Light Management Plan

Bendigo-Ophir Gold Project

Prepared for Matakanui Gold Limited
19 June 2026

This Light Management Plan has been prepared for Matakanui Gold Ltd by Paul Wilson (TechIES) from Xyst.

Revision History

Rev.	Date	Author	Notes
1.0	10/06/2026	PW	Draft for issue
2.0	19/06/2026	PW	Final for Issue

ACRONYMS AND ABBREVIATIONS

ADSA	Australian Dark Sky Alliance
AS/NZS1158	Australian/New Zealand Standard 1158.3.1:2020 Lighting for roads and public spaces, Part 3.1: Pedestrian area (Category P) lighting – Performance and design requirements.
AS/NZS1680	Australian/New Zealand Standard 1680.5: 2012 Interior and workplace lighting Part 5: Outdoor workplace lighting
AS/NZS4282	Australian/New Zealand Standard 4282:2023 Control of the obtrusive effects of outdoor lighting.
CCT	Colour correlated temperature
CODC	Central Otago District Council
DarkSky.org	International Dark Sky Association
LED	Light Emitting Diode
MGL	Matakanui Gold Limited

CONTENTS

1. INTRODUCTION

1.1 Overview

Matakanui Gold Limited ("MGL" or "the company") is proposing to establish a new goldmining operation called the Bendigo-Ophir Gold Project ("BOGP" or "the project") on the Bendigo and Ardgour Stations in the Dunstan Mountains of Central Otago, located approximately 20 km north of Cromwell.

The application by MGL, which is made under the Fast-track Approvals Act 2024 seeks to authorise the integrated development of four identified gold deposits - through the establishment of staged open pits and an underground mine - together with a modern gold processing plant and associated infrastructure and ancillary activities.

This Light Management Plan has been prepared to guide the design, installation and operation of outdoor lighting within the project site to minimise the effects of artificial light on the night sky, neighbours and surrounding environment.

The LMP has been prepared in accordance with best practice principles, regulatory requirements and current standards including AS/NZS 4282:2023 Control of the obtrusive effects of outdoor lighting.

This LMP proposes a higher standard of obtrusive light control than required by the existing local regulatory requirements and Australian/New Zealand standards. It has a focus on protecting the quality of the night sky and the amenity of the surrounding environment through good design, careful luminaire selection and use of lighting controls.

1.2 Project site

The proposed mining activities within the Project Site are located within the semi-arid high-country area in the Dunstan Mountains within the privately-owned pastoral lands of the Bendigo Station and Ardgour Station.

The majority of the Project (including the areas to be lit) is located within an area of an identified Outstanding Natural Landscape ("ONL") (as defined by the RMA and Central Otago District Plan). An ONL is naturally an area with low levels of ambient light and therefore, the mitigation of obtrusive lighting effects is especially important in that regard.

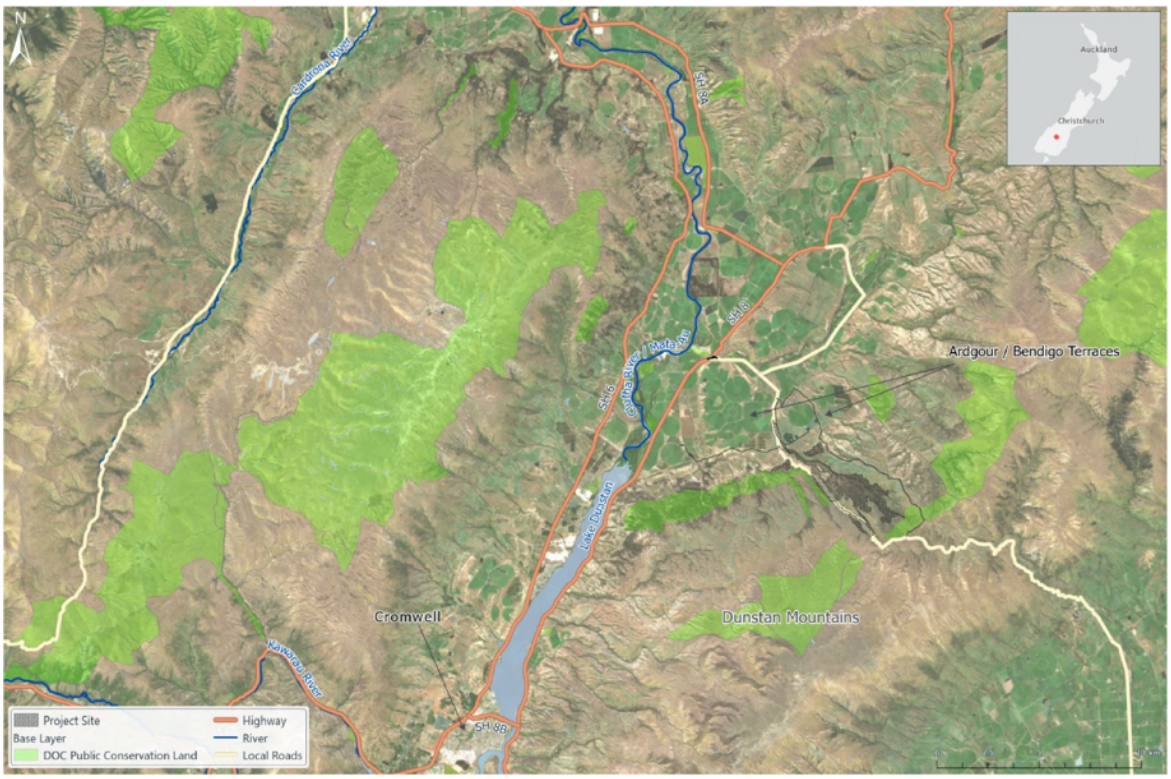

Figure 1 General Location of the Bendigo-Ophir Gold Project

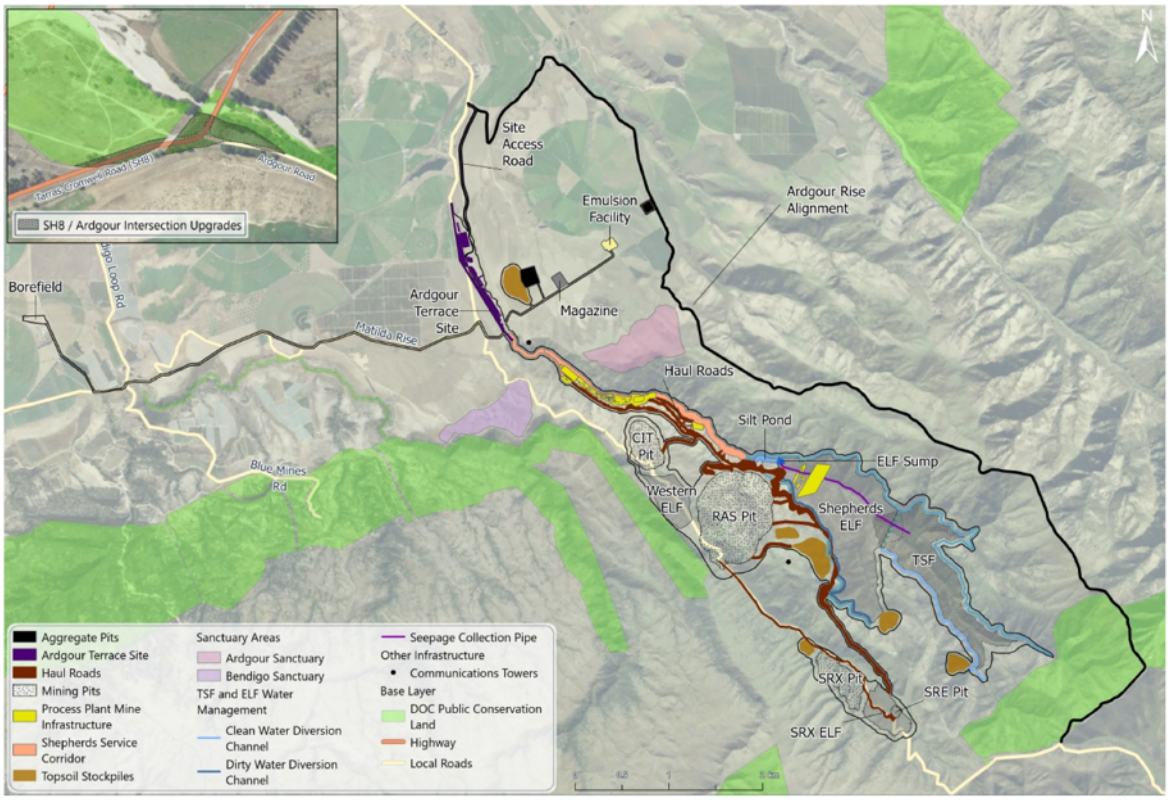

Figure 2 Project Site - Layout of the Bendigo-Ophir Gold Project

This LMP covers all fixed exterior lighting within the Project site as shown in Figure 2.

1.3 Proposed lighting

The following lighting is proposed:

1. Ardgour Terrace Site – parking, roading, storage, pedestrian circulation, building surrounds, weighbridge
2. Process Plant Mine Infrastructure – storage, circulation, processing areas, processing plant, building surrounds
3. Mobile Lighting – mining activity

1.4 Purpose of this plan

This LMP seeks to minimise potential lighting effects on the rural night-time environment and apply best practice principle to management of lighting in the design, installation and operation of lighting proposed on site. It sets out the requirements for all fixed, mobile, and construction artificial lighting to be used as a part of the mine works, including:

- Use lighting with a colour temperature of ≤3000K, except where a higher colour temperature is demonstrated to be necessary for operational safety.
- Reduce intensity/output of fittings to the minimum required for safety.
- Direct and tilt all lighting downward, avoiding spill onto roads, waterbodies, and residential areas.
- Apply a "start dark, add light only where needed" approach to all lighting decisions.
- Strategically locate lighting rigs to take advantage of natural landform shielding.
- Installation of blinds to windows and glass doors where buildings are to be used after dark.

1.5 Outcomes sought

The lighting installation shall achieve the following outcomes:

- Compliance with all relevant consent conditions and AS/NZS 4282:2023
- No unreasonable adverse effects on neighbouring properties or road users
- Protection of night sky values within the Outstanding Natural Landscape
- Minimisation of ecological effects on identified sensitive habitats
- Provision of safe and functional lighting for operational requirements

1.6 Scope

This LMP covers the design, operation and maintenance of all exterior lighting within the project site.

While AS/NZS 4282:2023 *Control of the obtrusive effects of lighting* explicitly excludes "emergency warning, wayfinding lights/ marker lights, navigation lighting, all traffic signals, traffic signage and vehicle headlights, including working lights mounted on moving vehicles and plant" this LMP includes measures to manage the effects of interior lighting, vehicle lighting and working lights.

1.6 Roles and responsibilities

The following roles and responsibilities apply to the LMP.

Role	Responsibility
Consent Holder	Overall compliance and implementation
Lighting Designer	Design certification and modelling
Site Manager	Day-to-day operation and controls
Independent Lighting Engineer	Audit and certification
Environmental Manager	Complaints + monitoring reporting

2. REGULATORY CONTROLS

2.1 District Plan lighting rules and performance standards

2.1.1 Operative District Plan

The Central Otago District Plan includes the following:

12.7.6 Light Spill	
i. **Lightspill Standard**	No activities shall result in greater than 10 lux spill (horizontal and vertical) of light onto any adjoining property or road, measured at the boundary of a road or the notional boundary of a neighbouring property, provided that this rule shall not apply to headlights of moving vehicles or vehicles that are stationary for less than 5 minutes or to street lighting.
	The amount of light that may be spilled onto a neighbouring property may be increased by not more than 100%, in cases where the activity on that neighbouring property is not residential.
	Note: The "notional boundary" in respect of a residential activity means the line 20 metres from the façade of the building or the legal boundary of the site on which the building is located where the boundary is closer to the building than 20 metres.
ii. **Breach of Standard**	Any activity which does not comply with this rule shall be a discretionary (restricted) activity. Council shall restrict the exercise of its discretion to the effects on amenity values of the neighbourhood and the safe and efficient operation of adjoining roads.
Reason	Lightspill from external lighting can be a nuisance and can be avoided by careful siting and design of lighting fixtures.

2.1.2 Plan Change 22 LIGHT (Dark Sky)

Plan Change 22 is an operative plan change that only apply to sites identified in the District Plan as being subject to a dark sky precinct. Currently this is limited to the Naseby Dark Sky Precinct. The Polices, Rules and Standards applicable to Plan Change 22 are included in Appendix 1.

2.2 Proposed land use consent and conditions

MGL has proposed the following land use consent conditions as part of it application:

Condition No.	Proposed Condition	Note
28.	Lighting from all activities within the Project Site (excluding vehicle headlights) must not result in greater than 10 lux spill (horizontal and vertical) of light onto any adjoining private property (not owned by the Consent Holder or related company, or subject to an agreement with the Consent Holder or related company) or public road. This condition does not apply to any streetlight installed for safety purposes insofar as it causes light spill on the public road. The amount of light that may be spilled onto a neighbouring private property may be increased by not more than 100% (compared to the situation in the absence of the lighting), in cases where the activity on that neighbouring property is not a residential activity.	Per BOGP Exterior Lighting report and District Plan.
29.	Where luminaires are visible from external locations or are high output floodlights: a. They must be installed such that their light producing faces are horizontal to the ground as far as reasonably practicable; b. Luminaires must be aimed away from external locations (i.e. into the Project Site); and c. They must be of luminous intensity not exceeding the limits set out in AS/NZS 4282:2023 "Control of the obtrusive effects of outdoor lighting" for the applicable environmental zone; d. Prior to final lighting design, the Consent Holder shall obtain written confirmation from Central Otago District Council of the applicable AS/NZS 4282:2023 environmental zone, and the lighting design carried out in compliance with the requirements of the confirmed zone.	
30.	The final lighting arrangement must be modelled to demonstrate compliance with AS/NZS 4282:2023 and, where practicable and safe to do so, the principles of the Dark Sky Chapter Provisions of the Central Otago District Plan as follows: a. All fixed exterior lighting must be directed away from any adjacent roads, residential properties and lakes; b. All outdoor lighting (excluding mobile equipment) must be shielded from above the light in such a manner that the edge of the shield is below the light source that no direct light is emitted above the horizontal; c. Only light-emitting diode (LED), low pressure sodium and high-pressure sodium lamps are to be used; and d. Lighting must be limited to a maximum of 12 lumens per square metre except where the lighting design shall demonstrate compliance with the obtrusive lighting limits of AS/NZS4282:2023 for the applicable environmental zone,	

	except where additional illuminance is required for operational practicality or health and safety requirements. e. All permanent exterior luminaires shall have zero upward light ratio (ULR = 0) when installed.	
31.	To minimise ecological impacts, the Consent Holder must, as far as reasonably practicable, use lighting with the following characteristics: For fixed lighting (such as the construction workers accommodation and office areas): Low-output, warm-coloured LED lighting at 3,000K (or less); Building-mounted lighting with bollard support to limit horizontal and vertical light spill; and Automated timing controls, dimming functions, and movement sensors to reduce unnecessary luminance. b. For fixed lighting (such as the processing plant and infrastructure areas): Horizontal and upward lighting fixture controls to contain light spill where practicable. As far as reasonably practicable, the Consent Holder must avoid direct lighting toward the high-value ecosystems (i.e. Cushionfields / Mixed depleted herbfield and grassland) shown in **Attachment A** to this Land Use Consent. This condition does not apply to vehicles and mobile plant that is temporarily located at a work site and repositioned as part of normal operations, but shall apply to any plant or equipment that remains in a fixed location for more than seven consecutive days.	
32.	Within six months of the commencement of this consent, the Consent Holder must engage a suitably qualified and experienced independent lighting engineer to model and review the lighting arrangements proposed for the construction / site establishment activities and mining operations for the BOGP and confirm that the lighting levels comply complies with Conditions 28 to 31 (above) of this consent. The lighting engineer undertaking this review shall not be the lighting designer responsible for preparing the lighting design for the project. A copy of the certification from the suitably qualified and experienced independent lighting engineer required under Condition 32 (above) must be held on site and provided to the Central Otago District Council. Where the review identifies that the lighting design does not comply with the consent conditions, the lighting design shall be modified and recertified to demonstrate compliance.	
New 1.	Lighting Management Plan Prior to commencement of construction, the Consent Holder shall prepare and submit a Lighting Management Plan to Central Otago District Council for approval. The Lighting Management Plan shall set requirements for all fixed and mobile lighting, including vehicle lighting	

	where practicable. It shall include an intent, scope, applicable legislation, roles and responsibilities, certification process and a complaints process. The Lighting Management Plan shall set out the requirements for all fixed, mobile, and construction artificial lighting to be used as a part of the mine works, including: i. Use lighting with a colour temperature of ≤3000K, except where a higher colour temperature is demonstrated to be necessary for operational safety. ii. Reduce intensity/output of fittings to the minimum required for safety. iii. Direct and tilt all lighting downward, avoiding spill onto roads, waterbodies, and residential areas. iv. Apply a "start dark, add light only where needed" approach to all lighting decisions. v. Strategically locate lighting rigs to take advantage of natural landform shielding. vi. Installation of blinds to windows and glass doors where buildings are to be used after dark. d. The Lighting Management Plan shall include Lighting Audit requirements and Periodic Review. e. The Lighting Management Plan shall be prepared by a suitably qualified and experienced lighting professional.	
New 2.	Neighbour Consultation The Consent Holder shall engage with potentially affected neighbours on the proposed lighting strategy prior to construction and shall implement reasonable and practicable measures raised through that consultation. Where lighting complaints are received and substantiated, the Consent Holder shall implement reasonable and practicable mitigation measures.	

3. LIGHTING GUIDANCE

3.1 Principles for responsible outdoor lighting

DarkSky and the IES have jointly published five principles for responsible outdoor lighting to prevent and reduce light pollution through the proper application of quality outdoor lighting. These principles shall be applied when designing and operating all exterior lighting within the Project site.

Figure 3 Five Lighting Principles for Responsible Outdoor Lighting (DarkSky.org)

3.2 Control of obtrusive light

AS/NZS 4282 is the current Australian/New Zealand standard for the control of obtrusive light. Applicable technical light limiting factors are based on selecting the relevant environmental zone which considers the ambient light levels present in the environment noting that in very dark rural areas, less light is required and people may be more sensitive to obtrusive light than in brightly lit urban areas.

3.2.1 Environmental Zone

ASNZS4282 (Table 3.1 Environmental zones) sets out environmental zones used for the assessment of conformance of lighting schemes under the Standard.

The site is assessed as Environmental Zone A1 based on its remote rural setting, absence of permanent surrounding lighting, and location within an Outstanding Natural Landscape. This represents a conservative (more stringent) classification than the Environmental Zone A2 but is achievable.

Table 3.1 — Environmental zones

Environmental zones	Ambient light conditions	Descriptions/ Examples
A0	Intrinsically dark	UNESCO Starlight Reserve. IDA: Dark Sky Parks, Reserves or Sanctuaries Major optical observatories Other accreditations for dark sky places for example astrotourism, heritage value, astronomical importance, wildlife/ecosystem protection Lighting for safe access may be required
A1	Dark	Relatively uninhabited rural areas (including terrestrial, marine, aquatic and coastal areas) Generally roadways without streetlighting through rural areas
A2	Low district brightness	Sparsely inhabited rural and semi-rural areas Generally roadways without streetlighting through suburban, rural or semi-rural areas other than intersections
A3	Medium district brightness	Suburban areas in towns and cities Generally roadways with streetlighting through suburban, rural or semi-rural areas
A4	High district brightness	Town and city centres and other commercial areas Residential areas abutting commercial areas Industrial and Port areas Transport Interchanges
TV	High district brightness	Vicinity of major sport and event stadiums during TV broadcasts
NOTE Zones A0 and A1 would normally have a minimum area of 50 ha.(0.5 km^2). There may be smaller environmentally sensitive areas.		

Figure 4 ASNZS4282 Table 3.1 Environmental Zones

3.2.2 Applicable limiting values

The applicable limiting values set by ASNZS4282 for Environmental Zones A1 and A2 (for comparison only are as follows:

Table 1 Summary of limiting values for Zones A1 and A2

Technical parameter	Limiting Value Zone A1 (Dark)	Limiting Value Zone A2 (Low District Brightness)
Maximum vertical illuminance (non-curfew)	2 (E_v) lux	5 (E_v) lux
Maximum vertical illuminance (curfew)	0.1 (E_v) lux	1 (E_v) lux
Maximum Threshold increment (TI)	20%	20%
Default Adaptation Level (L_{ad}) cd/m^2	0.1	0.2
Maximum Upward Light Ratio (ULR_s or ULR_L)	0.00	0.01

Maximum luminous intensities per luminaire (Non-curfew Level 1)	2,500 cd*	7,500 cd*
Maximum luminous intensities per luminaire (Curfew)	500 cd*	1,000 cd*
Maximum average luminance of surfaces (signs, façade lighting and objects)	50 cd/m^2	150 cd/m^2

* Clause 3.3.1.3 for location and design of calculation point/s for measurement of values

3.2.3 Curfew

Mining operations may be conducted 24/7. This LMP adopts the standard AS/NZS 4282 curfew period of 11 p.m. and 6 a.m.

3.3 Other important factors in control of obtrusive light

Appendix A of ASNZS4282 sets out a variety of measures that can help mitigate the effects of obtrusive light. Measures relevant to this LMP include the following:

1. A competent and experienced lighting designer should be engaged in the detailed design and commissioning of the lighting scheme.
2. Employ lighting controls such as time or motion sensors to limit lighting to only when it is needed.
3. Select fixtures of appropriate design and output to minimise light pollution.
4. Use the minimum amount of light required to meet standards and operational needs. Do not over-light.
5. Consider the reflective properties of surfaces and materials being lit. Select path and road surfaces with low reflectivity.
6. Use light sources with a CCT of 3000K or less.
7. Carefully select mounting heights of light fixtures. Low mounting heights can result in higher mounting angles, with higher intensities and increased spill light. Low mounting heights will also result in more fixtures being needed to light a given area with the required uniformity.
8. Where possible use building eaves, vegetation and other structures or landforms to shield the effects and impact on distant observers from lighting.

These measures have been incorporated into this LMP.

4. LIGHTING REQUIREMENTS

Lighting is required to illuminate three classes of workplace tasks: These are:

1. General outdoor tasks (movement, orientation, loading and unloading and some assembly work)
2. Specific outdoor tasks (outdoor tasks that are similar to indoor tasks)
3. Outdoor circulation tasks (vehicle and pedestrian movement including parking).

4.1 Working areas

AS/NZS 1680.1 AS/NZS 1680.2 describes the requirements for lighting of outdoor workplaces. The limiting values for lighting are shown for the relevant workspaces are shown in Table 2. Lighting should meet the limiting values required but not exceed them by more than is necessary.

Table 2 AS/NZS 1680 Limiting values for outdoor workspaces

Description		Average illuminance (E_{av}) Lux	Minimum Illuminance (E_{min}) Lux	Uniformity of illuminance Max	CIE Glare Rating (maximum) GR_{max}
Assembly, fabrication, manufacture or maintenance	General access around work areas and related areas	80	10	5	45
Loading and unloading (manual and forklift)	Loading and unloading of trucks by manual labour or machinery including the area surrounding the truck and route of the forklift.	40	5	5	45
General Storage – Pedestrian access	Large open area for storage of large objects; placement, movement and retrieval of objects by machines with integrated movement and working light; through traffic -internal only (site-inducted personnel); site-inducted pedestrian access only.	10	1	7	50
General Storage no pedestrian access	Large open area for storage of large objects; placement, movement and retrieval of objects by machines with integrated movement and working light; minimal through traffic; no pedestrian access	5	1	10	55

It is anticipated operational areas will be lit with building mounted bulkheads and pole mounted area lights and/or floodlights with time and motion controls as appropriate for security, access and health and safety reasons.

4.2 Circulation areas

AS/NZS1158 describes the requirements for lighting of roads, carparks, paths and circulation places where the owner or local authority requires design and installation of a lighting scheme in compliance with the Standard. The Standard does not cover lighting intended specifically as security lighting for building exteriors or 'wayfinding" lighting where lights are intended to provide a guide rather than to provide a particular level of illumination.[1]

Applicable limiting values are show in Table 3 below. Lighting should meet the limiting values required but not exceed them by more than is necessary.

Table 3 AS/NZS 1158 Limiting values for parking, roads and pathways/cycleways

Type of Area	Subcategory	Average horizontal illuminance E_h Lux	Minimum horizontal illuminance E_{ph} Lux	Illuminance Uniformity U_{E2}	Minimum vertical illuminance E_v Lux
Parking spaces, aisles and circulation roadways	PC3	3.5	0.7	8	n/a
Designated parking spaces intended for people with disabilities	PCD	n/a		n/a	n/a
Local Roads	PR6	0.7	0.07	10	n/a
Pedestrian paths – general (ASNZS1158.3.1)	PP5	0.85	0.14	5	0.02
Pedestrian paths "yellow zones" (ASNZS1158.3.1)	PA3	7	2	8	2

[1] ASNZS 1158.3.1 2020 p.6

Car parks will be lit with pole mounted area lights with motion controlled dimming to ASNZS1158 subcategory PC3/PCD.

5. LIGHT MANAGEMENT PLAN

The following sets out the requirements for the design, selection, installation and operation of lighting within the Project site.

5.1 Exterior fixed lighting

5.1.1 Design

1. A lighting design complying with the requirements of this LMP shall completed by a qualified and competent lighting designer and adhere to the principles for responsible outdoor lighting
2. The design shall meet the requirements of AS/NZS4282 for environmental zone A1 (Dark), the limiting values for which are included in Table 4 below

Table 4 AS/NZS4282 Limiting Values Environmental Zone A1

Technical parameter	Limiting Value Zone A1 (Dark)
Maximum vertical illuminance (curfew)	0.1 (E_v) lux
Maximum Threshold increment (TI)	20%
Default Adaptation Level (L_{ad}) cd/m^2	0.1
Maximum Upward Light Ratio (ULR_s or ULR_L)	0.00
Maximum luminous intensities per luminaire (Curfew)*	500 cd
Maximum average luminance of surfaces (signs, façade lighting and objects)	50 cd/m^2

* Clause 3.3.1.3 for location and design of calculation point/s for measurement of values

3. The design shall be submitted for the approval of the regulatory authority prior to installation.

5.1.2 Selection

1. All permanent outdoor light fixtures, unless exempt, shall meet the following minimum criteria:
   a. Be independently certified as Dark Sky approved fixtures by DarkSky or ADSA; or
   b. Meet the following minimum specifications
      i. Upward Waste Light (UWL): 0%
      ii. Correlated Colour Temperature (CCT): ≤3000K (2700K preferred)
      iii. On/Off control required

iv. Front & Back Very High Light (FVH & BVH): ≤2.0% (TM-15-11 standard)

c. Have a minimum CRI of 70 (80 preferred)

2. The following fixed lighting shall be exempt from this requirement:
   a. Luminaires with an output less than 500 lumens
   b. Emergency Exit lighting
   c. Deluge/Safety Shower Lighting (maximum 4000K)
   d. Task-specific lighting where there is a health and safety requirement for neutral daylight or high colour rendering properties. (maximum 4000K)
   e. Permanently mounted warning beacons, traffic lights or similar safety lighting
3. Lighting shall be LED with high ingress and impact resistance (IP65> IK8-10)

5.1.3 Installation

1. All lights shall be mounted such that the light emitting surface is horizontal, downward-facing, and with no forward tilt. Note: where the luminaire is designed to be tilted and achieve a luminaire UWLR of 0.0 the luminaire may be tilted in accordance with manufacturers design.
2. Where lights are to be fixed to buildings or other structures, mount lights under eaves or other similar structures wherever possible.
3. Mounting heights shall be selected to give the best overall outcome considering function, uniformity, glare control, minimising total flux and views of light sources from beyond the site.
4. Lights shall be aimed away from external locations (i.e. into the Project Site)
5. Where practical to do so, consider the use of physical back-shield or side-shield where a light source is visible from outside or below the site.
6. All lighting shall be inspected on completion of installation and a certificate of compliance with this LMP issued prior to operation.

5.1.4 Control

1. All lights exceeding 500 lumen output shall have one or more of the following control methods unless permanent static operation is required for health and safety or security reasons (e.g. close to processing machinery):
   a. Motion detection – capable of being activated on detection of human presence and being deactivated 5 minutes after activation.
   b. Time control – capable of being switched on and off according to time of night/day
   c. Dimming – capable of being dimmed according to human presence and/or time of night/day

5.1.5 Maintenance

1. Lighting shall be inspected annually to ensure lighting is correctly aimed, maintained in a horizontal, non-tilted position and operated in accordance with the approved design and this LMP.
2. Lights shall be cleaned at a frequency of 36 months providing a light depreciation factor (LDD) of 0.95 for design purposes
3. Any light that is damaged and requires replacement shall be replaced with a light of equivalent optical and control properties as the light being replaced.

5.2 Interior lighting

5.2.1 Window coverings

Blinds shall be installed to windows and glass doors where buildings are to be used after dark.

5.3 Mobile Light Platforms

5.3.1 Design

1. Mobile Light Platforms (MLP) shall achieve, as far as reasonably practicable, compliance with the design requirements set out for fixed lighting. (5.1.1)

5.3.2 Selection

1. Luminaires fixed to Mobile Light Platforms (MLP) shall, as far as reasonably practicable, have the same minimum criteria as fixed exterior lighting (5.1.2).

5.3.3 Installation

Mobile Light Platforms (MLP) shall be selected to ensure:

1. A minimum extended mounting height of 9m
2. The luminaire array is held in a horizontal position as far as reasonably practicable to minimise upward light spill.
3. The luminaire array can be in a "all lights forward" or 50% front – 50% back configuration
4. Carefully consider the placement of MLP and aiming of lights to minimise light spill beyond the site and screen light sources by use of natural landform shielding to reduce the effects and impact on distant observers from lighting.

5.3.4 Control

1. MLP shall only be operated as and when required and shall be turned off when the site is unoccupied.

5.3.5 Maintenance

1. Lighting shall be inspected annually to ensure lighting is correctly aimed, maintained in a horizontal, non-tilted position and operated in accordance with the approved design and this LMP.
2. Lights shall be cleaned at a frequency of 36 months providing a light depreciation factor (LDD) of 0.95 for design purposes
3. Any light that is damaged and requires replacement shall be replaced with a light of equivalent optical and control properties as the light being replaced.

5.4 Vehicle and machinery lighting

5.4.1 Driving Lights

1. Driving lights shall be original equipment manufacturer design and only be operated as and when required and shall be turned off when the vehicle is not operating.

5.4.2 Working Lights

1. Working lights shall only be operated as and when required and shall be turned off when the vehicle is not operating.
2. Working lights shall be regularly inspected and maintained to ensure they are correctly aimed to achieve efficient use and minimise upward light spill.

6. REVIEW AND AUDIT

6.1 Certification

1. Certification of lighting design shall conform to AS/NZS4282:2023 Appendix B: Design Documentation
2. Certification of installation and operation shall be completed at commissioning and shall include:
    a. an as-built inventory of lighting detailing make, model, initial luminaire lumens, colour temperature, tilt and orientation of each luminaire;
    b. Statement of conformance in accordance with AS/NZS4282:2023 Appendix B: Design Documentation

6.2 Light Effects Monitoring

1. Lights effects monitoring shall consist of:

a. Baseline illuminance and sky quality readings (using a Sky Quality Meter) to be established at locations agreed with any potentially affected neighbours and the consent authority.

b. Post-installation verification of illuminance field measurements in accordance with AS/NZS4282:2023 Appendix E: Field measurements at locations agreed with any potentially affected neighbours.

c. Re-verification after any significant lighting upgrade or changes

6.3 Audit inspection

1. Lighting shall be inspected annually to ensure lighting is correctly aimed and operated in accordance with the approved design and this LMP. The inspection shall be undertaken against the as-built inventory and include any additional luminaires installed, or existing luminaires relocated, re-aimed or removed.
2. Auditing shall be undertaken by suitably qualified lighting professional.

7. COMPLAINTS PROCEDURE

1. The Consent Holder shall maintain a register of all complaints received relating to exterior lighting, including the date, time, nature of the complaint, and contact details of the complainant (where provided).
2. All complaints shall be investigated as soon as practicable to determine whether the lighting installation is operating in accordance with the relevant consent conditions, applicable standards, and district plan requirements.
3. Where a complaint is substantiated, the Consent Holder shall, as soon as reasonably practicable, implement reasonable and practicable mitigation measures to address the issue. Such measures may include, but are not limited to:

   a. Identification of the source of non-compliance

   b. Adjustment of luminaire aiming or shielding

   c. Reduction of light output or operating hours

   d. Installation of additional screening or control devices

4. The Consent Holder shall keep a record of all investigations and actions taken and, upon request, shall make this information available to the relevant consent authority.

REFERENCES

AS/NZS 1158.3.1:2020 Lighting for roads and public spaces, Part 3.1: Pedestrian area (Category P) lighting – Performance and design requirements. Standards New Zealand 2020

AS/NZS 1680.5:2012 Interior and workplace lighting – Part 5 Outdoor workplace lighting. Standards New Zealand 2012

AS/NZS 4282:2023 Control of the obtrusive effects of outdoor lighting. Standards New Zealand 2023

APPENDIX 1: PLAN CHANGE 22

Plan Change 22 is an operative plan change that only apply to sites identified in the District Plan as being subject to a dark sky precinct. Currently this is limited to the Naseby Dark Sky Precinct.

Objectives	
LIGHT-O1 Dark Sky Precincts	**LIGHT-O1 Dark Sky Precincts**
Dark Sky Precincts provide for the protection, maintenance and enhancement of the night sky from the adverse effects of lighting associated with development.	
LIGHT-O2 Outdoor Lighting	**LIGHT-O2 Outdoor Lighting**
Outdoor lighting allows activities to occur beyond daylight hours and provides safety and security for activities, while protecting views of the night sky and managing light spill to maintain amenity values and the safe operation of the transport network.	

Policies	
LIGHT-P1 Protection of the Dark Sky	**LIGHT-P1 Protection of the Dark Sky**
Protect the benefits of unique night sky within the dark sky, including: **1.** visual amenity values of the dark sky; **2.** improved dark sky environmental quality; **3.** opportunities for education and science; **4.** preservation and transfer of mātauraka Māori. **5.** enhanced health and wellbeing; and **6.** opportunities for astro-tourism	
LIGHT-P2 Character and Qualities of the Dark Sky	**LIGHT-P2 Character and Qualities of the Dark Sky**
Only allow exterior lighting within a dark sky precinct that: 1. has a clear purpose; 2. is targeted only to where it is needed; 3. is no brighter than necessary; and 4. is used only when necessary.	

LIGHT-P3 Darkness	LIGHT-P3 Darkness
Require outdoor lighting to be installed to avoid the potential for light to be spilled upwards and affect the ability to view the night sky.	

Rules		
LIGHT-R1 Outdoor Lighting – Dark Sky Precinct	**LIGHT-R1 Outdoor Lighting – Dark Sky Precinct**	
LIGHT	**Activity Status: PER** **Where:** 1. There is outdoor lighting **Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1And the activity complies with the following rule requirements:** **LIGHT-S1 to LIGHT-S6** *Exceptions:* *(i) Night-time works for the construction, maintenance and upgrading of network utilities and energy generation facilities undertaken by a network utility operator or wind energy facility operator are exempt from complying with standards LIGHT-S1 to LIGHT-S5.* *(ii) Lighting on existing buildings or structures erected or maintained pursuant to civil aviation or maritime transport legislation are exempt from complying with standards LIGHT-S1 to LIGHT-S5.* *Lighting from or mounted to moveable vehicles.*	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**

LIGHT-R2 Security Lights – Dark Sky Precinct	**LIGHT-R2 Security Lights – Dark Sky Precinct**	
LIGHT	**Activity Status: PER** **Where:** 1. Security lights are fitted and controlled with a motion sensor. **And the activity complies with the following rule requirements:** **LIGHT-S1 to LIGHT-S6**	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**
LIGHT-R3 Skylights and Large Glass Doors and Windows – Dark Sky Precinct	**LIGHT-R3 Skylights and Large Glass Doors and Windows – Dark Sky Precinct**	
LIGHT	**Activity Status: PER** **Where:** 1. There is no spill of light through the skylight after 10pm. 2. Window coverings are installed for large glass doors and windows that allow light to spill outside (e.g., high vaulted and dormer windows). 3. Shielded and tilted light fittings are used for indoor lights that are fitted near glass doors, windows and skylights. *Note: Compliance with this rule may be achieved through use of blinds or other means of light covering; or by use of glass that does not emit internal light*	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**
LIGHT-R4	**Outdoor Landscape or Decorative Lighting Installations – Dark Sky Precinct**	
LIGHT	**Activity Status: PER** **Where:** 1. The lights are fitted and controlled with motion sensors. **And the activity complies with the following rule requirements:** **LIGHT-S1 to LIGHT-S6**	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**

LIGHT-R5	**Holiday Lighting – Dark Sky Precinct**	
LIGHT	**Activity Status: PER** **Where:** *1. The lighting is temporary and removed two weeks after the holiday.* *2. LED-type technologies are used.* *3. Lumen output is turned off, or dimmed/reduced, between 10.30pm and 5am.*	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**
LIGHT-R6	**Outdoor Sports Lighting and Recreational Facilities – Dark Sky Precinct**	
LIGHT	**Activity Status: PER** **Where:** 1. All outdoor sports lighting shall have a colour temperature of light emitted of 5700K Kelvin or lower. 2. Outdoor sports lighting shall be designed to the illumination levels recommended in Australian Standard AS 2560 Guide to sports lighting, all parts. 3. Maximum permitted illumination level is to be that recommended for "Level 3" competition standard. The lighting design initial levels shall not exceed the recommended average service illuminance level by more than 50% and shall meet the recommended uniformity. 4. Luminous intensity from any light source for any viewing angles at 1.5m height, at a distance of 45m beyond the field shall not exceed 1000 candela. 5. Outdoor sports lighting shall not operate between 10pm and 6am. 6. All outdoor sports lighting shall provide the following controls; (i) Automatic curfew controls to ensure the lighting is off between	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**

	10pm and 6am. (ii) Local control to turn lights on and off. (iii) If the lighting has a lighting level for competition, it shall also have a selectable lower lighting level for training. **And the activity complies with the following rule requirements:** **LIGHT-S1 to LIGHT-S6**	
LIGHT-R7	**Lighting for any new building – Dark Sky Precinct**	
LIGHT	**Activity Status: PER** **Where the activity complies with the following rule requirements:** **LIGHT-S1 to LIGHT-S6**	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7:** **RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**

Standards		
LIGHT-S1	**Direction**	
LIGHT	1. All fixed exterior lighting shall be directed away from any adjacent roads, residential properties and lakes.	**Activity status when compliance is not achieved with LIGHT-S1 to LIGHT-S6:** **RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**
LIGHT-S2	**Shielding**	
LIGHT	1. All outdoor lighting shall be shielded from above the light in such a manner that the edge of the shield is below the light source	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7:** **RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**
LIGHT-S3	**Colour Temperature**	
LIGHT	1. Within the Dark Sky, all outdoor lighting shall have a colour temperature of light emitted of 3000K Kelvin or lower.	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7:** **RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**

LIGHT-S4	**Lamp Types**	
LIGHT	1. Only light-emitting diode, low pressure sodium and high-pressure sodium lamps shall be used.	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**
LIGHT-S5	**Horizontal and Vertical Illuminance**	
LIGHT	1. Within the Dark Sky, all outdoor lighting with a light output of 500 lamp lumens or greater shall be shielded or tilted so as to not emit any light at or above a horizontal plane measured at the light source.	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**
LIGHT-S6	**Lumen Levels**	
LIGHT	1. Lighting shall be limited to a maximum of 12 lumens per m2	**Activity status when compliance is not achieved with LIGHT-R1 to LIGHT-R7: RDIS** **RDIS - Matters of discretion are restricted to:** **LIGHT-MD1**

Matters of Discretion

LIGHT-MD1

1. The individual or cumulative effects of the lighting fixture(s) on the ability to view the night sky.
2. The individual or cumulative effects of the lighting fixture(s) on the quality of the dark sky.
3. The effects on historic heritage or cultural values of sites, structures, placesand areas.
4. Whether the lighting is necessary for operational or functional purposes.
5. The effectiveness and practicality of any measures to mitigate the effects of light spill.
6. The effects of the siting of the lighting fixtures(s) on the safety and visibility on transportation networks.