------|----------------------------|-----------------|---------------------------|------------------------------|------------------------|-----------|---------------------------------|--------------|
| Name        | Company | Position            | Impact to water<br>(Level 1\2) | Impact to water<br>(Level 3) | Impact to water<br>(Level 4\5) | Impact to regional<br>aquifers | Impact to land<br>(Level 1\2) | Impact to land<br>(Level 3) | Impact to land<br>(Level 4/5) | Fugitive dust<br>emissions | Noise emissions | Visual light<br>emissions | Post rehabilitation<br>/fire | Hazardous<br>chemicals | Mine fire | Gas pipelines<br>fire/explosion | Criminal act |
| Elio Stocco | R4Risk  | Facilitator         | •                              | •                            | •                              | •                              | •                             | •                           | •                             | •                          | •               | •                         | •                            | •                      | •         | •                               | •            |
| Flora Chung | R4Risk  | Technical Secretary | •                              | •                            | •                              | •                              | •                             | •                           | •                             | •                          | •               | •                         | •                            | •                      | •         | •                               | •            |



#### 5.2 HAZID SUMMARY

The HAZID workshop identified fifteen credible hazards with the potential to pose a risk to the environment and or public safety. The summary of the identified hazards are presented in Table 9.

**Table 9: HAZID Summary** 

| Hazard ID. | Hazard                         | Hazard Description   |
|------------|--------------------------------|--|
| RR-R-00061 | Impact to water<br>(Level 1/2) | Mining operations which could cause Level 1/2 impact to the environment (water).   |
| RR-R-00062 | Impact to water (Level 3)      | Mining operations which could cause Level 3 impact to the environment (water).   |
| RR-R-00063 | Impact to water<br>(Level 4)   | Mining operations which could cause Level 4 impact to the environment (water)  |
| RR-R-00064 | Impact to regional aquifers    | Sustained changes to the aquifer properties or structures which may impact future users or sensitive receptors.                  |
| RR-R-00065 | Impact to land<br>(Level 1/2)  | Mining operations which could cause consequence Level 1/2 impact to the environment (ground movement/land degradation).          |
| RR-R-00066 | Impact to Land<br>(Level 3)    | Mining operations which could cause Level 3 impact to the environment (ground movement/land degradation) and or public safety.   |
| RR-R-00067 | Impact to Land<br>(Level 4/5)  | Mining operations which could cause Level 4/5 impact to the environment (ground movement/land degradation) and or public safety. |
| RR-R-00068 | Fugitive dust<br>emissions     | Mining operations generating fugitive dust emissions which may impact public safety and or loss of amenity/nuisance.             |
| RR-R-00069 | Noise emissions                | Mining operations generating noise which could cause nuisance or loss of amenity.  |
| RR-R-00070 | Visual light emissions         | Mining operations generating light emissions which could cause nuisance or loss of amenity.                                      |
| RR-R-00071 | Post rehabilitation/fire       | Post closure of mine future hazards which could impact the environment or public safety.   |
| RR-R-00072 | Hazardous chemicals            | Loss of containment of chemicals which could impact the environment.   |
| RR-R-00073 | Mine fire                      | Significant fire within/near the Mine lease area which may impact public safety and the environment.                             |
| RR-R-00074 | Gas pipelines fire/explosion   | Loss of containment from LP and HP natural gas pipelines.  |
| RR-R-00075 | Criminal act                   | Criminal act which may impact public safety and/or the environment   |

#### 5.3 RISK ASSESSMENT SUMMARY

The risk assessment reviewed the fifteen hazards identified from the HAZID workshop. A summary of the risk assessment summary is presented in Table 10.

Bowtie diagrams were prepared for each hazard. These show the relationship between the hazards/causes, consequences/impacts and the controls that prevent or mitigate the hazard. The bowtie diagrams also show the likelihood for each cause and the risk reduction assigned to preventative and mitigative controls. These are presented in Appendix C. A total of 43 critical controls were identified that prevent and or mitigate the hazards. A total of 27 recommendations were raised to further reduce the risk of the hazard. The complete list of critical controls and risk reduction recommendations are presented in Appendix D and Appendix E respectively.

During the risk assessment workshop, a number of causes of potential hazards were subsequently rejected by the workshop team where it was assessed that specific causes could not credibly lead to the



hazard and/or where the credible worst-case consequence could not result in a risk to the environment or public safety. The justification for rejecting these causes is documented in the risk assessment. Details of the rejected causes are provided in Appendix F.

The detailed report containing all the data and assumptions underlying the risk assessment is attached in Appendix G. Information included in this report includes comments that were captured in the workshop that relate to:

- The likelihood assessment for each cause;
- The existing controls for each cause;
- The adequacy assessment for each control, i.e. overall effectiveness as a function of effectiveness and applicability;
- Recommended additional controls or recommendation to improve existing controls;
- The rejected causes and reasoning for rejecting the causes;
- Consequence impacts for each outcome including potential receptors; and
- The risk of each impact.

The recommendations raised in the workshop should be assessed for criticality, practicality and effectiveness to be carried forward to close-out as addressed in the Management Plan.



**Table 10: Risk Assessment Output** 

| Hazard<br>Description          | Item<br>No.             | Consequence<br>Category | Impact Description  | Consequence<br>Rating | Current Risk | Future Risk |
|--------------------------------|-------------------------|-------------------------|---|-----------------------|--------------|-------------|
| Impact to water<br>(Level 1/2) | 1.                      | Environment & Community | Contaminated water discharge with the potential to impact the environment.                          | Level 2               | Moderate     | Moderate    |
|                                | 2.                      |                         | Contaminated water discharge with the potential to impact the environment.                          | Level 3               | Low          | Low         |
| Impact to water (Level 3)      | 3.                      | Environment & Community | Loss in biodiversity: vegetation, habitat destruction, threatened species.                          | Level 3               | Low          | Low         |
|                                | 4.                      |                         | Loss of water usage downstream  | Level 3               | Low          | Low         |
| Impact to water                | 5.                      | Environment &           | Contaminated water discharge with the potential to impact the environment.                          | Level 4               | Moderate     | Moderate    |
| (Level 4)                      | 6.                      | Community               | Change in creek grade with the potential to impact the environment                                  | Level 4               | Moderate     | High        |
| Impact to regional aquifers    | 7.                      | Environment & Community | Damage to regional aquifers   | Level 3               | Moderate     | Moderate    |
| Impact to land<br>(Level 1/2)  | 8.                      | Environment & Community | Ground movement / land degradation with the potential to impact the environment.                    | Level 1               | Moderate     | Moderate    |
| Impact to land                 | o land 9. Environment & |                         | Ground movement / land degradation with the potential to impact the environment.                    | Level 3               | Low          | Low         |
| (Level 3)                      | 10.                     | Community               | Ground movement / land degradation with the potential to impact public safety.                      | Level 3               | Low          | Low         |
|                                | 11.                     | Environment &           | Ground movement / land degradation with the potential to impact public safety                       | Level 4               | Moderate     | High        |
| Impact to land<br>(Level 4/5)  | 12. Community           |                         | Settling Pond dam wall failure induced flood event with the potential to impact public safety.      | Level 5               | High         | High        |
|                                | 13.                     | Public Safety           | Land subsidence with the potential to impact the environment  | Level 4               | Moderate     | High        |
| Fugitive dust                  | 14.                     | Public Safety           | Fugitive dust emissions with the potential to impact public safety.                                 | Level 2               | Moderate     | Moderate    |
| emissions                      | ů –                     |                         | Loss of amenities due to fugitive dust emissions (visual/nuisance).                                 | Level 3               | Moderate     | Moderate    |
| Noise emissions                | 16.                     | Environment & Community | Noise emissions with the potential to result in nuisance or loss of amenity to the local community. | Level 3               | Moderate     | Moderate    |
| Visual light emissions         | 17.                     | Environment & Community | Visual light emissions with the potential to result in nuisance or loss of amenity.                 | Level 1               | Low          | Low         |



| Hazard<br>Description        | Item<br>No.             | Consequence<br>Category | Impact Description   | Consequence<br>Rating | Current Risk | Future Risk |
|------------------------------|-------------------------|-------------------------|--|-----------------------|--------------|-------------|
|                              | 18.                     | Public Safety           | Fire risk with the potential to impact public safety.  | Level 5               | N/A          | High        |
| Post                         | Post                    |                         | Environmental impacts from unsuccessful rehabilitation - Land, Aquifer and Surface Water.          | Level 3               | N/A          | Moderate    |
| rehabilitation/fire          | 20.                     | Environment & Community | Smoke risk with the potential to impact the public safety  | Level 5               | N/A          | High        |
|                              | 21.                     |                         | Environmental risk from smoke with the potential to impact public amenities.                       | Level 3               | N/A          | Low         |
| Hazardous                    | 22.                     | Environment &           | Contaminated water discharge with the potential to impact the environment.                         | Level 3               | Moderate     | Moderate    |
| chemicals                    | chemicals 23. Community |                         | Contaminated land with the potential to impact the environment                                     | Level 2               | Moderate     | Moderate    |
|                              | 24.                     |                         | Fire risk with the potential to impact public safety.  | Level 5               | High         | High        |
| Mine fire                    | 25.                     | Public Safety           | Smoke risk with the potential to impact the public safety  | Level 5               | High         | High        |
|                              | 26.                     | Environment & Community | Environmental risk from smoke with the potential to impact public amenities.                       | Level 3               | Low          | Low         |
| Gas pipelines fire/explosion | 27.                     | Public Safety           | Natural gas pipeline leak and associated fire/explosion with the potential to impact public safety | Level 5               | High         | High        |
| Criminal act                 | 28.                     | Environment & Community | Criminal related hazard with the potential to impact the environment.                              | Level 3               | Low          | Low         |
| Criminal act                 | 29. Public Safety       |                         | Criminal related hazard with the potential to impact the public safety.                            | Level 5               | High         | High        |



#### 5.3.1 High Risk Hazards

The risk assessment has identified a total of 10 *High* risks of which may remain into the future irrespective of the implementation of recommendations. Table 11 provides commentary on each *High* risk item as identified in Table 10.

**Table 11: Mine High Risk Hazards** 

| Item<br>No. | Hazard<br>Description         | Impact Description   | Description   |  |  |  |  |
|-------------|-------------------------------|--|---|--|--|--|--|
| 6           | Impact to water<br>(Level 4)  | Change in creek grade with the potential to impact the environment.                            | The future development associated with the planned Traralgon Bypass is expected to impact the surface water and mine stability. This development as   |  |  |  |  |
| 11          | Impact to land<br>(Level 4/5) | Ground movement / land degradation with the potential to impact public safety.                 | currently proposed presents a potential <i>High</i> risk into the future. This cause is major risk contributor for each of these impacts. Recommendation RR-A-000   |  |  |  |  |
| 13          | Impact to land<br>(Level 4/5) | Ground movement / land degradation with the potential to impact the environment                | has been included in the assessment to address this. Successful mitigation of the risks associated with the Traralgon Bypass can potentially reduce these risks to <i>Moderate</i> .  |  |  |  |  |
| 6           | Impact to water<br>(Level 4)  | Change in creek grade with the potential to impact the environment.                            | Recommendations RR-A-00005, 19 and 20 have been raised to further reduce the risk of this hazard.   |  |  |  |  |
| 11          | Impact to land<br>(Level 4/5) | Ground movement / land degradation with the potential to impact public safety.                 | Recommendation RR-A-00005 has been raised to further reduce the risk of this hazard.  |  |  |  |  |
| 12          | Impact to land<br>(Level 4/5) | Settling Pond dam wall failure induced flood event with the potential to impact public safety. | The current and future risks are both considered <i>High</i> as a consequence category Level 5 has been assigned due to the potentially very serious consequences of the hazard. The likelihood in this event is at the lowest limit of the likelihood scale on the FIRM risk matrix. Recommendations RR-A-00024 has been raised to further reduce the risk of this hazard. |  |  |  |  |
| 18          | Post                          | Fire risk with the potential to impact public safety.  | The future risk is considered <i>High</i> as a consequence category Level 5 has been assigned due to the potentially very serious consequences of the hazard. The likelihood in this event is at the lowest limit of the likelihood scale on the FIRM risk  |  |  |  |  |
| 20          | rehabilitation/fire           | Smoke risk with the potential to impact the public safety                                      | matrix. Recommendations RR-A-00036 and 57 have been raised to further reduce the risk of this hazard  |  |  |  |  |
| 24          | Mine fire                     | Fire risk with the potential to impact public safety.  | The current and future risks are both considered <i>High</i> as a consequence category Level 5 has been assigned due to the potentially very serious consequences of the bazard. The likelihood in this event is at the lowest limit of the likelihood scale.   |  |  |  |  |
| 25          | IVIIIIE IIIE                  | Smoke risk with the potential to impact the public safety                                      | the hazard. The likelihood in this event is at the lowest limit of the likelihood sca<br>on the FIRM risk matrix. Recommendations RR-A-00005, 16, 33, 46, 50, 51 a<br>55 have been raised to further reduce the risk of this hazard   |  |  |  |  |



| Item<br>No. | Hazard<br>Description           | Impact Description   | Description  |
|-------------|---------------------------------|--|--|
| 27          | Gas pipelines<br>fire/explosion | Natural gas pipeline leak and associated fire/explosion with the potential to impact public safety | The current and future risks are both considered <i>High</i> as a consequence category Level 5 has been assigned due to the potentially very serious consequences of the hazard. The likelihood in this event is at the lowest limit of the likelihood scale on the FIRM risk matrix. No additional practical recommendations were identified. |
| 29          | Criminal act                    | Criminal related hazard with the potential to impact the public safety.                            | The current and future risks are both considered <i>High</i> as a consequence category Level 5 has been assigned due to the potentially very serious consequences of the hazard. The likelihood in this event is at the lowest limit of the likelihood scale on the FIRM risk matrix. No additional practical recommendations were identified. |



#### 5.4 RISK ASSESSMENT FOLLOW-UP WORK

The risk assessment represents a snapshot of the environmental and public safety hazards and risks at the mine at the time of the study. To ensure that risks are addressed and appropriately managed, AGL should address the following activities in the Management Plan:

- Assess each recommendation for criticality, practicality and effectiveness and carry them forward to close-out
- Implement a program to periodically update the risk assessment throughout the life cycle of the mine. This is to ensure that the assessment continually reflects these environmental and public safety hazards and risks at the mine
- Develop performance criteria for critical controls identified in the assessment by:
  - Establishing links between the controls and the mine's management system such that the adequacy with which the system manages these controls can then be assessed during future audits.
  - Defining performance standards and indicators for the controls such that the reliability
    of the controls assumed in the risk assessment continues to remain valid.

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#### 6 CONCLUSION

The HAZID identified fifteen credible hazards with the potential to pose a risk to the environment and or public safety. The risk assessment identified a total of ten *High* risks of which may remain into the future irrespective of the implementation of recommendations. A total of 43 critical controls were identified that prevent and or mitigate the hazards and 27 recommendations were raised to further reduce the risk of the hazards.

The HAZID and risk assessment process conducted meets the requirements of the risk assessment component within Condition 1A – Risk Management as follows:

- The assessment process adopted incorporated reviews of incidents, past studies, and other
  documentation to provide knowledge about potential risks to the environment and public
  safety from activities within the mine lease area. This ensured that all the hazards and
  causes and the potential impacts to the environment and or public safety were properly
  identified.
- The likelihood and consequence of each hazard/cause was assessed, and the resulting risks were assessed using AGLs corporate risk criteria via the FIRM risk matrix.
- Where it was considered reasonably practicable to implement additional or alternative controls to further reduce the risks, recommendations were raised to investigate these options. This included hazards where the likelihood assessment of the consequence is already at the lowest scale on the FIRM risk matrix.
- The bowtie diagrams allowed identification and prioritisation of potentially high risk hazards and clearly identifies the controls that manage the risks of those hazards.
- The assessment considered the effectiveness and adequacy of the controls, and identified the critical controls for each hazard.
- The involvement of knowledgeable and experienced personnel (independent experts and AGL staff) provided knowledge of additional potential hazards, associated consequences and considered the suitability and availability of controls.

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#### 7 REFERENCES

- 1 AGL Loy Yang Mining Licence No. 5189, Document No. RPT000013, Rev 01, 24/02/2015
- 2 AGL, "AGL Risk Management & Assessment Framework", June 2014.
- 3 AGL Loy Yang, "Loy Yang Mining Licence 5181 Work Plan".
- 4 AGL Loy Yang Work Plan Variation Mining Licence 5189, "Introduction Background", 19 October 2015.
- 5 AGL Loy Yang Mining Licence Work Plan Variation, "Figure 2 Regional Plan", Job No. 31-2072315, Rev 5, 25 September 2015.
- 6 AGL Loy Yang, "Health, Safety & Environment Risk Management Standard Methodology", Doc No. AGL-HSE-SDM-004.1, Version 1.0, 25 November 2014.
- 7 AGL Loy Yang Hazard Register, "FY15 Aspects and Impacts Register".
- 8 AGL Loy Yang Hazard Register, "Geotechnical Hazard Risk Register\_v2", 13 February 2015.
- 9 AGL Loy Yang Hazard Register, "LY Enviro Consequence Risks", 18 May 2015.
- 10 AGL Loy Yang Hazard Register, "FIRM Risk Register", 29 June 2015.
- 11 AGL Loy Yang Hard Register, "Major Fire", 29 June 2015
- 12 Figure 10 RRAM Risk Criteria, DEDJTR Risk Assessment and Management Plan 2015-06-30



#### **APPENDIX A – WORKSHOP ATTENDANCE LIST**

This appendix lists the workshop attendees that participated during the risk assessment process.

Representatives from the government authorities of DEDJTR, EPA and CFA were invited to participate in the HAZID and risk assessment process as observers of the workshop proceedings, these invitations were declined by the representatives from these departments.

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## **ATTENDANCE SHEET**

Project:

116-10 AGL Loy Yang Mine Licence Risk Assessment

Dates:

Hazard Identification & Risk Assessment:

12 - 14 October 2015

| Name             | Title                       | Company              | Mon 12/10 | Tue 13/10 | Wed 14/10    |            |          |    |
|------------------|-----------------------------|----------------------|-----------|-----------|--------------|------------|----------|----|
| Debbie Nay       | Env. Advisor                | AGL                  | Oray      | Chay      |              |            |          |    |
| Waic Baiwa       | GHD Principal FA            | y GHD                | 2         |           |              |            |          |    |
| Starks Kacavenda | Principal Eng Gett          |                      | M         |           |              |            |          |    |
| SON MIGGEN       | EXES SUPT                   | AGL LY               | m.        | m.        | -            |            |          | 4  |
| Pour Borramos    | ILE MANAGER                 | Acr                  | R         | R         | Harl         |            |          | 1  |
| WAJAHAT BAJWA    | Principal Engl              | GID                  |           | 1         | * ES FOR     |            |          |    |
| Slayes Kacacecke | Pringpal Geded Ever         | GNO                  |           | The       |              |            |          |    |
| BARRY COOK       | METEOROLOGIST               | CHD.                 |           | Brown     |              |            | ,        |    |
| RON KEITH        | FIRE EXPERT.                | m55.                 |           |           | Ru,          | ronkeith ( | biggood. | Co |
| JASON SHIELDS    | EMERICANT RESPONS           | MSS                  |           | <         | 111.         |            |          |    |
| ROHAN BETT       | CIVIL ENGINERA - FIRE SALAY | AG-C                 |           |           | MALL         | 13         |          |    |
| Matthew Anderson | AleBusiness Resilience      | e Alb TP6            |           |           | ES For<br>MA | _          |          |    |
| NICK Demenies    | Specialist                  |                      |           |           |              |            | ,        |    |
|                  | Head of Security            | Energency Management | t         | _         | 160          |            |          |    |
|                  | , 0                         |                      |           |           |              |            |          |    |
| Elio Stocco      | Facilitator                 | R4Risk               | ES        | ES        | ES           |            |          |    |
| Flora Chung      | Scribe                      | R4Risk               | FRE       | 200       | A            |            |          |    |

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# **ATTENDANCE SHEET**

Project:

116-10 AGL Loy Yang Mine Licence Risk Assessment

Dates:

Hazard Identification & Risk Assessment:

16 October 2015

| Title          | Company       | 16th Oct, 2015     |                       |                       |
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| Facilitator    | R/Rick        | E &                |                       | $\dashv$              |
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|                | assassa messa | Facilitator R4Risk | Facilitator R4Risk ES | Facilitator RARISK ES |



#### APPENDIX B - WORKSHOP PERSONNEL EXPERIENCE

The risk assessment workshop was attended by representatives from AGL who had the appropriate knowledge and expertise and the independent<sup>1</sup> experts<sup>2</sup>. This appendix list the experience and qualifications of the attendees.

#### **B.1. AGL REPRESENTATIVES**

| Name:             | Debbie Nay   |  |  |  |
|-------------------|--|--|--|--|
| Role:             | Environmental Advisor  |  |  |  |
| Qualification:    | Bachelor of Science (Hons) – Monash University               |  |  |  |
|                   | Honours Thesis on Loy Yang Ash Pond Groundwater Quality 2006 |  |  |  |
| Brief Description |  |  |  |  |

Debbie Nay has extensive experience in environmental management in relation to the mine operations. She has worked at GHD for 10 years in the Contamination Assessment and Remediation team undertaking Phase 1 site assessments, soil and groundwater assessments for audits, waste classification and project management on a number of industrial and commercial sites. She commenced working at AGL Loy Yang in 2013 undertaking tasks including licence compliance, environmental improvement plans, environmental risk assessment, community consultation, incidents investigations and audits.

| Name:          | Jason Shields  |  |  |  |  |  |  |
|----------------|--|--|--|--|--|--|--|
| Role:          | Emergency Response and Security Representative   |  |  |  |  |  |  |
| Qualification: | Incident Controllers Course (2014) – Australian School of Emergency Management (ASEM) Certificate III in Public Safety - Fire Fighting Operations (2007) Certificate II in Assessment Maintenance (2005) Australian Inter -Service Incident Management System (2008) |  |  |  |  |  |  |
|                | Brief Description  |  |  |  |  |  |  |

Jason has more than 20 years of experience in emergency and protective services. He has vast experience in developing, coordinating and directing emergency exercises within the power and mining industry. Jason is responsible for Energy Australia's fire prevention, detection and suppression systems which involved tendering and contract management of the service(s). He is also responsible for the review and update of the Emergency Response and Management Plans at Energy Australia and AGL Loy Yang.

| Name:             | Jon Missen   |  |  |  |
|-------------------|--|--|--|--|
| Role:             | Environment Representative - Environment & Earth Sciences Superintendent                             |  |  |  |
| Qualification:    | Certificate of Technology (Associate Diploma) – Civil Engineering Graduate Certificate of Management |  |  |  |
| Brief Description |  |  |  |  |

Jon has more than 30 years of experience in mine planning and operations, civil engineering, geotechnical engineering and environmental management at the Latrobe Valley brown coal mine. He is currently the Environment and Earth Sciences Superintendent at AGL Loy Yang mine. He is responsible for geotechnical and hydrogeological management, mine rehabilitation, land and environmental management.

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<sup>&</sup>lt;sup>1</sup> Independent is defined as not an employee of AGL or any of its related bodies corporate as per Licence Condition - 1A.3 in the Attachment 2 of AGL Mine License No. 5189.

<sup>&</sup>lt;sup>2</sup> Expert is defined as those who have the appropriate expertise in their representative field as per Licence Condition - 1A.3 in the Attachment 2 of AGL Mine License No. 5189



| Name:             | Paul Barrand  |
|-------------------|---|
| Role:             | Mine Representative – Infrastructure, Civil and Environmental Manager   |
| Qualification:    | Bachelor of Mining Engineering Post graduate in Business Management – Melbourne Business School Member of Australasian Institute of Mining and Metallurgy |
| Brief Description |   |

Paul Barrand has extensive experience in mining and geotechnical engineering, risk management and Occupational Health and Safety. His career encompasses working for Marsh, BHP Billiton, Newcrest and AGL, in and managing open cut gold, coal (both thermal and metalliferous) and iron ore mines. Since 2012, Paul has been appointed as the Infrastructure, Civil and Environmental Manager for AGL Loy Yang. His role manages primarily the mine infrastructure, earth sciences and mine rehabilitation at AGL Loy Yang.

| Name:             | Rohan Bett   |
|-------------------|--|
| Role:             | Emergency Response and Fire Representative   |
| Qualification:    | Bachelor of Interdisciplinary Engineering (Civil) – Monash University Level 2 Incident Controller - AIMS |
| Brief Description |  |

Rohan has more than 10 years of experience in design and project management of water, wastewater and fire service infrastructure. He was previously employed as a Civil Engineer with GHD and was seconded to Hazelwood Mine to assist post the mine fire. Rohan has extensive experience in fire prevention, mitigation and suppression systems. His relevant experience includes project managing the design and construction of the fire service and dewatering projects at the Hazelwood mine post the mine fire incident. Rohan is employed as the Fire Service and Dewatering Engineer at Loy Yang Mine since 2011. He is an active volunteer member of the CFA for more than 18 years.

| Name:             | Nick Demetrios                                 |
|-------------------|--|
| Role:             | Emergency Response and Security Representative |
| Brief Description |  |

Nick has extensive experience in the Power Industry in the Latrobe Valley. He specialises in security and emergency management. He is currently the Head of Security & Emergency Management. His role includes the oversight of the security and emergency services arrangements for the operating sites at AGL. Nick also represents AGL in regional fire and emergency response forums.

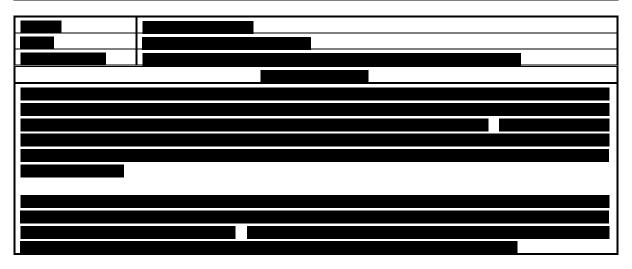
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#### **B.2. INDEPENDENT EXPERTS**

| Name:             | Barry Cook  |
|-------------------|---|
| Role:             | Air Quality Independent Expert  |
| Qualification:    | Bachelor of Science (Hons) in meteorology and physics – University of Melbourne Member of Clean Air Australia and New Zealand |
| Brief Description |   |

Barry is a Principal Professional of the Air and Noise Assessment team in GHD's Melbourne office. He has combined consulting, regulatory and industry experience with air quality modelling systems and assessments. His previous positions as a meteorologist at environmental consulting firms, EPA Victoria and Mount Isa Mines and now with GHD, have provided him with over 30 years of experience in air quality assessments. Barry has conducted Air Quality Assessments for various mines and facilities which include Mount Todd Gold Mine NT, Carmichael Coal Mine QLD, Teresa Coal Mine QLD, Coal Mine, Westport NZ, Ash Dump Relocation and the Mount Isa Mines QLD.



| Name:             | Ronald Keith  |
|-------------------|---|
| Role:             | Mine Fire Safety, Risk Management and Emergency Response Independent Expert   |
| Qualification:    | Certificate of Civil Engineering (Municipal) Graduate – Institution of Fire Engineers Diploma of Building Surveying - Swinburne |
| Brief Description |   |

Ronald has had over 40 years of experience managing large and diverse projects ranging from engineering projects, national conferences, training courses, major fire operations, corporate risk assessments, fire engineering software and small businesses. His relevant experiences include managing major bushfire operations in Victoria and New South Wales and developing national policies, procedures for fire safety management, emergency planning, the application of automatic and manual fire detection and suppression systems and the use of aspirated fire detection systems.

Ronald also has a sound theoretical and practice understanding of fire in the natural and developed environment, attributed to his years as a career officer with the Country Fire Authority. He has had extensive first-hand experience in wild and structural fires, thus, understands the influence of meteorological and environmental factors on fires. Ronald is currently a Risk Management and OHS Advisor for the Baw Baw Shire.

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| Name:             | Slavko Kacavenda   |
|-------------------|--|
| Role:             | Geotechnical Engineering Independent Expert              |
| Qualification:    | Bachelor of Engineering with Honours - Monash University |
| Brief Description |  |

Slavko has over thirty years of experience in application of geotechnical engineering to mining, civil infrastructure and other projects. He has extensive experience with the brown coal based electricity industry in the Latrobe Valley. Slavko main areas of expertise include organisation and supervision of ground investigations, assessment of soil parameters, stability analyses of natural and man-made slopes, mine and overburden dump batter design, geotechnical instrumentation, earth fill specifications and quality control and land subsidence modelling. Through his extensive expertise and exposure to technical mining advances he has developed a thorough understanding of the geotechnical issues with these mines.

| Name:             | Wajahat Bajwa   |
|-------------------|---|
| Role:             | Environmental Engineering Independent Expert  |
| Qualification:    | Bachelor of Science (Civil Engineering) - Lahore, Pakistan; Postgraduate Diploma (Sanitary Engineering), Institute of Hydraulic & Environmental Engineering, Delft, The Netherlands,; Postgraduate Diploma (Computer Science), Victoria University of Technology, Melbourne, Australia. |
| Brief Description |   |

Wajahat Bajwa is a Principal Environmental Engineer at GHD. He is an EPA Victoria appointed auditor for industrial facilities. His roles have involved legislative compliance, research and development, operational management, risk assessment and project management. Wajahat has extensive experience in environmental related risk assessment and has had considerable experience in dealing with landfills and wastewater management facilities, including the Victorian Desalination Plant, Long Term Contaminant Facility at Cranbourne and many other landfills. Prior to joining GHD, Wajahat was the Manager of the Yarra Region within EPA Victoria. In this position, he was responsible for the overall strategy and direction in managing/regulating a large number of waste management, storage and treatment facilities.

| Name:             | Elio Stocco   |
|-------------------|---|
| Role:             | Risk Assessment Independent Expert  |
| Qualification:    | Bachelor of Engineering (Chemical) – Royal Melbourne Institute of Technology. Chartered Chemical Engineer Chartered Member, Institution of Chemical Engineers. Registered Professional Engineer – Queensland. |
| Brief Description |   |

Elio Stocco is a chemical engineer with 24 years of experience in operations and risk management, of which he has worked for ten years as a Principal Risk Consultant. He has extensive experience in all methods of risk assessment across various industries and is a trained facilitator. His main areas of expertise include quantitative / qualitative risk assessments, layers of protection analysis, safety case development, HAZOP, HAZID and SIL analysis, occupied buildings risk assessments, emergency response planning, fire safety studies and consequence modelling. Elio has an intimate knowledge of the Major Hazard Facilities regulatory regimes in particularly those that relate to safety assessments.

| Name:             | Flora Chung   |
|-------------------|---|
| Role:             | Support to Risk Assessment Independent Expert   |
| Qualification:    | Bachelor of Engineering (Chemical and Biomolecular) with Honours – University of Melbourne. |
| Brief Description |   |

Flora Chung is a chemical engineer with over four years of experience in process safety and risk management. She has extensive experience in various methods of risk assessment across various industries. Flora's relevant experience includes facilitating and scribing risk assessment workshops and assisting in the development of safety management systems for various clients.

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# **APPENDIX C - BOWTIES**

This appendix list the bowtie diagrams developed during the risk assessment process. The bowtie diagrams graphically displays the link between causes, hazards and the preventative and mitigative controls for each causal pathway. The current and future risk for each hazard is also shown.

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R4Risk Ref.: 116-10, Release 1

| Causes   | Preventative Controls  |
|--|--|
| Contaminated water runoff from the OB dump due to excessive rainfall [Rare (1)]  |  |
|  | Containment of mine drainage within the Mine Lease Area (Containment of mine drainage (retention ponds) within the Mine Lease Area) [Good]         |
|  | →) Water Management Plan (Water Treatment System) [Good]   |
| Contamination of surface discharge due to failure of oil separation system [Possible (3)]                                  |  |
|  | Settling Pond Oil in Drain (Main drainage oil detection, alarm<br>and operator response (prior to settling pond)) [Good]                           |
|  | Containment of mine drainage within the Mine Lease Area<br>(Oil containment booms on settling pond) [Good]   |
| Generation of acid mine water runoff from exposed large areas of interseam in open cut and internal OB dump [Possible (3)] |  |
|  | <ul> <li>Operating procedure - lime addition (Operating procedure to<br/>adjust pH) [Assessed]</li> </ul>  |
|  | Containment of mine drainage within the Mine Lease Area<br>(Containment of mine drainage (based in the mine) within the<br>Mine Lease Area) [Good] |
| Contaminated water from Latrobe City Council new landfill site leachate dam discharged onto AGL property [Rare (1)]        |  |
| PCB spill from transformers [Unlikely (2)]   |  |
|  | Transformer Maintenance Program (Oil sampling on transformers scheduled through Asset Suite Annual based on condition of equipment) [Good]         |
|  | PCB Register allows tracking of spill/leak from transformer<br>(PCB Register allows tracking of a spill/leak from transformer)<br>[Average]        |
| Contaminated water from Latrobe City Council old landfill site leachate dam discharged onto AGL property [Possible (3)]    |  |
|  | Land Management Lease Agreements (Land management<br>and monitoring requirements described in the lease<br>agreement) [Assessed]                   |

# **Risk Scenario Bowtie**

Code

RR-R-00061

Scenario

Mining operations which could cause Level 1/2 impact to the environment (water)

Event

Impact to water (Level 1/2)

# **Mitigative Controls**

HSM0001C Emergency Management Plan (Emergency

→ Weekly sampling at discharge point L171 and L160

(Alarm and operator response) [Good]

(Independent third party sampling) [Assessed]

→ ( Monitoring equipment L171, alarm and operator response

Response Procedure) [Good]

Consequences

Contaminated water discharge with the potential to impact the environment [Environment & Community]

> Current Small scale and short term environmental impact to localised area of low environmental value. No impact beyond AGL's operational area. No/minor interest by local community. / Possible (3) Proposed Small scale and short term environmental impact to localised area of low environmental value. No impact beyond AGL's operational area. No/minor interest by local community. / Possible (3)





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| NOE ININE TROUTROGESSINE TO   |  |
|---|--|
| Causes  | Preventative Controls  |
| Contaminated water due to a failure of Dredge Ash holding cell [Unlikely (2)]                     |  |
|   | Ash Trial Environmental Improvement Plan (EPA Approval process) [Assessed]   |
|   | <ul> <li>Operational Monitoring Program for the dredging activity<br/>(Observational inspection and water balance) [Good]</li> </ul>             |
|   | Groundwater Monitoring Plan [Average]  |
|   | Dam monitoring program (Ash void monitoring program)<br>[Good]   |
| Disruption of flow to Sheepwash Creek due to failure of retention basin [Rare (1)]                |  |
|   | Incorporate Sheepwash Creek flow retention area into the<br>Dam Management Plan and adopt ANCOLD guidelines for<br>management. [Assessed]        |
| Settling Pond wall failure due to ground movement as a result of mining activities [Unlikely (2)] |  |
|   | Emergency Management Plan and TARPs [Good]   |
|   | Inspection, monitoring and maintenance of the Settling Pond<br>[Good]  |
| Contaminated water discharge (quality & quantity) due to site based activities [Unlikely (2)]     |  |
|   | Water Management Plan (Water Treatment System) [Good]  |
|   | Containment of mine drainage within the Mine Lease Area<br>(Containment of mine drainage (retention ponds) within the<br>Mine Lease Area) [Good] |
|   |  |

# **Risk Scenario Bowtie**

Code

# RR-R-00062

# Scenario

Mining operations which could cause Level 3 impact to the environment (water)

**Event** 

# Impact to water (Level 3)



# Mitigative Controls Consequences

Ontaminated water discharge with the potential to impact the environment [Environment & Community]

**Current** Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). /

Rare (1) **Proposed** Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)

Loss in biodiversity: vegetation, habitat destruction, threatened species [Environment & Community]

Current Moderate, short to medium term

environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)

Loss of water usage downstream [Public Safety]

Monitoring equipment L171, alarm and operator response (Alarm and operator response) [Good]

Monitoring equipment L171, alarm and operator response

(Alarm and operator response) [Good]

→ ( Weekly sampling at discharge point L171 and L160 (Independent third party sampling) [Assessed]

→ Weekly sampling at discharge point L171 and L160

(Alarm and operator response) [Good]

(Independent third party sampling) [Assessed]→ 《 Monitoring equipment L171, alarm and operator response

- → P000081 Community Engagement Plan (Community Engagement Plan) [Average]
- HSM0001C Emergency Management Plan (Emergency Response Procedure) [Good]

**Current** Injury to a member of the public (requiring medical attention). Members of the public required to take temporary shelter or remain indoors for a short period of time (1-2 hours) / Rare (1)

Proposed Injury to a member of the public (requiring medical attention).

Members of the public required to take temporary shelter or remain indoors for a short period of time (1-2 hours) / Rare (1)

Low

Low





|   | Causes   |             | Preventative Controls  |
|---|--|-------------|--|
|   | drainage from the overburden dump<br>Traralgon Creek water quality [Unlikely       |             |  |
|   |  | <b>→</b> )) | Water Management Plan (Water Treatment System) [Good]  |
|   |  | <b>→</b> )) | Environmental site plan (Ongoing Rehabilitation and Seepage Program) [Average]   |
|   |  | <b>→</b> )  | Hydrological model for the overburden dump runoff [Average]  |
| _ | creek bed grade and flood plains due to dence as a ground failure [Possible (3)]   |             |  |
|   |  | <b>→</b> )) | CPW001M Ground Control Management Plan (Subsidence modelling and monitoring) [Good]  |
|   |  | <b>→</b> )  | LV Regional Groundwater Management Plan (Regional coordination modelling and monitoring of subsidence) [Good]  |
|   |  | <b>→)</b> ) | Aquifer Depressurisation Annual Report (Optimisation of groundwater extraction to minimise subsidence effects) [Good]  |
|   |  | <b>→</b> )  | LV Regional Groundwater Management Plan (Regional and third party monitoring (every 5 years) reported to DEDJTR and Southern Rural Water) [Good]                             |
|   |  | <b>→</b> )  | Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain. [Good] |
|   | raralgon Bypass and associated<br>ent to impact surface water and mine<br>are (1)] |             |  |
|   |  | •)          | AGL to engage with the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed. [Assessed]                 |
|   | e due to coal block sliding impacting Creek. [Likely (4)]                          |             |  |
|   |  | <b>→</b> )) | Geotechnical Inspections and TARPS [Good]  |
|   |  | <b>→</b> )) | Surface drainage inspection and maintenance [Good]   |
|   |  | <b>→</b> )) | Subsurface (horizontal drains) drainage inspection and maintenance [Good]  |
|   |  | <b>→</b> )) | Inspection, monitoring and maintenance of the Settling Pond [Good]   |

# **Risk Scenario Bowtie**

Code

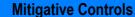
RR-R-00063

Scenario

Mining operations which could cause Level 4 impact to the environment (water)

Event

# Impact to water (Level 4)



→ P000081 Community Engagement Plan (Community

→ ( HSM0001C Emergency Management Plan (Emergency

→ Weekly sampling at discharge point L171 and L160

(Alarm and operator response) [Good]

(Independent third party sampling) [Assessed] → ( Monitoring equipment L171, alarm and operator response

HSM0001C Emergency Management Plan (Emergency

Response Procedure) [Good]

→ ( Emergency Management Plan and TARPs [Good]

Engagement Plan) [Average]

Management Plan) [Good]

Contaminated water discharge with the potential to impact the environment [Environment & Community]

Consequences

Current Significant medium term impact on important environment/habitat and/or widespread local community complaints. /

Proposed Significant medium term

impact on important environment/habitat and/or widespread local community complaints. / Rare (1)

Change in creek grade with the potential to impact the environment [Environment & Community]

> Current Significant medium term impact on important environment/habitat and/or widespread local community complaints. / Rare (1)

Proposed Significant medium term impact on important environment/habitat and/or widespread local community

complaints. / Unlikely (2)







|   | Causes  |             | Preventative Controls  |
|---|---|-------------|--|
| Θ | Cross contamination of regional aquifers from mine floor heave [Unlikely (2)]   |             |  |
|   |   | <b>→</b> )) | Aquifer Depressurisation Annual Report (Monitor aquifer depressurisation and TARPS) [Good]                             |
|   |   | <b>→)</b> ) | CPW001M Ground Control Management Plan (Aquifer/weight balance modelling) [Good]                                       |
|   |   | <b>→)</b> ) | Aquifer Depressurisation Annual Report (Optimisation of groundwater extraction to minimise subsidence effects) [Good]  |
| e | Cross contamination of regional aquifers as a result of exploration drilling activities [Unlikely (2)]                      |             |  |
|   |   | <b>→</b> )) | Third party contractual agreement (drilling contractors) [Good]  |
| e | Cross contamination of regional aquifers as a result of historical drilling activities or mine related bores [Possible (3)] |             |  |
|   |   | <b>→)</b> ) | LV Regional Groundwater Management Plan - Regional Bore (Maintenance of the regional bore database) [Good]             |
|   |   | <b>→</b> )) | LV Regional Groundwater Management Plan - Regional Bore (Inspection and maintenance program for regional bores) [Good] |

# **Risk Scenario Bowtie**

Code

RR-R-00064

Scenario

Sustained changes to the

aquifer properties or structures

**Mitigative Controls** 

# Consequences

Damage to regional aquifers [Environment &

Community]

Current Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Unlikely (2)

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Unlikely (2)

which may impact future users or sensitive receptors

Impact to regional aquifers

**Event** 





| Causes  | Preventative Controls  |
|---|--|
| Damage or unauthorised removal of European or Aboriginal Archaeology and Heritage sites due to mining activities [Almost Certain (5)] |  |
|   | Cultural Heritage Management Plans (CHMP) (Cultural<br>Heritage Management Plans (CHMP) in place for current<br>operational areas) [Very Good] |
| Subsidence of overburden dump due to instability from weakened or wet materials [Unlikely (2)]  |  |
|   | Geotechnical Inspections and TARPS [Good]  |
|   | Surface drainage inspection and maintenance [Good]   |
| Land movement due to inadequate aquifer depressurisation [Unlikely (2)]   |  |
|   | Geotechnical Inspections and TARPS [Good]  |
|   | Groundwater modelling, extraction and monitoring [Good]  |
| Ground movement single batter failure - operations [Possible (3)]   |  |
|   | <ul> <li>Daily Mine Inspections (Daily mine inspections and operator<br/>action) [Average]</li> </ul>  |
|   | Geotechnical Inspections and TARPS [Good]  |
|   | CPW001M Ground Control Management Plan (Ground movement modelling and monitoring) [Good]   |
| Acid mine drainage from the overburden dump impacting land [Likely (4)]   |  |
|   | Hydrological model for the overburden dump runoff<br>[Average]   |
|   | Environmental site plan (Ongoing Rehabilitation and<br>Seepage Program) [Average]  |

# **Risk Scenario Bowtie**

Code

RR-R-00065

Scenario

Mining operations which could cause consequence Level 1/2 impact to the environment (ground movement / land degradation)

**Event** 

# Impact to land (Level 1/2)





**Mitigative Controls** 

HSM0001C Emergency Management Plan (Emergency

Response Procedure) [Good]

Ground movement / land degradation with the potential to impact the environment [Environment & Community]

Consequences

Current Level 1 (0.5) / Likely (4)

Proposed Level 1 (0.5) / Likely (4)





| Causes   | Preventative Controls   |
|--|---|
| Damage to Saline Waste Outfall Pipeline (SWOP) due ground movement from mining activities [Rare (1)]                     |   |
|  | Subsidence modelling and monitoring [Good]  |
|  | Gippsland Water Authority & AGL Agreement (Third party bi-weekly visual inspection of the pipeline) [Good]    |
| Regional subsidence due to groundwater extraction from mining activities [Unlikely (2)]                                  |   |
|  | LV Regional Groundwater Management Plan (Regional coordination modelling and monitoring of subsidence) [Good] |
|  | <ul> <li>Subsidence modelling and monitoring [Good]</li> </ul>  |
| Fire Services Pond wall failure due to ground movement from a seismic event [Rare (1)]                                   |   |
|  | Dam Management Plan (Dam managed as per ANCOLD guidelines) [Good]   |
|  | Emergency Management Plan and TARPs [Good]  |
| OB run off pond wall failure due to seismic event or extreme rainfall [Rare (1)]   |   |
|  | Dam Management Plan (Dam managed as per ANCOLD guidelines) [Good]   |
|  | Emergency Management Plan and TARPs [Good]  |
| Damage to Saline Waste Outfall Pipeline (SWOP) due to internal corrosion/wear [Rare (1)]                                 |   |
|  | Gippsland Water Authority & AGL Agreement (Third party<br>bi-weekly visual inspection of the pipeline) [Good] |
|  | Gippsland Water Authority & AGL Agreement (Third party<br>pipe integrity testing) [Good]                      |
| Fire Services Pond wall failure due to internal drainage failure [Rare (1)]  |   |
|  | Dam Management Plan (Dam managed as per ANCOLD guidelines) [Good]   |
|  | Emergency Management Plan and TARPs [Good]  |
| Degradation of land due to pest, plants and animals [Possible (3)]   |   |
|  | <ul> <li>Lease plan conditions (Management of pest plants and<br/>animals) [Good]</li> </ul>                  |
|  | Mine Internal Vegetation Management-ICE (Management of<br>weed species) [Good]                                |
| Change in creek bed grade and flood plains due to land subsidence as a result of aquifer depressurisation [Possible (3)] |   |

Code

### - ---

# RR-R-00066

### Scenario

Mining operations which could cause Level 3 impact to the environment (ground movement / land degradation) and or public safety

Event

# Impact to land (Level 3)

riskview



# Mitigative Controls Consequences

Ground movement / land degradation with the potential to impact the environment [Environment & Community]

Current Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s).

Rare (1) **Proposed** Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)

Ground movement / land degradation with the potential to impact public safety [Public Safety]

and human activity in close proximity to affected area (buffer zone)) [Good]

HSM0001C Emergency Management Plan (Emergency

External Buffers-Exclusion Zones (Reduced population

HSM0001C Emergency Management Plan (Emergency

Response Procedure) [Good]

→ ( Emergency Management Plan and TARPs [Good]

HSM0001C Emergency Management Plan (Emergen Response Procedure) [Good]

→ ( Emergency Management Plan and TARPs [Good]

Current Injury to a member of the public (requiring medical attention). Members of the public required to take temporary shelter or remain indoors for a short period of time (1-2 hours) / Rare (1)

Proposed Injury to a member of the public (requiring medical attention).

Members of the public required to take temporary shelter or remain indoors for a short period of time (1-2 hours) / Rare (1)

Low

LOW

# **Risk Scenario Bowtie**



| Causes | Preventative Controls   |
|--------|---|
|        | CPW001M Ground Control Management Plan (Subsidence<br>modelling and monitoring) [Good]  |
|        | <ul> <li>LV Regional Groundwater Management Plan (Regional<br/>coordination modelling and monitoring of subsidence) [Good]</li> </ul>   |
|        | <ul> <li>Aquifer Depressurisation Annual Report (Optimisation of<br/>groundwater extraction to minimise subsidence effects)</li> <li>[Good]</li> </ul>                        |
|        | <ul> <li>LV Regional Groundwater Management Plan (Regional and<br/>third party monitoring (every 5 years) reported to DEDJTR<br/>and Southern Rural Water) [Good]</li> </ul>  |
|        | Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain.  [Good] |





| Causes  | Preventative Controls  |
|---|--|
| Causes  | Freventative Controls  |
| Localised ground movement as a result of subsidence due to mining activities affecting local roads [Possible (3)] |  |
|   | CPW001M Ground Control Management Plan (Ground movement modelling and monitoring) [Good]   |
|   | CPW001M Ground Control Management Plan (Geotechnical<br>Inspections and TARPS) [Good]  |
| Planned Traralgon Bypass and associated development to impact surface water and mine stability [Rare (1)]         |  |
|   | AGL to engage with the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed. [Assessed] |
| Subsidence due to coal block sliding impacting Traralgon Creek Road. [Likely (4)]                                 |  |
|   | Geotechnical Inspections and TARPS [Good]  |
|   | Surface drainage inspection and maintenance [Good]   |
|   | Subsurface (horizontal drains) drainage inspection and maintenance [Good]  |
| Settling Pond wall failure due to ground movement as a result of mining activities [Unlikely (2)]                 |  |
|   | Dam Management Plan (Emergency Management Plan and<br>TARPs) [Good]  |
|   | Inspection, monitoring and maintenance of the Settling Pond [Good]   |

# **Risk Scenario Bowtie**

Code

# RR-R-00067

# Scenario

Mining operations which could cause Level 4/5 impact to the environment (ground movement / land degradation) and or public safety

**Event** 

# Impact to land (Level 4/5)



# Consequences

Ground movement / land degradation with the potential to impact public safety [Public Safety]

> Current Serious harm to a member or injury to members of the public. Members of the public required to be displaced for a long

> period of time (days) / Rare (1) Proposed Serious harm to a member or injury to members of the public. Members of the public required to be displaced for a long

period of time (days) / Unlikely (2)

Ground movement / land degradation with the potential to impact the environment [Environment & Community]

Current Significant medium term impact on important environment/habitat and/or widespread local community complaints. / Rare (1)

Proposed Significant medium term impact on important environment/habitat and/or widespread local community

complaints. / Unlikely (2)

Settling pond dam wall failure induced flood event with the potential to impact public safety [Public Safety]

→ ( Dam Management Plan (Emergency Management Plan and TARPs) [Good]

HSM0001C Emergency Management Plan (Emergency Response Procedure) [Good]

Emergency Management Plan and TARPs [Good]

→ Emergency Management Plan and TARPs [Good]

Response Procedure) [Good]

HSM0001C Emergency Management Plan (Emergency

Response Procedure) [Good]

HSM0001C Emergency Management Plan (Emergency

Current Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

Proposed Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)





| / (OL IVIII |  |             |   |
|-------------|--|-------------|---|
|             | Causes   |             | Preventative Controls   |
| ⊖           | Fugitive dust emissions from excavation/dumping activities during handling of leached ash [Possible (3)]                                     |             |   |
|             |  | <b>→</b> )  | Confirm the particle size of the leached ash associated with the fugitive dust emissions from excavation/dumping activities. [Assessed] |
|             |  | →))         | CPG001M Dust Suppression Control Procedure<br>(Operational Controls for Dust Suppression procedure<br>(TARP)) [Good]                    |
| ⊖           | Fugitive dust emissions from mine operation (mining and earth works) due to high wind events (27 km/h) [Possible (3)]                        |             |   |
|             |  | →))         | CPG001M Dust Suppression Control Procedure<br>(Operational Controls for Dust Suppression procedure<br>(TARP)) [Good]                    |
|             |  | <b>→)</b> ) | CPG001M Dust Suppression Control Procedure (Dust Suppression work instruction (PRWF044M)) [Good]  |
|             |  | <b>→)</b> ) | CPG001M Dust Suppression Control Procedure (Dust source suppression activities) [Good]  |
| 0           | Fugitive dust emissions from crushed rock used for roads and general civil building activities onsite due to high wind events [Possible (3)] |             |   |
|             |  | <b>→</b> )) | CPG001M Dust Suppression Control Procedure<br>(Operational Controls for Dust Suppression procedure<br>(TARP)) [Good]                    |
|             |  | <b>→)</b> ) | CPG001M Dust Suppression Control Procedure (Dust Suppression work instruction (PRWF044M)(16837)) [Good]                                 |
| 0           | Fugitive dust emissions due to handling of black coal [Unlikely (2)]   |             |   |
|             |  | <b>→</b> )  | Develop a procedure to manage dust emissions from handling of black coal (update the existing briquette delivery procedure). [Good]     |

# **Risk Scenario Bowtie**

Code

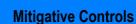
# RR-R-00068

# Scenario

Mining operations generating fugitive dust emissions which may impact public safety and/or loss of amenity/nuisance

**Event** 

# **Fugitive dust** emissions



Review the effectiveness of spray coverage and increase the implementation of the automated spray. [Assessed]

→ ( Loy Yang Mining Licence 5181 Work Plan (Rehabilitated

→ P000081 Community Engagement Plan (Community

→ ( Loy Yang Mining Licence 5181 Work Plan (Rehabilitated

Investigate the use of Compressed Air Foam (CAF) for

Review the effectiveness of spray coverage and increase the implementation of the automated spray. [Assessed] → ( Environmental site plan (Monitoring of air emissions and

dust suppressions. [Assessed]

exposure levels) [Average]

Engagement Plan) [Average]

land) [Good]

# Consequences

Fugitive dust emissions with the potential to impact public safety [Public Safety]

> Current Nuisance event to public safety (no medical attention) / Unlikely (2) Proposed Nuisance event to public safety (no medical attention) / Unlikely (2)

Loss of amenities due to fugitive dust emissions (visual/nuisance) [Environment & Community]

> Current Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). /

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Unlikely (2)





**Preventative Controls** Causes Noise emissions from mining related activities [Possible (3)] Buffer zone between site and residences [Good] **Risk Scenario Bowtie** 

Code

**Mitigative Controls** 

Consequences

Noise emissions with the potential to result in

nuisance and/or loss of amenity to the local

community [Environment & Community]

RR-R-00069

Scenario

Mining operations generating

noise which could cause

nuisance or loss of amenity

→ Complaints Registry Procedure (P00063) [Assessed]

→ ( Maintain noise signature model [Assessed]

Current Moderate, short to medium term

environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). /

Unlikely (2)

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Unlikely (2)

Noise emissions

**Event** 







Page 10 of 20

**Preventative Controls** Causes Light emissions from mining related activities [Unlikely (2)] Buffer zone between site and residences [Good]

# **Risk Scenario Bowtie**

Code

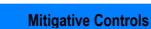
RR-R-00070

Scenario

Mining operations generating light emissions which could cause nuisance or loss of amenity

**Event** 

Visual light emissions



→ Complaints Registry Procedure (P00063) [Assessed]

# Consequences

Visual light emissions with the potential to result in nuisance and/or loss of amenity [Environment & Community]

> Current Negligible and short term environmental impact to localised area of Negligible environmental value. No impact beyond AGL's operational area. No interest by local community. / Rare (1) Proposed Negligible and short term

environmental impact to localised area of Negligible environmental value. No impact beyond AGL's operational area. No interest by local community. / Rare (1)



R4Risk Ref.: 116-10, Release 1



|   | Causes   |            | Preventative Controls  |
|---|--|------------|--|
| Θ | Insufficient topsoil to complete final rehabilitation for the open cut mine [Rare (1)]         |            |  |
|   |  | <b>→</b> ) | Loy Yang Mining Licence 5181 Work Plan Variation [Good]  |
|   |  | •)         | Continue to investigate alternative sources of topsoil, or alternative materials (include 4 year investigation on artificial topsoil study with Federation University). [Good] |
| Θ | Ground subsidence of rehabilitated landform post mining operations [Rare (1)]                  |            |  |
|   |  | <b>→</b> ) | Develop and implement the Mine Closure Plan [Good]   |
|   |  | <b>→</b> ) | Loy Yang Mining Licence 5181 Work Plan Variation [Good]  |
| Θ | Acid mine drainage from the overburden dump impacting Traralgon Creek water quality [Rare (1)] |            |  |
|   |  | <b>→</b> ) | Develop and implement the Mine Closure Plan [Good]   |
|   |  | <b>→</b> ) | Loy Yang Mining Licence 5181 Work Plan Variation [Good]  |
| 0 | Fire risk during mine closure progress [Rare (1)]  |            |  |
|   |  | <b>→</b> ) | Develop and implement the Mine Closure Plan [Good]   |
|   |  | <b>→</b> ) | Loy Yang Mining Licence 5181 Work Plan Variation [Good]  |

# RR-R-00071

Code

Scenario

Post closure of mine future hazards which could impact the environment or public safety

Event

# **Post** rehabilitation/fire

| gative Controls |   | Consequences   |
|-----------------|---|--|
|                 | Ð | Environmental impacts from unsuccessful rehabilitation - Land, Aquifer and Surface Water |

result in local community complaint(s). / Unlikely (2) Fire risk with the potential to impact public safety

beyond AGL's operational area and/or may

[Environment & Community] Proposed Moderate, short to medium term environmental impact that may extend

[Public Safety]

Proposed Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

Environmental risk from smoke with the potential to impact public amenities [Environment & Community]

Rehabilitation Fire Suppression Systems [Good]

Rehabilitation Fire Suppression Systems [Good]

→ ( Vic police and CFA Response [Assessed]

→ Vic police and CFA Response [Assessed]

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). /

Rare (1) Smoke risk with the potential to impact the public

Rehabilitation Fire Suppression Systems [Good]

→ ( Vic police and CFA Response [Assessed]

safety [Public Safety]

Proposed Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)





| AGL MINE RISK ASSESSMENT   |  |                     |
|--|--|---------------------|
| Causes   | Preventative Contr   | ols                 |
| Spill during unloading due to maloperation [Possible (3)]  |  |                     |
|  | HSW707 Unloading of Bulk Chemical Tar<br>Instruction (Procedure for unloading of bu<br>(generic)) [Good]   |                     |
|  | Bunding (Deliveries undertaken within a b [Good]   | unded area.)        |
|  | Verify that the bunding of hazardous cher<br>with AS1940 and EPA guidelines (EPA Po<br>a program is implemented to maintain the<br>bunding. [Good] | ublication 347) and |
| Spill during unloading due to hose failure [Possible (3)]  | buruing. [Cood]  |                     |
|  | HSW707 Unloading of Bulk Chemical Tar<br>Instruction (Procedure for unloading of bu<br>(generic)) [Good]   |                     |
|  | Bunding (Deliveries undertaken within a b [Good]   | unded area.)        |
|  | Verify that the bunding of hazardous chen<br>with AS1940 and EPA guidelines (EPA Po<br>a program is implemented to maintain the<br>bunding. [Good] | ublication 347) and |
| Spill due to tanker accident [Unlikely (2)]  |  |                     |
|  | Third party chemical suppliers (Competer third party tanker drivers) [Average]   | t and reputable     |
| Failure of underground storage tank from corrosion resulting in groundwater contamination [Possible (3)] |  |                     |
|  | <ul> <li>Ensure that the underground storage tank<br/>with the Vic EPA UPSS guidelines. [Asset</li> </ul>  | •                   |
|  | Maintenance Routine - Tanks [Good]   |                     |
| Tank overfill due to maloperation [Possible (3)]   |  |                     |
|  | HSW707 Unloading of Bulk Chemical Tar<br>Instruction (Procedure for unloading of bu<br>(generic)) [Good]   |                     |
|  | Bunding (Deliveries undertaken within a b [Good]   | unded area.)        |
|  | Verify that the bunding of hazardous chen<br>with AS1940 and EPA guidelines (EPA Po<br>a program is implemented to maintain the<br>bunding. [Good] | ublication 347) and |
| Spill whilst using mobile fill points [Possible (3)]   |  |                     |
|  | Third party contractor RTL - Refuelling of (RTL-OPS-WI-021) [Average]  | Mobile Plant        |



Consequences

Code

# RR-R-00072

# Scenario

Loss of containment of chemicals which could impact the environment

Event

# Hazardous chemicals

Mitigative Controls

 Contaminated water discharge with the potential to impact the environment [Environment & Community]

Management Plan) [Good]

→ Weekly sampling at discharge point L171 and L160 (Independent third party sampling) [Assessed]

Monitoring equipment L171, alarm and operator response (Alarm and operator response) [Good]

HSM0001C Emergency Management Plan (Emergency

Management Plan) [Good]

HSM0001C Emergency Management Plan (Emergency

**Current** Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Unlikely (2)

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Unlikely (2)

 Contaminated land with the potential to impact the environment [Environment & Community]

Current Small scale and short term environmental impact to localised area of low environmental value. No impact beyond AGL's operational area. No/minor interest by local community. / Unlikely (2)

Proposed Small scale and short term environmental impact to localised area of low environmental value. No impact beyond AGL's operational area. No/minor interest by local community. / Unlikely (2)

Moderate

...

Moderate



# Causes Preventative Controls Spill due to corrosion of aboveground tank [Possible (3)] Maintenance Routine - Tanks [Good] Ensure that the underground storage tanks are compliant

with the Vic EPA UPSS guidelines. [Assessed]



| AGL MINE RISK ASSESSMENT   |             |   |
|--|-------------|---|
| Causes   |             | Preventative Controls   |
| Hot surface temperature of brakes on conveyors, dredgers/stackers [Likely (4)] |             |   |
|  | <b>→</b> )) | Detection and suppression on conveyor lines [Average]   |
|  | <b>→</b> )  | General Housekeeping (Work area inspection will trigger the cleaning procedure) [Assessed]  |
|  | <b>→</b> )) | Mechanical Maintenance Routine (Maintenance routine on all brakes) [Good]   |
|  | →))         | PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good]   |
| Electrical sources of ignition [Likely (4)]                                    |             |   |
|  | <b>→</b> )) | Electrical routine maintenance [Good]   |
|  | <b>→</b> )) | Electrical Safety Systems (Earth leakage (residual current devices) and overcurrent protection devices) [Good]  |
|  | <b>→</b> )) | Detection and suppression on electrical equipment [Average]   |
|  | <b>→</b> )) | PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good]   |
| Ember attack from bush fire or grass fire [Likely (4)]                         |             |   |
|  | <b>→</b> )) | PCY000022 Fire Risk Management Plan (Period specific plans put in place prior to high fire danger days) [Good]  |
|  | <b>→</b> )) | External Buffers-Exclusion Zones (Buffer zone between coal mine and public access) [Good]   |
|  | →))         | Environmental site plan - vegetation management (Management of vegetation to manage fuel load to reduce the intensity of the fire within the mine) [Good] |
|  | <b>→</b> )  | Third party high danger period alerts (CFA/DEP/MFB alert on high danger period.) [Assessed]   |
|  | <b>→</b> )) | PCY000022 Fire Risk Management Plan (Mine Fire Preparedness and Prevention Procedure) [Good]  |
|  | <b>→</b> )) | PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good]   |
|  | →))         | PCY000022 Fire Risk Management Plan (Clay capping) [Good]   |
| Bearing Friction Failure [Likely (4)]  |             |   |
|  | <b>→</b> )) | Detection and suppression on conveyor lines [Average]   |
|  | <b>→</b> )  | General Housekeeping (Work area inspection will trigger the cleaning procedure) [Assessed]  |
|  | <b>→</b> )) | Mechanical Maintenance Routine (Maintenance routine on bearings) [Good]   |
|  | <b>→</b> )) | PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good]   |
| Hot Works [Likely (4)]   |             |   |
|  | <b>→)</b> ) | HSP900 Permit to work system (Hot work permit system) [Very Good]   |
| P/Disk Pof: 116-10 Poleage 1   |             |   |

# **Risk Scenario Bowtie**

Code

# RR-R-00073

## Scenario

Significant fire within/near the Mine lease area which may impact public safety and the environment

Event

# Mine fire

riskyjew



## Consequences

Fire risk with the potential to impact public safety
[Public Safety]

- P000081 Community Engagement Plan (Community Engagement Plan) [Average]
- → ( Vic police and CFA Response [Assessed]
- Security Management Plan (Incident (crime) management and escalation of security arrangements) [Good]
- HSM0001C Emergency Management Plan (Emergency Management Plan) [Good]
- Fixed Mine Fire Detection and Suppression Equipment
- HSM0001C Emergency Management Plan (Emergency Response Equipment) [Good]

Current Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

**Proposed** Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

Environmental risk from smoke with the potential to impact public amenities [Environment & Community]

High

- → ( HSM0001C Emergency Management Plan (Emergency Management Plan) [Good]
- Fixed Mine Fire Detection and Suppression Equipment [Good]
- HSM0001C Emergency Management Plan (Emergency Response Equipment) [Good]
- P000081 Community Engagement Plan (Community Engagement Plan) [Average]

**Current** Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)

- Loy Yang Mining Licence 5181 Work Plan (Rehabilitated land) [Good]
- HSM0001C Emergency Management Plan (Emergency Response Equipment) [Good]
- Fixed Mine Fire Detection and Suppression Equipment
  [Good]
- → P000081 Community Engagement Plan (Community Engagement Plan) [Average]

**3** S

Smoke risk with the potential to impact the public safety [Public Safety]

# AGL MINE RISK ASSESSMENT **Preventative Controls** Causes PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good] Light or heavy vehicle/mobile/ancillary equipment initiated fire [Likely (4)] Pre Startup Inspections (Pre Startup Inspections checklist triggers clean / washdown procedure) [Average] PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good] Vehicle Standards Procedure (Fire equipment standard for light or heavy vehicle/ancillary equipment) [Good] Ignition through discarded cigarettes [Likely (4)] HRP0024C Corporate Smoking Policy (Restricted smoking PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good] Spontaneous combustion of coal [Likely (4)] Daily Mine Inspections (Daily mine inspections by shift management personnel) [Average] CPW001M Ground Control Management Plan (Fortnightly geotechnical engineering inspection and TARPS) [Good] PCY000022 Fire Risk Management Plan (Operating practice to excavate and remove and/or apply water on identified hot spot) [Good] PCY000022 Fire Risk Management Plan (Clay capping/grouting of identified cracks) [Good] PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good] Transmission tower and distribution lines operated by third party failure resulting in fire [Unlikely (2)] Environmental site plan - vegetation management (Management of vegetation to manage fuel load to reduce the intensity of the fire within the mine) [Good] PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good] Implement oversight to ensure that SPI Ausnet manages their assets in accordance with legislation. [Assessed] Uncontrolled ignition sources from farming related activities (third party - local lessees) [Possible (3)] Third party contractual agreement (lessees) [Good] Site Security Fencing and Surveillance Systems (Cameras strategically installed along the site boundary and site

perimeter includes security fencing) [Good]

Security Management Plan (Site security undertake regular patrols of the mining lease and surrounding areas.) [Good]





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| IVIII  | ıwatıv |       | Ulli |     |

Vic police, CFA, EPA and Department of Health Response [Assessed]

HSM0001C Emergency Management Plan (Emergency Management Plan) [Good]

Consequences

Current Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

Proposed Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

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AGL MINE RISK ASSESSMENT

# **Risk Scenario Bowtie**



# Causes Preventative Controls

- PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good]
- Environmental site plan vegetation management (Management of vegetation to manage fuel load to reduce the intensity of the fire within the mine) [Good]
- Uncontrolled ignition source within the Mine Lease
  Area from members of the public [Possible (3)]
- External Buffers-Exclusion Zones (Buffer zone between coal mine and public access) [Good]
- Environmental site plan vegetation management (Management of vegetation to manage fuel load to reduce the intensity of the fire within the mine) [Good]
- Security Management Plan (Site security undertake regular patrols of the mining lease and surrounding areas.) [Good]
- Site Security Fencing and Surveillance Systems (Cameras strategically installed along the site boundary and site perimeter includes security fencing) [Good]
- PCY000022 Fire Risk Management Plan (Emergency Response Procedures Fast Determined Response) [Good]
- Criminal intent to initiate an arson attack [Likely (4)]
- Environmental site plan vegetation management (Management of vegetation to manage fuel load to reduce the intensity of the fire within the mine) [Good]
- External Buffers-Exclusion Zones (Buffer zone between coal mine and public access) [Good]
- Third party high danger period alerts (CFA/DEP/MFB alert on high danger period.) [Assessed]
- PCY000022 Fire Risk Management Plan (Mine Fire Preparedness and Prevention Procedure) [Good]
- Security Management Plan (Escalation of Security Measures) [Good]
- PCY000022 Fire Risk Management Plan (Period specific plans put in place prior to high fire danger days) [Good]
- Security Management Plan (Site security undertake regular patrols of the mining lease and surrounding areas.) [Good]
- Site Security Fencing and Surveillance Systems (Cameras strategically installed along the site boundary and site perimeter includes security fencing) [Good]

Belts failure [Likely (4)]

- Mechanical Maintenance Routine (Maintenance routine on conveyor belts) [Good]
- General Housekeeping (Work area inspection will trigger the cleaning procedure) [Assessed]
- Control Safety Devices (Belt alignment and underspeed detection switches) [Good]
- Detection and suppression on conveyor lines [Average]



# **Risk Scenario Bowtie**



Causes **Preventative Controls** PCY000022 Fire Risk Management Plan (Emergency Response Procedures - Fast Determined Response) [Good]



**Preventative Controls** Causes Damage to natural gas line due to excavation or ground penetration [Unlikely (2)] HSP900 Permit to work system (Permit to dig) [Very Good]

# **Risk Scenario Bowtie**

Code

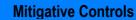
RR-R-00074

Scenario

Loss of containment from LP and HP natural gas pipelines

**Event** 

Gas pipelines fire/explosion



→ P000081 Community Engagement Plan (Community

→ ( HSM0001C Emergency Management Plan (Emergency

Engagement Plan) [Average] → Vic police and CFA Response [Assessed]

Management Plan) [Good]

Consequences

Natural gas pipeline leak and associated fire/explosion with the potential to impact public safety [Public Safety]

Current Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

Proposed Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)





| Causes   |             | Preventative Controls  |
|--|-------------|--|
| Criminal intent to cause harm to assets within the mine lease [Rare (1)] |             |  |
|  | <b>→</b> )) | Site Security Fencing and Surveillance Systems (Cameras strategically installed along the site boundary and site perimeter includes security fencing) [Good] |
|  | →))         | Security Management Plan (Site security undertake regular patrols of the mining lease and surrounding areas.) [Good]   |
|  | <b>→)</b> ) | Security Management Plan (Escalation of Security Measures) [Good]  |

Code

RR-R-00075

Scenario

Criminal act which may impact public safety and/or the environment

**Event** 

# **Criminal act**



**Mitigative Controls** Consequences

→ Security Management Plan (Security Response) Procedure) [Good]

→ ( Agency and government response [Assessed]

HSM0001C Emergency Management Plan (Emergency Response Plan) [Good]

Current Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

Oriminal related hazard with the potential to

impact public safety [Public Safety]

Proposed Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) / Rare (1)

Criminal related hazard with the potential to impact the environment [Environment &

Security Management Plan (Security Response Procedure) [Good]

→ ( Agency and government response [Assessed]

HSM0001C Emergency Management Plan (Emergency Response Plan) [Good]

Community]

Current Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)

Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). / Rare (1)



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# APPENDIX D - CRITICAL CONTROLS

This appendix lists the critical controls that reduce the likelihood and or mitigate the impact of an environmental and or public safety incident. These were identified during the risk assessment process.

| Tag ID   | Name   | Control Category | Comments   | Effectiveness | Type/Factor    |
|----------|--|------------------|--|---------------|----------------|
| BC-00088 | HSP900 Permit to<br>work system                      | Critical Control | Systems and procedures are used to minimise the risk when conducting hot work. End of day shift collect all hot work permits and hand over to night shift where all fire watch requirements are captured. Night shift sign off on inspections as done during the evening  Control is rated as very good based on collective acknowledgement of the importance of this inspection ahead of other shift tasks.  The base control is assessed via the following:  - Implemented: Yes  - Type: Administrative  - Reliability: Very Good  - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be VERY GOOD. | Very Good     | Administrative |
| BC-00109 | Site Security Fencing<br>and Surveillance<br>Systems | Critical Control | Cameras are strategically installed along the site and monitored. On the observation of suspicious activities, AGL responds accordingly.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  | Good          | Engineering    |
| BC-00142 | Control Safety<br>Devices                            | Critical Control | The control safety devices are installed on all head-ends and tail-ends of conveyors. In the event of belt misalignment, conveyors are shut down on alarm.  Under-speed detectors are installed on all driven pulleys. The under-speed detection system alarms and trips.  The base control is assessed via the following: - Implemented: Yes - Type: Engineering/Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Engineering    |
| BC-00150 | Electrical routine<br>maintenance                    | Critical Control | This includes general maintenance on electrical systems that include switch rooms, cabinets, MCCs, motors and etc.  Thermography is also conducted to identify potential hot spots within electrical systems.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD.  | Good          | Administrative |

Page D.1



| Tag ID   | Name   | Control Category | Comments  | Effectiveness | Type/Factor    |
|----------|--|------------------|---|---------------|----------------|
| BC-00179 | Electrical Safety<br>Systems                 | Critical Control | Electrical equipment is provided with earth leakage (residual current device) and overcurrent protection devices, as required by the governing legislation.  The base control is assessed via the following: - Implemented: Yes - Type: Engineering - Reliability: V. Good - Monitoring/Auditing: Performance monitoring (includes oversight of electrical systems which is undertaken by the responsible electrical regulator)  Based on the above, the effectiveness is assessed to be GOOD.  | Good          | Engineering    |
| BC-00186 | HSM0001C<br>Emergency<br>Management Plan     | Critical Control | The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:  - Vic police - EPA - West Gippsland Catchment Management Authority - Gippsland Water and - Department of Health etc.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |
| BC-00199 | External Buffers-<br>Exclusion Zones         | Critical Control | Exclusion Zones 0110 code. The land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the mining license.  The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. This include activities such as farming, slashing, ploughing, summer crops, stock (fuel) management by grazing, earthen breaks.  Exclusion Zones in force. Bushfire mitigation plans in place and submitted to Energy Safe Victoria. Exclusion zones around electrical infrastructure  The base control is assessed via the following: - Implemented: Yes - Type: Isolation - Reliability: Good - Monitoring/Auditing: None  Based on the above, the effectiveness is assessed to be GOOD. | Good          | Isolation      |
| BC-00216 | CPW001M Ground<br>Control Management<br>Plan | Critical Control | GCMP - rainfall and pin monitoring. Regional subsidence model for prediction - LV Regional Groundwater Group.  Stability analysis and batter design, ground movement modelling (predictions).  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Monitored and audited  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |



| Tag ID   | Name   | Control Category | Comments  | Effectiveness | Type/Factor    |
|----------|--|------------------|---|---------------|----------------|
| BC-00310 | HRP0024C<br>Corporate Smoking<br>Policy                      | Critical Control | AGL Loy Yang Smoking Rules - applicable to all Loy Yang activities onsite.  Restricted smoking areas designated above grass level.  No designated smoking areas in the mine below grass level or around coal carrying equipment. Smoking below grass level in the mine is cause for immediate dismissal in accordance with Corporate Smoking Policy HRP0024C AGL Loy Yang Smoking Rules.  AGL Golden Rules are in place as a set of clear rules on what can result as a breach of a safety rule, such as smoking in a restricted area. A breach of the Golden Rules by anyone at an AGL site may result in disciplinary action being taken, which may include termination of employment.  The base control is assessed via the following:  - Implemented: Yes  - Type: Behavioural  - Reliability: Good  - Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness is assessed to be GOOD.   | Average       | Administrative |
| BC-00337 | Fixed Mine Fire<br>Detection and<br>Suppression<br>Equipment | Critical Control | This activity involve the activation of spray lines and other suppression equipment as installed as fixed assets within the mine.  These assets are designed in accordance with Mine Fire Service design guidelines, which include key assets such as:  - the ability to cover 50% of the operational mine area with water  - capacity to supply 6400 L/sec to the mine spray line systems  - gravity supply of water from two locations namely fire service reservoir and High Level Storage Dam  - CFA compliant couplings every 50 m along operational spray lines  - strategically located truck fill points  - duplicated power supply to all mine key asset  - the fire main runs the length of the conveyor (either side) and has spray units located at intervals that allow complete coverage of the conveyor  - the main on the operating side of the conveyor is charged  - the main on the non-operating side is uncharged however all sprinkler points are open allowing activation of all sprinklers by charging the main  - dredgers are fitted with firewater tank (~2 kL) for initial response  - Hoses and extinguishers available at transfer points and at head ends  - Sprinkler, deluge and hose systems on dredgers/stackers fed from fire main  The base control is assessed via the following:  - Implemented: Yes  - Type: Engineering/Administrative  - Reliability: Good  - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD. | Good          | Engineering    |



| Tag ID   | Name  | Control Category | Comments  | Effectiveness | Type/Factor    |
|----------|---|------------------|---|---------------|----------------|
| BC-00405 | Water Management<br>Plan  | Critical Control | Inputs from the hydrological model and monitoring for the overburden dump runoff form the basis of the Water Treatment System.  The system includes the following water treatment: - caustic addition for pH adjustment - cationic polymer for turbidity - indirectly 10% of total dissolved solids removed with the dosing, 20% reduced by mixing with power station water  The system alarms on the operating level and pH of incoming water.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD. | Good          | Administrative |
| BC-00408 | Environmental site<br>plan                                      | Critical Control | The plan specifies the allowable discharge limits as referenced in the EPA licence 11149 conditions.  This includes ongoing visual inspection and remediation of targeted areas following the hydrological model and monitoring.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Fair - Monitoring/Auditing: None  Based on the above, the effectiveness is assessed to be AVERAGE.   | Average       | Administrative |
| BC-00409 | Monitoring<br>equipment L171,<br>alarm and operator<br>response | Critical Control | The equipment continuously monitor pH, turbidity, temperature and conductivity.  Operator periodically monitors the systems and responds to alarms.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed as GOOD.   | Good          | Administrative |
| BC-00413 | Dam monitoring<br>program                                       | Critical Control | Program specifies the monitoring program associated with dams and how they are to be built.  The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative - Reliability rating: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD.   | Good          | Administrative |
| BC-00414 | Groundwater<br>Monitoring Plan                                  | Critical Control | This includes consideration for environmental issues with regards to groundwater interactions as well as geotechnical stability.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Fair - Monitoring/Auditing: Ad-Hoc  Based on the above, the effectiveness of the control is assessed as AVERAGE.   | Average       | Administrative |



| Tag ID   | Name  | Control Category | Comments   | Effectiveness | Type/Factor    |
|----------|---|------------------|--|---------------|----------------|
| BC-00415 | Operational<br>Monitoring Program<br>for the dredging<br>activity | Critical Control | This activity involves observational inspection and sets the operational control for water balance. It provides an opportunity to suspend operation when operating limits are exceeded.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |
| BC-00419 | Containment of mine<br>drainage within the<br>Mine Lease Area     | Critical Control | Drainage system contains retention ponds and flow regulation (up to 1 in 2 year storm events).  The base control is assessed via the following: - Implemented: Yes - Type: Engineering - Reliability: Good - Monitoring/Auditing: Ad-Hoc  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Engineering    |
| BC-00423 | Dam Management<br>Plan  | Critical Control | Dam management plan includes TARPs to which will trigger a response to mitigate the effects of ground movement.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD.  | Good          | Administrative |
| BC-00425 | Aquifer<br>Depressurisation<br>Annual Report                      | Critical Control | This annual report specifies the volumes of artesian dewatering required to maintain mine stability.  This is considered a critical activity for mine stability. It is a mature and established process. It is essential in maintaining safe operations within the mine. The process is monitored and reviewed. There is also an external audit required within the process.  The base control is assessed via the following factors:  Implementation: Yes  Control type: Administrative  Reliability rating: Very Good  Monitoring/Auditing: Monitored and audited  Based on the above, the effectiveness is assessed to be GOOD. | Good          | Administrative |
| BC-00429 | Gippsland Water<br>Authority & AGL<br>Agreement                   | Critical Control | The agreement sets the roles and responsibilities between AGL and Gippsland Water regarding the management of the SWOP pump station and pipeline.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness is assessed to be GOOD.  | Good          | Administrative |



| Tag ID   | Name  | Control Category | Comments  | Effectiveness | Type/Factor    |
|----------|---|------------------|---|---------------|----------------|
| BC-00431 | CPG001M Dust<br>Suppression Control<br>Procedure                            | Critical Control | This control establishes expected practices, responsibilities, responses (including TARPs) and predicts the likelihood of dust events.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |
| BC-00433 | Vehicle Standards<br>Procedure  | Critical Control | Vehicle standard (incorporate aspects of CFA Act) sets out the requirements for all vehicles, which includes but not limited to: - fire extinguisher - two way radio - fire hose and branch - detection/suppression on mobile plant  The base control is assessed via the following: - Implemented: Yes - Type: Engineering/Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD.   | Good          | Administrative |
| BC-00435 | PCY000022 Fire<br>Risk Management<br>Plan                                   | Critical Control | The Fire Risk Management Plan (draft) is an overarching document that brings all facets of fire risk for the mine together.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  | Good          | Administrative |
| BC-00439 | Surface drainage<br>inspection and<br>maintenance                           | Critical Control | Surface drainage maintenance (including clay capping) to minimise surface water inflows to coal joints, horizontal drains (monitoring and maintenance), regular stability assessment and modelling using current groundwater levels (TARP).  The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative - Reliability rating: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed as GOOD.                                       | Good          | Administrative |
| BC-00440 | Subsurface<br>(horizontal drains)<br>drainage inspection<br>and maintenance | Critical Control | Although drains are considered to be an engineering control, they could be blocked (restriction in flow) if not appropriately maintained, therefore, it is considered to be an administrative type control. The control is regularly monitored and there is annual inspection.  The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative - Reliability rating: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD. | Good          | Administrative |



| Tag ID   | Name   | Control Category | Comments  | Effectiveness | Type/Factor    |
|----------|--|------------------|---|---------------|----------------|
| BC-00441 | Geotechnical<br>Inspections and<br>TARPS                             | Critical Control | Based on the results of the inspection, further activities are undertaken as required, which may include pin monitoring. Carry out mine inspections following significant rainfall events (consistent with TARP) or other defined trigger events including ground movement episodes and seismic events. Key stability monitoring bores have been identified and are monitored at regular intervals and in association with trigger rainfall events.  The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative - Reliability rating: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD. | Good          | Administrative |
| BC-00442 | Emergency<br>Management Plan<br>and TARPs                            | Critical Control | TARPs will trigger actions to mitigate the events of ground movement.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD.   | Good          | Administrative |
| BC-00443 | Inspection,<br>monitoring and<br>maintenance of the<br>Settling Pond | Critical Control | Program for the inspection, monitoring and maintenance of the Settling Pond.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |
| BC-00446 | Lease plan<br>conditions   | Critical Control | Lease plan specifies how land is to be managed regarding pest, plants and animals.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  This is an active management control.  Based on the above, the effectiveness is assessed to be GOOD.   | Good          | Administrative |
| BC-00449 | LV Regional<br>Groundwater<br>Management Plan -<br>Regional Bore     | Critical Control | Through the ongoing updating and maintenance of the regional bore database, potential high risk bores are identified and remediation plans are adopted, as appropriate.  The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative/Engineering - Reliability rating: Good - Monitoring/Auditing: Performance monitoring  The process is monitored and audited by the regulator and reviewed by the Regional Groundwater Management committee.  Based on the above, the effectiveness is assessed to be GOOD.   | Good          | Administrative |



| Tag ID   | Name  | Control Category | Comments   | Effectiveness | Type/Factor    |
|----------|---|------------------|--|---------------|----------------|
| BC-00450 | Third party<br>contractual<br>agreement (drilling<br>contractors) | Critical Control | The contractual agreement specifies how drilling activities are to be undertaken.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Monitored and audited  Based on the above, the effectiveness of the control is considered as GOOD.   | Good          | Administrative |
| BC-00452 | Buffer zone between site and residences                           | Critical Control | Exclusion Zones 0110 code. Planning controls mandate buffer zones between the site and residences to minimise the number of potential receptors. Tree planting and screening within the buffer zones. This land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the mining license. The planning zone ultimately results in reduced population, i.e. reduced human activity in this zone.  The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. These activities include farming, slashing, ploughing, summer crops, stock (fuel) management by grazing, earthen breaks.  Exclusion Zones in force. Bushfire mitigation plans in place and submitted to Energy Safe Victoria.  Exclusion zones around electrical infrastructure  The base control is assessed via the following: - Implemented: Yes - Type: Administrative (some aspects of isolation) - Reliability: Very Good - Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness of the control is assessed to be GOOD. | Good          | Isolation      |
| BC-00467 | Environmental site<br>plan - vegetation<br>management             | Critical Control | This plan manages the fire risks on the mine and surrounding areas, including reduced fuel loads (grazing/spraying/slashing), fire breaks and mineral earth breaks.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Monitored and audited  Based on the above, the effectiveness is assessed as GOOD.  | Good          | Administrative |
| BC-00469 | Mechanical<br>Maintenance Routine                                 | Critical Control | Preventative maintenance program is designed to maintain equipment to minimise integrity related problems / and or unexpected failure.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Monitored and Audited  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |



| Tag ID   | Name  | Control Category | Comments   | Effectiveness | Type/Factor    |
|----------|---|------------------|--|---------------|----------------|
| BC-00470 | Detection and suppression on conveyor lines                         | Critical Control | Some of the equipment will have automated detection and suppression on coal delivering structure. Other equipment items are reliant on activation of the manual fire suppression systems.  The Raw Coal Bunker and Crusher House fire detection and suppression system includes:  - Very Early Smoke Detection Alarm  - Thermal imaging cameras  - Manual deluge (operator initiated)  The base control is assessed via the following:  - Implemented: Part (fully implemented on the rising conveyors)  - Type: Administrative/Engineering  - Reliability: Good  - Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness of the control is assessed to be AVERAGE. | Average       | Engineering    |
| BC-00471 | Detection and suppression on electrical equipment                   | Critical Control | Switch rooms (post 2012) and some of the equipment (post 2012) will have automated detection and suppression. Other equipment items are reliant on activation of the manual fire suppression systems.  The base control is assessed via the following: - Implemented: Part (fully implemented in switch rooms post 2012) - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be AVERAGE  | Average       | Engineering    |
| BC-00474 | Security<br>Management Plan   | Critical Control | The security and management plan cover aspects of deter, detect, respond and recover. It also includes a business resilience plan.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Very Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness is assessed to be GOOD.  | Good          | Administrative |
| BC-00476 | HSW707 Unloading<br>of Bulk Chemical<br>Tankers Work<br>Instruction | Critical Control | The procedure includes appropriate steps and precautions to be undertaken to minimise the potential of a spill during bulk tanker unloading.  The base control is assessed via the following: Implemented: Yes Type: Administrative Reliability: Good Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness of the control is assessed to be GOOD.  | Good          | Administrative |
| BC-00477 | Bunding   | Critical Control | Existing bunding within the mine lease area is assessed to be in an appropriate condition to contain a spill.  The base control is assessed via the following: - Implemented: Yes - Type: Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  | Good          | Engineering    |



| Tag ID   | Name  | Control Category | Comments   | Effectiveness | Type/Factor    |
|----------|---|------------------|--|---------------|----------------|
| BC-00478 | Third party chemical suppliers                    | Critical Control | The site engages chemical suppliers that comply with the Australian Dangerous Goods (ADG) codes.  The base control is assessed via the following: - Implemented: Part (Third party control) - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc  Based on the above, the effectiveness of the control is assessed to be AVERAGE.  | Average       | Administrative |
| BC-00479 | Maintenance Routine<br>- Tanks                    | Critical Control | Inspections of aboveground and underground storage tanks is undertaken in line with the relevant standards.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc (Annual performance statement audit undertaken by an EPA auditor)  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |
| BC-00482 | Third party<br>contractual<br>agreement (lessees) | Critical Control | Lease agreement specifies that lessees must comply with the CFA Act. This includes: - supply of fire suppression equipment - maintenance of lessee equipment - the observation of fire restrictions on total fire ban days - fuel reduction requirements  AGL undertakes audits on lessees compliant with the above requirements.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD. | Good          | Administrative |
| BC-00483 | Loy Yang Mining<br>Licence 5181 Work<br>Plan      | Critical Control | The work plan includes: - commitments to government on key components on the mine rehabilitation - the site will be rehabilitated to its next use, which is proposed to be pasture for grazing and the waterbody at the base of the mine - outlines progressive mine rehabilitation  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.   | Good          | Administrative |



# **APPENDIX E - RECOMMENDATIONS**

This appendix lists the recommendations raised during the risk assessment workshop. A total of 27 recommendations were raised to further reduce the risk of an incident. The complete list of risk reduction recommendations are shown below. The recommendations raised in the workshop should be assessed for criticality, practicality and effectiveness to be carried forward to close-out as addressed in the Management Plan.

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AGL MINE RISK ASSESSMENT

R4Risk Ref.: 116-10, Release 1



| L WIINE KISK F                                      | ASSESSMENT .  |                  |       |                |     |                 |
|---|---|------------------|-------|----------------|-----|-----------------|
| ction Code  | Objective: Work to be Done  | Priority         | Owner | Currently With | Due | Status          |
| R-A-00003   | Determine the particle size of the leached ash that is associated with the fugitive dust emissions as a   | Normal           |       |                |     | Pending         |
|   | result of excavation/dumping activities.:   |                  |       |                |     |                 |
| Source  |   |                  |       |                |     |                 |
| RR-COF  | P-02336   Fugitive dust emissions   |                  |       |                |     |                 |
| R-A-00005   | Review subsidence and movement data and consider changing the density and frequency of pin line /   | Normal           |       |                |     | Pending         |
|   | movement surveys.:  |                  |       |                |     |                 |
| Source  |   |                  |       |                |     |                 |
| BC-0021   | 16   CPW001M Ground Control Management Plan   |                  |       |                |     |                 |
| BC-0021   | 16   Impact to water (Level 4)  |                  |       |                |     |                 |
| BC-0021   | 16   Impact to land (Level 4/5)   |                  |       |                |     |                 |
| BC-0021   | 16   Mine fire  |                  |       |                |     |                 |
| BC-0021   | 16   Impact to regional aquifers  |                  |       |                |     |                 |
| BC-0021   | 16   Impact to land (Level 3)   |                  |       |                |     |                 |
| BC-0021   | 16   Collapse of Major Mining Plant   |                  |       |                |     |                 |
| BC-0021   | 16   Impact to land (Level 1/2)   |                  |       |                |     |                 |
| R-A-00016   | Conduct an assessment of the OH&S risk of responders' exposure to firewater (hygiene), smoke,   | Normal           |       |                |     | Pending         |
|   | carbon monoxide and voids from fire activities:   |                  |       |                |     |                 |
| Source  |   |                  |       |                |     |                 |
| RR-CON  | M-02825   Mine fire   |                  |       |                |     |                 |
| R-A-00019   | Amend the trigger action response plan to include visual inspections of public roads which are  | Normal           |       |                |     | Pending         |
|   | potentially at risk.:   |                  |       |                |     |                 |
| Source  |   |                  |       |                |     |                 |
| RR-COF  | P-02639   Impact to land (Level 4/5)  |                  |       |                |     |                 |
| R-A-00020   | Finalise the Water Management Plan and associated TARPs (including OB & Settling Pond systems).:  | Normal           |       |                |     | Pending         |
| Source  |   |                  |       |                |     |                 |
|   | 05   Water Management Plan  |                  |       |                |     |                 |
|   | 05   Impact to water (Level 1/2)  |                  |       |                |     |                 |
|   | US FILLIDACE TO WATER IT EVEL 1771  |                  |       |                |     |                 |
|   |   |                  |       |                |     |                 |
| BC-0040   | 05   Impact to water (Level 4)  |                  |       |                |     |                 |
| BC-0040   | 05   Impact to water (Level 4) 05   Impact to water (Level 3)   | Normal           |       |                |     | Pending         |
| BC-0040   | 05   Impact to water (Level 4) 05   Impact to water (Level 3)  Develop the trigger points for action that relates to subsidence (surface deviation) in relation to  | Normal           |       |                |     | Pending         |
| BC-0040<br>BC-0040<br>R-A-00021                     | 05   Impact to water (Level 4) 05   Impact to water (Level 3)  Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain.:   | Normal           |       |                |     | Pending         |
| BC-0040<br>BC-0040<br><b>R-A-00021</b><br>Source    | 05   Impact to water (Level 4) 05   Impact to water (Level 3)  Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain.:   | Normal           |       |                |     | Pending         |
| BC-0040<br>BC-0040<br>R-A-00021<br>Source<br>RR-COF | 05   Impact to water (Level 4) 05   Impact to water (Level 3)  Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain.:  P-03010   Impact to water (Level 4)                                    | Normal           |       |                |     | Pending         |
| BC-0040<br>BC-0040<br>R-A-00021<br>Source<br>RR-COF | 05   Impact to water (Level 4) 05   Impact to water (Level 3)  Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain.:  P-03010   Impact to water (Level 4) P-03016   Impact to land (Level 3) |                  |       |                |     |                 |
| BC-0040<br>BC-0040<br>R-A-00021<br>Source<br>RR-COF | 05   Impact to water (Level 4) 05   Impact to water (Level 3)  Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain.:  P-03010   Impact to water (Level 4)                                    | Normal<br>Normal |       |                |     | Pending Pending |



AGL MINE RISK ASSESSMENT

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| L WIINE KISK A | ASSESSIVENT CONTROL OF THE PROPERTY OF THE PRO |          |       |                |     |         |
|----------------|--|----------|-------|----------------|-----|---------|
| ction Code     | Objective: Work to be Done   | Priority | Owner | Currently With | Due | Status  |
| -A-00023       | Install an upgraded SCADA on-line monitoring and dosing equipment (Automate operation of   | Normal   |       |                |     | Pending |
|                | settling pond and O/B valves).:  |          |       |                |     |         |
| Source         |  |          |       |                |     |         |
| BC-00411       | 1   Install upgraded SCADA on-line monitoring and dosing equipment   |          |       |                |     |         |
|                | 9   Monitoring equipment L171, alarm and operator response   |          |       |                |     |         |
| BC-00409       | 9   Impact to water (Level 1/2)  |          |       |                |     |         |
| BC-00409       | 9   Hazardous chemicals  |          |       |                |     |         |
| BC-00409       | 9   Impact to water (Level 4)  |          |       |                |     |         |
| BC-00409       | 9   Impact to water (Level 3)  |          |       |                |     |         |
| R-A-00024      | Incorporate Sheepwash Creek flow retention area into the Dam Management Plan and adopt ANCOLD  | Normal   |       |                |     | Pending |
|                | guidelines for management.:  |          |       |                |     |         |
| Source         |  |          |       |                |     |         |
| BC-00423       | 3   Dam Management Plan  |          |       |                |     |         |
| RR-COP-        | -03036   Impact to water (Level 3)   |          |       |                |     |         |
| BC-00423       | 3   Impact to land (Level 4/5)   |          |       |                |     |         |
| BC-00423       | 3   Impact to land (Level 3)   |          |       |                |     |         |
| R-A-00025      | Formalise the activity of lime dosing (pH correction) at the base of the mine.:  | Normal   |       |                |     | Pending |
| Source         |  |          |       |                |     |         |
| BC-00448       | 8   Operating procedure - lime addition  |          |       |                |     |         |
|                | 8   Impact to water (Level 1/2)  |          |       |                |     |         |
| R-A-00027      | Investigate the potential impacts of sustained changes to regional aquifer properties or structures to   | Normal   |       |                |     | Pending |
|                | receptors (e.g. future water users or other sensitive receptors) as a result of the depletion of regional  |          |       |                | •   |         |
|                | aquifers due to the current mining practice where groundwater is extracted to maintain mine  |          |       |                |     |         |
|                | stability.:  |          |       |                |     |         |
| Source         |  |          |       |                |     |         |
| RR-R-000       | 064   Impact to regional aquifers  |          |       |                |     |         |
| R-A-00033      | Update the Fire Risk Management Plan to incorporate activities undertaken by the site-based  | Normal   |       |                |     | Pending |
|                | emergency services and operations team into a single and coordinated approach that is initiated as a   |          |       |                | •   |         |
|                | result of an elevated fire danger.:  |          |       |                |     |         |
| Source         | ·  |          |       |                |     |         |
| BC-00435       | 5   PCY000022 Fire Risk Management Plan  |          |       |                |     |         |
|                | 5   Mine fire  |          |       |                |     |         |
| R-A-00036      | Develop and implement the Mine Closure Plan. This should include post closure monitoring, trigger  | Normal   |       |                |     | Pending |
|                | levels and associated tactical response. The plan should also set the completion and success criteria  |          |       |                | •   |         |
|                | for complete rehabilitation.:  |          |       |                |     |         |
| Source         | ·  |          |       |                |     |         |
| BC-00437       | 7   Loy Yang Mining Licence 5181 Work Plan Variation   |          |       |                |     |         |
|                | 5   Develop and implement the Mine Closure Plan  |          |       |                |     |         |
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| L MINE RISK A | ASSESSMENT Open A   | ctions   |       |                |     |   |
|---------------|---|----------|-------|----------------|-----|---|
| ction Code    | Objective: Work to be Done  | Priority | Owner | Currently With | Due | Status                                  |
| R-A-00036     | Develop and implement the Mine Closure Plan. This should include post closure monitoring, trigger     | Normal   |       |                |     | Pending                                 |
|               | levels and associated tactical response. The plan should also set the completion and success criteria |          |       |                |     |   |
|               | for complete rehabilitation.:   |          |       |                |     |   |
| Source        |   |          |       |                |     |   |
| RR-COF        | P-03144   Post rehabilitation/fire  |          |       |                |     |   |
| RR-COF        | P-03146   Post rehabilitation/fire  |          |       |                |     |   |
| RR-COF        | P-03152   Post rehabilitation/fire  |          |       |                |     |   |
| RR-COF        | P-02479   Post rehabilitation/fire  |          |       |                |     |   |
| RR-COF        | P-03275   Post rehabilitation/fire  |          |       |                |     |   |
| RR-COF        | P-03276   Post rehabilitation/fire  |          |       |                |     |   |
| R-A-00037     | Undertake an assessment to determine the likelihood and impacts of poor lake water quality to         | Normal   |       |                |     | Pending                                 |
|               | regional aquifers as a result of interchange with the lake.:  |          |       |                |     |   |
| Source        |   |          |       |                |     |   |
| RR-R-00       | 0071   Post rehabilitation/fire   |          |       |                |     |   |
| R-A-00038     | Verify that the bunding of hazardous chemicals is compliant with AS1940 and EPA guidelines (EPA       | Normal   |       |                |     | Pending                                 |
|               | Publication 347):   |          |       |                |     |   |
| Source        |   |          |       |                |     |   |
| BC-0047       | 77   Bunding  |          |       |                |     |   |
| BC-0047       | 77   Hazardous chemicals  |          |       |                |     |   |
| RR-COF        | P-02966   Hazardous chemicals   |          |       |                |     |   |
| RR-COF        | P-03170   Hazardous chemicals   |          |       |                |     |   |
| RR-COF        | P-03180   Hazardous chemicals   |          |       |                |     |   |
| R-A-00039     | Verify that third party chemical transport companies comply with the relevant Australian Dangerous    | Normal   |       |                |     | Pending                                 |
|               | Goods codes.:   |          |       |                |     |   |
| Source        |   |          |       |                |     |   |
| BC-0047       | 78   Third party chemical suppliers   |          |       |                |     |   |
| BC-0047       | 78   Hazardous chemicals  |          |       |                |     |   |
| R-A-00040     | Confirm the integrity testing regime for the above and below ground storage tanks.:                   | Normal   |       |                |     | Pending                                 |
| Source        |   |          |       |                |     |   |
| BC-0047       | 79   Maintenance Routine - Tanks  |          |       |                |     |   |
|               | 79   Hazardous chemicals  |          |       |                |     |   |
| R-A-00046     | Formalise the process of conducting daily mine inspections which includes looking for obvious         | Normal   |       |                |     | Pending                                 |
|               | ground related issues, i.e. ground movement and hotspots.:  |          |       |                |     | · |
| Source        |   |          |       |                |     |   |
|               | 66   Daily Mine Inspections   |          |       |                |     |   |
|               | 66   Engulfment   |          |       |                |     |   |
|               | 66   Major Fire   |          |       |                |     |   |
|               | 66   Mine fire  |          |       |                |     |   |
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| ction Code  | Objective: Work to be Done   | Priority         | Owner | Currently With | Due | Status          |
|---|--|------------------|-------|----------------|-----|-----------------|
| R-A-00046   | Formalise the process of conducting daily mine inspections which includes looking for obvious  | Normal           |       |                |     | Pending         |
|   | ground related issues, i.e. ground movement and hotspots.:   |                  |       |                |     |                 |
| Source  |  |                  |       |                |     |                 |
| BC-0016   | 66   Impact to land (Level 1/2)  |                  |       |                |     |                 |
| RR-A-00050  | Investigate the feasibility of installing long range infra-red system to monitor the open cut mining   | Normal           |       |                |     | Pending         |
|   | area (coal exposed areas).:  |                  |       |                |     |                 |
| Source  |  |                  |       |                |     |                 |
| BC-0033   | 37   Fixed Mine Fire Detection and Suppression Equipment   |                  |       |                |     |                 |
| BC-0033   | 37   Major Fire  |                  |       |                |     |                 |
| BC-0033   | 37   Mine fire   |                  |       |                |     |                 |
| RR-A-00051  | Determine the feasibility of installing an automated detection and suppression systems based on a  | Normal           |       |                |     | Pending         |
|   | multi-criteria assessment.:  |                  |       |                |     |                 |
| Source  |  |                  |       |                |     |                 |
| BC-0033   | 37   Fixed Mine Fire Detection and Suppression Equipment   |                  |       |                |     |                 |
|   | 37   Major Fire  |                  |       |                |     |                 |
| BC-003  | 37   Mine fire   |                  |       |                |     |                 |
| RR-A-00052  | Continue to investigate alternative sources of topsoil, or alternative materials (include 4 year   | Normal           |       |                |     | Pending         |
|   | investigation on artificial topsoil study with Federation University).:  |                  |       |                |     |                 |
| Source  |  |                  |       |                |     |                 |
|   |  |                  |       |                |     |                 |
|   | P-02481   Post rehabilitation/fire   |                  |       |                |     |                 |
|   | P-02481   Post rehabilitation/fire  Develop a procedure to manage dust emissions from the handling of black coal (update the existing  | Normal           |       |                |     | Pending         |
| RR-A-00053  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  | Normal           |       |                |     | Pending         |
| RR-A-00053<br>Source  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  | Normal           |       |                |     | Pending         |
| Source  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions   |                  |       |                |     |                 |
| Source  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned  | Normal Normal    |       |                |     | Pending Pending |
| Source<br>RR-COF<br>RR-A-00054  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  |                  |       |                |     |                 |
| Source<br>RR-COF<br>RR-A-00054<br>Source  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  |                  |       |                |     |                 |
| Source<br>RR-COF<br>RR-A-00054<br>Source<br>RR-COF  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)   |                  |       |                |     |                 |
| Source<br>RR-COF<br>RR-A-00054<br>Source<br>RR-COF<br>RR-COF                                  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)  P-02974   Impact to land (Level 4/5)   | Normal           |       |                |     | Pending         |
| Source<br>RR-COF<br>RR-A-00054<br>Source<br>RR-COF<br>RR-COF                                  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)  P-02974   Impact to land (Level 4/5)  Implement oversight to ensure that SPI Ausnet manages their assets (transmission tower and   |                  |       |                |     |                 |
| Source<br>RR-A-00054<br>Source<br>RR-COF<br>RR-COF<br>RR-COF                                  | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)  P-02974   Impact to land (Level 4/5)  Implement oversight to ensure that SPI Ausnet manages their assets (transmission tower and distribution lines) in accordance with legislation.:  | Normal           |       |                |     | Pending         |
| Source<br>RR-A-00054  Source<br>RR-COF<br>RR-COF<br>RR-COF<br>RR-COF<br>RR-A-00055            | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)  P-02974   Impact to land (Level 4/5)  Implement oversight to ensure that SPI Ausnet manages their assets (transmission tower and distribution lines) in accordance with legislation.:  | Normal           |       |                |     | Pending         |
| Source RR-A-00054  Source RR-COF RR-COF RR-COF RR-COF RR-COF RR-COF RR-A-00055  Source RR-COF | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)  P-02974   Impact to land (Level 4/5)  Implement oversight to ensure that SPI Ausnet manages their assets (transmission tower and distribution lines) in accordance with legislation.:  | Normal<br>Normal |       |                |     | Pending         |
| Source RR-A-00054  Source RR-COF RR-COF RR-COF RR-COF RR-COF RR-COF RR-A-00055  Source RR-COF | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)  P-02974   Impact to land (Level 4/5)  Implement oversight to ensure that SPI Ausnet manages their assets (transmission tower and distribution lines) in accordance with legislation.:  P-03219   Mine fire  Ensure that the underground storage tanks (one petrol and two diesel) near the Freight Gate are  | Normal           |       |                |     | Pending         |
| Source<br>RR-A-00054  Source<br>RR-COF<br>RR-COF<br>RR-COF<br>RR-COF<br>RR-A-00055            | Develop a procedure to manage dust emissions from the handling of black coal (update the existing briquette delivery procedure).:  P-03060   Fugitive dust emissions  AGL should engage the department and planning authorities to ensure that the risks of the planned Traralgon Bypass are considered and addressed.:  P-03011   Impact to water (Level 4)  P-02974   Impact to land (Level 4/5)  Implement oversight to ensure that SPI Ausnet manages their assets (transmission tower and distribution lines) in accordance with legislation.:  P-03219   Mine fire  Ensure that the underground storage tanks (one petrol and two diesel) near the Freight Gate are compliant with the Vic EPA UPSS guidelines.: | Normal<br>Normal |       |                |     | Pending         |



RR-COM-03278 | Fugitive dust emissions

# **Open Actions**



| GL MINE RISK A | ASSESSMENT Open A  | ctions   |       |                |     |         |
|----------------|--|----------|-------|----------------|-----|---------|
| Action Code    | Objective: Work to be Done   | Priority | Owner | Currently With | Due | Status  |
| RR-A-00056     | Ensure that the underground storage tanks (one petrol and two diesel) near the Freight Gate are compliant with the Vic EPA UPSS guidelines.:   | Normal   |       |                |     | Pending |
| Source         |  |          |       |                |     |         |
| RR-COP         | P-03182   Hazardous chemicals  |          |       |                |     |         |
| RR-A-00057     | Post mining closure, install a fire suppression system to prevent and/or mitigate against a mine fire.  The system should include a pump station that sources water from the base of the mine and a reticulated system of spray lines to protect exposed coal surfaces. The system can be manually | Normal   |       |                |     | Pending |
| Source         | activated.:  |          |       |                |     |         |
|                | M-03164   Post rehabilitation/fire   |          |       |                |     |         |
|                | M-03165   Post rehabilitation/fire   |          |       |                |     |         |
|                | M-03166   Post rehabilitation/fire   |          |       |                |     |         |
| RR-A-00058     | Review the effectiveness of spray coverage and increase the implementation of the automated spray  | Normal   |       |                |     | Pending |
|                | coverage in high risk areas to reduce dust emissions.:   |          |       |                |     |         |
| Source         | Coverage in ringin risk areas to readed dust emissions.  |          |       |                |     |         |
| RR-COM         | M-03063   Fugitive dust emissions  |          |       |                |     |         |
| RR-A-00059     | Investigate the use of Compressed Air Foam (CAF) for dust suppressions.:   | Normal   |       |                |     | Pending |
| Source         |  |          |       |                |     |         |
|                | M-03064   Fugitive dust emissions  |          |       |                |     |         |
| RR-A-00060     | Review the effectiveness of spray coverage and increase the implementation of the automated spray coverage in high risk areas to reduce dust emissions.:   | Normal   |       |                |     | Pending |
| Source         |  |          |       |                |     |         |





## **APPENDIX F - REJECTED CAUSES**

This appendix contains the list of rejected events/causes identified during the risk assessment process. The justification for rejecting the event/cause is also documented.

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## **Risk Scenario Rejected Causes**



| Risk Code  | Top Event                 | Cause Code  | Cause Name   | Comments   | Status   |
|------------|---------------------------|-------------|--|--|----------|
| RR-R-00071 | Post rehabilitation/fire  | RR-CA-00727 | Insufficient topsoil to complete final rehabilitation for overburden dump                                      | There is sufficient quantity of topsoil to complete final rehabilitation of the overburden dump. Therefore, this cause is rejected.  | Rejected |
| RR-R-00062 | Impact to water (Level 3) | RR-CA-00482 | Power station plant failure resulting in discharge of water with high conductivity levels to the Settling Pond | Potential pathways include: - plant failure; pumps valves etc management of clinker "trash pit" to minimise the likelihood of blockages  | Rejected |
|            |                           |             |  | The Settling Pond is located outside of the mine lease area, therefore it is assessed to be outside the scope of the Mine Risk Assessment and Management Plan. Therefore this cause is rejected.                           |          |
|            |                           | RR-CA-00483 | Water migration from the Ash Pond  | Power station discharging saline water and ash into the Ash Pond resulting in a potential of contaminated groundwater migrating beyond the attenuation zone boundary.  | Rejected |
|            |                           |             |  | The Power Station activity and Ash Pond are located outside of the mine lease area, therefore they are assessed to be outside the scope of the Mine Risk Assessment and Management Plan. Therefore this cause is rejected. |          |

## **Risk Scenario Rejected Causes**



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| Risk Code | Top Event                   | Cause Code  | Cause Name  | Comments  | Status   |
|-----------|-----------------------------|-------------|---|---|----------|
| R-R-00063 | Impact to water (Level 4)   | RR-CA-00490 | Additional water flow down Traralgon Creek due to | Possible pathways include:                                | Rejected |
|           |                             |             | High Level Storage Dam or Settling Pond wall      | - dam wall collapse (deterioration of dam structure)      |          |
|           |                             |             | failure   | - seismic event   |          |
|           |                             |             |   | - piping failure/erosion etc                              |          |
|           |                             |             |   | These pathways may result in additional water flow        |          |
|           |                             |             |   | down Traralgon Creek.                                     |          |
|           |                             |             |   | The High Level Storage Dam and Settling Pond are          |          |
|           |                             |             |   | located outside of the mine lease area, therefore it is   |          |
|           |                             |             |   | assessed to be outside the scope of the Mine Risk         |          |
|           |                             |             |   | Assessment and Management Plan. Therefore this            |          |
|           |                             |             |   | cause is rejected.  |          |
|           |                             |             |   | The water within the Storage Dam and Settling Pond        |          |
|           |                             |             |   | are both used as firewater sources for the mine,          |          |
|           |                             |             |   | therefore its reliability and effectiveness is considered |          |
|           |                             |             |   | during the control adequacy assessment.                   |          |
|           |                             | RR-CA-00686 | Contamination of Traralgon or Sheepwash Creek     | Malicious act within the mine site leaving the mine       | Rejected |
|           |                             |             | with chemical or toxin (malicious act)            | (eco-terrorism). This event is not considered credible    |          |
|           |                             |             |   | as contamination of the creeks is not achievable and      |          |
|           |                             |             |   | are not considered to be a valued target. Therefore       |          |
|           |                             |             |   | this cause is rejected.                                   |          |
| R-R-00061 | Impact to water (Level 1/2) | RR-CA-00590 | Abandoned geophysical probe Y4733 on northern     | Probe is broken and unable to be retrieved at depth       | Rejected |
|           |                             |             | batters potentially impacting groundwater         | of 200 m. Bore is sealed and encapsulated in grout.       |          |
|           |                             |             |   | The probe is a radioactive source, however, the           |          |
|           |                             |             |   | Department of Health has reviewed the impacts to          |          |
|           |                             |             |   | both land and public health and considered the            |          |
|           |                             |             |   | impacts to be insignificant. Therefore, this cause is     |          |
|           |                             |             |   | rejected.   |          |

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## **Risk Scenario Rejected Causes**



| Risk Code  | Top Event                    | Cause Code  | Cause Name  | Comments   | Status   |
|------------|------------------------------|-------------|---|--|----------|
| RR-R-00061 | Impact to water (Level 1/2)  | RR-CA-00509 | Degraded water quality due to blue green algae outbreak in the three OB runoff ponds and Fire Service Pond. | Blue green algae outbreak is not expected in the three OB runoff ponds and Fire Service Pond, as they are typically acidic (low pH). Therefore, this cause is rejected.  | Rejected |
|            |                              |             |   | Other ponds include Settling Pond, Ash Pond and High Level Storage Dam. The Settling Pond, Ash Pond and High Level Storage Dam are located outside of the mine lease area, therefore they are assessed to be outside the scope of the Mine Risk Assessment and Management Plan.                    |          |
| RR-R-00074 | Gas pipelines fire/explosion | RR-CA-00622 | Damage to natural gas line to Loy Yang B due to ground movement   | Mining related activities does not create longitudinal strain on the pipeline. Therefore, this is not considered to be a credible cause of a loss of containment.  | Rejected |
| RR-R-00068 | Fugitive dust emissions      | RR-CA-00717 | Smoke from small fire within the mine operations, general burn off or hotspot (steam/smoke)                 | Although these causes have the potential to generate some noticeable smoke, the amount of smoke generated is expected to be minor. Therefore, the amenities and/or public health impact is considered to be below level of concerns. Hence this cause is rejected.                                 | Rejected |
| RR-R-00065 | Impact to land (Level 1/2)   | RR-CA-00628 | Damage to potable water services to parts of<br>Traralgon due to ground movement from mining<br>activities  | Potential pathways include: - aquifer depressurisation - mining activity   | Rejected |
|            |                              |             |   | Failure on the pipeline may affect potable water supply to some parts of Traralgon. This may result in disruption to services and is considered not to be a risk to public safety or environment. Therefore, this is assessed as outside the Mine Risk Management Plan.                            |          |
|            |                              | RR-CA-00583 | Localised subsidence due to areas of fire leaving burnt out voids   | This hazard may result in localised/limited unstable areas within the mine void. There is a potential exposure to external fire fighters. The risk associated with this is considered in RR-R-00073. As this event is not expected to result in any environmental impacts, this cause is rejected. | Rejected |

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## **Risk Scenario Rejected Causes**



| Risk Code  | Top Event                  | Cause Code  | Cause Name   | Comments   | Status   |
|------------|----------------------------|-------------|--|--|----------|
| RR-R-00066 | Impact to land (Level 3)   | RR-CA-00632 | OB run off pond wall failure due to ground movement as a result of mining activities   | Strain on the wall structure coupled with elevated hydraulic loading.  | Rejected |
|            |                            |             |  | The amount of ground movement as a result of mining activity is expected to be uniform/regular and at a magnitude less than normal loading of the OB run off pond wall structure. Therefore, this is not considered to be a credible cause of wall failure. Hence, this cause is rejected. |          |
| RR-R-00067 | Impact to land (Level 4/5) | RR-CA-00592 | High Level Storage Dam, Ash Pond and Fire<br>Services Pond wall failure due to ground movement<br>as a result of mining activities | The localised mining induced ground strains are not of sufficient magnitude to impact the structural integrity of the High Level Storage Dam, Ash Pond and Fire Services Pond. Therefore, this cause is rejected.  | Rejected |
|            |                            | RR-CA-00591 | Settling Pond, Ash Pond and High Level Storage<br>Dam wall failure due to seismic event or extreme<br>rainfall                     | The Settling Pond, Ash Pond and High Level storage Dam are located outside of the mine lease area, therefore it is assessed to be outside the scope of the Mine Risk Assessment and Management Plan. Therefore this cause is rejected.   | Rejected |
| RR-R-00075 | Criminal act               | RR-CA-00732 | Contamination of Traralgon or Sheepwash Creek with chemical or toxin (malicious act).  | This cause is addressed in RR-R00063. Therefore, this cause is not included on this bowtie.  | Rejected |
|            |                            | RR-CA-00695 | Criminal intent to damage a single block batter or wall movement   | It is not considered a credible event for a person whose intent is to take action to compromise the integrity of the mine relating to batters and walls is conceived possible, as this would not result in damage to AGL of concern. Therefore, this cause is rejected.                    | Rejected |

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## **Risk Scenario Rejected Causes**



| Risk Code  | Top Event    | Cause Code  | Cause Name  | Comments  | Status   |
|------------|--------------|-------------|---|---|----------|
| RR-R-00075 | Criminal act | RR-CA-00689 | Criminal intent to damage the integrity of the High | This causes includes a criminal act with intent to      | Rejected |
|            |              |             | Level Storage Dam, Settling Pond, OB dam or Fire    | damage the integrity of various dams/ponds resulting    |          |
|            |              |             | Services Pond Dam                                   | in a dam wall failure.                                  |          |
|            |              |             |   | The High Level Storage Dam and Settling Pond are        |          |
|            |              |             |   | located outside of the mine lease area, therefore it is |          |
|            |              |             |   | assessed to be outside the scope of the Mine Risk       |          |
|            |              |             |   | Assessment and Management Plan. Therefore,              |          |
|            |              |             |   | these have not been considered in this assessment.      |          |
|            |              |             |   | It is not considered credible that a person wishing to  |          |
|            |              |             |   | do harm would take action to compromise the             |          |
|            |              |             |   | integrity of the dam wall of the OB dam or the Fire     |          |
|            |              |             |   | Services pond, as this would not result in damage of    |          |
|            |              |             |   | concern to AGL. It is also considered that the dam is   |          |
|            |              |             |   | not an attractive target and there is no motivation or  |          |
|            |              |             |   | capability to breach a dam wall. Therefore, this        |          |
|            |              |             |   | cause is rejected.                                      |          |
|            |              |             |   | Ground movement causes that have the potential to       |          |
|            |              |             |   | damage the integrity of the OB Dam or Fire              |          |
|            |              |             |   | Services Pond have been addressed in                    |          |
|            |              |             |   | RR-R00066.  |          |
|            |              | RR-CA-00688 | Criminal intent to initiate an arson attack         | This cause is addressed in RR-R00073. Therefore,        | Rejected |
|            |              |             |   | this cause is not included on this bowtie.              |          |

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## APPENDIX G - ALL DETAIL REPORT

This appendix includes the detailed report which contains all the data and assumptions underlying the risk assessment. Information included in this report includes comments that were captured in the workshop that relate to:

- The likelihood assessment for each cause;
- The existing controls for each cause;
- The adequacy assessment for each control, i.e. overall effectiveness as a function of effectiveness and applicability;
- Recommended additional controls or recommendation to improve existing controls;
- The rejected causes and reasoning for rejecting the causes;
- · Consequence impacts for each outcome including potential receptors; and
- The risk of each impact.

The report is contained within pages 159 to 313.

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AGL MINE RISK ASSESSMENT

### Active Risk Scenarios ID: RR-R-00061



Risk Scenario Details Status Active Top Event Impact to water (Level 1/2) Scenario Mining operations which could cause Level 1/2 impact to the environment (water) Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Possible (3) **Environment & Community** Level 2 (1.0) Moderate Proposed Possible (3) **Environment & Community** Level 2 (1.0) Moderate Causes Cause Contaminated water runoff from the OB dump due to excessive rainfall Code Likelihood Contribution Status RR-CA-00503 0.1% Active Rare (1) Current 0.1% Proposed Rare (1)

Risk Control Code

is considered to be RARE. Tag ID RR-COP-02221 BC-00419

Description

Comments A high rainfall event may result in the currently installed system capacity being exceeded with the potential to breach the EPA discharge licence.

Containment of mine drainage within the Mine Lease Area

The likelihood of this event occurring considered the drainage system in place, which contains retention ponds and flow regulation (up to 1 in 2 yr storm events),

Owner No Owner Defined

Status In Service Applicability Factor 100.0%

Criticality Critical Control Type/Factor Engineering

Reviewed 6-Oct-2015 Assessment Good

Comments

Base Control Drainage system contains retention ponds and flow regulation (up to 1 in 2 year storm events).

The base control is assessed via the following:

- Implemented: Yes
- Type: Engineering
- Reliability: Good
- Monitoring/Auditing: Ad-Hoc

Based on the above, the effectiveness of the control is assessed to be GOOD.

Context

Risk Control Containment of mine drainage (retention ponds) within the Mine Lease Area

Comments

Risk Control The retention ponds are used to expose the acidic drainage to sunlight which provides a mechanism for acids to break down.

Drainage system contains retention ponds and flow regulation for normal flows including minor storm events.

The risk control is assessed via the following factors:

- Independence: High
- Applicable: Mod-High

Based on the above, full applicability is assigned.





| IE RISK ASSESSMENT       |                        |                              |  | Active Risk                    | Scenarios ID: RR-I | R-00061    |                      |          |              |                |              | MAGL        | 5        |
|--------------------------|------------------------|------------------------------|--|--------------------------------|--------------------|------------|----------------------|----------|--------------|----------------|--------------|-------------|----------|
| Risk Control             | Code                   | Tag ID                       | Description  |                                | Owner              | Status     | Applicability Factor | С        | riticality   | Type/Factor    | Reviewed     | Assess      | sment    |
|                          | RR-COP-03039           | BC-00405                     | Water Management Plan                                      |                                | No Owner Defined   | In Service | 0.0%                 | Criti    | cal Control  | Administrative | 7-Oct-2015   | Goo         | od       |
| Base Control<br>Comments | Inputs from the hyd    | rological model and mon      | itoring for the overburden dump runoff form the basis      | of the Water Treatment System. |                    |            |                      |          |              |                |              |             |          |
|                          | The system include     | s the following water trea   | atment:  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | - caustic addition for | r pH adjustment              |  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | - cationic polymer for | •                            |  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | - indirectly 10% of t  | otal dissolved solids rem    | oved with the dosing, 20% reduced by mixing with pov       | ver station water              |                    |            |                      |          |              |                |              |             |          |
|                          | The system alarms      | on the operating level ar    | nd pH of incoming water.                                   |                                |                    |            |                      |          |              |                |              |             |          |
|                          |                        | assessed via the following   | ng:  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | - Implemented: Yes     |                              |  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | - Type: Administrati   | ve/Engineering               |  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | - Reliability: Good    | g: Performance monitoria     |  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | - Montoning/Additin    | g. Feriormance monitorii     | ig   |                                |                    |            |                      |          |              |                |              |             |          |
|                          | Based on the above     | e, the effectiveness is ass  | sessed to be GOOD.   |                                |                    |            |                      |          |              |                |              |             |          |
| Risk Control<br>Context  | Water Treatment S      | ystem                        |  |                                |                    |            |                      |          |              |                |              |             |          |
| Risk Control             | The risk control is a  | ssessed based on the fo      | llowing factors:   |                                |                    |            |                      |          |              |                |              |             |          |
| Comments                 | - Independence: Lo     | w (Control applicability h   | as been incorporated in determining the likelihood of t    | his event)                     |                    |            |                      |          |              |                |              |             |          |
|                          | - Applicable: High     |                              |  |                                |                    |            |                      |          |              |                |              |             |          |
|                          | Based on the above     | e, no applicability is assig | ned as the control has been incorporated in the likelih    | ood of this event.             |                    |            |                      |          |              |                |              |             |          |
| Actions                  | Code                   | Objective                    |  | Work to be Done                |                    |            |                      |          | Priority     | Implementer    | Status       | Complete By | Tracking |
|                          | RR-A-00020             | Finalise the Water Ma        | anagement Plan and associated TARPs (including<br>ystems). |                                |                    |            |                      |          | Normal       |                | Pending      |             | N/A      |
| Cause                    | Contamination of       | of surface discharge         | due to failure of oil separation system                    |                                | Code               | Status     |                      |          | Likelihood   |                | Contribution |             |          |
|                          |                        |                              |  |                                | RR-CA-00505        | Active     |                      | Current  | Possible (3) |                | 8.2%         |             |          |
|                          |                        |                              |  |                                |                    |            |                      | Proposed | Possible (3) |                | 8.2%         |             |          |

Station) outside the Mine Lease Area.

In the event of a failure of the oil separation units within the Mine Lease Area, all discharges will be contained within the mine. The likelihood of this event is considered to be POSSIBLE.



| K ASSESSMENT             |  |                                 | ACTIVE RISK   | Scenarios ID: RR-I  | K-00001          |                      |                            |                |                      |          |
|--------------------------|--|---------------------------------|---|---------------------|------------------|----------------------|----------------------------|----------------|----------------------|----------|
| Risk Control             | Code   | Tag ID                          | Description   | Owner               | Status           | Applicability Factor | Criticality                | Type/Factor    | Reviewed             | Assessme |
|                          | RR-COP-03040   | BC-00447                        | Settling Pond Oil in Drain  | No Owner Defined    | In Service       | 100.0%               | Non-Critical Control       | Administrative | 13-Oct-2015          | Good     |
| Base Control             | Main drainage oil o  | letection, alarm and operat     | tor response (prior to settling pond).  |                     |                  |                      |                            |                |                      |          |
| Comments                 | The base sector is   |                                 | _   |                     |                  |                      |                            |                |                      |          |
|                          | - Implemented: Ye  | s assessed via the following    | g.  |                     |                  |                      |                            |                |                      |          |
|                          | - Type: Administra   |                                 |   |                     |                  |                      |                            |                |                      |          |
|                          | - Reliability: Good  |                                 |   |                     |                  |                      |                            |                |                      |          |
|                          | - Monitoring/Auditii   | ng: Performance monitorin       | 9   |                     |                  |                      |                            |                |                      |          |
|                          |  |                                 | control is assessed to be GOOD.   |                     |                  |                      |                            |                |                      |          |
| Risk Control<br>Context  | Main drainage oil o  | letection, alarm and operat     | tor response (prior to settling pond)   |                     |                  |                      |                            |                |                      |          |
| Risk Control<br>Comments |  | assessed via the following      | factors:  |                     |                  |                      |                            |                |                      |          |
| Comments                 | <ul> <li>Independence: H</li> <li>Applicable: Mod-l</li> </ul>     | -                               |   |                     |                  |                      |                            |                |                      |          |
|                          | Based on the abov  | e, full applicability is assign | ned.  |                     |                  |                      |                            |                |                      |          |
| Risk Control             | Code   | Tag ID                          | Description   | Owner               | Status           | Applicability Factor | Criticality                | Type/Factor    | Reviewed             | Assessme |
|                          | RR-COP-03041   | BC-00419                        | Containment of mine drainage within the Mine Lease Area   | No Owner Defined    | In Service       | 0.0%                 | Critical Control           | Engineering    | 6-Oct-2015           | Good     |
| Base Control             | Drainage system o  | ontains retention ponds an      | nd flow regulation (up to 1 in 2 year storm events).  |                     |                  |                      |                            |                |                      |          |
| Comments                 | The base control is  | assessed via the following      | o:  |                     |                  |                      |                            |                |                      |          |
|                          | - Implemented: Ye  |                                 | y.  |                     |                  |                      |                            |                |                      |          |
|                          | - Type: Engineerin   | g                               |   |                     |                  |                      |                            |                |                      |          |
|                          | <ul> <li>Reliability: Good</li> <li>Monitoring/Audition</li> </ul> | ag: Ad-Hoc                      |   |                     |                  |                      |                            |                |                      |          |
|                          | Worldoning/rudial  | 19.710 1100                     |   |                     |                  |                      |                            |                |                      |          |
|                          |  |                                 | control is assessed to be GOOD.   |                     |                  |                      |                            |                |                      |          |
| Context                  |  | oms on settling pond            |   |                     |                  |                      |                            |                |                      |          |
| Risk Control<br>Comments | The retention pond   | s are used to expose the a      | acidic drainage to sunlight which provides a mechanism for acids to break down.   |                     |                  |                      |                            |                |                      |          |
|                          | Drainage system of   | ontains retention ponds an      | nd flow regulation for normal flows including minor storm events.   |                     |                  |                      |                            |                |                      |          |
|                          | The risk control is  | assessed via the following      | factors:  |                     |                  |                      |                            |                |                      |          |
|                          |  |                                 | oil detection, alarm and operator response control); hence not independent  |                     |                  |                      |                            |                |                      |          |
|                          | - Applicable: Mod-   | nigh                            |   |                     |                  |                      |                            |                |                      |          |
|                          |  |                                 | ned as control is part of the main drainage oil detection alarm and operator response control.  |                     |                  |                      |                            |                |                      |          |
| se                       |  | icid mine water runoff          | from exposed large areas of interseam in open cut and internal OB   | Code<br>RR-CA-00507 | Status<br>Active |                      | Likelihor Current Possible |                | Contribution<br>8.2% |          |
|                          | dump   |                                 |   | THE CA-00307        | Active           |                      | Proposed Possible          | • •            | 8.2%                 |          |
| Comments                 |  | nce mine activities ceased,     | as of interseam are left exposed in open cut. This is currently managed through the mine operation, there is a potential of untreated water being discharged from these uncapped areas. This hazard |                     |                  |                      |                            |                |                      |          |
|                          | The likeliheed of the  | is event is considered to b     | a POSSIDI E   |                     |                  |                      |                            |                |                      |          |
|                          | THE IIREIITIOOD OF T   | iis everit is considered to b   | E FOODELL.  |                     |                  |                      |                            |                |                      |          |

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00061



|         | MENT                                |   |   | 1  | Active Risk Scenarios ID: F   | K-K-00001        |                      |                     |              |              |             |          |
|---------|-------------------------------------|---|---|--|---|------------------|----------------------|---------------------|--------------|--------------|-------------|----------|
|         | Risk Control                        | Code  | Tag ID  | Description  | Owner   | Status           | Applicability Factor | Criticality         | Type/Factor  | Reviewed     | Assess      | sment    |
|         |                                     | RR-COP-02243  | BC-00448  | Operating procedure - lime addition  | No Owner Defined  | In Service       | 100.0%               | Non-Critical Contro | l Procedural | 6-Oct-2015   | Asses       | ssed     |
|         |                                     |   |   |  |   |                  |                      |                     |              |              |             |          |
|         | Base Control                        | The base control is a   | assessed via the following:   |  |   |                  |                      |                     |              |              |             |          |
|         | Comments                            | - Implemented: Part   | · ·   |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | - Type: Behavioural   |   |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | - Reliability: Fair   | ar None   |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | - Monitoring/Auditing   | g: None   |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | Based on the above  | , the effectiveness is assesse  | ed to be ASSESSED.   |   |                  |                      |                     |              |              |             |          |
|         | Risk Control<br>Context             | Operating procedure   | e to adjust pH  |  |   |                  |                      |                     |              |              |             |          |
|         | Risk Control                        | The risk control is as  | ssessed via the following fact  | ors:   |   |                  |                      |                     |              |              |             |          |
|         | Comments                            | - Independence: Hig   | ıh  |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | - Applicable: Mod-Hi  | igh   |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | Based on the above  | , full applicability is assigned.   |  |   |                  |                      |                     |              |              |             |          |
| Actions |                                     | Code  | Objective   | Work to be Done  | е   |                  |                      | Priority            | Implementer  | Status       | Complete By | Tracking |
|         |                                     | RR-A-00025  | Formalise the activity of limmine.  | ne dosing (pH correction) at the base of the   |   |                  |                      | Normal              |              | Pending      |             | N/A      |
|         | Risk Control                        | Code  | Tag ID  | Description  | Owner   | Status           | Applicability Factor | Criticality         | Type/Factor  | Reviewed     | Assess      | sment    |
|         |                                     | RR-COP-02612  | BC-00419  | Containment of mine drainage within the Mine Lease Area  | No Owner Defined  | In Service       | 100.0%               | Critical Control    | Engineering  | 7-Oct-2015   | God         | od       |
|         |                                     | The base control is a - Implemented: Yes - Type: Engineering  |   |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | - Reliability: Good<br>- Monitoring/Auditing  |   |  |   |                  |                      |                     |              |              |             |          |
|         |                                     | - Reliability: Good<br>- Monitoring/Auditing  | g: Ad-Hoc   | trol is assessed to be GOOD.   |   |                  |                      |                     |              |              |             |          |
|         | Risk Control<br>Context             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above  | g: Ad-Hoc<br>, the effectiveness of the con   | trol is assessed to be GOOD.   |   |                  |                      |                     |              |              |             |          |
|         | Context                             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above<br>Containment of mine   | g: Ad-Hoc<br>, the effectiveness of the con<br>e drainage (based in the mine  |  | down.   |                  |                      |                     |              |              |             |          |
|         | Context<br>Risk Control             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above<br>Containment of mine<br>The retention ponds  | g: Ad-Hoc<br>, the effectiveness of the con<br>e drainage (based in the mine<br>are used to expose the acidi  | s) within the Mine Lease Area  | down.   |                  |                      |                     |              |              |             |          |
|         | Context<br>Risk Control             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above<br>Containment of mine<br>The retention ponds<br>Drainage system con   | g: Ad-Hoc<br>, the effectiveness of the con<br>e drainage (based in the mine<br>are used to expose the acidi  | e) within the Mine Lease Area c drainage to sunlight which provides a mechanism for acids to break ow regulation for normal flows including minor storm events.  | down.   |                  |                      |                     |              |              |             |          |
|         | Context<br>Risk Control             | - Reliability: Good - Monitoring/Auditing Based on the above Containment of mine The retention ponds Drainage system con The risk control is as - Independence: Hig   | g: Ad-Hoc  , the effectiveness of the con e drainage (based in the mine are used to expose the acidi ntains retention ponds and fic ssessed via the following fact th   | e) within the Mine Lease Area c drainage to sunlight which provides a mechanism for acids to break ow regulation for normal flows including minor storm events.  | down.   |                  |                      |                     |              |              |             |          |
|         | Context<br>Risk Control             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above<br>Containment of mine<br>The retention ponds<br>Drainage system con<br>The risk control is as   | g: Ad-Hoc  , the effectiveness of the con e drainage (based in the mine are used to expose the acidi ntains retention ponds and fic ssessed via the following fact th   | e) within the Mine Lease Area c drainage to sunlight which provides a mechanism for acids to break ow regulation for normal flows including minor storm events.  | down.   |                  |                      |                     |              |              |             |          |
|         | Context<br>Risk Control             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above.<br>Containment of mine<br>The retention ponds<br>Drainage system con<br>The risk control is as<br>- Independence: Hig<br>- Applicable: Mod-Hi<br>Based on the above | g: Ad-Hoc  , the effectiveness of the con e drainage (based in the mine are used to expose the acidi ntains retention ponds and flo ssessed via the following fact th gh  | e) within the Mine Lease Area c drainage to sunlight which provides a mechanism for acids to break ow regulation for normal flows including minor storm events. ors:   |   |                  |                      |                     |              |              |             |          |
| ause    | Context<br>Risk Control             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above.<br>Containment of mine<br>The retention ponds<br>Drainage system con<br>The risk control is as<br>- Independence: Hig<br>- Applicable: Mod-Hi<br>Based on the above | g: Ad-Hoc  , the effectiveness of the con e drainage (based in the mine are used to expose the acidi ntains retention ponds and flo ssessed via the following fact th gh  | e) within the Mine Lease Area c drainage to sunlight which provides a mechanism for acids to break ow regulation for normal flows including minor storm events. ors:   | SL Code   | Status           |                      |                     | lihood       | Contribution |             |          |
| ause    | Context<br>Risk Control             | - Reliability: Good<br>- Monitoring/Auditing<br>Based on the above.<br>Containment of mine<br>The retention ponds<br>Drainage system con<br>The risk control is as<br>- Independence: Hig<br>- Applicable: Mod-Hi<br>Based on the above | g: Ad-Hoc  , the effectiveness of the con e drainage (based in the mine are used to expose the acidi ntains retention ponds and flo ssessed via the following fact th gh  | e) within the Mine Lease Area c drainage to sunlight which provides a mechanism for acids to break ow regulation for normal flows including minor storm events. ors:   |   | Status<br>Active |                      | Current Rai         | re (1)       | 0.8%         |             |          |
| ause    | Context<br>Risk Control<br>Comments | - Reliability: Good - Monitoring/Auditing Based on the above Containment of mine The retention ponds Drainage system con The risk control is as - Independence: Hig - Applicable: Mod-Hil Based on the above Contaminated with          | g: Ad-Hoc  , the effectiveness of the cone drainage (based in the mine are used to expose the acidi intains retention ponds and fix seessed via the following fact the fight, tull applicability is assigned, atter from Latrobe City Cuncil new landfill site is locate uncil new landfill site is locate. | e) within the Mine Lease Area  c drainage to sunlight which provides a mechanism for acids to break ow regulation for normal flows including minor storm events.  ors:  Council new landfill site leachate dam discharged onto AG and outside of the mine lease area and any potential surface discharge | SL Code<br>RR-CA-00508<br>from the site is not expected to enter the                              |                  |                      | Current Rai         |              |              |             |          |
| Cause   | Context<br>Risk Control<br>Comments | - Reliability: Good - Monitoring/Auditing Based on the above Containment of mine The retention ponds Drainage system cor The risk control is as - Independence: Hig - Applicable: Mod-Hi Based on the above Contaminated wa             | g: Ad-Hoc  the effectiveness of the cone a drainage (based in the mine are used to expose the acidi ntains retention ponds and fice sessed via the following fact th igh  full applicability is assigned. atter from Latrobe City Council new landfill site is locate refore it is assessed to be out       | e) within the Mine Lease Area  c drainage to sunlight which provides a mechanism for acids to break  ow regulation for normal flows including minor storm events.  ors:  Council new landfill site leachate dam discharged onto AG   | SL Code RR-CA-00508  from the site is not expected to enter the Therefore this cause is rejected. |                  |                      | Current Rai         | re (1)       | 0.8%         |             |          |



|   |   |   | Active r   | Risk Scenarios ID: RR-    | <b>K-</b> 00061      |                           |                                     |                               |                        | AGL                   |
|---|---|---|--|---------------------------|----------------------|---------------------------|-------------------------------------|-------------------------------|------------------------|-----------------------|
| Comments  | is Blue green algae o<br>rejected.  | outbreak is not expected in the   | he three OB runoff ponds and Fire Service Pond, as they are typically acidic (low pH).   | Therefore, this cause is  |                      |                           |                                     |                               |                        |                       |
|   | •   | •   | and High Level Storage Dam. The Settling Pond, Ash Pond and High Level Storage Dated to be outside the scope of the Mine Risk Assessment and Management Plan.  | am are located outside of |                      |                           |                                     |                               |                        |                       |
| Cause   | PCB spill from  | transformers  |  | Code                      | Status               |                           | Likeliho                            | od                            | Contribution           |                       |
|   |   |   |  | RR-CA-00521               | Active               |                           | Current Unlikely                    | (2)                           | 0.8%                   |                       |
|   |   |   |  |                           |                      |                           | Proposed Unlikely                   | (2)                           | 0.8%                   |                       |
| Comments  | s Potential pathways - general maintena - failure   |   |  |                           |                      |                           |                                     |                               |                        |                       |
|   | - equipment deteri  | ioration  |  |                           |                      |                           |                                     |                               |                        |                       |
|   | The likelihood of th  | his event is considered to be   | UNLIKELY.  |                           |                      |                           |                                     |                               |                        |                       |
| Risk Contro   |   | Tag ID  | Description  | Owner                     | Status               | Applicability Factor      | Criticality                         | Type/Factor                   | Reviewed               | Assessment            |
|   | RR-COP-02613  | BC-00420  | Transformer Maintenance Program  | No Owner Defined          | In Service           | 100.0%                    | Non-Critical Control                | Administrative                | 7-Oct-2015             | Good                  |
| Base Contro<br>Comment  | ts - Implemented: Ye  | is assessed via the following:  |  |                           |                      |                           |                                     |                               |                        |                       |
|   | <ul><li>Type: Administra</li><li>Reliability: Good</li><li>Monitoring/Audition</li></ul>  |   |  |                           |                      |                           |                                     |                               |                        |                       |
|   | Based on the above  | ve, the effectiveness is asses  | ssed to be GOOD.   |                           |                      |                           |                                     |                               |                        |                       |
| Risk Contro<br>Contex   |   | ansformers scheduled throug<br>condition of equipment   | ph Asset Suite   |                           |                      |                           |                                     |                               |                        |                       |
| Risk Contro<br>Comment  | ts - Independence: H  |   | actors:  |                           |                      |                           |                                     |                               |                        |                       |
|   | - Applicable: Mod-  | 111911  |  |                           |                      |                           |                                     |                               |                        |                       |
|   |   | ve, full applicability is assigne   | ed.  |                           |                      |                           |                                     |                               |                        |                       |
| Risk Contro   | Based on the abov   | -   | ed.  Description   | Owner                     | Status               | Applicability Factor      | Criticality                         | Type/Factor                   | Reviewed               | Assessment            |
| Risk Contro   | Based on the abov   | ve, full applicability is assigne   |  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor 0.0% | Criticality<br>Non-Critical Control | Type/Factor<br>Administrative | Reviewed<br>7-Oct-2015 | Assessment<br>Average |
|   | Based on the abov  Code  RR-COP-02614  The control include  | ve, full applicability is assigne<br>Tag ID<br>BC-00421   | Description  |                           |                      |                           | •                                   |                               |                        |                       |
| Base Contro   | Based on the above  Code  RR-COP-02614  The control include is  The base control is  Implemented: Ye  Type: Administra  Reliability: Good   | ve, full applicability is assigne Tag ID BC-00421  es a list of equipment that co s assessed via the following:   | Description PCB Register allows tracking of spill/leak from transformer Intain PCB. This allows the tracking when issues occur, i.e. leak, faults etc  |                           |                      |                           | •                                   |                               |                        |                       |
| Base Contro   | Based on the above  Code  RR-COP-02614  The control include  The base control is  Implemented: Ye  Type: Administra   | ve, full applicability is assigne Tag ID BC-00421  es a list of equipment that co s assessed via the following:   | Description PCB Register allows tracking of spill/leak from transformer Intain PCB. This allows the tracking when issues occur, i.e. leak, faults etc  |                           |                      |                           | •                                   |                               |                        |                       |
| Base Contro<br>Comments   | Based on the above Code RR-COP-02614  The control include The base control is Implemented: Ye Type: Administra Reliability: Good Monitoring/Auditit Based on the above  | ve, full applicability is assigne Tag ID BC-00421 es a list of equipment that co s assessed via the following: ss stive ing: Ad-hoc ve, the effectiveness is assesse  | Description  PCB Register allows tracking of spill/leak from transformer  Intain PCB. This allows the tracking when issues occur, i.e. leak, faults etc.   |                           |                      |                           | •                                   |                               |                        |                       |
| Base Contro<br>Comments   | Based on the abov  Code RR-COP-02614  The control include The base control is Implemented: Ye Type: Administra Reliability: Good Monitoring/Auditit Based on the abov  PCB Register allov   | ve, full applicability is assigne Tag ID BC-00421 es a list of equipment that co s assessed via the following: ss stive ing: Ad-hoc   | Description  PCB Register allows tracking of spill/leak from transformer  Intain PCB. This allows the tracking when issues occur, i.e. leak, faults etc.   |                           |                      |                           | •                                   |                               |                        |                       |
| Base Contro<br>Comments<br>Risk Contro<br>Contex                            | Based on the abov  Code RR-COP-02614  The control include The base control is Implemented: Ye Type: Administra Reliability: Good Monitoring/Auditit Based on the abov PCB Register allow to   | ve, full applicability is assigne Tag ID BC-00421  es a list of equipment that co is assessed via the following: es stive ing: Ad-hoc ve, the effectiveness is asses we tracking of a spill/leak fror assessed via the following fa cow (not independent; part of | Description PCB Register allows tracking of spill/leak from transformer Intain PCB. This allows the tracking when issues occur, i.e. leak, faults etc  |                           |                      |                           | •                                   |                               |                        |                       |
| Base Contro<br>Comments<br>Risk Contro<br>Contex<br>Risk Contro             | Based on the above Code RR-COP-02614  The control include The base control is Implemented: Ye Type: Administra Reliability: Good Monitoring/Auditi Based on the above Code The risk control is In the risk control is In Applicable: Mod  | Tag ID BC-00421  es a list of equipment that co s assessed via the following: stitive ing: Ad-hoc ve, the effectiveness is assess ws tracking of a spill/leak fror assessed via the following fa cow (not independent; part of                                    | Description PCB Register allows tracking of spill/leak from transformer  Intain PCB. This allows the tracking when issues occur, i.e. leak, faults etc  Seed to be GOOD.  In transformer  actors:  |                           |                      |                           | •                                   |                               |                        |                       |
| Base Contro<br>Comments<br>Risk Contro<br>Contex<br>Risk Contro<br>Comments | Based on the above PCB Register allow the sale of the risk control is:  Based on the above PCB Register allow the sale of the | rag ID BC-00421  es a list of equipment that co s assessed via the following: es stive  ing: Ad-hoc ve, the effectiveness is asses we tracking of a spill/leak fror assessed via the following fa cow (not independent; part of                                   | Description PCB Register allows tracking of spill/leak from transformer  antain PCB. This allows the tracking when issues occur, i.e. leak, faults etc  seed to be GOOD. In transformer  actors:  the Transformer Maintenance Program.   |                           |                      |                           | •                                   | Administrative                |                        |                       |
| Base Contro<br>Comments<br>Risk Contro<br>Contex<br>Risk Contro             | Based on the above PCB Register allow the sale of the risk control is:  Based on the above PCB Register allow the sale of the | rag ID BC-00421  es a list of equipment that co s assessed via the following: es stive  ing: Ad-hoc ve, the effectiveness is asses we tracking of a spill/leak fror assessed via the following fa cow (not independent; part of                                   | Description PCB Register allows tracking of spill/leak from transformer  antain PCB. This allows the tracking when issues occur, i.e. leak, faults etc  sseed to be GOOD. In transformer  actors: the Transformer Maintenance Program.  add, as this is part of the Transformer Maintenance Program. | No Owner Defined          | In Service           |                           | Non-Critical Control                | Administrative                | 7-Oct-2015             |                       |

Active Risk Scenarios ID: RR-R-00061 Comments The leachate pond for the old landfill site is located within the mine lease area. The potential discharge within that pond is within the Mine Lease Area The leachate pond and associated old landfill site of Latrobe City Council should operate within the site's EPA licence. They are not actively managing the old landfill site. Therefore, the likelihood of this event is considered to be POSSIBLE. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02285 BC-00454 No Owner Defined In Service 0.0% Non-Critical Control Administrative 6-Oct-2015 Land Management Lease Agreements Assessed Base Control Land management and monitoring requirements described in the lease agreement. Comments The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Fair - Monitoring/Auditing: None Based on the above, the effectiveness of the control is assessed to be ASSESSED. Risk Control Land management and monitoring requirements described in the lease agreement Context Risk Control The risk control is assessed via the following factors: Comments - Independence: Moderate - Applicable: Low Based on the above, no applicability is assigned. Cause Abandoned geophysical probe Y4733 on northern batters potentially impacting groundwater Code Status RR-CA-00590 Rejected Comments Probe is broken and unable to be retrieved at depth of 200 m. Bore is sealed and encapsulated in grout The probe is a radioactive source, however, the Department of Health has reviewed the impacts to both land and public health and considered the impacts to be insignificant. Therefore, this cause is rejected. Consequences Consequence Contaminated water discharge with the potential to impact the environment Code Likelihood Risk Rating Category Severity RR-CQ-00433 Current Environment & Possible (3) Small scale and short term Moderate Community environmental impact to localised area of low environmental value. No impact beyond AGL's operational area. No/minor interest by local community. Proposed Possible (3) Small scale and short term Moderate environmental impact to localised area of low environmental value. No impact

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riskview

12:03 pm

beyond AGL's operational area. No/minor interest by local community.



| RISK ASSESSME | ENT                      |                     |   |  | ACTIVE RISK S                    | cenarios ID: RR  | -K-UUU61   |                      |                      |                |            | MAGL        |       |
|---------------|--------------------------|---------------------|---|--|----------------------------------|------------------|------------|----------------------|----------------------|----------------|------------|-------------|-------|
| Ris           | sk Control               | Code                | Tag ID  | Description  |                                  | Owner            | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Asses       | sment |
|               |                          | RR-COM-03083        | BC-00409  | Monitoring equipment L171, alarm and operator response                           |                                  | No Owner Defined | In Service | 0.0%                 | Critical Control     | Administrative | 7-Oct-2015 | Go          | od    |
| В             | Base Control             | The equipment co    | ntinuously monitor pH,                          | turbidity, temperature and conductivity.   |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | Operator periodica  | ally monitors the system                        | ns and responds to alarms.   |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | The base control i  | s assessed via the follo                        | wing:  |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | - Implemented: Ye   |   |  |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | - Type: Administra  |   |  |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | - Reliability: Good |   |  |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | - Monitoring/Audit  | ing: Performance monit                          | oring  |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | Based on the abo    | ve, the effectiveness of                        | the control is assessed as GOOD.   |                                  |                  |            |                      |                      |                |            |             |       |
| F             | Risk Control<br>Context  | Alarm and operate   | or response                                     |  |                                  |                  |            |                      |                      |                |            |             |       |
|               | Risk Control<br>Comments | Although this is a  | separate system to the                          | Water Treatment System, there is a potential for common cause failu              | ure.                             |                  |            |                      |                      |                |            |             |       |
|               |                          | The risk control is | assessed via the follow                         | ving factors:  |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          |                     |   | f the Water Treatment System control).   |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | - Applicable: High  |   |  |                                  |                  |            |                      |                      |                |            |             |       |
|               |                          | Based on the abo    | ve, no applicability is as                      | signed as this is not fully independent of the Water Treatment Syste             | m, i.e. shares similar hardware. |                  |            |                      |                      |                |            |             |       |
| Actions       |                          | Code                | Objective                                       |  | Work to be Done                  |                  |            |                      | Priority             | Implementer    | Status     | Complete By | Trac  |
|               |                          | RR-A-00023          | Install an upgraded S<br>of settling pond and C | CADA on-line monitoring and dosing equipment (Automate operation<br>0/B valves). | 1                                |                  |            |                      | Normal               |                | Pending    |             | N/    |
| Ris           | sk Control               | Code                | Tag ID  | Description  |                                  | Owner            | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Asses       | sment |
|               |                          | RR-COM-03084        | BC-00410  | Weekly sampling at discharge point L171 and L160                                 |                                  | No Owner Defined | In Service | 100.0%               | Non-Critical Control |                | 7-Oct-2015 | Asse        | essed |

Comments

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness of the control is assessed to be ASSESSED.

Risk Control Independent third party sampling

Context

Risk Control The risk control is assessed via the following factors: Comments - Independence: High

- Applicable: High

Based on the above, full applicability is assigned.



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed RR-COM-03085 BC-00186 HSM0001C Emergency Management Plan 0.0% No Owner Defined In Service Critical Control Administrative 9-Oct-2015 Good

Comments - Vic police

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

- - EPA
  - West Gippsland Catchment Management Authority
  - Gippsland Water and
  - Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Procedure

Comments

Risk Control Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller.

The risk control is assessed via the following factors:

- Independence: Low
- Applicable: Low

Based on the above, no applicability is assigned.

### Active Risk Scenarios ID: RR-R-00062



Risk Scenario Details Status Active

Top Event Impact to water (Level 3)

Scenario Mining operations which could cause Level 3 impact to the environment (water)

Ratings Qualitative (Automatically Calculated)

Top Event Likelihood

Current Rare (1) Proposed Rare (1) Consequence Category **Environment & Community** 

**Environment & Community** 

Consequence Severity Level 3 (1.5)

Level 3 (1.5)

Proposed

Unlikely (2)

Max Consequence Risk

Low Low

4.9%

### Causes

| Cause |          | Power station plant failure resulting in discharge of water with high conductivity levels to the Settling  | Code        | Status   |         |              |              |  |
|-------|----------|--|-------------|----------|---------|--------------|--------------|--|
|       |          | Pond   | RR-CA-00482 | Rejected |         |              |              |  |
|       |          |  |             |          |         |              |              |  |
|       | Comments | Potential pathways include:  |             |          |         |              |              |  |
|       |          | - plant failure; pumps valves etc.   |             |          |         |              |              |  |
|       |          | - management of clinker "trash pit" to minimise the likelihood of blockages  |             |          |         |              |              |  |
|       |          |  |             |          |         |              |              |  |
|       |          | The Settling Pond is located outside of the mine lease area, therefore it is assessed to be outside the scope of the Mine Risk Assessment and Management (Section 2014). | gement      |          |         |              |              |  |
|       |          | Plan. Therefore this cause is rejected.  |             |          |         |              |              |  |
| Cause |          | Water migration from the Ash Pond  | Code        | Status   |         |              |              |  |
|       |          |  | RR-CA-00483 | Rejected |         |              |              |  |
|       |          |  |             |          |         |              |              |  |
|       |          |  |             |          |         |              |              |  |
|       | Comments | Power station discharging saline water and ash into the Ash Pond resulting in a potential of contaminated groundwater migrating beyond the attenuat                      | ion zone    |          |         |              |              |  |
|       |          | boundary.  |             |          |         |              |              |  |
|       |          | The Power Station activity and Ash Pond are located outside of the mine lease area, therefore they are assessed to be outside the scope of the Mine                      | Risk        |          |         |              |              |  |
|       |          | Assessment and Management Plan. Therefore this cause is rejected.  |             |          |         |              |              |  |
| Cause |          | Contaminated water due to a failure of Dredge Ash holding cell   | Code        | Status   |         | Likelihood   | Contribution |  |
|       |          |  | RR-CA-00601 | Active   | Current | Unlikely (2) | 4.9%         |  |
|       |          |  |             |          |         |              |              |  |

#### Comments Potential pathways include:

- piping failure (related to the performance of the clay liner and seepage)
- overtopping (erosion of the capping and liner)
- instability of the storage (movement)

A geotechnical failure of the cell wall may result in discharge of saline water to the external environment. Ash spill is expected to be contained within the Mine Lease Area. However, water discharge may extend beyond the Mine Lease Area.

The system is geotechnically designed for void and constructed (QA Plan) to ANCOLD guidelines (GHD report - Ash Void 31/11466/14/232965). The holding cell was designed and built in accordance with the relevant standards and practices. Based on the above, the likelihood of this event is considered to be UNLIKELY.

AGL MINE RISK ASSESSMENT



Active Risk Scenarios ID: RR-R-00062 Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00412 RR-COP-02485 Ash Trial Environmental Improvement Plan No Owner Defined Proposed 0.0% Non-Critical Control Procedural 7-Oct-2015 Assessed Base Control This is the approval plan recognised by the EPA. Comments The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: None Based on the above, the effectiveness of the control is assessed to be ASSESSED. Risk Control EPA Approval process Context Risk Control The risk control is assessed via the following factors: Comments - Independence: Moderate - Applicable: Low Based on the above, no applicability is assigned considering the effectiveness of the base control and applicability of the risk control. Therefore, no applicability is assigned. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-03032 BC-00415 No Owner Defined In Service 100.0% Critical Control Administrative 7-Oct-2015 Operational Monitoring Program for the dredging activity Good Base Control This activity involves observational inspection and sets the operational control for water balance. It provides an opportunity to suspend operation when operating

Comments limits are exceeded.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Observational inspection and water balance

Context

Risk Control The risk control is assessed via the following factors:

- Comments Independence: High
  - Applicable: Mod-High

Based on the above, full applicability is assigned.

Friday, October 30, 2015

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00062



| K ASSESSMENT             |  |                       |   | ACTIVE N                                       | ISK Scenarios ID: RR-I   | K-UUU0Z    |                      |               |                 |                | The second second |
|--------------------------|--|-----------------------|---|--|--------------------------|------------|----------------------|---------------|-----------------|----------------|-------------------|
| Risk Control             | Code Tag ID  |                       | Description   |  | Owner                    | Status     | Applicability Factor | Criticality   | Type/Facto      | or Reviewed    | Assessment        |
|                          | RR-COP-03033 BC-004  | 4                     | Groundwater Monitoring Plan   |  | No Owner Defined         | In Service | 100.0%               | Critical Cont | ol Administrati | ive 7-Oct-2015 | Average           |
| Base Control             | This includes consideration for  | environmental issu    | les with regards to groundwater interaction   | ns as well as neotechnical stability           |                          |            |                      |               |                 |                |                   |
| Comments                 |  |                       | nos warrogards to groundwater interdetion   | is as well as geolesimisar stability.          |                          |            |                      |               |                 |                |                   |
|                          | The base control is assessed v - Implemented: Yes                            | ia the following:     |   |  |                          |            |                      |               |                 |                |                   |
|                          | - Type: Administrative   |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | - Reliability: Fair  |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | - Monitoring/Auditing: Ad-Hoc  |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | Based on the above, the effect   | iveness of the contr  | rol is assessed as AVERAGE.   |  |                          |            |                      |               |                 |                |                   |
| Risk Control<br>Context  | Groundwater Monitoring Plan  |                       |   |  |                          |            |                      |               |                 |                |                   |
| Risk Control<br>Comments | The risk control is assessed via   | a the following facto | ors:  |  |                          |            |                      |               |                 |                |                   |
| Comments                 | - Independence: High<br>- Applicable: Mod-High                               |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | Based on the above, full applic  | ability is assigned.  |   |  |                          |            |                      |               |                 |                |                   |
| Risk Control             |  |                       | Description   |  | Owner                    | Status     | Applicability Factor | Criticality   | Type/Facto      |                | Assessmen         |
|                          | RR-COP-03034 BC-0041   | 3                     | Dam monitoring program  |  | No Owner Defined         | In Service | 31.0%                | Critical Cont | ol Administrati | ive 7-Oct-2015 | Good              |
| Base Control             | Program specifies the monitori   | na nroaram accocia    | ated with dams and how they are to be buil  | l <del>t</del>                                 |                          |            |                      |               |                 |                |                   |
| Comments                 | riogram specifies the monitori   | ng program associa    | ated with dams and now they are to be built   | и.   |                          |            |                      |               |                 |                |                   |
|                          | The base control is assessed v   | ia the following fact | tors:   |  |                          |            |                      |               |                 |                |                   |
|                          | - Implementation: Yes - Control type: Administrative                         |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | - Reliability rating: Good   |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | - Monitoring/Auditing: Performa  | ance monitoring       |   |  |                          |            |                      |               |                 |                |                   |
|                          | Based on the above, the effect   | iveness is assessed   | d to be GOOD.   |  |                          |            |                      |               |                 |                |                   |
| Risk Control<br>Context  | Ash void monitoring program  |                       |   |  |                          |            |                      |               |                 |                |                   |
| Risk Control<br>Comments | Construction and QA Plan for v   | oid design and con    | nstructed to ANCOLD guidelines. Geotechr  | nically designed (GHD report – Ash Void)       |                          |            |                      |               |                 |                |                   |
|                          | The risk control is assessed via   | a the following facto | ors:  |  |                          |            |                      |               |                 |                |                   |
|                          | - Independence: Mod  |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | - Applicable: Mod-High   |                       |   |  |                          |            |                      |               |                 |                |                   |
| se                       | Based on the above, partial ap   | -                     | ed.<br>Iue to failure of retention basin  |  | Code                     | Status     |                      |               | ikelihood       | Contribution   |                   |
|                          | Dioraption of now to one   | ppwdoir orook d       | do to fallaro of fotorition baoin   |  | RR-CA-00629              | Active     |                      |               | Rare (1)        | 45.3%          |                   |
|                          |  |                       |   |  |                          |            |                      |               | Rare (1)        | 45.3%          |                   |
| Comments                 | Possible pathways include:   |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          | - Significant ground movement  | S,                    |   |  |                          |            |                      |               |                 |                |                   |
|                          | <ul><li>Strains, subsidence</li><li>Major mine batter instability.</li></ul> |                       |   |  |                          |            |                      |               |                 |                |                   |
|                          |  |                       |   | Mino Loggo Area. There is a notantial for d    | icruption of flow to the |            |                      |               |                 |                |                   |
|                          |  |                       | ne mine which will be contained within the I<br>have no environmental (water quality, qua | antity and biodiversity) impact offsite to She |                          |            |                      |               |                 |                |                   |
|                          | Sheepwash Creek, however, the  | nis is considered to  | have no environmental (water quality, qua   |  | epwash Creek.            |            |                      |               |                 |                |                   |



| L MINE KISK ASSE | SSIVIEIVI                |  |                            | ACTIVE NIS  | k Scellarios ID. KK- | N-0000Z    |                      |                      |                |              |             |          |
|------------------|--------------------------|--|----------------------------|---|----------------------|------------|----------------------|----------------------|----------------|--------------|-------------|----------|
|                  | Risk Control             |  | Tag ID                     | Description   | Owner                | Status     | Applicability Factor | Criticality          |                | Reviewed     | Assessm     | ent      |
|                  |                          | RR-COP-03036                           |                            | Incorporate Sheepwash Creek flow retention area into the Dam Management Plan and<br>adopt ANCOLD guidelines for management.   | d No Owner Defined   | Proposed   | 100.0%               | Non-Critical Control |                | 13-Oct-2015  | Assesse     | ed       |
|                  | Risk Control<br>Context  | Incorporate Sheep                      | wash Creek flow retention  | on area into the Dam Management Plan and adopt ANCOLD guidelines for management.  |                      |            |                      |                      |                |              |             |          |
|                  | Risk Control<br>Comments | The implementation reduction is assign |                            | n will provide ongoing assurance that the asset will be maintained to the appropriate guidelines.   | . Therefore, no risk |            |                      |                      |                |              |             |          |
| Actions          |                          | Code                                   | Objective                  | Work to be Done   |                      |            |                      | Priority             | Implementer    | Status       | Complete By | Tracking |
|                  |                          | RR-A-00024                             |                            | ash Creek flow retention area into the Dam<br>nd adopt ANCOLD guidelines for management.  |                      |            |                      | Normal               |                | Pending      |             | N/A      |
| Cause            |                          | Settling Pond v                        | vall failure due to gro    | ound movement as a result of mining activities  | Code                 | Status     |                      | Likelihood           | l              | Contribution |             |          |
|                  |                          |  |                            |   | RR-CA-00714          | Active     |                      | Current Unlikely (2  | )              | 4.5%         |             |          |
|                  |                          |  |                            |   |                      |            |                      | Proposed Unlikely (2 | )              | 4.5%         |             |          |
|                  | Comments                 |  | •                          | d coal under the pond that has resulted in cracks being a conduit for leaks. In the event of a signifity of the dam wall to be compromised. This may result in a significant loss of containment of m |                      |            |                      |                      |                |              |             |          |
|                  |                          | The likelihood of the                  | nis event is considered to | be UNLIKELY.  |                      |            |                      |                      |                |              |             |          |
|                  | Risk Control             | Code                                   | Tag ID                     | Description   | Owner                | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed     | Assessme    | ent      |
|                  |                          | RR-COP-03021                           | BC-00442                   | Emergency Management Plan and TARPs   | No Owner Defined     | In Service | 100.0%               | Critical Control     | Administrative | 7-Oct-2015   | Good        |          |
|                  |                          |  |                            |   |                      |            |                      |                      |                |              |             |          |

Base Control TARPs will trigger actions to mitigate the events of ground movement.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Emergency Management Plan and TARPs

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: High

- Applicable: High

Based on the above, full applicability is assigned.



| NE KISK ASSESSIMENT |                       |                      |                               | Active  | KISK SCEIIAIIUS ID. KK- | 1-00002    |                      |                  |                |              |            |
|---------------------|-----------------------|----------------------|-------------------------------|---|-------------------------|------------|----------------------|------------------|----------------|--------------|------------|
| Risk C              | Control C             | Code                 | Tag ID                        | Description   | Owner                   | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed     | Assessment |
|                     | R                     | RR-COP-03022         | BC-00443                      | Inspection, monitoring and maintenance of the Settling Pond | No Owner Defined        | In Service | 100.0%               | Critical Control | Administrative | 7-Oct-2015   | Good       |
| Base<br>Cor         | Control P             | Program for the ins  | pection, monitoring and       | maintenance of the Settling Pond.                           |                         |            |                      |                  |                |              |            |
|                     | Т                     | he base control is   | assessed via the followi      | ing:  |                         |            |                      |                  |                |              |            |
|                     | -                     | Implemented: Yes     |                               |   |                         |            |                      |                  |                |              |            |
|                     |                       | Type: Administrati   | ve                            |   |                         |            |                      |                  |                |              |            |
|                     |                       | Reliability: Good    |                               |   |                         |            |                      |                  |                |              |            |
|                     | -                     | Monitoring/Auditin   | g: Performance monitor        | ing   |                         |            |                      |                  |                |              |            |
|                     | В                     | Based on the above   | e, the effectiveness of th    | e control is assessed to be GOOD.                           |                         |            |                      |                  |                |              |            |
|                     | Control Ir<br>Context | nspection, monitori  | ng and maintenance of         | the Settling Pond   |                         |            |                      |                  |                |              |            |
| Risk                | Control T             | he risk control is a | ssessed based on the fo       | ollowing factors:   |                         |            |                      |                  |                |              |            |
| Cor                 |                       | Independence: High   |                               | •   |                         |            |                      |                  |                |              |            |
|                     | -                     | Applicable: High     |                               |   |                         |            |                      |                  |                |              |            |
|                     | В                     | Based on the above   | e, full applicability is assi | gned.   |                         |            |                      |                  |                |              |            |
| Cause               | C                     | Contaminated w       | ater discharge (qua           | ality & quantity) due to site based activities              | Code                    | Status     |                      | Likelil          | nood           | Contribution |            |
|                     |                       |                      |                               |   | RR-CA-00723             | Active     |                      | Current Unlike   | ly (2)         | 45.3%        |            |
|                     |                       |                      |                               |   |                         |            | P                    | Proposed Unlike  | ly (2)         | 45.3%        |            |
|                     |                       |                      |                               |   |                         |            |                      |                  |                |              |            |

Comments Potential loss of biodiversity (flora & fauna) due to altered water discharge (quality & quantity) from site based activities.

Potential pathways include:

- acid wastewater (pH)
- contaminated water leaving site from a hydrocarbon spill
- high turbidity due to ineffective OB run-off treatment system
- suspended solids
- total dissolved solids
- flowrate (high rainfall/flood)
- reduced flowrate during drought conditions
- high temperature water

The likelihood of this event considered with the Water Treatment System control in place extending beyond the Mine Lease Area, is considered to be



| Base Control Comments  Th -cc -ci -in Th -Ir -TR -IR -IR -IR -IR -IR -IR -IR -IR -IR -I  | puts from the hydrological in<br>the system includes the follocaustic addition for pH adjus<br>cationic polymer for turbidity<br>indirectly 10% of total dissoli  | Water Management Plan  model and monitoring for the overburden dump runoff form the b  wing water treatment:  stment  |                                  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>0.0% | Criticality<br>Critical Control | Type/Factor<br>Administrative | Reviewed<br>7-Oct-2015 | Assessment<br>Good  |
|--|---|---|----------------------------------|---------------------------|----------------------|------------------------------|---------------------------------|-------------------------------|------------------------|---------------------|
| Base Control Comments  Th -cc -ci -in Th -Ir -TR -IR -IR -IR -IR -IR -IR -IR -IR -IR -I  | nputs from the hydrological not be system includes the follow caustic addition for pH adjust cationic polymer for turbidity indirectly 10% of total dissolute system alarms on the open the base control is assessed. | model and monitoring for the overburden dump runoff form the b<br>wing water treatment:<br>stment<br>/<br>ved solids removed with the dosing, 20% reduced by mixing wit |                                  | No Owner Defined          | In Service           | U.U%                         | Critical Control                | Administrative                | 7-UCI-2015             | Good                |
| Comments  Th - cc - ci - in  Th - If - If - R - M  Risk Control Context  Risk Control Comments - If - A  Actions  Comments - Cc - Comments - Cc   | he system includes the follow<br>caustic addition for pH adjusticationic polymer for turbidity<br>indirectly 10% of total dissol-<br>he system alarms on the open<br>he base control is assessed                      | wing water treatment: stment / ved solids removed with the dosing, 20% reduced by mixing wit  |                                  |                           |                      |                              |                                 |                               |                        |                     |
| - cc - cc - in  Th  Th - Ir - R - N  Risk Control Context  Risk Control Comments - Ir - A  Actions  C C  | caustic addition for pH adjus<br>cationic polymer for turbidity<br>indirectly 10% of total dissol<br>he system alarms on the open<br>he base control is assessed  | stment  vived solids removed with the dosing, 20% reduced by mixing wit   | th power station water           |                           |                      |                              |                                 |                               |                        |                     |
| - cc - in Th Th - Ir - Th - Ir - R Risk Control Wa Context Risk Control Th Comments - Ir - A Actions Code  | cationic polymer for turbidity indirectly 10% of total dissolute the system alarms on the open the base control is assessed   | r<br>lved solids removed with the dosing, 20% reduced by mixing wit   | th power station water           |                           |                      |                              |                                 |                               |                        |                     |
| - in Th Th - Ir - Ir - R - N Risk Control Context Risk Control Th Comments - Ir - A Ba Actions - Co  | indirectly 10% of total dissolution in the open he system alarms on the open he base control is assessed  | lived solids removed with the dosing, 20% reduced by mixing with  | th power station water           |                           |                      |                              |                                 |                               |                        |                     |
| Th  Th  Ir  Ir  R  M  Ba  Risk Control Context  Risk Control Comments In  Comments - Ir  A  Ba  Actions  Coc   | he system alarms on the ope   |   | ith power station water          |                           |                      |                              |                                 |                               |                        |                     |
| Th - Ir - T - R - N  Ba  Risk Control Context  Risk Control Th Comments - Ir - A  Ba  Actions  Co  | he base control is assessed   | erating level and pH of incoming water.   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| - Ir<br>- T<br>- R<br>- N<br>- N<br>- Risk Control Wa<br>Context<br>Risk Control Th<br>Comments - Ir<br>- A<br>- Ba<br>Actions   |   |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| - T - R - N - Ba Risk Control W Context Risk Control Th Comments - Ir - A - Ba Actions - C - C - C - C - C - C - C - C - C - C   | Implemented: Yes  | via the following:  |                                  |                           |                      |                              |                                 |                               |                        |                     |
| - R - N - N - N - N - N - N - N - N - N - N  |   |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Risk Control Context Risk Control Th Comments - Ir - A  Actions Co   | Type: Administrative/Engine   | eering  |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Risk Control Context  Risk Control Th Comments - Ir - A  Ba  Actions  Risk Control Th Comments - Ir - A  Comments - Comme | Reliability: Good<br>Monitoring/Auditing: Perform   | nance monitoring  |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Risk Control Context  Risk Control Th Comments - Ir - A  Ba  Actions  Risk Control Th Comments - Ir - A  Comments - Comme | ased on the above, the effec  | ctiveness is assessed to be GOOD.   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Risk Control Th<br>Comments - Ir<br>- A<br>Ba<br>Actions Co  | Vater Treatment System  |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Comments <sub>- Ir</sub>   |   |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| - A<br>Ba<br>Actions Co  |   | pased on the following factors:<br>Il applicability has been incorporated in determining the likelihoo  | ad of this avant)                |                           |                      |                              |                                 |                               |                        |                     |
| Actions Co   | Applicable: High  | applicability has been incorporated in determining the likelinoo  | of this event)                   |                           |                      |                              |                                 |                               |                        |                     |
|  | ased on the above, no appli   | icability is assigned as the control has been incorporated in the l   | likelihood of this event.        |                           |                      |                              |                                 |                               |                        |                     |
| RF   | ode Object  |   | Work to be Done                  |                           |                      |                              | Priority                        | Implementer                   | Status                 | Complete By Trackin |
|  |   | e the Water Management Plan and associated TARPs (including   | ıg                               |                           |                      |                              | Normal                          |                               | Pending                | N/A                 |
| Risk Control Co  |   | Settling Pond systems).  Description  |                                  | Owner                     | Status               | Applicability Factor         | Criticality                     | Type/Factor                   | Reviewed               | Assessment          |
| RF   | R-COP-03075 BC-004  | Containment of mine drainage within the   | e Mine Lease Area                | No Owner Defined          | In Service           | 100.0%                       | Critical Control                | Engineering                   | 6-Oct-2015             | Good                |
|  |   |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Comments Dra   | rainage system contains rete  | ention ponds and flow regulation (up to 1 in 2 year storm events  | s).                              |                           |                      |                              |                                 |                               |                        |                     |
| Th   | he base control is assessed   | via the following:  |                                  |                           |                      |                              |                                 |                               |                        |                     |
|  | Implemented: Yes  |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
|  | Type: Engineering   |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
|  | Reliability: Good   |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| - IV   | Monitoring/Auditing: Ad-Hoc   | 3   |                                  |                           |                      |                              |                                 |                               |                        |                     |
|  |   | ctiveness of the control is assessed to be GOOD.  |                                  |                           |                      |                              |                                 |                               |                        |                     |
| RISK Control Co<br>Context   | containment of mine drainage  | e (retention ponds) within the Mine Lease Area  |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Risk Control The Comments  | he retention ponds are used   | to expose the acidic drainage to sunlight which provides a med  | chanism for acids to break down. |                           |                      |                              |                                 |                               |                        |                     |
|  | rainage system contains rete  | tention ponds and flow regulation for normal flows including mind   | nor storm events.                |                           |                      |                              |                                 |                               |                        |                     |
| Th   | he risk control is assessed v   | via the following factors:  |                                  |                           |                      |                              |                                 |                               |                        |                     |
|  | Independence: High  |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
|  | Applicable: Mod-High  |   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| Ва   |   | tookiika ta aastaa ad   |                                  |                           |                      |                              |                                 |                               |                        |                     |
| equences   | ased on the above, full appli   | icability is assigned.  |                                  |                           |                      |                              |                                 |                               |                        |                     |
| nsequence Co   | ased on the above, full appli   | icability is assigned.  |                                  |                           |                      |                              |                                 |                               |                        |                     |



Tracking

N/A

Complete By

Priority

Normal

Implementer

Status

Pending

Current Rare (1) Moderate, short to medium term Community environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Proposed Rare (1) Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COM-03037 BC-00409 Monitoring equipment L171, alarm and operator response No Owner Defined In Service 31.0% Critical Control Administrative 7-Oct-2015

Base Control The equipment continuously monitor pH, turbidity, temperature and conductivity. Comments

Operator periodically monitors the systems and responds to alarms.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative/Engineering
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed as GOOD.

Risk Control Alarm and operator response

Context

Comments

Risk Control Although this is a separate system to the Water Treatment System, there is a potential for common cause failure.

The risk control is assessed via the following factors:

- Independence: Moderate (Not independent of the Water Treatment System control).
- Applicable: High

Based on the above, partial applicability is assigned as it is not fully independent of the Water Treatment System, i.e. shares similar hardware.

Actions Code Work to be Done

> RR-A-00023 Install an upgraded SCADA on-line monitoring and dosing equipment (Automate operation

> > of settling pond and O/B valves).

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Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Reviewed Status BC-00410 RR-COM-03038 Weekly sampling at discharge point L171 and L160 No Owner Defined In Service 100.0% Non-Critical Control 7-Oct-2015 Assessed Base Control Third party sampling analysis of monitoring equipment L160 and L171 on a weekly basis. This control provides assurance that the system is functioning Comments The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness of the control is assessed to be ASSESSED. Risk Control Independent third party sampling Context Risk Control The risk control is assessed via the following factors: Comments - Independence: High - Applicable: High Based on the above, full applicability is assigned. Consequence Loss in biodiversity: vegetation, habitat destruction, threatened species Code Likelihood Risk Rating Category Severity RR-CQ-00553 Current Environment & Rare (1) Moderate, short to medium term Community environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Proposed Rare (1) Low Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment BC-00410 RR-COM-03077 Weekly sampling at discharge point L171 and L160 100.0% 7-Oct-2015 No Owner Defined In Service Non-Critical Control Assessed Base Control Third party sampling analysis of monitoring equipment L160 and L171 on a weekly basis. This control provides assurance that the system is functioning. Comments The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness of the control is assessed to be ASSESSED. Risk Control Independent third party sampling Context Risk Control The risk control is assessed via the following factors: Comments - Independence: High - Applicable: High Based on the above, full applicability is assigned.

----- ID- DD D 00000 AGL



|                          |  |   |  | Active Risk S                          | cenarios ID: RR     | -R-00062                  |                      |                      |   |   | AGL         | -            |
|--------------------------|--|---|--|--|---------------------|---------------------------|----------------------|----------------------|---|---|-------------|--------------|
| Risk Control             |  | Tag ID  | Description  |  | Owner               | Status                    | Applicability Factor | Criticality          | Type/Factor   | Reviewed  | Asses       | sment        |
|                          | RR-COM-03078                             | BC-00409  | Monitoring equipment L171, alarm and operator response                     |  | No Owner Defined    | In Service                | 31.0%                | Critical Control     | Administrative  | 7-Oct-2015  | Go          | od           |
| Base Control<br>Comments | The equipment co                         | ntinuously monitor pH, tui                          | urbidity, temperature and conductivity.                                    |  |                     |                           |                      |                      |   |   |             |              |
| Comments                 | Operator periodica                       | Ilv monitors the systems                            | and responds to alarms.  |  |                     |                           |                      |                      |   |   |             |              |
|                          |  |   | •  |  |                     |                           |                      |                      |   |   |             |              |
|                          | The base control is<br>- Implemented: Ye | s assessed via the followi                          | ring:  |  |                     |                           |                      |                      |   |   |             |              |
|                          | - Type: Administra                       |   |  |  |                     |                           |                      |                      |   |   |             |              |
|                          | - Reliability: Good                      |   |  |  |                     |                           |                      |                      |   |   |             |              |
|                          | - Monitoring/Auditi                      | ng: Performance monitori                            | ring   |  |                     |                           |                      |                      |   |   |             |              |
|                          | Based on the above                       | e, the effectiveness of th                          | ne control is assessed as GOOD.  |  |                     |                           |                      |                      |   |   |             |              |
| Risk Control<br>Context  | Alarm and operato                        | r response  |  |  |                     |                           |                      |                      |   |   |             |              |
| Risk Control<br>Comments | Although this is a                       | separate system to the W                            | Vater Treatment System, there is a potential for common cause for          | ailure. Monitoring can detect lower wa | ater flows.         |                           |                      |                      |   |   |             |              |
|                          | The risk control is                      | assessed via the followin                           | ng factors:  |  |                     |                           |                      |                      |   |   |             |              |
|                          | - Independence: N<br>- Applicable: High  |   | nt of the Water Treatment System control).                                 |  |                     |                           |                      |                      |   |   |             |              |
|                          |  |   |  |  |                     |                           |                      |                      |   |   |             |              |
|                          |  |   | assigned as it is not fully independent of the Water Treatment Sy          |  |                     |                           |                      | B : "                |   | Q   |             | <b>.</b> .   |
| Actions                  | Code                                     | Objective   |  | Work to be Done                        |                     |                           |                      | Priority             | Implementer   | Status  | Complete By | Tracl        |
| 7.00.0110                |  | -   |  |  |                     |                           |                      |                      |   |   |             |              |
|                          | RR-A-00023                               | -   | ADA on-line monitoring and dosing equipment (Automate operat<br>B valves). | tion                                   |                     |                           |                      | Normal               |   | Pending   |             | N            |
|                          |  | Install an upgraded SCA                             |  | tion                                   | Code                | Category                  |                      |                      | ihood   | Pending<br>Severity   | Risk I      | N/<br>Rating |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   | Code<br>RR-CQ-00554 | Category<br>Public Safety |                      | Likel                | e (1) Injury to   | Severity a member of the public   |             |              |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel                | e (1) Injury to   | Severity o a member of the public ring medical attention).  |             | Rating       |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel                | e (1) Injury to<br>(requi<br>Membe  | Severity a member of the public   |             | Rating       |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel                | e (1) Injury to<br>(requi<br>Membe<br>to tak  | Severity o a member of the public ring medical attention). ers of the public required   | Lo          | Rating       |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel<br>Current Rar | e (1) Injury to<br>(requi<br>Membo<br>to tak<br>remain  | Severity o a member of the public ring medical attention). ers of the public required the temporary shelter or  | Lo          | Rating       |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel<br>Current Rar | e (1) Injury to (requi<br>Membo<br>to tak<br>remain<br>(c   | Severity  o a member of the public ring medical attention). rrs of the public required to temporary shelter or indoors for a short period of time (1-2 hours) o a member of the public  | L           | Rating       |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel<br>Current Rar | e (1) Injury to (requi) Membe to take remain coes (1) Injury to (requi)   | Severity  o a member of the public ring medical attention). res of the public required to temporary shelter or indoors for a short period of time (1-2 hours) o a member of the public ring medical attention).                               | L           | Rating       |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel<br>Current Rar | e (1) Injury to (requi Membe to tak remain control of the totak remain control of the | Severity  o a member of the public ing medical attention).  ors of the public required the temporary shelter or indoors for a short period of time (1-2 hours) on a member of the public ring medical attention).  ors of the public required | L           | Rating       |
|                          |  | Install an upgraded SCA<br>of settling pond and O/E |  | tion                                   |                     |                           |                      | Likel<br>Current Rar | e (1) Injury to (requisite to take take take take take take take take   | Severity  o a member of the public ring medical attention). res of the public required to temporary shelter or indoors for a short period of time (1-2 hours) o a member of the public ring medical attention).                               | L           | Rating       |

- Applicable: Low

Based on the above, no applicability is assigned.



| IL LUT TAING<br>IL MINE RISK ASS | SESSMENT                 |   |                           |  | Active Risk Scenarios ID: RR              | R-00062    |                      |                      |                |            | AGL        |
|----------------------------------|--------------------------|---|---------------------------|--|---|------------|----------------------|----------------------|----------------|------------|------------|
| =                                | Risk Control             | Code  | Tag ID                    | Description  | Owner                                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|                                  |                          | RR-COM-03079  | BC-00186                  | HSM0001C Emergency Management Plan   | No Owner Defined                          | In Service | 0.0%                 | Critical Control     | Administrative | 9-Oct-2015 | Good       |
|                                  | Base Control             | The activation of the   | ne Emergency Manage       | ement Plan may require engagement from major relevant stakeholders which m       | ay include:                               |            |                      |                      |                |            |            |
|                                  | Comments                 | - Vic police<br>- EPA   |                           |  |   |            |                      |                      |                |            |            |
|                                  |                          |   | Catchment Manageme        | nt Authority   |   |            |                      |                      |                |            |            |
|                                  |                          | - Gippsland Water   |                           |  |   |            |                      |                      |                |            |            |
|                                  |                          | - Department of He  | ealth etc.                |  |   |            |                      |                      |                |            |            |
|                                  |                          | The base control is   | s assessed via the follo  | owing:   |   |            |                      |                      |                |            |            |
|                                  |                          | - Implemented: Ye   |                           |  |   |            |                      |                      |                |            |            |
|                                  |                          | <ul> <li>Type: Administra</li> <li>Reliability: Good</li> </ul> |                           |  |   |            |                      |                      |                |            |            |
|                                  |                          |   | ng: Performance monit     | toring   |   |            |                      |                      |                |            |            |
|                                  |                          | Doord on the abov   | o the effectiveness of    | i the control is assessed to be COOD   |   |            |                      |                      |                |            |            |
|                                  | Pick Control             | Emergency Respo   |                           | f the control is assessed to be GOOD.  |   |            |                      |                      |                |            |            |
|                                  | Context                  | Lineigency (Kespe   | ilise i locedule          |  |   |            |                      |                      |                |            |            |
|                                  | Risk Control<br>Comments | Some of these haz   | zardous events may triç   | gger incident response as per the Emergency Response Procedure which will t      | be determined by the incident controller. |            |                      |                      |                |            |            |
|                                  |                          | The risk control is   | assessed via the follow   | wing factors:  |   |            |                      |                      |                |            |            |
|                                  |                          | - Independence: L   | ow                        |  |   |            |                      |                      |                |            |            |
|                                  |                          | - Applicable: Low   |                           |  |   |            |                      |                      |                |            |            |
|                                  |                          | Based on the above  | e, no applicability is as | ssigned.   |   |            |                      |                      |                |            |            |
|                                  | Risk Control             |   | Tag ID                    | Description  | Owner                                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|                                  |                          | RR-COM-03080  | BC-00436                  | P000081 Community Engagement Plan  | No Owner Defined                          | In Service | 0.0%                 | Non-Critical Control | Administrative | 8-Oct-2015 | Average    |
|                                  | Base Control<br>Comments |   | ement Plan will be acti   | ivated as required to inform any community concern following a significant incic | lent. Applicable stakeholders will be     |            |                      |                      |                |            |            |
|                                  | Comments                 | engaged.  |                           |  |   |            |                      |                      |                |            |            |
|                                  |                          | The base control is   | s assessed via the follo  | owing:   |   |            |                      |                      |                |            |            |
|                                  |                          | - Implemented: Ye   |                           |  |   |            |                      |                      |                |            |            |
|                                  |                          | <ul> <li>Type: Administra</li> <li>Reliability: Fair</li> </ul> | tive                      |  |   |            |                      |                      |                |            |            |
|                                  |                          | - Monitoring/Auditi   | ng: Ad-Hoc                |  |   |            |                      |                      |                |            |            |
|                                  |                          | Based on the abov   | ve, the effectiveness of  | f the control is asssessed to be AVERAGE.  |   |            |                      |                      |                |            |            |
|                                  | Risk Control<br>Context  | Community Engag   | ement Plan                |  |   |            |                      |                      |                |            |            |
|                                  | Risk Control<br>Comments | Engagement of sta   | akeholders within the co  | ommunity is the process to inform/manage community issues.                       |   |            |                      |                      |                |            |            |
|                                  |                          |   | assessed via the follow   | wing factors:  |   |            |                      |                      |                |            |            |
|                                  |                          | - Independence: N   | loderate                  |  |   |            |                      |                      |                |            |            |

Actions

Code

RR-A-00023

Active Risk Scenarios ID: RR-R-00062 AGL MINE RISK ASSESSMENT

Based on the above, partial applicability is assigned as it is not fully independent of the Water Treatment System, i.e. shares similar hardware.

Install an upgraded SCADA on-line monitoring and dosing equipment (Automate operation

of settling pond and O/B valves).



Tracking

N/A

Complete By

Priority

Implementer

Status

Pending

Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed RR-COM-03081 BC-00409 No Owner Defined Monitoring equipment L171, alarm and operator response In Service 31.0% Critical Control Administrative 7-Oct-2015 Good Base Control The equipment continuously monitor pH, turbidity, temperature and conductivity. Comments Operator periodically monitors the systems and responds to alarms. The base control is assessed via the following: - Implemented: Yes - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness of the control is assessed as GOOD. Risk Control Alarm and operator response Context Risk Control Although this is a separate system to the Water Treatment System, there is a potential for common cause failure. Monitoring can detect lower water flows. Comments The risk control is assessed via the following factors: - Independence: Moderate (Not independent of the Water Treatment System control). - Applicable: High

Work to be Done



Active Risk Scenarios ID: RR-R-00063 AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Impact to water (Level 4) Scenario Mining operations which could cause Level 4 impact to the environment (water) Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Unlikely (2) **Environment & Community** Level 4 (4) Moderate Proposed Likely (4) **Environment & Community** Level 4 (4) High Causes Cause Acid mine drainage from the overburden dump impacting Traralgon Creek water quality Likelihood Contribution Code Status RR-CA-00487 76.7% Active Unlikely (2) Current Unlikely (2) 1.0% Proposed Comments Potential pathways include: - exposed sulphites within excavated material to rainwater, groundwater and surface water - oxidation in the presence of air (within overdump and when exposed to air) and water acts as the transportation medium The likelihood of this event, with the Water Treatment System control in place, is considered to be UNLIKELY. Risk Control Code Tag ID Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02607 BC-00405 Water Management Plan No Owner Defined In Service 0.0% Critical Control Administrative 7-Oct-2015 Good Base Control Inputs from the hydrological model and monitoring for the overburden dump runoff form the basis of the Water Treatment System. The system includes the following water treatment: - caustic addition for pH adjustment - cationic polymer for turbidity - indirectly 10% of total dissolved solids removed with the dosing, 20% reduced by mixing with power station water The system alarms on the operating level and pH of incoming water. The base control is assessed via the following: - Implemented: Yes - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness is assessed to be GOOD. Risk Control Water Treatment System Context

Actions Code Work to be Done RR-A-00020 Finalise the Water Management Plan and associated TARPs (including

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: Low (Control applicability has been incorporated in determining the likelihood of this event)

OB & Settling Pond systems).

Based on the above, no applicability is assigned as the control has been incorporated in the likelihood of this event.

Priority Implementer Status Complete By Tracking Normal Pending N/A

Friday, October 30, 2015

12:03 pm

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|   |  |   |   | K Scenarios ID: RR-I | 1-0000     |                      |                      |                |            |            |
|---|--|---|---|----------------------|------------|----------------------|----------------------|----------------|------------|------------|
| Risk Control                                | Code   | Tag ID  | Description   | Owner                | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|   | RR-COP-03004   | BC-00408  | Environmental site plan   | No Owner Defined     | In Service | 31.0%                | Critical Control     | Administrative | 8-Oct-2015 | Average    |
|   |  |   |   |                      |            |                      |                      |                |            |            |
| Base Control                                | The plan specifies   | the allowable discharge I   | limits as referenced in the EPA licence 11149 conditions.   |                      |            |                      |                      |                |            |            |
| Comments                                    |  | g- ·  |   |                      |            |                      |                      |                |            |            |
|   | This includes ongoing  | ing visual inspection and   | remediation of targeted areas following the hydrological model and monitoring.  |                      |            |                      |                      |                |            |            |
|   | The base control is  | assessed via the followi  | ing:  |                      |            |                      |                      |                |            |            |
|   | - Implemented: Yes   |   | 9.  |                      |            |                      |                      |                |            |            |
|   | - Type: Administrat  | ive   |   |                      |            |                      |                      |                |            |            |
|   | - Reliability: Fair  |   |   |                      |            |                      |                      |                |            |            |
|   | - Monitoring/Auditin   | ng: None  |   |                      |            |                      |                      |                |            |            |
|   | Based on the above   | e, the effectiveness is as  | ssessed to be AVERAGE.  |                      |            |                      |                      |                |            |            |
| Risk Control<br>Context                     | Ongoing Rehabilita   | tion and Seepage Progra   | am  |                      |            |                      |                      |                |            |            |
| Risk Control                                | This control directly  | remediates the area of  | concern.  |                      |            |                      |                      |                |            |            |
| Comments                                    | <b>T</b> 1 11 11   |   |   |                      |            |                      |                      |                |            |            |
|   | - Independence: M  | assessed based on the fo  | ollowing factors:   |                      |            |                      |                      |                |            |            |
|   | - Applicable: Mod-F  |   |   |                      |            |                      |                      |                |            |            |
|   | Based on the above   | e, partial applicability is a   | assigned.   |                      |            |                      |                      |                |            |            |
| Risk Control                                |  | Tag ID  | Description   | Owner                | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessmen  |
|   | DD 000 0000  | 50.00440  |   |                      |            |                      |                      |                | 7.0-+ 0045 |            |
|   | RR-COP-03005   | BC-00418  | Hydrological model for the overburden dump runoff   | No Owner Defined     | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015 | Average    |
|   | RR-COP-03005   | BC-00418  | Hydrological model for the overburden dump runoff   | No Owner Defined     | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015 | Average    |
| Base Control                                | This control assess  |   | Hydrological model for the overburden dump runoff ogy of the overburden dump. It provides information allowing identification and response on tar   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015 | Average    |
| Base Control<br>Comments                    | This control assess  |   | ogy of the overburden dump. It provides information allowing identification and response on tar   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 1-0ct-2015 | Average    |
| Base Control<br>Comments                    | This control assess acidification. This is   | ses the runoff and hydrolo<br>s conducted once every \$   | ogy of the overburden dump. It provides information allowing identification and response on tar<br>5 years.   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 1-00t-2015 | Average    |
| Base Control<br>Comments                    | This control assess acidification. This is   | ses the runoff and hydrolo<br>s conducted once every 5<br>assessed via the followi  | ogy of the overburden dump. It provides information allowing identification and response on tar<br>5 years.   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-UCE-2015 | Average    |
| Base Control<br>Comments                    | This control assess<br>acidification. This is<br>The base control is<br>Implemented: Yes<br>Type: Administrat  | ses the runoff and hydrolo<br>s conducted once every \$<br>assessed via the followi   | ogy of the overburden dump. It provides information allowing identification and response on tar<br>5 years.   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-UCE-2015 | Average    |
| Base Control<br>Comments                    | This control assess<br>acidification. This is<br>The base control is<br>Implemented: Yes<br>Type: Administrat<br>Reliability: Fair   | ses the runoff and hydrolo<br>conducted once every to<br>assessed via the following<br>sive   | ogy of the overburden dump. It provides information allowing identification and response on tar<br>5 years.   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2015 | Average    |
| Base Control<br>Comments                    | This control assess<br>acidification. This is<br>The base control is<br>Implemented: Yes<br>Type: Administrat  | ses the runoff and hydrolo<br>conducted once every to<br>assessed via the following<br>sive   | ogy of the overburden dump. It provides information allowing identification and response on tar<br>5 years.   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015 | Average    |
| Base Control<br>Comments                    | This control assess<br>acidification. This is<br>The base control is<br>Implemented: Yes<br>- Type: Administrat<br>- Reliability: Fair<br>- Monitoring/Auditir   | ses the runoff and hydrolo<br>s conducted once every \$<br>assessed via the following<br>ive  | ogy of the overburden dump. It provides information allowing identification and response on tar<br>5 years.   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015 | Average    |
| Comments  Risk Control                      | This control assess acidification. This is The base control is Implemented: Yes - Type: Administrat - Reliability: Fair - Monitoring/Auditir Based on the abow Hydrological model  | ses the runoff and hydrolo<br>s conducted once every \$<br>assessed via the following<br>ive  | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  sing:   |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2015 | Average    |
| Comments  Risk Control Context Risk Control | This control assess acidification. This is acidification. This is The base control is Implemented: Yes - Type: Administrat - Reliability: Fair - Monitoring/Auditir Based on the abow Hydrological model   | ses the runoff and hydrolo<br>s conducted once every \$<br>assessed via the following<br>ive<br>ng: None<br>e, the effectiveness is as  | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  ing:  ssessed to be AVERAGE.  p runoff  |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2015 | Average    |
| Comments  Risk Control Context              | This control assess acidification. This is The base control is Implemented: Yes - Type: Administrat - Reliability: Fair - Monitoring/Auditir Based on the abow Hydrological model  | ses the runoff and hydrold is conducted once every \$ assessed via the following: None  e, the effectiveness is as for the overburden dumple and monitoring for the o   | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  seessed to be AVERAGE.  p runoff  overburden dump runoff                          |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2019 | Average    |
| Comments  Risk Control Context Risk Control | This control assess acidification. This is The base control is Implemented: Yes - Type: Administrat - Reliability: Fair - Monitoring/Auditir Based on the abow Hydrological model  | ses the runoff and hydrolo<br>s conducted once every \$<br>assessed via the following.  The second of the following in the following.  The second of the following is assessed based on the following is as a second or the following is as a second or the following is as a second or the following is a second or the foll | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  seessed to be AVERAGE.  p runoff  overburden dump runoff                          |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2019 | Average    |
| Comments  Risk Control Context Risk Control | This control assess acidification. This is acidification. This is The base control is - Implemented: Yes - Type: Administrat - Reliability. Fair - Monitoring/Auditin Based on the abow Hydrological model Hydrological model  | ses the runoff and hydrolo<br>s conducted once every s<br>assessed via the followi<br>s<br>ive<br>ag: None<br>e, the effectiveness is as<br>I for the overburden dum<br>and monitoring for the o  | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  seessed to be AVERAGE.  p runoff  overburden dump runoff                          |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2019 | Average    |
| Comments  Risk Control Context Risk Control | This control assess acidification. This is acidification. This is Implemented: Yes - Type: Administrat - Reliability: Fair - Monitoring/Auditir Based on the abow Hydrological model Hydrological model The risk control is a - Independence: Lc - Applicable: Model                                       | ses the runoff and hydrold is conducted once every \$ assessed via the following: None  e, the effectiveness is as a for the overburden dumple and monitoring for the object.   | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  seessed to be AVERAGE.  p runoff  overburden dump runoff                          |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2019 | Average    |
| Comments  Risk Control Context Risk Control | This control assess acidification. This is acidification. This is Implemented: Yes - Type: Administrat - Reliability: Fair - Monitoring/Auditir Based on the abow Hydrological model Hydrological model - Independence: Lc - Applicable: Moder The program sets to   | ses the runoff and hydrold is conducted once every \$ assessed via the following: None  e, the effectiveness is as a for the overburden dumple and monitoring for the object.   | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  ing:  ssessed to be AVERAGE. p runoff  overburden dump runoff  pollowing factors: |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2019 | Average    |
| Comments  Risk Control Context Risk Control | This control assess acidification. This is acidification. This is Implemented: Yes - Type: Administrat - Reliability: Fair - Monitoring/Auditir Based on the abow Hydrological model Hydrological model The risk control is a - Independence: Lc - Applicable: Moder The program sets to Based on the abow | ses the runoff and hydrolok is conducted once every seasessed via the following: None  e, the effectiveness is as a for the overburden dumplet and monitoring for the ownerate  he basis for the implement e, no applicability is assigned.   | ogy of the overburden dump. It provides information allowing identification and response on tar 5 years.  ing:  ssessed to be AVERAGE. p runoff  overburden dump runoff  pollowing factors: |                      | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-OCE-2019 | Average    |

### Active Dick Seenaries ID: DD D 00063



| AGL MINE RISK ASSESSMENT | Active R   | Risk Scenarios ID: RR-I     | R-00063  |          |              |              | 3L |
|--------------------------|--|-----------------------------|----------|----------|--------------|--------------|----|
| Com                      | ments Possible pathways include:   |                             |          |          |              |              |    |
|                          | - dam wall collapse (deterioration of dam structure)   |                             |          |          |              |              |    |
|                          | - seismic event  |                             |          |          |              |              |    |
|                          | - piping failure/erosion etc   |                             |          |          |              |              |    |
|                          | These pathways may result in additional water flow down Traralgon Creek.   |                             |          |          |              |              |    |
|                          | The High Level Storage Dam and Settling Pond are located outside of the mine lease area, therefore it is assessed to be outside the            | scope of the Mine Risk      |          |          |              |              |    |
|                          | Assessment and Management Plan. Therefore this cause is rejected.  |                             |          |          |              |              |    |
|                          | ·  |                             |          |          |              |              |    |
|                          | The water within the Storage Dam and Settling Pond are both used as firewater sources for the mine, therefore its reliability and effec        | tiveness is considered      |          |          |              |              |    |
|                          | during the control adequacy assessment.  |                             |          |          |              |              |    |
| Cause                    | Contamination of Traralgon or Sheepwash Creek with chemical or toxin (malicious act)   | Code                        | Status   |          |              |              |    |
|                          |  | RR-CA-00686                 | Rejected |          |              |              |    |
|                          |  |                             |          |          |              |              |    |
|                          |  |                             |          |          |              |              |    |
| Com                      | ments Malicious act within the mine site leaving the mine (eco-terrorism). This event is not considered credible as contamination of the creek | s is not achievable and are |          |          |              |              |    |
|                          | not considered to be a valued target. Therefore this cause is rejected.  |                             |          |          |              |              |    |
| Cause                    | Change in creek bed grade and flood plains due to land subsidence as a ground failure  | Code                        | Status   |          | Likelihood   | Contribution |    |
|                          |  | RR-CA-00710                 | Active   | Current  | Possible (3) | 8.0%         |    |
|                          |  |                             |          | Proposed | Possible (3) | 0.0%         |    |
|                          |  |                             |          |          | (0)          |              |    |

Comments There is a potential for this cause to result in local inundation and environmental impacts (substrate of the stream bed), which includes potential loss of biodiversity (flora & fauna).

Ground failure as a result of:

- seismic event
- high rainfall
- mining activities
- aquifer depressurisation
- geotechnical failure

There is an uncontrolled discharge of surface water into the mine from external catchments resulting in a loss of flow downstream.

These activities could potentially trigger horizontal ground strain which could result in cracking and creek water recharge of coal joints. Reduction in flow may affect biodiversity downstream.

The likelihood of this event is considered to be POSSIBLE.



Risk Control Code Tag ID Description Applicability Factor Type/Factor Status Criticality Reviewed Assessment RR-COP-03006 BC-00216 CPW001M Ground Control Management Plan No Owner Defined In Service 31.0% Critical Control Administrative 7-Oct-2015 Good Base Control GCMP - rainfall and pin monitoring. Regional subsidence model for prediction - LV Regional Groundwater Group. Comments Stability analysis and batter design, ground movement modelling (predictions). The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Monitored and audited Based on the above, the effectiveness of the control is assessed to be GOOD. Risk Control Subsidence modelling and monitoring Context Risk Control The risk control is assessed based on the following factors: Comments - Independence: Moderate - Applicable: Moderate Partial applicability is assigned as subsidence modelling and monitoring assists in the process of identifying the hazard. Actions Code Priority Implementer Status Tracking Objective Work to be Done Complete By RR-A-00005 Normal Pending N/A Review subsidence and movement data and consider changing the density and frequency of pin line / movement surveys. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-03007 BC-00426 No Owner Defined 31.0% 7-Oct-2015 In Service Non-Critical Control Administrative LV Regional Groundwater Management Plan Good

Base Control The modelling and monitoring reports are provided to Southern Rural Water. AGL Loy Yang provide information for input into the regional subsidence modelling and monitoring. They enable predictive modelling of subsidence which form the basis of the amount of groundwater removal. This ensures that overall subsidence is monitored.

The base control is assessed via the following factors:

- Implementated: Yes
- Control type: Administrative
- Reliability rating: Fair
- Monitoring/Auditing: Ad-hoc

The process is monitored and audited by the regulator and reviewed by the Regional Groundwater Management committee.

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Regional coordination modelling and monitoring of subsidence

Comments

Risk Control The risk control is assessed based on the following factors:

- Independence: Low (Not independent of subsidence modelling and monitoring control)
- Applicable: Moderate

The output from this control is combined with the subsidence modelling and monitoring control. Based on the above, partial applicability is assigned.



Risk Control Code Tag ID Description Applicability Factor Type/Factor Status Criticality Reviewed Assessment RR-COP-03008 BC-00425 Aquifer Depressurisation Annual Report No Owner Defined In Service 100.0% Critical Control Administrative 7-Oct-2015 Good

### Comments

Base Control This annual report specifies the volumes of artesian dewatering required to maintain mine stability

This is considered a critical activity for mine stability. It is a mature and established process. It is essential in maintaining safe operations within the mine. The process is monitored and reviewed. There is also an external audit required within the process.

The base control is assessed via the following factors:

- Implementation: Yes
- Control type: Administrative
- Reliability rating: Very Good
- Monitoring/Auditing: Monitored and audited

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Optimisation of groundwater extraction to minimise subsidence effects

Context

Comments

Risk Control Only the required amount of groundwater is extracted to maintain mine stability.

The risk control is assessed based on the following factors:

- Independence: High
- Applicable: Mod-High

The implementation of the action associated with the base control is expected to increase the overall effectiveness of the control.

Based on the above, full applicability is assigned.

Risk Contr

| ntrol Code | Tag ID      | Description                             | Owner            | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|------------|-------------|---|------------------|------------|----------------------|----------------------|----------------|------------|------------|
| RR-COP-030 | 09 BC-00426 | LV Regional Groundwater Management Plan | No Owner Defined | In Service | 0.0%                 | Non-Critical Control | Administrative | 5-Oct-2015 | Good       |

Base Control The modelling and monitoring reports are provided to Southern Rural Water. AGL Loy Yang provide information for input into the regional subsidence modelling Comments and monitoring. They enable predictive modelling of subsidence which form the basis of the amount of groundwater removal. This ensures that overall subsidence is monitored.

The base control is assessed via the following factors:

- Implementated: Yes
- Control type: Administrative
- Reliability rating: Fair
- Monitoring/Auditing: Ad-hoc

The process is monitored and audited by the regulator and reviewed by the Regional Groundwater Management committee.

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Regional and third party monitoring (every 5 years) reported to DEDJTR and Southern Rural Water

Risk Control Condition of Extraction licence (#2007440) Comments

The risk control is assessed based on the following factors:

Independence: Mod

Applicable: Low (no effect to reduce likelihood of cause; control function is to model and monitor subsidence

Based on the above, no applicability is assigned.

## Active Risk Scenarios ID: RR-R-00063

|--|

| RISK ASSESSI | SMENT   |  |  |   | Active Risk Sce   |  |                    |                                |          |                           |             |                            |               |             |
|--------------|---|--|--|---|---|--|--------------------|--------------------------------|----------|---------------------------|-------------|----------------------------|---------------|-------------|
| R            | Risk Control                                      | Code   | Tag ID   | Description   |   | Owner  | Status             | Applicability Factor           | Cri      | ticality                  |             | Reviewed                   | Asses         | sment       |
|              |   | RR-COP-03010   |  | Develop the trigger points for action that relate to aquifer depressurisation for Traralgon Creek   | ,   | No Owner Defined   | Proposed           | 100.0%                         | Non-Crit | tical Control             |             | 12-Oct-2015                | Go            | od          |
|              | Risk Control<br>Context                           | Develop the trigge   | r points for action that relate  | s to subsidence (surface deviation) in relation to aqu  | uifer depressurisation for Traralgon Creek and its  | flood plain.   |                    |                                |          |                           |             |                            |               |             |
|              | Risk Control<br>Comments                          | The implementatio action.  | n of this action is expected t   | to reduce the likelihood of this hazard by one order.   | Therefore one order of future risk reduction is ass   | igned to this  |                    |                                |          |                           |             |                            |               |             |
| Actions      |   | Code   | Objective  |   | Work to be Done   |  |                    |                                |          | Priority                  | Implementer | Status                     | Complete By   | Trac        |
|              |   | RR-A-00021   |  | ts for action that relates to subsidence (surface aquifer depressurisation for Traralgon Creek and  |   |  |                    |                                |          | Normal                    |             | Pending                    |               | N           |
| ause         |   | Planned Traral   | gon Bypass and assoc   | iated development to impact surface water   | r and mine stability  | Code   | Status             |                                |          | Likelihood                |             | Contribution               |               |             |
|              |   |  |  |   |   | RR-CA-00711  | Active             |                                | Current  | Rare (1)                  |             | 7.7%                       |               |             |
|              |   |  |  |   |   |  |                    |                                | Proposed | Likely (4)                |             | 98.9%                      |               |             |
|              | Comments  | A recent committee result in surface w   | ding the bypass and associate forum held by the West Giater being stored on the We   | ppsland Catchment Authority indicated that the auth stern Batters. This concept is expected to present a  | nority plans to implement flood protection for Trara significant risk to the Western Batters which could  | lgon would<br>d result in  |                    |                                |          |                           |             |                            |               |             |
|              |   | A recent committee<br>result in surface we<br>changing of the Tra<br>LIKELY. (This is a  | ding the bypass and associate forum held by the West Giater being stored on the Wearalgon Creek bed. Therefort potential future risk only).  | ted infrastructure.  ppsland Catchment Authority indicated that the auth stem Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg   | nority plans to implement flood protection for Trara significant risk to the Western Batters which could  | lgon would<br>d result in<br>ovement is                              |                    |                                |          |                           |             |                            |               |             |
| R            | Comments  | A recent committee result in surface we changing of the Tr. LIKELY. (This is a Code  | ding the bypass and associa<br>e forum held by the West Gi<br>ater being stored on the We<br>aralgon Creek bed. Therefor   | ted infrastructure.  ppsland Catchment Authority indicated that the auth stem Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg  Description  | nority plans to implement flood protection for Trara<br>significant risk to the Westem Batters which coul<br>gon Bypass project, it is considered that ground m   | lgon would<br>d result in<br>overnent is                             | Status             | Applicability Factor           |          | ticality                  |             | Reviewed                   | Asses         |             |
| R            |   | A recent committee<br>result in surface we<br>changing of the Tra<br>LIKELY. (This is a  | ding the bypass and associate forum held by the West Giater being stored on the Wearalgon Creek bed. Therefort potential future risk only).  | ted infrastructure.  ppsland Catchment Authority indicated that the auth stem Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg   | nority plans to implement flood protection for Trara<br>significant risk to the Western Batters which coul-<br>gon Bypass project, it is considered that ground m   | lgon would<br>d result in<br>ovement is                              | Status<br>Proposed | Applicability Factor<br>100.0% |          | ticality<br>tical Control |             | Reviewed<br>12-Oct-2015    | Asses<br>Asse |             |
| R            | Risk Control                                      | overall area, include A recent committee result in surface with changing of the Tr. LIKELY. (This is a Code RR-COP-03011   | ding the bypass and associal forum held by the West Giater being stored on the Wearalgon Creek bed. Therefor potential future risk only).  Tag ID  | ppsland Catchment Authority indicated that the auth stem Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg Description  AGL to engage with the department and plann   | nority plans to implement flood protection for Trara significant risk to the Western Batters which coulgon Bypass project, it is considered that ground ming authorities to ensure that the risks of the diaddressed.   | Igon would I result in ovement is  Owner  No Owner Defined           |                    | ,                              |          | •                         |             |                            |               |             |
| R            | Risk Control                                      | overall area, included A recent committee result in surface we changing of the Tr. LIKELY. (This is a Code RR-COP-03011  | ding the bypass and associal forum held by the West Giater being stored on the Wearalgon Creek bed. Therefor potential future risk only).  Tag ID  | ted infrastructure.  ppsland Catchment Authority indicated that the auth stem Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg  Description  AGL to engage with the department and plann planned Traralgon Bypass are considered and   | nority plans to implement flood protection for Trara significant risk to the Western Batters which coulgon Bypass project, it is considered that ground ming authorities to ensure that the risks of the diaddressed.   | Igon would I result in ovement is  Owner  No Owner Defined           |                    | ,                              |          | •                         |             |                            |               |             |
| R            | Risk Control  Risk Control  Context  Risk Control | overall area, include A recent committee result in surface we changing of the Tr. LIKELY. (This is a Code RR-COP-03011  AGL to engage with Learnings from the The action is expe   | ding the bypass and associal forum held by the West Gi ater being stored on the We aralgon Creek bed. Therefor potential future risk only).  Tag ID  the the department and plann we Morwell main drain project cled to reduce the likelihood cled the reduce the likelihood cled the reduce the likelihood cled the reduce the reduc | ted infrastructure.  ppsland Catchment Authority indicated that the auth stem Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg  Description  AGL to engage with the department and plann planned Traralgon Bypass are considered and sing authorities to ensure that the risks of the planned  | nority plans to implement flood protection for Trara significant risk to the Western Batters which coul gon Bypass project, it is considered that ground ming authorities to ensure that the risks of the diaddressed.  d Traralgon Bypass are considered and addresse  | Igon would<br>dresult in<br>overnent is<br>Owner<br>No Owner Defined |                    | ,                              |          | •                         |             |                            |               |             |
| R            | Risk Control  Risk Control  Context  Risk Control | overall area, include A recent committee result in surface we changing of the Tr. LIKELY. (This is a Code RR-COP-03011  AGL to engage with Learnings from the The action is expe   | ding the bypass and associal forum held by the West Gi ater being stored on the We aralgon Creek bed. Therefor potential future risk only).  Tag ID  the the department and plann we Morwell main drain project cled to reduce the likelihood cled the reduce the likelihood cled the reduce the likelihood cled the reduce the reduc | ted infrastructure.  ppsland Catchment Authority indicated that the auth stern Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg   Description  AGL to engage with the department and plann planned Traralgon Bypass are considered and ing authorities to ensure that the risks of the planned should be considered as part of this process.   | nority plans to implement flood protection for Trara significant risk to the Western Batters which coul gon Bypass project, it is considered that ground ming authorities to ensure that the risks of the diaddressed.  d Traralgon Bypass are considered and addresse  | Igon would<br>dresult in<br>overnent is<br>Owner<br>No Owner Defined |                    | ,                              | Non-Cri  | •                         | Implementer |                            |               | ssed        |
|              | Risk Control  Risk Control  Context  Risk Control | overall area, include A recent committee result in surface we changing of the Tr. LIKELY. (This is a Code RR-COP-03011  AGL to engage with Learnings from the The action is experimplementing actic implementing actic.) | e forum held by the West Gi<br>ater being stored on the We<br>aralgon Creek bed. Therefor<br>potential future risk only).  Tag ID  th the department and plann e Morwell main drain project<br>cled to reduce the likelihood<br>ons to prevent/mitigate the e<br>Objective  AGL should engage the  | ted infrastructure.  ppsland Catchment Authority indicated that the auth stern Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg   Description  AGL to engage with the department and plann planned Traralgon Bypass are considered and ing authorities to ensure that the risks of the planned should be considered as part of this process.   | nority plans to implement flood protection for Trara significant risk to the Western Batters which coul gon Bypass project, it is considered that ground ming authorities to ensure that the risks of the d addressed.  d Traralgon Bypass are considered and addresse external party (authorities) understanding the risk action.  Work to be Done | Igon would<br>dresult in<br>overnent is<br>Owner<br>No Owner Defined |                    | ,                              | Non-Cri  | tical Control             | Implementer | 12-Oct-2015                | Asse          | ssed<br>Tra |
|              | Risk Control  Risk Control  Context  Risk Control | overall area, include A recent committee result in surface we changing of the Tr. LIKELY. (This is a Code RR-COP-03011  AGL to engage with Learnings from the The action is experimplementing actic Code RR-A-00054      | e forum held by the West Gi ater being stored on the We aralgon Creek bed. Therefor potential future risk only).  Tag ID  th the department and plann e Morwell main drain project cted to reduce the likelihood ons to prevent/mitigate the e Objective  AGL should engage the the risks of the planned   | ted infrastructure.  ppsland Catchment Authority indicated that the auth stern Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralge   Description  AGL to engage with the department and planne planned Traralgon Bypass are considered and ing authorities to ensure that the risks of the planned should be considered as part of this process.  I of this event, however, it is highly dependent on the vent. Therefore, no risk reduction is assigned to this department and planning authorities to ensure that  | nority plans to implement flood protection for Trara significant risk to the Western Batters which coul gon Bypass project, it is considered that ground ming authorities to ensure that the risks of the d addressed.  d Traralgon Bypass are considered and addresse external party (authorities) understanding the risk action.  Work to be Done | Igon would<br>dresult in<br>overnent is<br>Owner<br>No Owner Defined |                    | ,                              | Non-Cri  | Priority                  | Implementer | 12-Oct-2015                | Asse          |             |
| Actions      | Risk Control  Risk Control  Context  Risk Control | overall area, include A recent committee result in surface we changing of the Tr. LIKELY. (This is a Code RR-COP-03011  AGL to engage with Learnings from the The action is experimplementing actic Code RR-A-00054      | e forum held by the West Gi ater being stored on the We aralgon Creek bed. Therefor potential future risk only).  Tag ID  th the department and plann e Morwell main drain project cted to reduce the likelihood ons to prevent/mitigate the e Objective  AGL should engage the the risks of the planned   | ted infrastructure.  ppsland Catchment Authority indicated that the auth stern Batters. This concept is expected to present a re, without AGL's involvement in the planned Traralg   Description  AGL to engage with the department and plann planned Traralgon Bypass are considered and ing authorities to ensure that the risks of the planned should be considered as part of this process.  I of this event, however, it is highly dependent on the vent. Therefore, no risk reduction is assigned to this department and planning authorities to ensure that Traralgon Bypass are considered and addressed. | nority plans to implement flood protection for Trara significant risk to the Western Batters which coul gon Bypass project, it is considered that ground ming authorities to ensure that the risks of the d addressed.  d Traralgon Bypass are considered and addresse external party (authorities) understanding the risk action.  Work to be Done | Igon would d result in ovement is  Owner  No Owner Defined d.        | Proposed           | ,                              | Non-Cri  | Priority Normal           | Implementer | 12-Oct-2015 Status Pending | Asse          | Trac        |

Comments Coal block sliding (mine permanent western batters) has the potential to impact Traralgon Creek.

Potential pathways include:

- Water levels elevated (ponded water bodies, inflow source, etc.),
- strain-softening (progressive weakening), progressive failure,
- creep movements,
- low shear-strength interseam and / or
- coal contact,
- structural complexities (eg: continuous and unfavourably oriented fault / interconnecting structures),
- water ingress due to erosion and piping, and
- water ingress from settling pond (failure of liner)

The likelihood of this event is considered to be LIKELY.



| AGL MINE RISK ASSESSMENT | Active Risk Scenarios ID: RR-R-00063          |   |  |                                     |                      |                           |                              |                               |                        |                    |  |
|--------------------------|---|---|--|-------------------------------------|----------------------|---------------------------|------------------------------|-------------------------------|------------------------|--------------------|--|
| Risk Control             | Code<br>RR-COP-03017                          | Tag ID<br>BC-00441  | Description Geotechnical Inspections and TARPS   | Owner<br>No Owner Defined           | Status<br>In Service | Applicability Factor 0.0% | Criticality Critical Control | Type/Factor<br>Administrative | Reviewed<br>7-Oct-2015 | Assessment<br>Good |  |
| Base Control<br>Comments | significant rainfall e<br>monitoring bores ha | vents (consistent with TA<br>ave been identified and a<br>assessed via the followings | er activities are undertaken as required, which may include pin monitorin<br>ARP) or other defined trigger events including ground movement episode<br>are monitored at regular intervals and in association with trigger rainfall e<br>ing factors: | s and seismic events. Key stability |                      |                           |                              |                               |                        |                    |  |
|                          | - Reliability rating: 0                       |   | ing  |                                     |                      |                           |                              |                               |                        |                    |  |
|                          | Based on the above                            | e, the effectiveness is as  | sessed to be GOOD.   |                                     |                      |                           |                              |                               |                        |                    |  |
| Risk Control<br>Context  | Geotechnical Inspe                            | ctions and TARPS  |  |                                     |                      |                           |                              |                               |                        |                    |  |
| Risk Control<br>Comments | - Independence: Lo<br>- Applicable: Low       | issessed based on the fow   | Ç  |                                     |                      |                           |                              |                               |                        |                    |  |
| Risk Control             |   | Tag ID  | Description  | Owner                               | Status               | Applicability Factor      | Criticality                  | Type/Factor                   | Reviewed               | Assessment         |  |
|                          | RR-COP-03018                                  | BC-00439  | Surface drainage inspection and maintenance  | No Owner Defined                    | In Service           | 100.0%                    | Critical Control             | Administrative                | 7-Oct-2015             | Good               |  |

Base Control Surface drainage maintenance (including clay capping) to minimise surface water inflows to coal joints, horizontal drains (monitoring and maintenance), regular Comments stability assessment and modelling using current groundwater levels (TARP).

The base control is assessed via the following factors:

- Implementation: Yes
- Control type: Administrative
- Reliability rating: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed as GOOD.

Risk Control Surface drainage inspection and maintenance

Risk Control The risk control is assessed based on the following factors:

- Comments Independence: Moderate
  - Applicable: High

Based on the above, full applicability is assigned.

Friday, October 30, 2015 12:03 pm

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00063



| ASSESSMENT               |  |                                |   | tive Risk Scenarios ID: RR |               |                      |          | - AGL      |                    |   |             |  |
|--------------------------|--|--------------------------------|---|----------------------------|---------------|----------------------|----------|------------|--------------------|---|-------------|--|
| Risk Control             |  | Tag ID                         | Description   | Owner                      | Status        | Applicability Factor |          | cality     | Type/Factor        | Reviewed  | Assessment  |  |
|                          | RR-COP-03019   | BC-00440                       | Subsurface (horizontal drains) drainage inspection and maintenance      | No Owner Defined           | In Service    | 100.0%               | Critical | Control    | Administrative     | 7-Oct-2015                                      | Good        |  |
| Base Control<br>Comments | Although drains are considered to be an engineering control, they could be blocked (restriction in flow) if not appropriately maintained, therefore, it is considered to be an administrative type control. The control is regularly monitored and there is annual inspection. |                                |   |                            |               |                      |          |            |                    |   |             |  |
|                          | The base control is assessed via the following factors:  |                                |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Implementation: Y  | es                             |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Control type: Adm  |                                |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Reliability rating: (  |                                |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Monitoring/Auditir   | g: Performance monitorin       | ng  |                            |               |                      |          |            |                    |   |             |  |
|                          | Based on the above   | e, the effectiveness of the    | e control is assessed to be GOOD.                                       |                            |               |                      |          |            |                    |   |             |  |
| Risk Control<br>Context  | Subsurface (horizo   | ntal drains) drainage inspe    | pection and maintenance   |                            |               |                      |          |            |                    |   |             |  |
| Risk Control<br>Comments | Surface drainage maintenance (including clay capping) to minimise surface water inflows to coal joints, horizontal drains (monitoring and maintenance), regular stability assessment and modelling using current groundwater levels (TARP).                                    |                                |   |                            |               |                      |          |            |                    |   |             |  |
|                          |  | ssessed based on the fol       |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Independence: M  | oderate                        |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Applicable: High   |                                |   |                            |               |                      |          |            |                    |   |             |  |
| Risk Control             |  | e, full applicability is assig |   | Owner                      | Status        | Applicability Factor | C-iti    | a a lite   | Type/Factor        |   |             |  |
|                          | RR-COP-03020   | Tag ID<br>BC-00443             | Description Inspection, monitoring and maintenance of the Settling Pond | No Owner Defined           | In Service    | 100.0%               |          | Control    | Administrative     | Reviewed<br>7-Oct-2015                          | Assessment  |  |
|                          | 111.001.00020  | 20 00 1.0                      | inspection, monitoring and maintenance of the Settling Ford             | 55                         | 00.1100       | 100.070              | Ontoo    | Control    | , an in iou activo | 7 00(2010                                       | 3000        |  |
| Base Control<br>Comments | Program for the ins  | pection, monitoring and m      | maintenance of the Settling Pond.                                       |                            |               |                      |          |            |                    |   |             |  |
|                          | The base control is  | assessed via the followin      | ng:   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Implemented: Yes   |                                |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Type: Administrat  | ve                             |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Reliability: Good  | g: Performance monitorin       |   |                            |               |                      |          |            |                    |   |             |  |
|                          | - Monitoring/Auditir   | g: Performance monitorin       | ng  |                            |               |                      |          |            |                    |   |             |  |
|                          | Based on the above   | e, the effectiveness of the    | e control is assessed to be GOOD.                                       |                            |               |                      |          |            |                    |   |             |  |
| Risk Control<br>Context  | Inspection, monitor  | ing and maintenance of th      | he Settling Pond  |                            |               |                      |          |            |                    |   |             |  |
| Risk Control             | The risk control is a  | ssessed based on the foll      | ollowing factors:   |                            |               |                      |          |            |                    |   |             |  |
|                          | Independence: Hig<br>Applicable: High  | h                              |   |                            |               |                      |          |            |                    |   |             |  |
|                          | Based on the above   | e, full applicability is assig | gned.   |                            |               |                      |          |            |                    |   |             |  |
| luences                  |  |                                |   |                            |               |                      |          |            |                    |   |             |  |
| sequence                 | Contaminated v   | vater discharge with t         | the potential to impact the environment                                 | Code                       | Category      |                      |          | Likelihood |                    | Severity  | Risk Rating |  |
|                          |  |                                |   | RR-CQ-00421                | Environment & |                      | Current  | Rare (1)   |                    | nt medium term impact                           | Moderate    |  |
|                          |  |                                |   |                            | Community     |                      |          |            | and/               | tant environment/habitat<br>or widespread local |             |  |
|                          |  |                                |   |                            |               |                      | D !      | D. (4)     |                    | munity complaints.                              |             |  |
|                          |  |                                |   |                            |               |                      | Proposed | Rare (1)   |                    | nt medium term impact                           | Moderate    |  |
|                          |  |                                |   |                            |               |                      |          |            |                    | tant environment/habitat                        |             |  |
|                          |  |                                |   |                            |               |                      |          |            | and/               | or widespread local                             |             |  |



| RISK ASSESSME | ENT                      |  |   |  | Active Risk S                 | cenarios ID: RR  | -R-00063   |                      |                      |                |            | MAGL        | <u> </u> |
|---------------|--------------------------|--|---|--|-------------------------------|------------------|------------|----------------------|----------------------|----------------|------------|-------------|----------|
| Ris           | sk Control               | Code   | Tag ID  | Description  |                               | Owner            | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Asses       | sment    |
|               |                          | RR-COM-02598   | BC-00409  | Monitoring equipment L171, alarm and operator response                           |                               | No Owner Defined | In Service | 31.0%                | Critical Control     | Administrative | 7-Oct-2015 | Go          | ·od      |
|               | Base Control<br>Comments | The equipment co   | entinuously monitor pH,                         | turbidity, temperature and conductivity.   |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | Operator periodically monitors the systems and responds to alarms. |   |  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | The base control i   | s assessed via the follo                        | wing:  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | - Implemented: Ye  |   |  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | - Type: Administra   |   |  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | - Reliability: Good  |   |  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | - Monitoring/Auditi  | ing: Performance monit                          | oring  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | Based on the abo   | ve, the effectiveness of                        | the control is assessed as GOOD.   |                               |                  |            |                      |                      |                |            |             |          |
| F             | Risk Control<br>Context  | Alarm and operato  | or response                                     |  |                               |                  |            |                      |                      |                |            |             |          |
|               | Risk Control<br>Comments | Although this is a   | separate system to the                          | Water Treatment System, there is a potential for common cause failure.           |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | The risk control is  | assessed via the follow                         | ring factors:  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | - Independence: N  | Moderate (Not independ                          | ent of the Water Treatment System control).                                      |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | - Applicable: High   |   |  |                               |                  |            |                      |                      |                |            |             |          |
|               |                          | Based on the abo   | ve, partial applicability is                    | s assigned as it is not fully independent of the Water Treatment System,         | i.e. shares similar hardware. |                  |            |                      |                      |                |            |             |          |
| Actions       |                          | Code   | Objective                                       |  | Work to be Done               |                  |            |                      | Priority             | Implementer    | Status     | Complete By | Tracki   |
|               |                          | RR-A-00023   | Install an upgraded S<br>of settling pond and C | CADA on-line monitoring and dosing equipment (Automate operation<br>0/B valves). |                               |                  |            |                      | Normal               |                | Pending    |             | N/A      |
| Ris           | sk Control               | Code   | Tag ID  | Description  |                               | Owner            | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Asses       | sment    |
|               |                          | RR-COM-02599   | BC-00410  | Weekly sampling at discharge point L171 and L160                                 |                               | No Owner Defined | In Service | 0.0%                 | Non-Critical Control |                | 7-Oct-2015 | Asse        | essed    |

Comments

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness of the control is assessed to be ASSESSED.

Risk Control Independent third party sampling

Context

Risk Control The risk control is assessed via the following factors:

Comments - Independence: High

- Applicable: Low (sampling is undertaken weekly, within this time, a spill may have already occurred).

Based on the above, no applicability is assigned.

Active Risk Scenarios ID: RR-R-00063



|   |  |  | 1  | Active Risk Scenarios ID: RR                           | ·R-00063   |                      |                     |                      |                      | AGL                 |
|---|--|--|--|--|------------|----------------------|---------------------|----------------------|----------------------|---------------------|
| Risk Control  | Code   | Tag ID   | Description  | Owner  | Status     | Applicability Factor | Criticality         | Type/Factor          | Reviewed             | Assessmen           |
|   | RR-COM-02896   | BC-00186   | HSM0001C Emergency Management Plan   | No Owner Defined                                       | In Service | 0.0%                 | Critical Conf       | rol Administrative   | 9-Oct-2015           | Good                |
| Base Control  |  |  |  |  |            |                      |                     |                      |                      |                     |
| Comments  | The activation of the  | ne Emergency Manager   | ement Plan may require engagement from major relevant stakeholders which n   | nay include:   |            |                      |                     |                      |                      |                     |
|   | - EPA  |  |  |  |            |                      |                     |                      |                      |                     |
|   |  | Catchment Managemer  | ent Authority  |  |            |                      |                     |                      |                      |                     |
|   | - Gippsland Water  |  |  |  |            |                      |                     |                      |                      |                     |
|   | - Department of He   | ealth etc.   |  |  |            |                      |                     |                      |                      |                     |
|   |  | s assessed via the follow  | owing:   |  |            |                      |                     |                      |                      |                     |
|   | - Implemented: Yes   |  |  |  |            |                      |                     |                      |                      |                     |
|   | <ul> <li>Type: Administrat</li> <li>Reliability: Good</li> </ul>   |  |  |  |            |                      |                     |                      |                      |                     |
|   |  | ng: Performance monito   | toring   |  |            |                      |                     |                      |                      |                     |
|   | Pacad on the abou  | o the effectiveness of   | f the control is assessed to be GOOD.  |  |            |                      |                     |                      |                      |                     |
| Risk Control  | Emergency Manag  |  | title collitor is assessed to be GOOD.   |  |            |                      |                     |                      |                      |                     |
| Context   |  |  |  |  |            |                      |                     |                      |                      |                     |
| Risk Control<br>Comments  | Some of these haz  | ardous events may trig   | gger incident response as per the Emergency Response Procedure which will  | be determined by the incident controller.              |            |                      |                     |                      |                      |                     |
|   |  | assessed via the follow  | wing factors:  |  |            |                      |                     |                      |                      |                     |
|   | - Independence: Lo   | OW   |  |  |            |                      |                     |                      |                      |                     |
|   | - Applicable: Low  |  |  |  |            |                      |                     |                      |                      |                     |
|   |  | e, no applicability is as  |  |  |            |                      |                     |                      |                      |                     |
| Risk Control  | Code   | Tag ID   | Description  | Owner  | Status     | Applicability Factor | Criticality         | Type/Factor          | Reviewed             | Assessmen           |
|   |  |  | •  |  |            |                      |                     |                      |                      |                     |
|   | RR-COM-02897   | BC-00436   | P000081 Community Engagement Plan  | No Owner Defined                                       | In Service | 0.0%                 | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
|   | Community Engag engaged.   | BC-00436<br>sement Plan will be active   | P000081 Community Engagement Plan iivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as a significa | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
| Base Control  | Community Engag engaged.   | BC-00436 sement Plan will be active  | P000081 Community Engagement Plan iivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as a significa | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
| Base Control  | Community Engagengaged.  The base control is - Implemented: Yes - Type: Administral  | BC-00436  ement Plan will be active a sassessed via the follows  | P000081 Community Engagement Plan iivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as a significa | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
| Base Control  | Community Engag<br>engaged.  The base control is<br>Implemented: Yes<br>Type: Administrat<br>Reliability: Fair   | BC-00436  Interest Plan will be active as assessed via the follows tive  | P000081 Community Engagement Plan iivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as a significa | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
| Base Control  | Community Engagengaged.  The base control is - Implemented: Yes - Type: Administral  | BC-00436  Interest Plan will be active as assessed via the follows tive  | P000081 Community Engagement Plan iivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as a significa | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
| Base Control  | Community Engagengaged.  The base control is Implemented: Ye-Type: Administrat - Reliability: Fair - Monitoring/Auditir  | BC-00436  ement Plan will be active s assessed via the follows s titve ng: Ad-Hoc  | P000081 Community Engagement Plan iivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as required to inform any community concern following a significant incitivated as a significa | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
| Base Control<br>Comments  | Community Engagengaged.  The base control is Implemented: Ye-Type: Administrat - Reliability: Fair - Monitoring/Auditir  | BC-00436  sement Plan will be active s assessed via the follows titve ng: Ad-Hoc re, the effectiveness of  | P000081 Community Engagement Plan ivated as required to inform any community concern following a significant incitioning:  | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
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| Base Control Comments  Risk Control Context Risk Control          | Community Engagengaged.  The base control is Implemented: Yes - Type: Administral - Reliability: Fair - Monitoring/Auditin Based on the abov Community Engagement of sta   | BC-00436  sement Plan will be active s assessed via the follows titive ng: Ad-Hoc ve, the effectiveness of sement Plan   | P000081 Community Engagement Plan  iivated as required to inform any community concern following a significant inci- owing:  If the control is asssessed to be AVERAGE.  | No Owner Defined                                       | In Service |                      | Non-Critical Co     | ntrol Administrative | 9-Oct-2015           | Average             |
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| Base Control Comments  Risk Control Context Risk Control          | Community Engage engaged.  The base control is - Implemented: Ye - Type: Administrat - Reliability: Fair - Monitoring/Auditin Based on the abov Community Engage Engagement of stather than the control is - Independence: M - Applicable: Low Based on the abov                                     | BC-00436  sement Plan will be active as assessed via the follow titive ng: Ad-Hoc ve, the effectiveness of ement Plan akeholders within the co   | P000081 Community Engagement Plan  iivated as required to inform any community concern following a significant inci- owing:  If the control is asssessed to be AVERAGE.  community is the process to inform/manage community issues.  wing factors:  | No Owner Defined                                       | In Service |                      |                     | incoming             | 9-Oct-2015  Outgoing | Average             |
| Risk Control<br>Context<br>Risk Control<br>Context                | Community Engage engaged.  The base control is - Implemented: Ye - Type: Administrat - Reliability: Fair - Monitoring/Auditin Based on the abov Community Engage Engagement of stather than the control is - Independence: M - Applicable: Low Based on the abov                                     | BC-00436  ement Plan will be active a sassessed via the follow titive ng: Ad-Hoc ve, the effectiveness of ement Plan akeholders within the co  | P000081 Community Engagement Plan  iivated as required to inform any community concern following a significant inci- owing:  If the control is asssessed to be AVERAGE.  community is the process to inform/manage community issues.  wing factors:  ssigned.  | No Owner Defined                                       |            |                      | Current             | ncoming              | Outgoing<br>Rare (1) | Probability<br>1.0% |
| Base Control Comments  Risk Control Context Risk Control Comments | Community Engage engaged.  The base control is - Implemented: Yet - Type: Administrat - Reliability: Fair - Monitoring/Auditin Based on the abov Community Engage Engagement of stather - Independence: M - Applicable: Low Based on the abov Code RR-IE-03029  This consequence                     | BC-00436  sement Plan will be active seassessed via the follows titive ng: Ad-Hoc ve, the effectiveness of sement Plan sekeholders within the co assessed via the follow loderate  ve, no applicability is as  Description  Cause contribution   | P000081 Community Engagement Plan  iivated as required to inform any community concern following a significant inci- owing:  If the control is asssessed to be AVERAGE.  community is the process to inform/manage community issues.  wing factors:  ssigned.  | No Owner Defined dent. Applicable stakeholders will be | Status     |                      | Current             | incoming             | Outgoing             | Probability         |
| Base Control Comments  Risk Control Context Risk Control Comments | Community Engage engaged.  The base control is - Implemented: Yer - Type: Administrat - Reliability: Fair - Monitoring/Auditin Based on the abov Community Engage Engagement of state - Independence: Mr Applicable: Low Based on the abov Code RR-IE-03029  This consequence likelihood is adjustit | BC-00436  sement Plan will be active s assessed via the follow stitive ng: Ad-Hoc ve, the effectiveness of sement Plan sekeholders within the co assessed via the follow loderate  ve, no applicability is as Description Cause contribution impact is only in relatio ed to UNLIKELY. | P000081 Community Engagement Plan  iivated as required to inform any community concern following a significant inci- bowing:  If the control is asssessed to be AVERAGE.  community is the process to inform/manage community issues.  wing factors:  ssigned.   | No Owner Defined dent. Applicable stakeholders will be | Status     |                      | Current<br>Proposed | ncoming              | Outgoing<br>Rare (1) | Probabili<br>1.0%   |



Owner

Owner

No Owner Defined

No Owner Defined

Community

Status

In Service

Current Rare (1)

Criticality

Critical Control

Unlikely (2)

Proposed

on important environment/habitat and/or widespread local

community complaints.

Significant medium term impact on important environment/habitat High

Assessment

Good

and/or widespread local

Administrative

Type/Factor Reviewed 7-Oct-2015

community complaints.

Base Control TARPs will trigger actions to mitigate the events of ground movement.

The base control is assessed via the following:

Tag ID

BC-00442

- Implemented: Yes
- Type: Administrative
- Reliability: Good

RR-COM-03024

- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Emergency Management Plan and TARPs

Risk Control Code

Comments

Context

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: Moderate

RR-COM-03026

- Applicable: Moderate-High

Based on the above, full applicability is assigned.

BC-00186

Risk Control Code Tag ID

HSM0001C Emergency Management Plan

Description

Description

Emergency Management Plan and TARPs

Status In Service

Applicability Factor 0.0%

Applicability Factor

100.0%

Criticality Critical Control

Type/Factor Administrative

Reviewed 7-Oct-2015 Assessment Good

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

Comments - Vic police

- EPA
- West Gippsland Catchment Management Authority
- Gippsland Water and
- Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Procedure

Comments

Risk Control Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller.

The risk control is assessed via the following factors:

- Independence: Low (not independent of Emergency Management Plan and TARPs)
- Applicable: Mod-High

Based on the above, no applicability is assigned, as not independent of the Emergency Management Plan and TARPs.

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Active Risk Scenarios ID: RR-R-00063 AGL MINE RISK ASSESSMENT



Intermediate Event Code Description Incoming Outgoing Probability RR-IE-03025 Probability of ground movement escalating to consequence Active 50.0% Current Rare (1) Rare (1) Unlikely (2) 50.0% Proposed Possible (3)

Comments Once ground movement occurs to the point where the grade of the creek bed is changing, it is difficult to reverse this process. There is a potential for mitigative controls to improve the the creek health and further mitigate the adverse effect of change to the creek. There is also a potential to reduce the magnitude of the impacts. Therefore the likelihood of the event to eventuate to the consequence is considered to be 50%.



Active Risk Scenarios ID: RR-R-00064 AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Impact to regional aquifers Scenario Sustained changes to the aquifer properties or structures which may impact future users or sensitive receptors Ratings Qualitative (Automatically Calculated) Consequence Severity Top Event Likelihood Consequence Category Max Consequence Risk Current Unlikely (2) **Environment & Community** Level 3 (1.5) Moderate Proposed Unlikely (2) **Environment & Community** Level 3 (1.5) Moderate Actions Code Priority Implementer Status Tracking Work to be Done Objective Complete By RR-A-00027 Investigate the potential impacts of sustained changes to regional aquifer Normal Pending N/A properties or structures to receptors (e.g. future water users or other sensitive receptors) as a result of the depletion of regional aguifers due to the current mining practice where groundwater is extracted to maintain mine stability. Causes Cause Cross contamination of regional aquifers from mine floor heave Likelihood Contribution Code Status RR-CA-00598 Active Current Unlikely (2) 4.9% Unlikely (2) 4.9% Proposed Comments Mining activities may result in the mine floor heave. This has the potential to damage the structure between the aquifers (T1 and MFA).

The likelihood of this event is considered to be UNLIKELY, as depressurisation is required to sustain mine operation.

Risk Control Code

Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02469 BC-00425 No Owner Defined 31.0% Aquifer Depressurisation Annual Report In Service Critical Control Administrative Good

Comments

Base Control This annual report specifies the volumes of artesian dewatering required to maintain mine stability.

This is considered a critical activity for mine stability. It is a mature and established process. It is essential in maintaining safe operations within the mine. The process is monitored and reviewed. There is also an external audit required within the process.

The base control is assessed via the following factors:

- Implementation: Yes
- Control type: Administrative
- Reliability rating: Very Good
- Monitoring/Auditing: Monitored and audited

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Monitor aquifer depressurisation and TARPS

Context

Risk Control Water volumes removed are checked against those specified in the model and licence requirements to ensure that aquifer pressures are managed, thus reducing Comments the potential for mine floor heave, and the likelihood of cross contamination between aquifers.

AGL allow redundancy in bore pumping system for pump outages and other distruptions. The optimisation of groundwater extraction reduces the potential for significant mine floor heave and thus mine stability.

The risk control is assessed based on the following factors:

- Independence: Moderate (part of the Aquifer/weight balance modelling control).
- Applicable: Mod-High

Based on the above, partial applicability is assigned as it is part of the Aquifer/weight balance modelling control.



| Risk Control  |  |  |  | Active Risk Scenarios ID: RR-  | IX-000 <del>04</del> |                               |                                  |                               |                         | AGL                  |
|---|--|--|--|--|----------------------|-------------------------------|----------------------------------|-------------------------------|-------------------------|----------------------|
| Nisk Collifor                                       | Code<br>RR-COP-03052   | Tag ID<br>BC-00216   | Description CPW001M Ground Control Management Plan   | Owner<br>No Owner Defined  | Status<br>In Service | Applicability Factor<br>31.0% | Criticality<br>Critical Control  | Type/Factor<br>Administrative | Reviewed<br>13-Oct-2015 | Assessment<br>Good   |
| Base Control<br>Comments                            | GCMP - rainfall an   | d pin monitoring. Region   | al subsidence model for prediction - LV Regional Groundwater Group.  |  |                      |                               |                                  |                               |                         |                      |
| 33  |  | nd batter design, ground   | movement modelling (predictions).  |  |                      |                               |                                  |                               |                         |                      |
|   |  | s assessed via the followi   | ng:  |  |                      |                               |                                  |                               |                         |                      |
|   | - Implemented: Ye  |  |  |  |                      |                               |                                  |                               |                         |                      |
|   | - Type: Administrat  |  |  |  |                      |                               |                                  |                               |                         |                      |
|   | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditir</li> </ul>  | ng: Monitored and audited  | d  |  |                      |                               |                                  |                               |                         |                      |
|   | Based on the abov  | e, the effectiveness of the  | e control is assessed to be GOOD.  |  |                      |                               |                                  |                               |                         |                      |
| Risk Control<br>Context                             | Aquifer/weight bala  | ance modelling   |  |  |                      |                               |                                  |                               |                         |                      |
|   | This determines th   | e minimum target for dep   | ressurisation to prevent mine floor heave. Also, the trigger levels are calc   | culated and these are incorporated into the  |                      |                               |                                  |                               |                         |                      |
|   |  |  |  |  |                      |                               |                                  |                               |                         |                      |
|   |  | assessed via the following   | -  |  |                      |                               |                                  |                               |                         |                      |
|   |  |  | aquifer depressurisation and TARPS control).   |  |                      |                               |                                  |                               |                         |                      |
|   | - Applicable: Mod-l  | High   |  |  |                      |                               |                                  |                               |                         |                      |
|   | Based on the abov  | re, partial applicability is a   | assigned as part of the Monitor aquifer depressurisation and TARPS contr   | rol.   |                      |                               |                                  |                               |                         |                      |
| Actions   | Code   | Objective  | Work to be Do  | one  |                      |                               | Priority                         | Implementer                   | Status                  | Complete By Tracking |
|   | RR-A-00005   |  | nd movement data and consider changing the<br>y of pin line / movement surveys.  |  |                      |                               | Normal                           |                               | Pending                 | N/A                  |
| Risk Control  |  | Tag ID   | Description  | Owner  | Status               | Applicability Factor          | Criticality                      | Type/Factor                   | Reviewed                | Assessment           |
|   | RR-COP-03251   | BC-00425   | Aquifer Depressurisation Annual Report   | No Owner Defined   | In Service           | 0.0%                          | Critical Control                 | Administrative                | 7-Oct-2015              | Good                 |
|   |  |  |  |  |                      |                               |                                  |                               |                         |                      |
|   |  | specifies the volumes of   | artesian dewatering required to maintain mine stability.   |  |                      |                               |                                  |                               |                         |                      |
| Base Control<br>Comments                            |  |  |  | in the second se |                      |                               |                                  |                               |                         |                      |
|   | This is considered   | a critical activity for mine   | artesian dewatering required to maintain mine stability.  stability. It is a mature and established process. It is essential in maintain s also an external audit required within the process.   | ning safe operations within the mine. The  |                      |                               |                                  |                               |                         |                      |
|   | This is considered process is monitored  | a critical activity for mine   | stability. It is a mature and established process. It is essential in maintains also an external audit required within the process.  | ning safe operations within the mine. The  |                      |                               |                                  |                               |                         |                      |
|   | This is considered process is monitor.  The base control is - Implementation: \( \text{Y} \)   | a critical activity for mine<br>ed and reviewed. There is<br>a assessed via the followi<br>Yes   | stability. It is a mature and established process. It is essential in maintains also an external audit required within the process.  | ning safe operations within the mine. The  |                      |                               |                                  |                               |                         |                      |
|   | This is considered process is monitored.  The base control is - Implementation: \( \) - Control type: Adn  | a critical activity for mine<br>ed and reviewed. There is<br>assessed via the followi<br>Yes<br>ninistrative   | stability. It is a mature and established process. It is essential in maintains also an external audit required within the process.  | ning safe operations within the mine. The  |                      |                               |                                  |                               |                         |                      |
|   | This is considered process is monitor.  The base control is - Implementation: \( \) - Control type: Adn - Reliability rating:  | a critical activity for mine<br>ed and reviewed. There is<br>assessed via the followi<br>Yes<br>ninistrative   | stability. It is a mature and established process. It is essential in maintain<br>s also an external audit required within the process.  | ning safe operations within the mine. The  |                      |                               |                                  |                               |                         |                      |
|   | This is considered process is monitor  The base control is  - Implementation:  - Control type: Adn  - Reliability rating:  - Monitoring/Auditir  | a critical activity for mine<br>ed and reviewed. There is<br>assessed via the followi<br>Yes<br>ninistrative<br>Very Good  | stability. It is a mature and established process. It is essential in maintain<br>s also an external audit required within the process.  In gractors:  | ning safe operations within the mine. The  |                      |                               |                                  |                               |                         |                      |
| Comments  | This is considered process is monitor.  The base control is - Implementation: \(^1\) - Control type: Adn - Reliability rating: - Monitoring/Auditin  Based on the abov  Optimisation of gro  | a critical activity for mine ed and reviewed. There is a assessed via the followings of the following of the following of the following. Monitored and auditer e, the effectiveness is as  | stability. It is a mature and established process. It is essential in maintain<br>s also an external audit required within the process.  In gractors:  | ning safe operations within the mine. The  |                      |                               |                                  |                               |                         |                      |
| Comments  Risk Control Context                      | This is considered process is monitor.  The base control is - Implementation: - Control type: Adn - Reliability rating: - Monitoring/Auditir  Based on the abov Optimisation of gro  | a critical activity for mine ed and reviewed. There is a sassessed via the following as assessed via the following the following the following as a sassessed via the following the following as a sassessed via the following the | stability. It is a mature and established process. It is essential in maintains also an external audit required within the process.  It is essential in maintain a factors:  |  |                      |                               |                                  |                               |                         |                      |
| Comments  Risk Control Context Risk Control         | This is considered process is monitored.  The base control is - Implementation: - Control type: Adn - Reliability rating: - Monitoring/Auditir  Based on the abov Optimisation of gro The optimisation of  | a critical activity for mine ed and reviewed. There is a sassassed via the following sassassed via the following fes ninistrative. Very Good ng: Monitored and audited the ether effectiveness is as sundwater extraction to mind of groundwater extraction assessed based on the for and reviewed.  | stability. It is a mature and established process. It is essential in maintains also an external audit required within the process.  It is essential in maintain a close and external audit required within the process.  It is essential in maintain a close session and external audit required within the process.  It is essential in maintain a close session and external audit required within the process.   |  |                      |                               |                                  |                               |                         |                      |
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| Comments  Risk Control Context Risk Control         | This is considered process is monitored.  The base control is - Implementation: \(^1\) - Control type: Adn - Reliability rating: - Monitoring/Auditing  Based on the above Optimisation of ground of | a critical activity for mine ed and reviewed. There is assessed via the following sassessed via the following fes ninistrative. Very Good ng: Monitored and audited re, the effectiveness is as sundwater extraction to mind of groundwater extraction is assessed based on the folloderate.   | stability. It is a mature and established process. It is essential in maintains also an external audit required within the process.  It is essential in maintain a large process. It is essential in maintain a large process.  It is essential in maintain and a large process. It is essential in maintain a large process. It is essenti |  |                      |                               |                                  |                               |                         |                      |
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| Risk Control<br>Context<br>Risk Control<br>Comments | This is considered process is monitoring the base control is - Implementation: \(^1\) - Control type: Adn - Reliability rating: - Monitoring/Auditing Based on the above Optimisation of ground the protein state of the control is - Independence: Monitoring and the Applicable: Low (   | a critical activity for mine ed and reviewed. There is a sasessed via the following sasessed via the following fes ministrative. Very Gooding: Monitored and auditer et., the effectiveness is as bundwater extraction to ministrative et., the effectiveness is as bundwater extraction to ministrative assessed based on the followers are sasessed based on the followers are the followers of the followe | stability. It is a mature and established process. It is essential in maintain salso an external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  | epressurisation.   | Status<br>Active     |                               | Likeli<br>Current <b>Unlik</b> e |                               | Contribution 46.6%      |                      |
| Risk Control<br>Context<br>Risk Control<br>Comments | This is considered process is monitoring the base control is - Implementation: \(^1\) - Control type: Adn - Reliability rating: - Monitoring/Auditing Based on the above Optimisation of ground the protein state of the control is - Independence: Monitoring and the Applicable: Low (   | a critical activity for mine ed and reviewed. There is a sasessed via the following sasessed via the following fes ministrative. Very Gooding: Monitored and auditer et., the effectiveness is as bundwater extraction to ministrative et., the effectiveness is as bundwater extraction to ministrative assessed based on the followers are sasessed based on the followers are the followers of the followe | stability. It is a mature and established process. It is essential in maintain salso an external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  It is essential in maintain galaxies and external audit required within the process.  | epressurisation.   |                      |                               |                                  | ly (2)                        |                         |                      |

### Active Risk Scenarios ID: RR-R-00064 AGL MINE RISK ASSESSMENT

Comments Exploration drilling activities may result in ground disturbance / interconnection of aquifers resulting in potential groundwater contamination. This has the potential

to damage the structure between the aquifers (T1 and MFA).

The exploration drilling activities is managed by permits and licence requirements. With current drilling practices, the likelihood of this event, is considered to be

Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02503 BC-00450 No Owner Defined 0.0% 7-Oct-2015 Third party contractual agreement (drilling contractors) In Service Critical Control Administrative Good

Comments

Base Control The contractual agreement specifies how drilling activities are to be undertaken.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Monitored and audited

Based on the above, the effectiveness of the control is considered as GOOD.

Risk Control Third party contractual agreement (drilling contractors)

Comments

Risk Control The requirements to comply with the exploration licence conditions is specified in this agreement.

The risk control is assessed via the following factors:

- Independence: Low (Considered in cause likelihood)
- Applicable: Mod-High

Based on the above, no applicability is assigned to this control as it has been included in the likelihood assessment.

Cause Cross contamination of regional aquifers as a result of historical drilling activities or mine related bores

RR-CA-00715

Code

Status Active

Current

Proposed

Likelihood Possible (3) Possible (3) Contribution 48.5%

48.5%

Comments There is a number of drill holes that date back to late 1800s. These drill holes have poor record and unknown construction techniques. There is a number of mine related bores which may fit this profile. The likelihood of one of this drill holes failing is considered to be POSSIBLE.

Risk Control Code

RR-COP-03056 BC-00449

LV Regional Groundwater Management Plan - Regional Bore

Owner No Owner Defined

Status In Service Applicability Factor 31.0%

Criticality Critical Control

Type/Factor Administrative

Reviewed 5-Oct-2015 Assessment Good

Base Control Through the ongoing updating and maintenance of the regional bore database, potential high risk bores are identified and remediation plans are adopted, as Comments appropriate.

The base control is assessed via the following factors:

Tag ID

- Implementation: Yes
- Control type: Administrative/Engineering
- Reliability rating: Good
- Monitoring/Auditing: Performance monitoring

The process is monitored and audited by the regulator and reviewed by the Regional Groundwater Management committee.

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Maintenance of the regional bore database

Context

Risk Control Condition of Extraction licence (#2007440) Comments

The risk control is assessed via the following factors:

- Independence: Moderate (part of the Maintenance of the regional bore database control)
- Applicable: Mod-High

Based on the above, partial applicability is assigned as this is part of the Maintenance of the regional bore database control.



Active Risk Scenarios ID: RR-R-00064 Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00449 RR-COP-03057 LV Regional Groundwater Management Plan - Regional Bore No Owner Defined In Service 31.0% Critical Control Administrative 13-Oct-2015 Good Base Control Through the ongoing updating and maintenance of the regional bore database, potential high risk bores are identified and remediation plans are adopted, as Comments appropriate. The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative/Engineering - Reliability rating: Good - Monitoring/Auditing: Performance monitoring The process is monitored and audited by the regulator and reviewed by the Regional Groundwater Management committee. Based on the above, the effectiveness is assessed to be GOOD. Risk Control Inspection and maintenance program for regional bores Context Risk Control The risk control is assessed via the following factors: Comments - Independence: Moderate (part of the Inspection and maintenance program for regional bores control) - Applicable: Mod-High Based on the above, partial applicability is assigned as this is part of the Inspection and maintenance program for regional bores control. Consequences Consequence Damage to regional aquifers Likelihood Code Category Severity Risk Rating RR-CQ-00498 Current Environment & Unlikely (2) Moderate, short to medium term Moderate Community environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Unlikely (2) Proposed Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community

riskview

complaint(s).



Risk Scenario Details Status Active Top Event Impact to land (Level 1/2) Scenario Mining operations which could cause consequence Level 1/2 impact to the environment (ground movement / land degradation) Comments None of the causes identified have the potential to impact public safety. Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Likely (4) **Environment & Community** Level 1 (0.5) Moderate Proposed Likely (4) **Environment & Community** Level 1 (0.5) Causes Cause Likelihood Contribution Damage or unauthorised removal of European or Aboriginal Archaeology and Heritage sites due to Code Status RR-CA-00549 9.0% mining activities Active Current Almost Certain (5) Almost Certain (5) 9.0% Proposed Comments There is a potential for artefacts to be damaged or removed during mining activities (exploration, excavation etc.). The artifacts that have been identified are not considered to be of significant value. As surveys have identified and retrieved artifacts within the Mine Lease Area, the likelihood of this event is considered to be ALMOST CERTAIN. Risk Control Code Tag ID Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment BC-00430 100.0% RR-COP-02380 Cultural Heritage Management Plans (CHMP) No Owner Defined In Service Non-Critical Control Procedural 7-Oct-2015 Very Good Base Control A Registered Aboriginal Party (RAP) approved Cultural Heritage Management Plan (CHMP), has been developed for mining operations. These plans involve Comments the clearance and recovery of any artefacts that may be damaged by the mining activity. Cultural Heritage Management Plans are generally developed 5 to 7 years ahead of the mining operations to allow for any variations to the mining sequence, clearance of artefacts and recovery of topsoil. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: V.Good - Monitoring/Auditing: Monitored and Audited Based on the above, the effectiveness is assessed to be VERY GOOD. Risk Control Cultural Heritage Management Plans (CHMP) in place for current operational areas Context Risk Control This control is considered to be robust and effective. The control is also third party approved and reviewed. Comments The risk control is assessed based on the following factors: - Independence: High - Applicable: High Based on the above, full applicability is assigned. Cause Localised subsidence due to areas of fire leaving burnt out voids Code Status RR-CA-00583 Rejected Comments This hazard may result in localised/limited unstable areas within the mine void. There is a potential exposure to external fire fighters. The risk associated with this is considered in RR-R-00073. As this event is not expected to result in any environmental impacts, this cause is rejected. Cause Subsidence of overburden dump due to instability from weakened or wet materials Likelihood Contribution Code Status RR-CA-00587 Active Unlikely (2) 0.0% Current 0.0% Proposed Unlikely (2)

### Active Risk Scenarios ID: RR-R-00065 AGL MINE RISK ASSESSMENT



Comments Overburden dump instability may result in large scale failure of permanent batter. Material flow that may impact mine infrastructure ie. treatment ponds, road,

Poor strength and/or wet materials placed in dump causing instability. Ground movement, poor drainage, over height dumping. Seismic event - liquefaction

This may extend to the Mining Licence boundary on the western side. The effects of this is contained within the Mine Lease Area with no impact on the environment or public safety outside of the Mine Lease Area

The likelihood of this event is considered to be UNLIKELY

| Risk | Control | Code |
|------|---------|------|
|------|---------|------|

Tag ID Description RR-COP-02990 BC-00441 Geotechnical Inspections and TARPS

Owner No Owner Defined

Status In Service Applicability Factor 100.0%

Criticality Critical Control

Type/Factor Administrative

Reviewed 7-Oct-2015 Assessment Good

Base Control Based on the results of the inspection, further activities are undertaken as required, which may include pin monitoring. Carry out mine inspections following significant rainfall events (consistent with TARP) or other defined trigger events including ground movement episodes and seismic events. Key stability monitoring bores have been identified and are monitored at regular intervals and in association with trigger rainfall events.

The base control is assessed via the following factors:

- Implementation: Yes
- Control type: Administrative
- Reliability rating: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Geotechnical Inspections and TARPS

Context

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: High

- Applicable: Mod - High

# Based on the above, full applicability is assigned. Risk Control Code

Tag ID Description RR-COP-02991 BC-00439

Surface drainage inspection and maintenance

Owner No Owner Defined

Status In Service Applicability Factor 31.0%

Criticality

Critical Control

Type/Factor Administrative

Reviewed 7-Oct-2015 Assessment

Good

Base Control Surface drainage maintenance (including clay capping) to minimise surface water inflows to coal joints, horizontal drains (monitoring and maintenance), regular Comments stability assessment and modelling using current groundwater levels (TARP).

The base control is assessed via the following factors:

- Implementation: Yes
- Control type: Administrative
- Reliability rating: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed as GOOD.

Risk Control Surface drainage inspection and maintenance

Context

Risk Control The risk control is assessed based on the following factors: Comments

- Independence: High - Applicable: Low

Based on the above, partial applicability is assigned.

Cause Land movement due to inadequate aquifer depressurisation

Code RR-CA-00603

Status Active

Likelihood Current Unlikely (2) Contribution 0.1%

Proposed Unlikely (2) 0.1%

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Comments Potential pathways include:

- inability to remove groundwater
- lack of equipment/spares due to deterioration in storage
- unstable ground conditions

Inadequate aquifer depressurisation can potentially result in mine floor heave. Mine floor heave can impact the structural integrity of regional aquifers. This is addressed in RR-R-00064. The impacts of this event is limited to the Mine Lease Area. This could potentially trigger batter movement.

The likelihood of this event is considered to be UNLIKELY.

Risk Control Code

Tag ID BC-00441

Owner No Owner Defined

Status In Service Applicability Factor 31.0%

Criticality

Critical Control

Type/Factor Administrative

Reviewed 7-Oct-2015 Assessment Good

Base Control Based on the results of the inspection, further activities are undertaken as required, which may include pin monitoring. Carry out mine inspections following significant rainfall events (consistent with TARP) or other defined trigger events including ground movement episodes and seismic events. Key stability monitoring bores have been identified and are monitored at regular intervals and in association with trigger rainfall events.

Geotechnical Inspections and TARPS

The base control is assessed via the following factors:

- Implementation: Yes

RR-COP-02993

- Control type: Administrative
- Reliability rating: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Geotechnical Inspections and TARPS

Context

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: Low (part of groundwater modelling, extraction and monitoring

- Applicable: Moderate

Based on the above, partial applicability is assigned as this is part of the groundwater modelling, extraction and monitoring.

Risk Control Code

Tag ID RR-COP-02994 BC-00445 Description

Groundwater modelling, extraction and monitoring

Owner No Owner Defined Status

In Service

Applicability Factor 31.0%

Criticality Non-Critical Control

Reviewed 7-Oct-2015 Assessment

Base Control Regional subsidence modelling. LV Regional Groundwater Committee to collaborate on depressurisation program. GCMP - pin survey monitoring program Comments including regional pin network. Maintenance inspections and pipe pressure monitoring.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Groundwater modelling, extraction and monitoring

Context

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: Low (part of Geotechnical Inspections and TARPS)

- Applicable: High

Based on the above, partial applicability is assigned as this is part of Geotechnical Inspections and TARPS.

Cause

Damage to potable water services to parts of Traralgon due to ground movement from mining activities

Code RR-CA-00628 Status

Rejected

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Active Risk Scenarios ID: RR-R-00065 AGL MINE RISK ASSESSMENT Comments Potential pathways include: - aquifer depressurisation - mining activity Failure on the pipeline may affect potable water supply to some parts of Traralgon. This may result in disruption to services and is considered not to be a risk to public safety or environment. Therefore, this is assessed as outside the Mine Risk Management Plan. Cause Ground movement single batter failure - operations Likelihood Contribution Code Status RR-CA-00645 Possible (3) 0.9% Active Current 0.9% Proposed Possible (3) Comments Ground movement of single batter due to: - undercutting - surface water build up - unfavourable structures / jointing The likelihood of this event is considered to be POSSIBLE. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02792 BC-00166 No Owner Defined In Service 31.0% Non-Critical Control Administrative 1-Sep-2015 Daily Mine Inspections Average Base Control Shift personnel are required to undertake work place inspection which includes looking for obvious ground related issues, i.e. ground movement and hotspots. The base control is assessed via the following: - Implemented: Part - Type: Administrative - Reliability: Fair - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness is assessed to be AVERAGE. Risk Control Daily mine inspections and operator action Risk Control The inspections will identify any incorrect batter angle that may have occurred, an assessment is then made on the appropriate corrective action. Supervisor Comments undertakes inspection of batter including the operating face daily. The risk control is assessed based on the following factors: - Independence: Moderate - Applicable: Moderate Based on the above, partial applicability is assigned. Actions Code Objective Work to be Done Priority Implementer Status Tracking Complete By

> RR-A-00046 Formalise the process of conducting daily mine inspections which

> > includes looking for obvious ground related issues, i.e. ground movement

and hotspots.

N/A

Pending

Normal

Active Risk Scenarios ID: RR-R-00065



| E RISK ASSESSMENT        |  |  | Active Risk Scer                                     | narios ID: RR-l           | R-00065              |                               |          |                   |                               |                        | AGL         | -   |
|--------------------------|--|--|--|---------------------------|----------------------|-------------------------------|----------|-------------------|-------------------------------|------------------------|-------------|-----|
| Risk Control             | Code         Tag ID           RR-COP-02997         BC-00441  | Description Geotechnical Inspections and TARPS   |  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor 31.0%    |          | cality<br>Control | Type/Factor<br>Administrative | Reviewed<br>7-Oct-2015 | Assess      |     |
| Base Control<br>Comments | significant rainfall events (consistent wi   | further activities are undertaken as required, which may ir<br>ith TARP) or other defined trigger events including ground<br>and are monitored at regular intervals and in association v | movement episodes and seismic events. Key stabilit   |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | The base control is assessed via the fo<br>- Implementation: Yes<br>- Control type: Administrative<br>- Reliability rating: Good | ollowing factors:  |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | - Monitoring/Auditing: Performance mon   |  |  |                           |                      |                               |          |                   |                               |                        |             |     |
| Risk Control<br>Context  | Based on the above, the effectiveness<br>Geotechnical Inspections and TARPS  |  |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | The risk control is assessed based on t  |  |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          |  | y is assigned as this is part of ground movement modellin  | g and monitoring.                                    |                           |                      |                               |          |                   |                               |                        |             |     |
| Risk Control             | Code         Tag ID           RR-COP-02998         BC-00216  | Description CPW001M Ground Control Management Pla  | an   | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>31.0% |          | Control           | Type/Factor<br>Administrative | Reviewed<br>7-Oct-2015 | Assess      |     |
| Base Control<br>Comments |  | egional subsidence model for prediction - LV Regional Gro  | oundwater Group.                                     |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | Stability analysis and batter design, gro  |  |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | The base control is assessed via the fo<br>- Implemented: Yes  | ollowing:  |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | - Type: Administrative<br>- Reliability: Good  |  |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | - Monitoring/Auditing: Monitored and au  | udited   |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | Based on the above, the effectiveness  | of the control is assessed to be GOOD.   |  |                           |                      |                               |          |                   |                               |                        |             |     |
| Risk Control<br>Context  | Ground movement modelling and moni   | itoring  |  |                           |                      |                               |          |                   |                               |                        |             |     |
| Risk Control<br>Comments | GCMP - pin surveys including calculation are made to observe water level.  | on of strain along radial survey lines. Subsidence prediction  | ons along area of current alignment. Piezometer obse | ervations                 |                      |                               |          |                   |                               |                        |             |     |
|                          |  | ored regularly. This data is regularly reviewed to determinis study would trigger actions following the analysis, this v   |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | The risk control is assessed based on t<br>- Independence: Low-Moderate (Part of<br>- Applicable: Mod-High                       | the following factors:<br>if Geotechnical Inspections and TARPS)   |  |                           |                      |                               |          |                   |                               |                        |             |     |
|                          | Based on the above, partial applicability  | y is assigned as this is part of the Geotechnical Inspection   | ns and TARPS.  |                           |                      |                               |          |                   |                               |                        |             |     |
| Actions                  | Code Objective   |  | Work to be Done                                      |                           |                      |                               |          | Priority          | Implementer                   | Status                 | Complete By | Tra |
|                          |  | nce and movement data and consider changing the uency of pin line / movement surveys.  |  |                           |                      |                               |          | Normal            |                               | Pending                |             | 1   |
| Cause                    | Acid mine drainage from the over   | erburden dump impacting land   |  | Code                      | Status               |                               |          | Likelihood        |                               | Contribution           |             |     |
|                          |  |  |  | RR-CA-00707               | Active               |                               | Current  | Likely (4)        |                               | 89.9%                  |             |     |
|                          |  |  |  |                           |                      |                               | Proposed | Likely (4)        |                               | 89.9%                  |             |     |

# Active Risk Scenarios ID: RR-R-00065



Comments Potential pathways include:

- exposed sulphites within excavated material to rainwater and surface water

The acid mine drainage from the OB dump is expected to be contained within the Mine Lease Area. This event is occurring in some small areas, therefore, the

Hydrological model for the overburden dump runoff

likelihood of this event is considered to be LIKELY.

Risk Control Code

Tag ID BC-00418 RR-COP-02986

Description

Owner No Owner Defined

Status In Service Applicability Factor 31.0%

Criticality Non-Critical Control

Type/Factor Administrative

Reviewed 7-Oct-2015 Assessment Average

Base Control This control assesses the runoff and hydrology of the overburden dump. It provides information allowing identification and response on targeted areas preventing Comments acidification. This is conducted once every 5 years.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: None

Based on the above, the effectiveness is assessed to be AVERAGE.

Context

Risk Control Hydrological model for the overburden dump runoff

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: Low (part of the Ongoing Rehabilitation and Seepage Program)

- Applicable: Mod-High

Based on the above, partial applicability is assigned as the control is part of the Ongoing Rehabilitation and Seepage Program.

Risk Control Code

Tag ID RR-COP-02987 BC-00408 Description

Environmental site plan

Owner No Owner Defined

Status In Service

Applicability Factor 31.0%

Criticality

Critical Control

Type/Factor Administrative

Reviewed 8-Oct-2015 Assessment Average

Comments

Base Control The plan specifies the allowable discharge limits as referenced in the EPA licence 11149 conditions.

This includes ongoing visual inspection and remediation of targeted areas following the hydrological model and monitoring.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: None

- Applicable: Moderate

Based on the above, the effectiveness is assessed to be AVERAGE.

Risk Control Ongoing Rehabilitation and Seepage Program

Risk Control The risk control is assessed based on the following factors:

Comments - Independence: Moderate (part of Hydrological model for the overburden dump runoff)

Based on the above, partial applicability is assigned as this is part of Hydrological model for the overburden dump runoff

Consequences

Ground movement / land degradation with the potential to impact the environment Consequence

Code RR-CQ-00456 Category

Environment & Community

Current

Likelihood Likely (4)

Severity Level 1 (0.5)

Moderate

Proposed Likely (4) Level 1 (0.5) Moderate

Risk Rating

Active Risk Scenarios ID: RR-R-00065 AGL MINE RISK ASSESSMENT



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed RR-COM-02999 BC-00186 HSM0001C Emergency Management Plan 0.0% No Owner Defined In Service Critical Control Administrative 7-Oct-2015 Good

Comments - Vic police

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

- - EPA
  - West Gippsland Catchment Management Authority
  - Gippsland Water and
  - Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Procedure

Comments

Risk Control Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller.

The risk control is assessed based on the following factors:

- Independence: Low
- Applicable: Low

Based on the above, no applicability is assigned.



Risk Scenario Details Status Active Top Event Impact to land (Level 3) Scenario Mining operations which could cause Level 3 impact to the environment (ground movement / land degradation) and or public safety Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Unlikely (2) **Environment & Community** Level 3 (1.5) Low Low Proposed Unlikely (2) **Environment & Community** Level 3 (1.5) Causes Cause Damage to Saline Waste Outfall Pipeline (SWOP) due ground movement from mining activities Likelihood Contribution Code Status RR-CA-00552 0.3% Active Rare (1) Current 0.5% Proposed Rare (1) Comments There is a potential that mining activities may result in ground movement that could affect the mechanical integrity of the SWOP system. This may result in failure of the pipeline causing a leak of saline water to land. The area where the SWOP traverse is not an area that is subject to significant strain nor significant ground movement. Therefore, the likelihood of this event occurring is considered to be RARE. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment

No Owner Defined

In Service

0.0%

Non-Critical Control

Procedural

7-Oct-2015

Good

Base Control The base control is assessed via the following:

BC-00444

Comments - Implemented: Yes

- Type: Administrative

RR-COP-02387

- Reliability: Good

- Monitoring/Auditing: Monitored and audited

Based on the above, the effectiveness of the control is assessed as GOOD.

Risk Control Subsidence modelling and monitoring

Context

Risk Control Regional subsidence modelling. LV Regional Groundwater Committee to collaborate on depressurisation program. GCMP - pin survey monitoring program including regional pin network. Maintenance inspections and pipe pressure monitoring. Subsidence modelling and monitoring is considered to assist in

Subsidence modelling and monitoring

identifying the risk.

The risk control is assessed based on the following factors:

- Independence: Low

- Applicable: Low

Based on the above, no applicability is assigned.

Active Risk Scenarios ID: RR-R-00066 AGL MINE RISK ASSESSMENT



| Risk Control             | Code                  | Tag ID                            | Description   | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed     | Assessment |
|--------------------------|-----------------------|-----------------------------------|---|------------------|------------|----------------------|------------------|----------------|--------------|------------|
|                          | RR-COP-02708          | BC-00429                          | Gippsland Water Authority & AGL Agreement   | No Owner Defined | In Service | 100.0%               | Critical Control | Administrative | 8-Oct-2015   | Good       |
|                          |                       |                                   |   |                  |            |                      |                  |                |              |            |
| Base Control<br>Comments | The agreement sets    | the roles and responsibilities    | between AGL and Gippsland Water regarding the management of the SWOP pump station and | d pipeline.      |            |                      |                  |                |              |            |
|                          | The base control is   | assessed via the following:       |   |                  |            |                      |                  |                |              |            |
|                          | - Implemented: Yes    |                                   |   |                  |            |                      |                  |                |              |            |
|                          | - Type: Administrativ | ve                                |   |                  |            |                      |                  |                |              |            |
|                          | - Reliability: Good   |                                   |   |                  |            |                      |                  |                |              |            |
|                          | - Monitoring/Auditing | g: Ad-hoc                         |   |                  |            |                      |                  |                |              |            |
|                          | Based on the above    | , the effectiveness is assesse    | ed to be GOOD.  |                  |            |                      |                  |                |              |            |
| Risk Control<br>Context  |                       | y visual inspection of the pipe   | line  |                  |            |                      |                  |                |              |            |
| Risk Control<br>Comments |                       | pection conducted by Gippsla      | nd Water.   |                  |            |                      |                  |                |              |            |
|                          | The risk control is a | ssessed based on the following    | ng factors:   |                  |            |                      |                  |                |              |            |
|                          | Independence: High    |                                   |   |                  |            |                      |                  |                |              |            |
|                          | Applicable: Mod-Hig   | h                                 |   |                  |            |                      |                  |                |              |            |
|                          | Based on the above    | , full applicability is assigned. |   |                  |            |                      |                  |                |              |            |
| Cause                    | Regional subsid       | ence due to groundwate            | er extraction from mining activities  | Code             | Status     |                      | Likeli           | hood           | Contribution |            |
|                          |                       |                                   |   | RR-CA-00585      | Active     | (                    | Current Unlike   | ly (2)         | 32.8%        |            |
|                          |                       |                                   |   |                  |            | Pro                  | oposed Unlike    | ly (2)         | 46.5%        |            |

## Comments Potential pathways include:

- tensile strains due to stress relief and additional strains due to block movement
- horizontal movement due to block movement.

Regional subsidence that may impact community services, i.e.:

- Sewage ground movement exceeding design criteria (alongside Traralgon Creek Rd)
- gas
- potable water services
- pavement/housing
- Hydraulic sewer flow impact due to change in grade
- Old LCC Landfill / Transfer Station ground movement exceeds tolerance limits. Failure of natural liner and clay cap, redistribution of waste materials, exposure of hazardous materials.

The infrastructure which could potentially be impacted is situated at a distance from the mine hence, the tilt and ground strains is considered to be minor. Therefore, the likelihood of this event is considered to be UNLIKELY.



| GL MINE RISK ASSESSMENT |   |                             |  | Active Risk Scenarios ID: RR-I            | R-00066    |                      |                      |                |              | AGL        |
|-------------------------|---|-----------------------------|--|---|------------|----------------------|----------------------|----------------|--------------|------------|
| Risk Cont               | ol Code   | Tag ID                      | Description  | Owner                                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed     | Assessment |
|                         | RR-COP-02666  | BC-00426                    | LV Regional Groundwater Management Plan  | No Owner Defined                          | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015   | Good       |
|                         |   |                             |  |   |            |                      |                      |                |              |            |
| Base Con                |   |                             | e provided to Southern Rural Water. AGL Loy Yang provide information for i       |   |            |                      |                      |                |              |            |
| Comme                   | and monitoring. T<br>subsidence is mo                               |                             | nodelling of subsidence which form the basis of the amount of groundwater        | removal. This ensures that overall        |            |                      |                      |                |              |            |
|                         | Subsiderice is mic  | intorea.                    |  |   |            |                      |                      |                |              |            |
|                         |   | is assessed via the follo   | owing factors:   |   |            |                      |                      |                |              |            |
|                         | <ul> <li>Implementated:</li> <li>Control type: Ad</li> </ul>        |                             |  |   |            |                      |                      |                |              |            |
|                         | - Reliability rating  | : Fair                      |  |   |            |                      |                      |                |              |            |
|                         | - Monitoring/Audi   | ting: Ad-hoc                |  |   |            |                      |                      |                |              |            |
|                         | The process is m  | onitored and audited by     | the regulator and reviewed by the Regional Groundwater Management cor            | nmittee.                                  |            |                      |                      |                |              |            |
|                         | Based on the abo  | ove, the effectiveness is   | assessed to be GOOD.   |   |            |                      |                      |                |              |            |
| Risk Con<br>Cont        |   | ation modelling and mor     | nitoring of subsidence   |   |            |                      |                      |                |              |            |
| Risk Con<br>Comme       |   | his control is combined     | with the subsidence modelling and monitoring control.                            |   |            |                      |                      |                |              |            |
|                         |   | s assessed based on the     | e following factors:   |   |            |                      |                      |                |              |            |
|                         | <ul> <li>Independence: I</li> <li>Applicable: Low</li> </ul>        |                             |  |   |            |                      |                      |                |              |            |
|                         | - Applicable. Low   |                             |  |   |            |                      |                      |                |              |            |
|                         |   | ove, no applicability is as | ssigned.   |   |            |                      |                      |                |              |            |
| Risk Cont               |   | Tag ID                      | Description  | Owner                                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed     | Assessment |
|                         | RR-COP-02988  | BC-00444                    | Subsidence modelling and monitoring  | No Owner Defined                          | In Service | 0.0%                 | Non-Critical Control | Procedural     | 8-Oct-2015   | Good       |
| Base Con                | rol The base control  | is assessed via the follo   | owing:   |   |            |                      |                      |                |              |            |
| Comme                   | impioritoritos. 1   |                             |  |   |            |                      |                      |                |              |            |
|                         | <ul> <li>Type: Administration</li> <li>Reliability: Good</li> </ul> |                             |  |   |            |                      |                      |                |              |            |
|                         | •   | ting: Monitored and aud     | lited  |   |            |                      |                      |                |              |            |
|                         | Based on the abo  | ove, the effectiveness of   | f the control is assessed as GOOD.   |   |            |                      |                      |                |              |            |
| Risk Con<br>Cont        | rol Subsidence mode   | elling and monitoring       |  |   |            |                      |                      |                |              |            |
|                         |   | r loval monitorina roqui    | lar (12-month reporting) assessment of strain levels. Subsidence modelling       | and manifesing is considered to essist in |            |                      |                      |                |              |            |
| Comme                   | identifying the ris   |                             | iai (12-inorum reporumg) assessment or suam revers. Subsidence modelling         | and monitoring is considered to assist in |            |                      |                      |                |              |            |
|                         | This is not expect  | ted to stop the actual re   | gional subsidence.   |   |            |                      |                      |                |              |            |
|                         |   | s assessed based on the     | e following factors:   |   |            |                      |                      |                |              |            |
|                         | <ul> <li>Independence: I</li> <li>Applicable: Low</li> </ul>        |                             |  |   |            |                      |                      |                |              |            |
|                         | - Applicable: Low   |                             |  |   |            |                      |                      |                |              |            |
|                         |   | ove, no applicability is as |  |   |            |                      |                      |                |              |            |
| Cause                   | Fire Services   | Pond wall failure du        | ue to ground movement from a seismic event                                       | Code                                      | Status     |                      | Likelih              |                | Contribution |            |
|                         |   |                             |  | RR-CA-00594                               | Active     |                      | Current Rare         |                | 0.1%         |            |
|                         |   |                             |  |   |            |                      | Proposed Rare        | (1)            | 0.2%         |            |
| Comme                   |   |                             | ins, in combination with the northern Ash Pond wall failure could potentially in | mpact the Loy Yang B. The likelihood of   |            |                      |                      |                |              |            |
|                         | triis event is cons   | idered to be RARE.          |  |   |            |                      |                      |                |              |            |

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ACLIVE Risk Scenarios ID: RR-R-00066

Traralgon Creek Road. The likelihood of the natural events to result in this failure is considered to be RARE.



| E RISK ASSESSMENT        |  |                                |  | Active Risk So        | cenarios ID: RR-          | R-00066              |                                |          |                        |                               |                        |             |        |
|--------------------------|--|--------------------------------|--|-----------------------|---------------------------|----------------------|--------------------------------|----------|------------------------|-------------------------------|------------------------|-------------|--------|
| Risk Control             | Code<br>RR-COP-02465   | Tag ID<br>BC-00423             | Description  Dam Management Plan   |                       | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>100.0% |          | ticality<br>al Control | Type/Factor<br>Administrative | Reviewed<br>7-Oct-2015 |             | ssment |
| Base Control<br>Comments | Dam management   | plan includes TARPs to w       | which will trigger a response to mitigate the effects                                  | s of ground movement. |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | The base control is  | assessed via the following     | ng:  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | - Implemented: Yes   |                                |  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | <ul> <li>Type: Administrat</li> <li>Reliability: Good</li> </ul> | ve                             |  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | •  | g: Performance monitorin       | ng   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | Based on the above   | e, the effectiveness is ass    | sessed to be GOOD.   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
| Risk Control<br>Context  |  | per ANCOLD guidelines          |  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
| Risk Control<br>Comments | The risk control is a  | ssessed based on the fol       | llowing factors:   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | - Applicable: High   | •                              |  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | Based on the above   | e, full applicability is assig | ned.   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
| Actions                  | Code   | Objective                      |  | Work to be Done       |                           |                      |                                |          | Priority               | Implementer                   | Status                 | Complete By | Tracl  |
|                          | RR-A-00024   |                                | sh Creek flow retention area into the Dam<br>d adopt ANCOLD guidelines for management. |                       |                           |                      |                                |          | Normal                 |                               | Pending                |             | N/     |
| Risk Control             | Code   | Tag ID                         | Description  |                       | Owner                     | Status               | Applicability Factor           | Crit     | ticality               | Type/Factor                   | Reviewed               | Asses       | sment  |
|                          | RR-COP-02667   | BC-00442                       | Emergency Management Plan and TARPs  | s                     | No Owner Defined          | In Service           | 31.0%                          | Critica  | al Control             | Administrative                | 8-Oct-2015             |             | ood    |
| Base Control<br>Comments | TARPs will trigger a   | actions to mitigate the eve    | ents of ground movement.   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | The base control is  | assessed via the followin      | ng:  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | - Implemented: Yes   |                                |  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | <ul> <li>Type: Administrat</li> <li>Reliability: Good</li> </ul> | ve                             |  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | •  | g: Performance monitorin       | ng   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | Based on the above   | e, the effectiveness is ass    | sessed to be GOOD.   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
| Risk Control<br>Context  |  | ement Plan and TARPs           |  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
| Risk Control<br>Comments | The risk control is a  | ssessed based on the fol       | llowing factors:<br>managed as per ANCOLD guidelines)                                  |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          | - Applicable: Moder  |                                | managed as per virto of by guidelinesy   |                       |                           |                      |                                |          |                        |                               |                        |             |        |
|                          |  |                                | ssigned as part of the Dam managed as per ANCO   | OLD guidelines.       |                           |                      |                                |          |                        |                               |                        |             |        |
| Cause                    | OB run off pond  | wall failure due to se         | eismic event or extreme rainfall   |                       | Code                      | Status               |                                |          | Likelihoo              |                               | Contribution           |             |        |
|                          |  |                                |  |                       | RR-CA-00597               | Active               |                                | Current  | Rare (1)               |                               | 1.1%                   |             |        |
|                          |  |                                |  |                       |                           |                      |                                | Proposed | Rare (1)               |                               | 1.5%                   |             |        |

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| IISK ASSE | 22INIEIN I               |   |                               |   | Active Risi                            | k Scenarios ID: KK-I | <b>1-00000</b> |                      |          |            |                | The same of  | Street, Square or other party of |
|-----------|--------------------------|---|-------------------------------|---|--|----------------------|----------------|----------------------|----------|------------|----------------|--------------|----------------------------------|
|           | Risk Control             | Code  | Tag ID                        | Description   |  | Owner                | Status         | Applicability Factor | Critic   | cality     | Type/Factor    | Reviewed     | Assessment                       |
|           |                          | RR-COP-02673  | BC-00423                      | Dam Management Plan   |  | No Owner Defined     | In Service     | 0.0%                 | Critical | Control    | Administrative | 7-Oct-2015   | Good                             |
|           | Base Control<br>Comments | Dam management  | plan includes TARPs to v      | which will trigger a response to mitigate the effect                                | s of ground movement.                  |                      |                |                      |          |            |                |              |                                  |
|           |                          | The base control is   | assessed via the following    | ng:   |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | - Implemented: Yes  | 3                             |   |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | - Type: Administrat   | ive                           |   |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | - Reliability: Good   | ng: Performance monitorir     | ng  |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | Worldoning// tuditii  | ig. i chomianoc momon         | 19  |  |                      |                |                      |          |            |                |              |                                  |
|           |                          |   | e, the effectiveness is ass   | sessed to be GOOD.  |  |                      |                |                      |          |            |                |              |                                  |
|           | Risk Control<br>Context  | Dam managed as  | per ANCOLD guidelines         |   |  |                      |                |                      |          |            |                |              |                                  |
|           | Risk Control<br>Comments | The risk control is a   | assessed based on the fo      | llowing factors:  |  |                      |                |                      |          |            |                |              |                                  |
|           |                          |   | not specific to OB run off    | pond walls)   |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | Based on the abov   | e, no applicability is assig  | ned. Note that implementation of action will incre                                  | ase the applicability of this control. |                      |                |                      |          |            |                |              |                                  |
| Actions   |                          | Code  | Objective                     |   | Work to be Done                        |                      |                |                      | P        | riority    | Implementer    | Status       | Complete By Tracki               |
|           |                          | RR-A-00024  |                               | sh Creek flow retention area into the Dam d adopt ANCOLD guidelines for management. |  |                      |                |                      | N        | Normal     |                | Pending      | N/A                              |
|           | Risk Control             | Code  | Tag ID                        | Description   |  | Owner                | Status         | Applicability Factor | Critic   | cality     | Type/Factor    | Reviewed     | Assessment                       |
|           |                          | RR-COP-02674  | BC-00442                      | Emergency Management Plan and TARF  | Ps .                                   | No Owner Defined     | In Service     | 31.0%                | Critical | Control    | Administrative | 8-Oct-2015   | Good                             |
|           | Base Control<br>Comments | The base control is   | assessed via the following    | ents of ground movement.  |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | <ul> <li>Implemented: Yes</li> <li>Type: Administrat</li> </ul> |                               |   |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | - Reliability: Good   | ive                           |   |  |                      |                |                      |          |            |                |              |                                  |
|           |                          |   | ng: Performance monitorir     | ng  |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | Based on the abov   | e, the effectiveness is ass   | sessed to be GOOD.  |  |                      |                |                      |          |            |                |              |                                  |
|           | Risk Control<br>Context  | Emergency Manag   | ement Plan and TARPs          |   |  |                      |                |                      |          |            |                |              |                                  |
|           |                          |   |                               | llowing factors:<br>managed as per ANCOLD guidelines)                               |  |                      |                |                      |          |            |                |              |                                  |
|           |                          | Based on the abov   | e, partial applicability is a | ssigned as part of the Dam managed as per ANC                                       | OLD guidelines.                        |                      |                |                      |          |            |                |              |                                  |
| use       |                          | Damage to Sali  | ne Waste Outfall Pip          | eline (SWOP) due to internal corrosion/   | wear                                   | Code                 | Status         |                      |          | Likelihood |                | Contribution |                                  |
|           |                          |   |                               |   |  | RR-CA-00630          | Active         |                      | Current  | Rare (1)   |                | 0.0%         |                                  |
|           |                          |   |                               |   |  |                      |                |                      | Proposed | Rare (1)   |                | 0.0%         |                                  |
|           |                          |   |                               |   |  |                      |                |                      |          |            |                | 0.0 /0       |                                  |

would require the leak to occur for a few days. Therefore, the likelihood of this event is considered to be RARE.

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00066



| ASSESSMENT               |  |                             | A  | ctive Risk Scenarios ID: RR-I   | <b>X-UUUOO</b> |                      |          |           |                |              | The second second |
|--------------------------|--|-----------------------------|--|---------------------------------|----------------|----------------------|----------|-----------|----------------|--------------|-------------------|
| Risk Control             | Code   | Tag ID                      | Description  | Owner                           | Status         | Applicability Factor | Criti    | icality   | Type/Factor    | Reviewed     | Assessment        |
|                          | RR-COP-02656                                 | BC-00429                    | Gippsland Water Authority & AGL Agreement  | No Owner Defined                | In Service     | 100.0%               | Critical | I Control | Administrative | 8-Oct-2015   | Good              |
| Base Control             | The agreement sets                           | the roles and responsibi    | oilities between AGL and Gippsland Water regarding the management of the S       | SWOP pump station and pipeline. |                |                      |          |           |                |              |                   |
| Comments                 |  |                             |  |                                 |                |                      |          |           |                |              |                   |
|                          | I he base control is a<br>- Implemented: Yes | ssessed via the followin    | ug:  |                                 |                |                      |          |           |                |              |                   |
|                          | - Type: Administrativ                        | A                           |  |                                 |                |                      |          |           |                |              |                   |
|                          | - Reliability: Good                          | •                           |  |                                 |                |                      |          |           |                |              |                   |
|                          | - Monitoring/Auditing                        | : Ad-hoc                    |  |                                 |                |                      |          |           |                |              |                   |
|                          | Based on the above,                          | the effectiveness is ass    | sessed to be GOOD.   |                                 |                |                      |          |           |                |              |                   |
| Risk Control<br>Context  | Third party bi-weekly                        | visual inspection of the    | pipeline   |                                 |                |                      |          |           |                |              |                   |
| Risk Control<br>Comments |  | ection conducted by Gip     | ppsland Water.   |                                 |                |                      |          |           |                |              |                   |
|                          |  | sessed based on the fol     | ollowing factors:  |                                 |                |                      |          |           |                |              |                   |
|                          | - Independence: High                         | n                           |  |                                 |                |                      |          |           |                |              |                   |
|                          | - Applicable: High                           |                             |  |                                 |                |                      |          |           |                |              |                   |
|                          |  |                             | the leaks. Based on the above, full applicability is assigned.                   |                                 |                |                      |          |           |                |              |                   |
| Risk Control             |  | Tag ID                      | Description  | Owner                           | Status         | Applicability Factor |          | icality   | Type/Factor    | Reviewed     | Assessme          |
|                          | RR-COP-02657                                 | BC-00429                    | Gippsland Water Authority & AGL Agreement  | No Owner Defined                | In Service     | 100.0%               | Critical | I Control | Administrative | 8-Oct-2015   | Good              |
| Base Control<br>Comments | The agreement sets                           | the roles and responsibi    | pilities between AGL and Gippsland Water regarding the management of the S       | SWOP pump station and pipeline. |                |                      |          |           |                |              |                   |
|                          | The base control is a                        | ssessed via the followin    | ng:  |                                 |                |                      |          |           |                |              |                   |
|                          | - Implemented: Yes                           |                             |  |                                 |                |                      |          |           |                |              |                   |
|                          | - Type: Administrativ                        | е                           |  |                                 |                |                      |          |           |                |              |                   |
|                          | - Reliability: Good                          | . Ad bas                    |  |                                 |                |                      |          |           |                |              |                   |
|                          | - Monitoring/Auditing                        | : Ad-noc                    |  |                                 |                |                      |          |           |                |              |                   |
| D: 1.0                   |  | the effectiveness is ass    | sessed to be GOOD.   |                                 |                |                      |          |           |                |              |                   |
| Context                  | Third party pipe integ                       | inty testing                |  |                                 |                |                      |          |           |                |              |                   |
| Risk Control<br>Comments | This is formal testing                       | conducted by Gippsland      | nd Water which is able to identify and segregate the area of pipe requiring repl | lacement.                       |                |                      |          |           |                |              |                   |
|                          | AGL conducts regula                          | r meetings and liaison w    | with Gippsland Water to manage this control.                                     |                                 |                |                      |          |           |                |              |                   |
|                          | The risk control is as                       | sessed based on the fol     | ollowing factors:  |                                 |                |                      |          |           |                |              |                   |
|                          | - Independence: High                         | n                           |  |                                 |                |                      |          |           |                |              |                   |
|                          | - Applicable: High                           |                             |  |                                 |                |                      |          |           |                |              |                   |
|                          |  | full applicability is assig |  |                                 |                |                      |          |           |                |              |                   |
| e                        | FIRE Services Pol                            | nd wall fallure due to      | to internal drainage failure   | Code                            | Status         |                      |          | Likelihoo |                | Contribution |                   |
|                          |  |                             |  | RR-CA-00631                     | Active         |                      | Current  | Rare (1)  |                | 0.1%<br>0.2% |                   |
| Comments                 | Potential pathways in                        | nclude:                     |  |                                 |                |                      | Proposed | Rare (1)  | 1              | U.270        |                   |
|                          | - pipe failure                               |                             |  |                                 |                |                      |          |           |                |              |                   |
|                          |  | ane                         |  |                                 |                |                      |          |           |                |              |                   |
|                          | - compromised drain                          | ugo                         |  |                                 |                |                      |          |           |                |              |                   |
|                          |  |                             | SWOP and Fire Service Pond walls. Therefore, the likelihood of this event is     | considered to be DADE           |                |                      |          |           |                |              |                   |



| INE RISK ASSESSMENT      |   |   |   | Active Ris                      | k Scenarios ID: RR-    | R-00066    |                      |                  |                |              |                  |
|--------------------------|---|---|---|---------------------------------|------------------------|------------|----------------------|------------------|----------------|--------------|------------------|
| Risk Control             | Code  | Tag ID                                    | Description   |                                 | Owner                  | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed     | Assessment       |
|                          | RR-COP-02669  | BC-00423                                  | Dam Management Plan   |                                 | No Owner Defined       | In Service | 100.0%               | Critical Control | Administrative | 7-Oct-2015   | Good             |
| Base Control             | Dam managemer   | nt plan includes TARPs to                 | which will trigger a response to mitigate the effect                                  | s of ground movement.           |                        |            |                      |                  |                |              |                  |
| Comments                 |   | is assessed via the follow                | ing   |                                 |                        |            |                      |                  |                |              |                  |
|                          | - Implemented: Y  |   | ing.  |                                 |                        |            |                      |                  |                |              |                  |
|                          | - Type: Administr   |   |   |                                 |                        |            |                      |                  |                |              |                  |
|                          | - Reliability: Good   |   |   |                                 |                        |            |                      |                  |                |              |                  |
|                          | - Monitoring/Audi   | ting: Performance monitor                 | ing   |                                 |                        |            |                      |                  |                |              |                  |
|                          | Based on the abo  | ve, the effectiveness is as               | ssessed to be GOOD.   |                                 |                        |            |                      |                  |                |              |                  |
| Risk Control<br>Context  |   | per ANCOLD guidelines                     |   |                                 |                        |            |                      |                  |                |              |                  |
| Risk Control<br>Comments | Inspection and ris  | k rating as per ANCOLD                    | Guideline.  |                                 |                        |            |                      |                  |                |              |                  |
|                          |   | assessed based on the fi                  | ollowing factors:   |                                 |                        |            |                      |                  |                |              |                  |
|                          | <ul> <li>Independence: I</li> <li>Applicable: High</li> </ul>     |   |   |                                 |                        |            |                      |                  |                |              |                  |
|                          | Based on the abo  | ve, full applicability is ass             | igned.  |                                 |                        |            |                      |                  |                |              |                  |
| Actions                  | Code  | Objective                                 |   | Work to be Done                 |                        |            |                      | Priority         | Implementer    | Status       | Complete By Trac |
|                          | RR-A-00024  |   | ash Creek flow retention area into the Dam nd adopt ANCOLD guidelines for management. |                                 |                        |            |                      | Normal           |                | Pending      | N                |
| Risk Control             | Code  | Tag ID                                    | Description   |                                 | Owner                  | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed     | Assessment       |
|                          | RR-COP-02670  | BC-00442                                  | Emergency Management Plan and TARF  | o <sub>s</sub>                  | No Owner Defined       | In Service | 31.0%                | Critical Control | Administrative | 8-Oct-2015   | Good             |
| Base Control<br>Comments | The base control Implemented: Y Type: Administr Reliability: Good | is assessed via the follow<br>es<br>ative |   |                                 |                        |            |                      |                  |                |              |                  |
|                          | Based on the abo  | ve, the effectiveness is as               | ssessed to be GOOD.   |                                 |                        |            |                      |                  |                |              |                  |
| Risk Control<br>Context  | I Emergency Mana  | gement Plan and TARPs                     |   |                                 |                        |            |                      |                  |                |              |                  |
|                          |   | assessed based on the fo                  | iollowing factors:  |                                 |                        |            |                      |                  |                |              |                  |
| Comments                 |   | ow (part of the Dam man                   | laged as per ANCOLD guidelines)   |                                 |                        |            |                      |                  |                |              |                  |
|                          | Based on the abo  | ve, partial applicability is              | assigned as part of the Dam is managed as per Al                                      | NCOLD guidelines.               |                        |            |                      |                  |                |              |                  |
| Cause                    | OB run off por  | nd wall failure due to                    | ground movement as a result of mining a   | activities                      | Code                   | Status     |                      |                  |                |              |                  |
|                          |   |   |   |                                 | RR-CA-00632            | Rejected   |                      |                  |                |              |                  |
| Comments                 | Strain on the wall  | structure coupled with ele                | evated hydraulic loading.   |                                 |                        |            |                      |                  |                |              |                  |
|                          |   |   | ult of mining activity is expected to be uniform/regu                                 |                                 | ling of the OB run off |            |                      |                  |                |              |                  |
| Cause                    |   | f land due to pest, pla                   | onsidered to be a credible cause of wall failure. He<br>ants and animals              | erice, trils cause is rejected. | Code                   | Status     |                      | Likelih          | ood            | Contribution |                  |
|                          | _ 0g. addition 0  | aas to poot, pit                          |   |                                 | RR-CA-00709            | Active     |                      | Current Possibl  |                | 32.8%        |                  |
|                          |   |   |   |                                 | 141-0A-00100           | 10016      |                      |                  |                |              |                  |
|                          |   |   |   |                                 |                        |            |                      | Proposed Possibl | le (3)         | 46.5%        |                  |
|                          |   |   |   |                                 |                        |            |                      |                  |                |              |                  |

# Active Risk Scenarios ID: RR-R-00066



Comments Mining activities have the potential to increase the level of pest, plants and/or animals that may result in land degradation. The potential impact may extend beyond the Mine Lease Area. The likelihood of this event is considered to be POSSIBLE. Risk Control Code Tag ID Status Description Owner Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-03000 BC-00446 No Owner Defined 100.0% 12-Oct-2015 Lease plan conditions In Service Critical Control Administrative Good Base Control Lease plan specifies how land is to be managed regarding pest, plants and animals. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring This is an active management control. Based on the above, the effectiveness is assessed to be GOOD. Risk Control Management of pest plants and animals Risk Control The risk control is assessed based on the following factors: Comments - Independence: High - Applicable: Mod - High Based on the above, full applicability is assigned. Risk Control Code Tag ID Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-03001 BC-00285 No Owner Defined In Service 0.0% Non-Critical Control Administrative 12-Oct-2015 Mine Internal Vegetation Management-ICE Good Base Control The base control is assessed via the following: Comments - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring This is an active management control. Based on the above, the effectiveness is assessed to be GOOD. Risk Control Management of weed species Context Risk Control The risk control is assessed based on the following factors: Comments - Independence: Low - Applicable: Low Based on the above, no applicability is assigned. Cause Change in creek bed grade and flood plains due to land subsidence as a result of aquifer Code Status Likelihood Contribution RR-CA-00712 Active Possible (3) 32.8% depressurisation Current Proposed Possible (3) 4.7%

Comments There is a potential for this cause to result in local inundation and environmental impacts (substrate of the stream bed).

The likelihood of this event is considered to be POSSIBLE.

Active Dick Secretics ID: DD D 00066 AGL



| RISK ASSESSMENT         |   |                               |   | Active Risk S   | Scenarios ID: RR-F | ₹-00066    |                      |                      |                |            | ACIL        | <b>3</b> |
|-------------------------|---|-------------------------------|---|-----------------|--------------------|------------|----------------------|----------------------|----------------|------------|-------------|----------|
| Risk Contro             | Code  | Tag ID                        | Description   |                 | Owner              | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assess      | sment    |
|                         | RR-COP-03012  | BC-00216                      | CPW001M Ground Control Management Plan                                    |                 | No Owner Defined   | In Service | 0.0%                 | Critical Control     | Administrative | 7-Oct-2015 | Go          | bod      |
| Base Contro<br>Comments | GCMP - rainfall and   | I pin monitoring. Regional    | subsidence model for prediction - LV Regional Groun                       | ndwater Group.  |                    |            |                      |                      |                |            |             |          |
|                         | Stability analysis ar   | nd batter design, ground m    | novement modelling (predictions).   |                 |                    |            |                      |                      |                |            |             |          |
|                         |   | assessed via the following    | <b>j</b> :  |                 |                    |            |                      |                      |                |            |             |          |
|                         | <ul> <li>Implemented: Yes</li> <li>Type: Administrat</li> </ul> |                               |   |                 |                    |            |                      |                      |                |            |             |          |
|                         | - Reliability: Good   | ve                            |   |                 |                    |            |                      |                      |                |            |             |          |
|                         | - Monitoring/Auditin  | g: Monitored and audited      |   |                 |                    |            |                      |                      |                |            |             |          |
|                         | Based on the above  | e, the effectiveness of the   | control is assessed to be GOOD.   |                 |                    |            |                      |                      |                |            |             |          |
| Risk Contro<br>Contex   | Subsidence modell   | ng and monitoring             |   |                 |                    |            |                      |                      |                |            |             |          |
| Risk Contro             | The risk control is a   | ssessed based on the follo    | owing factors:  |                 |                    |            |                      |                      |                |            |             |          |
| Comments                | - independence. Lo  | w                             |   |                 |                    |            |                      |                      |                |            |             |          |
|                         | - Applicable: Low   |                               |   |                 |                    |            |                      |                      |                |            |             |          |
|                         | Based on the above  | e, no applicability is assign | ned.  |                 |                    |            |                      |                      |                |            |             |          |
| Actions                 | Code  | Objective                     |   | Work to be Done |                    |            |                      | Priority             | Implementer    | Status     | Complete By | Trackin  |
|                         | RR-A-00005  |                               | d movement data and consider changing the of pin line / movement surveys. |                 |                    |            |                      | Normal               |                | Pending    |             | N/A      |
| Risk Contro             | Code  | Tag ID                        | Description   |                 | Owner              | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assess      | sment    |
|                         | RR-COP-03013  | BC-00426                      | LV Regional Groundwater Management Plan                                   |                 | No Owner Defined   | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015 | Go          |          |

Base Control The modelling and monitoring reports are provided to Southern Rural Water. AGL Loy Yang provide information for input into the regional subsidence modelling Comments and monitoring. They enable predictive modelling of subsidence which form the basis of the amount of groundwater removal. This ensures that overall subsidence is monitored.

The base control is assessed via the following factors:

- Implementated: Yes
- Control type: Administrative
- Reliability rating: Fair
- Monitoring/Auditing: Ad-hoc

The process is monitored and audited by the regulator and reviewed by the Regional Groundwater Management committee.

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Regional coordination modelling and monitoring of subsidence

Comments

Risk Control The output from this control is combined with the subsidence modelling and monitoring control.

The risk control is assessed based on the following factors:

- independence: Low
- Applicable: Low

Based on the above, no applicability is assigned.

R4Risk Ref.: 116-10, Release 1 Page 209 of 313 riskview



Active Risk Scenarios ID: RR-R-00066 Risk Control Code Tag ID Description Applicability Factor Type/Factor Status Criticality Reviewed Assessment RR-COP-03014 BC-00425 Aguifer Depressurisation Annual Report No Owner Defined In Service 100.0% Critical Control Administrative 7-Oct-2015 Good Base Control This annual report specifies the volumes of artesian dewatering required to maintain mine stability Comments This is considered a critical activity for mine stability. It is a mature and established process. It is essential in maintaining safe operations within the mine. The process is monitored and reviewed. There is also an external audit required within the process. The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative - Reliability rating: Very Good - Monitoring/Auditing: Monitored and audited Based on the above, the effectiveness is assessed to be GOOD. Risk Control Optimisation of groundwater extraction to minimise subsidence effects Context Risk Control The optimisation of groundwater extraction reduces the potential for significant mine floor heave and thus mine stability. Comments The risk control is assessed based on the following factors: - Independence: High - Applicable: High Based on the above, full applicability is assigned. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-03015 BC-00426 No Owner Defined 0.0% Administrative 5-Oct-2015 LV Regional Groundwater Management Plan In Service Non-Critical Control Good

Base Control The modelling and monitoring reports are provided to Southern Rural Water. AGL Loy Yang provide information for input into the regional subsidence modelling Comments and monitoring. They enable predictive modelling of subsidence which form the basis of the amount of groundwater removal. This ensures that overall subsidence is monitored.

The base control is assessed via the following factors:

- Implementated: Yes
- Control type: Administrative
- Reliability rating: Fair
- Monitoring/Auditing: Ad-hoc

The process is monitored and audited by the regulator and reviewed by the Regional Groundwater Management committee.

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Regional and third party monitoring (every 5 years) reported to DEDJTR and Southern Rural Water

Context

Risk Control Condition of Extraction licence (#2007440) Comments

The risk control is assessed based on the following factors:

- Independence: High
- Applicable: Low

Based on the above, no applicability is assigned.

R4Risk Ref.: 116-10. Release 1 Page 210 of 313 12:03 pm



Active Risk Scenarios ID: RR-R-00066 Risk Control Code Tag ID Description Applicability Factor Criticality Status Reviewed Assessment RR-COP-03016 Develop the trigger points for action that relates to subsidence (surface deviation) in relation No Owner Defined Proposed 100.0% Non-Critical Control 12-Oct-2015 Good to aquifer depressurisation for Traralgon Creek and its flood plain. Risk Control Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain. Context Risk Control The implementation of this action is expected to reduce the likelihood of this hazard by one order of risk reduction has been allocated to this action. Comments Actions Code Objective Work to be Done Priority Implementer Status Tracking Complete By RR-A-00021 Normal Pending N/A Develop the trigger points for action that relates to subsidence (surface deviation) in relation to aquifer depressurisation for Traralgon Creek and its flood plain. Consequences Consequence Ground movement / land degradation with the potential to impact the environment Code Category Likelihood Severity Risk Rating RR-CQ-00465 Environment & Current Rare (1) Moderate, short to medium term Low Community environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Proposed Rare (1) Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COM-02684 BC-00442 Emergency Management Plan and TARPs No Owner Defined In Service 100.0% Critical Control Administrative 7-Oct-2015 Good Base Control TARPs will trigger actions to mitigate the events of ground movement. Comments

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Emergency Management Plan and TARPs

Comments

The risk control is assessed based on the following factors:

- Independence: Moderate
- Applicable: Mod-High

Based on the above, full applicability is assigned.



Active Risk Scenarios ID: RR-R-00066 Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed BC-00186 HSM0001C Emergency Management Plan RR-COM-02706 No Owner Defined In Service 0.0% Critical Control Administrative 7-Oct-2015 Good Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include: Comments - Vic police - EPA - West Gippsland Catchment Management Authority - Gippsland Water and - Department of Health etc. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness of the control is assessed to be GOOD. Risk Control Emergency Response Procedure Risk Control Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller. Comments The risk control is assessed via the following factors: - Independence: Low (not independent of Emergency Management Plan and TARPs) - Applicable: Mod-High Based on the above, no applicability is assigned. Consequence Ground movement / land degradation with the potential to impact public safety Code Likelihood Risk Rating Category Severity RR-CQ-00467 Public Safety Current Rare (1) Injury to a member of the public (requiring medical attention). Members of the public required to take temporary shelter or remain indoors for a short period of time (1-2 hours) Proposed Rare (1) Low Injury to a member of the public (requiring medical attention). Members of the public required to take temporary shelter or remain indoors for a short period of time (1-2 hours)



| GL MINE RISK ASSE | ESSMENT                  |                       |                             |  | Active Risk Scena | rios ID: RR-  | R-00066    |                      |                  |                |            | AGL        |
|-------------------|--------------------------|-----------------------|-----------------------------|--|-------------------|---------------|------------|----------------------|------------------|----------------|------------|------------|
|                   | Risk Control             | Code                  | Tag ID                      | Description                            |                   | Owner         | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |
|                   |                          | RR-COM-02683          | BC-00442                    | Emergency Management Plan and TARPs    | No 0              | Owner Defined | In Service | 100.0%               | Critical Control | Administrative | 7-Oct-2015 | Good       |
|                   | Base Control<br>Comments | TARPs will trigger a  | actions to mitigate the     | events of ground movement.             |                   |               |            |                      |                  |                |            |            |
|                   |                          | The base control is   | assessed via the follo      | wing:                                  |                   |               |            |                      |                  |                |            |            |
|                   |                          | - Implemented: Yes    |                             |  |                   |               |            |                      |                  |                |            |            |
|                   |                          | - Type: Administrat   | ive                         |  |                   |               |            |                      |                  |                |            |            |
|                   |                          | - Reliability: Good   |                             |  |                   |               |            |                      |                  |                |            |            |
|                   |                          | - Monitoring/Auditir  | g: Performance monitor      | oring                                  |                   |               |            |                      |                  |                |            |            |
|                   |                          | Based on the above    | e, the effectiveness is     | assessed to be GOOD.                   |                   |               |            |                      |                  |                |            |            |
|                   | Risk Control<br>Context  | Emergency Manag       | ement Plan and TARP         | S                                      |                   |               |            |                      |                  |                |            |            |
|                   | Risk Control<br>Comments | The TARPs presen      | t an opportunity to red     | uce the likelihood of ground movement. |                   |               |            |                      |                  |                |            |            |
|                   |                          | The risk control is a | assessed based on the       | following factors:                     |                   |               |            |                      |                  |                |            |            |
|                   |                          | - Independence: Me    | oderate                     |  |                   |               |            |                      |                  |                |            |            |
|                   |                          | - Applicable: Mod-H   | ligh                        |  |                   |               |            |                      |                  |                |            |            |
|                   |                          | Based on the above    | e, full applicability is as | ssigned.                               |                   |               |            |                      |                  |                |            |            |
|                   | Risk Control             | Code                  | Tag ID                      | Description                            |                   | Owner         | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |
|                   |                          | RR-COM-02707          | BC-00186                    | HSM0001C Emergency Management Plan     | No 0              | Owner Defined | In Service | 0.0%                 | Critical Control | Administrative | 7-Oct-2015 | Good       |
|                   |                          |                       |                             |  |                   |               |            |                      |                  |                |            |            |

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include: Comments - Vic police

- West Gippsland Catchment Management Authority

- Gippsland Water and

- Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes

- Type: Administrative

- Reliability: Good

- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Procedure Context

Risk Control Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller. Comments

The risk control is assessed via the following factors:

- Independence: Low (not independent of Emergency Management Plan and TARPs)

- Applicable: Mod-High

Based on the above, no applicability is assigned.

Active Risk Scenarios ID: RR-R-00066 AGL MINE RISK ASSESSMENT



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Reviewed Status BC-00199 RR-COM-02981 External Buffers-Exclusion Zones No Owner Defined In Service 0.0% Critical Control Isolation 8-Oct-2015 Good

Base Control Exclusion Zones 0110 code. The land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the Comments mining license.

The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. This include activities such as farming, slashing, ploughing, summer crops, stock (fuel) management by grazing, earthen breaks.

Exclusion Zones in force. Bushfire mitigation plans in place and submitted to Energy Safe Victoria. Exclusion zones around electrical infrastructure

The base control is assessed via the following:

- Implemented: Yes
- Type: Isolation
- Reliability: Good
- Monitoring/Auditing: None

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Reduced population and human activity in close proximity to affected area (buffer zone)

Risk Control Exclusion Zones 0110 code. The land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the Comments mining license. The planning zone ultimately results in reduced population; reduced human activity in this zone may result in a reduced likelihood of fire.

The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. This include activities such as slashing, ploughing, summer crops, stock (fuel) management by grazing, earthern breaks.

Exclusion zones in force bushfire mitigation plans in place and submitted to Energy Safe Victoria

Exclusion zones around electrical infrastructure.

The risk control is assessed based on the following factors:

- Independence: Low
- Applicable: Low

Based on the above, no applicability is assigned.



Possible (3)

Possible (3)

Current Proposed 48.4%

1.0%

Risk Scenario Details Status Active Top Event Impact to land (Level 4/5) Scenario Mining operations which could cause Level 4/5 impact to the environment (ground movement / land degradation) and or public safety Comments Subsidence may result in deterioration of roads surrounding the mine, which may pose a hazard to public safety. Relevant roads include Traralgon Creed Rd and Bartons Rd and the proposed Traralgon Bypass. Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Unlikely (2) Public Safety Level 5 (5) Moderate High Proposed Likely (4) Public Safety Level 5 (5) Causes Cause Localised ground movement as a result of subsidence due to mining activities affecting local roads Code Status Likelihood Contribution

RR-CA-00565

Active

## Comments Possible pathways include:

- groundwater extraction
- adverse jointing arrangements
- ground movement induced from mining activities
- excessive infiltration of water into batter cracks and joints (increase pore pressures)

The above pathways have the potential to result in subsidence that may impact Traralgon Creek Rd, Bartons Lane (Hyland Highway) and the proposed Traralgon Bypass alignment.

The likelihood of this event is considered to be POSSIBLE.

Active Rick Scenarios ID: RR-R-00067



|   |  |  |   | Active Risk So                                 | cenarios ID: RR-          | R-00067              |                               |                    |                           |            |             |      |
|---|--|--|---|--|---------------------------|----------------------|-------------------------------|--------------------|---------------------------|------------|-------------|------|
| Risk Control  | Code   | Tag ID   | Description   |  | Owner                     | Status               | Applicability Factor          | Criticality        | Type/Factor               | Reviewed   | Asses       | ssme |
|   | RR-COP-02637   | BC-00216   | CPW001M Ground Control Management Plan  |  | No Owner Defined          | In Service           | 31.0%                         | Critical Control   | Administrative            | 7-Oct-2015 | Go          | iood |
|   |  | pin monitoring. Regio  | onal subsidence model for prediction - LV Regional Ground   | dwater Group.                                  |                           |                      |                               |                    | Administrative 7-Oct-2015 |            |             |      |
| Comments  |  | d batter design, groun   | nd movement modelling (predictions).  |  |                           |                      |                               |                    |                           |            |             |      |
|   |  | assessed via the follow  | wing:   |  |                           |                      |                               |                    |                           |            |             |      |
|   | <ul> <li>Implemented: Yes</li> <li>Type: Administrativ</li> </ul>  |  |   |  |                           |                      |                               |                    |                           |            |             |      |
|   | - Reliability: Good  |  |   |  |                           |                      |                               |                    |                           |            |             |      |
|   | - Monitoring/Auditing  | g: Monitored and audit   | ted   |  |                           |                      |                               |                    |                           |            |             |      |
| Risk Control  | Based on the above<br>Ground movement r  |  | the control is assessed to be GOOD.   |  |                           |                      |                               |                    |                           |            |             |      |
| Context   |  | nodelling and mornion  | 9   |  |                           |                      |                               |                    |                           |            |             |      |
| Risk Control<br>Comments                                    | GCMP - pin surveys<br>Plan progressive reh   | including calculation of the consideration in the consideration with consideration with consideration in the consideration with consideration in the consideration in the consideration with consideration in the considera | of strain along radial survey lines.<br>deration to potential freeway alignment. Update of rehabilit  | ation concept with assumption that freeway v   | will be in place          |                      |                               |                    |                           |            |             |      |
|   | (Dec 2014).  | ons along area of curre  |   |  |                           |                      |                               |                    |                           |            |             |      |
|   |  | itions are made to obs   |   |  |                           |                      |                               |                    |                           |            |             |      |
|   | There are survey pir   | ns which are monitored   | d regularly. This data is regularly reviewed to determine th  | e location of the ground movement. Based or    | n ground                  |                      |                               |                    |                           |            |             |      |
|   | strains and ground r<br>likelihood of this cau   |  | study would trigger actions following the analysis. This wo   | uld subsequently trigger actions that would re | educe the                 |                      |                               |                    |                           |            |             |      |
|   | The risk control is as   | ssessed based on the   | following factors:  |  |                           |                      |                               |                    |                           |            |             |      |
|   |  | derate (Part of the Ge   | eotechnical Inspections and TARPS control)  |  |                           |                      |                               |                    |                           |            |             |      |
|   | Applicable: High   |  |   |  |                           |                      |                               |                    |                           |            |             |      |
|   | - Applicable: High   | e i e i i e i e  |   | TADDO  |                           |                      |                               |                    |                           |            |             |      |
| Actions   | Based on the above   |  | s assigned as it is part of the Geotechnical Inspections and  |  |                           |                      |                               | Priority           | Implementer               | Status     | Complete By |      |
| Actions   | Based on the above   | Objective  |   | TARPS control.  Work to be Done                |                           |                      |                               | Priority<br>Nomal  | Implementer               |            | Complete By |      |
| Actions   | Based on the above   | Objective<br>Review subsidence   | s assigned as it is part of the Geotechnical Inspections and<br>and movement data and consider changing the<br>ncy of pin line / movement surveys.  |  |                           |                      |                               | Priority<br>Normal | Implementer               |            | Complete By |      |
| Actions  Risk Control                                       | Based on the above<br>Code<br>RR-A-00005   | Objective Review subsidence density and frequen Tag ID   | e and movement data and consider changing the   |  | Owner                     | Status               | Applicability Factor          | Normal             | Type/Factor               | Pending    | Complete By | essn |
|   | Based on the above<br>Code<br>RR-A-00005   | Objective Review subsidence density and frequen  | e and movement data and consider changing the ncy of pin line / movement surveys.   |  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>31.0% | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and   | Objective Review subsidence density and frequen Tag ID BC-00216  | e and movement data and consider changing the<br>ncy of pin line / movement surveys.<br>Description   | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and   | Objective Review subsidence density and frequen Tag ID BC-00216 pin monitoring. Regic  | e and movement data and consider changing the<br>ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan   | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and  | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow  | e and movement data and consider changing the ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan  onal subsidence model for prediction - LV Regional Ground and movement modelling (predictions).   | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and The base control is a limit of the control is a li | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow  | e and movement data and consider changing the ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan  onal subsidence model for prediction - LV Regional Ground and movement modelling (predictions).   | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and  | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow  | e and movement data and consider changing the ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan  onal subsidence model for prediction - LV Regional Ground and movement modelling (predictions).   | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and The base control is a - Implemented: Yes - Type: Administrativ - Reliability: Good   | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow  | e and movement data and consider changing the ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan onal subsidence model for prediction - LV Regional Ground movement modelling (predictions).  | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and The base control is a - implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing  | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow we g: Monitored and audit  | e and movement data and consider changing the ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan onal subsidence model for prediction - LV Regional Ground movement modelling (predictions).  | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  Base Control  Comments                        | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and The base control is a - Implemented: Yes - Type: Administrativ - Reliability: Good - Monitoring/Auditing Based on the above Geotechnical Inspec  | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regicd d batter design, groun assessed via the followive g: Monitored and audit defectiveness of the effectiveness of the subside of th | e and movement data and consider changing the ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan  conal subsidence model for prediction - LV Regional Ground movement modelling (predictions).  wing:   | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       | ssn  |
| Risk Control  Base Control  Comments  Risk Control  Context | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and The base control is a limplemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing Based on the above Geotechnical Inspect   | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow ve g: Monitored and audit t, the effectiveness of t titions and TARPS ssessed based on the   | e and movement data and consider changing the ney of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan onal subsidence model for prediction - LV Regional Ground movement modelling (predictions).  wing:  ted  the control is assessed to be GOOD. | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  Base Control  Comments  Risk Control  Context | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and The base control is a limplemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing Based on the above Geotechnical Inspect   | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow we g: Monitored and audit t, the effectiveness of t ctions and TARPS ssessed based on the iderate (Part of the Gro   | e and movement data and consider changing the ncy of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan onal subsidence model for prediction - LV Regional Ground movement modelling (predictions).  wing:  ted  the control is assessed to be GOOD. | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |
| Risk Control  Base Control  Comments  Risk Control  Context | Based on the above Code RR-A-00005  Code RR-COP-02639  GCMP - rainfall and Stability analysis and The base control is a - Implemented: Yes - Type: Administrativ - Reliability: Good - Monitoring/Auditing Based on the above Geotechnical Inspec The risk control is as - Independence: Mo  | Objective Review subsidence density and frequen Tag ID BC-00216  pin monitoring. Regic d batter design, groun assessed via the follow we g: Monitored and audit the effectiveness of tections and TARPS ssessed based on the derate (Part of the Gro   | e and movement data and consider changing the ney of pin line / movement surveys.  Description  CPW001M Ground Control Management Plan onal subsidence model for prediction - LV Regional Ground movement modelling (predictions).  wing:  ted  the control is assessed to be GOOD. | Work to be Done                                |                           |                      |                               | Normal             | Type/Factor               | Pending    | Asses       |      |



# Active Risk Scenarios ID: RR-R-00067



| NE RISK ASSESSME | ENT                     |                     |   |   | Active Risk Sc                                      | enarios ID: RR-      | R-00067  |                      |          |                  |             |              |             |          |
|------------------|-------------------------|---------------------|---|---|---|----------------------|----------|----------------------|----------|------------------|-------------|--------------|-------------|----------|
|                  |                         | RR-A-00005          |   | and movement data and consider changing the acy of pin line / movement surveys.   |   |                      |          |                      | Nomal    |                  |             | Pending      |             | N/A      |
|                  |                         | RR-A-00019          | 00  | action response plan to include visual inspections of are potentially at risk.  |   |                      |          |                      |          | Normal           |             | Pending      |             | N/A      |
| Cause            |                         | Planned Traral      | lgon Bypass and as                                | sociated development to impact surface water  | r and mine stability                                | Code                 | Status   |                      |          | Likelihood       |             | Contribution |             |          |
|                  |                         |                     |   |   |   | RR-CA-00569          | Active   |                      | Current  | Rare (1)         |             | 4.6%         |             |          |
|                  |                         |                     |   |   |   |                      |          |                      | Proposed | Likely (4)       |             | 98.0%        |             |          |
|                  | Comments                |                     | algon Bypass developm<br>ass and associated infra | ent has the potential to impact surface water and the mir structure.  | ne stability, which will have an impact to the over | rall area,           |          |                      |          |                  |             |              |             |          |
|                  |                         |                     | •   | st Gippsland Catchment Authority indicated that the auth  |   | •                    |          |                      |          |                  |             |              |             |          |
|                  |                         |                     | raralgon Creek bed. The                           | e Westem Batters. This concept is expected to present a<br>prefore, without AGL's involvement in the planned Trarals  | •   |                      |          |                      |          |                  |             |              |             |          |
| Ris              | sk Control              | Code                | Tag ID  | Description   |   | Owner                | Status   | Applicability Factor | (        | Criticality      |             | Reviewed     | Asses       | sment    |
|                  |                         | RR-COP-02974        |   | AGL to engage with the department and plans planned Traralgon Bypass are considered and   |   | System Administrator | Proposed | 100.0%               | Non-0    | Critical Control |             | 12-Oct-2015  | Asse        | ssed     |
|                  | Risk Control<br>Context | AGL to engage wi    | th the department and p                           | planning authorities to ensure that the risks of the planne   | d Traralgon Bypass are considered and address       | sed.                 |          |                      |          |                  |             |              |             |          |
|                  |                         | however, this is hi | ghly dependent on the                             | oject should be considered as part of this process. The a<br>external party (authorities) understanding the risk and im<br>gate this hazard). Conservatively no future risk reduction | plementing actions to prevent/mitigate the event    |                      |          |                      |          |                  |             |              |             |          |
| Actions          |                         | Code                | Objective   | guice this hazaraj. Conservatively no latare her reduction  | Work to be Done                                     |                      |          |                      |          | Priority         | Implementer | Status       | Complete By | Tracking |
|                  |                         | RR-A-00054          | AGL should engage                                 | e the department and planning authorities to ensure that<br>ned Traralgon Bypass are considered and addressed.  |   |                      |          |                      |          | Normal           |             | Pending      |             | N/A      |
| Cause            |                         | Subsidence du       | ie to coal block slidi                            | ng impacting Traralgon Creek Road.  |   | Code                 | Status   |                      |          | Likelihood       |             | Contribution |             |          |
|                  |                         |                     |   |   |   | RR-CA-00588          | Active   |                      | Current  | Likely (4)       |             | 46.5%        |             |          |
|                  |                         |                     |   |   |   |                      |          |                      | Proposed | Likely (4)       |             | 1.0%         |             |          |

Comments Coal block sliding (mine permanent western batters) has the potential to impact Traralgon Creek Road.

Potential pathways include:

- Water levels elevated (ponded water bodies, inflow source, etc.)
- strain-softening (progressive weakening), progressive failure
- creep movements
- low shear-strength interseam and / or
- coal contact
- structural complexities (eg: continuous and unfavourably oriented fault / interconnecting structures)
- water ingress due to erosion and piping
- water ingress from settling pond (failure of liner)

The likelihood of this event is considered to be LIKELY.

Active Risk Scenarios ID: RR-R-00067 AGL MINE RISK ASSESSMENT



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00441 RR-COP-02644 Geotechnical Inspections and TARPS No Owner Defined In Service 0.0% Critical Control Administrative 7-Oct-2015 Good Base Control Based on the results of the inspection, further activities are undertaken as required, which may include pin monitoring. Carry out mine inspections following Comments significant rainfall events (consistent with TARP) or other defined trigger events including ground movement episodes and seismic events. Key stability monitoring bores have been identified and are monitored at regular intervals and in association with trigger rainfall events. The base control is assessed via the following factors: - Implementation: Yes - Control type: Administrative - Reliability rating: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness is assessed to be GOOD. Risk Control Geotechnical Inspections and TARPS Context Risk Control The risk control is assessed based on the following factors: Comments - Independence: Moderate - Applicable: Low (not specific to cause) Based on the above, no applicability is assigned.

Risk Control Code Tag ID

Surface drainage inspection and maintenance

Owner No Owner Defined

Status In Service Applicability Factor 100.0%

Criticality Critical Control

Type/Factor Administrative

Reviewed 7-Oct-2015 Assessment Good

Base Control Surface drainage maintenance (including clay capping) to minimise surface water inflows to coal joints, horizontal drains (monitoring and maintenance), regular Comments stability assessment and modelling using current groundwater levels (TARP).

The base control is assessed via the following factors:

BC-00439

- Implementation: Yes

RR-COP-02975

- Control type: Administrative
- Reliability rating: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed as GOOD.

Risk Control Surface drainage inspection and maintenance

Risk Control The risk control is assessed based on the following factors:

- Comments Independence: High
  - Applicable: High

Based on the above, full applicability is assigned.

Friday, October 30, 2015

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00067

The likelihood of this event is considered to be UNLIKELY.



| IE RISK ASSESSMENT    |  |                            | Active Ris   | sk Scenarios ID: RR-         | K-00001    |                      |             |                    |               |            |
|-----------------------|--|----------------------------|--|------------------------------|------------|----------------------|-------------|--------------------|---------------|------------|
| Risk Contro           | l Code Tag ID  | )                          | Description  | Owner                        | Status     | Applicability Factor | Criticali   | ty Type/Facto      | r Reviewed    | Assessment |
|                       | RR-COP-02976 BC-00                                       | 0440                       | Subsurface (horizontal drains) drainage inspection and maintenance   | No Owner Defined             | In Service | 100.0%               | Critical Co | ntrol Administrati | /e 7-Oct-2015 | Good       |
| Base Contro<br>Commen | Although drains are consider                             | red to be an engineering   | control, they could be blocked (restriction in flow) if not appropriately maintained, the<br>larly monitored and there is annual inspection. | erefore, it is considered to |            |                      |             |                    |               |            |
|                       |  |                            |  |                              |            |                      |             |                    |               |            |
|                       | The base control is assessed<br>- Implementation: Yes    | d via the following facto  | S:   |                              |            |                      |             |                    |               |            |
|                       | Control type: Administrative                             | Э                          |  |                              |            |                      |             |                    |               |            |
|                       | - Reliability rating: Good                               |                            |  |                              |            |                      |             |                    |               |            |
|                       | - Monitoring/Auditing: Perform                           | mance monitoring           |  |                              |            |                      |             |                    |               |            |
|                       | Based on the above, the effe                             | ectiveness of the contro   | is assessed to be GOOD.  |                              |            |                      |             |                    |               |            |
| Risk Contro<br>Conte  | I Subsurface (horizontal drains<br>tt                    | s) drainage inspection a   | nd maintenance   |                              |            |                      |             |                    |               |            |
| Risk Contro<br>Commen | Surface drainage maintenand stability assessment and mo  |                            | ng) to minimise surface water inflows to coal joints, horizontal drains (monitoring and nundwater levels (TARP).                             | maintenance), regular        |            |                      |             |                    |               |            |
|                       | •  |                            | . ,  |                              |            |                      |             |                    |               |            |
|                       | The risk control is assessed<br>- Independence: Moderate | based on the following     | actors:  |                              |            |                      |             |                    |               |            |
|                       | - Applicable: High                                       |                            |  |                              |            |                      |             |                    |               |            |
|                       |  |                            |  |                              |            |                      |             |                    |               |            |
|                       | Based on the above, full app                             |                            |  |                              |            |                      |             |                    |               |            |
| Cause                 | Settling Pond, Ash Pon                                   | d and High Level S         | torage Dam wall failure due to seismic event or extreme  | Code                         | Status     |                      |             |                    |               |            |
|                       | rainfall   |                            |  | RR-CA-00591                  | Rejected   |                      |             |                    |               |            |
| Commen                | s The Settling Pond, Ash Pond                            | d and High Level storag    | e Dam are located outside of the mine lease area, therefore it is assessed to be outsi   | ide the scope of the         |            |                      |             |                    |               |            |
|                       | Mine Risk Assessment and M                               | Management Plan. The       | efore this cause is rejected.  |                              |            |                      |             |                    |               |            |
| Cause                 | High Level Storage Dar                                   | m, Ash Pond and F          | re Services Pond wall failure due to ground movement as a  | Code                         | Status     |                      |             |                    |               |            |
|                       | result of mining activitie                               | es                         |  | RR-CA-00592                  | Rejected   |                      |             |                    |               |            |
| Commen                | s The localised mining induced                           | d ground strains are not   | of sufficient magnitude to impact the structural integrity of the High Level Storage Da  | am, Ash Pond and Fire        |            |                      |             |                    |               |            |
|                       | Services Pond. Therefore, th                             |                            |  |                              |            |                      |             |                    |               |            |
| Cause                 | Settling Pond wall failur                                | re due to ground me        | ovement as a result of mining activities   | Code                         | Status     |                      |             | Likelihood         | Contribution  |            |
|                       |  |                            |  | RR-CA-00595                  | Active     |                      | Current     | Unlikely (2)       | 0.5%          |            |
|                       |  |                            |  |                              |            |                      | Proposed    | Unlikely (2)       | 0.0%          |            |
| Commen                | s Historically, there has been e                         | exposed coal under the     | pond that has resulted in cracks being a conduit for leaks. In the event of a significan   | at ground movement,          |            |                      |             |                    |               |            |
|                       | there is potential for the integ                         | grity of the dam wall to I | e compromised. This may result in a significant loss of containment of material within   | n the Settling Pond.         |            |                      |             |                    |               |            |

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AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00067



| NE RISK ASSESSMENT   |   |  |  | Active R                      | isk Scenarios ID: RR-     | R-00067              |                                |                                 |                               |   |                     |
|----------------------|---|--|--|-------------------------------|---------------------------|----------------------|--------------------------------|---------------------------------|-------------------------------|---|---------------------|
| Risk Contro          | PI Code<br>RR-COP-02463   | Tag ID<br>BC-00423                     | Description  Dam Management Plan   |                               | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>100.0% | Criticality<br>Critical Control | Type/Factor<br>Administrative | Reviewed<br>7-Oct-2015  | Assessment<br>Good  |
| Base Contr<br>Commen | ol Dam managemen  | t plan includes TARPs to               | which will trigger a response to mitigate the  | e effects of ground movement. |                           |                      |                                |                                 |                               |   |                     |
|                      |   | s assessed via the follow              | ving:  |                               |                           |                      |                                |                                 |                               |   |                     |
|                      | - Implemented: Ye   |  |  |                               |                           |                      |                                |                                 |                               |   |                     |
|                      | <ul> <li>Type: Administra</li> <li>Reliability: Good</li> </ul> |  |  |                               |                           |                      |                                |                                 |                               |   |                     |
|                      |   | ng: Performance monitor                | ring   |                               |                           |                      |                                |                                 |                               |   |                     |
|                      | Based on the abo  | ve, the effectiveness is a             | ssessed to be GOOD.  |                               |                           |                      |                                |                                 |                               |   |                     |
| Risk Contr<br>Conte  |   | gement Plan and TARPs                  |  |                               |                           |                      |                                |                                 |                               |   |                     |
| Risk Contr<br>Commen | ol The risk control is  | assessed based on the f                | following factors:   |                               |                           |                      |                                |                                 |                               |   |                     |
|                      | - Applicable: High  |  |  |                               |                           |                      |                                |                                 |                               |   |                     |
|                      |   | ve, full applicability is ass          | signed.  |                               |                           |                      |                                |                                 |                               |   |                     |
| Actions              | Code  | Objective                              |  | Work to be Done               |                           |                      |                                | Priority                        | Implementer                   | Status  | Complete By Trackin |
|                      | RR-A-00024  |  | ash Creek flow retention area into the Dam<br>nd adopt ANCOLD guidelines for managem |                               |                           |                      |                                | Normal                          |                               | Pending   | N/A                 |
| Risk Contro          | ol Code   | Tag ID                                 | Description  |                               | Owner                     | Status               | Applicability Factor           | Criticality                     | Type/Factor                   | Reviewed  | Assessment          |
|                      | RR-COP-02646  | BC-00443                               | Inspection, monitoring and mainter   | nance of the Settling Pond    | No Owner Defined          | In Service           | 100.0%                         | Critical Control                | Administrative                | 7-Oct-2015  | Good                |
| Base Contr<br>Commen | ts  | s assessed via the follow<br>s<br>tive | maintenance of the Settling Pond.  |                               |                           |                      |                                |                                 |                               |   |                     |
|                      | - Monitoring/Audit  | ng: Performance monitor                | ring   |                               |                           |                      |                                |                                 |                               |   |                     |
| D: 1.0. /            |   |  | he control is assessed to be GOOD.   |                               |                           |                      |                                |                                 |                               |   |                     |
| Conte                |   | ring and maintenance of                | the Settling Pond  |                               |                           |                      |                                |                                 |                               |   |                     |
| Risk Contr<br>Commen | ol The risk control is<br>- Independence: H                     | assessed based on the f                | following factors:   |                               |                           |                      |                                |                                 |                               |   |                     |
|                      | - Applicable: High  |  |  |                               |                           |                      |                                |                                 |                               |   |                     |
|                      | Based on the abo  | e, full applicability is ass           | signed.  |                               |                           |                      |                                |                                 |                               |   |                     |
| onsequences          |   |  |  |                               |                           |                      |                                |                                 |                               |   |                     |
| Consequence          | Ground mover  | nent / land degradati                  | ion with the potential to impact publi   | ic safety                     | Code                      | Category             |                                | Likelil                         |                               | Severity  | Risk Rating         |
|                      |   |  |  |                               | RR-CQ-00479               | Public Safety        |                                | Current Rare                    | injury to<br>Member           | harm to a member or<br>members of the public.<br>s of the public required<br>placed for a long period<br>of time (days) | Moderate            |
|                      |   |  |  |                               |                           |                      |                                | Proposed Unlike                 | injury to<br>Member           | harm to a member or<br>members of the public.<br>s of the public required<br>placed for a long period<br>of time (days) | High                |

GL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00067



| ISK ASSESSMENT           | Active Risk Scenarios ID: RR-R-00067  |  |  |            |                      |             |                       |              |             |  |  |  |
|--------------------------|---|--|--|------------|----------------------|-------------|-----------------------|--------------|-------------|--|--|--|
| Risk Control             | Code Tag ID   | Description  | Owner                                    | Status     | Applicability Factor | Critical    | ity Type/Factor       | Reviewed     | Assessmen   |  |  |  |
|                          | RR-COM-02648 BC-00186   | HSM0001C Emergency Management Plan   | No Owner Defined                         | In Service | 0.0%                 | Critical Co | ontrol Administrative | 7-Oct-2015   | Good        |  |  |  |
|                          |   |  |  |            |                      |             |                       |              |             |  |  |  |
| Base Control<br>Comments | The activation of the Emergency M   | Management Plan may require engagement from major relevant stakeholders which m  | nay include:                             |            |                      |             |                       |              |             |  |  |  |
|                          | - Vic police<br>- EPA   |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - West Gippsland Catchment Mana   | nagement Authority   |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Gippsland Water and   |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Department of Health etc.   |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | The base control is assessed via the  | the following:   |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Implemented: Yes  |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Type: Administrative  |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditing: Performance</li> </ul>   | e monitorina   |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Worldoning Additing. I enormance  | is monitoring  |  |            |                      |             |                       |              |             |  |  |  |
|                          |   | eness of the control is assessed to be GOOD.   |  |            |                      |             |                       |              |             |  |  |  |
| Risk Control<br>Context  | Emergency Response Procedure  |  |  |            |                      |             |                       |              |             |  |  |  |
| Risk Control<br>Comments | Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller. |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | The risk control is assessed via the  | ne following factors:  |  |            |                      |             |                       |              |             |  |  |  |
|                          |   | ndent of Emergency Management Plan and TARPs)  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Applicable: Mod-High  |  |  |            |                      |             |                       |              |             |  |  |  |
|                          |   | ility is assigned, as it is not independent of the Emergency Management Plan and TAR   | RPs.                                     |            |                      |             |                       |              |             |  |  |  |
| Risk Control             | •   | Description  | Owner                                    | Status     | Applicability Factor | Critical    | •                     | Reviewed     | Assessmer   |  |  |  |
|                          | RR-COM-02651 BC-00442   | Emergency Management Plan and TARPs  | No Owner Defined                         | In Service | 100.0%               | Critical Co | ontrol Administrative | 7-Oct-2015   | Good        |  |  |  |
| Base Control<br>Comments | TARPs will trigger actions to mitigate  | gate the events of ground movement.  |  |            |                      |             |                       |              |             |  |  |  |
|                          | The base control is assessed via the  | the following:   |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Implemented: Yes  | •  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Type: Administrative  |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Reliability: Good   |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Monitoring/Auditing: Performance  | se monitoring  |  |            |                      |             |                       |              |             |  |  |  |
|                          | Based on the above, the effectiven  | eness is assessed to be GOOD.  |  |            |                      |             |                       |              |             |  |  |  |
| Risk Control<br>Context  | Emergency Management Plan and   | d TARPs  |  |            |                      |             |                       |              |             |  |  |  |
| Risk Control<br>Comments |   | ad to the point where someone may be injured is expected to take a significant period of expected to present opportunities for AGL to mitigate the effects of road damage. | of time. During this time, the Emergency |            |                      |             |                       |              |             |  |  |  |
|                          | -   |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | The risk control is assessed based<br>- Independence: Moderate  | d on the following factors.  |  |            |                      |             |                       |              |             |  |  |  |
|                          | - Applicable: Mod-High  |  |  |            |                      |             |                       |              |             |  |  |  |
|                          | Based on the above, full applicabili  | ulity is assigned  |  |            |                      |             |                       |              |             |  |  |  |
| Intermediate Event       |   | · •  |  | Status     |                      |             | Incoming              | Outgoing     | Probability |  |  |  |
|                          | •   | of ground movement escalating to consequence   |  | Active     |                      | Current     | Rare (1)              | Rare (1)     | 50.0%       |  |  |  |
| •                        |   |  |  |            |                      | Proposed    | Possible (3)          | Unlikely (2) | 50.0%       |  |  |  |
| Comments                 |   | ment has the potential to deteriorate the roads surrounding the mine. This may pose a l  |  |            |                      |             |                       |              |             |  |  |  |
|                          |   | at mitigate the hazard, i.e. reduce speed limits, road closures etc. Therefore the likeliho  | OOG OF THE EAGUE TO EAGURING ED TUG      |            |                      |             |                       |              |             |  |  |  |
|                          | consequence is considered to be 5   |  |  |            |                      |             |                       |              |             |  |  |  |

riskview

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Community

Current Rare (1)

Significant medium term impact on important environment/habitat and/or widespread local

community complaints.

Proposed

Unlikely (2) Significant medium term impact

High

Assessment

Good

on important environment/habitat and/or widespread local community complaints.

Risk Control Code

Tag ID RR-COM-02649 BC-00186 Description HSM0001C Emergency Management Plan

Owner No Owner Defined

Status In Service Applicability Factor 0.0%

Criticality Critical Control

Type/Factor Administrative

Reviewed 7-Oct-2015

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

Comments - Vic police

- EPA

- West Gippsland Catchment Management Authority

- Gippsland Water and

- Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Procedure

Context

Risk Control Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller. Comments

The risk control is assessed via the following factors:

- Independence: Low (not independent of Emergency Management Plan and TARPs)
- Applicable: Mod-High

Based on the above, no applicability is assigned, as it is not independent of the Emergency Management Plan and TARPs.

Risk Control Code

Tag ID Description

Emergency Management Plan and TARPs

Owner No Owner Defined

Status In Service Applicability Factor 100.0%

Criticality Critical Control Type/Factor Administrative

7-Oct-2015

Reviewed

Assessment Good

Base Control TARPs will trigger actions to mitigate the events of ground movement. Comments

The base control is assessed via the following:

BC-00442

- Implemented: Yes

RR-COM-02652

- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Emergency Management Plan and TARPs

Risk Control The TARPs present an opportunity to reduce the likelihood of ground movement.

The risk control is assessed based on the following factors:

- Independence: Moderate
- Applicable: Mod-High

Based on the above, full applicability is assigned.

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|                    |                     |                                | 7.00.  | O TRIOR GOODINGTION IST TRIC       |               |                      |          |               |                        |  |             |
|--------------------|---------------------|--------------------------------|--|------------------------------------|---------------|----------------------|----------|---------------|------------------------|--|-------------|
| Intermediate Event | Code                | Description                    |  |                                    | Status        |                      |          | Incoming      | 1                      | Outgoing   | Probability |
|                    | RR-IE-02982         | Probability of ground mo       | evement escalating to consequence  |                                    | Active        |                      | Current  | Rare (1)      |                        | Rare (1)   | 50.0%       |
|                    |                     |                                |  |                                    |               |                      | Proposed | Possible (    | 3)                     | Jnlikely (2)   | 50.0%       |
| Comments           | Once ground move    | ment occurs to the point wh    | ere the grade of the creek bed is changing, it is difficult to reverse this process. T | here is a potential for mitigative |               |                      |          |               |                        |  |             |
|                    | controls to improve | the the creek health and fu    | rther mitigate the adverse effect of change of creek. There is also a potential to n   | educe the magnitude of the         |               |                      |          |               |                        |  |             |
|                    | impacts. Therefore  | the likelihood of the event to | o eventuate to the consequence is considered to be 50%.                                |                                    |               |                      |          |               |                        |  |             |
| Consequence        | Settling pond da    | am wall failure induced        | flood event with the potential to impact public safety                                 | Code                               | Category      |                      |          | Likelihoo     | d                      | Severity   | Risk Rating |
|                    |                     |                                |  | RR-CQ-00499                        | Public Safety |                      | Current  | Rare (1)      | public. Me<br>required | rm to members of the<br>embers of the public<br>to be displaced for a<br>ant period of time<br>(weeks) | High        |
|                    |                     |                                |  |                                    |               |                      | Proposed | Rare (1)      | public. Me<br>required | rm to members of the<br>embers of the public<br>to be displaced for a<br>ant period of time<br>(weeks) | High        |
| Risk Control       | Code                | Tag ID                         | Description  | Owner                              | Status        | Applicability Factor |          | Criticality   | Type/Factor            | Reviewed   | Assessment  |
|                    | RR-COM-02650        | BC-00186                       | HSM0001C Emergency Management Plan   | No Owner Defined                   | In Service    | 0.0%                 | Crit     | tical Control | Administrative         | 7-Oct-2015   | Good        |

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include: Comments - Vic police

- West Gippsland Catchment Management Authority
- Gippsland Water and
- Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Procedure Context

Risk Control The risk control is assessed via the following factors:

- Comments Independence: Low (not independent of Emergency Management Plan and TARPs)
  - Applicable: Mod-High

Based on the above, no applicability is assigned, as it is not independent of the Emergency Management Plan and TARPs.

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00067



| SK ASSESSMENT            |  |  |   | ACTIVE INISK S  | cenarios id: KK  | 11-00007   |                      |          |              |                |            |             |         |
|--------------------------|--|--|---|-----------------|------------------|------------|----------------------|----------|--------------|----------------|------------|-------------|---------|
| Risk Control             | Code   | Tag ID                                     | Description   |                 | Owner            | Status     | Applicability Factor | C        | Criticality  | Type/Factor    | Reviewed   | Assess      | sment   |
|                          | RR-COM-02653   | BC-00423                                   | Dam Management Plan   |                 | No Owner Defined | In Service | 100.0%               | Crit     | ical Control | Administrative | 7-Oct-2015 | Go          | od      |
| Base Control<br>Comments | Dam managemen  | plan includes TARPs to                     | o which will trigger a response to mitigate the effects of ground mo                | vement.         |                  |            |                      |          |              |                |            |             |         |
|                          | The base control i   | s assessed via the follow                  | wing:   |                 |                  |            |                      |          |              |                |            |             |         |
|                          | - Implemented: Ye  | s  |   |                 |                  |            |                      |          |              |                |            |             |         |
|                          | - Type: Administra   | tive                                       |   |                 |                  |            |                      |          |              |                |            |             |         |
|                          | - Reliability: Good  |  |   |                 |                  |            |                      |          |              |                |            |             |         |
|                          | - Monitoring/Audit   | ng: Performance monito                     | oring   |                 |                  |            |                      |          |              |                |            |             |         |
|                          | Based on the abo   | ve, the effectiveness is a                 | assessed to be GOOD.  |                 |                  |            |                      |          |              |                |            |             |         |
| Risk Control<br>Context  |  | gement Plan and TARPs                      | S   |                 |                  |            |                      |          |              |                |            |             |         |
| Risk Control<br>Comments | The TARPs prese  | nt an opportunity to redu                  | uce the likelihood of ground movement.  |                 |                  |            |                      |          |              |                |            |             |         |
|                          |  | assessed based on the                      | following factors:  |                 |                  |            |                      |          |              |                |            |             |         |
|                          | <ul> <li>Independence: Node</li> <li>Applicable: Mode</li> </ul> |  |   |                 |                  |            |                      |          |              |                |            |             |         |
|                          | Based on the abo   | e, full applicability is as                | signed.   |                 |                  |            |                      |          |              |                |            |             |         |
| Actions                  | Code   | Objective                                  |   | Work to be Done |                  |            |                      |          | Priority     | Implementer    | Status     | Complete By | Trackir |
|                          | RR-A-00024   | Incorporate Sheepwas<br>adopt ANCOLD guide | sh Creek flow retention area into the Dam Management Plan and lines for management. |                 |                  |            |                      |          | Normal       |                | Pending    |             | N/A     |
| Intermediate Event       | Code   | Description                                |   |                 |                  | Status     |                      |          | Incoming     |                | Outgoing   | Proba       | ability |
|                          | RR-IE-02476  | Likelihood adjustme                        | ent for Settling Pond dam wall failure cause only                                   |                 |                  | Active     |                      | Current  | Rare (1)     |                | Rare (1)   | 0.1         | .1%     |
|                          |  |  |   |                 |                  |            |                      | Proposed | Possible (3) |                | Rare (1)   |             | .1%     |

Settling Dam wall failure (i.e. RARE). Therefore, probability of 0.1% is assigned to this consequence.

Actions

Risk Control Confirm the particle size of the leached ash associated with the fugitive dust emissions from excavation/dumping activities.

Determine the particle size of the leached ash that is associated with the fugitive dust emissions as a result of excavation/dumping activities.

occurring, no risk reduction is assigned.

Objective

Code

RR-A-00003

Risk Control The implementation of this recommendation will provide additional information and understanding of the cause. As it does not reduce the likelihood of the event

Work to be Done

Active Risk Scenarios ID: RR-R-00068 AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Fugitive dust emissions Scenario Mining operations generating fugitive dust emissions which may impact public safety and/or loss of amenity/nuisance Comments This requires the following: - Air emission that causes nuisance to the public - Visible emission The mine operations associated with water, land and discharges to water: EPA Licence 11149 Environmental Management: Mining and Extractive Industries (Mining PEM): 1. PM10: 60 ug/m3 (24-hour averaging period) 2. PM2.5: 25 ug/m3 (24-hour averaging period) 3. Respirable crystalline silica (as PM2.5): 3ug/m3 (annual average) Landfill sites can generate odour. However, the mine site landfill contains exclusively leached ash and no green waste. No credible sources of odour emissions associated with mining or leached ash landfill activities extending offsite have been identified. Therefore, these activities are not considered to be a credible cause for odour Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Moderate Current Unlikely (2) **Environment & Community** Level 3 (1.5) Proposed Unlikely (2) **Environment & Community** Level 3 (1.5) Moderate Causes Cause Fugitive dust emissions from excavation/dumping activities during handling of leached ash Code Likelihood Contribution Status RR-CA-00534 Active Current Possible (3) 37.6% Proposed Possible (3) 56.9% Comments Excavation is undertaken within the Mine Lease Area. However, as this is integral in the handling of leached ash, it is included in the assessment. The likelihood of this event to extend offsite is considered to be POSSIBLE. Risk Control Code Applicability Factor Tag ID Description Owner Status Criticality Reviewed Assessment RR-COP-02336 System Administrator Proposed 100.0% Non-Critical Control 6-Oct-2015 Confirm the particle size of the leached ash associated with the fugitive dust emissions from Assessed excavation/dumping activities.

R4Risk Ref.: 116-10. Release 1 Page 225 of 313 12:03 pm

riskview

Tracking

N/A

Complete By

Priority

Normal

Implementer

Status

Pending

Active Diek Co erice ID. DD D 00060 AGL



| AGL MINE RISK ASSESSMENT |  |                                | Active Risk  | Scenarios ID: RR-F | R-00068    |                      |                  |                |              | AGL        |
|--------------------------|--|--------------------------------|--|--------------------|------------|----------------------|------------------|----------------|--------------|------------|
| Risk Control             | Code   | Tag ID                         | Description  | Owner              | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed     | Assessment |
|                          | RR-COP-02725   | BC-00431                       | CPG001M Dust Suppression Control Procedure   | No Owner Defined   | In Service | 100.0%               | Critical Control | Administrative | 8-Oct-2015   | Good       |
| Base Control<br>Comments | This control establis  | hes expected practices, re     | esponsibilities, responses (including TARPs) and predicts the likelihood of dust events. |                    |            |                      |                  |                |              |            |
|                          | The base control is  | assessed via the following     | r  |                    |            |                      |                  |                |              |            |
|                          | - Implemented: Yes   |                                |  |                    |            |                      |                  |                |              |            |
|                          | - Type: Administrativ  | ve                             |  |                    |            |                      |                  |                |              |            |
|                          | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditing</li> </ul> | n: Ad boo                      |  |                    |            |                      |                  |                |              |            |
|                          | - Worldoning/Additing  | y. Au-1100                     |  |                    |            |                      |                  |                |              |            |
|                          | Based on the above   | , the effectiveness of the     | control is assessed to be GOOD.  |                    |            |                      |                  |                |              |            |
| Risk Control<br>Context  | Operational Controls   | s for Dust Suppression pro     | ocedure (TARP)   |                    |            |                      |                  |                |              |            |
| Risk Control             | Operational controls   | and TARPS for dust sup         | pression include:  |                    |            |                      |                  |                |              |            |
| Comments                 | - alert triggers for fu  | gitive dust thresholds.        |  |                    |            |                      |                  |                |              |            |
|                          | The risk control is as   | ssessed via the following      | actors:  |                    |            |                      |                  |                |              |            |
|                          | - Independence: Hig  | -                              |  |                    |            |                      |                  |                |              |            |
|                          | - Applicable: Mod-H  | igh                            |  |                    |            |                      |                  |                |              |            |
|                          | Based on the above   | , full applicability is assigr | ed.  |                    |            |                      |                  |                |              |            |
| Cause                    | Fugitive dust em   | issions from mine op           | eration (mining and earth works) due to high wind events (27 km/h)                       | Code               | Status     |                      | Lik              | elihood        | Contribution |            |
|                          | -  | •                              |  | RR-CA-00535        | Active     |                      | Current Pos      | sible (3)      | 12.6%        |            |
|                          |  |                                |  |                    |            | F                    | Proposed Pos     | sible (3)      | 19.1%        |            |
| Comments                 | This event requires  | dry conditions and winds i     | n excess of ~27 km/hr. Dust generated from the open cut mine will be predominantly PM10. |                    |            |                      |                  |                |              |            |

Mine operations include

- vehicle movement
- open cut mine
- raw coal bunker and
- crusher house

Excavation operations include:

- earth works,
- stripping of topsoil.

AGL conducts progressive mine rehabilitation to minimise the potential fugitive dust emissions.

The likelihood of this event is considered to be POSSIBLE.



| ASSESSMENT              |                                   |                             | Active Ris  | k Scenarios ID: RR- | R-00068    |                      |                  |                |            | AGI  |
|-------------------------|-----------------------------------|-----------------------------|---|---------------------|------------|----------------------|------------------|----------------|------------|------|
| Risk Control            | Code                              | Tag ID                      | Description   | Owner               | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Asse |
|                         | RR-COP-02313                      | BC-00431                    | CPG001M Dust Suppression Control Procedure  | No Owner Defined    | In Service | 31.0%                | Critical Control | Administrative | 6-Oct-2015 | G    |
| Base Control            | This control establish            | shes expected practice      | is, responsibilities, responses (including TARPs) and predicts the likelihood of dust events. |                     |            |                      |                  |                |            |      |
|                         | The base control is               | assessed via the follow     | wing:   |                     |            |                      |                  |                |            |      |
|                         | - Implemented: Yes                |                             |   |                     |            |                      |                  |                |            |      |
|                         | - Type: Administrat               | ve                          |   |                     |            |                      |                  |                |            |      |
|                         | - Reliability: Good               |                             |   |                     |            |                      |                  |                |            |      |
|                         | - Monitoring/Auditir              | g: Ad-hoc                   |   |                     |            |                      |                  |                |            |      |
|                         | Based on the above                | e, the effectiveness of t   | the control is assessed to be GOOD.   |                     |            |                      |                  |                |            |      |
| Risk Control<br>Context | Operational Contro                | ls for Dust Suppression     | n procedure (TARP)  |                     |            |                      |                  |                |            |      |
| Risk Control            |                                   | s and TARPS for dust s      | suppression include:  |                     |            |                      |                  |                |            |      |
| Comments                | - alert triggers for fu           | igitive dust thresholds,    |   |                     |            |                      |                  |                |            |      |
|                         | - the use of paper r              | nulch,                      |   |                     |            |                      |                  |                |            |      |
|                         | <ul> <li>water sprays,</li> </ul> |                             |   |                     |            |                      |                  |                |            |      |
|                         | - water carts on roa              | ds and                      |   |                     |            |                      |                  |                |            |      |
|                         | - capping dump.                   |                             |   |                     |            |                      |                  |                |            |      |
|                         | These activities onl              | y cover certain parts of    | f the mine.   |                     |            |                      |                  |                |            |      |
|                         | The risk control is a             | ssessed via the followi     | ing factors:  |                     |            |                      |                  |                |            |      |
|                         | - Independence: Me                | oderate (part of the Dus    | st Suppression work instruction control)  |                     |            |                      |                  |                |            |      |
|                         | - Applicable: Moder               | rate                        |   |                     |            |                      |                  |                |            |      |
|                         | Based on the above                | e, partial applicability is | assigned as it is part of the Dust Suppression work instruction control.                      |                     |            |                      |                  |                |            |      |
| Risk Control            | Code                              | Tag ID                      | Description   | Owner               | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Asse |
|                         | RR-COP-02314                      | BC-00431                    | CPG001M Dust Suppression Control Procedure  | No Owner Defined    | In Service | 31.0%                | Critical Control | Administrative | 6-Oct-2015 | G    |

Comments

Base Control This control establishes expected practices, responsibilities, responses (including TARPs) and predicts the likelihood of dust events.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness of the control is assessed to be GOOD.

Context

Risk Control Dust Suppression work instruction (PRWF044M)

Comments

Risk Control The dust suppression work instruction is interlinked with the operational controls for dust suppressions (TARP).

The risk control is assessed via the following factors:

- Independence: Moderate (part of the Operational Controls for Dust Suppression procedure (TARP) control)
- Applicable: Moderate

Based on the above, partial applicability is assigned as it is part of the Operational Controls for Dust Suppression procedure (TARP) control.

Active Risk Scenarios ID: RR-R-00068 AGL MINE RISK ASSESSMENT



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00431 RR-COP-02732 CPG001M Dust Suppression Control Procedure No Owner Defined In Service 31.0% Critical Control Administrative 8-Oct-2015 Good Base Control This control establishes expected practices, responsibilities, responses (including TARPs) and predicts the likelihood of dust events. Comments The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness of the control is assessed to be GOOD. Risk Control Dust source suppression activities Context Risk Control Dust suppression activities includes: Comments - clay capping - mulching - progressive mine rehabilitation - re-vegetation These activities target high risk areas, however, not all areas can be suppressed. The risk control is assessed via the following factors: - Independence: Moderate - Applicable: Moderate Based on the above, partial applicability is assigned. Cause Fugitive dust emissions from crushed rock used for roads and general civil building activities onsite due Code Status Likelihood Contribution to high wind events RR-CA-00538 Active Current Possible (3) 12.1% Possible (3) 18.3% Proposed Comments This event requires dry conditions and winds in excess of ~27 km/hr. There is a potential that the emission may include PM10 dust and respirable crystalline silica (RCS). Current results from monitoring of mine emissions indicate that PM10 dust and RCS levels are within the acceptable limits (intervention levels). Therefore, the

likelihood of PM10 dust and RCS extending beyond the Mine Lease Area is considered to be POSSIBLE.

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AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00068



| Base Control Tr Comments  Tr -II -IF -N  Risk Control Or Context  Risk Control Or Tr -II -II -II -II -II -II -II -II -II -I  | RR-COP-02729  This control established the base control is as Implemented: Yes Type: Administrative Reliability: Good Monitoring/Auditing: Based on the above, Operational Controls all alert triggers for fugithe use of paper mulwater sprays.  The risk control is ass Independence: High Applicable: Mod-High Sased on the above, Code  | Ad-hoc he effectiveness of the cor or Dust Suppression proce and TARPS for dust suppre ive dust thresholds, ch and other remediation of   | ession include: works ctors:   | Owner No Owner Defined     | Status<br>In Service | Applicability Factor<br>100.0% | Critical C  |                   |                | Assessme |
|--|---|---|--|----------------------------|----------------------|--------------------------------|-------------|-------------------|----------------|----------|
| Base Control Tr Comments  Th -II -F -N  Risk Control Context  Risk Control Comments -t -V  Risk Control Comments -t -Risk Control Comments | This control established the base control is as Implemented: Yes Type: Administrative Reliability: Good Monitoring/Auditing: Based on the above, Operational Controls of alert triggers for fugithe use of paper mulwater sprays.  The risk control is assindependence: High Applicable: Mod-Hig Based on the above, Code   | es expected practices, responses expected practices, responses expected via the following:  Ad-hoc the effectiveness of the coror Dust Suppression procedure for the following factors and other remediation via the following factors.  Tag ID | ponsibilities, responses (including TARPs) and predicts the likelihood of dust events.  Introl is assessed to be GOOD.  edure (TARP)  ession include:  works  ctors: |                            | In Service           | 100.0%                         | Critical Cr | ontrol Administra | ive 6-Oct-2015 | Good     |
| Risk Control Comments  Risk Control Comments  -ti -ti -ti -ti -ti -ti -ti -ti -ti -t   | The base control is as Implemented: Yes Type: Administrative Reliability: Good Monitoring/Auditing: Based on the above, in Operational Controls: Operational Controls allert triggers for fugit the use of paper mulwater sprays.  The risk control is ass Independence: High Applicable: Mod-Hig Sased on the above, it code   | Ad-hoc  Ad-hoc  the effectiveness of the cor or Dust Suppression proce and TARPS for dust suppresive dust thresholds, ch and other remediation to essed via the following fact and applicability is assigned Tag ID                             | ntrol is assessed to be GOOD. edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Comments  Risk Control Comments  Risk Control Comments  -tt -r  Risk Control Comments  -tt -r  Risk Control Comments  -tt -r  Base Risk Control Comments  Risk Control Comments  Risk Control Comments  | The base control is as Implemented: Yes Type: Administrative Reliability: Good Monitoring/Auditing: Based on the above, in Operational Controls: Operational Controls allert triggers for fugit the use of paper mulwater sprays.  The risk control is ass Independence: High Applicable: Mod-Hig Sased on the above, it code   | Ad-hoc  Ad-hoc  the effectiveness of the cor or Dust Suppression proce and TARPS for dust suppresive dust thresholds, ch and other remediation to essed via the following fact and applicability is assigned Tag ID                             | ntrol is assessed to be GOOD. edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Comments  Risk Control Comments  - ti - r - r - r - r - r - r - r - r - r - r   | Implemented: Yes Type: Administrative Reliability: Good Monitoring/Auditing: Based on the above, Operational Controls of Departional Controls of allert triggers for fugit the use of paper mu water sprays. The risk control is ass Independence: High Applicable: Mod-Hig Based on the above, Code  | Ad-hoc  the effectiveness of the cor  or Dust Suppression proce  and TARPS for dust suppresive dust thresholds,  ch and other remediation was  essed via the following factor  ull applicability is assigned  Tag ID                            | edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Comments  Risk Control Comments  Risk Control Comments  The second control Comments  Risk Control Comments  Risk Control Comments  Risk Control Comments  | Implemented: Yes Type: Administrative Reliability: Good Monitoring/Auditing: Based on the above, Operational Controls of Departional Controls of allert triggers for fugit the use of paper mu water sprays. The risk control is ass Independence: High Applicable: Mod-Hig Based on the above, Code  | Ad-hoc  the effectiveness of the cor  or Dust Suppression proce  and TARPS for dust suppresive dust thresholds,  ch and other remediation was  essed via the following factor  ull applicability is assigned  Tag ID                            | edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Comments  Risk Control Comments  - ti - y  Risk Control Comments  | Type: Administrative Reliability: Good Monitoring/Auditing: Good Monitoring/Auditing: Based on the above, in Operational Controls a alert triggers for fugithe use of paper mulwater sprays.  The risk control is ass Independence: High Applicable: Mod-High Sased on the above, it code   | the effectiveness of the cor<br>or Dust Suppression proces<br>and TARPS for dust suppresive dust thresholds,<br>ch and other remediation of<br>esseed via the following factors   | edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Or Comments  Risk Control Or Comments  - ti - tr   | Reliability: Good Monitoring/Auditing: Based on the above, in operational Controls in operational Controls a latert triggers for fugithe use of paper mulwater sprays.  The risk control is ass Independence: High Applicable: Mod-Hig Based on the above, it code  | the effectiveness of the cor<br>or Dust Suppression proces<br>and TARPS for dust suppresive dust thresholds,<br>ch and other remediation of<br>esseed via the following factors   | edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Or Comments  Risk Control Comments  -tt  -tr  -tr  -tr  -tr  -tr  -tr  -  | Sased on the above, in perational Controls of the above, in perational controls a alert triggers for fugithe use of paper mulwater sprays.  The risk control is assimined perational in the above, in | the effectiveness of the cor<br>or Dust Suppression proces<br>and TARPS for dust suppresive dust thresholds,<br>ch and other remediation of<br>esseed via the following factors   | edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Or Context  Risk Control Comments  - ti - v  Risk Control Comments  Risk Control Comments  Risk Control Comments  | Operational Controls of<br>Operational controls a<br>alert triggers for fugithe use of paper mul<br>water sprays.<br>The risk control is ass<br>Independence: High<br>Applicable: Mod-High<br>Sased on the above,<br>Code   | or Dust Suppression proce<br>and TARPS for dust suppre-<br>ive dust thresholds,<br>ch and other remediation was<br>essed via the following fact<br>and ull applicability is assigned<br>Tag ID  | edure (TARP) ession include: works ctors:  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Comments  - ti - t  | Operational controls a<br>alert triggers for fugi<br>the use of paper mu<br>water sprays.  The risk control is ass<br>Independence: High<br>Applicable: Mod-Hig<br>Sased on the above,  | nd TARPS for dust suppre<br>ive dust thresholds,<br>ch and other remediation of<br>essed via the following fact<br>n<br>ull applicability is assigned<br>Tag ID   | ession include: works clors:   | Owner                      |                      |                                |             |                   |                |          |
| Comments - a - ti - ti - v  Th - li - / A  Risk Control C  Ri  Base Control  | alert triggers for fugi<br>the use of paper mu<br>water sprays.  The risk control is ass<br>Independence: High<br>Applicable: Mod-Hig<br>Based on the above, it<br>Code   | ive dust thresholds,<br>ch and other remediation was<br>essed via the following fact<br>null applicability is assigned<br>Tag ID  | works clors:   | Owner                      |                      |                                |             |                   |                |          |
| Comments - a - ti - ti - v  Th - li - / A  Risk Control C  Ri  Base Control  | alert triggers for fugi<br>the use of paper mu<br>water sprays.  The risk control is ass<br>Independence: High<br>Applicable: Mod-Hig<br>Based on the above, it<br>Code   | ive dust thresholds,<br>ch and other remediation was<br>essed via the following fact<br>null applicability is assigned<br>Tag ID  | works clors:   | Owner                      |                      |                                |             |                   |                |          |
| - v Tr - l - r - R Risk Control Co   | water sprays.  The risk control is ass Independence: High Applicable: Mod-High Based on the above, it   | essed via the following fac<br>n<br>ull applicability is assigned<br>Tag ID   | ctors:   | Owner                      |                      |                                |             |                   |                |          |
| Th - Ii - Ir - If   | The risk control is ass<br>Independence: High<br>Applicable: Mod-Hig<br>Based on the above,   | n<br>ull applicability is assigned<br>Tag ID  | d.   | Owner                      |                      |                                |             |                   |                |          |
| - II<br>- A<br>Ba<br>Risk Control Co.<br>Ri<br>Base Control  | Independence: High<br>Applicable: Mod-Hig<br>Based on the above,  | n<br>ull applicability is assigned<br>Tag ID  | d.   | Owner                      |                      |                                |             |                   |                |          |
| Risk Control C. Ri   | Applicable: Mod-Hig<br>Based on the above,  | ull applicability is assigned   |  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Co  | Based on the above,   | ull applicability is assigned   |  | Owner                      |                      |                                |             |                   |                |          |
| Risk Control Co  | Code  | Tag ID  |  | Owner                      |                      |                                |             |                   |                |          |
| RI<br>Base Control Th  |   | -   | Description  | Owner                      |                      |                                |             |                   |                |          |
| Base Control Th  | RR-COP-02730  | BC-00431  |  |                            | Status               | Applicability Factor           | Critica     | lity Type/Fact    | or Reviewed    | Assessme |
| Base Control The Comments  |   |   | CPG001M Dust Suppression Control Procedure   | No Owner Defined           | In Service           | 31.0%                          | Critical C  | ontrol Administra | ive 6-Oct-2015 | Good     |
| - li   | he base control is as<br>Implemented: Yes<br>Type: Administrative   | sessed via the following:   |  |                            |                      |                                |             |                   |                |          |
| 1-   | Reliability: Good   |   |  |                            |                      |                                |             |                   |                |          |
| - P  | Monitoring/Auditing:  | Ad-hoc  |  |                            |                      |                                |             |                   |                |          |
| Br   | Based on the above,   | he effectiveness of the cor   | ntrol is assessed to be GOOD.  |                            |                      |                                |             |                   |                |          |
| Risk Control Du<br>Context   | Oust Suppression wor  | k instruction (PRWF044M)  | )(16837)   |                            |                      |                                |             |                   |                |          |
| Risk Control The   | he dust suppression   | work instruction is interline   | ked with the operational controls for dust suppressions (TARP).  |                            |                      |                                |             |                   |                |          |
| Tì   | he risk control is ass  | essed via the following fac   | ctors:   |                            |                      |                                |             |                   |                |          |
|  |   |   | ntrols for dust suppressions (TARP) control.   |                            |                      |                                |             |                   |                |          |
| - /  | Applicable: Mod-Hig   | ı   |  |                            |                      |                                |             |                   |                |          |
| Br   | Based on the above,   | partial applicability is assig  | ned as it is part of the operational controls for dust suppressions (TARP) control.  |                            |                      |                                |             |                   |                |          |
| use Fo   | ugitive dust emis   | sions due to handling   | g of black coal  | Code                       | Status               |                                |             | Likelihood        | Contribution   |          |
|  |   |   |  | RR-CA-00539                | Active               |                                | Current     | Unlikely (2)      | 37.6%          |          |
|  |   |   |  |                            |                      |                                | Proposed    | Unlikely (2)      | 5.7%           |          |
| Comments Br  | Briquettes is no longe  | handled onsite.   |  |                            |                      |                                |             |                   |                |          |
|  |   |   |  |                            |                      |                                |             |                   |                |          |
|  |   |   | handling of black coal, offsite emission are not expected as dust emissions is expected t  | to be contained within the |                      |                                |             |                   |                |          |
| Sit  | ite boundary. Therefo   | ore, the likelihood of this ev  | vent is considered to be UNLIKELY.   |                            |                      |                                |             |                   |                |          |

------ ID. DD D 00060



| NE RISK ASSES         | SIMEINI                  |                      |  | ACTIVE ICION   | Scenarios ID: RR          | -1X-00000          |                                |                     |                               |                 | The same of the sa | AGL         |                |
|-----------------------|--------------------------|----------------------|--|--|---------------------------|--------------------|--------------------------------|---------------------|-------------------------------|-----------------|--|-------------|----------------|
|                       | Risk Control             | Code<br>RR-COP-03060 | Tag ID   | Description  Develop a procedure to manage dust emissions from handling of black coal (update the existing briquette delivery procedure).            | Owner<br>No Owner Defined | Status<br>Proposed | Applicability Factor<br>100.0% |                     | riticality<br>ritical Control |                 | Reviewed<br>13-Oct-2015  | Asses       |                |
|                       | Risk Control<br>Context  | Develop a procedu    | re to manage dust emiss                                  | existing triquette delivery procedure).  ions from handling of black coal (update the existing briquette delivery procedure).                        |                           |                    |                                |                     |                               |                 |  |             |                |
|                       | Risk Control<br>Comments |                      | nd effective procedure pe<br>er of risk reduction is ass | rformed by competent operators to minimise dust emission whilst handling black coal is expecte<br>igned to this action.                              | to reduce the risk.       |                    |                                |                     |                               |                 |  |             |                |
| Actions               |                          | Code                 | Objective  | Work to be Done  |                           |                    |                                |                     | Priority                      | Implementer     | Status   | Complete By | Tracki         |
|                       |                          | RR-A-00053           |  | to manage dust emissions from the handling of<br>e existing briquette delivery procedure).   |                           |                    |                                |                     | Normal                        |                 | Pending  |             | N/A            |
| Cause                 |                          | Smoke from sm        | all fire within the mi                                   | ne operations, general burn off or hotspot (steam/smoke)   | Code                      | Status             |                                |                     |                               |                 |  |             |                |
| ouusc                 |                          |                      |  |  |                           |                    |                                |                     |                               |                 |  |             |                |
| ouuse                 |                          |                      |  |  | RR-CA-00717               | Rejected           |                                |                     |                               |                 |  |             |                |
| oduse                 | Comments                 | Although these car   | ises have the notential to                               | a generate some noticeable smoke the amount of smoke generated is expected to be minor. That   |                           | Rejected           |                                |                     |                               |                 |  |             |                |
| oduse                 | Comments                 | -                    |  | generate some noticeable smoke, the amount of smoke generated is expected to be minor. The be below level of concerns. Hence this cause is rejected. |                           | Rejected           |                                |                     |                               |                 |  |             |                |
|                       |                          | -                    |  | · ·  |                           | Rejected           |                                |                     |                               |                 |  |             |                |
|                       | es                       | and/or public health | n impact is considered to                                | · ·  |                           | Rejected           |                                |                     | Likelihood                    |                 | Severity   | Risk F      | ating          |
| onsequenc             | es                       | and/or public health | n impact is considered to                                | be below level of concerns. Hence this cause is rejected.  | refore, the amenities     | ·                  |                                | Current             | Likelihood<br>Unlikely (2)    |                 | Severity e event to public safety medical attention)   | Risk F      |                |
| onsequenc             | es                       | and/or public health | n impact is considered to                                | be below level of concerns. Hence this cause is rejected.  | refore, the amenities     | Category           |                                | Current<br>Proposed |                               | (no<br>Nuisance | e event to public safety   |             | erate          |
| onsequenc<br>Conseque | es                       | and/or public health | n impact is considered to                                | be below level of concerns. Hence this cause is rejected.  | refore, the amenities     | Category           | Applicability Factor           | Proposed            | Unlikely (2)                  | (no<br>Nuisance | e event to public safety<br>medical attention)<br>e event to public safety   | Mode        | erate<br>erate |

# Base Control Community Engagement Plan will be activated as required to inform any community concern following a significant incident. Applicable stakeholders will be Comments engaged.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: Ad-Hoc

Based on the above, the effectiveness of the control is asssessed to be AVERAGE.

Context

Risk Control Community Engagement Plan

Risk Control Engagement of stakeholders within the community is the process to inform/manage community issues.

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Low

Based on the above, no applicability is assigned.

------ ID. DD D 00060 AGL



| RISK ASSESSMENT                       |   |   |   | Active Risk   | Scenarios ID: RF | R-R-00068              |                      |          |                                  |   |   | AGL         | •             |
|---------------------------------------|---|---|---|---|------------------|------------------------|----------------------|----------|----------------------------------|---|---|-------------|---------------|
| Risk Control                          | Code  | Tag ID  | Description   |   | Owner            | Status                 | Applicability Factor | Crit     | icality                          | Type/Factor   | Reviewed  | Assess      | ment          |
|                                       | RR-COM-03245  | BC-00483  | Loy Yang Mining Licence 5181 Work Plan  |   | No Owner Defined | In Service             | 0.0%                 | Critica  | Il Control                       | Administrative  | 16-Oct-2015   | Goo         | d             |
| Base Control                          | The work plan in  | dudes:  |   |   |                  |                        |                      |          |                                  |   |   |             |               |
| Comments                              | - commitments to  | government on key comp  | ponents on the mine rehabilitation  |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       |   | ehabilitated to its next use<br>sive mine rehabilitation  | e, which is proposed to be pasture for grazing and the waterbody a  | at the base of the mine                             |                  |                        |                      |          |                                  |   |   |             |               |
|                                       |   | is assessed via the follow  | ving:   |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | - Implemented: Y  |   |   |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | - Type: Administr   |   |   |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | <ul> <li>Reliability: Good</li> <li>Monitoring/Audit</li> </ul> | i<br>ting: Performance monitor  | ring  |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | Based on the abo  | ve, the effectiveness of th   | he control is assessed to be GOOD.  |   |                  |                        |                      |          |                                  |   |   |             |               |
| Risk Control<br>Context               | Rehabilitated lan   | i   |   |   |                  |                        |                      |          |                                  |   |   |             |               |
| Risk Control<br>Comments              | Rehabilitated lan   | d will reduce the potential   | of dust emissions from the mine.  |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | The risk control is   | assessed via the following  | ng factors:   |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | - Independence:   | Moderate  |   |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | - Applicable: Mod   | erate   |   |   |                  |                        |                      |          |                                  |   |   |             |               |
|                                       | Based on the abo  | ve, conservatively no app   | olicability is assigned.  |   |                  |                        |                      |          |                                  |   |   |             |               |
| Risk Control                          |   | Tag ID  | Description   |   | Owner            | Status                 | Applicability Factor |          | icality                          | Type/Factor   | Reviewed  | Assess      | ment          |
|                                       | RR-COM-03278  |   | Review the effectiveness of spray coverage and increase t<br>automated spray.   | he implementation of the                            | No Owner Defined | Proposed               | 100.0%               | Non-Crit | ical Control                     |   | 13-Oct-2015   | Asses       | sed           |
|                                       | Review the effect   | iveness of soray coverage   | e and increase the implementation of the automated spray.   |   |                  |                        |                      |          |                                  |   |   |             |               |
| Risk Control<br>Context               |   | ronoco or opia, corolage  |   |   |                  |                        |                      |          |                                  |   |   |             |               |
| Context<br>Risk Control               | Implementation of   | f effective and automated   | I spray coverage in high risk areas is expected to reduce dust emi  | ssions and has the potential to red                 | duce the risk.   |                        |                      |          |                                  |   |   |             |               |
| Context                               | Implementation of   | f effective and automated   | I spray coverage in high risk areas is expected to reduce dust emiction is assigned to this action.   | ssions and has the potential to red Work to be Done | duce the risk.   |                        |                      |          | Priority                         | Implementer   | Status  | Complete By | Tra           |
| Context<br>Risk Control<br>Comments   | Implementation of   | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes                          | ction is assigned to this action. ss of spray coverage and increase the implementation of the   |   | duce the risk.   |                        |                      |          | <b>Priority</b><br>Normal        | Implementer   | Status<br>Pending   | Complete By | Tı            |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | ction is assigned to this action.   |   | duce the risk.   | Category               |                      |          | -                                | Implementer   |   | Complete By |               |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   |                  | Category Environment & |                      |          | Normal<br>Likelihood             | ·   | Pending   | . ,         | ating         |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             |                        |                      |          | Normal                           | Moderate  | Pending<br>Severity   | Risk R      | atinç         |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      |          | Normal<br>Likelihood             | Moderate<br>environn  | Pending  Severity e, short to medium term   | Risk R      | atinç         |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      |          | Normal<br>Likelihood             | Moderate<br>environn<br>exte  | Pending  Severity  a, short to medium term nental impact that may   | Risk R      | ating         |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      |          | Normal<br>Likelihood             | Moderate<br>environn<br>exte<br>operati<br>result                                 | Pending  Severity  a, short to medium term mental impact that may and beyond AGL's onal area and/or may t in local community  | Risk R      | ating         |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      | Current  | Normal  Likelihood  Unlikely (2) | Moderate<br>environn<br>exte<br>operati<br>result                                 | Pending  Severity  a, short to medium term mental impact that may and beyond AGL's onal area and/or may t in local community complaint(s).  | Risk R      | ating<br>rate |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      |          | Normal<br>Likelihood             | Moderate<br>environn<br>exte<br>operati<br>result<br>Moderate                     | Pending  Severity  e, short to medium term nental impact that may and beyond AGL's onal area and/or may t in local community complaint(s). e, short to medium term  | Risk R      | ating<br>rate |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      | Current  | Normal  Likelihood  Unlikely (2) | Moderate<br>environn<br>exte<br>operati<br>result<br>Moderate<br>environn         | Pending  Severity  a, short to medium term mental impact that may end beyond AGL's onal area and/or may tin local community complaint(s). a, short to medium term mental impact that may                  | Risk R      | ating<br>rate |
| Context Risk Control Comments Actions | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      | Current  | Normal  Likelihood  Unlikely (2) | Moderate<br>environn<br>exte<br>operati<br>result<br>Moderate<br>environn<br>exte | Pending  Severity e, short to medium term mental impact that may end beyond AGL's onal area and/or may t in local community complaint(s). e, short to medium term mental impact that may end beyond AGL's | Risk R      | ating<br>rate |
| Context<br>Risk Control<br>Comments   | Implementation of<br>However consense<br>Code<br>RR-A-00060     | f effective and automated<br>atively no future risk reduce<br>Objective<br>Review the effectivenes<br>automated spray coven | oction is assigned to this action.  ss of spray coverage and increase the implementation of the rage in high risk areas to reduce dust emissions. |   | Code             | Environment &          |                      | Current  | Normal  Likelihood  Unlikely (2) | Moderate environn exte operati result  Moderate environn exte operati             | Pending  Severity  a, short to medium term mental impact that may end beyond AGL's onal area and/or may tin local community complaint(s). a, short to medium term mental impact that may                  | Risk R      | ating<br>rate |

Active Rick Scenarios ID: PR-P-00068



| ISK ASSESSMENT    |   |                           | Active Risk   | k Scenarios ID: RR-       | -R-00068   |                      |                      |                |             | AGL         | •        |
|-------------------|---|---------------------------|---|---------------------------|------------|----------------------|----------------------|----------------|-------------|-------------|----------|
| Risk Cont         | rol Code  | Tag ID                    | Description   | Owner                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed    | Assess      | ment     |
|                   | RR-COM-03059  | BC-00408                  | Environmental site plan   | No Owner Defined          | In Service | 0.0%                 | Critical Control     | Administrative | 13-Oct-2015 | Avera       | ige      |
| Base Con<br>Comme | trol The plan specifie  | s the allowable dischar   | rge limits as referenced in the EPA licence 11149 conditions.   |                           |            |                      |                      |                |             |             |          |
|                   | This includes ong   | oing visual inspection    | and remediation of targeted areas following the hydrological model and monitoring.  |                           |            |                      |                      |                |             |             |          |
|                   |   | is assessed via the fol   | lowing:   |                           |            |                      |                      |                |             |             |          |
|                   | - Implemented: Y  |                           |   |                           |            |                      |                      |                |             |             |          |
|                   | <ul> <li>Type: Administration</li> <li>Reliability: Fair</li> </ul> | ative                     |   |                           |            |                      |                      |                |             |             |          |
|                   | - Monitoring/Audi   | ting: None                |   |                           |            |                      |                      |                |             |             |          |
|                   | Based on the abo  | ve, the effectiveness i   | s assessed to be AVERAGE.   |                           |            |                      |                      |                |             |             |          |
| Risk Con<br>Cont  | trol Monitoring of air elext  | emissions and exposul     | re levels   |                           |            |                      |                      |                |             |             |          |
| Risk Con          | trol Data from monito   | ring the air emissions i  | is used to inform the operational controls and mine rehabilitation plans. AGL has installed numerous  | s air monitoring stations |            |                      |                      |                |             |             |          |
| Comme             | nts which assist and  | validate complaints.      |   |                           |            |                      |                      |                |             |             |          |
|                   | The monitoring or   | ccurs after the event ha  | as occurred.  |                           |            |                      |                      |                |             |             |          |
|                   |   | assessed via the follo    | owing factors:  |                           |            |                      |                      |                |             |             |          |
|                   | - Independence: I   |                           |   |                           |            |                      |                      |                |             |             |          |
|                   | - Applicable: Low   | (monitoring occurs aft    | er the event).  |                           |            |                      |                      |                |             |             |          |
|                   |   | ve, no applicability is a | assigned.   |                           |            |                      |                      |                |             |             |          |
| Risk Cont         |   | Tag ID                    | Description   | Owner                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed    | Assess      | ment     |
|                   | RR-COM-03063  |                           | Review the effectiveness of spray coverage and increase the implementation of the<br>automated spray.                                       | No Owner Defined          | Proposed   | 100.0%               | Non-Critical Control |                | 13-Oct-2015 | Assess      | sed      |
| Risk Con<br>Cont  |   | iveness of spray cover    | rage and increase the implementation of the automated spray.  |                           |            |                      |                      |                |             |             |          |
|                   |   |                           |   |                           |            |                      |                      |                |             |             |          |
| Comme             | -4-   |                           | ted spray coverage in high risk areas is expected to reduce dust emissions and has the potential to<br>eduction is assigned to this action. | reduce the risk.          |            |                      |                      |                |             |             |          |
| Actions           | Code  | Objective                 | Work to be Done   |                           |            |                      | Priority             | Implementer    | Status      | Complete By | Tracking |
|                   | RR-A-00058  |                           | eness of spray coverage and increase the implementation of the<br>verage in high risk areas to reduce dust emissions.                       |                           |            |                      | Normal               |                | Pending     |             | N/A      |
| Risk Cont         | rol Code  | Tag ID                    | Description   | Owner                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed    | Assess      | ment     |
|                   | RR-COM-03064  |                           | Investigate the use of Compressed Air Foam (CAF) for dust suppressions.   | No Owner Defined          | Proposed   | 100.0%               | Non-Critical Control |                | 13-Oct-2015 | Asses       | sed      |
| Risk Con<br>Cont  |   | e of Compressed Air F     | Foam (CAF) for dust suppressions.   |                           |            |                      |                      |                |             |             |          |
| Risk Con<br>Comme | trol The implementation risk reduction is a                         |                           | ation will provide additional information to the cause. As this does not reduce the likelihood of the ev                                    | vent from occurring, no   |            |                      |                      |                |             |             |          |
| Actions           | Code  | Objective                 | Work to be Done   |                           |            |                      | Priority             | Implementer    | Status      | Complete By | Tracking |
|                   | RR-A-00059  | Investigate the use       | of Compressed Air Foam (CAF) for dust suppressions.   |                           |            |                      | Normal               |                | Pending     |             | N/A      |
|                   |   |                           |   |                           |            |                      |                      |                |             |             |          |

Active Risk Scenarios ID: RR-R-00068 AGL MINE RISK ASSESSMENT



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed RR-COM-03246 BC-00483 Loy Yang Mining Licence 5181 Work Plan No Owner Defined In Service 0.0% Critical Control Administrative 16-Oct-2015 Good

Base Control The work plan includes:

- Comments commitments to government on key components on the mine rehabilitation - the site will be rehabilitated to its next use, which is proposed to be pasture for grazing and the waterbody at the base of the mine

  - outlines progressive mine rehabilitation

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Rehabilitated land Context

Comments

Risk Control Rehabilitated land will reduce the potential of dust emissions from the mine.

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Moderate

Based on the above, conservatively no applicability is assigned.



Active Risk Scenarios ID: RR-R-00069 AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Noise emissions Scenario Mining operations generating noise which could cause nuisance or loss of amenity Comments Recommended levels by SEPP (Noise from industry in regional Victoria 2011) (NIRV): Day: 45 dB(A) Evening: 37 dB(A) Night: 32 db(A) Due to noise emissions, there is the risk that noise incidents result in verified complaints from local residents. The noise emissions are not expected to result in hearing damage to members of the public. Therefore, no risk to public safety was identified. Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Unlikely (2) Environment & Community Level 3 (1.5) Moderate Proposed Unlikely (2) **Environment & Community** Level 3 (1.5)

## Causes

Cause Noise emissions from mining related activities Code Likelihood Contribution Status RR-CA-00421 Active Possible (3) 100.0% Current Proposed Possible (3) 100.0%

## Comments Potential sources include:

- dredgers
- stackers
- conveyors
- crushing plant
- mobile plant (heavy machinery)
- drilling

Most of the equipment operated onsite is not expected to generate noise emissions greater than 85 dBa. Therefore, the likelihood of this event is considered to be POSSIBLE.

Active Risk Scenarios ID: RR-R-00069 AGL MINE RISK ASSESSMENT



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00452 RR-COP-01998 Buffer zone between site and residences No Owner Defined In Service 100.0% Critical Control Isolation 5-Oct-2015 Good Base Control Exclusion Zones 0110 code. Planning controls mandate buffer zones between the site and residences to minimise the number of potential receptors. Tree planting and screening within the buffer zones. This land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the mining license. The planning zone ultimately results in reduced population, i.e. reduced human activity in this zone. The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. These activities include farming, slashing, ploughing, summer crops, stock (fuel) management by grazing, earthen breaks. Exclusion Zones in force. Bushfire mitigation plans in place and submitted to Energy Safe Victoria. Exclusion zones around electrical infrastructure The base control is assessed via the following: - Implemented: Yes - Type: Administrative (some aspects of isolation) - Reliability: Very Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness of the control is assessed to be GOOD. Risk Control Buffer zone between site and residences Context Risk Control Buffer zone provides distance between the mine and potential receptors. Comments The risk control is assessed via the following factors: - Independence: Moderate - Applicable: Mod-High Based on the above, full applicability is assigned. Consequences Consequence Noise emissions with the potential to result in nuisance and/or loss of amenity to the local community Code Likelihood Severity Risk Rating Category RR-CQ-00351 Environment & Current Unlikely (2) Moderate, short to medium term Community environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Proposed Unlikely (2) Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s).

riskview

..... ID. DD D 00000 AGL M



| GL MINE RISK ASSESSI | MENI                     |                       |                           |   | Active Risk Scenarios ID: RF | K-R-00069  |                      |                      |                |            |            |
|----------------------|--------------------------|-----------------------|---------------------------|---|------------------------------|------------|----------------------|----------------------|----------------|------------|------------|
| F                    | Risk Control             | Code                  | Tag ID                    | Description                             | Owner                        | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|                      |                          | RR-COM-02634          | BC-00453                  | Maintain noise signature model          | No Owner Defined             | In Service | 0.0%                 | Non-Critical Control | Administrative | 7-Oct-2015 | Assessed   |
|                      | Base Control<br>Comments | This aids in respons  | se to noise emitted fro   | om the mine site.                       |                              |            |                      |                      |                |            |            |
|                      |                          | The base control is   | assessed via the follo    | owing:                                  |                              |            |                      |                      |                |            |            |
|                      |                          | - Implemented: Yes    |                           |   |                              |            |                      |                      |                |            |            |
|                      |                          | - Type: Administrati  | ive                       |   |                              |            |                      |                      |                |            |            |
|                      |                          | - Reliability: Fair   |                           |   |                              |            |                      |                      |                |            |            |
|                      |                          | - Monitoring/Auditin  | ig: Ad-hoc                |   |                              |            |                      |                      |                |            |            |
|                      |                          | Based on the above    | e, the effectiveness of   | the control is assessed to be ASSESSED. |                              |            |                      |                      |                |            |            |
|                      | Risk Control<br>Context  | Maintain noise sign   | ature model               |   |                              |            |                      |                      |                |            |            |
|                      | Risk Control             | The risk control is a | assessed via the follow   | ving factors:                           |                              |            |                      |                      |                |            |            |
|                      | Comments                 | - Independence: Lo    | ow .                      | <b>3</b> · · · ·                        |                              |            |                      |                      |                |            |            |
|                      |                          | - Applicable: Moder   |                           |   |                              |            |                      |                      |                |            |            |
|                      |                          | Based on the above    | e, no applicability is as | ssigned.                                |                              |            |                      |                      |                |            |            |
| F                    | Risk Control             | Code                  | Tag ID                    | Description                             | Owner                        | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|                      |                          | RR-COM-02635          | BC-00424                  | Complaints Registry Procedure (P00063)  | No Owner Defined             | In Service | 0.0%                 | Non-Critical Control | Procedural     | 7-Oct-2015 | Assessed   |

Base Control Process that administers issues raised via community complaints. Comments

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness is assessed to be ASSESSED.

Risk Control Complaints Registry Procedure (P00063)

Context

Risk Control The risk control is assessed via the following factors:

- Comments Independence: Low
  - Applicable: Moderate

Based on the above, no applicability is assigned.



AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00070 Risk Scenario Details Status Active Top Event Visual light emissions Scenario Mining operations generating light emissions which could cause nuisance or loss of amenity Comments Recommended levels by SEPP (Noise from industry in regional Victoria 2011) (NIRV): Day: 45 dB(A) Evening: 37 dB(A) Night: 32 db(A) Due to noise emissions there is the risk that noise incidents result in verified complaints from local residents. Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Low Current Rare (1) **Environment & Community** Level 1 (0.5) Low Proposed Rare (1) **Environment & Community** Level 1 (0.5) Causes Cause Light emissions from mining related activities Code Status Likelihood Contribution RR-CA-00690 Active Current Unlikely (2) 100.0% Proposed Unlikely (2) 100.0% Comments The site activities emit light. However, none of these are significant to the point of generating community complaints. Therefore, the likelihood of this event is considered to be UNLIKELY. Risk Control Code Owner Applicability Factor Tag ID Description Status Criticality Type/Factor Reviewed Assessment BC-00452 RR-COP-03066 Buffer zone between site and residences No Owner Defined In Service 100.0% Critical Control Isolation 5-Oct-2015 Good Base Control Exclusion Zones 0110 code. Planning controls mandate buffer zones between the site and residences to minimise the number of potential receptors. Tree planting and screening within the buffer zones. This land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the mining license. The planning zone ultimately results in reduced population, i.e. reduced human activity in this zone. The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. These activities include farming, slashing, ploughing, summer crops, stock (fuel) management by grazing, earthen breaks. Exclusion Zones in force. Bushfire mitigation plans in place and submitted to Energy Safe Victoria. Exclusion zones around electrical infrastructure The base control is assessed via the following: - Implemented: Yes - Type: Administrative (some aspects of isolation) - Reliability: Very Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness of the control is assessed to be GOOD. Risk Control Buffer zone between site and residences Risk Control Buffer zone provides distance between the mine and potential receptors. (Issues are not expected from members of the public utilising the roads that travel Comments through the mine lease). The risk control is assessed via the following factors: - Independence: Moderate - Applicable: Mod-High Based on the above, full applicability is assigned.

Consequences

riskview



| Consequence  | Visual light emis | sions with the potentia | al to result in nuisance and/or loss of amenity | Code             | Category      |                      | Likel                | hood      | Severity                        | Risk Rating |
|--------------|-------------------|-------------------------|---|------------------|---------------|----------------------|----------------------|-----------|---------------------------------|-------------|
|              |                   |                         |   | RR-CQ-00545      | Environment & |                      | Current Ran          | e (1)     | Negligible and short term       | Low         |
|              |                   |                         |   |                  | Community     |                      |                      |           | environmental impact to         |             |
|              |                   |                         |   |                  |               |                      |                      |           | localised area of Negligible    |             |
|              |                   |                         |   |                  |               |                      |                      |           | environmental value. No impact  |             |
|              |                   |                         |   |                  |               |                      |                      |           | beyond AGL's operational area.  |             |
|              |                   |                         |   |                  |               |                      |                      |           | No interest by local community. |             |
|              |                   |                         |   |                  |               |                      | Proposed Ran         | e (1)     | Negligible and short term       | Low         |
|              |                   |                         |   |                  |               |                      |                      |           | environmental impact to         |             |
|              |                   |                         |   |                  |               |                      |                      |           | localised area of Negligible    |             |
|              |                   |                         |   |                  |               |                      |                      |           | environmental value. No impact  |             |
|              |                   |                         |   |                  |               |                      |                      |           | beyond AGL's operational area.  |             |
|              |                   |                         |   |                  |               |                      |                      |           | No interest by local community. |             |
| Risk Control | Code              | Tag ID                  | Description                                     | Owner            | Status        | Applicability Factor | Criticality          | Type/Fact | or Reviewed                     | Assessment  |
|              | RR-COM-03065      | BC-00424                | Complaints Registry Procedure (P00063)          | No Owner Defined | In Service    | 0.0%                 | Non-Critical Control | Procedur  | al 7-Oct-2015                   | Assessed    |

Base Control Process that administers issues raised via community complaints. Comments

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness is assessed to be ASSESSED.

Risk Control Complaints Registry Procedure (P00063)

Context

Risk Control The risk control is assessed via the following factors:

Comments - Independence: Low

- Applicable: Moderate

Based on the above, no applicability is assigned.

Causes



AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Post rehabilitation/fire

Comments | Issue 1:

For the lake to be successfully filled, water must be granted to AGL through two licences for extraction of groundwater and the provision of bulk water from the La Trobe river. This is dependent on a third party. The consequence and likelihood of inadequate water for lake filing and weight balance cannot be determined, as this is dependent on the two governing bodies providing approval to grant licences.

Issue 2:

Issues around poor lake quality include:

- pH (acid rock drainage)
- aquifer pressure rebound sooner than anticipated
- adverse colour

Poor lake quality is expected to be contained within the Mine Lease Area. For it to escalate beyond the Mine Lease Area would require an interchange between the aquifers and the lake.

The likelihood of offsite and adverse environmental impact cannot be assessed without further investigation.

Scenario Post closure of mine future hazards which could impact the environment or public safety

Ratings Qualitative (Automatically Calculated)

Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk High Proposed Unlikely (2) Public Safety Level 5 (5) Actions Code Priority Implementer Status Tracking Work to be Done Complete By Objective Pending RR-A-00037 Undertake an assessment to determine the likelihood and impacts of Normal poor lake water quality to regional aquifers as a result of interchange

with the lake.

Cause Insufficient topsoil to complete final rehabilitation for the open cut mine Code Likelihood Contribution Status RR-CA-00600 Active Current Rare (1) 25.0% Proposed Possible (3) 7.7%

Comments Unsuccessful rehabilitation may contribute to erosion and water quality issueS that may result in water runoff. This water runoff due to acid mine drainage has the potential for higher consequence impact and been considered in RR-R-00063.

It has been identified that there may be insufficient topsoil to successfully complete final rehabilitation. This is expected to be contained within the Mine Lease

Area. Therefore, the future likelihood of this event is considered to be POSSIBLE.

Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Reviewed Assessment RR-COP-02479 System Administrator 100.0% 7-Oct-2015 Proposed Non-Critical Control Loy Yang Mining Licence 5181 Work Plan Variation Good

Risk Control Loy Yang Mining Licence 5181 Work Plan Variation

RR-A-00036

Risk Control Program to stockpile topsoil. Program to detail how to apply closure plan in relation to water management post mine closure. The work plan variation includes:

Comments - commitments to government on key components on the mine rehabilitation

- the site will be rehabilitated to its next use, which is proposed to be pasture for grazing and the waterbody at the base of the mine

Once this plan is approved and implemented, it is expected to be an effective control. Therefore the future effectiveness is assessed to be GOOD.

Code Actions Priority Implementer Status Tracking Objective Work to be Done Complete By

> Develop and implement the Mine Closure Plan. This should include post closure monitoring, trigger levels and associated tactical response. The plan should also set the completion and success criteria for complete

rehabilitation.

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riskview



N/A

12:03 pm

Pending

Normal



| E RISK ASSESS | SMENT                               |  |   |   | Active Risk Sce   | enarios ID: RR-I              | R-00071            |                                |                      |                       |             |                         | AGL         | -      |
|---------------|-------------------------------------|--|---|---|---|-------------------------------|--------------------|--------------------------------|----------------------|-----------------------|-------------|-------------------------|-------------|--------|
| 1             | Risk Control                        | Code<br>RR-COP-02481   | Tag ID  | Description  Continue to investigate alternative sources of investigation on artificial topsoil study with Fe                                     | topsoil, or alternative materials (include 4 year deration University). | Owner<br>System Administrator | Status<br>Proposed | Applicability Factor<br>100.0% | Critic<br>Non-Critic | cality<br>cal Control |             | Reviewed<br>7-Oct-2015  | Asses<br>Go |        |
|               | Risk Control<br>Context             | Continue to investig   | gate alternative sources of to                                    | psoil, or alternative materials (include 4 year inves   | stigation on artificial topsoil study with Federation                   | University).                  |                    |                                |                      |                       |             |                         |             |        |
|               |                                     |  | topsoil is identified, it is expense.  Therefore effectiveness is | cted to eliminate the issues associated with the ca considered to be GOOD.  | use, therefore it is expected that this would provide                   | e one order of                |                    |                                |                      |                       |             |                         |             |        |
| Actions       |                                     | Code   | Objective   |   | Work to be Done   |                               |                    |                                | P                    | Priority              | Implementer | Status                  | Complete By | Tracki |
|               |                                     | RR-A-00052   | -   | Iternative sources of topsoil, or alternative investigation on artificial topsoil study with  |   |                               |                    |                                | ١                    | Normal                |             | Pending                 |             | N/A    |
| Cause         |                                     | Ground subside   | ence of rehabilitated lan   | dform post mining operations  |   | Code                          | Status             |                                |                      | Likelihood            |             | Contribution            |             |        |
|               |                                     |  |   |   |   | RR-CA-00647                   | Active             |                                | Current<br>Proposed  | Rare (1) Possible (3) |             | 25.0%<br>7.7%           |             |        |
|               |                                     | Potential pathways - groundwater extra - adverse jointing a - excessive infiltrati - saturated soils - material quality is | action<br>arrangements<br>ion of water into batter cracks         | s and joints (increase pore pressures)  |   |                               |                    |                                | ,                    | ,                     |             |                         |             |        |
|               |                                     |  | od of this event is considered                                    |   |   |                               |                    |                                |                      |                       |             |                         |             |        |
|               | Risk Control                        | Code<br>RR-COP-03144   | Tag ID  | Description  Develop and implement the Mine Closure Pla   | n   | Owner No Owner Defined        | Status<br>Proposed | Applicability Factor<br>100.0% |                      | cality<br>cal Control |             | Reviewed<br>14-Oct-2015 | Asses       |        |
|               |                                     | This Mine Closure criteria for complete  |   | monitoring, trigger levels and associated tactical r  | esponse. The plan also sets the completion and s                        | uccess                        |                    |                                |                      |                       |             |                         |             |        |
|               |                                     | Once this plan is a  | pproved and implemented, it                                       | is expected to be an effective control. Therefore the   | ne future effectiveness is assessed to be GOOD.                         |                               |                    |                                |                      |                       |             |                         |             |        |
| Actions       |                                     | Code   | Objective   |   | Work to be Done   |                               |                    |                                | P                    | Priority              | Implementer | Status                  | Complete By | Tracki |
|               |                                     | RR-A-00036   | closure monitoring, trigge  | he Mine Closure Plan. This should include post<br>or levels and associated tactical response. The<br>completion and success criteria for complete |   |                               |                    |                                | ١                    | Normal                |             | Pending                 |             | N/A    |
| ı             | Risk Control                        |  | Tag ID  | Description   |   | Owner                         | Status             | Applicability Factor           | Critic               | -                     |             | Reviewed                | Asses       |        |
|               | Risk Control                        | RR-COP-03275  Loy Yang Mining Li   | icence 5181 Work Plan Varia                                       | Loy Yang Mining Licence 5181 Work Plan Va<br>tition   | riation   | No Owner Defined              | Proposed           | 100.0%                         | Non-Critic           | cal Control           |             | 23-Oct-2015             | Go          | ood    |
|               | Context<br>Risk Control<br>Comments | - commitments to g   | government on key componer  | now to apply closure plan in relation to water mana<br>nts on the mine rehabilitation<br>ich is proposed to be pasture for grazing and the v      |   | n includes:                   |                    |                                |                      |                       |             |                         |             |        |
|               |                                     | Once this plan is a  | pproved and implemented, it                                       | is expected to be an effective control. Therefore the   | ne future effectiveness is assessed to be GOOD.                         |                               |                    |                                |                      |                       |             |                         |             |        |
| Actions       |                                     | Code   | Objective   |   | Work to be Done   |                               |                    |                                | P                    | Priority              | Implementer | Status                  | Complete By | Tracki |
|               |                                     | RR-A-00036   | closure monitoring, trigge  | he Mine Closure Plan. This should include post<br>or levels and associated tactical response. The<br>completion and success criteria for complete |   |                               |                    |                                | 1                    | Normal                |             | Pending                 |             | N/A    |

Active Risk Scenarios ID: RR-R-00071 AGL MINE RISK ASSESSMENT



| Part      | NE RISK ASSESS | SMENT                    |                      |                                  |  | Active Risk S                                      | cenarios ID: RR- | -R-000/1 |                      |          |              |             |              |             |          |
|--|----------------|--------------------------|----------------------|----------------------------------|--|--|------------------|----------|----------------------|----------|--------------|-------------|--------------|-------------|----------|
| Part      | Cause          |                          | Acid mine drain      | nage from the overburde          | en dump impacting Traralgon Creek wate                 | r quality  | Code             | Status   |                      |          | Likelihood   |             | Contribution |             |          |
| Part   |                |                          |                      |                                  |  |  | RR-CA-00649      | Active   |                      | Current  | Rare (1)     |             | 25.0%        |             |          |
| Application      |                |                          |                      |                                  |  |  |                  |          |                      | Proposed | Possible (3) |             | 7.7%         |             |          |
| Application      |                | Comments                 | Potential nathways   | include:                         |  |  |                  |          |                      |          |              |             |              |             |          |
| Properties   |                |                          |                      |                                  | o rainwater and surface water                          |  |                  |          |                      |          |              |             |              |             |          |
| Red Coal Section   Table   Table   Section   Sec   |                |                          |                      |                                  |  |  |                  |          |                      |          |              |             |              |             |          |
| Risk Centrol   Case  |                |                          | - geotechnical inst  | ability in the area              |  |  |                  |          |                      |          |              |             |              |             |          |
| Risk Centrol   Case  |                |                          | The future likelihoo | nd of this event is considered   | to be POSSIBLE   |  |                  |          |                      |          |              |             |              |             |          |
| Rot Control   Specified Control      |                | Risk Control             |                      |                                  |  |  | Owner            | Status   | Annlicability Factor |          | Criticality  |             | Paviousd     | Acces       | cmont    |
| Real Control     |                |                          |                      |                                  | •  | n  |                  |          |                      |          | -            |             |              |             |          |
| Content   Cont   |                |                          |                      |                                  | Service and impromone the mine electric in a           |  |                  | .,       |                      |          |              |             |              | •           | , ou     |
| Relix Continue   Part   Continue   Part   Continue   Part   Continue   Part   P |                |                          | Develop and imple    | ment the Mine Closure Plan       |  |  |                  |          |                      |          |              |             |              |             |          |
| Communication   Communicati    |                |                          |                      |                                  |  |  |                  |          |                      |          |              |             |              |             |          |
| Actions    Contains   Paris    |                | Risk Control<br>Comments |                      |                                  | monitoring, trigger levels and associated tactical r   | esponse. The plan also sets the completion an      | d success        |          |                      |          |              |             |              |             |          |
| Action   Column   C   |                |                          | criteria for complet | e renabilitation.                |  |  |                  |          |                      |          |              |             |              |             |          |
| Pending   Pend   |                |                          | Once this plan is a  | pproved and implemented, it      | is expected to be an effective control. Therefore the  | he future effectiveness is assessed to be GOOI     | D.               |          |                      |          |              |             |              |             |          |
| Risk Control Risk  | Actions        |                          | Code                 | Objective                        |  | Work to be Done                                    |                  |          |                      |          | Priority     | Implementer | Status       | Complete By | Tracking |
| Risk Control Risk  |                |                          | RR-A-00036           | Develop and implement t          | he Mine Closure Plan. This should include post         |  |                  |          |                      |          | Nomal        |             | Pending      |             | N/A      |
| Risk Control   2016   2019     |                |                          |                      |                                  |  |  |                  |          |                      |          |              |             |              |             |          |
| Risk Control Risk  |                |                          |                      |                                  | completion and success criteria for complete           |  |                  |          |                      |          |              |             |              |             |          |
| Risk Control Contents Risk Control Committed Risk Control Robert Pages to attackpile lapsed. Program to data blook to spay) clease plant in relation to water management post mine dispute. The work plan variation includes:  |                | Risk Control             | Code                 |                                  | Description  |  | Owner            | Status   | Applicability Factor |          | Criticality  |             | Daviawad     | A           | amant    |
| Risk Control Context  Risk Control Comments  Risk Control Comments  Comments |                |                          |                      | rug ib                           | •  | riation  |                  |          |                      |          | •            |             |              |             |          |
| Comments Risk Confloat  Risk Comments Risk Comments Comments Risk Commen |                |                          |                      |                                  | Loy rang mining closure 5101 Work harr va              | inauon   |                  |          |                      |          |              |             |              | GC GC       | Jou      |
| - the site will be rehabilitated to its next use, which is proposed to be pasture for grazing and the waterbody at the base of the mine  Code Nojective Work to be Done  RR-A00030 Develop and implement the Mine Closure Plan. This should include governow forming, trigger levels and associated factical response. The consumer of rehabilitation.  Cause  Fire risk during mine closure progress  Fire risk during mine closure progress  Committed  Polymose Polymose Subdistance  RR-CA-00552 Active  Committed  Polymose Subdistance of graining equipment or farming related activities accounted in Victoria, therefore the future likelihood for a bush fire or ember attack to directly  Bush fire hazards are managed by other authorities. Bush fire has accounted in Victoria, therefore the future likelihood for a bush fire or ember attack to directly  |                | Context<br>Risk Control  | Program to stockp    | ile topsoil. Program to detail l | now to apply closure plan in relation to water mana    | agement post mine closure. The work plan varia     | ation includes:  |          |                      |          |              |             |              |             |          |
| Actions Code Objective Work to be Done Priority Implementer Status Complete By Tracking ARA-0036 Develop and implement the Mine Closure Plan. This should include post closure monitoring, frigge fews and associated factical response. The plan should also set the completion and success criteria for complete rehabilitation.  Cause Fire fisk during mine closure progress Code Status Likelihood Current Race (1) 25.0%  Froposed Likely (4) 76.9%  Comment Spring |                |                          |                      |                                  |  | vaterbody at the base of the mine                  |                  |          |                      |          |              |             |              |             |          |
| RR-A00036 Develop and implement the Mine Closure Plan. This should include post closure monitoring, trigger levels and associated factical response. The plan should also set the completion and success criteria for complete rehabilitation.  Cause  Fire fisk during mine closure progress  Code  RR-CA-00652  Active  Current  Rare (1)  25.0%  Proposed  Likel Hood  76.9%  RR-CA-00652  Active  Current  Rare (1)  25.0%  76.9%  Formal set in the proposed of the propo |                |                          |                      | pproved and implemented, it      | is expected to be an effective control. Therefore the  | he future effectiveness is assessed to be GOOI     | D.               |          |                      |          |              |             |              |             |          |
| closure monitoring, trigger levels and associated factical response. The plan should also set the completion and success criteria for complete rehabilitation.  Cause  Fire risk during mine closure progress  Code  RR-CA-00652  Active  Current  Rare (1)  25.0%  Proposed  Likely (4)  76.9%  Comments  Someting pethways includes:  - smoking  - spontaneous combustion - uncontrolled ignition sources from farming equipment or farming related activities - electrical source of ignition - but works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly  | Actions        |                          | Code                 | Objective                        |  | Work to be Done                                    |                  |          |                      |          | Priority     | Implementer | Status       | Complete By | Tracking |
| plan should also set the completion and success criteria for complete rehabilitation.  Cause  Fire risk during mine closure progress  Coments  Polential pathways includes:  |                |                          | RR-A-00036           |                                  |  |  |                  |          |                      |          | Normal       |             | Pending      |             | N/A      |
| Tensabilitation.  Cause Fire risk during mine closure progress Code RR-CA-00652 Active Current Rare (1) 25.0%  RR-CA-00652 Active Current Rare (1) 25.0%  Proposed Likely (4) 76.9%  Comments Potential pathways includes: - smoking - spontaneous combustion - uncontrolled ignition sources from farming equipment or farming related activities - electrical sources of ignitio - into works - light or heavy equipment - arsons  |                |                          |                      |                                  |  |  |                  |          |                      |          |              |             |              |             |          |
| RR-CA-00652 Active Current Rare (1) 25.0%  Proposed Likely (4) 76.9%  Comments Potential pathways includes: - smoking - spontaneous combustion - uncontrolled ignition sources from farming equipment or farming related activities - electrical source of ignition - hot works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly   |                |                          |                      |                                  | completion and success chiena for complete             |  |                  |          |                      |          |              |             |              |             |          |
| Comments Potential pathways includes: - smoking - spontaneous combustion - uncontrolled ignition sources from farming equipment or farming related activities - electrical source of ignition - hot works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly   | Cause          |                          | Fire risk during     | mine closure progress            |  |  | Code             | Status   |                      |          | Likelihood   |             | Contribution |             |          |
| Comments Potential pathways includes: - smoking - spontaneous combustion - uncontrolled ignition sources from farming equipment or farming related activities - electrical source of ignition - hot works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly   |                |                          |                      |                                  |  |  | RR-CA-00652      | Active   |                      | Current  | Rare (1)     |             | 25.0%        |             |          |
| Comments Potential pathways includes: - smoking - spontaneous combustion - uncontrolled ignition sources from farming equipment or farming related activities - electrical source of ignition - hot works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly   |                |                          |                      |                                  |  |  |                  |          |                      | Proposed | Likely (4)   |             | 76.9%        |             |          |
| - smoking - spontaneous combustion - uncontrolled ignition sources from farming equipment or farming related activities - electrical source of ignition - hot works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly   |                | Comments                 | Potential nathways   | s includes:                      |  |  |                  |          |                      |          |              |             |              |             |          |
| - uncontrolled ignition sources from farming equipment or farming related activities  - electrical source of ignition  - hot works  - light or heavy equipment  - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly  |                |                          |                      | , included.                      |  |  |                  |          |                      |          |              |             |              |             |          |
| - electrical source of ignition - hot works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly   |                |                          |                      |                                  |  |  |                  |          |                      |          |              |             |              |             |          |
| - hot works - light or heavy equipment - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly   |                |                          | -                    | · ·                              | ipment or farming related activities                   |  |                  |          |                      |          |              |             |              |             |          |
| - arsons  Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly  |                |                          |                      | or ignition                      |  |  |                  |          |                      |          |              |             |              |             |          |
| Bush fire hazards are managed by other authorities. Bush fire has occurred in Victoria, therefore the future likelihood for a bush fire or ember attack to directly  |                |                          | - light or heavy eq  | uipment                          |  |  |                  |          |                      |          |              |             |              |             |          |
| · ·  |                |                          | - arsons             |                                  |  |  |                  |          |                      |          |              |             |              |             |          |
| · ·  |                |                          | Bush fire hazards    | are managed by other author      | ities. Bush fire has occurred in Victoria. therefore t | the future likelihood for a bush fire or ember att | ack to directly  |          |                      |          |              |             |              |             |          |
|  |                |                          |                      |                                  |  | 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3           |                  |          |                      |          |              |             |              |             |          |
|  |                |                          |                      |                                  |  |  |                  |          |                      |          |              |             |              |             |          |

Active Risk Scenarios ID: RR-R-00071 AGL MINE RISK ASSESSMENT



| NE RISK ASSESSMENT | IT                      |  |                             |  | ACTIVE KISK SCE                                | enarios ID: KK      | -K-000/1                  |                      |          |                        |   | The second second  |               |       |
|--------------------|-------------------------|--|-----------------------------|--|--|---------------------|---------------------------|----------------------|----------|------------------------|---|--|---------------|-------|
| Risk               | Control                 | Code Ta  | g ID                        | Description  |  | Owner               | Status                    | Applicability Factor | Cri      | ticality               |   | Reviewed   | Assess        | ment  |
|                    | I                       | RR-COP-03152   |                             | Develop and implement the Mine Closure Plan  |  | No Owner Defined    | Proposed                  | 100.0%               | Non-Cri  | tical Control          |   | 14-Oct-2015  | Goo           | d     |
| Ris                | sk Control I            | Develop and implement                                  | he Mine Closure Plan        |  |  |                     |                           |                      |          |                        |   |  |               |       |
| Ris<br>C           | sk Control              | This Mine Closure Plan (<br>criteria for complete reha |                             | nonitoring, trigger levels and associated tactical response  | onse. The plan also sets the completion and su | uccess              |                           |                      |          |                        |   |  |               |       |
|                    | ,                       | •  |                             |  |  |                     |                           |                      |          |                        |   |  |               |       |
| Actions            |                         |  |                             | s expected to be an effective control. Therefore the fu  |  |                     |                           |                      |          | Priority               | Implementer   | Status   | 0 11 0        | Ten   |
| Actions            |                         |  | pjective                    |  | Work to be Done                                |                     |                           |                      |          | Nomal                  | impiementer   | Status<br>Pending  | Complete By   | Tra   |
|                    | !                       | clo  | sure monitoring, trigger    | e Mine Closure Plan. This should include post<br>levels and associated tactical response. The<br>ampletion and success criteria for complete |  |                     |                           |                      |          | Nomai                  |   | Pending  |               | r     |
| Risk               | Control                 | Code Ta  | g ID                        | Description  |  | Owner               | Status                    | Applicability Factor | Cri      | ticality               |   | Reviewed   | Assess        | ment  |
|                    | I                       | RR-COP-03277   |                             | Loy Yang Mining Licence 5181 Work Plan Variation   | on   | No Owner Defined    | Proposed                  | 100.0%               | Non-Cri  | tical Control          |   | 23-Oct-2015  | God           | ıd    |
| Ris                | sk Control I<br>Context | Loy Yang Mining Licence                                | 5181 Work Plan Variat       | ion  |  |                     |                           |                      |          |                        |   |  |               |       |
| Ris<br>C           | Comments                | - commitments to govern                                | ment on key component       | ow to apply closure plan in relation to water managem<br>ts on the mine rehabilitation   |  | n includes:         |                           |                      |          |                        |   |  |               |       |
|                    |                         | - the site will be rehabilita                          | ated to its next use, which | ch is proposed to be pasture for grazing and the water   | rbody at the base of the mine                  |                     |                           |                      |          |                        |   |  |               |       |
| -                  |                         |  |                             | s expected to be an effective control. Therefore the fu  | uture effectiveness is assessed to be GOOD.    |                     |                           |                      |          |                        |   |  |               |       |
| Cause              | l                       | Insufficient topsoil to                                | complete final reha         | abilitation for overburden dump  |  | Code<br>RR-CA-00727 | Status                    |                      |          |                        |   |  |               |       |
|                    |                         |  |                             |  |  | KR-0A-00121         | Rejected                  |                      |          |                        |   |  |               |       |
| С                  | Comments                | There is sufficient quanti                             | ty of topsoil to complete   | final rehabilitation of the overburden dump. Therefore   | e, this cause is rejected.                     |                     |                           |                      |          |                        |   |  |               |       |
| nsequences         |                         |  |                             |  |  |                     |                           |                      |          |                        |   |  |               |       |
| Consequence        | ı                       | Environmental impa                                     | cts from unsuccessi         | ful rehabilitation - Land, Aquifer and Surface   | e Water  | Code                | Category                  |                      |          | Likelihood             |   | Severity   | Risk R        | ating |
|                    |                         |  |                             |  |  | RR-CQ-00306         | Environment &             |                      | Current  | Rare (1)               |   | short to medium term   | Lo            | N     |
|                    |                         |  |                             |  |  |                     | Community                 |                      |          |                        |   | ental impact that may<br>nd beyond AGL's   |               |       |
|                    |                         |  |                             |  |  |                     |                           |                      |          |                        | operation   | nal area and/or may  |               |       |
|                    |                         |  |                             |  |  |                     |                           |                      |          |                        |   | in local community<br>complaint(s).  |               |       |
|                    |                         |  |                             |  |  |                     |                           |                      | Proposed | Unlikely (2)           |   | short to medium term   | Mode          | rate  |
|                    |                         |  |                             |  |  |                     |                           |                      |          |                        |   | ental impact that may  |               |       |
|                    |                         |  |                             |  |  |                     |                           |                      |          |                        |   | nd beyond AGL's  |               |       |
|                    |                         |  |                             |  |  |                     |                           |                      |          |                        |   |  |               |       |
|                    |                         |  |                             |  |  |                     |                           |                      |          |                        | operation result  | nal area and/or may<br>in local community  |               |       |
| Consequence        |                         | Fire risk with the not                                 | ential to impact pub        | olic safety  |  | Code                | Category                  |                      |          | Likelihood             | operation result  | nal area and/or may<br>in local community<br>complaint(s).                           | Riek D        | ating |
| Consequence        |                         | Fire risk with the pot                                 | ential to impact pub        | olic safety  |  | Code<br>RR-CO-00558 | Category Public Safety    |                      | Current  | Likelihood             | operatio<br>result  | nal area and/or may<br>in local community<br>complaint(s).                           | Risk R        | _     |
| Consequence        |                         | Fire risk with the pot                                 | ential to impact pub        | olic safety  |  | Code<br>RR-CQ-00558 | Category<br>Public Safety |                      | Current  | Likelihood<br>Rare (1) | operation result  | nal area and/or may<br>in local community<br>complaint(s).                           | Risk R<br>Hig |       |
| Consequence        | ı                       | Fire risk with the pot                                 | ential to impact pub        | olic safety  |  |                     |                           |                      | Current  |                        | operatic<br>result<br>Serious h.<br>public. N<br>required | nal area and/or may in local community complaint(s).  Severity arm to members of the |               | _     |

## Active Risk Scenarios ID: RR-R-00071



Proposed Rare (1) Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COM-03156 Vic police and CFA Response No Owner Defined 100.0% Non-Critical Control 9-Oct-2015 In Service Assessed Risk Control Vic police and CFA Response Risk Control External emergency responders will initiate various plans and protocols in response to a major fire to minimise the risk to public health and property. The CFA will be required to treat the rehabilitated area no differently to the surrounding land uses. Although this is an effective and applicable control, the adequacy is not assessed as it is a third party control. Risk Control Code Tag ID Description Owner Status Applicability Factor Type/Factor Reviewed Criticality Assessment RR-COM-03166 Rehabilitation Fire Suppression Systems No Owner Defined Proposed 100.0% Non-Critical Control 14-Oct-2015 Good Risk Control Rehabilitation Fire Suppression Systems Context Risk Control The fire suppression equipment is expected to include a pump station which sources water from the base of the mine and a reticulated system of spraylines to protect exposed coal surfaces. The system is expected to be manually activated. Once this is implemented, it is expected to provide one order of future risk reduction. Therefore effectiveness is considered to be GOOD. Tracking Actions Code Priority Implementer Status Work to be Done RR-A-00057 N/A Normal Pending Post mining closure, install a fire suppression system to prevent and/or mitigate against a mine fire. The system should include a pump station that sources water from the base of the mine and a reticulated system of spray lines to protect exposed coal surfaces. The system can be manually activated. Consequence Environmental risk from smoke with the potential to impact public amenities Code Category Likelihood Severity Risk Rating RR-CQ-00559 Environment & Current Moderate, short to medium term Rare (1) environmental impact that may Community extend beyond AGL's operational area and/or may result in local community complaint(s). Proposed Rare (1) Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COM-03159 Vic police and CFA Response No Owner Defined In Service 100.0% Non-Critical Control 9-Oct-2015 Assessed Risk Control Vic police and CFA Response Context Risk Control External emergency responders will initiate various plans and protocols in response to a major fire to minimise the risk to public health and property. The CFA will be required to treat the rehabilitated area no differently to the surrounding land uses. Although this is an effective and applicable control, the adequacy is not assessed as it is a third party control.

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| RISK ASSESSMENT          |                      |                            |   | Active Risk S                  | Scenarios ID: RR          | -R-00071           |                                |            |                       |                       |  |             | -              |
|--------------------------|----------------------|----------------------------|---|--------------------------------|---------------------------|--------------------|--------------------------------|------------|-----------------------|-----------------------|--|-------------|----------------|
| Risk Control             | Code<br>RR-COM-03164 | Tag ID                     | Description Rehabilitation Fire Suppression Systems   |                                | Owner<br>No Owner Defined | Status<br>Proposed | Applicability Factor<br>100.0% |            | cality<br>cal Control | Type/Factor           | Reviewed<br>14-Oct-2015  | Asses       |                |
| Risk Control<br>Context  | Rehabilitation Fire  | e Suppression Systems      |   |                                |                           |                    |                                |            |                       |                       |  |             |                |
| Risk Control<br>Comments |                      |                            | d to include a pump station which sources water from the base of the min<br>is expected to be manually activated.   | ne and a reticulated system    | of spraylines to          |                    |                                |            |                       |                       |  |             |                |
|                          | Once this is imple   | emented, it is expected to | provide one order of future risk reduction. Therefore effectiveness is cor  | nsidered to be GOOD.           |                           |                    |                                |            |                       |                       |  |             |                |
| Actions                  | Code                 | Objective                  |   | Work to be Done                |                           |                    |                                | F          | Priority              | Implementer           | Status   | Complete By | Track          |
|                          | RR-A-00057           | mine fire. The system s    | stall a fire suppression system to prevent and/or mitigate against a<br>should include a pump station that sources water from the base of the<br>system of spray lines to protect exposed coal surfaces. The system<br>ted. |                                |                           |                    |                                | 1          | Normal                |                       | Pending  |             | N/A            |
| onsequence               | Smoke risk wi        | th the potential to imp    | pact the public safety  |                                | Code                      | Category           |                                |            | Likelihood            |                       | Severity   | Risk R      | lating         |
|                          |                      |                            |   |                                | RR-CQ-00560               | Public Safety      |                                | Current    | Rare (1)              | public. M<br>required | darm to members of the<br>Members of the public<br>d to be displaced for a<br>licant period of time<br>(weeks) | Hiç         | jh             |
|                          |                      |                            |   |                                |                           |                    |                                | Proposed   | Rare (1)              | public. N<br>required | arm to members of the<br>Members of the public<br>If to be displaced for a<br>licant period of time<br>(weeks) | Hiç         | <sub>j</sub> h |
| Risk Control             | Code                 | Tag ID                     | Description   |                                | Owner                     | Status             | Applicability Factor           | Criti      | cality                | Type/Factor           | Reviewed   | Assess      | sment          |
|                          | RR-COM-03154         |                            | Vic police and CFA Response   |                                | No Owner Defined          | In Service         | 100.0%                         | Non-Critic | cal Control           |                       | 9-Oct-2015   | Asse        | ssed           |
| Risk Control<br>Context  | Vic police and CF    | A Response                 |   |                                |                           |                    |                                |            |                       |                       |  |             |                |
| Risk Control<br>Comments |                      |                            | various plans and protocols in response to a major fire to minimise the lean of differently to the surrounding land uses.   | risk to public health and prop | perty. The CFA            |                    |                                |            |                       |                       |  |             |                |
|                          | Although this is a   | n effective and applicable | control, the adequacy is not assessed as it is a third party control.   |                                |                           |                    |                                |            |                       |                       |  |             |                |
| Risk Control             | Code<br>RR-COM-03165 | Tag ID                     | Description Rehabilitation Fire Suppression Systems   |                                | Owner<br>No Owner Defined | Status<br>Proposed | Applicability Factor<br>100.0% |            | cality<br>cal Control | Type/Factor           | Reviewed<br>14-Oct-2015  | Asses       |                |
| Risk Control<br>Context  | Rehabilitation Fire  | e Suppression Systems      |   |                                |                           |                    |                                |            |                       |                       |  |             |                |
| Risk Control<br>Comments |                      |                            | d to include a pump station which sources water from the base of the min<br>is expected to be manually activated.   | ne and a reticulated system    | of spraylines to          |                    |                                |            |                       |                       |  |             |                |
|                          | Once this is imple   | emented, it is expected to | provide one order of future risk reduction. Therefore effectiveness is cor  | nsidered to be GOOD.           |                           |                    |                                |            |                       |                       |  |             |                |
| Actions                  | Code                 | Objective                  |   | Work to be Done                |                           |                    |                                | F          | Priority              | Implementer           | Status   | Complete By | Track          |
|                          | RR-A-00057           | mine fire. The system s    | stall a fire suppression system to prevent and/or mitigate against a<br>should include a pump station that sources water from the base of the<br>system of spray lines to protect exposed coal surfaces. The system<br>ted. |                                |                           |                    |                                | ١          | Normal                |                       | Pending  |             | N/A            |



Type/Factor

Administrative

Reviewed

6-Oct-2015

Assessment

Good

Criticality

Critical Control

AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Hazardous chemicals Scenario Loss of containment of chemicals which could impact the environment Comments This includes the following areas: 1. Northen OB retention pond polymer & lime dosing area 2. Freight gate - physical bunding, oil in 1000 L aboveground being transferred and tanked petrol & diesel belowground 3. Behind the Freight Gate is the Fuel Depot, transfer points of oil, diesel and petrol 4. RTL Yards - bunded area, triple intercepted pits - transfer point for oil pods A spill of polymer or lime is not expected to result in an environmental impact of concern. In addition, it is not expected to extend beyond the Mine Lease Area. The polymer dosing station is upstream of the OB pond and settlement ponds, any spill will be significantly diluted by these two water bodies. Therefore, hazards associated with a spill of polymer or lime are not considered a credible cause of concern. This assessment will consider spills associated with petrol, diesel and/or oil. Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Possible (3) **Environment & Community** Level 3 (1.5) Moderate Proposed Possible (3) **Environment & Community** Level 3 (1.5) Moderate Causes Cause Spill during unloading due to maloperation Likelihood Contribution Code Status RR-CA-00697 Active Current Possible (3) 6.3% 0.8% Possible (3) Proposed Comments Hazardous chemical which includes: oil, petrol, diesel. A spill can occur due to operator error during unloading, i.e. valve left open etc. Therefore, the likelihood

Owner

No Owner Defined

Status

In Service

Applicability Factor

0.0%

Base Control The procedure includes appropriate steps and precautions to be undertaken to minimise the potential of a spill during bulk tanker unloading.

Description

HSW707 Unloading of Bulk Chemical Tankers Work Instruction

The base control is assessed via the following:

of this event is considered to be POSSIBLE.

Tag ID

BC-00476

- Implemented: Yes

RR-COP-02947

- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Procedure for unloading of bulk chemical (generic)

Risk Control Code

Context

Risk Control The risk control is assessed via the following factors:

- Comments Independence: Low (included in cause likelihood)
  - Applicable: Moderate

Based on the above, no applicability is assigned as the control is not independent of the cause.

riskview

Active Risk Scenarios ID: RR-R-00072



| RISK ASSESSMEN | TV                      |  |  |   | Active Risk Sce   | enarios ID: RR-  | R-00072    |                      |         |                  |             |              |             | -     |
|----------------|-------------------------|--|--|---|---|------------------|------------|----------------------|---------|------------------|-------------|--------------|-------------|-------|
| Risk           | k Control               | Code   | Tag ID   | Description   |   | Owner            | Status     | Applicability Factor | C       | Criticality      | Type/Factor | Reviewed     | Assess      | sment |
|                |                         | RR-COP-02956                                   | BC-00477   | Bunding   |   | No Owner Defined | In Service | 100.0%               | Crit    | tical Control    | Engineering | 6-Oct-2015   | Go          | od    |
| Bas<br>C       | ase Control<br>Comments | Existing bunding wi                            | ithin the mine lease area is a                     | assessed to be in an appropriate condition to con   | tain a spill.   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | The base control is                            | assessed via the following:                        |   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | - Implemented: Yes                             | 3  |   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | - Type: Engineering                            | 1  |   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | - Reliability: Good                            |  |   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | - Monitoring/Auditin                           | g: Performance monitoring                          |   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         |  |  | ontrol is assessed to be GOOD.  |   |                  |            |                      |         |                  |             |              |             |       |
| Ris            | isk Control<br>Context  | Deliveries undertak                            | en within a bunded area.                           |   |   |                  |            |                      |         |                  |             |              |             |       |
|                | isk Control<br>Comments | Bunding is expecte                             | d to contain and hence mitig                       | gate a release in the event of a spill during unload  | ling.   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | The risk control is a                          | assessed via the following fa                      | actors:   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | - Independence: Hi                             | gh   |   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | - Applicable: High                             |  |   |   |                  |            |                      |         |                  |             |              |             |       |
|                |                         | Based on the above                             | e, full applicability is assigne                   | ed.   |   |                  |            |                      |         |                  |             |              |             |       |
| Actions        |                         | Code   | Objective  |   | Work to be Done   |                  |            |                      |         | Priority         | Implementer | Status       | Complete By | Trac  |
|                |                         | RR-A-00038                                     | Verify that the bunding of and EPA guidelines (EPA | of hazardous chemicals is compliant with AS1940<br>A Publication 347)                                 |   |                  |            |                      |         | Normal           |             | Pending      |             | N/A   |
| Risk           | k Control               | Code   | Tag ID   | Description   |   | Owner            | Status     | Applicability Factor | C       | Criticality      |             | Reviewed     | Assess      | sment |
|                |                         | RR-COP-02966                                   |  | Verify that the bunding of hazardous chemic guidelines (EPA Publication 347) and a proof the bunding. | cals is compliant with AS1940 and EPA gram is implemented to maintain the integrity of                            | No Owner Defined | Proposed   | 100.0%               | Non-C   | Critical Control |             | 14-Oct-2015  | Go          | od    |
| Ris            | isk Control<br>Context  | Verify that the bund<br>the integrity of the b | ling of hazardous chemicals<br>ounding.            | s is compliant with AS1940 and EPA guidelines (E  | PA Publication 347) and a program is implemented  | to maintain      |            |                      |         |                  |             |              |             |       |
| Ris<br>C       | isk Control<br>Comments | Existing bunding ha                            | as been assigned as "Good"                         | and full applicability; hence it is expected to redu  | ice the likelihood of the event by one order of magni   | tude.            |            |                      |         |                  |             |              |             |       |
|                |                         | -  | ction is completed, it is expe                     |   | ide an overall likelihood reduction of two orders of n<br>order of risk reduction. Therefore, the future effectiv | -                |            |                      |         |                  |             |              |             |       |
| Actions        |                         | Code   | Objective  |   | Work to be Done   |                  |            |                      |         | Priority         | Implementer | Status       | Complete By | Trac  |
|                |                         | RR-A-00038                                     | Verify that the bunding of and EPA guidelines (EPA | of hazardous chemicals is compliant with AS1940<br>A Publication 347)                                 |   |                  |            |                      |         | Normal           |             | Pending      |             | N/A   |
| Cause          |                         | Spill during unlo                              | pading due to hose failu                           | ure   |   | Code             | Status     |                      |         | Likelihood       |             | Contribution |             |       |
|                |                         |  |  |   |   | RR-CA-00698      | Active     |                      | Current | Possible (3)     |             | 6.3%         |             |       |
|                |                         |  |  |   |   |                  |            |                      |         |                  |             | 0.8%         |             |       |

Potential pathways include:

- wear and tear

- drive away

The likelihood of this event is considered to be POSSIBLE.

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00072



| ISK ASSESSMENT                          |  |   | Active Risk Sc   | enarios ID: RR-                            | ₹-00072    |                      |                      |                |             |             |       |
|---|--|---|--|--|------------|----------------------|----------------------|----------------|-------------|-------------|-------|
| Risk Control                            | Code   | Tag ID  | Description  | Owner                                      | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed    | Assess      | sment |
|   | RR-COP-03168   | BC-00476  | HSW707 Unloading of Bulk Chemical Tankers Work Instruction   | No Owner Defined                           | In Service | 0.0%                 | Critical Control     | Administrative | 6-Oct-2015  | Go          | od    |
| Base Control                            | The procedure inc  | udes appropriate steps and  | precautions to be undertaken to minimise the potential of a spill during bulk tanker unloading.  |  |            |                      |                      |                |             |             |       |
| Comments                                |  | assessed via the following  |  |  |            |                      |                      |                |             |             |       |
|   | - Implemented: Ye  |   |  |  |            |                      |                      |                |             |             |       |
|   | - Type: Administra   |   |  |  |            |                      |                      |                |             |             |       |
|   | - Reliability: Good  | 146   |  |  |            |                      |                      |                |             |             |       |
|   | - Monitoring/Auditi  | ng: Ad-hoc  |  |  |            |                      |                      |                |             |             |       |
|   | Based on the above   | e, the effectiveness of the o   | control is assessed to be GOOD.  |  |            |                      |                      |                |             |             |       |
| Risk Control<br>Context                 |  | ading of bulk chemical (gen   | eric)  |  |            |                      |                      |                |             |             |       |
| Risk Control                            | The risk control is  | assessed via the following f  | factors:   |  |            |                      |                      |                |             |             |       |
| Comments                                | - Independence: L  | ow (included in cause likelih   | nood)  |  |            |                      |                      |                |             |             |       |
|   | - Applicable: Mode   | rate  |  |  |            |                      |                      |                |             |             |       |
|   |  |   | ed as control is not independent of the cause.   |  |            |                      |                      |                |             |             |       |
| Risk Control                            | Code   | Tag ID  | Description  | Owner                                      | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed    | Assess      | sment |
|   | RR-COP-03169   | BC-00477  | Bunding  | No Owner Defined                           | In Service | 100.0%               | Critical Control     | Engineering    | 6-Oct-2015  | Go          | od    |
| Base Control<br>Comments                | Existing bunding w   | ithin the mine lease area is  | assessed to be in an appropriate condition to contain a spill.   |  |            |                      |                      |                |             |             |       |
| Comments                                |  | assessed via the following  | r.   |  |            |                      |                      |                |             |             |       |
|   | - Implemented: Ye  | S   |  |  |            |                      |                      |                |             |             |       |
|   | - Type: Engineerin   | g   |  |  |            |                      |                      |                |             |             |       |
|   | - Reliability: Good  |   |  |  |            |                      |                      |                |             |             |       |
|   | - Monitoring/Auditi  | ng: Performance monitoring  |  |  |            |                      |                      |                |             |             |       |
|   | Based on the above   | e, the effectiveness of the o   | control is assessed to be GOOD.  |  |            |                      |                      |                |             |             |       |
| Risk Control<br>Context                 |  | ken within a bunded area.   |  |  |            |                      |                      |                |             |             |       |
| Risk Control<br>Comments                | Bunding is expected  | ed to contain and hence miti  | igate the spill in the event of a spill during unloading.  |  |            |                      |                      |                |             |             |       |
|   | The risk control is  | assessed via the following f  | factors:   |  |            |                      |                      |                |             |             |       |
|   | - Independence: H  | •   |  |  |            |                      |                      |                |             |             |       |
|   | - Applicable: High   |   |  |  |            |                      |                      |                |             |             |       |
|   | Based on the above   | e, full applicability is assign   | ed.  |  |            |                      |                      |                |             |             |       |
| Actions                                 | Code   | Objective   | Work to be Done  |  |            |                      | Priority             | Implementer    | Status      | Complete By | Tracl |
|   | RR-A-00038   | Verify that the bunding and EPA guidelines (EF  | of hazardous chemicals is compliant with AS1940<br>PA Publication 347)   |  |            |                      | Normal               |                | Pending     |             | N/    |
|   | Code   | Tag ID  | Description  | Owner                                      | Status     | Applicability Factor | Criticality          |                | Reviewed    | Assess      | sment |
| Risk Control                            |  |   |  | No Owner Defined                           | Proposed   | 100.0%               | Non-Critical Control |                | 14-Oct-2015 | Go          | nd    |
| Risk Control                            |  |   | Verify that the hunding of hazardous chemicals is compliant with AS1940 and EPA  |  |            |                      |                      |                |             | -           |       |
| Risk Control                            | RR-COP-03170   |   | Verify that the bunding of hazardous chemicals is compliant with AS1940 and EPA guidelines (EPA Publication 347) and a program is implemented to maintain the integrity of the bunding.  |  |            |                      |                      |                |             |             |       |
| Risk Control                            | RR-COP-03170  Verify that the bun  | ding of hazardous chemical  |  |  |            |                      |                      |                |             |             |       |
| Risk Control<br>Context                 | RR-COP-03170  Verify that the bun the integrity of the Existing bunding h  | bunding.  | guidelines (EPA Publication 347) and a program is implemented to maintain the integrity of the bunding.  | ed to maintain                             |            |                      |                      |                |             |             |       |
| Risk Control<br>Context<br>Risk Control | RR-COP-03170  Verify that the bun the integrity of the Existing bunding h Bunding that is con Hence, once this a | bunding. as been assigned as "Good npliant with AS1940 and EF ction is completed, it is exp | guidelines (EPA Publication 347) and a program is implemented to maintain the integrity of the bunding.  s is compliant with AS1940 and EPA guidelines (EPA Publication 347) and a program is implemented to the program | ed to maintain<br>nritude.<br>r magnitude. |            |                      |                      |                |             |             |       |
| Risk Control<br>Context<br>Risk Control | RR-COP-03170  Verify that the bun the integrity of the Existing bunding had bunding that is con                  | bunding. as been assigned as "Good npliant with AS1940 and EF ction is completed, it is exp | guidelines (EPA Publication 347) and a program is implemented to maintain the integrity of the bunding.  is is compliant with AS1940 and EPA guidelines (EPA Publication 347) and a program is implemented and full applicability; hence it is expected to reduce the likelihood of the event by one order of magazine.  PA guidelines and maintained accordingly will provide an overall likelihood reduction of two orders of  | ed to maintain<br>nritude.<br>r magnitude. |            |                      | Priority             | Implementer    | Status      | Complete By | Traci |



## Active Risk Scenarios ID: RR-R-00072



RR-A-00038 Verify that the bunding of hazardous chemicals is compliant with AS1940 Normal and EPA guidelines (EPA Publication 347) Cause Spill due to tanker accident Likelihood Code Contribution Status Unlikely (2) 6.3% RR-CA-00700 Active Current Proposed Unlikely (2) 7.5% Comments Bulk tanker delivery error. This could result in a contaminated surface discharge of hazardous chemicals, which includes oil, petrol and diesel. The likelihood of a spill as a result of a tanker accident is expected to be UNLIKELY considering typical road rule controls (speed limits, licenced driver, road design etc) implemented onsite Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02951 BC-00478 0.0% No Owner Defined 11-Oct-2015 Third party chemical suppliers In Service Critical Control Administrative Average Base Control The site engages chemical suppliers that comply with the Australian Dangerous Goods (ADG) codes. The base control is assessed via the following: - Implemented: Part (Third party control) - Type: Administrative - Reliability: Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness of the control is assessed to be AVERAGE. Risk Control Competent and reputable third party tanker drivers Context Risk Control The risk control is assessed via the following factors: Comments - Independence: Low (Considered in cause likelihood) - Applicable: Moderate Based on the above, no applicability is assigned to this control as it has been included in the likelihood assessment. Actions Code Priority Objective Work to be Done Implementer Status Complete By Tracking RR-A-00039 Verify that third party chemical transport companies comply with the Normal Pending N/A relevant Australian Dangerous Goods codes. Cause Failure of underground storage tank from corrosion resulting in groundwater contamination Likelihood Contribution Code Status RR-CA-00702 Active Possible (3) 6.3% Current Proposed Possible (3) 7.5% Comments The underground storage tanks include diesel and petrol tanks. There is a potential for an underground leak from these tanks. The likelihood of this event is considered to be POSSIBLE Risk Control Code Owner Applicability Factor Criticality Tag ID Status Reviewed Assessment RR-COP-02941 No Owner Defined Proposed 100.0% Non-Critical Control 6-Oct-2015 Ensure that the underground storage tanks are compliant with the Vic EPA UPSS Assessed Context Risk Control Three underground tanks (one petrol and two diesel) are located near the Freight Gate. The implementation of this recommendation will provide ongoing assurance that the storage tanks are compliant with the appropriate guidelines. Therefore, no risk reduction is assigned. Actions Code Objective Work to be Done Priority Implementer Status Tracking Complete By RR-A-00056 N/A Normal Pending Ensure that the underground storage tanks (one petrol and two diesel) near the Freight Gate are compliant with the Vic EPA UPSS guidelines.

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00072



| NE RISK ASSESSMENT |  |   |  | Active Ris                                       | k Scenarios ID: RR-I | R-00072    |                      |                   |                |              |             |          |
|--------------------|--|---|--|--|----------------------|------------|----------------------|-------------------|----------------|--------------|-------------|----------|
| Risk Co            | ntrol Code   | Tag ID                                  | Description  |  | Owner                | Status     | Applicability Factor | Criticality       | Type/Factor    | Reviewed     | Assess      | sment    |
|                    | RR-COP-031   | 178 BC-00479                            | Maintenance Routine - Tanks                            |  | No Owner Defined     | In Service | 100.0%               | Critical Control  | Administrative | 14-Oct-2015  | Goo         | od       |
| Base Co            |  | of aboveground and undergrou            | nd storage tanks is undertaken in line with the rele   | evant standards.                                 |                      |            |                      |                   |                |              |             |          |
| Com                |  | ntrol is assessed via the followi       | ina:   |  |                      |            |                      |                   |                |              |             |          |
|                    | - Implemente   |   | ·  |  |                      |            |                      |                   |                |              |             |          |
|                    | - Type: Admi   |   |  |  |                      |            |                      |                   |                |              |             |          |
|                    | - Reliability: (   |   |  | Pr. A  |                      |            |                      |                   |                |              |             |          |
|                    | - Monitoring/  | Auditing: Ad-noc (Annual perio          | rmance statement audit undertaken by an EPA au         | uditor)  |                      |            |                      |                   |                |              |             |          |
|                    |  |   | e control is assessed to be GOOD.                      |  |                      |            |                      |                   |                |              |             |          |
|                    | ontrol Maintenance<br>ontext                             | routine - Tanks                         |  |  |                      |            |                      |                   |                |              |             |          |
| Risk Co            | 4-   | rol is assessed via the followin        | g factors:   |  |                      |            |                      |                   |                |              |             |          |
| Comi               | - independen   |   |  |  |                      |            |                      |                   |                |              |             |          |
|                    | - Applicable:  | nign                                    |  |  |                      |            |                      |                   |                |              |             |          |
| A                  |  | above, full applicability is assi       | gned.  |  |                      |            |                      | P. "              |                | 21.1         |             | <b>-</b> |
| Actions            | Code   | Objective                               |  | Work to be Done                                  |                      |            |                      | Priority          | Implementer    | Status       | Complete By | Tracking |
|                    | RR-A-00040   |   | testing regime for the above and below ground          |  |                      |            |                      | Normal            |                | Pending      |             | N/A      |
| Cause              | Tank over  | storage tanks. fill due to maloperation |  |  | Code                 | Status     |                      | Likeliho          | and .          | Contribution |             |          |
| Cause              | Talik Over   | iii due to maioperation                 |  |  | RR-CA-00703          | Active     |                      | Current Possible  |                | 6.3%         |             |          |
|                    |  |   |  |  | KK-0A-00703          | Active     |                      |                   |                |              |             |          |
|                    |  |   |  |  |                      |            |                      | Proposed Possible | 9 (3)          | 0.8%         |             |          |
| Comi               | nents A tank overfi<br>POSSIBLE.                         | Il can occur due to operator em         | or during unloading, i.e. incorrect ullage calculation | on etc. Therefore, the likelihood of this event  | is considered to be  |            |                      |                   |                |              |             |          |
| Risk Co            | ntrol Code   | Tag ID                                  | Description  |  | Owner                | Status     | Applicability Factor | Criticality       | Type/Factor    | Reviewed     | Assess      | sment    |
|                    | RR-COP-03  | 172 BC-00476                            | HSW707 Unloading of Bulk Chemical Ta                   | nkers Work Instruction                           | No Owner Defined     | In Service | 0.0%                 | Critical Control  | Administrative | 6-Oct-2015   | God         | od       |
| Base Co            | ontrol The procedu                                       | re includes appropriate steps a         | and precautions to be undertaken to minimise the       | potential of a spill during bulk tanker unloadir | ng.                  |            |                      |                   |                |              |             |          |
| Comi               |  | ntrol is assessed via the followi       | ina:   |  |                      |            |                      |                   |                |              |             |          |
|                    | - Implemente   |   | ·  |  |                      |            |                      |                   |                |              |             |          |
|                    | - Type: Admi   |   |  |  |                      |            |                      |                   |                |              |             |          |
|                    | <ul> <li>Reliability: 0</li> <li>Monitoring/a</li> </ul> | Good<br>Auditing: Ad-hoc                |  |  |                      |            |                      |                   |                |              |             |          |
|                    | Pasad on the   | above the effectiveness of th           | e control is assessed to be GOOD.                      |  |                      |            |                      |                   |                |              |             |          |
|                    | ontrol Procedure fo                                      | r unloading of bulk chemical (g         |  |  |                      |            |                      |                   |                |              |             |          |
| Co<br>Risk Co      | ontext   |   |  |  |                      |            |                      |                   |                |              |             |          |
| Comi               | nents  | checking the daily tank levels          |  |  |                      |            |                      |                   |                |              |             |          |
|                    |  | rol is assessed via the followin        | ~  |  |                      |            |                      |                   |                |              |             |          |
|                    | <ul> <li>Independer</li> <li>Applicable:</li> </ul>      | nce: Low (included in cause like        | elihood)   |  |                      |            |                      |                   |                |              |             |          |
|                    | - Арріісавіе.  | Widdel ate                              |  |  |                      |            |                      |                   |                |              |             |          |
|                    | Based on the   | above, no applicability is assi         | gned as the control is not independent of the caus     | se.  |                      |            |                      |                   |                |              |             |          |
|                    |  |   |  |  |                      |            |                      |                   |                |              |             |          |
|                    |  |   |  |  |                      |            |                      |                   |                |              |             |          |

Active Risk Scenarios ID: RR-R-00072 AGL MINE RISK ASSESSMENT



| RISK ASSESSMENT |                      |  |   |  | Active Risk 50                                     | enarios ID: RR-I          | K-000/2              |                      |         |                           |                            |                        |             |        |
|-----------------|----------------------|--|---|--|--|---------------------------|----------------------|----------------------|---------|---------------------------|----------------------------|------------------------|-------------|--------|
| Risk Co         | ontrol c             | Code<br>RR-COP-03179                         | Tag ID<br>BC-00477                                    | Description Bunding  |  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor |         | riticality<br>cal Control | Type/Factor<br>Engineering | Reviewed<br>6-Oct-2015 | Asses       | ssment |
|                 |                      |  | 20 00 111   | Buriding   |  | no o mior pointou         | 551 1155             | .00.070              | 5       | our control               | Lingingoning               | 0 00( 20 10            | 30          | ou     |
| Base C          | Control E            | Existing bunding wit                         | thin the mine lease area is as                        | ssessed to be in an appropriate condition to conta   | ain a spill.                                       |                           |                      |                      |         |                           |                            |                        |             |        |
|                 | Т                    | The base control is                          | assessed via the following:                           |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 |                      | Implemented: Yes                             |   |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 |                      | Type: Engineering                            |   |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 |                      | Reliability: Good                            | Df  |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 | -                    | ivionitoring/Auditin                         | g: Performance monitoring                             |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 |                      |  |   | ntrol is assessed to be GOOD.  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 | Control D<br>Context | Deliveries undertake                         | en within a bunded area.                              |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
| Risk C          | Control B            | Bunding is expected                          | d to contain and hence mitiga                         | ate a release in the event of overfill.  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 | Т                    | The risk control is a                        | ssessed via the following fac                         | etors:   |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 | -                    | Independence: Hig                            | gh  |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 | -                    | Applicable: High                             |   |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
|                 | В                    | Based on the above                           | e, full applicability is assigned                     | d.   |  |                           |                      |                      |         |                           |                            |                        |             |        |
| Actions         | C                    | Code   | Objective   |  | Work to be Done                                    |                           |                      |                      |         | Priority                  | Implementer                | Status                 | Complete By | Tracki |
|                 | R                    | RR-A-00038                                   | Verify that the bunding of<br>and EPA guidelines (EPA | hazardous chemicals is compliant with AS1940<br>Publication 347)   |  |                           |                      |                      |         | Normal                    |                            | Pending                |             | N/A    |
| Risk Co         | ontrol c             | Code   | Tag ID  | Description  |  | Owner                     | Status               | Applicability Factor | C       | riticality                |                            | Reviewed               | Assess      | sment  |
|                 | R                    | RR-COP-03180                                 |   | Verify that the bunding of hazardous chemica guidelines (EPA Publication 347) and a prograthe bunding.     | •  | No Owner Defined          | Proposed             | 100.0%               | Non-C   | ritical Control           |                            | 14-Oct-2015            | Go          | od     |
| Risk C          |                      | erify that the bund<br>he integrity of the b |   | is compliant with AS1940 and EPA guidelines (EP  | PA Publication 347) and a program is implemented   | ed to maintain            |                      |                      |         |                           |                            |                        |             |        |
| Risk C          | Control E            | Existing bunding ha                          | s been assigned as "Good" a                           | and full applicability; hence it is expected to reduce   | be the likelihood of the event by one order of mag | gnitude.                  |                      |                      |         |                           |                            |                        |             |        |
|                 | Н                    |  | tion is completed, it is expec                        | guidelines and maintained accordingly will provide<br>ted that this control would provide an additional or |  |                           |                      |                      |         |                           |                            |                        |             |        |
| Actions         | C                    | Code   | Objective   |  | Work to be Done                                    |                           |                      |                      |         | Priority                  | Implementer                | Status                 | Complete By | Tracki |
|                 | R                    | RR-A-00038                                   | Verify that the bunding of<br>and EPA guidelines (EPA | hazardous chemicals is compliant with AS1940<br>Publication 347)   |  |                           |                      |                      |         | Normal                    |                            | Pending                |             | N/A    |
| ause            | S                    | Spill whilst using                           | g mobile fill points                                  |  |  | Code                      | Status               |                      |         | Likelihood                |                            | Contribution           |             |        |
| ause            |                      |  |   |  |  |                           |                      |                      |         |                           |                            |                        |             |        |
| Jause           |                      |  |   |  |  | RR-CA-00704               | Active               |                      | Current | Possible (3)              |                            | 62.5%                  |             |        |

Comments Hazardous chemical which includes: oil, petrol, diesel. A spill can occur due to operator error during unloading, i.e. valve left open etc. Therefore, the likelihood of this event is considered to be POSSIBLE.

Active Risk Scenarios ID: RR-R-00072 AGL MINE RISK ASSESSMENT



| K ASSESSMENT                          |  |  |  |   |                              | K-000/2              |                                |                 |                    |                             |                   |
|---------------------------------------|--|--|--|---|------------------------------|----------------------|--------------------------------|-----------------|--------------------|-----------------------------|-------------------|
| Risk Contro                           | Ol Code  | Tag ID   | Description  |   | Owner                        | Status               | Applicability Factor           | Criticality     | Type/Facto         | r Reviewed                  | Assessmen         |
|                                       | RR-COP-03171   | BC-00480   | Third party contractor RTL - Refuelling of   | of Mobile Plant (RTL-OPS-WI-021)                | No Owner Defined             | In Service           | 0.0%                           | Non-Critical Co | ntrol Administrati | e 6-Oct-2015                | Average           |
| Base Contro                           | ol The refuelling of r   | nobile plant is undertaken   | by a third party (RTL & Production Support Grou  | up).  |                              |                      |                                |                 |                    |                             |                   |
| Comment                               |  | a accepted via the following   | ng:  |   |                              |                      |                                |                 |                    |                             |                   |
|                                       | - Implemented: Ye  | s assessed via the followi   | ng:  |   |                              |                      |                                |                 |                    |                             |                   |
|                                       | - Type: Administra   |  |  |   |                              |                      |                                |                 |                    |                             |                   |
|                                       | - Reliability: Fair  |  |  |   |                              |                      |                                |                 |                    |                             |                   |
|                                       | - Monitoring/Audit   | ing: Ad-hoc  |  |   |                              |                      |                                |                 |                    |                             |                   |
|                                       | Based on the abo   | ve, the effectiveness of the   | e control is assessed to be AVERAGE.   |   |                              |                      |                                |                 |                    |                             |                   |
| Risk Contro<br>Conte                  |  | ctor RTL - Refuelling of M   | obile Plant (RTL-OPS-WI-021)   |   |                              |                      |                                |                 |                    |                             |                   |
| Risk Contro<br>Comment                | The refuelling of r  | nobile plant is undertaken   | by third party (RTL & Production Support Group)  | ).  |                              |                      |                                |                 |                    |                             |                   |
|                                       |  | assessed via the following   | -  |   |                              |                      |                                |                 |                    |                             |                   |
|                                       | <ul> <li>Independence: L</li> <li>Applicable: Mod</li> </ul>   | ow (Considered in cause  | likelihood).   |   |                              |                      |                                |                 |                    |                             |                   |
|                                       |  |  |  |   |                              |                      |                                |                 |                    |                             |                   |
| se                                    |  | ve, no applicability is assignosion of abovegrour  | gned to this control as it has been included in the  | e likelihood assessment.                        | Code                         | Status               |                                |                 | ikelihood          | Contribution                |                   |
| 50                                    | opin due to co   | rosion of abovegrouf   | id talik   |   | RR-CA-00705                  | Active               |                                |                 | ossible (3)        | 6.3%                        |                   |
|                                       |  |  |  |   | KK-CA-00703                  | ACTIVE               |                                | Guitelli F      | ossible (3)        | 0.3 /0                      |                   |
|                                       |  |  |  |   |                              |                      |                                | Proposed P      | ossible (3)        | 7.5%                        |                   |
| Comment                               | s The aboveground POSSIBLE.  | storage tanks include an   | oil tank. There is potential for an underground lea  | ak from these tanks. The likelihood of this eve | nt is considered to be       |                      |                                | Proposed P      | ossible (3)        | 7.5%                        |                   |
| Comment                               | POSSIBLE.  | storage tanks include an   | oil tank. There is potential for an underground lea  | ak from these tanks. The likelihood of this eve | nt is considered to be Owner | Status               | Applicability Factor           | Proposed P      | Type/Facto         |                             | Assessme          |
|                                       | POSSIBLE.  |  |  | ak from these tanks. The likelihood of this eve |                              | Status<br>In Service | Applicability Factor<br>100.0% |                 | Type/Facto         | r Reviewed                  | Assessme<br>Good  |
| Risk Contro                           | POSSIBLE.  DI Code  RR-COP-03181   | Tag ID<br>BC-00479   | Description  |   | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of aboves   | Tag ID<br>BC-00479<br>oveground and underground  | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel   |   | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Ol Code  RR-COP-03181  Inspections of above  The base control   | Tag ID BC-00479  eveground and undergrour s assessed via the followi   | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel   |   | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of aboves   | Tag ID<br>BC-00479<br>eveground and underground<br>s assessed via the followings   | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel   |   | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of above  The base control  Implemented: Ye   | Tag ID BC-00479  veground and undergrour s assessed via the followi ss tive  | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel   |   | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of above  The base control Implemented: Yu Type: Administre Reliability: Good   | Tag ID BC-00479  veground and undergrour s assessed via the followi  | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel   | levant standards.                               | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Ol Code  RR-COP-03181  Inspections of about the base control of limplemented: Year of the base control of the base  | Tag ID BC-00479  eveground and undergrount as assessed via the following sets of the following sets of the following: Ad-hoc (Annual performance)  | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel   | levant standards.                               | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro<br>Base Contro<br>Comment | POSSIBLE.  Code  RR-COP-03181  Inspections of about the base control - Implemented: Ye - Type: Administrative - Reliability: Good - Monitoring/Audit - Based on the about Maintenance rout   | Tag ID BC-00479  eveground and undergrount is assessed via the following: Ad-hoc (Annual performer, the effectiveness of the large in the large  | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel  ng:  rmance statement audit undertaken by an EPA a                                     | levant standards.                               | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of about the base control - Implemented: Yu - Type: Administrative - Reliability: Good - Monitoring/Audit Based on the about Maintenance rout to the state of the risk control is   | Tag ID BC-00479  veground and underground as assessed via the following: Ad-hoc (Annual performer: Ad-hoc (Annual performe | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel  ang:  rmance statement audit undertaken by an EPA a  e control is assessed to be GOOD. | levant standards.                               | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of about the base control of limplemented: Yu - Type: Administrative - Reliability: Good - Monitoring/Audit Based on the about Maintenance rout of the risk control is  | Tag ID BC-00479  oveground and underground as assessed via the following: Ad-hoc (Annual performer: Ad-hoc (Annual performer: Annual perfo | Description  Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel  ang:  rmance statement audit undertaken by an EPA a  e control is assessed to be GOOD. | levant standards.                               | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of about the base control of limplemented; Yu - Type: Administrative - Reliability: Good - Monitoring/Audit Based on the about Maintenance rout the sist of limited in the limited in the sist of limited in the limited i | Tag ID BC-00479  oveground and underground as assessed via the following: Ad-hoc (Annual performer: Ad-hoc (Annual performer: Annual perfo | Description Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel  ang:  armance statement audit undertaken by an EPA a  e control is assessed to be GOOD. | levant standards.                               | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed                  |                   |
| Risk Contro                           | POSSIBLE.  Code  RR-COP-03181  Inspections of about the base control of limplemented; Yu - Type: Administrative - Reliability: Good - Monitoring/Audit Based on the about Maintenance rout the sist of limited in the limited in the sist of limited in the limited i | Tag ID BC-00479  veground and underground as assessed via the following: Ad-hoc (Annual performer, the effectiveness of the ne - Tanks  assessed via the following assessed via the fol | Description Maintenance Routine - Tanks  and storage tanks is undertaken in line with the rel  ang:  armance statement audit undertaken by an EPA a  e control is assessed to be GOOD. | levant standards.                               | Owner                        |                      | **                             | Criticality     | Type/Facto         | r Reviewed<br>e 14-Oct-2015 | Assessmer<br>Good |

Active Risk Scenarios ID: RR-R-00072 AGL MINE RISK ASSESSMENT

of settling pond and O/B valves).



Risk Control Code Tag ID Description Applicability Factor Criticality Status Reviewed Assessment RR-COP-03182 Ensure that the underground storage tanks are compliant with the Vic EPA UPSS No Owner Defined Proposed 100.0% Non-Critical Control 6-Oct-2015 Assessed Risk Control Ensure that the underground storage tanks are compliant with the Vic EPA UPSS guidelines. Context Risk Control Three underground tanks (one petrol and two diesel) are located near the Freight Gate. The implementation of this recommendation will provide ongoing assurance that the storage tanks are compliant with the appropriate guidelines. Therefore, no risk reduction is assigned. Actions Code Objective Work to be Done Priority Implementer Status Complete By Tracking RR-A-00056 Normal Pending N/A Ensure that the underground storage tanks (one petrol and two diesel) near the Freight Gate are compliant with the Vic EPA UPSS guidelines. Consequences Contaminated water discharge with the potential to impact the environment Likelihood Consequence Code Category Severity Risk Rating RR-CQ-00547 Environment & Current Moderate, short to medium term Moderate Unlikely (2) Community environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Proposed Unlikely (2) Moderate, short to medium term environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s). Risk Control Code Reviewed Tag ID Owner Status Applicability Factor Criticality Type/Factor Description Assessment 7-Oct-2015 RR-COM-03183 BC-00409 Monitoring equipment L171, alarm and operator response No Owner Defined In Service 31.0% Critical Control Administrative Good Base Control The equipment continuously monitor pH, turbidity, temperature and conductivity. Operator periodically monitors the systems and responds to alarms. The base control is assessed via the following: - Implemented: Yes - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness of the control is assessed as GOOD. Risk Control Alarm and operator response Context Risk Control Not all spills would discharge through L171. Comments The risk control is assessed via the following factors: - Independence: Moderate - Applicable: Moderate (not all spills discharge through L171). Based on the above, partial applicability is assigned. Actions Code Work to be Done Priority Implementer Status Tracking Objective Complete By RR-A-00023 Install an upgraded SCADA on-line monitoring and dosing equipment (Automate operation Normal Pending N/A

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00072



| RISK ASSESSMENT               |   |                            | A  | ctive Risk Scenarios ID: RR            | -R-00072      |                      |                      |            |                                |            |
|-------------------------------|---|----------------------------|--|--|---------------|----------------------|----------------------|------------|--------------------------------|------------|
| Risk Control                  | Code                                    | Tag ID                     | Description  | Owner                                  | Status        | Applicability Factor | Criticality          | Type/Fac   | tor Reviewed                   | Assessmen  |
|                               |   | BC-00410                   | Weekly sampling at discharge point L171 and L160                           | No Owner Defined                       | In Service    | 0.0%                 | Non-Critical Control |            | 7-Oct-2015                     | Assessed   |
|                               |   |                            |  |  |               |                      |                      |            |                                |            |
| Base Control<br>Comments      | Third party sampling a                  | analysis of monitoring e   | equipment L160 and L171 on a weekly basis. This control provides assurance | that the system is functioning.        |               |                      |                      |            |                                |            |
|                               | The base control is as                  | ssessed via the following  | ng:  |  |               |                      |                      |            |                                |            |
|                               | - Implemented: Yes                      |                            |  |  |               |                      |                      |            |                                |            |
|                               | - Type: Administrative                  | •                          |  |  |               |                      |                      |            |                                |            |
|                               | - Reliability: Good                     |                            |  |  |               |                      |                      |            |                                |            |
|                               | - Monitoring/Auditing:                  | Ad-hoc                     |  |  |               |                      |                      |            |                                |            |
|                               | Based on the above, t                   | the effectiveness of the   | e control is assessed to be ASSESSED.                                      |  |               |                      |                      |            |                                |            |
| Risk Control<br>Context       | Independent third part                  | ty sampling                |  |  |               |                      |                      |            |                                |            |
| Risk Control<br>Comments      | The risk control is ass                 | sessed via the following   | g factors:   |  |               |                      |                      |            |                                |            |
|                               | - Independence: High                    |                            |  |  |               |                      |                      |            |                                |            |
|                               |   |                            | veekly at which in this time a spill may have already occurred).           |  |               |                      |                      |            |                                |            |
|                               | Based on the above, i                   | no applicability is assig  | gned.  |  |               |                      |                      |            |                                |            |
| Risk Control                  |   | Tag ID                     | Description  | Owner                                  | Status        | Applicability Factor | Criticality          | Type/Fac   | tor Reviewed                   | Assessmer  |
|                               | RR-COM-03185                            | BC-00186                   | HSM0001C Emergency Management Plan   | No Owner Defined                       | In Service    | 31.0%                | Critical Control     | Administra | ative 9-Oct-2015               | Good       |
|                               |   |                            |  |  |               |                      |                      |            |                                |            |
| Base Control                  | The activation of the E                 | Emergency Manageme         | ent Plan may require engagement from major relevant stakeholders which may | / include:                             |               |                      |                      |            |                                |            |
| Comments                      |   |                            |  |  |               |                      |                      |            |                                |            |
|                               | - EPA                                   |                            |  |  |               |                      |                      |            |                                |            |
|                               |   | chment Management A        | Authority  |  |               |                      |                      |            |                                |            |
|                               | <ul> <li>Gippsland Water and</li> </ul> |                            |  |  |               |                      |                      |            |                                |            |
|                               | - Department of Healt                   | h etc.                     |  |  |               |                      |                      |            |                                |            |
|                               | The base control is as                  | ssessed via the following  | ng:  |  |               |                      |                      |            |                                |            |
|                               | - Implemented: Yes                      |                            |  |  |               |                      |                      |            |                                |            |
|                               | - Type: Administrative                  |                            |  |  |               |                      |                      |            |                                |            |
|                               | - Reliability: Good                     |                            |  |  |               |                      |                      |            |                                |            |
|                               | - Monitoring/Auditing:                  | Performance monitoring     | ing  |  |               |                      |                      |            |                                |            |
|                               | Based on the above, t                   | the effectiveness of the   | e control is assessed to be GOOD.  |  |               |                      |                      |            |                                |            |
|                               | Emergency Managem                       | nent Plan                  |  |  |               |                      |                      |            |                                |            |
| Context Risk Control Comments | Some of these hazard                    | dous events may trigge     | er incident response as per the Emergency Response Procedure which will be | determined by the incident controller. |               |                      |                      |            |                                |            |
|                               | The risk control is ass                 | sessed via the following   | g factors:   |  |               |                      |                      |            |                                |            |
|                               | - Independence: Mode                    | erate                      |  |  |               |                      |                      |            |                                |            |
|                               | - Applicable: Moderate                  | е                          |  |  |               |                      |                      |            |                                |            |
|                               | Based on the above, p                   | partial applicability is a | assigned.  |  |               |                      |                      |            |                                |            |
| Consequence                   | Contaminated lan                        | d with the potentia        | al to impact the environment   | Code                                   | Category      |                      | Likelil              | nood       | Severity                       | Risk Ratin |
|                               |   |                            |  | RR-CQ-00562                            | Environment & |                      | Current Unlike       | iy (2)     | Small scale and short term     | Moderate   |
|                               |   |                            |  |  | Community     |                      |                      |            | environmental impact to        |            |
|                               |   |                            |  |  |               |                      |                      |            | localised area of low          |            |
|                               |   |                            |  |  |               |                      |                      |            | localised area of low          |            |
|                               |   |                            |  |  |               |                      |                      |            | environmental value. No impact |            |
|                               |   |                            |  |  |               |                      |                      |            |                                |            |
|                               |   |                            |  |  |               |                      |                      |            | environmental value. No impact |            |



Proposed

Small scale and short term environmental impact to localised area of low environmental value. No impact

beyond AGL's operational area.

No/minor interest by local

community.

Reviewed

Risk Control Code

Tag ID BC-00186 Description HSM0001C Emergency Management Plan

Owner No Owner Defined

Status In Service Applicability Factor 31.0%

Criticality Critical Control

Unlikely (2)

Type/Factor Administrative

9-Oct-2015

Assessment Good

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

Comments - Vic police

- EPA

RR-COM-03186

- West Gippsland Catchment Management Authority

- Gippsland Water and

- Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes

- Type: Administrative

- Reliability: Good

- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Management Plan

Context

Comments

Risk Control Some of these hazardous events may trigger incident response as per the Emergency Response Procedure which will be determined by the incident controller.

The risk control is assessed via the following factors:

- Independence: Moderate

- Applicable: Moderate

Based on the above, partial applicability is assigned.



AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Mine fire Scenario Significant fire within/near the Mine lease area which may impact public safety and the environment Ratings Qualitative (Automatically Calculated) Consequence Severity Top Event Likelihood Consequence Category Max Consequence Risk Current Unlikely (2) Public Safety Level 5 (5) High Proposed Unlikely (2) Public Safety Level 5 (5) High Causes Cause Hot surface temperature of brakes on conveyors, dredgers/stackers Likelihood Contribution Code Status RR-CA-00610 0.2% Active Likely (4) Current Likely (4) 0.2% Proposed Comments Thruster failure and/or failure to adjust are typical causes of hot surface temperature on a dredger. This includes the Raw Coal Bunker and Crusher House. Likelihood include consideration that brake unit design is fit for purpose and meets standards, OEM documentation (OEM's). In the past 3 years (2012-2015), 2 of the 41 smouldering coal/fire events have been attributed to brake failure. The likelihood of this event is considered to be LIKELY Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02751 BC-00470 100.0% 8-Oct-2015 No Owner Defined Detection and suppression on conveyor lines In Service Critical Control Engineering Average Base Control Some of the equipment will have automated detection and suppression on coal delivering structure. Other equipment items are reliant on activation of the manual Comments fire suppression systems. The Raw Coal Bunker and Crusher House fire detection and suppression system includes: - Very Early Smoke Detection Alarm - Thermal imaging cameras - Manual deluge (operator initiated) The base control is assessed via the following: - Implemented: Part (fully implemented on the rising conveyors) - Type: Administrative/Engineering - Reliability: Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness of the control is assessed to be AVERAGE. Risk Control Detection and suppression on conveyor lines Context Risk Control Some of the equipment will have automated detection and suppression. Other equipment items are reliant on activation of the manual fire suppression systems. Comments The risk control is assessed via the following factors: - Independence: Mod-High - Applicable: High Based on the above, full applicability is assigned. Intermediate Event Code Description Status Incoming Outgoing Probability RR-IE-02759 Probability of initial fire escalating Active Unlikely (2) Rare (1) 0.1% Current

riskview

Comments The likelihood of this event and the initial emergency response activities (which includes mandatory CFA attendance) being unsuccessful and resulting in an

escalation to a significant mine fire is considered to be UNLIKELY. Therefore, probability is assessed as 0.1%.

Proposed

Unlikely (2)

Rare (1)

0.1%

wise ID. DD D 00072 AGL M



| K ASSESSMENT             |                       |                              |  | Active Risk Scenarios ID: RR-                          | R-00073              |                                |                                  |                               |                        | ACIL.                  |
|--------------------------|-----------------------|------------------------------|--|--|----------------------|--------------------------------|----------------------------------|-------------------------------|------------------------|------------------------|
| Risk Control             | Code<br>RR-COP-02764  | Tag ID<br>BC-00151           | Description General Housekeeping                                   | Owner<br>No Owner Defined                              | Status<br>In Service | Applicability Factor<br>100.0% | Criticality Non-Critical Control | Type/Factor<br>Administrative | Reviewed<br>1-Sep-2015 | Assessment<br>Assessed |
| Base Control<br>Comments | The housekeeping      | removes fuel (coal, grea     | ase, oil) around hot components, i.e. potential ignition sources.  |  |                      |                                |                                  |                               |                        |                        |
|                          |                       | assessed via the follow      | ving:  |  |                      |                                |                                  |                               |                        |                        |
|                          | - Implemented: Yes    |                              |  |  |                      |                                |                                  |                               |                        |                        |
|                          | - Type: Administrat   | ive                          |  |  |                      |                                |                                  |                               |                        |                        |
|                          | - Reliability: Fair   |                              |  |  |                      |                                |                                  |                               |                        |                        |
|                          | - Monitoring/Auditin  | ig: Ad-noc                   |  |  |                      |                                |                                  |                               |                        |                        |
|                          | Based on the above    | e, the effectiveness is as   | ssessed to be ASSESSED.  |  |                      |                                |                                  |                               |                        |                        |
| Risk Control<br>Context  | Work area inspection  | on will trigger the cleaning | ng procedure   |  |                      |                                |                                  |                               |                        |                        |
| Risk Control<br>Comments | The procedure redu    | uces the potential for fue   | el to come into contact with hot surfaces on the mobile plant thu  | is reducing the potential for a fire.                  |                      |                                |                                  |                               |                        |                        |
|                          | General cleaning d    | oes not always extend to     | to the required depth. It removes bulk coal material but often, la | yers of grease and oil may remain. Specialist cleaning |                      |                                |                                  |                               |                        |                        |
|                          | utilising degreasing  | agents and pressurised       | d steam may be required.   |  |                      |                                |                                  |                               |                        |                        |
|                          | The risk control is a | assessed via the following   | na factore:  |  |                      |                                |                                  |                               |                        |                        |
|                          | - Independence: Hi    |                              | 19 144675.   |  |                      |                                |                                  |                               |                        |                        |
|                          | - Applicable: Mod-F   | •                            |  |  |                      |                                |                                  |                               |                        |                        |
|                          |                       |                              |  |  |                      |                                |                                  |                               |                        |                        |
|                          |                       | e, full applicability is ass | •  |  |                      |                                |                                  |                               |                        |                        |
| Risk Control             | Code                  | Tag ID                       | Description  | Owner  | Status               | Applicability Factor           | Criticality                      | Type/Factor                   | Reviewed               | Assessment             |
|                          | RR-COP-03117          | BC-00469                     | Mechanical Maintenance Routine                                     | No Owner Defined                                       | In Service           | 0.0%                           | Critical Control                 | Administrative                | 14-Oct-2015            | Good                   |

Comments

Base Control Preventative maintenance program is designed to maintain equipment to minimise integrity related problems / and or unexpected failure.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Monitored and Audited

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Maintenance routine on all brakes

Context

Risk Control The risk control is assessed via the following factors:

- Comments Independence: Low (Considered in cause likelihood)
  - Applicable: High

Based on the above, no applicability is assigned to this control as it has been included in the likelihood assessment.

Active Dick Secretics ID: DD D 00073



| MINE RISK ASSESSIV | MENT                     |   |   |   | Active Risk                                    | Scenarios ID: RR-F        | R-00073              |                                |                              |                               |                         |             | -        |
|--------------------|--------------------------|---|---|---|--|---------------------------|----------------------|--------------------------------|------------------------------|-------------------------------|-------------------------|-------------|----------|
| R                  | Risk Control             | Code<br>RR-COP-03118  | Tag ID<br>BC-00435                              | Description PCY000022 Fire Risk Management Plan           |  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>100.0% | Criticality Critical Control | Type/Factor<br>Administrative | Reviewed<br>14-Oct-2015 | Assess      |          |
|                    | Base Control<br>Comments | The Fire Risk Mana  | agement Plan (draft) is ar                      | n overarching document that brings all facets of fire ris | sk for the mine together.                      |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | The base control is   | assessed via the following                      | ing:  |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | - Implemented: Yes  |   |   |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | - Type: Administrat   | ive   |   |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditir</li> </ul> | ng: Performance monitori                        | ina   |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          |   |   | 9   |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          |   | .,  | e control is assessed to be GOOD.                         |  |                           |                      |                                |                              |                               |                         |             |          |
|                    | Risk Control<br>Context  | Emergency Respon  | nse Procedures - Fast De                        | etermined Response  |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          |   |   | quired emergency response to the incident which redu      |  | nel are trained and       |                      |                                |                              |                               |                         |             |          |
|                    | Comments                 | regular drills are ur   | ndertaken to ensure an ac                       | dequate level of response can be provided by both op      | erations and site-based emergency staff.       |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | In addition to opera<br>stand-by during hig                       |   | nimum of 3 site-based emergency staff ready to mobil      | ise. Additional personnel and firefighting equ | ipment are on             |                      |                                |                              |                               |                         |             |          |
|                    |                          | The risk control is a   | assessed via the following                      | g factors:  |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | - Independence: Hi  |   |   |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | - Applicable: High  |   |   |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          | Based on the abov   | e, full applicability is assi                   | gned.   |  |                           |                      |                                |                              |                               |                         |             |          |
| Actions            |                          | Code  | Objective                                       |   | Work to be Done                                |                           |                      |                                | Priority                     | Implementer                   | Status                  | Complete By | Tracking |
|                    |                          | RR-A-00033  | Update the Fire Risk                            | Management Plan to incorporate activities                 |  |                           |                      |                                | Normal                       |                               | Pending                 |             | N/A      |
|                    |                          |   | •   | e-based emergency services and operations team            |  |                           |                      |                                |                              |                               |                         |             |          |
|                    |                          |   | into a single and coor<br>elevated fire danger. | rdinated approach that is initiated as a result of an     |  |                           |                      |                                |                              |                               |                         |             |          |
| Cause              |                          | Electrical sourc  |   |   |  | Code                      | Status               |                                | Likelih                      | ood                           | Contribution            |             |          |
|                    |                          |   | <u>-</u>  |   |  | RR-CA-00612               | Active               | Cu                             | rent Likely                  | (4)                           | 0.0%                    |             |          |
|                    |                          |   |   |   |  |                           |                      | Prop                           | sed Likely                   | (4)                           | 0.0%                    |             |          |
|                    | Commente                 | Potential pathways  | includo:  |   |  |                           |                      |                                | ·                            |                               |                         |             |          |
|                    | Johnnollis               | i oteriuai paulways   | moude.  |   |  |                           |                      |                                |                              |                               |                         |             |          |

- Failure of electrical components and / or electrical equipment
- Transformer failure, arcing of outdoor equipment,
- electrical systems overhead powerlines are also a cause of fire

This includes the Raw Coal Bunker and Crusher House.

Transformers on dredgers and stackers and other select high criticality locations on the coal face have silicon or other combustible (high flash point) oil to prevent

Electrical Safety Management System & Electrical equipment maintenance and inspection to the relevant Australian Standard has been considered in the likelihood.

In the past 3 years (2012-2015), 3 of the 41 smouldering coal/fire events have been attributed to electrical ignition sources. The likelihood of this event is considered to be LIKELY.

Active Risk Scenarios ID: RR-R-00073 AGL MINE RISK ASSESSMENT



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00150 RR-COP-02515 Electrical routine maintenance No Owner Defined In Service 0.0% Critical Control Administrative 1-Sep-2015 Good Base Control This includes general maintenance on electrical systems that include switch rooms, cabinets, MCCs, motors and etc. Comments Thermography is also conducted to identify potential hot spots within electrical systems. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness is assessed to be GOOD. Risk Control Electrical routine maintenance Context Risk Control The risk control is assessed via the following factors: Comments - Independence: Low (Considered in cause likelihood) - Applicable: High Based on the above, no applicability is assigned to this control as it has been included in the likelihood assessment. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-02516 BC-00179 Electrical Safety Systems No Owner Defined In Service 100.0% Critical Control Engineering 1-Sep-2015 Good

Base Control Electrical equipment is provided with earth leakage (residual current device) and overcurrent protection devices, as required by the governing legislation

The base control is assessed via the following:

- Implemented: Yes
- Type: Engineering
- Reliability: V. Good
- Monitoring/Auditing: Performance monitoring (includes oversight of electrical systems which is undertaken by the responsible electrical regulator)

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Earth leakage (residual current devices) and overcurrent protection devices

Context

Risk Control The risk control is assessed via the following factors:

- Comments Independence: High
  - Applicable: High

Based on the above, full applicability is assigned.

riskview



| RISK ASSESSMENT          |  |   |  | Active Risk S                                    | icenarios ID: RR-F   | k-000/3    |                      |                 |            |                 |             |        |
|--------------------------|--|---|--|--|----------------------|------------|----------------------|-----------------|------------|-----------------|-------------|--------|
| Risk Control             | Code   | Tag ID  | Description  |  | Owner                | Status     | Applicability Factor | Criticality     | Type/Fac   | ctor Reviewed   | Asses       | ssment |
|                          | RR-COP-02760   | BC-00471  | Detection and suppression on electrical equip  | oment  | No Owner Defined     | In Service | 100.0%               | Critical Contro | l Engineer | ring 8-Oct-2015 | Ave         | erage  |
| Base Control<br>Comments |  | st 2012) and some of the ec<br>suppression systems.           | quipment (post 2012) will have automated detection a   | and suppression. Other equipment items are r     | eliant on activation |            |                      |                 |            |                 |             |        |
|                          |  |   |  |  |                      |            |                      |                 |            |                 |             |        |
|                          |  | s assessed via the following<br>art (fully implemented in swi | -  |  |                      |            |                      |                 |            |                 |             |        |
|                          | - Type: Administra   |   | 100110 post 2012)  |  |                      |            |                      |                 |            |                 |             |        |
|                          | - Reliability: Good  |   |  |  |                      |            |                      |                 |            |                 |             |        |
|                          | - Monitoring/Auditi  | ing: Performance monitoring                                   | 9  |  |                      |            |                      |                 |            |                 |             |        |
| D: 1.0. / 1              |  |   | control is assessed to be AVERAGE  |  |                      |            |                      |                 |            |                 |             |        |
| RISK Control<br>Context  |  | pression on electrical equip                                  | oment  |  |                      |            |                      |                 |            |                 |             |        |
| Risk Control             |  | assessed via the following                                    | factors:   |  |                      |            |                      |                 |            |                 |             |        |
| Comments                 | <ul> <li>Independence: N</li> <li>Applicable: High</li> </ul>    |   |  |  |                      |            |                      |                 |            |                 |             |        |
|                          |  |   |  |  |                      |            |                      |                 |            |                 |             |        |
| Risk Control             |  | ve, full applicability is assign<br>Tag ID                    | Description  |  | Owner                | Status     | Applicability Factor | Criticality     | Type/Fac   | ctor Reviewed   | Λοοοι       | ssment |
|                          | RR-COP-03103   | BC-00435  | PCY000022 Fire Risk Management Plan  |  | No Owner Defined     | In Service | 100.0%               | Critical Contro |            |                 |             | ood    |
|                          |  |   |  |  |                      |            |                      |                 |            |                 |             |        |
| Base Control<br>Comments | The Fire Risk Man  | nagement Plan (draft) is an                                   | overarching document that brings all facets of fire ris  | sk for the mine together.                        |                      |            |                      |                 |            |                 |             |        |
| Comments                 |  | s assessed via the following                                  | a:   |  |                      |            |                      |                 |            |                 |             |        |
|                          | - Implemented: Ye  |   | •  |  |                      |            |                      |                 |            |                 |             |        |
|                          | - Type: Administra   |   |  |  |                      |            |                      |                 |            |                 |             |        |
|                          | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditi</li> </ul> | ing: Performance monitoring                                   | g  |  |                      |            |                      |                 |            |                 |             |        |
|                          | Daged on the above   | us the effective page of the                                  | control is assessed to be GOOD.  |  |                      |            |                      |                 |            |                 |             |        |
| Risk Control             |  | ve, the eπectiveness of the<br>onse Procedures - Fast Det     |  |  |                      |            |                      |                 |            |                 |             |        |
| Context                  |  | nice i recoddies i last bet                                   | ominion reciporate   |  |                      |            |                      |                 |            |                 |             |        |
| Risk Control<br>Comments |  |   | uired emergency response to the incident which redu<br>late level of response can be provided by both operal |  | el are trained and   |            |                      |                 |            |                 |             |        |
|                          | rogular armo are a   | •   |  |  |                      |            |                      |                 |            |                 |             |        |
|                          |  | ation staff, there are a mini<br>gh fire risk periods.        | mum of 3 site-based emergency staff ready to mobili  | ise. Additional personnel and firefighting equip | oment are on         |            |                      |                 |            |                 |             |        |
|                          |  |   |  |  |                      |            |                      |                 |            |                 |             |        |
|                          | - Independence: H  | assessed via the following                                    | factors:   |  |                      |            |                      |                 |            |                 |             |        |
|                          | - Applicable: High   |   |  |  |                      |            |                      |                 |            |                 |             |        |
|                          | Based on the above   | ve, full applicability is assign                              | ned.   |  |                      |            |                      |                 |            |                 |             |        |
| Actions                  | Code   | Objective   |  | Work to be Done                                  |                      |            |                      | Priority        | Implen     | nenter Status   | Complete By | Tra    |
|                          | RR-A-00033   | •   | lanagement Plan to incorporate activities  |  |                      |            |                      | Normal          |            | Pending         |             | -      |
|                          |  |   | -based emergency services and operations team<br>linated approach that is initiated as a result of an        |  |                      |            |                      |                 |            |                 |             |        |
|                          |  | elevated fire danger.   | mated approach that to minated do a rocal of an  |  |                      |            |                      |                 |            |                 |             |        |
| ause                     | Ember attack f   | rom bush fire or grass  | fire   |  | Code                 | Status     |                      |                 | kelihood   | Contribution    |             |        |
|                          |  |   |  |  | RR-CA-00613          | Active     |                      | Current L       | ikely (4)  | 73.4%           |             |        |
|                          |  |   |  |  |                      |            |                      | roposed L       | ikely (4)  | 73.4%           |             |        |

### AGL MINE RISK ASSESSMENT

# Active Risk Scenarios ID: RR-R-00073



Comments Bush fire and grass fire, whether internal or external to the Mine Lease Area (ML 5189), may present a hazard. The recent event at Hazelwood Mine (2014) showed that an external fire some kilometers away from the mine may present a threat which is real and should be managed as such.

Ember attack or grass fire may originate from many sources, including:

- motor vehicle accident
- lightning strike
- farming equipment
- uncontrolled burnt off There is a potential for a planned burn off to become uncontrolled due to rapid changes in wind condition
- natural gas pipeline leak.

Bush fire hazards are managed by other authorities. A severe ember attack from multiple fronts has the potential to exhaust the internal capabilities of AGL resources. Bush fires have occurred in Victoria, therefore the likelihood for a bush fire or ember attack that directly affect the mine is considered to be LIKELY.

| Risk Control Code | Tag ID   | Description                         | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |
|-------------------|----------|-------------------------------------|------------------|------------|----------------------|------------------|----------------|------------|------------|
| RR-COP-02523      | BC-00435 | PCY000022 Fire Risk Management Plan | No Owner Defined | In Service | 0.0%                 | Critical Control | Administrative | 1-Sep-2015 | Good       |

# Comments

Base Control The Fire Risk Management Plan (draft) is an overarching document that brings all facets of fire risk for the mine together.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

### Risk Control Period specific plans put in place prior to high fire danger days Context

Risk Control Site initiated weather monitoring during period of high fire danger. Comments

Security and emergency services manager reviews the predictive weather conditions and determine appropriate response.

Some of these activities include:

- Additional fire patrols (patrols are vital to early fire detection or identification of suspicious activity)
- Vehicle patrols implemented by AGL around boundaries, early detection should result in activation of EMP
- Mobile plant fire tankers are checked and are on stand by in these situations
- Engaging additional emergency response personnel
- Daily mine inspections by shift management personnel look at general risk conditions (additional housekeeping) to the mine, including external fire threats.

Weather conditions may present an elevated fire threat. Inspection requirements cover the issue of fire

- Restricts high risk activities
- Spraylines situated around the mine are activated to wet down exposed coal.

Memo to key operational staff alerting them of fire preparedness activities that need to be undertaken.

The risk control is assessed via the following factors:

- Independence: Low (similar to personnel undertaking Mine Fire Preparedness and Prevention Procedure)
- Applicable: High

RR-A-00033

Based on the above, no applicability is assigned, as period specific plans are undertaken by the same personnel who administer the Mine Preparedness and Prevention Procedure.

Actions Code Objective Work to be Done

> Update the Fire Risk Management Plan to incorporate activities undertaken by the site-based emergency services and operations team into a single and coordinated approach that is initiated as a result of an

> > elevated fire danger.

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Complete By

Tracking

N/A

12:03 pm

Priority

Normal

Implementer

Status

Pending



| AGL LUT TANG       |                         |                                      |   |  |  |                  |            |                      |                  |             |            | AGL             |
|--------------------|-------------------------|--------------------------------------|---|--|--|------------------|------------|----------------------|------------------|-------------|------------|-----------------|
| AGL MINE RISK ASSE | SSMENT                  |                                      |   |  | Active Risk Sce                                  | enarios ID: RR-  | R-00073    |                      |                  |             |            | AGL             |
|                    | Risk Control            | Code                                 | Tag ID  | Description  |  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor | Reviewed   | Assessment      |
|                    |                         | RR-COP-02527                         | BC-00199  | External Buffers-Exclusion Zones                         |  | No Owner Defined | In Service | 31.0%                | Critical Control | Isolation   | 1-Sep-2015 | Good            |
|                    |                         |                                      |   |  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | Exclusion Zones 0′ mining license.   | 10 code. The land use is in                           | line with local council zoning and town planning requ    | irements. Buffer is defined from the mine crest  | and not the      |            |                      |                  |             |            |                 |
|                    |                         |                                      | GL Loy Yang to manage (or by grazing, earthen breaks. | n land it owns) vegetation. This include activities such | h as farming, slashing, ploughing, summer crop   | os, stock        |            |                      |                  |             |            |                 |
|                    |                         | Exclusion Zones in                   | force. Bushfire mitigation pla                        | ans in place and submitted to Energy Safe Victoria. E    | Exclusion zones around electrical infrastructure |                  |            |                      |                  |             |            |                 |
|                    |                         | The base control is                  | assessed via the following:                           |  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | - Implemented: Yes                   | •   |  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | - Type: Isolation                    |   |  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | - Reliability: Good                  |   |  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | - Monitoring/Auditin                 | g: None   |  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | Based on the above                   | e, the effectiveness is asses                         | sed to be GOOD.  |  |                  |            |                      |                  |             |            |                 |
|                    | Risk Control<br>Context | Buffer zone betwee                   | n coal mine and public acce                           | ISS  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | The planning zone reduced likelihood | •   | population; reduced human activity in this zone and      | allows for vegetation to be controlled that may  | result in a      |            |                      |                  |             |            |                 |
|                    |                         | The risk control is a                | ssessed via the following fa                          | ctors:   |  |                  |            |                      |                  |             |            |                 |
|                    |                         | - Independence: Lo                   | w (part of the Management                             | of Vegetation to manage fuel loads)                      |  |                  |            |                      |                  |             |            |                 |
|                    |                         | - Applicable: High                   |   |  |  |                  |            |                      |                  |             |            |                 |
|                    |                         | Based on the above                   | e, partial applicability is assig                     | gned.  |  |                  |            |                      |                  |             |            |                 |
|                    | Risk Control            |                                      | Tag ID  | Description  |  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor | Reviewed   | Assessment      |
|                    |                         |                                      | -   | •  |  |                  |            |                      | •                |             |            | , 1000001110111 |

RR-COP-02528 BC-00467 No Owner Defined In Service 31.0% Critical Control 1-Sep-2015 Environmental site plan - vegetation management Administrative Good

Base Control This plan manages the fire risks on the mine and surrounding areas, including reduced fuel loads (grazing/spraying/slashing), fire breaks and mineral earth Comments breaks.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Monitored and audited

Based on the above, the effectiveness is assessed as GOOD.

Risk Control Management of vegetation to manage fuel load to reduce the intensity of the fire within the mine

Risk Control The reduction of fuel load reduces the fire intensity and reduces the likelihood of additional embers from generated which could potentially affect the mine or Comments exposed coal area. This control is not applicable to the exposed coal area.

Lessees and neighbouring land holders are requested to reduce fuel loads and inform AGL of suspicious activities/behaviours (this is part of the induction).

The risk control is assessed via the following factors:

- Independence: Low (part of the buffer zone between coal mine and public access control)
- Applicable: Moderate (only works for 75% of the mine area)

Based on the above, partial applicability is assigned.



| Risk Contro            |  |   |   | ACTIVE IVISK OF                                     | enarios ID: KK-           | K-000/3              |                                |                              |                               |                        |                                       |
|------------------------|--|---|---|---|---------------------------|----------------------|--------------------------------|------------------------------|-------------------------------|------------------------|---------------------------------------|
|                        | l Code   | Tag ID  | Description   |   | Owner                     | Status               | Applicability Factor           | Criticality                  |                               | Reviewed               | Assessment                            |
|                        | RR-COP-02762   | BC-00468  | Third party high danger period alerts   |   | No Owner Defined          | In Service           | 31.0%                          | Non-Critical Control         |                               | 1-Sep-2015             | Assessed                              |
|                        |  |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
| Base Contro            | CFA/DEP/MFB ale  | rt on high danger period.                               | CFA issues alert to AGL staff on high fire danger per                                       | riod. CFA/DEP/MFB provide notification of both fi   | ires and                  |                      |                                |                              |                               |                        |                                       |
| Comment                |  | ated fire danger period.                                | g p   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | <b></b>  |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        |  | assessed via the followir<br>s (Third party control)    | ng:   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Type: Administra   |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Reliability: Good  |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Monitoring/Auditi  | ng: None (Third party cont                              | trol)   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | As this is a third pa  | arty control, the effectivene                           | ess is assessed to be ASSESSED.   |   |                           |                      |                                |                              |                               |                        |                                       |
| Risk Contro<br>Conte   |  | rt on high danger period.                               |   |   |                           |                      |                                |                              |                               |                        |                                       |
| Risk Contro<br>Comment | CFA issues an ale  | t to AGL staff on high fire                             | danger period. CFA/DEP/MFB provide notification of  | of both fires and advice during elevated fire dange | er period.                |                      |                                |                              |                               |                        |                                       |
|                        | The alerts trigger t   | ne activation of fire prepar                            | redness and prevention measures   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        |  | assessed via the following                              | g factors:  |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | <ul> <li>Independence: H</li> <li>Applicable: Mode</li> </ul>    | -   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        |  |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
| Risk Contro            |  | e, partial applicability is a                           | •   |   |                           |                      | A P 1777 F 4                   | 0.111                        | T (5 )                        |                        |                                       |
| KISK COILL             | RR-COP-02763   | Tag ID<br>BC-00435                                      | Description   |   | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>100.0% | Criticality Critical Control | Type/Factor<br>Administrative | Reviewed<br>8-Oct-2015 | Assessment                            |
|                        | 1114-001-02703   | DO-00400  | PCY000022 Fire Risk Management Plan   |   | NO OWNER DEIMEG           | III OGI VICE         | 100.070                        | Officer Control              | Administrative                | 0-001-2013             | Good                                  |
| Base Contro<br>Comment | l The Fire Risk Man  | agement Plan (draft) is an                              | n overarching document that brings all facets of fire ri                                    | isk for the mine together.                          |                           |                      |                                |                              |                               |                        |                                       |
|                        | The base control is  | assessed via the following                              | ng:   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Implemented: Ye  |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Type: Administra   | tive  |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditi</li> </ul> | ng: Performance monitorir                               | na  |   |                           |                      |                                |                              |                               |                        |                                       |
|                        |  | <b>J</b>  |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        |  |   | e control is assessed to be GOOD.   |   |                           |                      |                                |                              |                               |                        |                                       |
| Risk Contro<br>Conte   |  | dness and Prevention Pro                                | cedure  |   |                           |                      |                                |                              |                               |                        |                                       |
| Risk Contro<br>Comment | The procedure in ps  | lace to manage the risk d                               | luring high fire danger periods.  |   |                           |                      |                                |                              |                               |                        |                                       |
|                        |  | assessed via the following                              | g factors:  |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Independence: H  | igh   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Applicable: High   |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        | - Applicable: High   |   |   |   |                           |                      |                                |                              |                               |                        |                                       |
|                        |  | e, full applicability is assig                          | gned.   |   |                           |                      |                                |                              |                               |                        |                                       |
| Actions                |  | e, full applicability is assig                          | gned.   | Work to be Done                                     |                           |                      |                                | Priority                     | Implementer                   | Status                 | Complete By Tracking                  |
| Actions                | Based on the above   | Objective Update the Fire Risk N                        | Management Plan to incorporate activities   | Work to be Done                                     |                           |                      |                                | Priority<br>Normal           | Implementer                   | Status<br>Pending      | Complete By Tracking N/A              |
| Actions                | Based on the above   | Objective  Update the Fire Risk Nundertaken by the site | Management Plan to incorporate activities<br>s-based emergency services and operations team | Work to be Done                                     |                           |                      |                                | •                            | Implementer                   |                        | · · · · · · · · · · · · · · · · · · · |
| Actions                | Based on the above   | Objective  Update the Fire Risk Nundertaken by the site | Management Plan to incorporate activities   | Work to be Done                                     |                           |                      |                                | •                            | Implementer                   |                        | · · · · · · · · · · · · · · · · · · · |



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00435 RR-COP-03104 PCY000022 Fire Risk Management Plan No Owner Defined In Service 0.0% Critical Control Administrative 14-Oct-2015 Good

Comments

Base Control The Fire Risk Management Plan (draft) is an overarching document that brings all facets of fire risk for the mine together.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Procedures - Fast Determined Response

Context

Risk Control Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and Comments regular drills are undertaken to ensure an adequate level of response can be provided by both operations and site-based emergency staff.

In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.

The risk control is assessed via the following factors:

- Independence: Low (part of the Mine Fire Preparedness and Prevention Procedure control)
- Applicable: Moderate

Based on the above, no applicability is assigned, as this is part of the Mine Fire Preparedness and Prevention Procedure control.

Actions Code Work to be Done Objective

RR-A-00033

undertaken by the site-based emergency services and operations team into a single and coordinated approach that is initiated as a result of an elevated fire danger.

Normal Pendina Update the Fire Risk Management Plan to incorporate activities

Priority

Implementer

Status

Tracking

N/A

Complete By

R4Risk Ref.: 116-10. Release 1 Page 263 of 313 12:03 pm





| L MINE RISK ASSESS | SMENT                    |  |                                 |  | Active Risk                                    | Scenarios ID: RR-F        | R-00073              |                           |                                 |                               |                        | AGL         | -        |
|--------------------|--------------------------|--|---------------------------------|--|--|---------------------------|----------------------|---------------------------|---------------------------------|-------------------------------|------------------------|-------------|----------|
|                    | Risk Control             | Code<br>RR-COP-03105   | Tag ID<br>BC-00435              | Description PCY000022 Fire Risk Management Plan  |  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor 0.0% | Criticality<br>Critical Control | Type/Factor<br>Administrative | Reviewed<br>1-Sep-2015 | Assess      |          |
|                    | Base Control<br>Comments | The Fire Risk Man  | agement Plan (draft) is an o    | overarching document that brings all facets of fire ris  | k for the mine together.                       |                           |                      |                           |                                 |                               |                        |             |          |
|                    |                          | - Implemented: Ye<br>- Type: Administra<br>- Reliability: Good | tive                            |  |  |                           |                      |                           |                                 |                               |                        |             |          |
|                    |                          | •  | ng: Performance monitoring      | control is assessed to be GOOD.  |  |                           |                      |                           |                                 |                               |                        |             |          |
|                    | Risk Control<br>Context  | Clay capping   | e, the effectiveness of the c   | Williams assessed to be GOOD.  |  |                           |                      |                           |                                 |                               |                        |             |          |
|                    | Risk Control<br>Comments | Capping of hot spo   | ot to prevent air/water ingres  | SS   |  |                           |                      |                           |                                 |                               |                        |             |          |
|                    |                          |  |                                 | nd associated cracks can assist in preventing air inger to spontaneous combustion.   | ress into an insitu hot spot. The reduction of | of air can ultimately     |                      |                           |                                 |                               |                        |             |          |
|                    |                          |  |                                 | e fire behaving in a similar way to clay capping; wher<br>ed, a risk assessment is required prior to application                               |  | that there is many        |                      |                           |                                 |                               |                        |             |          |
|                    |                          | This control is not  | applicable on the exposed       | coal area.   |  |                           |                      |                           |                                 |                               |                        |             |          |
|                    |                          |  |                                 | factors:<br>between coal mine and public access)   |  |                           |                      |                           |                                 |                               |                        |             |          |
|                    |                          | Based on the above   | ve, no applicability is this is | part of the Buffer zone between coal mine and public   | c access control.                              |                           |                      |                           |                                 |                               |                        |             |          |
| Actions            |                          | Code   | Objective                       |  | Work to be Done                                |                           |                      |                           | Priority                        | Implementer                   | Status                 | Complete By | Tracking |
|                    |                          | RR-A-00033   | undertaken by the site-l        | anagement Plan to incorporate activities<br>based emergency services and operations team<br>nated approach that is initiated as a result of an |  |                           |                      |                           | Normal                          |                               | Pending                |             | N/A      |
| Cause              |                          | Bearing Friction   | n Failure                       |  |  | Code                      | Status               |                           | Likelihood                      |                               | Contribution           |             |          |
|                    |                          |  |                                 |  |  | RR-CA-00614               | Active               | Current<br>Proposed       | Likely (4)<br>Likely (4)        |                               | 0.2%<br>0.2%           |             |          |
|                    | Comments                 | Potential pathway  | s include:                      |  |  |                           |                      | 1100000                   | <b>,</b> (+)                    |                               | 3.m./v                 |             |          |
|                    |                          | - contacting parts   |                                 |  |  |                           |                      |                           |                                 |                               |                        |             |          |

- contacting parts (metal on n
   wear and tear on bearings
- Stand alone idler failure dropping hot material onto coal below, alternatively the belt is stopped and the idler sets fire to the belt and coal
- build up of flammable material (grease, oil and coal)

This includes the Raw Coal Bunker and Crusher House.

In the past 3 years (2012-2015), 3 of the 41 smouldering coal/fire events have been attributed to bearing failure. The likelihood of this event is considered to be LIKELY.



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment RR-COP-02766 BC-00470 Detection and suppression on conveyor lines No Owner Defined In Service 100.0% Critical Control Engineering 8-Oct-2015 Average Base Control Some of the equipment will have automated detection and suppression on coal delivering structure. Other equipment items are reliant on activation of the manual

Comments fire suppression systems.

The Raw Coal Bunker and Crusher House fire detection and suppression system includes:

- Very Early Smoke Detection Alarm
- Thermal imaging cameras
- Manual deluge (operator initiated)

The base control is assessed via the following:

- Implemented: Part (fully implemented on the rising conveyors)
- Type: Administrative/Engineering
- Reliability: Good
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness of the control is assessed to be AVERAGE

Risk Control Detection and suppression on conveyor lines

Context

Comments

Risk Control Some of the equipment will have automated detection and suppression. Other equipment items are reliant on activation of the manual fire suppression systems.

The risk control is assessed via the following factors:

- Independence: Mod-High
- Applicable: High

### Based on the above, full applicability is assigned.

Risk Control Code

Type/Factor Owner Applicability Factor Tag ID Description Status Criticality Reviewed Assessment RR-COP-02767 BC-00151 No Owner Defined 100.0% Non-Critical Control Administrative 1-Sep-2015 In Service General Housekeeping Assessed

Comments

Base Control The housekeeping removes fuel (coal, grease, oil) around hot components, i.e. potential ignition sources.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: Ad-hoc

Based on the above, the effectiveness is assessed to be ASSESSED.

Risk Control Work area inspection will trigger the cleaning procedure Context

Risk Control The procedure reduces the potential for fuel to come into contact with hot surfaces on the mobile plant thus reducing the potential for a fire. Comments

General cleaning does not always extend to the required depth. It removes bulk coal material but often, layers of grease and oil may remain. Specialist cleaning utilising degreasing agents and pressurised steam may be required.

The risk control is assessed via the following factors:

- Independence: High
- Applicable: Mod-High

Based on the above, full applicability is assigned.

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00073



| BL MINE RISK ASSESSMENT  |   |  |   | Active Risk Sc                                   | enarios ID: RR-l | ₹-00073    |                      |                  |                |             |                      |
|--------------------------|---|--|---|--|------------------|------------|----------------------|------------------|----------------|-------------|----------------------|
| Risk Control             | Code  | Tag ID                                   | Description   |  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Assessment           |
|                          | RR-COP-03190  | BC-00469                                 | Mechanical Maintenance Routine  |  | No Owner Defined | In Service | 0.0%                 | Critical Control | Administrative | 14-Oct-2015 | Good                 |
| Base Control<br>Comments | Preventative maint  | tenance program is design                | ed to maintain equipment to minimise integrity related  | d problems / and or unexpected failure.          |                  |            |                      |                  |                |             |                      |
|                          | The base control is   | s assessed via the followin              | g:  |  |                  |            |                      |                  |                |             |                      |
|                          | - Implemented: Ye   |  |   |  |                  |            |                      |                  |                |             |                      |
|                          | <ul> <li>Type: Administra</li> <li>Reliability: Good</li> </ul>                       |  |   |  |                  |            |                      |                  |                |             |                      |
|                          |   | ng: Monitored and Audited                |   |  |                  |            |                      |                  |                |             |                      |
|                          | Based on the abov   | ve, the effectiveness of the             | control is assessed to be GOOD.   |  |                  |            |                      |                  |                |             |                      |
| Risk Control<br>Context  | Maintenance routing   | ne on bearings                           |   |  |                  |            |                      |                  |                |             |                      |
| Risk Control<br>Comments |   |  | e a lubrication program (however most bearings are s<br>ng and historical data determine when bearings are to                                       |  | d condition      |            |                      |                  |                |             |                      |
|                          |   | assessed via the following               |   |  |                  |            |                      |                  |                |             |                      |
|                          | - Independence: Lo<br>- Applicable: High  | ow (Considered in cause li               | kelihood)   |  |                  |            |                      |                  |                |             |                      |
|                          | Based on the abov   | ve, no applicability is assign           | ned to this control as it has been included in the likeli   | hood assessment.                                 |                  |            |                      |                  |                |             |                      |
| Risk Control             |   | Tag ID                                   | Description   |  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Assessment           |
|                          | RR-COP-03197  | BC-00435                                 | PCY000022 Fire Risk Management Plan   |  | No Owner Defined | In Service | 100.0%               | Critical Control | Administrative | 14-Oct-2015 | Good                 |
| Base Control<br>Comments | The base control is<br>- Implemented: Ye<br>- Type: Administra<br>- Reliability: Good | s assessed via the followin<br>s<br>tive |   | k for the mine together.                         |                  |            |                      |                  |                |             |                      |
|                          |   |  | control is assessed to be GOOD.   |  |                  |            |                      |                  |                |             |                      |
| Risk Control<br>Context  | Emergency Respo   | nse Procedures - Fast Det                | termined Response   |  |                  |            |                      |                  |                |             |                      |
| Risk Control<br>Comments |   |  | uired emergency response to the incident which redu<br>equate level of response can be provided by both op  |  | are trained and  |            |                      |                  |                |             |                      |
|                          | In addition to opera  |  | imum of 3 site-based emergency staff ready to mobili  | se. Additional personnel and firefighting equipm | ent are on       |            |                      |                  |                |             |                      |
|                          | The risk control is - Independence: H - Applicable: High                              | assessed via the following igh           | factors:  |  |                  |            |                      |                  |                |             |                      |
|                          |   | ve, full applicability is assig          | ned.  |  |                  |            |                      |                  |                |             |                      |
| Actions                  | Code  | Objective                                |   | Work to be Done                                  |                  |            |                      | Priority         | Implementer    | Status      | Complete By Tracking |
|                          | RR-A-00033  | undertaken by the site                   | flanagement Plan to incorporate activities<br>-based emergency services and operations team<br>dinated approach that is initiated as a result of an |  |                  |            |                      | Normal           |                | Pending     | N/A                  |



| AGL IVIIN | E RISK ASSESSIVENT |                                |                               |   | Active Nisk Scellarios ID. NN-               | 1-00013    |               |              |                  |                |              |             |
|-----------|--------------------|--------------------------------|-------------------------------|---|--|------------|---------------|--------------|------------------|----------------|--------------|-------------|
|           | Intermediate Event | Code                           | Description                   |   |  | Status     |               | Incoming     | Outgoing         |                |              | Probability |
|           |                    | RR-IE-03199                    | Probability of initial fire e | escalating  |  | Active     | Current       | Unlikely (2) | Rare (1)         |                |              | 0.1%        |
|           |                    |                                |                               |   |  |            | Proposed      | Unlikely (2) | Rare (1)         |                |              | 0.1%        |
|           | Comments           |                                |                               | rgency response activities (which includes mandatory CFA attendated to be UNLIKELY. Therefore, probability is assessed as 0.1%. | ance) being unsuccessful and resulting in an |            |               |              |                  |                |              |             |
|           | Cause              | Hot Works                      |                               |   | Code   | Status     |               |              | Likeliho         | ood            | Contribution |             |
|           |                    |                                |                               |   | RR-CA-00615                                  | Active     |               | Current      | Likely           | (4)            | 0.7%         |             |
|           |                    |                                |                               |   |  |            |               | Proposed     | Likely           | (4)            | 0.7%         |             |
|           | Comments           | Potential pathways             | includes welding / cutting.   |   |  |            |               |              |                  |                |              |             |
|           |                    | In the past 3 years<br>LIKELY. | (2012-2015), 2 of the 41 sn   | mouldering coal/fire events have been attributed to hot works. The  | likelihood of this event is considered to be |            |               |              |                  |                |              |             |
|           | Risk Control       | Code                           | Tag ID                        | Description   | Owner  | Status     | Applicability | Factor       | Criticality      | Type/Factor    | Reviewed     | Assessment  |
|           |                    | RR-COP-02541                   | BC-00088                      | HSP900 Permit to work system  | No Owner Defined                             | In Service | 0.0%          | (            | Critical Control | Administrative | 1-Sep-2015   | Very Good   |
|           |                    |                                |                               |   |  |            |               |              |                  |                |              |             |

Base Control Systems and procedures are used to minimise the risk when conducting hot work. End of day shift collect all hot work permits and hand over to night shift Comments where all fire watch requirements are captured. Night shift sign off on inspections as done during the evening

Control is rated as very good based on collective acknowledgement of the importance of this inspection ahead of other shift tasks.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Very Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be VERY GOOD.

Context

Risk Control Hot work permit system

Comments

Risk Control Depending on weather conditions, hot works may be suspended.

The risk control is assessed via the following factors:

- Independence: High
- Applicable: Mod-High

The risk control is assessed via the following factors:

- Independence: Low (Considered in cause likelihood)
- Applicable: High

Based on the above, no applicability is assigned to this control as it has been included in the likelihood assessment.

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00073

of this event is considered to be LIKELY.



| E RISK ASSESSMENT        |   |   |  | Active Risk S  | Scenarios ID: RR-I  | K-000/3    |             |              |             |            |                |              |             |          |
|--------------------------|---|---|--|--|---------------------|------------|-------------|--------------|-------------|------------|----------------|--------------|-------------|----------|
| Risk Control             | Code                                    | Tag ID  | Description  |  | Owner               | Status     | Applicabili | ity Factor   | Critica     | lity       | Type/Factor    | Reviewed     | Assess      | sment    |
|                          | RR-COP-03200                            | BC-00435  | PCY000022 Fire Risk Management Plan  | 1  | No Owner Defined    | In Service | 100         | .0%          | Critical Co | ontrol     | Administrative | 14-Oct-2015  | Go          | od       |
|                          | The Fire Risk Ma                        | nagement Plan (draft)                                 | is an overarching document that brings all facets of f   | ire risk for the mine together.                      |                     |            |             |              |             |            |                |              |             |          |
| Comments                 | The base control                        | is assessed via the fol                               | llowing:   |  |                     |            |             |              |             |            |                |              |             |          |
|                          | - Implemented: Y                        |   |  |  |                     |            |             |              |             |            |                |              |             |          |
|                          | - Type: Administr                       | ative   |  |  |                     |            |             |              |             |            |                |              |             |          |
|                          | - Reliability: Good                     | d   |  |  |                     |            |             |              |             |            |                |              |             |          |
|                          | - Monitoring/Audi                       | iting: Performance mon                                | nitoring   |  |                     |            |             |              |             |            |                |              |             |          |
|                          | Based on the abo                        | ove, the effectiveness of                             | of the control is assessed to be GOOD.   |  |                     |            |             |              |             |            |                |              |             |          |
| Risk Control<br>Context  | Emergency Resp                          | oonse Procedures - Fas                                | st Determined Response   |  |                     |            |             |              |             |            |                |              |             |          |
| Risk Control<br>Comments |   |   | e required emergency response to the incident which<br>an adequate level of response can be provided by bo     |  | el are trained and  |            |             |              |             |            |                |              |             |          |
|                          |   | eration staff, there are a<br>nigh fire risk periods. | a minimum of 3 site-based emergency staff ready to   | mobilise. Additional personnel and firefighting equi | pment are on        |            |             |              |             |            |                |              |             |          |
|                          |   |   |  |  |                     |            |             |              |             |            |                |              |             |          |
|                          | I he risk control is<br>- Independence: | s assessed via the follo                              | owing factors:   |  |                     |            |             |              |             |            |                |              |             |          |
|                          | - Applicable: High                      | -   |  |  |                     |            |             |              |             |            |                |              |             |          |
|                          | Based on the abo                        | ove, full applicability is                            | assigned.  |  |                     |            |             |              |             |            |                |              |             |          |
| Actions                  | Code                                    | Objective   |  | Work to be Done                                      |                     |            |             |              | Prio        | ority      | Implementer    | Status       | Complete By | Tracking |
|                          | RR-A-00033                              |   | Risk Management Plan to incorporate activities   |  |                     |            |             |              | No          | mal        |                | Pending      |             | N/A      |
|                          |   |   | e site-based emergency services and operations tear  |  |                     |            |             |              |             |            |                |              |             |          |
|                          |   | into a single and of<br>elevated fire dang            | coordinated approach that is initiated as a result of a<br>ger.  | n  |                     |            |             |              |             |            |                |              |             |          |
| Intermediate Event       | Code                                    | Description   | <u> </u>   |  |                     | Status     |             | Incoming     | Outgoi      | ng         |                |              | Proba       | ability  |
|                          | RR-IE-03201                             | Probability of initia                                 | ial fire escalating  |  |                     | Active     | Current     | Possible (3) | Rare (      | 1)         |                |              | 0.1         | 1%       |
|                          |   |   |  |  |                     |            | Proposed    | Possible (3) | Rare (      | 1)         |                |              | 0.′         | 1%       |
| Comments                 |   |   | al emergency response activities (which includes man<br>considered to be UNLIKELY. Therefore, probability is a |  | resulting in an     |            |             |              |             |            |                |              |             |          |
| Cause                    |   | •   | onsidered to be onlined. Therefore, probability is a nicillary equipment initiated fire                        | issessed as 0.1%.                                    | Code                | Status     |             |              |             | Likelihood |                | Contribution |             |          |
|                          | ŭ ,                                     |   |  |  | RR-CA-00616         | Active     |             | C            | urrent      | Likely (4) |                | 0.7%         |             |          |
|                          |   |   |  |  |                     |            |             |              | posed       | Likely (4) |                | 0.7%         |             |          |
| Comments                 | Wat and build ur                        | on avhausts, than drie                                | es and catches fire on the exhaust - falling off onto th   | o coal curface. Once a light/heavy vehicle is purch  | and the             |            |             |              |             | • • • •    |                |              |             |          |
| Comments                 |   |   | external temperature limits are within tolerable limits.   |  | aseu, ille          |            |             |              |             |            |                |              |             |          |
|                          | Mobile plant inclu                      | uding dozers, rubber tyr                              | rred dozers, Integrated Tool (IT) Carriers and haul tru  | cks initiate fire on vehicle.                        |                     |            |             |              |             |            |                |              |             |          |
|                          | Potential pathwa                        | ys include:   |  |  |                     |            |             |              |             |            |                |              |             |          |
|                          |   | mable material in critica                             | al areas   |  |                     |            |             |              |             |            |                |              |             |          |
|                          | - electrical failure                    |   |  |  |                     |            |             |              |             |            |                |              |             |          |
|                          | tailed hydraulic     vehicle acciden    | hoses onto hot comports                               | nents  |  |                     |            |             |              |             |            |                |              |             |          |
|                          | During the period                       | d when a mine fire alert                              | t has been declared, these vehicles are not permitted  | to be on the mine site.                              |                     |            |             |              |             |            |                |              |             |          |
|                          | Initiated fire ever                     | its from stackers and d                               | dredgers have been considered in electrical, belts, be   | arings, brakes and conveyor causes                   |                     |            |             |              |             |            |                |              |             |          |
|                          | In the past 3 year                      |   | e 41 smouldering coal/fire events have been attribute  | d to light or heavy vehicle/mobile/ancillary equipm  | ent. The likelihood |            |             |              |             |            |                |              |             |          |
|                          | of this ayant is a                      | anaidered to be LIVELY                                | /  |  |                     |            |             |              |             |            |                |              |             |          |

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00073



| MINE RISK ASSESSMENT     |  |                               |  | Active Risk S                                    | cenarios ID: RR-F | ₹-00073    |                 |             |                      |                |             |                      |
|--------------------------|--|-------------------------------|--|--|-------------------|------------|-----------------|-------------|----------------------|----------------|-------------|----------------------|
| Risk Control             | Code   | Tag ID                        | Description  |  | Owner             | Status     | Applicability F | actor       | Criticality          | Type/Factor    | Reviewed    | Assessment           |
|                          | RR-COP-02771   | BC-00315                      | Pre Startup Inspections  |  | No Owner Defined  | In Service | 0.0%            | !           | Non-Critical Control | Administrative | 1-Sep-2015  | Average              |
| Base Control<br>Comments | This includes pre-   | startup checks to ensure      | that equipment is fit for purpose. The pre-startup process   | ess identifies if cleaning is required.          |                   |            |                 |             |                      |                |             |                      |
| Comments                 | The base control i   | s assessed via the follow     | ving:  |  |                   |            |                 |             |                      |                |             |                      |
|                          | - Implemented: Ye  |                               |  |  |                   |            |                 |             |                      |                |             |                      |
|                          | - Type: Administra   | ative/Behavioural             |  |  |                   |            |                 |             |                      |                |             |                      |
|                          | <ul> <li>Reliability: Fair</li> <li>Monitoring/Auditi</li> </ul> | ing: Ad-hoc                   |  |  |                   |            |                 |             |                      |                |             |                      |
|                          | Based on the abo   | ve, the effectiveness is as   | ssessed to be AVERAGE.   |  |                   |            |                 |             |                      |                |             |                      |
| Risk Control<br>Context  | Pre Startup Inspec   | ctions checklist triggers cl  | lean / washdown procedure  |  |                   |            |                 |             |                      |                |             |                      |
| Risk Control<br>Comments | Procedure reduce   | s the potential for fuel to   | come into contact with hot surfaces on vehicles thus, n  | reducing the potential of a fire.                |                   |            |                 |             |                      |                |             |                      |
|                          | The risk control is  | assessed via the following    | ng factors:  |  |                   |            |                 |             |                      |                |             |                      |
|                          | <ul> <li>Independence: L</li> <li>Applicable: High</li> </ul>    | ow (Considered in cause       | likelihood)  |  |                   |            |                 |             |                      |                |             |                      |
|                          | Based on the above   | ve, no applicability is assi  | igned to this control as it has been included in the likeli  | ihood assessment.                                |                   |            |                 |             |                      |                |             |                      |
| Risk Control             | Code   | Tag ID                        | Description  |  | Owner             | Status     | Applicability F | actor       | Criticality          | Type/Factor    | Reviewed    | Assessment           |
|                          | RR-COP-03203   | BC-00435                      | PCY000022 Fire Risk Management Plan  |  | No Owner Defined  | In Service | 100.0%          |             | Critical Control     | Administrative | 14-Oct-2015 | Good                 |
| Base Control<br>Comments | The Fire Risk Mar  | nagement Plan (draft) is a    | an overarching document that brings all facets of fire ris   | sk for the mine together.                        |                   |            |                 |             |                      |                |             |                      |
| Comments                 | The base control i   | s assessed via the follow     | ving:  |  |                   |            |                 |             |                      |                |             |                      |
|                          | - Implemented: Ye  |                               | 9.   |  |                   |            |                 |             |                      |                |             |                      |
|                          | - Type: Administra   |                               |  |  |                   |            |                 |             |                      |                |             |                      |
|                          | - Reliability: Good  |                               |  |  |                   |            |                 |             |                      |                |             |                      |
|                          | - Monitoring/Auditi  | ing: Performance monitor      | ring   |  |                   |            |                 |             |                      |                |             |                      |
|                          | Based on the abo   | ve, the effectiveness of th   | ne control is assessed to be GOOD.   |  |                   |            |                 |             |                      |                |             |                      |
| Risk Control<br>Context  | Emergency Respo  | onse Procedures - Fast D      | Determined Response  |  |                   |            |                 |             |                      |                |             |                      |
| Risk Control<br>Comments |  |                               | equired emergency response to the incident which redu<br>adequate level of response can be provided by both op |  | are trained and   |            |                 |             |                      |                |             |                      |
|                          |  |                               | inimum of 3 site-based emergency staff ready to mobili   | ise. Additional personnel and firefighting equip | ment are on       |            |                 |             |                      |                |             |                      |
|                          | stand-by during hi   | gh fire risk periods.         |  |  |                   |            |                 |             |                      |                |             |                      |
|                          |  | assessed via the following    | ng factors:  |  |                   |            |                 |             |                      |                |             |                      |
|                          | <ul> <li>Independence: F</li> <li>Applicable: High</li> </ul>    |                               |  |  |                   |            |                 |             |                      |                |             |                      |
|                          | Based on the abo   | ve, full applicability is ass | signed.  |  |                   |            |                 |             |                      |                |             |                      |
| Actions                  | Code   | Objective                     |  | Work to be Done                                  |                   |            |                 |             | Priority             | Implementer    | Status      | Complete By Tracking |
|                          | RR-A-00033   | Update the Fire Risk          | Management Plan to incorporate activities  |  |                   |            |                 |             | Normal               |                | Pending     | N/A                  |
|                          |  |                               | te-based emergency services and operations team<br>ordinated approach that is initiated as a result of an      |  |                   |            |                 |             |                      |                |             |                      |
| Intermediate Event       | Code   | Description                   |  |  |                   | Status     |                 | Incoming    | Outgoing             |                |             | Probability          |
|                          | RR-IE-03204  | Probability of initial fi     | ire escalating   |  |                   | Active     | Current F       | ossible (3) | Rare (1)             |                |             | 0.1%                 |
|                          |  |                               |  |  |                   |            | Proposed F      | ossible (3) | Rare (1)             |                |             | 0.1%                 |
| Comments                 |  |                               | mergency response activities (which includes mandato   |  | sulting in an     |            |                 |             |                      |                |             |                      |
| of : 116 10 Palaces 1    | escalation to a sig  | Initicant mine fire is consi  | dered to be UNLIKELY. Therefore, probability is asses  | sed as U.1%.                                     |                   |            |                 |             |                      |                |             |                      |



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Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00433 RR-COP-03252 Vehicle Standards Procedure No Owner Defined In Service 0.0% Critical Control Administrative 8-Oct-2015 Good Base Control Vehicle standard (incorporate aspects of CFA Act) sets out the requirements for all vehicles, which includes but not limited to: Comments - fire extinguisher - two way radio - fire hose and branch - detection/suppression on mobile plant The base control is assessed via the following: - Implemented: Yes - Type: Engineering/Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness is assessed to be GOOD. Risk Control Fire equipment standard for light or heavy vehicle/ancillary equipment Context Risk Control The risk control is assessed via the following factors: Comments - Independence: Low (part of the Emergency Response Procedure - Fast Determined Response control) - Applicable: Mod-High Based on the above, no applicability is assigned as this control is part of the Emergency Response Procedure - Fast Determined Response control. Cause Ignition through discarded cigarettes Code Status Likelihood Contribution RR-CA-00618 Active Likely (4) 0.7% Current Proposed Likely (4) 0.7%

# Comments Potential pathways include:

- smoking in unauthorised area
- smoking below the grass level at the mine

In the past 3 years (2012-2015), 1 of the 41 smouldering coal/fire events have been attributed to ignition through discarded cigarettes. The likelihood of this event is considered to be LIKELY.

AGL MINE RISK ASSESSMENT



Active Risk Scenarios ID: RR-R-00073 Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment BC-00310 RR-COP-02550 HRP0024C Corporate Smoking Policy No Owner Defined In Service 0.0% Critical Control Administrative 1-Sep-2015 Average Base Control AGL Loy Yang Smoking Rules - applicable to all Loy Yang activities onsite. Comments Restricted smoking areas designated above grass level. No designated smoking areas in the mine below grass level or around coal carrying equipment. Smoking below grass level in the mine is cause for immediate dismissal in accordance with Corporate Smoking Policy HRP0024C AGL Loy Yang Smoking Rules. AGL Golden Rules are in place as a set of clear rules on what can result as a breach of a safety rule, such as smoking in a restricted area. A breach of the Golden Rules by anyone at an AGL site may result in disciplinary action being taken, which may include termination of employment. The base control is assessed via the following: - Implemented: Yes - Type: Behavioural - Reliability: Good - Monitoring/Auditing: Ad-hoc Based on the above, the effectiveness is assessed to be GOOD. Risk Control Restricted smoking areas Context Risk Control The risk control is assessed via the following factors: Comments - Independence: Low (Considered in cause likelihood) - Applicable: High Based on the above, no applicability is assigned to this control as it has been included in the likelihood assessment.

Intermediate Event Code Description Status Incoming Outgoing Probability RR-IE-03206 Probability of initial fire escalating Active 0.1% Current Possible (3) Rare (1) Proposed Possible (3) Rare (1) 0.1%

Comments The likelihood of this event and the initial emergency response activities (which includes mandatory CFA attendance) being unsuccessful and resulting in an escalation to a significant mine fire is considered to be UNLIKELY. Therefore, probability is assessed as 0.1%.

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Active Risk Scenarios ID: RR-R-00073



| RISK ASSESSMEN | NT                      |                       |                              |  | Active Risk                                  | Scenarios ID: RR-I   | K-000/3    |                      |          |             |                |              |             | -     |
|----------------|-------------------------|-----------------------|------------------------------|--|--|----------------------|------------|----------------------|----------|-------------|----------------|--------------|-------------|-------|
| Risl           | k Control               |                       | Tag ID                       | Description  |  | Owner                | Status     | Applicability Factor |          | riticality  | Type/Factor    | Reviewed     | Assess      | sment |
|                |                         | RR-COP-03207          | BC-00435                     | PCY000022 Fire Risk Management Plan                        |  | No Owner Defined     | In Service | 100.0%               | Crit     | cal Control | Administrative | 14-Oct-2015  | God         | bc    |
|                | ase Control<br>Comments | The Fire Risk Mana    | agement Plan (draft) is a    | an overarching document that brings all facets of fire ris | k for the mine together.                     |                      |            |                      |          |             |                |              |             |       |
|                |                         | The base control is   | assessed via the follow      | ving:  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | - Implemented: Yes    |                              |  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | - Type: Administrat   | ve                           |  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | - Reliability: Good   |                              |  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | - Monitoring/Auditir  | g: Performance monitor       | ring   |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | Based on the above    | e, the effectiveness of the  | he control is assessed to be GOOD.                         |  |                      |            |                      |          |             |                |              |             |       |
| R              | Risk Control<br>Context | Emergency Respon      | nse Procedures - Fast D      | Determined Response  |  |                      |            |                      |          |             |                |              |             |       |
| R              | Risk Control            | Includes fire instruc | tions that initiates the re  | equired emergency response to the incident which redu      | ices the risk of the event escalating. Perso | nnel are trained and |            |                      |          |             |                |              |             |       |
|                | Comments                | regular drills are un | dertaken to ensure ade       | equate level of response can be provided by both opera     | tions and site-based emergency staff.        |                      |            |                      |          |             |                |              |             |       |
|                |                         |                       |                              | ninimum of 3 site-based emergency staff ready to mobili    | se. Additional personnel and firefighting ed | quipment are on      |            |                      |          |             |                |              |             |       |
|                |                         | stand-by during hig   | h fire risk periods.         |  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         |                       | ssessed via the following    | ng factors:  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | - Independence: Hi    | gh                           |  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | - Applicable: High    |                              |  |  |                      |            |                      |          |             |                |              |             |       |
|                |                         | Based on the above    | e, full applicability is ass | signed.  |  |                      |            |                      |          |             |                |              |             |       |
| Actions        |                         | Code                  | Objective                    |  | Work to be Done                              |                      |            |                      |          | Priority    | Implementer    | Status       | Complete By | Trac  |
|                |                         | RR-A-00033            | Update the Fire Risk         | k Management Plan to incorporate activities                |  |                      |            |                      |          | Normal      |                | Pending      |             | N     |
|                |                         |                       | undertaken by the si         | ite-based emergency services and operations team           |  |                      |            |                      |          |             |                |              |             |       |
|                |                         |                       | -                            | ordinated approach that is initiated as a result of an     |  |                      |            |                      |          |             |                |              |             |       |
|                |                         |                       | elevated fire danger.        | :  |  |                      |            |                      |          |             |                |              |             |       |
| Cause          |                         | Spontaneous co        | ombustion of coal            |  |  | Code                 | Status     |                      |          | Likelihood  |                | Contribution |             |       |
|                |                         |                       |                              |  |  | RR-CA-00619          | Active     |                      | Current  | Likely (4)  |                | 0.0%         |             |       |
|                |                         |                       |                              |  |  |                      |            |                      | Proposed | Likely (4)  |                | 0.0%         |             |       |

this reaction is trapped, such as in a stockpile, the temperature of the material will begin to rise and if unchecked may ultimately ignite; i.e. spontaneously

The reactivity of the materials varies considerably; coal is a more reactive material than materials that contain no carbon, e.g. sandstone, rocks and soil and clay, are inert. In general, the reactivity of a material depends on its carbon content. Large amounts of reactive carbonaceous materials in stockpile increases the risk of spontaneous combustion.

Hot Spot:

- Deterioration of batter integrity
- Cavity formation
- Introduction of water to batter
- Undermining of batters and berms
- Localised generally single batter scale

Historically, there has been one known issue in 30 years, related to spontaneous combustion. This is isolated to one location on the Southern Batters. This is actively managed by Infrastructure Civil and Environment (ICE) group.

The likelihood of this event is considered to be LIKELY.

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AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00073



|         |  |  |  |  | Active Risk   |                           |                      |                                |                              |                               |                        |             |          |
|---------|--|--|--|--|---|---------------------------|----------------------|--------------------------------|------------------------------|-------------------------------|------------------------|-------------|----------|
| R       | Risk Control   | Code   | Tag ID   | Description  |   | Owner                     | Status               | Applicability Factor           | Criticality                  | Type/Factor                   | Reviewed               | Asses       | sment    |
|         |  | RR-COP-02553   | BC-00166   | Daily Mine Inspections   |   | No Owner Defined          | In Service           | 0.0%                           | Non-Critical Control         | Administrative                | 1-Sep-2015             | Ave         | rage     |
|         | Base Control   | Shift nersonnel are  | required to undertake wo   | rk place inspection which includes looking for obv   | vious around related issues i.e. around move  | nent and hotsnots         |                      |                                |                              |                               |                        |             |          |
|         | Comments   |  |  |  | vious ground related issues, i.e. ground move   | ment and notapota.        |                      |                                |                              |                               |                        |             |          |
|         |  | - Implemented: Par   | assessed via the followin  | g:   |   |                           |                      |                                |                              |                               |                        |             |          |
|         |  | - Type: Administrati   |  |  |   |                           |                      |                                |                              |                               |                        |             |          |
|         |  | - Reliability: Fair  |  |  |   |                           |                      |                                |                              |                               |                        |             |          |
|         |  | - Monitoring/Auditin   | ig: Ad-hoc   |  |   |                           |                      |                                |                              |                               |                        |             |          |
|         | B: 1.0   |  | e, the effectiveness is ass  |  |   |                           |                      |                                |                              |                               |                        |             |          |
|         | Context  | Daily mine inspection  | ons by shift management  | personnel  |   |                           |                      |                                |                              |                               |                        |             |          |
|         | Risk Control   |  |  | the mine is evidenced by steam or smoke emana  |   |                           |                      |                                |                              |                               |                        |             |          |
|         | Comments   |  | onnel look at general risk o<br>racks within in-situ coal et   | conditions within the mine, including hot spot ever  | nts. Hot spot conditions may present similar t  | a fire event, as          |                      |                                |                              |                               |                        |             |          |
|         |  | steam rising nom o   | racks within in-situ coal et   | <b>6.</b>  |   |                           |                      |                                |                              |                               |                        |             |          |
|         |  |  | assessed via the following   |  |   |                           |                      |                                |                              |                               |                        |             |          |
|         |  | <ul> <li>Independence: Lo</li> <li>Applicable: Mod-F</li> </ul>  | ow (Considered in cause li<br>High   | kelihood)  |   |                           |                      |                                |                              |                               |                        |             |          |
|         |  |  |  | ned to this control as it has been included in the li  | likelihaad assassment   |                           |                      |                                |                              |                               |                        |             |          |
| Actions |  | Code   | Objective  | ieu to una control da it has been included in the ii   | Work to be Done   |                           |                      |                                | Priority                     | Implementer                   | Status                 | Complete By | Tracking |
|         |  | RR-A-00046   |  | of conducting daily mine inspections which   |   |                           |                      |                                | Normal                       |                               | Pending                |             | N/A      |
|         |  |  |  |  |   |                           |                      |                                |                              |                               |                        |             |          |
|         |  |  |  | vious ground related issues, i.e. ground moveme  | ent   |                           |                      |                                |                              |                               |                        |             |          |
| R       | Risk Control   | Code   | and hotspots.  Tag ID  | vious ground related issues, i.e. ground moveme  | ent   | Owner                     | Status               | Applicability Factor           | Criticality                  | Type/Factor                   | Reviewed               | Asses       | ssment   |
| F       |  | RR-COP-02554   | and hotspots.  Tag ID  BC-00216  | Description CPW001M Ground Control Management  | Plan  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>100.0% | Criticality Critical Control | Type/Factor<br>Administrative | Reviewed<br>1-Sep-2015 |             | ssment   |
| F       |  | RR-COP-02554  GCMP - rainfall and Stability analysis ar  | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regional  | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Convernent modelling (predictions).  | Plan  |                           |                      |                                |                              |                               |                        |             |          |
| F       | Base Control   | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes   | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regional d batter design, ground n assessed via the following.  | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Convernent modelling (predictions).  | Plan  |                           |                      |                                |                              |                               |                        |             |          |
| F       | Base Control   | RR-COP-02554  GCMP - rainfall and Stability analysis ar  The base control is - Implemented: Yes - Type: Administrati   | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regional d batter design, ground n assessed via the following.  | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Convernent modelling (predictions).  | Plan  |                           |                      |                                |                              |                               |                        |             |          |
| F       | Base Control   | RR-COP-02554  GCMP - rainfall and Stability analysis ar  The base control is - Implemented: Yes - Type: Administrati - Reliability: Good   | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regional d batter design, ground n assessed via the following.  | Description CPW001M Ground Control Management ( I subsidence model for prediction - LV Regional Convernent modelling (predictions).  | Plan  |                           |                      |                                |                              |                               |                        |             |          |
| F       | Base Control   | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes - Type: Administrati - Reliability: Good - Monitoring/Auditin   | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regiona and batter design, ground in assessed via the followin sive gg. Monitored and audited   | Description CPW001M Ground Control Management ( I subsidence model for prediction - LV Regional Convernent modelling (predictions).  | Plan  |                           |                      |                                |                              |                               |                        |             |          |
| F       | Base Control<br>Comments                                 | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes - Type: Administratil - Reliability: Good - Monitoring/Auditin Based on the above   | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regiona and batter design, ground in assessed via the followin sive gg. Monitored and audited   | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Converment modelling (predictions).  g:  control is assessed to be GOOD.   | Plan  |                           |                      |                                |                              |                               |                        |             |          |
| F       | Base Control Comments  Risk Control Context Risk Control | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes - Type: Administrati - Reliability: Good - Monitoring/Auditin Based on the abow Fortnightly geotech   | and hotspots.  Tag ID BC-00216  d pin monitoring. Regional datter design, ground in assessed via the following: Monitored and audited e, the effectiveness of the nical engineering inspections.   | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Converment modelling (predictions).  g:  control is assessed to be GOOD.   | Plan<br>Groundwater Group.  |                           |                      |                                |                              |                               |                        |             |          |
| F       | Base Control<br>Comments  Risk Control<br>Context        | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is Implemented: Yes - Type: Administrati - Reliability: Good - Monitoring/Auditin Based on the abow Fortnightly geotech   | and hotspots.  Tag ID BC-00216  d pin monitoring. Regional datter design, ground in assessed via the following: Monitored and audited e, the effectiveness of the nical engineering inspectivitions including steam and audited ditions including stea | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Convernment modelling (predictions).  g:  control is assessed to be GOOD.  on and TARPS  | Plan  Groundwater Group.  e spontaneous combustion conditions.  | No Owner Defined          |                      |                                |                              |                               |                        |             |          |
| F       | Base Control Comments  Risk Control Context Risk Control | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes - Type: Administrati - Reliability: Good - Monitoring/Auditin Based on the abow Fortnightly geotech Observing field con Inspection may incl   | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regional datter design, ground in assessed via the following: We gr. Monitored and audited et, the effectiveness of the nical engineering inspection ditions including steam and ude temperature monitorionical engineerature monitorionical engineering inspections.   | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Convernent modelling (predictions).  g:  control is assessed to be GOOD. on and TARPS ising from cracks/coal surfaces that may indicate  | Plan  Groundwater Group.  e spontaneous combustion conditions.  ase. Suppression and sealing techniques under | No Owner Defined          |                      |                                |                              |                               |                        |             |          |
| F       | Base Control Comments  Risk Control Context Risk Control | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes - Type: Administrati - Reliability: Good - Monitoring/Auditin Based on the abow Fortnightly geotech Observing field con Inspection may incl Southern batters ex The risk control is a   | and hotspots.  Tag ID BC-00216  d pin monitoring. Regional department of the properties of the following sees and batter design, ground not assessed via the following. Monitored and audited e, the effectiveness of the nical engineering inspective ditions including steam and the temperature monitoric cavated and sealed. Exclusivessessed via the following sees and the following steam and t | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Conversement modelling (predictions).  g:  control is assessed to be GOOD. on and TARPS  ising from cracks/coal surfaces that may indicate ng. Monitoring of cracks and recording via databa usion of air will limit combustion but some heat by           | Plan  Groundwater Group.  e spontaneous combustion conditions.  ase. Suppression and sealing techniques under | No Owner Defined          |                      |                                |                              |                               |                        |             |          |
| F       | Base Control Comments  Risk Control Context Risk Control | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes - Type: Administrati - Reliability: Good - Monitoring/Auditin Based on the abow Fortnightly geotech Observing field con Inspection may incl Southern batters ex   | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regional datter design, ground in assessed via the following with the following of the mical engineering inspection ditions including steam are ude temperature monitoric cavarated and sealed. Exclusivessed via the following gh  | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Conversement modelling (predictions).  g:  control is assessed to be GOOD. on and TARPS  ising from cracks/coal surfaces that may indicate ng. Monitoring of cracks and recording via databa usion of air will limit combustion but some heat by           | Plan  Groundwater Group.  e spontaneous combustion conditions.  ase. Suppression and sealing techniques under | No Owner Defined          |                      |                                |                              |                               |                        |             |          |
| F       | Base Control Comments  Risk Control Context Risk Control | RR-COP-02554  GCMP - rainfall and Stability analysis ar The base control is - Implemented: Yes - Type: Administrati - Reliability: Good - Monitoring/Auditin Based on the above Fortnightly geotech Observing field con Inspection may incl Southern batters ex The risk control is a - Independence: Hi - Applicable: Mod-H | and hotspots.  Tag ID  BC-00216  d pin monitoring. Regional datter design, ground in assessed via the following with the following of the mical engineering inspection ditions including steam are ude temperature monitoric cavarated and sealed. Exclusivessed via the following gh  | Description CPW001M Ground Control Management I I subsidence model for prediction - LV Regional Convernent modelling (predictions).  g:  control is assessed to be GOOD.  on and TARPS  ising from cracks/coal surfaces that may indicate ing. Monitoring of cracks and recording via databatusion of air will limit combustion but some heat but factors: | Plan  Groundwater Group.  e spontaneous combustion conditions.  ase. Suppression and sealing techniques under | No Owner Defined          |                      |                                |                              |                               |                        |             |          |

undertaken by the site-based emergency services and operations team into a single and coordinated approach that is initiated as a result of an

elevated fire danger.

| LOY YANG             |                  |   |                             |  |  |                   |            |                      |                  |                | 21         | AGL         |          |
|----------------------|------------------|---|-----------------------------|--|--|-------------------|------------|----------------------|------------------|----------------|------------|-------------|----------|
| MINE RISK ASSESSMENT |                  |   |                             |  | Active Risk S  | Scenarios ID: RR- | R-00073    |                      |                  |                |            | AGL         | -        |
| -                    | F                | RR-A-00005                              |                             | and movement data and consider changing the            |  |                   |            |                      | Normal           |                | Pending    |             | N/A      |
|                      |                  |   | density and frequen         | cy of pin line / movement surveys.                     |  |                   |            |                      |                  |                |            |             |          |
| Risk C               | Control C        | Code                                    | Tag ID                      | Description  |  | Owner             | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assess      | sment    |
|                      | F                | RR-COP-02557                            | BC-00435                    | PCY000022 Fire Risk Management Plan                    |  | No Owner Defined  | In Service | 31.0%                | Critical Control | Administrative | 1-Sep-2015 | God         | od       |
|                      | Control Tomments | The Fire Risk Mana                      | gement Plan (draft) is      | an overarching document that brings all facets of fire | risk for the mine together.                          |                   |            |                      |                  |                |            |             |          |
|                      | Т                | The base control is                     | assessed via the follow     | wing:  |  |                   |            |                      |                  |                |            |             |          |
|                      |                  | Implemented: Yes                        |                             |  |  |                   |            |                      |                  |                |            |             |          |
|                      |                  | Type: Administrati<br>Reliability: Good | ve                          |  |  |                   |            |                      |                  |                |            |             |          |
|                      |                  | •                                       | g: Performance monito       | oring  |  |                   |            |                      |                  |                |            |             |          |
|                      | -                |   |                             | the control is assessed to be GOOD.                    |  |                   |            |                      |                  |                |            |             |          |
|                      |                  |   | ,                           |  |  |                   |            |                      |                  |                |            |             |          |
|                      | Control C        | Operating practice t                    | o excavate and remov        | e and/or apply water on identified hot spot            |  |                   |            |                      |                  |                |            |             |          |
| Risk                 | Control T        | The removal of an i                     | dentified hot spot from     | additional fuel sources reduces the escalation of a fi | ire. Also, includes application of water to the affe | cted area may     |            |                      |                  |                |            |             |          |
| Col                  | mments re        | esult in limiting the                   | growth of the fire pote     | ntial or suppression.                                  |  |                   |            |                      |                  |                |            |             |          |
|                      | Т                | The risk control is a                   | ssessed via the followi     | ing factors:   |  |                   |            |                      |                  |                |            |             |          |
|                      | -                | Independence: Mo                        | od (part of the clay cap    | ping/grouting of identified cracks control).           |  |                   |            |                      |                  |                |            |             |          |
|                      | -                | Applicable: Mod-H                       | ligh                        |  |  |                   |            |                      |                  |                |            |             |          |
|                      | В                | Based on the above                      | e, partial applicability is | assigned as this control is part of the clay capping/g | grouting of identified cracks control.               |                   |            |                      |                  |                |            |             |          |
| Actions              | C                | Code                                    | Objective                   |  | Work to be Done                                      |                   |            |                      | Priority         | Implementer    | Status     | Complete By | Tracking |
|                      | F                | RR-A-00033                              | Update the Fire Ris         | k Management Plan to incorporate activities            |  |                   |            |                      | Normal           |                | Pending    |             | N/A      |
|                      |                  |   |                             |  |  |                   |            |                      |                  |                |            |             |          |



| ISK ASSESSMENT           | Active Risk Scenarios ID: RR-R-00073                             |                               |   |  |                      |                     |                   |                               |                        |             |         |  |
|--------------------------|--|-------------------------------|---|--|----------------------|---------------------|-------------------|-------------------------------|------------------------|-------------|---------|--|
| Risk Control             | Code<br>RR-COP-02803   | Tag ID<br>BC-00435            | Description PCY000022 Fire Risk Management Plan   | Owner<br>No Owner Defined                            | Status<br>In Service | Applicability 31.0% | •                 | Type/Factor<br>Administrative | Reviewed<br>1-Sep-2015 | Asses<br>Go |         |  |
| Base Control<br>Comments | The Fire Risk Mana   | agement Plan (draft) is a     | in overarching document that brings all facets of fire risk for the mine  | together.  |                      |                     |                   |                               |                        |             |         |  |
|                          |  | assessed via the follow       | ing:  |  |                      |                     |                   |                               |                        |             |         |  |
|                          | - Implemented: Yes   |                               |   |  |                      |                     |                   |                               |                        |             |         |  |
|                          | <ul> <li>Type: Administrat</li> <li>Reliability: Good</li> </ul> | ive                           |   |  |                      |                     |                   |                               |                        |             |         |  |
|                          | •  | ng: Performance monitor       | ring  |  |                      |                     |                   |                               |                        |             |         |  |
|                          | Based on the abov  | e, the effectiveness of th    | ne control is assessed to be GOOD.  |  |                      |                     |                   |                               |                        |             |         |  |
| Risk Control<br>Context  | Clay capping/grout   | ing of identified cracks      |   |  |                      |                     |                   |                               |                        |             |         |  |
| Risk Control<br>Comments | Capping of hot spo   | t to prevent air / water in   | ngress  |  |                      |                     |                   |                               |                        |             |         |  |
|                          |  | -                             | s and associated cracks can assist in preventing air ingress into an in<br>over to spontaneous combustion.  | n-situ hot spot. The reduction of air can ultimately |                      |                     |                   |                               |                        |             |         |  |
|                          |  |                               | the fire behaving in a similar way to clay capping; where air supply to<br>titlised, a risk assessment is required prior to application).             | the hot spot is reduced (note that there is many     |                      |                     |                   |                               |                        |             |         |  |
|                          | The risk control is a  | assessed via the following    | ng factors:   |  |                      |                     |                   |                               |                        |             |         |  |
|                          | - Independence: M<br>- Applicable: Mod-h                         |                               | practice to excavate and remove and/or apply water on identified hol  | t spot control)                                      |                      |                     |                   |                               |                        |             |         |  |
|                          | Based on the abov control.                                       | e, partial applicability is a | assigned as this is part of the operating practice to excavate and rem  | nove and/or apply water on identified hot spot       |                      |                     |                   |                               |                        |             |         |  |
| Actions                  | Code   | Objective                     | Work to b   | pe Done  |                      |                     | Priority          | Implementer                   | Status                 | Complete By | Trackin |  |
|                          | RR-A-00033   | undertaken by the sit         | Management Plan to incorporate activities<br>te-based emergency services and operations team<br>rdinated approach that is initiated as a result of an |  |                      |                     | Nomal             |                               | Pending                |             | N/A     |  |
| Intermediate Event       | Code   | Description                   |   |  | Status               |                     | Incoming Outgoing |                               |                        | Proba       | ability |  |
|                          | RR-IE-03215  | Probability of initial fi     | re escalating   |  | Active               | Current             | Rare (1) Rare (1) |                               |                        |             | 1%      |  |
|                          |  |                               |   |  |                      | Proposed            | Rare (1) Rare (1) |                               |                        | 0.          | 1%      |  |

Comments The likelihood of this event and the initial emergency response activities (which includes mandatory CFA attendance) being unsuccessful and resulting in an escalation to a significant mine fire is considered to be UNLIKELY. Therefore, probability is assessed as 0.1%.

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AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00073



| Risk Control Risk Risk Rinangement Plan Risk Risk Ranagement Plan Ris | Reviewed Assessme<br>14-Oct-2015 Good |
|--|---------------------------------------|
| Base Control Comments  The Fire Risk Management Plan (draft) is an overarching document that brings all facets of fire risk for the mine together.  The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  Risk Control Context  Risk Control Context  Risk Control Context  Risk Control Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and Comments  Includes fire instructions that initiates the required emergency response can be provided by both operations and site-based emergency staff.  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High  | 14-Oct-2015 Good                      |
| The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  Risk Control Context  Risk Control Comments  Risk Control Comments  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High   |                                       |
| The base control is assessed via the following:  - Implemented: Yes  - Type: Administrative  - Reliability: Good  - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  Risk Control  Context  Risk Control  Comments  Risk Control  Comments  Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and regular drills are undertaken to ensure adequate level of response can be provided by both operations and site-based emergency staff.  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors:  - Independence: High  |                                       |
| Implemented: Yes - Type: Administrative - Reliability: Cood - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  Risk Control Context  Risk Control Comments  Risk Control Comments  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High   |                                       |
| - Reliability: Good - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  Risk Control Context  Risk Control Comments  Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and regular drills are undertaken to ensure adequate level of response can be provided by both operations and site-based emergency staff.  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High   |                                       |
| - Monitoring/Auditing: Performance monitoring  Based on the above, the effectiveness of the control is assessed to be GOOD.  Risk Control Context  Risk Control Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and regular drills are undertaken to ensure adequate level of response can be provided by both operations and site-based emergency staff.  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High   |                                       |
| Based on the above, the effectiveness of the control is assessed to be GOOD.  Risk Control Context  Risk Control Comments  Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and regular drills are undertaken to ensure adequate level of response can be provided by both operations and site-based emergency staff.  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: Independence: High  |                                       |
| Risk Control Context  Risk Control Comments  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: Independence: High   |                                       |
| Risk Control Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and regular drills are undertaken to ensure adequate level of response can be provided by both operations and site-based emergency staff.  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: Independence: High  |                                       |
| Comments regular drills are undertaken to ensure adequate level of response can be provided by both operations and site-based emergency staff.  In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High  |                                       |
| In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High  |                                       |
| stand-by during high fire risk periods.  The risk control is assessed via the following factors: - Independence: High  |                                       |
| The risk control is assessed via the following factors: - Independence: High   |                                       |
| - Independence: High   |                                       |
| - Independence: High   |                                       |
| - Applicable: High   |                                       |
|  |                                       |
| Based on the above, full applicability is assigned.  |                                       |
| Actions Code Objective Work to be Done Priority Implementer  | Status Complete By                    |
| RR-A-00033 Update the Fire Risk Management Plan to incorporate activities Normal undertaken by the site-based emergency services and operations team into a single and coordinated approach that is initiated as a result of an  | Pending                               |
| elevated fire danger.  |                                       |
| Cause Transmission tower and distribution lines operated by third party failure resulting in fire Code Status Likelihood Co  | Contribution                          |
| RR-CA-00620 Active Current Unlikely (2)  | 0.0%                                  |
| Proposed Unlikely (2)  | 0.0%                                  |
| Comments Fire may result from damage to overhead line.   |                                       |
| Potential pathways include:  |                                       |
| - poles/wires/transformers failure   |                                       |
| - switchgear failure   |                                       |
| Historically, failure of these items have resulted in fires which have escalated to bush fires. However, within the Mine Lease and surrounding area, this has not been an issue of concern. Therefore, the likelihood is considered to be UNLIKELY.  |                                       |
| Intermediate Event Code Description Status Incoming Outgoing   | Probabilit                            |
| RR-IE-03216 Probability of initial fire escalating Active Current Rare (1) Rare (1)  | 0.1%                                  |
| Proposed Rare (1) Rare (1)   | 0.1%                                  |
| Comments The likelihood of this event and the initial emergency response activities (which includes mandatory CFA attendance) being unsuccessful and resulting in an escalation to a significant mine fire is considered to be UNLIKELY. Therefore, probability is assessed as 0.1%.   |                                       |

Active Rick Scenarios ID: PR-P-00073



| Ва      | ase Control<br>Comments | RR-COP-03217 This plan manages breaks.  | assessed via the follow     | Description Environmental site plan - vegetation manage ine and surrounding areas, including reduced fuel loads  |  | Owner<br>No Owner Defined<br>and mineral earth | Status<br>In Service | Applicability Factor 0.0% | Criticality<br>Critical Control | Type/Factor<br>Administrative | Reviewed<br>1-Sep-2015 | Assessment<br>Good   |
|---------|-------------------------|---|-----------------------------|--|--|--|----------------------|---------------------------|---------------------------------|-------------------------------|------------------------|----------------------|
| Ba<br>( | ase Control<br>Comments | This plan manages<br>breaks.<br>The base control is<br>- Implemented: Yes<br>- Type: Administrati | the fire risks on the mi    | ine and surrounding areas, including reduced fuel load:  |  |  | In Service           | 0.0%                      | Critical Control                | Administrative                | 1-Sep-2015             | Good                 |
| Ba<br>( | Comments                | breaks.  The base control is - Implemented: Yes - Type: Administrati                              | assessed via the follow     |  | s (grazing/spraying/slashing), fire breaks a   | and mineral earth                              |                      |                           |                                 |                               |                        |                      |
|         |                         | - Implemented: Yes<br>- Type: Administrati  |                             |  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Implemented: Yes<br>- Type: Administrati  |                             | wing:  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | ,,  | ,                           | 3  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Reliability: Good   | ive                         |  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         |   | g: Monitored and audit      | ted  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | •   |                             |  |  |  |                      |                           |                                 |                               |                        |                      |
| D:      |                         |   | e, the effectiveness is a   | assessed as GOOD.<br>Il load to reduce the intensity of the fire within the mine   |  |  |                      |                           |                                 |                               |                        |                      |
| Ki      | Context                 | iviariagement or vet  | getation to manage rue      | n load to reduce the intensity of the life within the mine   |  |  |                      |                           |                                 |                               |                        |                      |
| Ri      |                         |   |                             | intensity and reduces the likelihood of fire embers gen  | erated which could potentially affect the m    | nine or exposed coal                           |                      |                           |                                 |                               |                        |                      |
| (       | Comments                | area. This control is   | s not applicable to the     | exposed coal area.   |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | The risk control is a   | assessed via the follow     | ing factors:   |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Independence: Lo  |                             | W. 511   |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Applicable: Moder   | rate (only works for 75%    | % of the mine area)  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         |   | e, no applicability is as   | signed to this control as it has been included in the like   | lihood assessment.                             |  |                      |                           |                                 |                               |                        |                      |
| Risk    | k Control               |   | Tag ID                      | Description  |  | Owner  | Status               | Applicability Factor      | Criticality                     | Type/Factor                   | Reviewed               | Assessment           |
|         |                         | RR-COP-03218  | BC-00435                    | PCY000022 Fire Risk Management Plan  |  | No Owner Defined                               | In Service           | 100.0%                    | Critical Control                | Administrative                | 14-Oct-2015            | Good                 |
| Ba<br>( | Comments                |   | agement Plan (draft) is     | an overarching document that brings all facets of fire r   | sk for the mine together.                      |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Implemented: Yes  |                             |  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Type: Administrati  | ive                         |  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditin</li> </ul>                                 | g: Performance monito       | oring  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | •   |                             | •  |  |  |                      |                           |                                 |                               |                        |                      |
| D:      |                         |   |                             | the control is assessed to be GOOD.  Determined Response   |  |  |                      |                           |                                 |                               |                        |                      |
| N       | Context                 | Lineigency Respoi   | ise Flocedules - Last I     | Determined Nesponse  |  |  |                      |                           |                                 |                               |                        |                      |
| Ri      |                         |   |                             | required emergency response to the incident which rec<br>equate level of response can be provided by both oper   |  | connel are trained and                         |                      |                           |                                 |                               |                        |                      |
|         |                         | In addition to opera<br>stand-by during hig   |                             | ninimum of 3 site-based emergency staff ready to mob   | lise. Additional personnel and firefighting of | equipment are on                               |                      |                           |                                 |                               |                        |                      |
|         |                         | The risk control is a   | assessed via the follow     | ing factors:   |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Independence: Hi  | gh                          |  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | - Applicable: High  |                             |  |  |  |                      |                           |                                 |                               |                        |                      |
|         |                         | Based on the above  | e, full applicability is as | ssigned.   |  |  |                      |                           |                                 |                               |                        |                      |
| Actions |                         | Code  | Objective                   |  | Work to be Done                                |  |                      |                           | Priority                        | Implementer                   | Status                 | Complete By Tracking |
|         |                         | RR-A-00033  | undertaken by the s         | ik Management Plan to incorporate activities<br>site-based emergency services and operations team<br>prodinated approach that is initiated as a result of an |  |  |                      |                           | Normal                          |                               | Pending                | N/A                  |



| AGE MINE KISK ASSESS | DIVIEINI                 |                               |                              | ACTIVE KISK SC   | elialios ID. KK-I | X-00073    |                      |                      |                |              |             |          |
|----------------------|--------------------------|-------------------------------|------------------------------|--|-------------------|------------|----------------------|----------------------|----------------|--------------|-------------|----------|
|                      | Risk Control             | Code                          | Tag ID                       | Description  | Owner             | Status     | Applicability Factor | Criticality          |                | Reviewed     | Assess      | sment    |
|                      |                          | RR-COP-03219                  |                              | Implement oversight to ensure that SPI Ausnet manages their assets in accordance with legislation.       | No Owner Defined  | Proposed   | 100.0%               | Non-Critical Control |                | 16-Oct-2015  | Asse        | ssed     |
|                      | Risk Control<br>Context  | Implement oversigi            | at to ensure that SPI Ausnet | t manages their assets in accordance with legislation.   |                   |            |                      |                      |                |              |             |          |
|                      | Risk Control<br>Comments | The implementation assigned.  | n of this recommendation w   | Ill provide ongoing assurance that third party contractors meet their obligation. Therefore, no risk re- | duction is        |            |                      |                      |                |              |             |          |
| Actions              |                          | Code                          | Objective                    | Work to be Done  |                   |            |                      | Priority             | Implementer    | Status       | Complete By | Tracking |
|                      |                          | RR-A-00055                    |                              | ensure that SPI Ausnet manages their assets distribution lines) in accordance with legislation.          |                   |            |                      | Normal               |                | Pending      |             | N/A      |
| Cause                |                          | Uncontrolled ig               | nition sources from far      | ming related activities (third party - local lessees)  | Code              | Status     |                      | Likelihood           |                | Contribution |             |          |
|                      |                          |                               |                              |  | RR-CA-00625       | Active     |                      | Current Possible (   | )              | 0.0%         |             |          |
|                      |                          |                               |                              |  |                   |            |                      | Proposed Possible (3 | )              | 0.0%         |             |          |
|                      | Comments                 | Potential pathways            | include:                     |  |                   |            |                      |                      |                |              |             |          |
|                      |                          | - Failure of equipm           | ent                          |  |                   |            |                      |                      |                |              |             |          |
|                      |                          | - burnoffs<br>- grass cutting |                              |  |                   |            |                      |                      |                |              |             |          |
|                      |                          | - grass cutting               |                              |  |                   |            |                      |                      |                |              |             |          |
|                      |                          | The likelihood of th          | s event is considered to be  | POSSIBLE.  |                   |            |                      |                      |                |              |             |          |
|                      | Risk Control             | Code                          | Tag ID                       | Description  | Owner             | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed     | Assess      | sment    |
|                      |                          | RR-COP-02782                  | BC-00482                     | Third party contractual agreement (lessees)  | No Owner Defined  | In Service | 100.0%               | Critical Control     | Administrative | 8-Oct-2015   | Go          | od       |

Base Control Lease agreement specifies that lessees must comply with the CFA Act. This includes: Comments - supply of fire suppression equipment

- maintenance of lessee equipment

- the observation of fire restrictions on total fire ban days

- fuel reduction requirements

AGL undertakes audits on lessees compliant with the above requirements.

The base control is assessed via the following:

- Implemented: Yes

- Type: Administrative

- Reliability: Good

- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Third party contractual agreement (lessees)

Context

Risk Control The risk control is assessed via the following factors:

Comments - Independence: High

- Applicable: Mod-High

Based on the above, full applicability is assigned.



|                                     |  |  |  |                                  | enarios ID: KK-I          |                      |                          |          |                                 |                               | 1                      |                         |
|-------------------------------------|--|--|--|----------------------------------|---------------------------|----------------------|--------------------------|----------|---------------------------------|-------------------------------|------------------------|-------------------------|
| Risk Control                        | Code   | Tag ID   | Description  |                                  | Owner                     | Status               | Applicability Fa         | ictor C  | riticality                      | Type/Factor                   | Reviewed               | Assessn                 |
|                                     | RR-COP-03208   | BC-00109   | Site Security Fencing and Surveillance Systems   |                                  | No Owner Defined          | In Service           | 0.0%                     | Criti    | cal Control                     | Engineering                   | 1-Sep-2015             | Good                    |
| Base Control<br>Comments            | Cameras are strate   | egically installed along the   | site and monitored. On the observation of suspicious activi  | ities, AGL responds accordingly. |                           |                      |                          |          |                                 |                               |                        |                         |
| Comments                            | The base control is  | assessed via the following   |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | - Implemented: Ye  | -  | •  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | - Type: Administra   | tive/Engineering   |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | <ul> <li>Reliability: Good</li> <li>Monitoring/Auditi</li> </ul>   | ng: Performance monitoring   |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | •  |  |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Diek Control                        |  |  | control is assessed to be GOOD.  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Context                             | Cameras strategic  | ally installed along the site  | boundary and site perimeter includes security fencing  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Risk Control<br>Comments            | Cameras and resp   | onse can identify approach   | ing fire within the surrounding landscape.   |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | Surveillance and d   | ouble fenced perimeter in s  | some areas assist in identifying approaching fire within the   | surrounding landscape.           |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     |  | assessed via the following   | factors:   |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | <ul> <li>Independence: H</li> <li>Applicable: Low (</li> </ul>   | -  | redominantly designed for surveillance related to provided   | controlled access)               |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     |  |  |  | ······                           |                           |                      |                          |          |                                 |                               |                        |                         |
| Diek Central                        |  | e, no applicability is assign  |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Risk Control                        | RR-COP-03209   | Tag ID<br>BC-00474   | Description Security Management Plan   |                                  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Fa<br>0.0% |          | riticality<br>cal Control       | Type/Factor<br>Administrative | Reviewed<br>1-Sep-2015 | Assessn                 |
|                                     | 141 001 00203  | 20 00414   | Security Management Flan   |                                  | No owner benned           | III GOI VICE         | 0.070                    | Olla     | our control                     | Administrative                | 1 00p 2010             | 9000                    |
| Base Control<br>Comments            | The security and n   | nanagement plan cover asp  | pects of deter, detect, respond and recover. It also includes  | s a business resilience plan.    |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | The base control is  | assessed via the following   | g:   |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | - Implemented: Ye  | 8  |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     |  |  |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | - Type: Administra   | tive   |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | - Type: Administra<br>- Reliability: Very C  | tive   | 3  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
|                                     | - Type: Administra<br>- Reliability: Very C<br>- Monitoring/Auditi   | ive<br>Good<br>ng: Performance monitoring  |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Risk Control<br>Context             | - Type: Administration - Reliability: Very Condition - Monitoring/Audition - Monitoring  | ive<br>Good<br>ng: Performance monitoring<br>e, the effectiveness is asse  |  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Context                             | Type: Administra     Reliability: Very C     Monitoring/Auditit  Based on the abov Site security under   | tive Good ng: Performance monitoring e, the effectiveness is asset take regular patrols of the r   | essed to be GOOD.  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Context<br>Risk Control             | - Type: Administra<br>- Reliability: Very C<br>- Monitoring/Auditii<br>Based on the abov<br>Site security under<br>Personnel underta<br>The risk control is  | ive Sood gg: Performance monitoring e, the effectiveness is asse take regular patrols of the r king patrols can detect a fir assessed via the following r  | essed to be GOOD.  mining lease and surrounding areas.  re, however can fire could develop in between patrols.           |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Context<br>Risk Control             | - Type: Administra<br>- Reliability: Very C<br>- Monitoring/Auditi<br>Based on the abov<br>Site security under<br>Personnel underta<br>The risk control is.  | ive Good ng: Performance monitoring e, the effectiveness is asse take regular patrols of the r king patrols can detect a fir assessed via the following to   | essed to be GOOD.  mining lease and surrounding areas.  re, however can fire could develop in between patrols.  factors: |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Context<br>Risk Control             | - Type: Administra<br>- Reliability: Very C<br>- Monitoring/Auditi<br>Based on the abov<br>Site security under<br>Personnel underta<br>The risk control is.  | ive Sood gg: Performance monitoring e, the effectiveness is asse take regular patrols of the r king patrols can detect a fir assessed via the following r  | essed to be GOOD.  mining lease and surrounding areas.  re, however can fire could develop in between patrols.  factors: |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Context<br>Risk Control<br>Comments | - Type: Administra<br>- Reliability: Very C<br>- Monitoring/Auditii<br>Based on the abov<br>Site security under<br>Personnel underta<br>The risk control is<br>- Independence: M<br>- Applicable: Low (<br>Based on the abov | ive Good ng: Performance monitoring e, the effectiveness is asse take regular patrols of the r king patrols can detect a fir assessed via the following to   | assed to be GOOD.  mining lease and surrounding areas.  e, however can fire could develop in between patrols.  factors:  |                                  |                           |                      |                          |          |                                 |                               |                        |                         |
| Context<br>Risk Control             | - Type: Administra - Reliability: Very C - Monitoring/Auditii Based on the abov Site security under Personnel underta The risk control is - Independence: M - Applicable: Low ( Based on the abov Code                       | ive Sood ag: Performance monitoring e, the effectiveness is asse take regular patrols of the r king patrols can detect a fir assessed via the following oderate infrequent to detect all fires e, no applicability is assign Description | assed to be GOOD.  mining lease and surrounding areas.  re, however can fire could develop in between patrols.  factors: |                                  |                           | Status               |                          |          | utgoing                         |                               |                        | Probabi                 |
| Context<br>Risk Control<br>Comments | - Type: Administra<br>- Reliability: Very C<br>- Monitoring/Auditii<br>Based on the abov<br>Site security under<br>Personnel underta<br>The risk control is<br>- Independence: M<br>- Applicable: Low (<br>Based on the abov | ive Good ag: Performance monitoring e, the effectiveness is asse take regular patrols of the r king patrols can detect a fir assessed via the following oderate infrequent to detect all fires e, no applicability is assign             | assed to be GOOD.  mining lease and surrounding areas.  re, however can fire could develop in between patrols.  factors: |                                  |                           | Status<br>Active     | Current                  | Rare (1) | utgoing<br>Rare (1)<br>Rare (1) |                               |                        | Probabi<br>0.1%<br>0.1% |



| AGL MINE RISK ASSESSMENT | Т                      |  |   |   | Active Risk Sce  | enarios ID: RR-F          | R-00073              |                                |                                 |                               |                         | AGL                  |
|--------------------------|------------------------|--|---|---|--|---------------------------|----------------------|--------------------------------|---------------------------------|-------------------------------|-------------------------|----------------------|
| Risk                     | Control                | Code<br>RR-COP-03227   | Tag ID<br>BC-00435  | Description PCY000022 Fire Risk Management Plan   |  | Owner<br>No Owner Defined | Status<br>In Service | Applicability Factor<br>100.0% | Criticality<br>Critical Control | Type/Factor<br>Administrative | Reviewed<br>14-Oct-2015 | Assessment<br>Good   |
| Bas<br>C                 | se Control             | The Fire Risk Mana   | agement Plan (draft) is an o                                    | verarching document that brings all facets of fire risk   | k for the mine together.                               |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | The base control is  | assessed via the following:                                     |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | - Implemented: Yes   |   |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | <ul> <li>Type: Administrat</li> <li>Reliability: Good</li> </ul> | ive   |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | •  | ng: Performance monitoring                                      |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | Based on the above   | e, the effectiveness of the c                                   | ontrol is assessed to be GOOD.  |  |                           |                      |                                |                                 |                               |                         |                      |
| Ris                      |                        |  | nse Procedures - Fast Dete                                      |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        |  | · ·   | red emergency response to the incident which reduct<br>te level of response can be provided by both operati | -  | e trained and             |                      |                                |                                 |                               |                         |                      |
|                          |                        | In addition to opera   |   | num of 3 site-based emergency staff ready to mobilis  | se. Additional personnel and firefighting equipmer     | at are on                 |                      |                                |                                 |                               |                         |                      |
|                          |                        | The rick central is s  | assessed via the following fa                                   | peters:   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | - Independence: Hi   |   | actors.   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | - Applicable: High   |   |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | Based on the above   | e, full applicability is assigne                                | ed.   |  |                           |                      |                                |                                 |                               |                         |                      |
| Actions                  |                        | Code   | Objective   |   | Work to be Done  |                           |                      |                                | Priority                        | Implementer                   | Status                  | Complete By Tracking |
|                          |                        | RR-A-00033   |   | nagement Plan to incorporate activities   |  |                           |                      |                                | Normal                          |                               | Pending                 | N/A                  |
|                          |                        |  | •   | ased emergency services and operations team<br>ated approach that is initiated as a result of an            |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        |  | elevated fire danger.   | ···   |  |                           |                      |                                |                                 |                               |                         |                      |
| Risk                     | Control                |  | Tag ID  | Description   |  | Owner                     | Status               | Applicability Factor           | Criticality                     | Type/Factor                   | Reviewed                | Assessment           |
|                          |                        | RR-COP-03254   | BC-00467  | Environmental site plan - vegetation managem  | nent   | No Owner Defined          | In Service           | 31.0%                          | Critical Control                | Administrative                | 1-Sep-2015              | Good                 |
| Bas<br>C                 | se Control<br>Comments | This plan manages<br>breaks.                                     | the fire risks on the mine a                                    | nd surrounding areas, including reduced fuel loads (  | (grazing/spraying/slashing), fire breaks and miner     | al earth                  |                      |                                |                                 |                               |                         |                      |
|                          |                        | The base control is  | assessed via the following:                                     |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | - Implemented: Yes   | 3   |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | <ul> <li>Type: Administrat</li> <li>Reliability: Good</li> </ul> | ive   |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        |  | ng: Monitored and audited                                       |   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | Based on the above   | e, the effectiveness is asses                                   | ssed as GOOD.   |  |                           |                      |                                |                                 |                               |                         |                      |
| Ris                      | sk Control<br>Context  | Management of ve   | getation to manage fuel load                                    | d to reduce the intensity of the fire within the mine   |  |                           |                      |                                |                                 |                               |                         |                      |
| Ris<br>C                 |                        |  | el load reduces fire intensity<br>trol is not applicable on the | and reduces the likelihood of additional embers from exposed coal area.                                     | om generated which could potentially affect the mi     | ne or exposed             |                      |                                |                                 |                               |                         |                      |
|                          |                        | Lessees and neigh  | bouring land holders are red                                    | quested to reduce fuel loads and inform AGL of susp   | picious activities/behaviours (this is part of the ind | uction).                  |                      |                                |                                 |                               |                         |                      |
|                          |                        |  | assessed via the following fa                                   | actors:   |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | - Independence: Moder<br>- Applicable: Moder                     | oderate<br>rate (only works for 75% of                          | the mine area)  |  |                           |                      |                                |                                 |                               |                         |                      |
|                          |                        | Based on the above   | e, partial applicability is assi                                | igned.  |  |                           |                      |                                |                                 |                               |                         |                      |



Cause Uncontrolled ignition source within the Mine Lease Area from members of the public Likelihood Status Contribution RR-CA-00626 Active Current Possible (3) 0.0% Proposed Possible (3) 0.0%

Comments Potential pathways include:

- cigarette butts
- vehicle (inc. trucks) along Bartons Lane
- members of the public accessing miner's lookout

The likelihood of this event is considered to be POSSIBLE.

Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COP-03220 BC-00199 31.0% No Owner Defined Critical Control Isolation 1-Sep-2015 External Buffers-Exclusion Zones In Service Good

Base Control Exclusion Zones 0110 code. The land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the Comments mining license.

The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. This include activities such as farming, slashing, ploughing, summer crops, stock (fuel) management by grazing, earthen breaks.

Exclusion Zones in force. Bushfire mitigation plans in place and submitted to Energy Safe Victoria. Exclusion zones around electrical infrastructure

The base control is assessed via the following:

- Implemented: Yes
- Type: Isolation
- Reliability: Good
- Monitoring/Auditing: None

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Buffer zone between coal mine and public access

Risk Control The planning zone ultimately results in reduced population; reduced human activity in this zone and allows for vegetation to be controlled that may result in a Comments reduced likelihood of fire.

The risk control is assessed via the following factors:

- Independence: Low (part of the Management of Vegetation to manage fuel loads)
- Applicable: High

Based on the above, partial applicability is assigned.



| AGL MINE RISK ASSESSMENT |   |                                 |   | Active Risk Scenarios ID: RR-I                | R-00073    |                      |                  |                |            | AGL        |
|--------------------------|---|---------------------------------|---|---|------------|----------------------|------------------|----------------|------------|------------|
| Risk Cor                 | trol Code   | Tag ID                          | Description   | Owner   | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |
|                          | RR-COP-03221  | BC-00467                        | Environmental site plan - vegetation management                           | No Owner Defined                              | In Service | 31.0%                | Critical Control | Administrative | 1-Sep-2015 | Good       |
| Base Co<br>Comm          | ntrol This plan manages<br>ents breaks.                         | s the fire risks on the mine a  | and surrounding areas, including reduced fuel loads (grazing/spraying/sk  | ashing), fire breaks and mineral earth        |            |                      |                  |                |            |            |
|                          |   | s assessed via the following    | i:  |   |            |                      |                  |                |            |            |
|                          | - Implemented: Ye   |                                 |   |   |            |                      |                  |                |            |            |
|                          | <ul> <li>Type: Administra</li> <li>Reliability: Good</li> </ul> |                                 |   |   |            |                      |                  |                |            |            |
|                          | •   | ng: Monitored and audited       |   |   |            |                      |                  |                |            |            |
| Risk Co                  |   | ve, the effectiveness is asse   | essed as GOOD.  ad to reduce the intensity of the fire within the mine    |   |            |                      |                  |                |            |            |
| Co                       |   | getation to manage ruerioa      | to reduce the intensity of the life within the milite                     |   |            |                      |                  |                |            |            |
| Risk Co                  | 1110 100000011 01 10  | el load reduces fire intensit   | ty and reduces the likelihood of additional embers generated which could  | d potentially affect the mine or exposed coal |            |                      |                  |                |            |            |
| Comm                     | ents area. This control i                                       | s not applicable on the exp     | osed coal area.   |   |            |                      |                  |                |            |            |
|                          | Lessees and neigh   | nbouring land holders are re    | equested to reduce fuel loads and inform AGL of suspicious activities/bel | haviours (this is part of the induction).     |            |                      |                  |                |            |            |
|                          | The risk control is   | assessed via the following      | factors:  |   |            |                      |                  |                |            |            |
|                          | - Independence: M   | loderate                        |   |   |            |                      |                  |                |            |            |
|                          | - Applicable: Mode  | erate (only works for 75% of    | the mine area)  |   |            |                      |                  |                |            |            |
|                          | Based on the abov   | e, partial applicability is as: | signed.   |   |            |                      |                  |                |            |            |
| Risk Cor                 | trol Code   | Tag ID                          | Description   | Owner   | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |
|                          | RR-COP-03222  | BC-00474                        | Security Management Plan  | No Owner Defined                              | In Service | 0.0%                 | Critical Control | Administrative | 1-Sep-2015 | Good       |

### Base Control The security and management plan cover aspects of deter, detect, respond and recover. It also includes a business resilience plan. Comments

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Very Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Site security undertake regular patrols of the mining lease and surrounding areas.

Comments

Risk Control Personnel undertaking patrols can detect a fire, however can fire could develop in between patrols.

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Low (infrequent to detect all fires).

Based on the above, no applicability is assigned.

Active Rick Scenarios ID: PR-P-00073



| AGL MINE RISK ASSESSMENT |   |   |   | Active Risk Scenarios ID: RR-          | R-00073    |                      |                  |                |             | AGL                  |
|--------------------------|---|---|---|--|------------|----------------------|------------------|----------------|-------------|----------------------|
| Risk Control             |   | Tag ID  | Description   | Owner                                  | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Assessment           |
|                          | RR-COP-03225  | BC-00109  | Site Security Fencing and Surveillance Systems  | No Owner Defined                       | In Service | 0.0%                 | Critical Control | Engineering    | 1-Sep-2015  | Good                 |
| Base Control<br>Comments |   | tegically installed along the                       | e site and monitored. On the observation of suspicious activities, AGL res  | ponds accordingly.                     |            |                      |                  |                |             |                      |
| Comments                 |   | s assessed via the followi                          | ina:  |  |            |                      |                  |                |             |                      |
|                          | - Implemented: Ye   |   | 9.  |  |            |                      |                  |                |             |                      |
|                          | - Type: Administra  |   |   |  |            |                      |                  |                |             |                      |
|                          | - Reliability: Good   | ing: Performance monitori                           | ing   |  |            |                      |                  |                |             |                      |
|                          |   | -   |   |  |            |                      |                  |                |             |                      |
| B: 1.0 ( )               |   |   | e control is assessed to be GOOD.   |  |            |                      |                  |                |             |                      |
| Risk Control<br>Context  | Cameras strategio   | cally installed along the sit                       | te boundary and site perimeter includes security fencing  |  |            |                      |                  |                |             |                      |
| Risk Control<br>Comments |   | oonse can identify approa                           | ching fire within the surrounding landscape.  |  |            |                      |                  |                |             |                      |
|                          | Surveillance and  | double fenced perimeter in                          | n some areas assist in identifying arson attack / approaching fire within the   | surrounding landscape.                 |            |                      |                  |                |             |                      |
|                          |   | assessed via the followin                           |   |  |            |                      |                  |                |             |                      |
|                          | - Independence: L<br>- Applicable: Mode                         | ow (not independent of the<br>erate                 | ne Site Security  |  |            |                      |                  |                |             |                      |
|                          | Based on the abo  | ve, no applicability is assi                        | gned.   |  |            |                      |                  |                |             |                      |
| Intermediate Event       | Code  | Description   |   |  | Status     | Incoming             | Outgoing         |                |             | Probability          |
|                          | RR-IE-03226   | Probability of initial fir                          | re escalating   |  | Active     | Current Rare (1)     | Rare (1)         |                |             | 0.1%                 |
|                          |   |   |   |  |            | Proposed Rare (1)    | Rare (1)         |                |             | 0.1%                 |
| Comments                 |   |   | mergency response activities (which includes mandatory CFA attendance)<br>dered to be UNLIKELY. Therefore, probability is assessed as 0.1%.         | being unsuccessful and resulting in an |            |                      |                  |                |             |                      |
| Risk Control             | Code  | Tag ID  | Description   | Owner                                  | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Assessment           |
|                          | RR-COP-03228  | BC-00435  | PCY000022 Fire Risk Management Plan   | No Owner Defined                       | In Service | 100.0%               | Critical Control | Administrative | 14-Oct-2015 | Good                 |
| Base Control             | The Fire Risk Mar   | nagement Plan (draft) is a                          | n overarching document that brings all facets of fire risk for the mine toget   | her.                                   |            |                      |                  |                |             |                      |
| Comments                 |   | s assessed via the followi                          |   |  |            |                      |                  |                |             |                      |
|                          | - Implemented: Ye   |   |   |  |            |                      |                  |                |             |                      |
|                          | - Type: Administra  |   |   |  |            |                      |                  |                |             |                      |
|                          | <ul> <li>Reliability: Good</li> <li>Monitoring/Audit</li> </ul> | ing: Performance monitori                           | ing   |  |            |                      |                  |                |             |                      |
|                          |   |   |   |  |            |                      |                  |                |             |                      |
| Pick Control             |   |   | ne control is assessed to be GOOD.  |  |            |                      |                  |                |             |                      |
| Context                  |   | onse Procedures - Fast De                           | eterminet Response  |  |            |                      |                  |                |             |                      |
| Risk Control<br>Comments |   |   | equired emergency response to the incident which reduces the risk of the equate level of response can be provided by both operations and site-based |  |            |                      |                  |                |             |                      |
|                          |   |   |   |  |            |                      |                  |                |             |                      |
|                          |   | ration staff, there are a miligh fire risk periods. | nimum of 3 site-based emergency staff ready to mobilise. Additional person  | nnel and firefighting equipment are on |            |                      |                  |                |             |                      |
|                          | The risk control is   | assessed via the following                          | ng factors:   |  |            |                      |                  |                |             |                      |
|                          | <ul> <li>Independence: H</li> <li>Applicable: High</li> </ul>   | -   |   |  |            |                      |                  |                |             |                      |
|                          | Based on the abo  | ve, full applicability is assi                      | igned.  |  |            |                      |                  |                |             |                      |
| Actions                  | Code  | Objective   | Work to be Do   | ne                                     |            |                      | Priority         | Implementer    | Status      | Complete By Tracking |
|                          |   |   |   |  |            |                      |                  |                |             |                      |



RR-A-00033 Normal Update the Fire Risk Management Plan to incorporate activities undertaken by the site-based emergency services and operations team into a single and coordinated approach that is initiated as a result of an elevated fire danger. Cause Criminal intent to initiate an arson attack Code Status Likelihood Contribution RR-CA-00685 Active Current Likely (4) 23.7% Proposed Likely (4) 23.7% Comments There is sufficient propensity for an arson incident to occur within the La Trobe Valley. It is well known that there are approximately 200 person of interest that may choose to do harm to AGL Loy Yang. Therefore, the likelihood of this event is considered to be LIKELY. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment BC-00467 RR-COP-03122 No Owner Defined 31.0% Administrative Environmental site plan - vegetation management In Service Critical Control 1-Sep-2015 Good

Comments breaks.

Base Control This plan manages the fire risks on the mine and surrounding areas, including reduced fuel loads (grazing/spraying/slashing), fire breaks and mineral earth

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Monitored and audited

Based on the above, the effectiveness is assessed as GOOD.

Risk Control Management of vegetation to manage fuel load to reduce the intensity of the fire within the mine Context

Risk Control The reduction of fuel load reduces the fire intensity and reduces the likelihood of additional embers from generated which could potentially affect the mine or exposed coal area. This control is not applicable to the exposed coal area.

Lessees and neighbouring land holders are requested to reduce fuel loads and inform AGL of suspicious activities/behaviours (this is part of the induction).

The risk control is assessed via the following factors:

- Independence: Low (part of the buffer zone between coal mine and public access control)
- Applicable: Moderate (only works for 75% of the mine area)

Based on the above, partial applicability is assigned.

AGL MINE RISK ASSESSMENT



Active Risk Scenarios ID: RR-R-00073 Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment RR-COP-03123 BC-00199 External Buffers-Exclusion Zones No Owner Defined In Service 31.0% Critical Control Isolation 1-Sep-2015 Good Base Control Exclusion Zones 0110 code. The land use is in line with local council zoning and town planning requirements. Buffer is defined from the mine crest and not the Comments mining license. The buffer allows AGL Loy Yang to manage (on land it owns) vegetation. This include activities such as farming, slashing, ploughing, summer crops, stock (fuel) management by grazing, earthen breaks. Exclusion Zones in force. Bushfire mitigation plans in place and submitted to Energy Safe Victoria. Exclusion zones around electrical infrastructure The base control is assessed via the following: - Implemented: Yes - Type: Isolation - Reliability: Good - Monitoring/Auditing: None Based on the above, the effectiveness is assessed to be GOOD. Risk Control Buffer zone between coal mine and public access Context Risk Control The planning zone ultimately results in reduced population; reduced human activity in this zone and allows for vegetation to be controlled that may result in a Comments reduced likelihood of fire. The risk control is assessed via the following factors: - Independence: Low (part of the Management of Vegetation to manage fuel loads) - Applicable: High Based on the above, partial applicability is assigned.

Risk Control Code Applicability Factor Criticality Tag ID Description Owner Status Reviewed Assessment RR-COP-03124 BC-00468 No Owner Defined 31.0% Third party high danger period alerts In Service Non-Critical Control 1-Sep-2015 Assessed

Base Control CFA/DEP/MFB alert on high danger period. CFA issues alert to AGL staff on high fire danger period. CFA/DEP/MFB provide notification of both fires and Comments advice during elevated fire danger period.

The base control is assessed via the following:

- Implemented: Yes (Third party control)
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: None (Third party control)

As this is a third party control, the effectiveness is assessed to be ASSESSED.

Risk Control CFA/DEP/MFB alert on high danger period.

Context

Risk Control CFA issues an alert to AGL staff on high fire danger period. CFA/DEP/MFB provide notification of both fires and advice during elevated fire danger period. Comments

The alerts trigger the activation of fire preparedness and prevention measures

The risk control is assessed via the following factors:

- Independence: High
- Applicable: Moderate

Based on the above, partial applicability is assigned.

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AGL MINE RISK ASSESSMENT Active Dick Secretics ID: DD D 00073



| MINE RISK ASSESSMEN | NT                      |                      |   |  | Active Risk                         | Scenarios ID: RR-I | R-00073    |                      |                  |                |             |             | -        |
|---------------------|-------------------------|----------------------|---|--|-------------------------------------|--------------------|------------|----------------------|------------------|----------------|-------------|-------------|----------|
| Risk                | k Control               | Code                 | Tag ID  | Description  |                                     | Owner              | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Asses       | sment    |
|                     |                         | RR-COP-03125         | BC-00435  | PCY000022 Fire Risk Management Plan  |                                     | No Owner Defined   | In Service | 0.0%                 | Critical Control | Administrative | 8-Oct-2015  | Go          | od       |
|                     | ase Control<br>Comments | The Fire Risk Man    | agement Plan (draft) is a                               | n overarching document that brings all facets of fire ris  | sk for the mine together.           |                    |            |                      |                  |                |             |             |          |
|                     |                         | The base control is  | assessed via the follow                                 | ing:   |                                     |                    |            |                      |                  |                |             |             |          |
|                     |                         | - Implemented: Yes   | S   |  |                                     |                    |            |                      |                  |                |             |             |          |
|                     |                         | - Type: Administrat  |   |  |                                     |                    |            |                      |                  |                |             |             |          |
|                     |                         | - Reliability: Good  |   |  |                                     |                    |            |                      |                  |                |             |             |          |
|                     |                         | - Monitoring/Auditir | ng: Performance monitor                                 | ing  |                                     |                    |            |                      |                  |                |             |             |          |
|                     |                         | Based on the abov    | e, the effectiveness of th                              | e control is assessed to be GOOD.  |                                     |                    |            |                      |                  |                |             |             |          |
| Ris                 | isk Control<br>Context  | Mine Fire Prepared   | dness and Prevention Pr                                 | ocedure  |                                     |                    |            |                      |                  |                |             |             |          |
| Ri:                 | isk Control<br>Comments | The procedure in p   | lace to manage the risk                                 | during high fire danger periods.   |                                     |                    |            |                      |                  |                |             |             |          |
|                     |                         |                      | assessed via the followin<br>ow (part of the Escalation | g factors:<br>of Security Measures control).   |                                     |                    |            |                      |                  |                |             |             |          |
|                     |                         | Based on the abov    | e, no applicability is assi                             | gned as this control is part of the Escalation of Securit  | y Measures.                         |                    |            |                      |                  |                |             |             |          |
| Actions             |                         | Code                 | Objective   |  | Work to be Done                     |                    |            |                      | Priority         | Implementer    | Status      | Complete By | Tracking |
|                     |                         | RR-A-00033           | undertaken by the sit                                   | Management Plan to incorporate activities<br>e-based emergency services and operations team<br>rdinated approach that is initiated as a result of an |                                     |                    |            |                      | Normal           |                | Pending     |             | N/A      |
| Risk                | k Control               | Code                 | Tag ID  | Description  |                                     | Owner              | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Asses       | sment    |
|                     |                         | RR-COP-03126         | BC-00474  | Security Management Plan   |                                     | No Owner Defined   | In Service | 100.0%               | Critical Control | Administrative | 14-Oct-2015 | Go          | od       |
|                     | ase Control<br>Comments | •                    | nanagement plan cover a                                 | spects of deter, detect, respond and recover. It also in   | ncludes a business resilience plan. |                    |            |                      |                  |                |             |             |          |

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Very Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Escalation of Security Measures

Risk Control There is a defined escalation process/set of measures required to be undertaken by the site security personnel in the event that there is an elevated risk of Comments criminal/terrorist attack.

The risk control is assessed via the following factors:

- Independence: High
- Applicable: High

Based on the above, full applicability is assigned.



Priority

Normal

Implementer

Status

Pending

Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Status Reviewed Assessment RR-COP-03187 BC-00435 PCY000022 Fire Risk Management Plan No Owner Defined In Service 0.0% Critical Control Administrative 1-Sep-2015 Good

Comments

Base Control The Fire Risk Management Plan (draft) is an overarching document that brings all facets of fire risk for the mine together.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Period specific plans put in place prior to high fire danger days

Context

Comments

Risk Control Site initiated weather monitoring during period of high fire danger.

Security and emergency services manager reviews the predictive weather conditions and determine appropriate response.

Some of these activities include:

- Additional fire patrols (patrols are vital to early fire detection or identification of suspicious activity)
- Vehicle patrols implemented by AGL around boundaries, early detection should result in activation of EMP
- Mobile plant fire tankers are checked and are on stand by in these situations
- Engaging additional emergency response personnel
- Daily mine inspections by shift management personnel look at general risk conditions (additional housekeeping) to the mine, including external fire threats.

Weather conditions may present an elevated fire threat. Inspection requirements cover the issue of fire

- Restricts high risk activities
- Spraylines situated around the mine are activated to wet down exposed coal.

Memo to key operational staff alerting them of fire preparedness activities that need to be undertaken.

The risk control is assessed via the following factors:

- Independence: Low (similar to personnel undertaking Mine Fire Preparedness and Prevention Procedure)
- Applicable: High

RR-A-00033

Based on the above, no applicability is assigned, as period specific plans are undertaken by the same personnel who administer the Mine Preparedness and Prevention Procedure.

Actions

Code Work to be Done Objective

> Update the Fire Risk Management Plan to incorporate activities undertaken by the site-based emergency services and operations team

into a single and coordinated approach that is initiated as a result of an

elevated fire danger.

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Tracking

N/A

Complete By



| E RISK ASSESSMENT       |  |  | ACTIVE RISK  | Scenarios ID: RR- | K-000/3    |                      |                  |                |              |            |
|-------------------------|--|--|--|-------------------|------------|----------------------|------------------|----------------|--------------|------------|
| Risk Contro             | Code                                     | Tag ID   | Description  | Owner             | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed     | Assessment |
|                         | RR-COP-03255                             | BC-00474   | Security Management Plan   | No Owner Defined  | In Service | 0.0%                 | Critical Control | Administrative | 1-Sep-2015   | Good       |
| Base Contro             | The security and r                       | management plan cover a                                  | spects of deter, detect, respond and recover. It also includes a business resilience plan.             |                   |            |                      |                  |                |              |            |
| Comments                |  |  |  |                   |            |                      |                  |                |              |            |
|                         | - Implemented: Ye                        | s assessed via the followi                               | 19:  |                   |            |                      |                  |                |              |            |
|                         | - Type: Administra                       |  |  |                   |            |                      |                  |                |              |            |
|                         | - Reliability: Very                      | Good   |  |                   |            |                      |                  |                |              |            |
|                         | - Monitoring/Auditi                      | ing: Performance monitori                                | ng   |                   |            |                      |                  |                |              |            |
|                         | Based on the abo                         | ve, the effectiveness is as                              | sessed to be GOOD.   |                   |            |                      |                  |                |              |            |
| Risk Contro<br>Contex   |  | rtake regular patrols of the                             | mining lease and surrounding areas.  |                   |            |                      |                  |                |              |            |
| Risk Contro<br>Comments | Personnel underta<br>patrols will occur. | aking patrols can detect a                               | fire, however can fire could develop in between patrols. However in the event of suspicious activities | es additional     |            |                      |                  |                |              |            |
|                         | The risk central is                      | accessed via the fellowin                                | forders.   |                   |            |                      |                  |                |              |            |
|                         |  | assessed via the following<br>ow (part of the escalation | of security measures control)  |                   |            |                      |                  |                |              |            |
|                         | - Applicable: Mode                       | **   | of decarity measures controlly   |                   |            |                      |                  |                |              |            |
|                         | Based on the abo                         | ve, no applicability is assig                            | gned.  |                   |            |                      |                  |                |              |            |
| Risk Contro             | Code                                     | Tag ID   | Description  | Owner             | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed     | Assessment |
|                         | RR-COP-03256                             | BC-00109   | Site Security Fencing and Surveillance Systems   | No Owner Defined  | In Service | 31.0%                | Critical Control | Engineering    | 1-Sep-2015   | Good       |
| Base Contro             | Cameras are strat                        | tegically installed along the                            | e site and monitored. On the observation of suspicious activities, AGL responds accordingly.           |                   |            |                      |                  |                |              |            |
| Comments                |  |  |  |                   |            |                      |                  |                |              |            |
|                         | - Implemented: Ye                        | s assessed via the followi                               | 19:  |                   |            |                      |                  |                |              |            |
|                         | - Type: Administra                       |  |  |                   |            |                      |                  |                |              |            |
|                         | - Reliability: Good                      |  |  |                   |            |                      |                  |                |              |            |
|                         | - Monitoring/Auditi                      | ing: Performance monitori                                | ng   |                   |            |                      |                  |                |              |            |
|                         | Based on the abo                         | ve, the effectiveness of the                             | e control is assessed to be GOOD.  |                   |            |                      |                  |                |              |            |
| Risk Contro<br>Contex   |  | cally installed along the sit                            | e boundary and site perimeter includes security fencing  |                   |            |                      |                  |                |              |            |
| Risk Contro<br>Comments | Cameras and resp                         | oonse can identify approac                               | ching fire within the surrounding landscape.   |                   |            |                      |                  |                |              |            |
|                         | Surveillance and o                       | double fenced perimeter in                               | some areas assist in identifying arson attack / approaching fire within the surrounding landscape.     |                   |            |                      |                  |                |              |            |
|                         | The risk control is                      | assessed via the following                               | g factors:   |                   |            |                      |                  |                |              |            |
|                         | - Independence: H                        | -  |  |                   |            |                      |                  |                |              |            |
|                         | - Applicable: Mode                       | erate  |  |                   |            |                      |                  |                |              |            |
|                         |  | ve, partial applicability is a                           | ssigned.   |                   |            |                      |                  |                |              |            |
| Cause                   | Belts failure                            |  |  | Code              | Status     |                      | Likelih          | ood            | Contribution |            |
|                         |  |  |  | RR-CA-00728       | Active     |                      | Current Likely   | (4)            | 0.2%         |            |
|                         |  |  |  |                   |            |                      | Proposed Likely  | (4)            | 0.2%         |            |

### AGL MINE RISK ASSESSMENT

# Active Risk Scenarios ID: RR-R-00073



- Comments Potential pathways include: - Misalignment of belt, belt rubbing on structure
  - Stand alone idler failure dropping hot material onto coal below, alternatively the belt is stopped and the idler sets fire to the belt and coal
  - Build up of coal materials under belt and the material gets into bearing (including sealed bearings) can cause pre mature failure, bearing heat is sufficient to ignite surrounding material
  - Build up of flammable material (grease, oil and coal)

This includes the Raw Coal Bunker and Crusher House.

In the past 3 years (2012-2015), 5 of the 41 smouldering coal/fire events have been attributed to belt friction. The likelihood of this event is considered to be LIKELY.

| R | isk | Co | ntro |
|---|-----|----|------|
|   |     |    |      |

ol Code Tag ID Description Owner Applicability Factor Status Criticality Type/Factor Reviewed Assessment RR-COP-03192 BC-00469 Mechanical Maintenance Routine No Owner Defined In Service 0.0% Critical Control Administrative 14-Oct-2015 Good

# Comments

Base Control Preventative maintenance program is designed to maintain equipment to minimise integrity related problems / and or unexpected failure.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Monitored and Audited

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Maintenance routine on conveyor belts

Context

Risk Control The maintenance routine on conveyor belts include:

Comments - visual inspection whilst conveyor belt is running

- static visual inspection

The risk control is assessed via the following factors:

- Independence: Low (Considered in cause likelihood)
- Applicable: Mod-High

Based on the above, no applicability is assigned to this control as it has been included in the likelihood assessment.



| AGL MINE RISK ASSESSMENT |                       |                                  |   | Active Risk Scenarios ID: RR-I            | R-00073    |                      |                      |                |            | AGL        |
|--------------------------|-----------------------|----------------------------------|---|---|------------|----------------------|----------------------|----------------|------------|------------|
| Risk Control             | Code                  | Tag ID                           | Description   | Owner                                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|                          | RR-COP-03193          | BC-00151                         | General Housekeeping  | No Owner Defined                          | In Service | 100.0%               | Non-Critical Control | Administrative | 1-Sep-2015 | Assessed   |
| Base Control<br>Comments | The housekeeping r    | removes fuel (coal, grease,      | oil) around hot components, i.e. potential ignition sources.                |   |            |                      |                      |                |            |            |
|                          | The base control is   | assessed via the following:      |   |   |            |                      |                      |                |            |            |
|                          | - Implemented: Yes    |                                  |   |   |            |                      |                      |                |            |            |
|                          | - Type: Administrativ | ve                               |   |   |            |                      |                      |                |            |            |
|                          | - Reliability: Fair   |                                  |   |   |            |                      |                      |                |            |            |
|                          | - Monitoring/Auditing | g: Ad-hoc                        |   |   |            |                      |                      |                |            |            |
|                          | Based on the above    | e, the effectiveness is asses    | sed to be ASSESSED.   |   |            |                      |                      |                |            |            |
| Risk Control<br>Context  | Work area inspection  | on will trigger the cleaning pr  | rocedure  |   |            |                      |                      |                |            |            |
| Risk Control<br>Comments | The procedure redu    | ices the potential for fuel to   | come into contact with hot surfaces on the mobile plant thus reducing the   | e potential for a fire.                   |            |                      |                      |                |            |            |
|                          | General cleaning do   | oes not always extend to the     | e required depth. It removes bulk coal material but often, layers of grease | e and oil may remain. Specialist cleaning |            |                      |                      |                |            |            |
|                          | utilising degreasing  | agents and pressurised stea      | am may be required.   |   |            |                      |                      |                |            |            |
|                          | The risk control is a | ssessed via the following fac    | ctors:  |   |            |                      |                      |                |            |            |
|                          | - Independence: Hig   | gh                               |   |   |            |                      |                      |                |            |            |
|                          | - Applicable: Mod-H   | ligh                             |   |   |            |                      |                      |                |            |            |
|                          | Based on the above    | e, full applicability is assigne | d.  |   |            |                      |                      |                |            |            |
| Risk Control             | Code                  | Tag ID                           | Description   | Owner                                     | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |
|                          | RR-COP-03194          | BC-00142                         | Control Safety Devices  | No Owner Defined                          | In Service | 31.0%                | Critical Control     | Engineering    | 1-Sep-2015 | Good       |
|                          |                       |                                  |   |   |            |                      |                      |                |            |            |

Comments

Base Control The control safety devices are installed on all head-ends and tail-ends of conveyors. In the event of belt misalignment, conveyors are shut down on alarm.

Under-speed detectors are installed on all driven pulleys. The under-speed detection system alarms and trips.

The base control is assessed via the following:

- Implemented: Yes

- Type: Engineering/Administrative

- Reliability: Good

- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Belt alignment and underspeed detection switches

Context

Risk Control Should a component suffer a failure and cause either belt misalignment or under-speed, the belt will shut down. Comments

The risk control is assessed via the following factors:

- Independence: High

- Applicable: Moderate (Not all failure modes can be prevented by this control).

Based on the above, partial applicability is assigned as this control does not prevent all failure modes.

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00073



| AGL MINE RISK ASSE | ESSMENT                  |   |  |   | Active Risk Sce                                | enarios ID: RR-  | R-00073    |                      |                  |                |             |                      |   |
|--------------------|--------------------------|---|--|---|--|------------------|------------|----------------------|------------------|----------------|-------------|----------------------|---|
|                    | Risk Control             | Code  | Tag ID   | Description   |  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Assessment           |   |
|                    |                          | RR-COP-03195  | BC-00470   | Detection and suppression on conveyor lines                     |  | No Owner Defined | In Service | 31.0%                | Critical Control | Engineering    | 8-Oct-2015  | Average              |   |
|                    |                          |   |  | 2 saction and cappings on conveyor miles                        |  |                  |            |                      |                  |                |             | 7.10.290             |   |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    | Base Control             | Base Control Some of the equipment will have automated detection and suppression on coal delivering structure. Other equipment items are reliant on activation of the manual free suppression systems.  |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    | Comments                 | fire suppression sy   | ystems.  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | The Raw Coal Bur  | nker and Crusher House                                 | fire detection and suppression system includes:                 |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Very Early Smok   |  | and detection and dapprocessor eyelem includes.                 |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Thermal imaging   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Manual deluge (d  | operator initiated)                                    |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   | s assessed via the follow<br>art (fully implemented on |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Type: Administra  |  | the histing conveyors)  |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Reliability: Good   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Monitoring/Auditi   | ing: Ad-hoc  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   |  | ne control is assessed to be AVERAGE.                           |  |                  |            |                      |                  |                |             |                      |   |
|                    | Risk Control<br>Context  | Detection and sup   | pression on conveyor lin                               | es  |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    | Risk Control<br>Comments | Some of the equip   | ment will have automate                                | d detection and suppression. Other equipment items are reli     | iant on activation of the manual fire suppress | ion systems.     |            |                      |                  |                |             |                      |   |
|                    |                          | The risk control is   | assessed via the following                             | no factors:   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Independence: H   |  | ig idolors.   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   | -  | nanual activation by the operator).                             |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   |  | assigned as some systems require manual activation by the       | operator.                                      |                  |            |                      |                  |                |             |                      |   |
|                    | Risk Control             |   | Tag ID   | Description   |  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed    | Assessment           |   |
|                    |                          | RR-COP-03196  | BC-00435   | PCY000022 Fire Risk Management Plan                             |  | No Owner Defined | In Service | 100.0%               | Critical Control | Administrative | 14-Oct-2015 | Good                 |   |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    | Base Control             | The Fire Risk Man   | nagement Plan (draft) is a                             | in overarching document that brings all facets of fire risk for | the mine together.                             |                  |            |                      |                  |                |             |                      |   |
|                    | Comments                 | ments , and the second |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   | s assessed via the follow                              | ing:  |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Implemented: Ye   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | <ul> <li>Type: Administra</li> <li>Reliability: Good</li> </ul>   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   | ing: Performance monitor                               | ring  |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | Based on the above  | ve, the effectiveness of the                           | ne control is assessed to be GOOD.                              |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | Emergency Respo   | onse Procedures - Fast D                               | letermined Response   |  |                  |            |                      |                  |                |             |                      |   |
|                    | Context                  |   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | Control Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    | Comments                 | regular drills are undertaken to ensure adequate level of response can be provided by both operations and site-based emergency staff.   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | In addition to operation staff, there are a minimum of 3 site-based emergency staff ready to mobilise. Additional personnel and firefighting equipment are on   |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          |   | gh fire risk periods.                                  | million of 5 site-based emergency stall ready to mobilise. A    | aditional personnel and mengriting equipmen    | it are on        |            |                      |                  |                |             |                      |   |
|                    |                          | g   | g p  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | The risk control is   | assessed via the following                             | ng factors:   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Independence: H   | -  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | - Applicable: High  |  |   |  |                  |            |                      |                  |                |             |                      |   |
|                    |                          | Rased on the above  | ve, full applicability is ass                          | igned   |  |                  |            |                      |                  |                |             |                      |   |
| Actions            |                          | Code  |  |   | Mark to be Dane                                |                  |            |                      | Priority         | Implementer    | Status      | Complete By Tracking | ~ |
| Actions            |                          | code  | Objective  | V   | Nork to be Done                                |                  |            |                      | Priority         | implementer    | Status      | Complete By Tracking | 1 |
|                    |                          |   |  |   |  |                  |            |                      |                  |                |             |                      |   |

AGL MINE RISK ASSESSMENT



Active Risk Scenarios ID: RR-R-00073 RR-A-00033 Nomal Pending Update the Fire Risk Management Plan to incorporate activities undertaken by the site-based emergency services and operations team into a single and coordinated approach that is initiated as a result of an elevated fire danger. Intermediate Event Code Description Status Incoming Outgoing Probability RR-IE-03198 Probability of initial fire escalating Active Current Unlikely (2) Rare (1) 0.1% Unlikely (2) 0.1% Proposed Rare (1) Comments The likelihood of this event and the initial emergency response activities (which includes mandatory CFA attendance) being unsuccessful and resulting in an escalation to a significant mine fire is considered to be UNLIKELY. Therefore, probability is assessed as 0.1%. Consequences Fire risk with the potential to impact public safety Consequence Code Category Likelihood Severity Risk Rating RR-CQ-00507 Public Safety Current High Rare (1) Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) Rare (1) Proposed High Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks)



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed BC-00186 RR-COM-02815 HSM0001C Emergency Management Plan No Owner Defined In Service 31.0% Critical Control Administrative 9-Oct-2015 Good

# Comments - Vic police

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

- - EPA
  - West Gippsland Catchment Management Authority
  - Gippsland Water and
  - Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

### Risk Control Emergency Response Equipment

Risk Control The emergency management plan specifies that the following equipment is available at the mine:

- Comments 2 fire trucks (1 truck has Compressed Air Foam (CAF) capability)
  - 2 roving security vehicles with CAFs capability
  - 1 mine vehicle with CAF capability
  - 1 ambulance,

  - Fully fitted rescue vehicle
  - Standard UHF radio system
  - Fire retardant materials
  - Fire extinguishers and hoses
  - All mine compliant vehicles are equipped with fire extinguishers, hoses and branches
  - CFA and SES equivalent equipment
  - Earth moving equipment
  - 3 water carts permanently situated onsite (2 x 30 kL, 1 x 10 kL)
  - Heat camera used to search out hot spots on machines

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Moderate

This has been assessed in combination with the Emergency Management Plan and Fixed Mine Fire Detection and Suppression Equipment controls. Based on the above, partial applicability is assigned.



Priority

Normal

Implementer

Status

Pending

Pendina

Tracking

N/A

N/A

Complete By

Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Reviewed BC-00337 RR-COM-02817 Fixed Mine Fire Detection and Suppression Equipment No Owner Defined In Service 31.0% Critical Control Engineering 8-Oct-2015 Good

# Comments

Base Control This activity involve the activation of spray lines and other suppression equipment as installed as fixed assets within the mine.

These assets are designed in accordance with Mine Fire Service design guidelines, which include key assets such as:

- the ability to cover 50% of the operational mine area with water
- capacity to supply 6400 L/sec to the mine spray line systems
- gravity supply of water from two locations namely fire service reservoir and High Level Storage Dam
- CFA compliant couplings every 50 m along operational spray lines
- strategically located truck fill points
- duplicated power supply to all mine key asset
- the fire main runs the length of the conveyor (either side) and has spray units located at intervals that allow complete coverage of the conveyor
- the main on the operating side of the conveyor is charged
- the main on the non-operating side is uncharged however all sprinkler points are open allowing activation of all sprinklers by charging the main
- dredgers are fitted with firewater tank (~2 kL) for initial response
- Hoses and extinguishers available at transfer points and at head ends
- Sprinkler, deluge and hose systems on dredgers/stackers fed from fire main

The base control is assessed via the following:

- Implemented: Yes
- Type: Engineering/Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Context

Risk Control Fixed Mine Fire Detection and Suppression Equipment

Risk Control The risk control is assessed via the following factors: Comments - Independence: Moderate

- Applicable: Moderate

This has been assessed in combination with the Emergency Management Plan and Emergency Response Equipment controls. Based on the above, partial applicability is assigned.

Code Actions Work to be Done

> RR-A-00050 Investigate the feasibility of installing long range infra-red system to monitor the open cut

> > mining area (coal exposed areas).

RR-A-00051 Determine the feasibility of installing an automated detection and suppression systems

based on a multi-criteria assessment.

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Active Risk Scenarios ID: RR-R-00073



| AGL MINE RISK ASSESSI     | MENT                     |  |   |  | Active Risk Scenarios ID: RI                    | R-R-00073            |                               |                              |                               |                         | AGL                      |
|---------------------------|--------------------------|--|---|--|---|----------------------|-------------------------------|------------------------------|-------------------------------|-------------------------|--------------------------|
| F                         | Risk Control             | Code<br>RR-COM-02825   | <b>Tag ID</b><br>BC-00186   | Description HSM0001C Emergency Management Plan   | Owner<br>No Owner Defined                       | Status<br>In Service | Applicability Factor<br>31.0% | Criticality Critical Control | Type/Factor<br>Administrative | Reviewed<br>9-Oct-2015  | Assessment<br>Good       |
|                           | Base Control<br>Comments | - Vic police<br>- EPA  | Catchment Management A  | t Plan may require engagement from major relevant stakeholders wh  | iich may include:                               |                      |                               |                              |                               |                         |                          |
|                           |                          | - Implemented: Yes   | s assessed via the following  | x  |   |                      |                               |                              |                               |                         |                          |
|                           |                          | <ul><li>Type: Administrat</li><li>Reliability: Good</li><li>Monitoring/Auditir</li></ul> |   | 1  |   |                      |                               |                              |                               |                         |                          |
|                           | Risk Control<br>Context  | Based on the abov<br>Emergency Manag   |   | control is assessed to be GOOD.  |   |                      |                               |                              |                               |                         |                          |
|                           | Risk Control<br>Comments | regular drills are ur  | ndertaken to ensure an ade  | irred emergency response to the incident which reduces the risk of the<br>equate level of response can be provided. Minimum emergency responding high fire risk periods. Evacuation sirens - regularly tested - week | onse team compromises of 3 people ready to      |                      |                               |                              |                               |                         |                          |
|                           |                          | The ICC has a bac to carbon monoxide   |   | ludes site based emergency crew available 24 hour. Adopted guidelii  | nes for CFA protocol for managing exposure      |                      |                               |                              |                               |                         |                          |
|                           |                          | The risk control is a - Independence: M - Applicable: Mode                               |   | factors:   |   |                      |                               |                              |                               |                         |                          |
|                           |                          |  | essed in combination with t<br>al applicability is assigned.                              | he Fixed Mine Fire Detection and Suppression Equipment and Emer  | gency Response Equipment controls. Based        |                      |                               |                              |                               |                         |                          |
| Actions                   |                          | <b>Code</b><br>RR-A-00016  |   | of the OH&S risk of responders' exposure to firewater (hygiene), and voids from fire activities  | Work to be Done                                 |                      |                               | Priority<br>Normal           | Implementer                   | Status<br>Pending       | Complete By Tracking N/A |
| F                         | Risk Control             | Code<br>RR-COM-03127   | <b>Tag ID</b> BC-00474  | Description Security Management Plan   | Owner<br>No Owner Defined                       | Status<br>In Service | Applicability Factor 0.0%     | Criticality Critical Control | Type/Factor<br>Administrative | Reviewed<br>14-Oct-2015 | Assessment<br>Good       |
|                           | Base Control<br>Comments | The security and m   | nanagement plan cover asp   | pects of deter, detect, respond and recover. It also includes a busines  | ss resilience plan.                             |                      |                               |                              |                               |                         |                          |
|                           |                          | - Implemented: Yes<br>- Type: Administrat  | tive  | d:   |   |                      |                               |                              |                               |                         |                          |
|                           |                          |  | ng: Performance monitoring  |  |   |                      |                               |                              |                               |                         |                          |
|                           | Risk Control<br>Context  |  | e, the effectiveness is asse  |  |   |                      |                               |                              |                               |                         |                          |
|                           | Risk Control<br>Comments | Assistance (provisi of threat.   | on of personnel, facilities a   | nd equipment) is provided to the authorities and additional security a   | ctivities are stepped up depending on the level |                      |                               |                              |                               |                         |                          |
|                           |                          | - Independence: Lo   | assessed via the following<br>ow (it does not address all<br>it does not address all caus | causes - relates to arson only)  |   |                      |                               |                              |                               |                         |                          |
| R4Risk Ref : 116-10 Relea | 200 1                    | Based on the abov  | e, no applicability is assign   | ed.  |   |                      |                               |                              |                               |                         | Page 295 of 313          |

AGL MINE RISK ASSESSMENT Active Risk Scenarios ID: RR-R-00073



Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Reviewed Status RR-COM-03229 Vic police and CFA Response No Owner Defined In Service 100.0% Non-Critical Control 9-Oct-2015 Assessed Risk Control Vic police and CFA Response Context Risk Control External emergency responders will initiate various plans and protocols in response to a major fire to minimise the risk to public health and property. The CFA will be required to treat the rehabilitated area no differently to the surrounding land uses. Although this is an effective and applicable control, the adequacy is not assessed as it is third party control. Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COM-03230 BC-00436 P000081 Community Engagement Plan No Owner Defined In Service 0.0% Non-Critical Control Administrative 8-Oct-2015 Average Base Control Community Engagement Plan will be activated as required to inform any community concern following a significant incident. Applicable stakeholders will be Comments engaged. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Fair - Monitoring/Auditing: Ad-Hoc Based on the above, the effectiveness of the control is asssessed to be AVERAGE. Risk Control Community Engagement Plan Context Risk Control Engagement of stakeholders within the community is the process to inform/manage community issues. The risk control is assessed via the following factors: - Independence: Moderate - Applicable: Low Based on the above, no applicability is assigned. Environmental risk from smoke with the potential to impact public amenities Category Consequence Code Likelihood Severity Risk Rating RR-CQ-00508 Current Low Environment & Rare (1) Moderate, short to medium term environmental impact that may Community extend beyond AGL's operational area and/or may result in local community complaint(s). Moderate, short to medium term Proposed Rare (1) Low environmental impact that may extend beyond AGL's operational area and/or may result in local community complaint(s).



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed RR-COM-03234 BC-00436 P000081 Community Engagement Plan 0.0% No Owner Defined In Service Non-Critical Control Administrative 8-Oct-2015 Average

Base Control Community Engagement Plan will be activated as required to inform any community concern following a significant incident. Applicable stakeholders will be Comments engaged.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: Ad-Hoc

Based on the above, the effectiveness of the control is asssessed to be AVERAGE.

Context

Risk Control Community Engagement Plan

Comments

Risk Control Engagement of stakeholders within the community is the process to inform/manage community issues.

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Low

Based on the above, no applicability is assigned.



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed BC-00186 RR-COM-03235 HSM0001C Emergency Management Plan No Owner Defined In Service 31.0% Critical Control Administrative 9-Oct-2015 Good

Comments - Vic police

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

- - EPA
  - West Gippsland Catchment Management Authority
  - Gippsland Water and
  - Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Response Equipment

Risk Control The emergency management plan specifies that the following equipment is available at the mine:

- Comments 2 fire trucks (1 truck has Compressed Air Foam (CAF) capability)
  - 2 roving security vehicles with CAFs capability
  - 1 mine vehicle with CAF capability
  - 1 ambulance,

  - Fully fitted rescue vehicle
  - Standard UHF radio system
  - Fire retardant materials
  - Fire extinguishers and hoses
  - All mine compliant vehicles are equipped with fire extinguishers, hoses and branches
  - CFA and SES equivalent equipment
  - Earth moving equipment
  - 3 water carts permanently situated onsite (2 x 30 kL, 1 x 10 kL)
  - Heat camera used to search out hot spots on machines

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Moderate

This has been assessed in combination with the Emergency Management Plan and Fixed Mine Fire Detection and Suppression Equipment controls. Based on the above, partial applicability is assigned.



Priority

Normal

Implementer

Status

Pending

Pendina

Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Reviewed BC-00337 RR-COM-03236 Fixed Mine Fire Detection and Suppression Equipment No Owner Defined In Service 31.0% Critical Control Engineering 8-Oct-2015 Good

# Comments

Base Control This activity involve the activation of spray lines and other suppression equipment as installed as fixed assets within the mine.

These assets are designed in accordance with Mine Fire Service design guidelines, which include key assets such as:

- the ability to cover 50% of the operational mine area with water
- capacity to supply 6400 L/sec to the mine spray line systems
- gravity supply of water from two locations namely fire service reservoir and High Level Storage Dam
- CFA compliant couplings every 50 m along operational spray lines
- strategically located truck fill points
- duplicated power supply to all mine key asset
- the fire main runs the length of the conveyor (either side) and has spray units located at intervals that allow complete coverage of the conveyor
- the main on the operating side of the conveyor is charged
- the main on the non-operating side is uncharged however all sprinkler points are open allowing activation of all sprinklers by charging the main
- dredgers are fitted with firewater tank (~2 kL) for initial response
- Hoses and extinguishers available at transfer points and at head ends
- Sprinkler, deluge and hose systems on dredgers/stackers fed from fire main

The base control is assessed via the following:

- Implemented: Yes
- Type: Engineering/Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Context

Risk Control Fixed Mine Fire Detection and Suppression Equipment

Risk Control The risk control is assessed via the following factors: Comments - Independence: Moderate

- Applicable: Moderate

This has been assessed in combination with the Emergency Management Plan and Emergency Response Equipment controls. Based on the above, partial applicability is assigned.

Code Actions Work to be Done

> RR-A-00050 Investigate the feasibility of installing long range infra-red system to monitor the open cut

> > mining area (coal exposed areas).

RR-A-00051 Determine the feasibility of installing an automated detection and suppression systems

based on a multi-criteria assessment.

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Tracking

N/A

N/A

Complete By



Active Risk Scenarios ID: RR-R-00073 AGL MINE RISK ASSESSMENT Risk Control Code Tag ID Description Applicability Factor Criticality Type/Factor Reviewed Status BC-00186 RR-COM-03237 HSM0001C Emergency Management Plan No Owner Defined In Service 31.0% Critical Control Administrative 9-Oct-2015 Good Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include: Comments - Vic police - EPA - West Gippsland Catchment Management Authority - Gippsland Water and - Department of Health etc. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness of the control is assessed to be GOOD. Risk Control Emergency Management Plan Risk Control Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and regular drills are undertaken to ensure an adequate level of response can be provided. Minimum emergency response team compromises of 3 people ready to mobilise. Additional personnel on stand-by during high fire risk periods. Evacuation sirens - regularly tested - weekly Tuesday 10:00am The ICC has a backup power supply. This includes site based emergency crew available 24 hour. Adopted guidelines for CFA protocol for managing exposure to carbon monoxide. The risk control is assessed via the following factors: - Independence: Moderate - Applicable: Moderate This has been assessed in combination with the Fixed Mine Fire Detection and Suppression Equipment and Emergency Response Equipment controls. Based on the above, partial applicability is assigned. Consequence Smoke risk with the potential to impact the public safety Code Likelihood Severity Risk Rating Category RR-CQ-00509 Public Safety Current Rare (1) Serious harm to members of the High public. Members of the public required to be displaced for a significant period of time (weeks) Rare (1) High Proposed Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks)



| L LOY YANG        |                          |  |   |   |   |            |                      |                      |                | 201        | AGL        |  |  |  |  |
|-------------------|--------------------------|--|---|---|---|------------|----------------------|----------------------|----------------|------------|------------|--|--|--|--|
| L MINE RISK ASSES | SSMENT                   |  |   |   | Active Risk Scenarios ID: RR-               | R-00073    |                      |                      |                |            | AGL        |  |  |  |  |
|                   | Risk Control             | Code   | Tag ID  | Description   | Owner                                       | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |  |  |  |  |
|                   |                          | RR-COM-02827   | BC-00186  | HSM0001C Emergency Management Plan  | No Owner Defined                            | In Service | 31.0%                | Critical Control     | Administrative | 9-Oct-2015 | Good       |  |  |  |  |
|                   | Base Control             |  | ne Emergency Manager  | ment Plan may require engagement from major relevant stakeholders whi     | ch may include:                             |            |                      |                      |                |            |            |  |  |  |  |
|                   | Comments                 | - vic police   |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | - EPA<br>West Ginnsland (  | Catchment Managemer   | at Authority  |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | - Gippsland Water  | -   | it Additionly   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | - Department of He   |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          |  | s assessed via the follo  | wing:   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | - Implemented: Yes   |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | <ul> <li>Type: Administrat</li> <li>Reliability: Good</li> </ul>   |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | •  | ng: Performance monito  | oring   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | Based on the abov  | e, the effectiveness of   | the control is assessed to be GOOD.                                       |   |            |                      |                      |                |            |            |  |  |  |  |
|                   | Risk Control<br>Context  | Emergency Manag  |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   | Risk Control             | Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and                                  |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   | Comments                 |  | regular drills are undertaken to ensure an adequate level of response can be provided. Minimum emergency response team compromises of 3 people ready to |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | mobilise. Additional personnel on stand-by during high fire risk periods. Evacuation sirens - regularly tested - weekly Tuesday 10:00am  |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | The ICC has a bac  |   | s includes site based emergency crew available 24 hour. Adopted guidelin  | nes for CFA protocol for managing exposure  |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | to carbon monoxidi   | е.  |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | The risk control is a  | assessed via the follow   | ing factors:  |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | - Independence: M  |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | - Applicable: Mode   | rate  |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   |                          | This has been assessed in combination with the Fixed Mine Fire Detection and Suppression Equipment and Emergency Response Equipment controls. Based on the above, partial applicability is assigned. |   |   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   | Risk Control             | Code   | Tag ID  | Description   | Owner                                       | Status     | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment |  |  |  |  |
|                   |                          | RR-COM-02830   |   | Vic police, CFA, EPA and Department of Health Response                    | System Administrator                        | In Service | 100.0%               | Non-Critical Control |                | 9-Oct-2015 | Assessed   |  |  |  |  |
|                   | Risk Control<br>Context  | Vic police, CFA, EF  | PA and Department of I  | Health Response   |   |            |                      |                      |                |            |            |  |  |  |  |
|                   | Risk Control<br>Comments | External emergence health.   | cy responders will initiat  | te various plans and protocols in response to hazards associated with sme | oke exposure to minimise the risk to public |            |                      |                      |                |            |            |  |  |  |  |

Although this is an effective and applicable control, the adequacy is not assessed as it is third party control.

AGL MINE RISK ASSESSMENT

AGL LOY YANG Active Risk Scenarios ID: RR-R-00073 Risk Control Code Tag ID Description Applicability Factor Type/Factor Reviewed Status Criticality RR-COM-03233 BC-00436 P000081 Community Engagement Plan No Owner Defined In Service 0.0% Non-Critical Control Administrative 8-Oct-2015 Average Base Control Community Engagement Plan will be activated as required to inform any community concern following a significant incident. Applicable stakeholders will be Comments engaged. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Fair - Monitoring/Auditing: Ad-Hoc Based on the above, the effectiveness of the control is asssessed to be AVERAGE. Risk Control Community Engagement Plan Context Risk Control Engagement of stakeholders within the community is the process to inform/manage community issues. Comments The risk control is assessed via the following factors: - Independence: Moderate - Applicable: Low Based on the above, no applicability is assigned. Risk Control Code Reviewed Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Assessment RR-COM-03239 No Owner Defined BC-00337 Fixed Mine Fire Detection and Suppression Equipment In Service 31.0% Critical Control Engineering 8-Oct-2015 Good Base Control This activity involve the activation of spray lines and other suppression equipment as installed as fixed assets within the mine. Comments These assets are designed in accordance with Mine Fire Service design guidelines, which include key assets such as: - the ability to cover 50% of the operational mine area with water - capacity to supply 6400 L/sec to the mine spray line systems - gravity supply of water from two locations namely fire service reservoir and High Level Storage Dam - CFA compliant couplings every 50 m along operational spray lines - strategically located truck fill points - duplicated power supply to all mine key asset - the fire main runs the length of the conveyor (either side) and has spray units located at intervals that allow complete coverage of the conveyor - the main on the operating side of the conveyor is charged - the main on the non-operating side is uncharged however all sprinkler points are open allowing activation of all sprinklers by charging the main - dredgers are fitted with firewater tank (~2 kL) for initial response - Hoses and extinguishers available at transfer points and at head ends - Sprinkler, deluge and hose systems on dredgers/stackers fed from fire main

The base control is assessed via the following:

- Implemented: Yes
- Type: Engineering/Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Objective

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Fixed Mine Fire Detection and Suppression Equipment

Context

Actions

Risk Control The risk control is assessed via the following factors:

Comments - Independence: Moderate

- Applicable: Moderate

This has been assessed in combination with the Emergency Management Plan and Emergency Response Equipment controls. Based on the above, partial

applicability is assigned. Code

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riskview

Work to be Done



Complete By

Tracking

Priority

Implementer

Status



|  | RR-A-00050        | Investigate the fea | sibility of installing long range infra-red system to monitor the open cut exposed areas). |                  |            |                      | Normal           |                | Pending    | N/A        |  |  |
|--|-------------------|---------------------|--|------------------|------------|----------------------|------------------|----------------|------------|------------|--|--|
|  | RR-A-00051        | Determine the feas  | sibility of installing an automated detection and suppression systems                      |                  |            |                      | Normal           |                | Pending    | N/A        |  |  |
|  |                   | based on a multi-c  | riteria assessment.  |                  |            |                      |                  |                |            |            |  |  |
|  | Risk Control Code | Tag ID              | Description  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |  |  |
|  | RR-COM-03240      | BC-00186            | HSM0001C Emergency Management Plan   | No Owner Defined | In Service | 31.0%                | Critical Control | Administrative | 9-Oct-2015 | Good       |  |  |

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include:

- Comments Vic police
  - EPA
  - West Gippsland Catchment Management Authority
  - Gippsland Water and
  - Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

### Risk Control Emergency Response Equipment Context

Risk Control The emergency management plan specifies that the following equipment is available at the mine:

- Comments 2 fire trucks (1 truck has Compressed Air Foam (CAF) capability)
  - 2 roving security vehicles with CAFs capability
  - 1 mine vehicle with CAF capability
  - 1 ambulance,
  - Fully fitted rescue vehicle
  - Standard UHF radio system
  - Fire retardant materials
  - Fire extinguishers and hoses
  - All mine compliant vehicles are equipped with fire extinguishers, hoses and branches
  - CFA and SES equivalent equipment
  - Earth moving equipment
  - 3 water carts permanently situated onsite (2 x 30 kL, 1 x 10 kL)
  - Heat camera used to search out hot spots on machines

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Moderate

This has been assessed in combination with the Emergency Management Plan and Fixed Mine Fire Detection and Suppression Equipment controls. Based on the above, partial applicability is assigned.



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed RR-COM-03244 BC-00483 Loy Yang Mining Licence 5181 Work Plan No Owner Defined In Service 31.0% Critical Control Administrative 16-Oct-2015 Good

Base Control The work plan includes:

- Comments commitments to government on key components on the mine rehabilitation
  - the site will be rehabilitated to its next use, which is proposed to be pasture for grazing and the waterbody at the base of the mine
  - outlines progressive mine rehabilitation

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Rehabilitated land Context

Risk Control Rehabilitated land still presents a fire risk, as the grass and pasture can be consumed by fire. However, the duration and intensity of this fire is less than the Comments mine, therefore, the subsequent smoke is expected to be smaller, in comparison to a coal fire.

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Mod-Low

Based on the above, partial applicability is assigned.



AGL MINE RISK ASSESSMENT Risk Scenario Details Status Active Top Event Gas pipelines fire/explosion Scenario Loss of containment from LP and HP natural gas pipelines Comments The natural gas pipeline includes the high pressure transmission pipeline to Loy Yang B from the east and the low pressure distribution pipeline to AGL Loy Yang from the west. These are assets owned and maintained by APA and licensed by the appropriate authority. Therefore this assessment only includes potential hazards that AGL Loy Yang pose on the pipeline. Controls managed by APA are excluded from this assessment. Ratings Qualitative (Automatically Calculated) Top Event Likelihood Consequence Category Consequence Severity Max Consequence Risk Current Rare (1) Public Safety Level 5 (5) High High Proposed Rare (1) Public Safety Level 5 (5) Causes Cause Damage to natural gas line to Loy Yang B due to ground movement Code Status RR-CA-00622 Rejected Comments Mining related activities does not create longitudinal strain on the pipeline. Therefore, this is not considered to be a credible cause of a loss of containment. Damage to natural gas line due to excavation or ground penetration Cause Code Likelihood Contribution Status RR-CA-00623 Active Unlikely (2) 100.0% Current Unlikely (2) 100.0% Proposed Comments There is a potential for a leak resulting in a fire and/or explosion within the mine lease area, which may impact Bartons Lane and Loy Yang B personnel. There was a recent incident where a pipeline was impacted by an excavator, however there was no loss of containment. The likelihood of this event to result in a loss of containment is considered to be UNLIKELY. Risk Control Code Tag ID Type/Factor Description Owner Applicability Factor Criticality Status Reviewed Assessment RR-COP-02876 BC-00088 No Owner Defined 100.0% 1-Sep-2015 HSP900 Permit to work system In Service Critical Control Administrative Very Good Base Control Systems and procedures are used to minimise the risk when conducting hot work. End of day shift collect all hot work permits and hand over to night shift Comments where all fire watch requirements are captured. Night shift sign off on inspections as done during the evening Control is rated as very good based on collective acknowledgement of the importance of this inspection ahead of other shift tasks. The base control is assessed via the following: - Implemented: Yes - Type: Administrative - Reliability: Very Good - Monitoring/Auditing: Performance monitoring Based on the above, the effectiveness is assessed to be VERY GOOD. Risk Control Permit to dig Context Risk Control Systems and procedures are used to minimise the risk to underground services when excavating. This includes ringing "dial before you dig". Comments The risk control is assessed via the following factors: - Independence: High - Applicable: Mod-High Based on the above, full applicability is assigned. Consequences Natural gas pipeline leak and associated fire/explosion with the potential to impact public safety Consequence Code Category Likelihood Severity Risk Rating

Active Risk Scenarios ID: RR-R-00074 Current Rare (1) Serious harm to members of the public. Members of the public required to be displaced for a significant period of time (weeks) Proposed Rare (1) High Serious harm to members of the public. Members of the public required to be displaced for a significant period of time

(weeks) Risk Control Code Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment HSM0001C Emergency Management Plan 100.0% RR-COM-03241 BC-00186 No Owner Defined In Service Critical Control Administrative 9-Oct-2015 Good

Base Control The activation of the Emergency Management Plan may require engagement from major relevant stakeholders which may include: Comments - Vic police

- EPA
- West Gippsland Catchment Management Authority
- Gippsland Water and
- Department of Health etc.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness of the control is assessed to be GOOD.

Risk Control Emergency Management Plan

Context

Risk Control Includes fire instructions that initiates the required emergency response to the incident which reduces the risk of the event escalating. Personnel are trained and regular drills are undertaken to ensure an adequate level of response can be provided. Minimum emergency response team compromises of 3 people ready to mobilise. Additional personnel on stand-by during high fire risk periods. Evacuation sirens - regularly tested - weekly Tuesday 10:00am

The ICC has a backup power supply. This includes site based emergency crew available 24 hour. Adopted guidelines for CFA protocol for managing exposure to carbon monoxide.

The risk control is assessed via the following factors:

- Independence: High
- Applicable: Mod-High

Based on the above, full applicability is assigned.

Risk Control Code

Tag ID Description Owner Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COM-03249 No Owner Defined Vic police and CFA Response 100.0% Non-Critical Control 9-Oct-2015 In Service Assessed

Risk Control Vic police and CFA Response

Context

Risk Control External emergency responders will initiate various plans and protocols in response to major fire to minimise the risk to public health and property. The CFA will Comments be required to treat the rehabilitated area no differently to surrounding land uses.

Although this is an effective and applicable control, the adequacy is not assessed as this is third party control



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed RR-COM-03250 BC-00436 P000081 Community Engagement Plan 0.0% No Owner Defined In Service Non-Critical Control Administrative 8-Oct-2015 Average

Base Control Community Engagement Plan will be activated as required to inform any community concern following a significant incident. Applicable stakeholders will be Comments engaged.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Fair
- Monitoring/Auditing: Ad-Hoc

Based on the above, the effectiveness of the control is asssessed to be AVERAGE.

Context

Risk Control Community Engagement Plan

Comments

Risk Control Engagement of stakeholders within the community is the process to inform/manage community issues.

The risk control is assessed via the following factors:

- Independence: Moderate
- Applicable: Low

Based on the above, no applicability is assigned to this.



Risk Scenario Details Status Active

Top Event Criminal act

Current

Proposed

Scenario Criminal act which may impact public safety and/or the environment

Comments A gap assessment was undertaken to determine potential causes not previously identified and/or causes identified that had the potential to impact public safety and or the environment. Potential gaps as identified are included on this bowtie.

Ratings Qualitative (Automatically Calculated)

Rare (1)

Top Event Likelihood Rare (1)

Consequence Category

Public Safety

Public Safety

Consequence Severity Level 5 (5) Level 5 (5)

Proposed

Rare (1)

Max Consequence Risk

High High

100.0%

## Causes

| Cause | Criminal intent to initiate an arson attack  | Code                       | Status   |   |        |            |              |  |  |  |  |  |
|-------|--|----------------------------|----------|---|--------|------------|--------------|--|--|--|--|--|
|       |  | RR-CA-00688                | Rejected |   |        |            |              |  |  |  |  |  |
|       |  |                            |          |   |        |            |              |  |  |  |  |  |
|       | Comments This cause is addressed in RR-R00073. Therefore, this cause is not included on this bowtie.   |                            |          |   |        |            |              |  |  |  |  |  |
| Cause | Criminal intent to damage the integrity of the High Level Storage Dam, Settling Pond, OB dam or Fire   | Code                       | Status   |   |        |            |              |  |  |  |  |  |
|       | Services Pond Dam  | RR-CA-00689                | Rejected |   |        |            |              |  |  |  |  |  |
|       |  |                            |          |   |        |            |              |  |  |  |  |  |
|       | Comments This causes includes a criminal act with intent to damage the integrity of various dams/ponds resulting in a dam wall failure.                    |                            |          |   |        |            |              |  |  |  |  |  |
|       | The High Level Storage Dam and Settling Pond are located outside of the mine lease area, therefore it is assessed to be outside the scope of the Mine Risk |                            |          |   |        |            |              |  |  |  |  |  |
|       | Assessment and Management Plan. Therefore, these have not been considered in this assessment.  |                            |          |   |        |            |              |  |  |  |  |  |
|       | It is not considered credible that a person wishing to do harm would take action to compromise the integrity of the dam wall of the OB dan                 | n or the Fire Services     |          |   |        |            |              |  |  |  |  |  |
|       | pond, as this would not result in damage of concern to AGL. It is also considered that the dam is not an attractive target and there is no m               | otivation or capability to |          |   |        |            |              |  |  |  |  |  |
|       | breach a dam wall. Therefore, this cause is rejected.  |                            |          |   |        |            |              |  |  |  |  |  |
|       | Ground movement causes that have the potential to damage the integrity of the OB Dam or Fire Services Pond have been addressed in F                        | RR-R00066.                 |          |   |        |            |              |  |  |  |  |  |
| Cause | Criminal intent to damage a single block batter or wall movement   | Code                       | Status   |   |        |            |              |  |  |  |  |  |
|       |  | RR-CA-00695                | Rejected |   |        |            |              |  |  |  |  |  |
|       |  |                            |          |   |        |            |              |  |  |  |  |  |
|       | Comments It is not considered a credible event for a person whose intent is to take action to compromise the integrity of the mine relating to batters a   | and walls is conceived     |          |   |        |            |              |  |  |  |  |  |
|       | possible, as this would not result in damage to AGL of concern. Therefore, this cause is rejected.   |                            |          |   |        |            |              |  |  |  |  |  |
| Cause | Criminal intent to cause harm to assets within the mine lease  | Code                       | Status   |   |        | Likelihood | Contribution |  |  |  |  |  |
|       |  | RR-CA-00726                | Active   | С | urrent | Rare (1)   | 100.0%       |  |  |  |  |  |
|       |  |                            |          |   |        |            |              |  |  |  |  |  |

Comments The hazards and the controls that relate to the prevention and mitigation of risks to public safety and the environment are referenced in the Security Management Plan. No other credible causes of security or terrorism threats have been identified.

The controls represented on this bowtie describe the main controls regarding aspects that prevent/mitigate criminal acts being deter, detect, respond and recover. The likelihood of this event is considered to be RARE.



| AGL MINE RISK ASSESSMENT |  | SAGL                         |  |                  |            |                      |                  |                |            |            |
|--------------------------|--|------------------------------|--|------------------|------------|----------------------|------------------|----------------|------------|------------|
| Risk Control             | Code   | Tag ID                       | Description  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |
|                          | RR-COP-03136   | BC-00109                     | Site Security Fencing and Surveillance Systems   | No Owner Defined | In Service | 31.0%                | Critical Control | Engineering    | 1-Sep-2015 | Good       |
| Base Control<br>Comments | Cameras are strate                                     | gically installed along the  | site and monitored. On the observation of suspicious activities, AGL responds accordingly.         |                  |            |                      |                  |                |            |            |
|                          | The base control is                                    | assessed via the following   | g:   |                  |            |                      |                  |                |            |            |
|                          | - Implemented: Yes                                     |                              |  |                  |            |                      |                  |                |            |            |
|                          | - Type: Administrati                                   |                              |  |                  |            |                      |                  |                |            |            |
|                          | - Reliability: Good                                    |                              |  |                  |            |                      |                  |                |            |            |
|                          | - Monitoring/Auditin                                   | g: Performance monitoring    | 9  |                  |            |                      |                  |                |            |            |
|                          | Based on the above                                     | e, the effectiveness of the  | control is assessed to be GOOD.  |                  |            |                      |                  |                |            |            |
| Risk Control<br>Context  | Cameras strategica                                     | lly installed along the site | boundary and site perimeter includes security fencing  |                  |            |                      |                  |                |            |            |
| Risk Control<br>Comments | Cameras and respo                                      | onse can identify an appro   | paching fire within the surrounding landscape.   |                  |            |                      |                  |                |            |            |
|                          | Surveillance and do                                    | ouble fenced perimeter in    | some areas assist in identifying arson attack / approaching fire within the surrounding landscape. |                  |            |                      |                  |                |            |            |
|                          | The risk control is a                                  | ssessed via the following    | factors:   |                  |            |                      |                  |                |            |            |
|                          | - Independence: High                                   |                              |  |                  |            |                      |                  |                |            |            |
|                          | - Applicable: Moder                                    | ate                          |  |                  |            |                      |                  |                |            |            |
|                          | Based on the above, partial applicability is assigned. |                              |  |                  |            |                      |                  |                |            |            |
| Risk Control             | Code   | Tag ID                       | Description  | Owner            | Status     | Applicability Factor | Criticality      | Type/Factor    | Reviewed   | Assessment |
|                          | RR-COP-03137   | BC-00474                     | Security Management Plan   | No Owner Defined | In Service | 0.0%                 | Critical Control | Administrative | 1-Sep-2015 | Good       |

### Base Control The security and management plan cover aspects of deter, detect, respond and recover. It also includes a business resilience plan. Comments

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Very Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Risk Control Site security undertake regular patrols of the mining lease and surrounding areas.

Context

Risk Control The patrols are vital to early fire detection or identification of suspicious activity. Comments

The risk control is assessed via the following factors:

- Independence: Low (not independent of Escalation of Security Measures)
- Applicable: Mod-High

Based on the above, no applicability is assigned, as applicability has been assigned to the Escalation of Security Measures control.



| MINE RISK ASSESSMENT     | Active Risk Scenarios ID: RR-R-00075 |   |   |                             |                      |                                |                              |                               |  |             |  |  |
|--------------------------|--------------------------------------|---|---|-----------------------------|----------------------|--------------------------------|------------------------------|-------------------------------|--|-------------|--|--|
| Risk Control             | Code<br>RR-COP-03138                 | Tag ID<br>BC-00474                          | Description   | Owner<br>No Owner Defined   | Status<br>In Service | Applicability Factor<br>100.0% | Criticality Critical Control | Type/Factor<br>Administrative | Reviewed<br>14-Oct-2015                                    | Assessment  |  |  |
|                          | KK-COF-03130                         | DC-00474                                    | Security Management Plan  | No Owner Defined            | III Selvice          | 100.076                        | Chical Control               | Autilitistiative              | 14-00-2013   | Good        |  |  |
| Base Control<br>Comments | The security and i                   | management plan cover a                     | aspects of deter, detect, respond and recover. It also includes a business resilience pla | an.                         |                      |                                |                              |                               |  |             |  |  |
|                          |                                      | s assessed via the follow                   | ving:   |                             |                      |                                |                              |                               |  |             |  |  |
|                          | - Implemented: Ye                    |   |   |                             |                      |                                |                              |                               |  |             |  |  |
|                          | - Type: Administra                   |   |   |                             |                      |                                |                              |                               |  |             |  |  |
|                          | - Reliability: Very                  |   | <u> </u>  |                             |                      |                                |                              |                               |  |             |  |  |
|                          | - Monitoring/Audit                   | Monitoring/Auditing: Performance monitoring |   |                             |                      |                                |                              |                               |  |             |  |  |
|                          |                                      | ve, the effectiveness is as                 | ssessed to be GOOD.   |                             |                      |                                |                              |                               |  |             |  |  |
| Risk Control<br>Context  | Escalation of Sec                    | urity Measures                              |   |                             |                      |                                |                              |                               |  |             |  |  |
| Risk Control             | There is a defined                   | escalation process/set o                    | of measures required to be undertaken by the site security personnel in the event that t  | here is an elevated risk of |                      |                                |                              |                               |  |             |  |  |
| Comments                 | criminal/terrorist a                 |   | , , ,   |                             |                      |                                |                              |                               |  |             |  |  |
|                          | The risk control is                  | assessed via the following                  | ng factors:   |                             |                      |                                |                              |                               |  |             |  |  |
|                          | - Independence: H                    | ligh  |   |                             |                      |                                |                              |                               |  |             |  |  |
|                          | - Applicable: High                   |   |   |                             |                      |                                |                              |                               |  |             |  |  |
|                          | Based on the abo                     | ve, full applicability is ass               | signed.   |                             |                      |                                |                              |                               |  |             |  |  |
| Cause                    | Contamination                        | of Traralgon or She                         | epwash Creek with chemical or toxin (malicious act).                                      | Code                        | Status               |                                |                              |                               |  |             |  |  |
|                          |                                      |   |   | RR-CA-00732                 | Rejected             |                                |                              |                               |  |             |  |  |
| Comments                 | This cause is add                    | ressed in RR-R00063 Th                      | nerefore, this cause is not included on this bowtie.                                      |                             |                      |                                |                              |                               |  |             |  |  |
| onsequences              | 11110 00000 10 000                   |   | is color, the cause is not maked as in the sound.   |                             |                      |                                |                              |                               |  |             |  |  |
| Consequence              | Criminal relate                      | d hazard with the po                        | etential to impact public safety  | Code                        | Category             |                                | Likelih                      | ood                           | Severity   | Risk Rating |  |  |
| ·                        |                                      |   |   | RR-CQ-00556                 | Public Safety        |                                | Current Rare                 | (1) Seri                      | ous harm to members of the                                 | High        |  |  |
|                          |                                      |   |   |                             |                      |                                |                              | . ,                           | blic. Members of the public                                |             |  |  |
|                          |                                      |   |   |                             |                      |                                |                              | rer                           | quired to be displaced for a                               |             |  |  |
|                          |                                      |   |   |                             |                      |                                |                              |                               | significant period of time                                 |             |  |  |
|                          |                                      |   |   |                             |                      |                                |                              |                               | (weeks)  |             |  |  |
|                          |                                      |   |   |                             |                      | Pr                             | roposed Rare                 |                               | ous harm to members of the                                 | High        |  |  |
|                          |                                      |   |   |                             |                      |                                |                              |                               | blic. Members of the public                                |             |  |  |
|                          |                                      |   |   |                             |                      |                                |                              |                               | quired to be displaced for a<br>significant period of time |             |  |  |
|                          |                                      |   |   |                             |                      |                                |                              | ,                             | (weeks)  |             |  |  |
|                          |                                      |   |   |                             |                      |                                |                              |                               | (WOOKO)  |             |  |  |



| AGL MINE RISK ASS | ESSMENT                  | Active Risk Scenarios ID: RR-R-00075                             |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|-------------------|--------------------------|--|---------------------------------|--|--------------------------------|------------|----------------------|----------------------|---------------------|-------------|------------|--|--|
|                   | Risk Control             | Code   | Tag ID                          | Description  | Owner                          | Status     | Applicability Factor | Criticality          | Type/Factor         | Reviewed    | Assessment |  |  |
|                   |                          | RR-COM-03132   | BC-00186                        | HSM0001C Emergency Management Plan   | No Owner Defined               | In Service | 0.0%                 | Critical Control     | Administrative      | 9-Oct-2015  | Good       |  |  |
|                   |                          | 00 00.02   | 20 00100                        | Tomoco o Emolgono, managamont i an   | no omici zomici                | 00.1100    | 5.5 / 0              | ondear control       | , idiliiiilot diivo | 0 00(2010   | G000       |  |  |
|                   |                          |  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Base Control             | The activation of the  | e Emergency Management          | Plan may require engagement from major relevant stakeholders which may include         | 9:                             |            |                      |                      |                     |             |            |  |  |
|                   | Comments                 |  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - EPA  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  | atchment Management Au          | thority  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | <ul> <li>Gippsland Water a</li> <li>Department of He</li> </ul>  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Department of Fie  | aiti etc.                       |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | The base control is  | assessed via the following      |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Implemented: Yes   | -                               |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Type: Administrati   | ve                              |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Reliability: Good  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Monitoring/Auditin   | g: Performance monitoring       |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  |                                 | ontrol is assessed to be GOOD.   |                                |            |                      |                      |                     |             |            |  |  |
|                   | Risk Control<br>Context  | Emergency Respon   | nse Plan                        |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Risk Control<br>Comments | The Emergency Ma   | nagement Plan details the       | required response to various criminal acts.  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Comments                 | <b></b>  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  | ssessed via the following f     |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Applicable: Mod-H  | w (not independent of Section   | inty response Procedure)   |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Applicable, Wou-I  | iigii                           |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | Based on the above   | e, no applicability is assigne  | ed as this is not independent of the Security Response Procedure.                      |                                |            |                      |                      |                     |             |            |  |  |
|                   | Risk Control             | Code   | Tag ID                          | Description  | Owner                          | Status     | Applicability Factor | Criticality          | Type/Factor         | Reviewed    | Assessment |  |  |
|                   |                          | RR-COM-03133   | -                               | Agency and government response   | No Owner Defined               | In Service | 100.0%               | Non-Critical Control |                     | 9-Oct-2015  | Assessed   |  |  |
|                   |                          |  |                                 |  |                                |            |                      |                      |                     |             | 71000000   |  |  |
|                   | Diek Central             | Agency and govern  | mont roomana                    |  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Context                  | Agency and govern  | inent response                  |  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Pick Control             | Eutomal amargana   | roonandara will initiata wa     | rious plans and protocols in response to major fire and/or criminal act to minimise th | so risk to public health and   |            |                      |                      |                     |             |            |  |  |
|                   | Commonto                 | property.  | y responders will initiate va   | nous plans and protocols in response to major line and/or criminal act to minimise ti  | ie risk to public riealtir and |            |                      |                      |                     |             |            |  |  |
|                   |                          | property.  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | Although this is an  | effective and applicable co     | ntrol, the adequacy is not assessed as this is third party control.                    |                                |            |                      |                      |                     |             |            |  |  |
|                   | Risk Control             | Code   | Tag ID                          | Description  | Owner                          | Status     | Applicability Factor | Criticality          | Type/Factor         | Reviewed    | Assessment |  |  |
|                   |                          | RR-COM-03135   | BC-00474                        | Security Management Plan   | No Owner Defined               | In Service | 100.0%               | Critical Control     | Administrative      | 14-Oct-2015 | Good       |  |  |
|                   |                          |  |                                 |  |                                |            |                      |                      |                     |             | G000       |  |  |
|                   |                          |  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Base Control<br>Comments | The security and ma  | anagement plan cover asp        | ects of deter, detect, respond and recover. It also includes a business resilience pla | n.                             |            |                      |                      |                     |             |            |  |  |
|                   | Comments                 | <b>.</b>   |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  | assessed via the following      |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | <ul> <li>Implemented: Yes</li> <li>Type: Administrati</li> </ul> |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Reliability: Very G  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  | g: Performance monitoring       |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | ŭ  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | Based on the above   | e, the effectiveness is asse    | ssed to be GOOD.   |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | Security Response  | Procedure                       |  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Context                  |  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Risk Control             | In the event of a se   | curity threat, scenario plans   | s as identified in the Security Management Plan Manual are initiated.                  |                                |            |                      |                      |                     |             |            |  |  |
|                   | Comments                 |  |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          |  | ssessed via the following for   | actors:  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Independence: High   | gh                              |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | - Applicable: High   |                                 |  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | Rased on the above   | e, full applicability is assign | ed.  |                                |            |                      |                      |                     |             |            |  |  |
|                   |                          | Dasou on the above   | o, run approadility is assign   | ou.  |                                |            |                      |                      |                     |             |            |  |  |



| MINE RISK ASSESSMENT     |   |                            | Active Kis  | Active Risk Scenarios ID. RR-R-00075 |               |                      |                      |                |  |             |  |  |
|--------------------------|---|----------------------------|---|--------------------------------------|---------------|----------------------|----------------------|----------------|--|-------------|--|--|
| Consequence              | Criminal related  | hazard with the po         | otential to impact the environment  | Code                                 | Category      |                      | Likelil              | ood            | Severity   | Risk Rating |  |  |
|                          |   |                            |   | RR-CQ-00557                          | Environment & |                      | Current Rare         | (1) Mo         | derate, short to medium term                         | Low         |  |  |
|                          |   |                            |   |                                      | Community     |                      |                      | en             | vironmental impact that may                          |             |  |  |
|                          |   |                            |   |                                      |               |                      |                      |                | extend beyond AGL's                                  |             |  |  |
|                          |   |                            |   |                                      |               |                      |                      |                | perational area and/or may result in local community |             |  |  |
|                          |   |                            |   |                                      |               |                      |                      |                | complaint(s).  |             |  |  |
|                          |   |                            |   |                                      |               |                      | Proposed Rare        | (1) Mo         | derate, short to medium term                         | Low         |  |  |
|                          |   |                            |   |                                      |               |                      |                      | en             | vironmental impact that may                          |             |  |  |
|                          |   |                            |   |                                      |               |                      |                      |                | extend beyond AGL's                                  |             |  |  |
|                          |   |                            |   |                                      |               |                      |                      |                | perational area and/or may result in local community |             |  |  |
|                          |   |                            |   |                                      |               |                      |                      |                | complaint(s).  |             |  |  |
| Risk Control             | Code  | Tag ID                     | Description   | Owner                                | Status        | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment  |  |  |
|                          | RR-COM-03139  | BC-00186                   | HSM0001C Emergency Management Plan  | No Owner Defined                     | In Service    | 0.0%                 | Critical Control     | Administrative | 9-Oct-2015   | Good        |  |  |
| Paga Control             | The set set of the  | - F M                      |   |                                      |               |                      |                      |                |  |             |  |  |
| Comments                 | - Vic police  | E Lineigency Managen       | ment Plan may require engagement from major relevant stakeholders which may include:                |                                      |               |                      |                      |                |  |             |  |  |
|                          | - EPA   |                            |   |                                      |               |                      |                      |                |  |             |  |  |
|                          |   | atchment Managemen         | tt Authority  |                                      |               |                      |                      |                |  |             |  |  |
|                          | <ul> <li>Gippsland Water a</li> <li>Department of Heat</li> </ul> |                            |   |                                      |               |                      |                      |                |  |             |  |  |
|                          | Dopartment of Flor  | uiui oto.                  |   |                                      |               |                      |                      |                |  |             |  |  |
|                          |   | assessed via the follow    | wing:   |                                      |               |                      |                      |                |  |             |  |  |
|                          | - Implemented: Yes  |                            |   |                                      |               |                      |                      |                |  |             |  |  |
|                          | <ul> <li>Type: Administrati</li> <li>Reliability: Good</li> </ul> | ve                         |   |                                      |               |                      |                      |                |  |             |  |  |
|                          | •   | g: Performance monito      | pring   |                                      |               |                      |                      |                |  |             |  |  |
|                          | Rased on the above  | the effectiveness of t     | the control is assessed to be GOOD.   |                                      |               |                      |                      |                |  |             |  |  |
| Risk Control             | Emergency Respon  | ,                          | 30.000 0 000000 0 00 00000.   |                                      |               |                      |                      |                |  |             |  |  |
| Context                  | g,p   |                            |   |                                      |               |                      |                      |                |  |             |  |  |
| Risk Control<br>Comments | The Emergency Ma  | nagement Plan details      | the required response to various criminal acts.   |                                      |               |                      |                      |                |  |             |  |  |
|                          | The risk control is a   | ssessed via the followi    | ing factors:  |                                      |               |                      |                      |                |  |             |  |  |
|                          | - Independence: Lo  |                            |   |                                      |               |                      |                      |                |  |             |  |  |
|                          | - Applicable: Mod-H   | ligh                       |   |                                      |               |                      |                      |                |  |             |  |  |
|                          | Based on the above  | e, no applicability is ass | signed as this is not independent of the Security Response Procedure.                               |                                      |               |                      |                      |                |  |             |  |  |
| Risk Control             | Code  | Tag ID                     | Description   | Owner                                | Status        | Applicability Factor | Criticality          | Type/Factor    | Reviewed   | Assessment  |  |  |
|                          | RR-COM-03140  |                            | Agency and government response  | No Owner Defined                     | In Service    | 100.0%               | Non-Critical Control |                | 9-Oct-2015   | Assessed    |  |  |
| Risk Control<br>Context  | Agency and govern   | ment response              |   |                                      |               |                      |                      |                |  |             |  |  |
| • •                      |   | responders will initiate   | e various plans and protocols in response to major fire and/or criminal act to minimise the risk to | public health and                    |               |                      |                      |                |  |             |  |  |
|                          |   |                            |   |                                      |               |                      |                      |                |  |             |  |  |

Although this is an effective and applicable control, the adequacy is not assessed as this is third party control.



Risk Control Code Tag ID Description Status Applicability Factor Criticality Type/Factor Reviewed Assessment RR-COM-03141 BC-00474 Security Management Plan 100.0% No Owner Defined In Service Critical Control Administrative 14-Oct-2015 Good

Comments

Base Control The security and management plan cover aspects of deter, detect, respond and recover. It also includes a business resilience plan.

The base control is assessed via the following:

- Implemented: Yes
- Type: Administrative
- Reliability: Very Good
- Monitoring/Auditing: Performance monitoring

Based on the above, the effectiveness is assessed to be GOOD.

Context

Risk Control Security Response Procedure

Comments

Risk Control In the event of a security threat, scenario plans as identified in the Security Management Plan Manual are initiated.

The risk control is assessed via the following factors:

- Independence: High
- Applicable: High

Based on the above, full applicability is assigned.