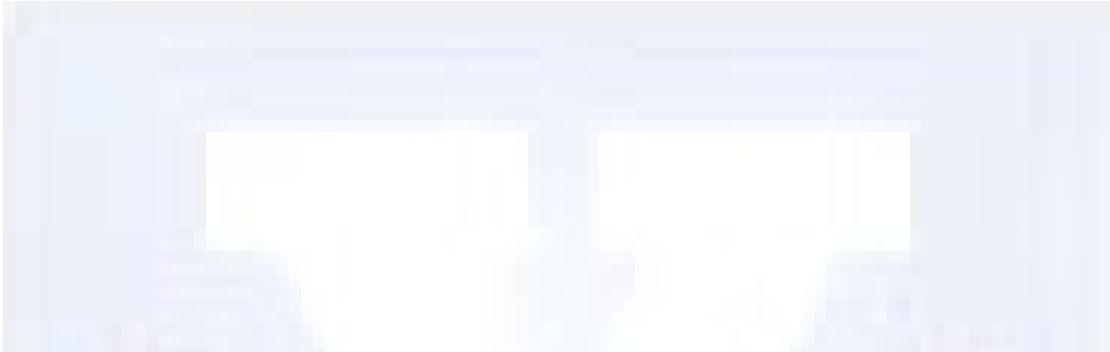
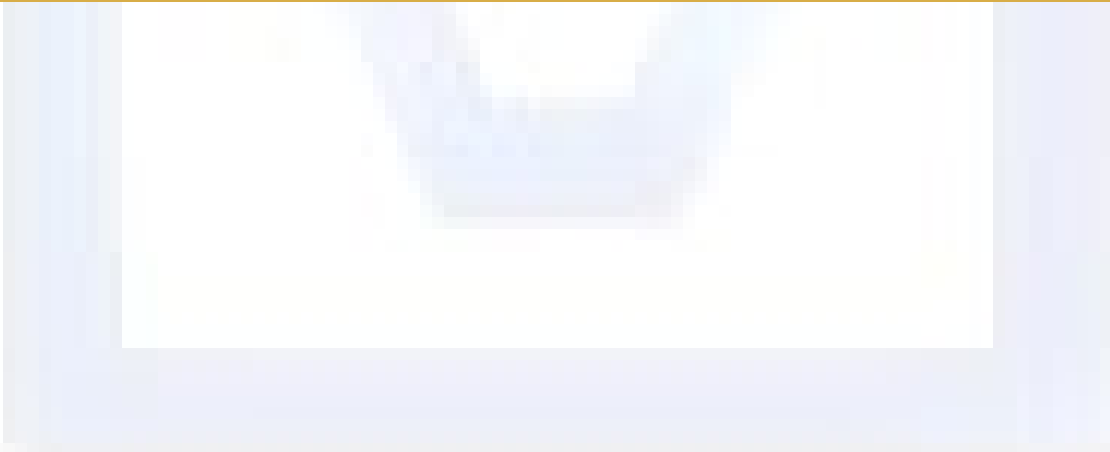




Mine Operating Procedure Lighting





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1. PURPOSE

The purpose of this procedure is to describe the requirements and to ensure effective management of hazards and risks associated with lighting at the Vulcan Mine.

2. SCOPE

This procedure is applicable to all persons at the Vulcan Mine including employees, contractors and visitors. The controls within this procedure are mandatory.

3. DEFINITIONS

Authorised Person	A person who has the required competencies and who has been appointed by the Site Senior Executive to carry out a designated scope of duties.
CMSHA	Queensland Coal Mining Safety and Health Act (1999).
CMSHR	Queensland Coal Mining Safety and Health Regulation (2017).
CMW	Coal Mine Worker.
Competent Person	A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly a specified task.
JHA	Job Hazard Analysis.
HME	Heavy Mining Equipment.
IP Rating	Ingress Protection Rating.
MOP	Mine Operating Procedure.
MOP	Mine Operating Procedure.
ROM	Run of Mine.
SHMS	Safety and Health Management System.
Take 5	Personal Risk Assessment.

4. PROCEDURE

4.1. Strategy

Buildings, structures and areas at the Vulcan Mine will be provided with appropriate levels of lighting which:

- Are adequate to allow employees to work safely;
- Do not create excessive glare or reflection;
- Are adequate to allow persons to move safely within the workplace; and
- facilitate safe access to and egress from the workplace.

Positioning of mobile lighting equipment shall be considered regarding contrast, shadow and glare.

Lighting apparatus shall meet the requirements of:

- AS 2293.1 Emergency Evacuation Lighting for Buildings;
- AS 1680 Interior Lighting; and
- Recommended luminance levels are as per Appendix 1, AS 1680.2.4 Industrial tasks and processes.

Lighting levels will comply with the Minimum Average Values of Illuminance (where practicable).



Lighting measurements shall be undertaken in accordance with Australian Standard AS 1680.3 - Interior Lighting - Part 3: 'Measurement, Calculation and Presentation of Photometric Data'.

4.2. Lighting at Operational Areas

Adequate lighting resources shall be provided on-site to service all mandatory areas including:

- pedestrian crossings;
- permanent walkways;
- go-lines;
- permanent parking and workshop areas;
- active mining areas;
- ROM pad;
- drill bench;
- dig floor;
- active tip head; and
- any other areas as indicated by risk assessment.

The type and quality of the lighting provided shall consider the following factors:

- required safe illumination level;
- position and height of lights relative to traffic;
- delineation and protection from vehicle impacts; and
- access and servicing requirements for lighting.

Light vehicle or HME headlamps shall not be considered an appropriate form of lighting for areas where mandatory lighting applies.

Lighting plant shall have acceptable access for maintenance and refuelling operations.

4.3. Work Area Lighting

General lighting or work lighting adequate for the task shall be provided and used for work conducted in the hours of darkness or in low light areas.

Work lighting may be provided by portable lighting or work lights fitted to vehicles and equipment.

Lighting provided shall be arranged to cause minimum glare and eyestrain and to ensure external moving parts of any fixed machinery are clearly visible.

Some of the general provisions for lighting include:

- portable lighting plants and automatic light control systems are to be regularly maintained;
- defects to lighting plant shall be advised to the Supervisor and appropriate action taken to rectify;
- safe lighting fixtures shall be used in areas where flammable or explosive atmospheres could be generated. the class of lighting used of an IP rating for certain areas including near water, heat, dust, flammable or explosive areas etc;
- statutory checks are conducted and recorded by the Site Electrician;
- extra low voltage portable lighting shall be provided for work in confined spaces;
- extra low voltage hand-held lighting shall be provided for work in workshops and plant;
- extra low voltage cap lighting shall be provided for plant operators and mechanical personnel; and



- portable lighting over 50 volts shall only be used as area lighting, not as a personal work light.

4.4. Emergency Lighting

Emergency evacuation lighting shall be installed in buildings and plant where necessary. This shall operate following the failure of general lighting in any occupied building or plant enclosure to ensure self-escape of persons to a point of safety.

Emergency lighting systems shall conform to the AS 2293.1 Emergency evacuation lighting for buildings.

The EEM will perform an audit each year to map compliance against the standard.

The use of self-illuminated exit signs conforming to the AS 2293.3 are considered suitable to denote emergency exits from buildings or enclosures.

In the event of a power outage emergency lighting indicates where the emergency exits are located and shall illuminate long enough for people to exit the building before shutting off.

4.5. Hand-Held Portable Lighting

The use of portable lighting may be required from time to time. When working in hazardous areas such as confined spaces, the use of low voltage lighting (i.e. less than 32 volts) should be considered.

4.6. Lighting Plant

Lighting plant shall be used in work areas where it is otherwise not practicable to install permanent lighting. Lighting Plants should be up in accordance with VUL-SWP-144 (1) Setup Lighting Plant. The lighting plants should be set up to ensure adequate lighting, having regard to shadow, contrast, and glare, in each area of the mine in which work is to be carried out so the work can be carried out safely.

4.7. Inspection and Maintenance

Any lighting failure shall be reported through maintenance planning and management system to allow suitable repairs to be completed in a planned process.

All emergency lighting apparatus shall be inspected and tested every 12 months as per the maintenance program with reference to statutory requirements.

4.8. Mobile Equipment and Lighting

Lighting on mobile equipment should be set up to suit the tasks the equipment will be performing. All equipment lighting shall be checked for operation as part of the equipment prestart inspection.

Any lighting failure shall be reported through the maintenance planning and management system to allow suitable repairs to be completed in a planned process.

4.9. Reporting

All equipment defects shall be reported to the defect reporting system to ensure the non-operating equipment is scheduled for repair.



5. ROLES AND RESPONSIBILITIES

SSE	Shall review and approve this procedure.
HSET Superintendent	Shall ensure that all provisions of this procedure are implemented, and that compliance is achieved.
Managers/Superintendents	Shall be responsible for their area of operations and the implementation and application of this procedure; Provide adequate training, information, structure and supervision to ensure that this procedure is implemented; Carry-out a periodic review of activities to ensure the appropriate application and understanding of this procedure; and Ensure immediate and appropriate steps are taken to investigate and rectify any risks to health and safety arising from these activities.
Supervisors	Ensure all CMWs are familiar with, have access to and comply with the requirements set out in this procedure.
All CMWs (including visitors and contactor)	Shall comply with the requirements of this procedure.

6. REFERENCES

- AS/NZS 1680.0:2009 Interior lighting - Safe movement
- AS/NZS 1680.1:2006 Interior and workplace lighting – General principles and recommendations
- AS/NZS 1680.2.2:2008 Interior and workplace lighting – Specific applications - Office and screen-based tasks
- AS/NZS 1680.2.4:2017 Interior and workplace lighting – Industrial tasks and processes
- AS/NZS 1680.3:2017 Interior Lighting - Measurement, calculation and presentation of photometric data
- AS/NZS 2293.1:2018 Emergency lighting and exit signs for building – System design, installation and operation
- Coal Mining Safety and Health Act 1999 (Qld)
- Coal Mining Safety and Health Regulation 2017 (Qld)

7. REVIEW

This document shall be reviewed at a minimum every two (2) years or, as follows:

- when there is a change of method and/or technology and/or legal or other requirement that may affect the accuracy of this document;
- when operational changes occur that effect the currency of the document;
- when there has been a significant event to which this document was relevant; and
- as a result of relevant audit findings.

8. DOCUMENT CONTROL

Version	Date	Description	Document Controller
01	21/05/2020	Initial draft	Rachael Dacker
02	03/07/2020	Risk workshop	Shane Johnson
03	05/12/2023	Review and formatting	Kelly Jensen



9. APPENDIX 1 RECOMMENDED LIGHTING INTENSITY STANDARDS

RECOMMENDED MAINTAINED ILLUMINANCES FOR VARIOUS TYPES OF TASKS, ACTIVITIES OR INTERIORS

Class of task		Recommended maintained illuminance lx	Characteristics of the activity/interior	Representative activities/interiors
Movement and orientation*		40	Interiors rarely visited with visual tasks limited to movement and orientation	Corridors; cable tunnels; indoor storage tanks; walkways.
Rough intermittent*		80	Interiors requiring intermittent use with visual tasks limited to movement, orientation and coarse detail.	Staff change rooms; live storage of bulky materials; dead storage of materials needing care; locker rooms; loading bays.
Normal range of tasks and work places	Simple	160	Any continuously occupied interior where there are no tasks requiring perception of other than coarse detail. Occasional reading of clearly printed documents for short periods.	Waiting rooms; staff canteens; rough checking of stock; rough bench and machine work; entrance halls; general fabrication of structural steel; casting concrete; automated process monitoring; turbine halls.
	Ordinary or moderately easy	240	Continuously occupied interiors with moderately easy visual tasks with high contrasts or large detail (>10 min arc).	School chalkboards and charts; medium woodworking; food preparation; counters for transactions.
	Moderately difficult	320	Areas where visual tasks are moderately difficult with moderate detail (5-10 min arc or tolerances to 125µm) or with low contrasts.	Routine office tasks, e.g. reading, writing, typing, enquiry desks.
		400		Inspection of medium work; fine woodwork; car assembly.
	Difficult	600	Areas where visual tasks are difficult with small detail (3-5 min arc or tolerances to 25µm) or with low contrast.	Drawing boards; most inspection tasks; proofreading; fine machine work; fine painting and finishing; colour matching.
	Very difficult	800	Areas where visual tasks are very difficult with very small detail (2-3 min arc) or with very low contrast.	Fine inspection; paint retouching; fine manufacture; grading of dark materials; colour matching of dyes.
Extremely difficult		1200	Areas where visual tasks are extremely difficult with extremely small detail (1-2 min arc or tolerances below 25µm) or of low contrast. Visual aids may assist.	Graphic arts inspection; hand tailoring; fine die sinking; inspection of dark goods; extra-fine bench work.
Exceptionally difficult		1600	Areas where visual tasks are exceptionally difficult with exceptionally small detail (<1 min arc) or with very low contrasts. Visual aids will be of advantage.	Finished fabric inspection; assembly of minute mechanisms, jewellery and watchmaking.

* Refer also to AS/NZS 1680.0 for minimum requirements for safe movement.

NOTE: See the Standards in the AS(NZS) 1680.2 series for the recommended maintained illuminance for specific tasks and interiors.