

# Section 32 Report

## Tūramarama/Light

prepared for the

# Proposed

# Waimakariri District Plan

18 September 2021



**WAIMAKARIRI**  
DISTRICT COUNCIL

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# 1. EXECUTIVE SUMMARY

Outdoor lighting is important to allow a range of activities to be undertaken at night or during low light conditions, including business, recreation activities. Lighting is also important for the safe operation of the transport network. However, light spill and glare from activities can adversely affect health and detract from amenity values, environmental quality and zone or overlay character where the light level and characteristics are inconsistent with the values, character and qualities of the receiving environment. In some locations, including around the Oxford Observatory, it may also interfere with dark sky qualities and astronomical observation.

The Operative District Plan does not contain specific objectives and policies for light and manages glare through maximum standards applied to zones.

The key resource management issues for light are:

- (a) Outdoor lighting can result in adverse effects on amenity values (including cultural amenity values), health (particularly sleep disturbance), and safety. At the same time, outdoor light needs to be provided for safety, and to enable a range of activities to take place when it is dark; and
- (b) Sky glow effects from light spill can reduce visibility of the night sky, both for casual observation and for astronomical observation.

The key changes introduced for light are:

- (a) specific objectives, policies and methods for light are contained within a separate district wide chapter;
- (b) updated standards and terminology that relate specifically to light spill and glare effects within zones; and
- (c) specific management of dark sky qualities through general light controls and identification of a protection area in the vicinity of the Oxford Observatory.

Overall, the proposed policies and methods are the most appropriate option to achieve the objectives for light, and management of associated light spill and glare effects in the District, and meet the purpose of the Resource Management Act 1991.

## 2. OVERVIEW AND PURPOSE

### 2.1 Purpose of Section 32 RMA

The overarching purpose of Section 32 of the Resource Management Act 1991 (RMA) is to ensure that plans are developed using sound evidence and rigorous policy analysis, leading to more robust and enduring provisions.

Section 32 reports are intended to clearly and transparently communicate the reasoning behind plan provisions to the public. The report should provide a record of the evaluation process, including the consultation, technical work, methods, assumptions and risks that informed that process. A robust report can prove highly useful to decision makers, particularly where it clearly communicates the analysis undertaken to identify the most appropriate way to achieve the purpose of the RMA.

The District Council is required to undertake an evaluation of any proposed District Plan provisions before notifying those provisions. The Section 32 evaluation report provides the reasoning and rationale for the proposed provisions and should be read in conjunction with those provisions.

### 2.2 Topic Description

The Light chapter has district-wide provisions for activities that generate light spill or glare effects. The chapter recognises that artificial night time lighting is important to allow a range of activities, but control of adverse effects is required to maintain community and environmental health, safety and amenity values. The chapter does not cover:

- a. illuminated signs outside of the Oxford Observatory Protection Area (as these are included in the Signs chapter),
- b. lighting covered by the Navigation and Safety Bylaw 2016, or
- c. street light design, which is covered by the Waimakariri District Council Engineering Code of Practice.

Zones have different purposes, values and features that are more or less tolerant of light spill and glare effects, or may require higher levels of lighting to facilitate safety or operation of activities in the zone. For example, industrial and commercial zones may have greater need for outdoor lighting for security, safety and to allow activities in those zones to function at night, whereas rural zones are characterised by a general absence, or low level of, outdoor lighting.

Key proposed changes include revision of the terminology and technical specifications for light management and added protection for night sky visibility (sky glow management) to allow for the ongoing operation of the Oxford Area School Observatory (Oxford Observatory) as requested by the Oxford Observatory as part of public consultation on the direction of the Proposed District Plan (see Section 2.6). The proposed provisions identify that light spill and glare are two distinct effects that may result from outdoor lighting that require different management approaches. A range of activities that are necessary for safety and transport are enabled, such as navigational lighting.

## 2.3 Significance of this Topic

The chapter recognises the need for outdoor lighting to allow activities to occur at night and to provide for health, safety and security. The chapter also recognises that in some instances, unwanted light can be obtrusive and adversely affect the health and wellbeing of individuals, the community and the wider environment. Management of light spill and glare effects is significant in that it helps to maintain the expected amenity values and environmental quality of zones and overlays.

The approach of the proposed provisions recognises the potential importance of the observatory for the Oxford community, while also recognising that it is located within an urban centre where outdoor lighting is an expected characteristic.

## 2.4 Current Objectives, Policies and Methods

The effects-based Operative District Plan does not contain a separate chapter for light, but does include objectives, policies and rules for glare (together with a range of other matters) in the Health and Safety and Wellbeing chapters of the Plan.

The Waimakariri District Plan became operative in November 2005. No plan changes to revise the approach for light management have been introduced.

### 2.4.1 Operative District Plan Provisions

A single general objective seeks to avoid or mitigate adverse environmental effects from glare, together with a range of other effects not addressed in the Light Chapter.

Policies for glare aim to control artificial light so that it is appropriate for the zone and to avoid adverse effects on amenity values, health and safety, properties and roads. The explanation to the policies provide examples of situations where glare may become an issue and methods that could be used to address these issues, such as hours of operation. The explanation also identifies that there is an appreciation of the night sky in Rural Zones due to low lighting levels, and that this should be protected.

The principal reasons for adopting the objectives and policies and methods also identifies differing zone expectations for light level and possible positive and negative effects from lighting. The policies and explanations for zone chapters set out the amenity and character expectations (that may be affected by glare).

Rules for glare in Chapter 31 enable activities that comply with conditions (rules). The conditions for Rural Zones require direction of exterior lighting away from the sky, boundaries and roads and in a way that avoids causing air or sea navigation hazards. Within residential zones, LUX maximum levels are set at various boundaries, and there are requirements to not interfere with navigational lighting or imitate traffic signals. The rules for glare also include an exemption for farming or agricultural activity (not emanating from a structure) providing it does not create a transport hazard. Where activities do not comply, a resource consent is required for a Restricted Discretionary Activity.

## 2.5 Information and Analysis

**Table 1 – List of relevant background assessments and reports**

<b>Title</b>	<b>Author</b>
District Plan Effectiveness Review	<i>Waimakariri District Council, March 2017</i>
<b>Description of Report</b>	
<p>Following the completion of the District Plan Effectiveness Review in late 2016, a series of summary documents were made available for viewing on the Waimakariri District Council District Plan Review webpage. This included a 'District Wide' summary that included the main issues for glare management.</p> <p>The District Plan Effectiveness Review recommended that glare provisions be reviewed to reflect best practice, and that the best management option for street lighting should also be reviewed.</p> <p>Technical assessment of appropriate LUX limits was recommended as some limits seemed very permissive in sensitive areas.</p> <p>The District Plan Effectiveness Review also identified that within some zones, gate lighting, street lighting security lights, carpark and sign lighting have been a sources of complaint.</p>	
<b>Title</b>	<b>Author</b>
<b>Waimakariri District Council District Plan Review – Light (24 September 2019)</b>	<b>WSP</b>
<b>Description of Report</b>	
<p>Expert advice was sought for light spill (illuminance and intensity), glare, lighting of vertical planes (such as signs or façades), the use of curfews, and general guidance on district wide controls for lighting for different zones.</p> <p>This was supplemented by additional information specifically addressing the sky glow issue identified by the Oxford Area School Observatory (Oxford Observatory), and in particular spectral colour.</p>	
<b>Title</b>	<b>Author</b>
AS/NZS 4282:2019 – Control of the obtrusive effects of outdoor lighting	Standards New Zealand
<b>Description of Report</b>	
<p>This standard provides a common basis for the assessment of the likely effects of developments that involve the provision of outdoor lighting. The standard updates previous standards in respect to lighting of vertical planes (including signs), classification of environmentally sensitive areas, position of calculation planes. The standard does not apply to public lighting.</p>	
<b>Title</b>	<b>Author</b>
New Zealand Transport Agency M30 Specification and Guidelines for Road Lighting Design 2014	New Zealand Transport Agency

Description of Report	
These guidelines and specifications set out requirements for lighting design briefs, technical performance, design, approval, reviews, and luminaire selection and installation requirements for the lighting of roads, cycle ways, footpaths, tunnels, underpasses, overpasses and bridges built as part of the State Highway network or under New Zealand Transport Agency (Transport Agency) control. It was written for wider application, including full or part adoption by local authorities.	
Title	Author
Waimakariri District Council Engineering Code of Practice	Waimakariri District Council
Description of Report	
The Engineering Code of Practice sets out guidelines for developers and contractors to assist them in complying with the District Plan, bylaws, policies and consents. Part 11 of the Engineering Code of Practice relates to lighting.	

## 2.6 Consultation Undertaken

Consultation has been undertaken as part of this District Plan Review process with key stakeholders and the local community. Consultation with relevant Waimakariri District Council staff and Councillors has also been undertaken as part of developing and testing the direction and content of draft provisions. External peer and technical reviews were also carried out.

### 2.6.1 Issues and Options

The main issues from the District Plan Effectiveness Review were included in Issues and Options discussion documents that were publicly consulted on to inform the Proposed District Plan. The consultation period ran for seven weeks, closing on 27 October 2017. Light spill and glare were not identified as significant separate issues for consultation. However, one comment on lighting was received sought to improve lighting at a rural intersection (which is a matter outside the scope of the District Plan Review).

### 2.6.2 What's the Plan? Shaping the Content of the Reviewed District Plan

In mid-2019 a consultation document that outlined the intended direction of the District Plan Review was released for public consultation. Light was not identified as a separate topic, but was included in discussion of other specific topic areas such as intensive farming.

### 2.6.3 Selwyn District Council

Selwyn District Council (SDC) planning staff were consulted on the management of sky glow in relation to the West Melton Observatory and in particular light from roads.

### 2.6.4 Stakeholder Consultation

- (a) Members of the Oxford Area School Observatory have requested greater protection for the night sky from sky glow effects, in order to protect their ability to view the night sky and potentially expand observatory activities. This included requested buffer areas within which stricter provisions for outdoor lighting would apply.



Potential adverse effects from 'cool spectrum' LED street lights on ecology and human health were identified by the Oxford Observatory. It was sought that 'warm spectrum' LED lights with a similar effect to sodium lights be used or required.

Current activities that affect observatory activities include light spill from sports grounds and clubs. Some good examples of lighting that was adequately screened and installed were also noted.

- (b) A timber processing firm commented that they would not want to see the lighting rules becoming stricter for industrial zones outside of urban areas.

## 2.7 Iwi Authority Advice

Clause 3(1)(d) of Schedule 1 of the RMA sets out the requirements for local authorities to consult with iwi authorities during the preparation of a proposed plan. Clause 4A requires the District Council to provide a copy of a draft proposed plan to iwi authorities and have particular regard to any advice received. This section summarises the consultation feedback/advice received from the iwi authority relevant to the Light Chapter, and the District Council's consideration of, and response to (as required by Section 32(4A)(b) of the RMA), that feedback/advice.

No specific feedback on light spill or glare has been received.

## 2.8 Reference to Other Relevant Evaluations

This Section 32 topic report should be read in conjunction with the following evaluations:

- (a) Signs topic section 32 report – for illuminated sign provisions
- (b) Residential topic section 32 report – for related amenity value considerations and to establish the expectations for the receiving environment
- (c) Rural topic section 32 report - for related amenity value considerations and to establish the expectations for the receiving environment

Note that other zone chapters will also contain expectations in relation to the receiving environment and level of sensitivity.

# 3. STATUTORY AND POLICY CONTEXT

## 3.1 Resource Management Act 1991

Part 2 of the RMA sets out the purpose and principles of the Act.

Section 5 sets out the purpose of the RMA, which is to promote the sustainable management of natural and physical resources. In achieving this purpose, authorities need to recognise and provide for matters of national importance identified in Section 6, have particular regard to other matters listed in Section 7, and take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) under Section 8.

The Proposed District Plan recognises that light is produced by activities throughout the District and that the adverse effects of light spill and glare require management that is consistent with the amenity values, character and cultural values of the receiving environment.

### 3.1.1 Section 6

Section 6 of the RMA specifically requires that the Council recognise and provide for matters of national importance. There are no matters of national importance of specific relevance to the light topic, however lighting is associated with a wide range of activities and values in a range of locations. As such, it is possible that any of the matters of national importance could be relevant, such as the following:

- (a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development;*
- (b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development;*
- (c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;*
- (e) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga; and*
- (f) The protection of historic heritage from inappropriate subdivision, use and development;*

### 3.1.2 Section 7

The Section 7 matters relevant to effects from light are:

- (c) the maintenance and enhancement of amenity values, and*
- (f) the maintenance and enhancement of the quality of the environment.*

### 3.1.3 Section 8

Section 8 of the RMA requires the Council to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi). Consultation with mana whenua has been undertaken and feedback has informed the section 32 evaluations for the District Plan Review. Section 74(2A) further requires councils to take into account relevant Iwi Management Plans and their bearing on the resource management issues of the District.

The proposed Light Chapter recognises the policy direction in the Iwi Management Plan for observation of celestial skies through the management of outdoor lighting, particularly in rural areas where dark night skies are generally expected.

## 3.2 National Instruments

The following national instrument is relevant to this chapter:

### 3.2.1 National Planning Standards

Under RMA s75 (3) a District Plan must give effect to a National Planning Standard. The Proposed Waimakariri District Plan has been prepared in accordance with National Planning Standards 2019, which were introduced by the Resource Legislation Amendment Act 2017 to make plans and policy statements more useable, accessible and easier to prepare.

The Proposed District Plan will give effect to the National Planning Standards by including a separate district-wide chapter for light and by using standardised definitions and standards. The National Planning Standards states that the Light Chapter may include:

- (a) provisions for light spill and glare (including light spill limits) for different zones, receiving environments or other spatially defined area, and
- (b) specific requirements for common significant light generating activities.

### 3.3 Regional policy statement and plans

The Proposed District Plan must give effect to the Canterbury Regional Policy Statement 2013 (CRPS). The CRPS is a high level policy document with the Light Chapter helping to deliver the following policy directions:

**Policy 5.3.1 Regional growth (wider region)** seeks to (among other matters) encourage high quality urban design and to maintain and enhance amenity values, identity and character of urban areas.

#### Comment

The proposed provisions support the policy to the extent that lighting and management of light spill and glare effects contributes to the values identified.

**Policy 5.3.2 Development conditions (Wider Region)** seeks to enable development which avoids or mitigates reverse sensitivity effects and conflicts between incompatible activities.

#### Comment

This is relevant for District Plan management of light spill and glare effects, and provisions to reduce sky glow effects in relation to the Oxford Observatory. Separation of activities with incompatible effects is also achieved through the management of activities within zones.

**Policy 6.3.2 Development form and urban design** seeks that development is designed to consider safety and environmentally sustainable design, among other matters.

#### Comment

Adequate lighting for safety in some areas, and management of light spill and glare to avoid adverse environmental effects (including on natural values).

**Policy 8.3.3 Management of activities in the coastal environment** includes direction to avoid adverse effects on the coastal environment. A range of values are identified such as amenity, cultural and recreational values, natural character, outstanding natural features and outstanding natural landscapes and the mauri of coastal ecosystems.

#### Comment

The proposed controls for light spill and glare will support the maintenance of the values identified by preventing excessive light while providing for light necessary for recreation,

safety and wellbeing. Safety is also considered through provisions that seek to avoid adverse impacts on navigational lighting.

### 3.4 Iwi Management Plan

The Mahaanui Iwi Management Plan 2013 is relevant to this topic. Issue 5.2 (Cultural Amenity Values) includes Issue R2: *'Protection of cultural amenity values such as celestial darkness'* and Ngā kaupapa/policy R2.1 *'To support use of light suppression or limitation measures to protect celestial darkness values in some areas.'*

The explanation of the policies includes the following:

*'Celestial darkness is a cultural amenity value associated with air. Increased lights from development activity such as subdivisions can affect celestial darkness. Celestial darkness is important during the tuna season at sites such as Te Roto o Wairewa. Lights shine into the tuna drains and affect the ability of tāngata whenua to catch tuna. Light pollution can also affect the use of stars to signal the start of the tuna heke.'*

The proposed provisions manage a range of amenity values including light spill and glare that will assist in protection of celestial darkness and activities that are related to night sky darkness.

### 3.5 Any relevant management plans and strategies

The following management plans and strategies are relevant to this matter:

**3.5.1 Waimakariri District Council Engineering Code of Practice:** A guidance document that includes standards for lighting design in relation to roads, footpaths and cycleways within Part 11: Lighting. The Engineering Code of Practice is provided to assist in compliance with the District Plan, bylaws and other Council policies.

**3.5.2 Waimakariri District Council Reserves Management Plans** (under the Reserves Act 1977) These plans provide for the management of outdoor lighting within reserves, such as lighting for sports fields and ambient lighting for public safety.

**3.5.3 Waimakariri District Town Centre Plans for Oxford, Kaiapoi and Rangiora** These plans include preferred direction for street and public space lighting and lighting of monuments and other 'places'. Town centre amenity, safety and security are major considerations.

### 3.6 Any other relevant legislation or regulations

The following legislation / regulations are relevant to this matter:

#### 3.6.2 NZTA M30 Specifications and Guidelines for Road Lighting

This guideline sets out requirements for lighting including technical performance, design approval, review and luminaire selection and installation for roads, cycle ways, footpaths and other roading infrastructure. The specifications encourage energy efficient design.

#### 3.6.3 Canterbury Regional Council Navigation and Safety Bylaw 2016 and Controls

The bylaw is relevant in relation to the management of navigational aids (or warnings) and devices that may mimic those devices. Proposed provisions are included to avoid lighting that could have adverse effects on navigation and safety.

### 3.7 Any plans of adjacent territorial authorities

The District Council is required to have regard to the extent to which the district plan needs to be consistent with the plans and proposed plans of adjacent territorial authorities under Section 74(2)(c) of the RMA.

District plans from other councils, including those from neighbouring District and City Councils were considered. The approach of updating light spill and glare provisions to current best practice, and including provisions for sky glow controls achieve a good level of consistency, while reflecting the local significance of the issue.

## 4. KEY RESOURCE MANAGEMENT ISSUES

The key resource management issues that need to be addressed for light are:

1. Where light spill and glare result from outdoor lighting, this can result in adverse effects on amenity values (including cultural amenity values), health (particularly sleep disturbance), and safety. At the same time, outdoor light needs to be provided for safety, security, and to enable a range of activities to take place when it is dark; and
2. Sky glow effects from light spill can reduce visibility of the night sky, both for casual observation and for astronomical observatories.

The resource management issues set out in this section use sources of information including (but not limited to) the following:

- a. WSP/Opus District Plan Review – Light 2019 (Technical review)
- b. District Plan Effectiveness Review – Quality of the Environment Assessments
- d. Matters raised in various forums by statutory partners and key stakeholder(s)/advisory groups, such as sky glow management and control of light spill from streetlights.

## 5. OVERVIEW OF PROPOSED OBJECTIVES, POLICIES AND METHODS

### 5.1 Strategic Direction

SD-02, Urban development, aims to provide:

*Consolidated and integrated urban development and if that:*

1. *Provides a good quality urban environment that recognises existing character, amenity values, and historic heritage values, and is attractive and functional to residents, businesses and visitors;...*

The proposed provisions for light give effect to this objective by revising the management of light spill and glare to better reflect the character of the receiving zone environment.

The Urban Form and Development directions also seek to manage reverse sensitivity effects from new development in relation to infrastructure and rural production.

Reverse sensitivity effects may include effects from lightspill and glare. These effects are addressed through the management of activities within zones, and district wide rules for light that specify expected levels and any requirements for shielding (or other characteristics). Rules for sign illumination are contained in the Signs Chapter through provisions restricting the use of flashing or revolving lights and reflectivity.

## 5.2 District-wide Subject

The provisions of the Light Chapter apply district-wide. The proposed sky glow provisions will affect all zones within the protection area surrounding the Oxford Observatory.

## 5.3 Proposed Objectives and Policies

The following objectives are proposed for the Light Chapter:

<b>LIGHT–O1 Outdoor lighting</b>
Outdoor lighting enables a range of activities including work, rural production, recreation activities, sport, entertainment, and transportation to occur beyond daylight hours while: <ol style="list-style-type: none"><li>1. minimising adverse effects on amenity values, health and safety, ecology, significant natural values, areas of historic or cultural significance; and</li><li>2. maintaining the safe operation of the transport system.</li></ol>
<b>LIGHT–O2 Sky Glow</b>
Dark sky visibility is maintained and enables ongoing use of the Oxford Observatory.

These objectives are supported by the following policies:

<b>LIGHT–P1 Outdoor lighting</b>
Enable outdoor lighting for night-time activities, safety and security while: <ol style="list-style-type: none"><li>1. remedying or mitigating adverse effects from light spill or glare on the receiving environment by controlling the intensity, shielding, colour temperature and direction of light;</li><li>2. ensuring that outdoor lighting does not distract traffic or interfere with any traffic aids and signals on the road, air or sea; and</li><li>3. ensuring lighting is compatible with the zone or zones in which the light spill and glare is received by applying the light levels for the receiving zone.</li></ol>
<b>LIGHT–P2 Outdoor lighting design - sky glow</b>
Reduce the potential for upward light spill that contributes to sky glow, by controlling the location, direction, design and operation of outdoor lighting to minimise adverse effects on: <ol style="list-style-type: none"><li>1. amenity values including ability to view the night sky;</li><li>2. health and well-being of people and ecosystems; and</li><li>3. ongoing use of the Oxford Observatory.</li></ol>

## 5.4 Proposed Methods

The methods to give effect to the objectives and policies are rules and standards that apply to outdoor lighting activities, and relate to the sensitivity of the receiving environment. For example, lower lux levels at night will apply in residential areas, and commercial areas may have higher limits.

Where standards cannot be met, resource consent is required for a restricted discretionary activity, for which matters of discretion are specified.

**5.4.1** The following are **Permitted** Activities subject to compliance with any specified **activity standards**:

- navigational lighting, traffic signals and temporary lighting for emergency response
- outdoor lighting within 2km of the Oxford Observatory
- general use of outdoor lighting

Navigational lighting, traffic signals and temporary lighting for the purpose of emergency response are excluded from the outdoor lighting rule, and navigational lighting, Christmas light displays and temporary lighting for emergencies are excluded from the Oxford Observatory Protection Area rules. This recognises the temporary nature and public safety and welfare benefits of these activities.

**5.4.2 Activity standards** for light spill and glare are provided which set out the maximum illuminance permitted during specified daytime and nighttime hours, and by zone. The glare standard sets out design requirements for fixtures to control light direction.

**5.4.3 Matters of discretion** are restricted to 'outdoor lighting' which includes a range of considerations to guide assessment.

5.4.4 **Definitions** used include those for amenity values, sky glow, emergency and illuminated signs.

## 6. SCALE AND SIGNIFICANCE EVALUATION

Section 32 (1)(c) of the RMA requires that a Section 32 report contain a level of detail that corresponds with the scale and significance of the environmental, economic, social and cultural effects that are anticipated from the implementation of the proposed objectives, policies and methods.

The level of detail undertaken for the subsequent evaluation of the proposed objectives, policies and methods has been determined by this scale and significance assessment.

In particular, Section 32 (1)(c) of the RMA requires that:

- (a) Any new proposals need to be examined for their appropriateness in achieving the purpose of the RMA;
- (b) The benefits and costs, and risks of new policies and methods on the community, the economy and the environment need to be clearly identified and assessed; and
- (c) All advice received from iwi authorities, and the response to the advice, needs to be summarised.

Further, the analysis has to be documented to assist stakeholders and decision-makers understand the rationale for the proposed objectives, policies and methods under consideration.

In making this assessment regard has been had to a range of scale and significance factors, including whether the provisions:

- (a) Are of regional or district wide significance;
- (b) Involve a matter of national importance in terms of Section 6 of the RMA;
- (c) Involve another matter under Section 7 of the RMA;
- (d) Raise any principles of the Treaty of Waitangi (Te Tiriti o Waitangi) under Section 8 of the RMA;
- (e) Address an existing or new resource management issue;
- (f) Adversely affect people's health and safety;
- (g) Adversely affect those with particular interests including Maori;
- (h) Adversely affect a large number of people;
- (i) Result in a significant change to the character and amenity of local communities;
- (j) Result in a significance change to development opportunities or land use options;
- (k) Limit options for future generations to remedy effects;
- (l) Whether the effects have been considered implicitly or explicitly by higher order documents;  
and
- (m) Include regulations or other interventions that will impose significant costs on individuals or communities.



Policies and methods have been evaluated as a package, as together they address a particular issue and seek to meet a specific objective.

## 6.1 Evaluation of Scale and Significance

	Low	Medium	High
Degree of change from the Operative Plan		✓	
The degree of change is moderate as new objectives and policies are introduced, standards have been revised and new provisions for sky glow management have been introduced for the Oxford area.			
Effects on matters of national importance	✓		
Light spill and glare have some potential to affect matters of national importance, but this is likely to be a relatively minor issue within the District.			
Scale of effects geographically (local, district wide, regional, national)	✓		
Provisions apply district wide, and more specifically in the Oxford Observatory Protection Overlay			
Scale of effects on people (how many will be affected – single landowners, multiple landowners, neighbourhoods, the public generally, future generations?)		✓	
The provisions will affect all zones and overlays, but it is expected that most activities should be enabled. Maintaining amenity values through light standards will both benefit and restrict the wider community.			
Scale of effects on those with specific interests, e.g., Mana Whenua, industry groups	✓		
The activities of the Oxford Observatory have been afforded some protection in the proposed provisions, in as far as mitigation measures apply to outdoor lighting in the Oxford vicinity around the Observatory. These provisions will impose some restrictions on activities in the identified Oxford Observatory Protection Overlay.			
Degree of policy risk – does it involve effects that have been considered implicitly or explicitly by higher order documents? Does it involve effects addressed by other standards/commonly accepted best practice? Is it consistent, inconsistent or contrary to those?	✓		
The format and terminology of the proposed provisions is consistent with the National Planning Standards and give effect to Regional Policy Statement policies.  The provisions are also generally consistent with the approach taken in other operative or proposed district plans, including those for Selwyn District and Christchurch City.			
Likelihood of increased costs or restrictions on individuals, communities or businesses		✓	
New restrictions are proposed for outdoor lighting in the vicinity of the Oxford Observatory which.			
<b>Summary - Scale and Significance</b>			
Overall, there is a low to medium degree of change from the Operative Plan as:			
a. the introduction of a separate chapter for light is largely a formatting matter aside from the introduction of specific objectives and policies for light;			

- b. updating the standards for light measurement and introducing requirements for a number of specified activities are not significant changes, and
- c. new sky glow management provisions apply within the Oxford area.

The level of detail in this report corresponds with the scale and significance anticipated from implementing the Light Chapter provisions.

## 7. EVALUATION OF PROPOSED OBJECTIVES

Section 32(1)(a) of the RMA requires the District Council to evaluate the extent to which the objectives are the most appropriate way to achieve the purpose of the RMA. The level of detail undertaken for the evaluation of the proposed objectives has been determined by the preceding scale and significance assessment. Below is a summary of the proposed objectives that have been identified as the most appropriate to address the resource management issue(s) and achieve the purpose of the RMA, against those objectives in the operative plan.

### 7.1 Evaluation of Proposed Objectives

Existing Objective	Appropriateness to achieve the purpose of the RMA
<p><b>Objective 12.1.1</b></p> <p>Maintain the amenity values and a quality of environment appropriate for different parts of the District which protects the health, safety and wellbeing of present and future generations, and ensure that any potential adverse environmental effects from buildings and structures, signs, glare, noise and hazardous substances are avoided or mitigated.</p>	<p><b>Relevance:</b></p> <p>The objective is broadly consistent with Part 2 of the Resource Management Act 1991.</p> <p>The objective is limited to glare which is only one of the adverse effects from lighting.</p> <p>Does not specifically anticipate protection for night sky clarity.</p> <p><b>Reasonableness:</b></p> <p>The objective provides broad guidance for decision making, but does not meet the direction of the National Planning Standards to provide for all matters pertaining to light in a single chapter with objectives and policies.</p> <p><b>Achievability:</b></p> <p>Does not specifically address lighting effects and the aim in regard to any particular environments or locations and provides little direction for decision making in that regard. These aspects limit the achievability of the objective.</p>

Proposed Objectives	Appropriateness to achieve the purpose of the RMA
<p><b>LIGHT-O1 Outdoor lighting</b></p> <p>Outdoor lighting enables a range of activities including work, rural production, recreation activities, sport,</p>	<p><b>Relevance:</b></p> <p>The proposal is consistent with Part 2 of the Resource Management Act 1991 and provides greater direction in relation to the key aims of enabling outdoor lighting and recognising its benefits, but also recognising the potential adverse effects from both light spill and glare and specifies</p>

Proposed Objectives	Appropriateness to achieve the purpose of the RMA
<p>entertainment, and transportation to occur beyond daylight hours while:</p> <ol style="list-style-type: none"> <li>1. minimising adverse effects on amenity values, health and safety, ecology, significant natural values, areas of historic or cultural significance; and</li> <li>2. maintaining the safe operation of the transport system.</li> </ol>	<p>particular values, activities and areas that may be adversely affected.</p> <p><b>Reasonableness:</b> Provides clearer direction for lighting within zones and that sky glow effects are managed within the area around the Oxford Observatory.</p> <p>Provides for safe operation of the transport network for all transport modes.</p> <p>This is consistent with the direction in section 7(c) of the Act, which requires that Council have particular regard to the maintenance and enhancement of amenity values.</p>
<p><b>LIGHT–O2 Sky Glow</b></p> <p>Dark sky visibility is maintained and enables ongoing use of the Oxford Observatory.</p>	<p><b>Achievability:</b> The objectives are considered to be achievable as they:</p> <ol style="list-style-type: none"> <li>a. will assist Council to more effectively achieve Part 2 of the RMA;</li> <li>b. will provide more direction to assist decision makers when assessing applications involving light spill and glare effects above those anticipated by the Plan; and</li> <li>c. will provide measurable outcomes to determine whether the objectives are being achieved.</li> </ol>
Evaluation of Alternative Approaches	Appropriateness to achieve the purpose of the RMA
<p>A more stringent approach to management of effects that includes protection of the night sky for all of the District.</p>	<p><b>Relevance:</b> This approach is relevant to the issue of light management and Part 2 considerations. In particular, it would support</p> <p><b>Reasonableness:</b> Would be less enabling for some activities but the community and wider environment may benefit from greater night sky visibility. Likely to increase compliance costs and may restrict some activities.</p> <p><b>Achievability:</b> Achievability may be limited by existing activities that emit light and public understanding of the rules for outdoor lighting. Monitoring and compliance checks would be necessary to ensure the approach was enforced.</p>

## 7.2 Summary - Evaluation of Proposed Objectives

The proposed objectives are appropriate to achieve the purpose and principles of the Act (Part 2), as it manages use and development that involves outdoor lighting by enabling a range of activities and controlling those that have potential adverse effects. This is consistent with the direction to enable people and communities to provide for their social, economic and cultural wellbeing and for their health and safety while avoiding, remedying or mitigating any adverse effects.

Clearer direction is provided in relation to particular areas, values and activities that may require management of outdoor lighting, or specific protection.

## 8. EVALUATION OF PROPOSED POLICIES AND METHODS

Section 32 (1)(b) of the RMA requires an evaluation of whether the proposed policies and methods are the most appropriate way to achieve the proposed objectives by identifying other reasonably practicable options, assessing the efficiency and effectiveness of the proposed policies and methods in achieving the objectives, and summarising the reasons for deciding on the proposed policies and methods.

The level of detail undertaken for the evaluation of the proposed policies and methods has been determined by the preceding scale and significance assessment.

The assessment must identify and assess the benefits and costs of environmental, economic, social and cultural effects that are anticipated from the implementation of the proposed policies and methods, including opportunities for economic growth and employment.

The assessment must, if practicable, quantify the benefits and costs and assess the risk of acting or not acting if there is uncertain or insufficient information available about the subject matter.

Policies and methods have been evaluated as a package, as together they address a particular issue and seek to meet a specific objective.

The evaluation being undertaken is of reasonably practical options that have been identified, resulting in a preferred option being put forward.

## 8.1 Evaluation of Proposed Policies and Methods

Options to achieve the District Plan objectives relating to light	Benefits Environmental, economic, social and cultural effects anticipated	Costs Environmental, economic, social and cultural effects anticipated	Efficiency and Effectiveness	Risk of acting / not acting if there is uncertain or insufficient information about the subject matter of the provisions
<b>Option A: Proposed Approach</b>				
<p>(a) Introduces policies to recognise the benefits from outdoor lighting and manage the associated effects.</p> <p>(b) Identify light spill and glare as effects from light and identify standards to control illuminance and light direction, in the context of a zone/overlay framework where there are different sensitivities to effects from light.</p> <p>(c) Non-compliance is treated as a restricted discretionary activity with associated assessment matters.</p> <p>(d) Guidance on light management is included,</p>	<p><b>Environmental:</b> Light spill and glare are controlled to ensure that effects are minimised relative to the sensitivity of the receiving environment.</p> <p>The quality of the environment and amenity values/character of zones (and overlays) are maintained.</p> <p>Matters for consideration in the assessment of an application for resource consent provide greater clarity for decision making and environmental outcomes.</p> <p><b>Economic:</b> Clearly identifies the status of outdoor lighting activities.</p> <p><b>Social and Cultural:</b> Enables a level of lighting that provides for the needs of the</p>	<p><b>Environmental:</b> None identified.</p> <p><b>Economic:</b> Cost to comply with the standards for light spill and glare effects.</p> <p>Cost relating to resource consent applications, both for applicants and for any other participants in the process, where a lighting activity does not comply with the standards for the zone.</p> <p>Monitoring costs to enforce standards (to the community via Council) or direct cost to operator.</p> <p>Costs for those in the Oxford Observatory Protection Area to comply with requirements that support night sky protection, including restriction of outdoor lighting during 'curfew' hours, and</p>	<p>(a) The provisions give effect to LIGHT-01 and LIGHT 02 and are consistent with the policy direction in the Canterbury Regional Policy Statement for amenity values in relation to development and sensitive environments.</p> <p>(b) The provisions take account of the direction in the Iwi Management Plan and provide controls for light spill and glare that should assist in management of effects on celestial sky observation and customary harvest. Lighting design guidance also discourages lighting fixtures that contribute to light spill and glare.</p> <p>(c) The provisions to provide additional controls around the Oxford Observatory are designed to efficiently and effectively</p>	<p><b>Risk of not acting:</b></p> <p>(a) Failure to implement the National Planning Standards, or address the issues and gaps identified in the District Plan Effectiveness Review.</p> <p>(b) District Plan would not implement Part 2 of the Resource Management Act 1991, particularly s7(f), and the National Planning Standards 2019. As a consequence there would be a greater likelihood of adverse environmental effects from light spill and glare occurring, together with a reduction in amenity values, and the anticipated environmental quality within zones and overlays could be reduced.</p> <p><b>Risk of acting:</b></p> <p>(a) Change in legislation or best practice may emerge and</p>

Options to achieve the District Plan objectives relating to light	Benefits Environmental, economic, social and cultural effects anticipated	Costs Environmental, economic, social and cultural effects anticipated	Efficiency and Effectiveness	Risk of acting / not acting if there is uncertain or insufficient information about the subject matter of the provisions
including diagrams and maps.	<p>community for a range of activities that supports economic, cultural and social wellbeing, and in particular provides for emergency and safety related services.</p> <p>Manage the effects of sky glow through general rules for glare and light spill, and more specifically in relation to the Oxford Observatory. This also supports celestial observation and cultural harvesting which is consistent with the direction in the Iwi Management Plan.</p>	<p>any associated limitation of activities. The extent of the costs are likely to relate to shielding of the light source. Restrictions relate to light shielding requirements, use of search lights and floodlighting of building exteriors.</p> <p><b>Social and Cultural</b> None identified</p>	provide for ongoing use of the facility, while limiting the protection area to the area where the greatest effects are likely to be, and will be consistent with the approach for the observatory in Selwyn District.	<p>provisions may require subsequent amendment.</p> <p>(b) Community awareness of provisions may take time to achieve.</p> <p>(c) Generally low risk in relation to standards as provisions are supported by technical evidence.</p> <p>Overall, there is sufficient information to act and the risk from not acting is higher than the risk of acting.</p>
<b>Opportunities for economic growth and employment</b>				
<p>The provisions enable a range of activities to occur at night which can facilitate economic growth and employment, providing compliance with provisions or resource consent conditions are achieved. Greater certainty for amenity within zones may also encourage economic development and growth.</p>				
<b>Options less appropriate to achieve the objective</b>				
<b>Option B: Status Quo (Effects-based approach)</b>				
(a) Two policies aim to control artificial light to protect amenity, health and safety. This is provided in a chapter that deals	<b>Environmental:</b> Provides protection from some adverse light effects, and some reduction of effects for night sky clarity as lights are required to face downwards.	<b>Environmental:</b> Potential loss of amenity for light spill and glare effects that are not covered. Operative provisions allow higher permitted LUX levels, especially within rural and	a. The approach would partly give effect to the proposed objectives but are limited in the extent to which they address light spill, glare and sky glow effects.	a. Risk of acting: <ul style="list-style-type: none"><li>possible challenge to District Plan Review based on non-compliance with National Planning Standards 2019;</li></ul>

Options to achieve the District Plan objectives relating to light	Benefits Environmental, economic, social and cultural effects anticipated	Costs Environmental, economic, social and cultural effects anticipated	Efficiency and Effectiveness	Risk of acting / not acting if there is uncertain or insufficient information about the subject matter of the provisions
<p>with a wide range of issues grouped together as matters related to health, safety and wellbeing.</p> <p>(b) Rules to manage glare permit land uses where specified conditions are met. The conditions relate to zones and provide for light direction, night sky protection, limits for illumination and management of effects on roads and transport safety. Exemptions are applied for farming activities. Protection is also provided for navigational lighting.</p> <p>(c) Glare is listed as a matter of discretion and a matter the council shall consider (amongst others) for discretionary activities.</p>	<p><b>Economic:</b> Continues with the approach taken in the Operative Plan and would be familiar to existing Plan users.</p> <p>Generally enabling for a range of business activities.</p> <p><b>Social and Cultural:</b> By not restricting lighting in the vicinity of the Oxford Observatory, there may be some benefits for social and community events that require outdoor lighting.</p>	<p>residential zones, than recommended by the technical report commissioned, or District Plans for neighbouring Councils. Light spill and glare effects are not specifically addressed, but grouped as light. There is also less emphasis on dark sky visibility in the operative provisions.</p> <p><b>Economic:</b> Costs related to challenge and review as the approach is not consistent with the National Planning Standards including terminology and format.</p> <p>Costs for resource consent where required, both for applicants and other parties.</p> <p>Any cost associated with rule compliance.</p> <p>Monitoring and enforcement costs.</p> <p><b>Social and Cultural:</b> Oxford Observatory activities are not specifically recognised and there could be social costs for the</p>	<p>b. Less efficient and effective than Option 1 as the rule structure is more complex, and not specific to light spill and glare effects.</p> <p>c. The broad policy directions are not as efficient for considering light effects when resource consent decision making.</p> <p>d. The approach would still be effective in managing some light effects, but does not meet current best practice.</p>	<ul style="list-style-type: none"> <li>• best practice terminology and methods for managing light spill and glare are not identified;</li> <li>• reduction in environment quality for some effects not specified such as sky quality in vicinity of Oxford Observatory;</li> </ul> <p>b. Risk of not acting:</p> <ul style="list-style-type: none"> <li>• none are identified.</li> </ul> <p>There is sufficient information to identify that the risk of acting is higher than the risk of not acting, and information on the National Planning Standards direction is available.</p>

Options to achieve the District Plan objectives relating to light	Benefits Environmental, economic, social and cultural effects anticipated	Costs Environmental, economic, social and cultural effects anticipated	Efficiency and Effectiveness	Risk of acting / not acting if there is uncertain or insufficient information about the subject matter of the provisions
		Oxford community if the quality of the night sky was insufficient to maintain observatory functions.		
<p><b>Opportunities for economic growth and employment</b>  The status quo provisions would enable a range of activities to occur at night which can facilitate economic growth and employment, providing compliance with provisions or resource consent conditions are achieved. There would be less certainty for amenity within zones but any effects this may have on economic growth or employment would be uncertain.</p>				
<b>As for proposal but with more stringent provisions for sky glow</b>				
Provisions would be stricter for dark sky protection in all zones, including restrictions on light colour temperature, screening and hours of operation, particularly within rural areas and around the Oxford Observatory.	<p><b>Environmental:</b> As for Option A, but with greater protection of night sky, and any benefits that would have for ecology and human health.</p> <p><b>Economic:</b> Could facilitate any economic ventures that are dependent on the darkness qualities of the night sky.</p> <p><b>Social and cultural:</b>  Would provide for dark sky protection for Oxford Observatory.  Cultural benefits related to enhanced celestial observation and customary harvesting.</p>	<p><b>Environmental:</b> May be costs relating to environmental safety, particularly for zones or activities where security lighting and camera use are required.</p> <p><b>Economic:</b> Higher costs to meet lighting standards, and costs for any activities that are not be able to operate within the requirements. Costs for any resource consent applications required, also time delays. Costs for environmental monitoring.</p> <p><b>Social and cultural:</b></p>	<p>(d) The provisions could give effect to LIGHT-01 and LIGHT 02 and be consistent with the policy direction in the Canterbury Regional Policy Statement for amenity values in relation to development.</p> <p>(e) The provisions could take account of the direction in the Iwi Management Plan and provide controls for light spill and glare that should assist in management of effects on celestial sky observation and customary harvest.</p> <p>(f) The provisions could provide additional controls around the Oxford Observatory are designed to efficiently and effectively provide for ongoing use of the</p>	<p>Risk of acting includes:</p> <p>(a) Controls may be inconsistent with the direction taken by other District Councils in the area.</p> <p>(b) Risk that widespread potential costs may be unacceptable in relation to benefits.</p> <p>(c) Risk related to technical advice not supporting more stringent controls.</p>



Options to achieve the District Plan objectives relating to light	Benefits Environmental, economic, social and cultural effects anticipated	Costs Environmental, economic, social and cultural effects anticipated	Efficiency and Effectiveness	Risk of acting / not acting if there is uncertain or insufficient information about the subject matter of the provisions
	Social benefits for any activities that benefit from dark sky qualities.	<ul style="list-style-type: none"> <li>(a) Cost to comply with the higher standards for light spill and glare effects.</li> <li>(b) Social and cultural cost for any activities that may be restricted or prevented due to higher standards, for example night time sports events.</li> <li>(c) Cost relating to resource consent applications, both for applicants and for any other participants in the process, where a lighting activity does not comply with the standards for the zone.</li> <li>(d) Monitoring costs to enforce standards (to the community via Council) or direct cost to operator.</li> </ul>	<ul style="list-style-type: none"> <li>facility, while limiting the protection area to the area where the greatest effects are likely to be.</li> <li>(g) The higher number of resource consent applications that may be required would be less efficient.</li> <li>(h) Higher monitoring costs to ensure provisions are effective.</li> </ul>	

**Quantification**

Section 32(2)(b) requires that if practicable the benefits and costs of a proposal are quantified.

Given the assessment of the scale and significance of the proposed changes above it is considered that quantifying costs and benefits would add significant time and cost to the s32 evaluation processes. The evaluation in this report identifies where there may be additional cost(s), however the exact quantification of the benefits and costs discussed was not considered necessary, beneficial or practicable.

## 8.2 Summary - Evaluation of Proposed Policies and Methods

The proposed policies and methods are the most appropriate option to achieve the objectives for light, and management of associated light spill and glare effects in the District.

The status quo approach in the Operative District Plan is effects based and is not consistent with current best practice that distinguishes the effects of light spill, glare and upward light spill that results in sky glow. Lack of specific policy direction for light is also less efficient and effective in providing direction for the assessment of effects from lighting.

The proposed approach both enables a wide range of activities that require outdoor lighting, but also restricts light spill, glare and sky glow effects to ensure adverse effects on the environment are appropriately managed. The proposed approach aligns with the National Planning Standards and will achieve Part 2 of the RMA.

## 9. SUMMARY

This evaluation has been undertaken in accordance with Section 32 of the RMA in order to identify the need, benefits and costs and the appropriateness of the proposed approach having regard to its effectiveness and efficiency relative to other means in achieving the purpose of the RMA. The evaluation demonstrates that the proposed approach is the most appropriate option as:

- (a) It includes a separate zone and activities-based chapter for objectives and policies and methods for the management of adverse effects of light and is aligned with the National Planning Standards.
- (b) Specific objectives and policies, rules, standards, definitions and matters of discretion are proposed to:
  - Provide greater guidance for activities and associated light spill and glare effects that are anticipated within zones in the District;
  - Manage adverse effects between zones and incompatible activities;
  - Provide specific standards for light spill and glare;
  - Enable a range of activities while providing greater certainty for the receiving environment in relation to light spill and glare;
  - Provide greater management of sky glow effects on the natural darkness of the night sky, and recognise the function of the Oxford Observatory; and
  - Specifying matters of discretion to be considered for Restricted Discretionary Activities specific to the potential effects from light spill and glare.
- (c) The proposed provisions refer to updated New Zealand Standards that reflect current best practice for light management and other newer District Plans throughout New Zealand.

Overall, it is considered that the proposed provisions are the most appropriate given that the benefits outweigh the costs, and there are improvements in efficiency to be gained from adopting the proposed provisions. The risks of acting are also clearly identifiable and limited in their extent.