



Climate Change Risk Assessment & Adaptation Planning Snowy Valleys Council

30 JULY 2020



Prepared for

Snowy Valleys Council

Developed by

Statewide Mutual

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Disclaimer

The Climate Change Risk Management Assessments contained within this report have been developed solely on the site-specific information supplied by various participants and have been prima facie accepted by the authors of this report. The information has not been independently verified for accuracy. JLT accepts no responsibility for any loss that arises out of Council having failed to bring all relevant facts to our attention or having provided inaccurate information.

Use of this Report

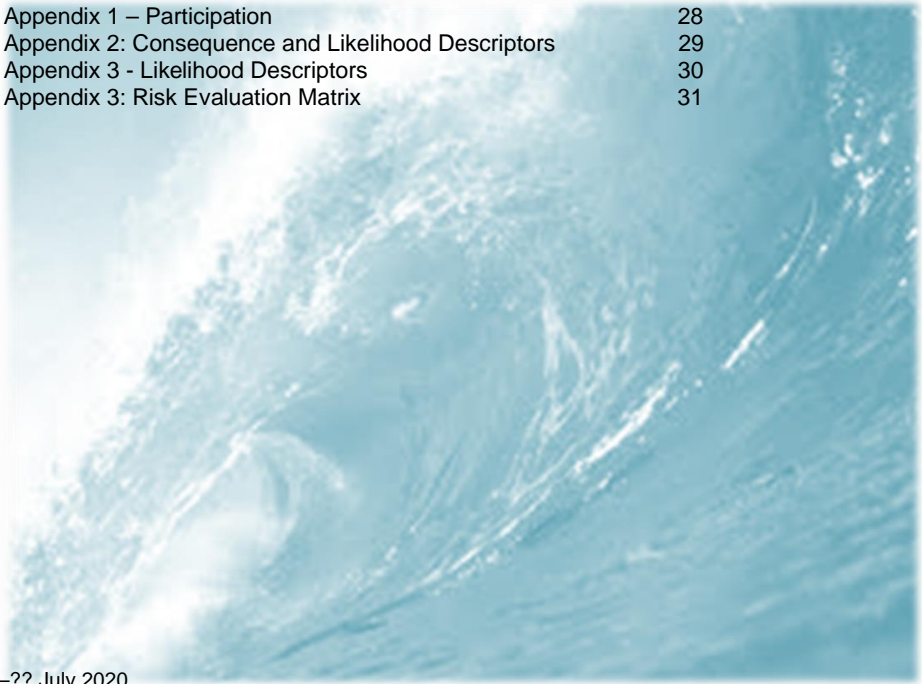
This report has been prepared by JLT and Statewide Mutual for Council for the purpose of providing an informed view of the Council's approach to Climate Change Risk Management.





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ASSUMPTIONS AND LIMITATIONS

There is a level of uncertainty regarding climate change projections, including those for New South Wales. JLT acknowledges that climate change data may change over time and has committed to the scenarios and projections available at the time of the assessment.

This review utilised the most current scientific data available through such sources as:

- the Intergovernmental Panel for Climate Change (IPCC) 5th Report projections;
- the New South Wales Government by the CSIRO,
- the Australian Bureau of Meteorology,
- the NSW Office of Environment and Heritage (OEH)
- the NSW and ACT Governments and the Climate Change and Research Centre (NARClIM) at the University of NSW

This data did not include scenarios for all weather events such as hail or commentary on other potential climate change factors such as the heat island effect.

The focus of this Climate Change Risk Assessment and Adaptation Planning Report was to conduct a new risk assessment in light of new and more region-specific data that will more accurately inform Council policy decisions.

The aim continues to focus on planned and gradual adaptation on the awareness that conditions have or are likely to change over the short

and long term and that action is or will be required to return to, maintain, or achieve a desired state.

The second scope of this project is to identify adaptation-planning initiatives where the impact levels rated HIGH and/ or EXTREME.

Medium and Low level risk impacts are outside the scope of this project in respect of developing adaptation initiatives, however Council is encouraged to continuously monitor, review and manage climate change risks at all levels and scenarios.

Council acknowledges that the information provided for this study is within the scope of those who participated in the workshops only and that this report may be used as a reference for reviewing not only Council's climate change and environmental management strategies but any high strategy that may have been identified within the Adaptation Action Plan. Some impacts and risk levels may have been omitted or misrepresented.

Council also acknowledges that whilst this study focussed on the potential adverse impacts of climate change, opportunities may also arise from the changing climate. Council proposes to identify and incorporate such opportunities in subsequent assessments and adaptation plans.



EXECUTIVE SUMMARY

Snowy Valleys Council, as member of the Statewide Mutual Liability Scheme (Statewide Mutual) selected to participate in the Climate Change Risk Assessment program proudly offered to member Councils as part of its series of funded initiatives.

Statewide Mutual understands the impact that Climate Change can potentially have on Council operations and the importance of understanding the risks associated.

The Risk Assessment

Snowy Valleys Council participated in the Climate Change Risk Assessment workshop on 26 February 2020 with representation from most areas of the organisation and identified a total of **25** risks; the ratings as follows.

Four (4) rated

LOW

Twelve (12) risks rated

MEDIUM

Nine (9) risks rated

HIGH

Nil (0) risks rated

EXTREME

This project was undertaken using the latest Climate data and scenarios available.

The NSW and ACT Governments and the Climate Change Research Centre (NARClIM) at the University of NSW. Together with other NSW Government authorities have partnered to develop Regional Climate Modelling for key catchment areas with climate change projections at a regional scale through interactive mapping.

The workshop made use of the projected impacts of climate variation that are specifically related to its region, thus providing a more accurate assessment of the impacts on Snowy Valleys Council.

This report outlines the findings and results of the risk assessment based on the applied methodology.

The short to medium term effects of climate change may directly impact on the functionality of Council. Studies indicate that there is a real risk that the impact on Council assets and operations could increase in a number of areas such as:

- Inability to preserve “community” owned and valued assets affected by more intense natural disasters.
- The number of claims in the area of asset damage (physical damage to Council owned buildings infrastructure and assets);
- Higher insurance premiums as a result of increased claims;
- Professional indemnity issues relating to the management of the development and building approvals, issuing of certificates, verbal advice;



- Corporate governance issues including failure to implement legislation, financial responsibility, strategic planning and corporate responsibility; and
- Public liability issues caused by extreme weather events.

It is therefore important to ensure Council understands the potential risk exposure to these risks and consider any appropriate action.

The report illustrates the result of the risk assessment, followed by the identification of adaptation initiatives to mitigate those risks rated “High” three selected Medium rated risks.

Adaptation Planning

The focus of the Adaptation Planning process is primarily focused on risks that rated HIGH & EXTREME, and in some instances selected MEDIUM rated risks. Council considered it prudent to determine possible adaptation initiatives for some of the Medium rated risks. A further workshop was conducted to identify possible adaptation initiatives.

The workshop reviewed and considered adaptation initiatives for the nine (9) High and three (3) selected Medium rated risks. Adaptation initiatives were developed for these twelve risks.

This report aims to consolidate the information of both the Risk assessment and the Adaptation Planning sessions. As such the report re-illustrates the findings of the risk assessment conducted in March 2020 and subsequently outlines the Action Plan for the new adaptation initiatives proposed for implementation.



Action Going Forward

The Adaptation Action Plan table is found from **page 22** onwards. The proposed actions are to be implemented in accordance with the responsibility and timeframes outlined therein. Further, a series of overall recommendations are presented on **page 27**.

The report is now presented to Council for consideration and appropriate action.



CLIMATE CHANGE RISK ASSESSMENT DATA ANALYSIS

The following provides a graphical representation and analysis of the Climate Change Risk Assessment including impacts, and ratings.

Current controls and proposed adaptation initiatives are also noted for the identified High risks as well as selected Medium rated risks.

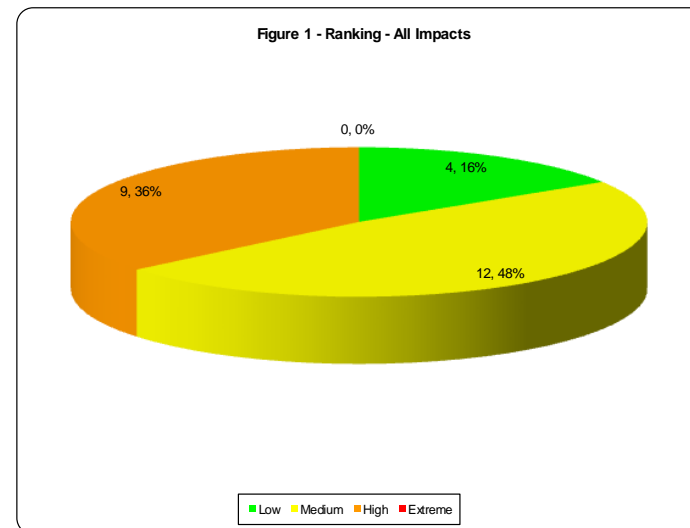


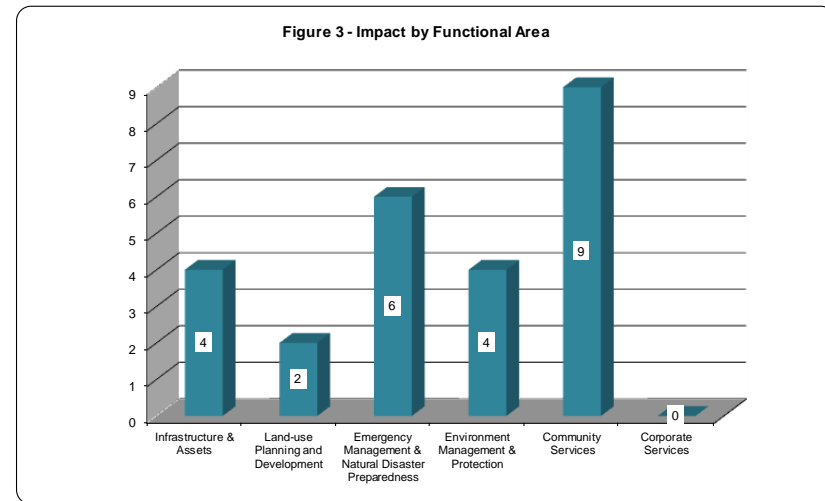
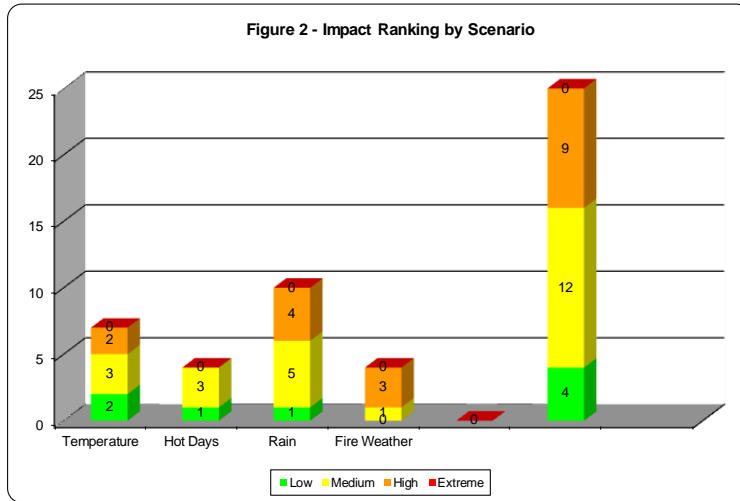


Analysis of all Impacts

Table 1 – Number of Risks per Scenario and Risk Rating

Table 1 - Impact Rankings by Scenario					Ranking All Impacts Total	
	Temperature	Hot Days	Rain	Fire Weather		
Low	2	1	1	0	Low	4
Medium	3	3	5	1	Medium	12
High	2	0	4	3	High	9
Extreme	0	0	0	0	Extreme	0
	7	4	10	4	25	25







METHODOLOGY

The Climate Change Risk Assessment process is broken down into three stages:

- Research on the relevant Climate data for the appropriate region and or Local Government Area
- Workshop facilitation and
- Development of a report outlining the risk assessment results.

The process is facilitated by a JLT Consultant on behalf of Statewide Mutual. The Consultant's role is to guide attendees through the risk assessment process utilising Climate specific tools and information.

Central to the process is the Australian Standard for Risk management – as ISO 31000 and provides the framework for assessing climate change impacts.

The risk assessment process largely based on the likelihood and consequence approach and a standard/ recognised risk matrix for evaluating the risks. This process was enhanced with the use of:

- Climate Change Scenarios and specific projections that best reflected Council's geographical location.
- The impact on Functional Areas posed by the Scenarios
- Against Council's objective or Success Criteria and impact on its ability to achieve them





ASSESSMENT TOOLS

The following aims to explain the identifiers and descriptors used in this report.

Risk ID

Each risk identified is given a Risk Identification code. This code is made up of the following identifiers:

- Success Criterion
- Climate Scenario:
- Functional Area
- Number of the risk

The ID is then displayed as CS/SC/FA/N

Success Criteria

'Success Criteria' are overall typical local government long term objectives, as originally defined in Climate Change Impacts & Risk Management A Guide for Business, Australian Greenhouse Office 2006. For consistency purposes the same were used in this year's assessment.

These criteria give consideration to the impact of Climate change on Council in terms of its ability to:

- A** Maintain public safety
- B** Protect and enhance the local economy
- C** Protect existing community structures and the lifestyle enjoyed by the people of the region
- D** Sustain and enhance the physical and natural environment

E Ensure sound public administration

Functional Areas of Council

As done in the original assessment, all functions of Council are grouped into generic areas consistent with all local government across the State. These areas were slightly modified as follows:

- I** Infrastructure and Assets
- E** Environmental Management & Protection
- CS** Community Services
- L** Land-use Planning and Development
- D** Emergency Management & Natural Disaster Preparedness
- C** Corporate Services

The agreed distribution of Council's business operations (functional areas) in line with the above categories is found at Appendix 7

Example: a risk identified in the Temperature Scenario, impacting Council's ability to maintain public safety and affecting the Functional Area of Infrastructure is coded as "TAI1".

The report also captures how the Success Criteria are impacted by the various Climate Scenarios and the specific Functional Areas potentially affected in each. This grouping is found in Appendix 6.

Risk Evaluation

The risks were evaluated using the same evaluation matrix as that of 2010 for effective comparison of the assessments and consistency with the NSW OEH.

The Risk Matrix tools can be found at Appendices 1 to 3.



This project and assessment utilises data is based on scientific research and studies published in the Intergovernmental Panel on Climate Change (IPCC) in its Fifth Assessment Report (2013) and information data and resources made available through the National Climate Change Adaptation Research Facility (NCCARF), Dept. of Environment and the NSW Office of Environment and Heritage (OEH).

It shows further warming of the atmosphere and oceans in the Australian region, as is happening globally. This change is occurring against the background of high climate variability, but the signal is clear.

Air and ocean temperatures across Australia are now, on average, almost a degree Celsius warmer than they were in 1910, with most of the warming occurring since 1950... ..Rainfall averaged across all of Australia has slightly increased since 1900. Since 1970, there have been large increases in annual rainfall in the northwest and decreases in the southwest. Autumn and early winter rainfall has mostly been below average in the southeast since 1990.

Atmospheric greenhouse gas concentrations continue to rise and continued emissions will cause further warming over this century. Limiting the magnitude of future climate change requires large and sustained net global reductions in greenhouse gases.” State of the Climate 2014 – CSIRO & BOM



“Observed impacts of climate change are widespread and consequential. Recent changes in climate have caused impacts on natural and human systems on all continents and across the oceans. This conclusion is strengthened by more numerous and improved observations and analyses since the AR4. For many natural systems on land and in the ocean, new or stronger evidence exists for substantial and wide-ranging climate change impacts...”

IPCC WGAR5 accepted March 2014



CLIMATE CHANGE RISK ASSESSMENT

Scenario for TEMPERATURE

CURRENT
 The current Summer average daily maximum average temperature in the Snowy Mountains is below 18°C with the Summer average temp ranging between 10°C - 14°C across the elevated areas
 Winter minimum average temperature will range from - 6°C to - 4°C in the Snowy Mountains and average temp range 0°C - 2°C degrees.
 Temps have been increasing since 1960

PROJECTIONS
Maximum Average Temperature
 By 2030 increase by 1.0°C; By 2070 increase by 2.9°C
Minimum Average Temperature
 By 2030 increase by 0.8°C; By 2070 increase by 2.6°C
Cold nights (below 2°C):
CURRENT
 Over 220.8 cold nights per year
PROJECTIONS
 By 2030 206.8 cold nights per year; By 2070 172.8 cold nights per year

ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
TEI1	There is a risk that as a result of an increase in the average ambient temperature, Council's existing A/C systems in Councils buildings may not be sufficient to cope resulting in facilities becoming unusable	E - Ensure sound public administration and governance	Infrastructure & Assets	Asset Maintenance Plans are in place	Mostly beneficial (reduces consequence)	Possible	Insignificant	Low	No
TEL2	There is a risk that Council may have State and Federal Government policies/ legislation imposed upon increasing the levels of pressure/expectation currently placed upon the administrative and governance functions	E - Ensure sound public administration and governance	Land-use Planning & Development	All policies/procedures reviewed every 4 years	Mostly beneficial (reduces consequence)	Possible	Minor	Med	No



ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
	of Council and resulting in have detrimental cost implications.								
TDE3	An increase in annual average temperature could lead to an increase in both pest and weeds species impacting on the overall natural environment of the region.	D - Sustain and enhance the physical and natural environment	Environment Management & Protection	Weeds management program	Mostly beneficial (reduces consequence)	Likely	Moderate	High	Yes
TCI4	An increase in ambient temperature could lead to increased degradation of sporting fields impacting on sporting activities in the community.	C - Protect existing community structures and the lifestyle enjoyed by the local people	Infrastructure & Assets	Management Plans in place	Mostly beneficial (reduces consequence)	Likely	Minor	Med	No
TAI5	An increase in average temperature could result in Council recreational facilities and public parks becoming too hot to use impacting on the public safety and enjoyment.	A - Maintain public safety	Infrastructure & Assets	legislated procedures in place	Some Benefit (reduces likelihood)	Likely	Moderate	High	Yes
TCI6	An increase in ambient temperature could lead to faster degradation of roads, footpaths and bridges infrastructure and becoming substandard	C - Protect existing community structures and the lifestyle enjoyed by the local people	Infrastructure & Assets	Existing maintenance programs in place	Mostly beneficial (reduces consequence)	Likely	Minor	Med	No
TAC7	An increase in ambient temperature could lead to increased pressure on the usage of public buildings as places of refuge.	A - Maintain public safety	Community Services	Hours can be extended at pools	Some Benefit (reduces likelihood)	Likely	Insignificant	Low	No



Scenario for HOT DAYS

CURRENT

The current number of very hot days (above 35°C) 17.6

PROJECTIONS

By 2030 the number of very hot days is projected to increase to 25.6

By 2070 the number of very hot days is projected to increase to 38.7

ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
HDC11	There is a risk that as a result of an increased number of hot days, there may be greater incidents of bitumen bleeding on roads infrastructure within the LGA.	C - Protect existing community structures and the lifestyle enjoyed by the local people	Infrastructure & Assets	Maintenance programs in place	Mostly beneficial (reduces consequence)	Almost Certain	Minor	Med	Yes
HDED2	There is a risk that as a result of an increase in the number of hot days within the LGA, combined with ageing electricity supply infrastructure, power outages and brown outs may occur with far greater regularity.	E - Ensure sound public administration and governance	Emergency Management & Natural Disaster Preparedness	BCP in draft form	Some Benefit (reduces likelihood)	Almost Certain	Minor	Med	Yes
HDEC S3	There is a risk that due to an increase in the number of hot days operational staff, contractors and volunteers may be exposed to adverse health risks (heat stress, heat stroke, dehydration) and the associated downtime costs	E - Ensure sound public administration and governance	Corporate Services	WHS management systems in place	Highly beneficial	Possible	Insignificant	Low	No
HDEI4	As a result of an increase in the number of hot days annually there would be reduced stream flow into the catchment, greater evaporation at	E - Ensure sound public administration and governance	Infrastructure & Assets	BCP in draft form	Some Benefit (reduces likelihood)	Possible	Minor	Med	Yes



ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
	water storage areas as well as a significant increase demand on potable water supplies.								



Scenario for RAINFALL

CURRENT

Annual rainfall ranges from 1600mm in the Snowy Mountains to 400-600 mm in Cooma Monaro

PROJECTIONS

Rainfall expected to decrease in the region with greatest change projected for South West slopes in 2030 and 2070 and the Snowy Mountains in 2070

All models predict a decrease

Range of -1% to -17% by 2030 and -2% to -19% by 2070

ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
RC11	As a result of a reduction in average rainfall annually there would be reduced stream flow into the catchment, water storage would be significantly reduced with adverse follow on consequences for potable water supply.	C - Protect existing community structures and the lifestyle enjoyed by the local people	Infrastructure & Assets	Drought management plans, water restrictions policy & IWCM strategy in place.	Highly beneficial	Likely	Moderate	High	Yes
RC12	A decrease in average rainfall may have an impact on the maintenance and condition of recreational and sporting grounds	C - Protect existing community structures and the lifestyle enjoyed by the local people	Infrastructure & Assets	Drought management plans, water restrictions policy and IWCM strategy in place.	Highly beneficial	Likely	Minor	Med	No
REI3	Due to declining rainfall levels there is a risk that Town Water capacity could be reduced	E - Ensure sound public administration and governance	Infrastructure & Assets	Controlled via licences and approvals	Highly beneficial	Possible	Insignificant	Low	No



ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
RDE4	As a result of decrease rainfall Council may have to review its species and planting profile	D - Sustain and enhance the physical and natural environment	Environment Management & Protection	Tree Management Policy in place	Mostly beneficial (reduces consequence)	Possible	Minor	Med	No
RBL5	As a result of a decreased annual average rainfall, local industry such as forestry, viticulture, who are reliant on a consistent water supply, would be adversely impacted (Economic Development consideration)	B - Protect and enhance the local economy	Land-use Planning & Development	User agreements in place	Mostly beneficial (reduces consequence)	Possible	Major	High	Yes
RAD6	Due to reduced rainfall levels there will be a reduction in firefighting capacity within town, rural, remote and village areas (Strategic planning consideration)	A - Maintain public safety	Emergency Management & Natural Disaster Preparedness	Controlled via conditions of approval	Mostly beneficial (reduces consequence)	Possible	Major	High	Yes
RDE7	As a result of a decrease in average rainfall levels, Council will be faced with increased costs for weed control/noxious pest control (Foxes, rabbits and Deer)	D - Sustain and enhance the physical and natural environment	Environment Management & Protection	Weed Management Programs in place	Mostly beneficial (reduces consequence)	Possible	Moderate	Med	No
RAI8	As a result of a decrease in average rainfall levels, Council will be faced with degraded water quality including Blue Green Algae outbreaks	A - Maintain public safety	Infrastructure & Assets	Drought management plans in place, water restrictions policy and IWCM strategy, DWMP. Blue Green Algae Policy	Highly beneficial	Likely	Minor	Med	No
RDI9	Climate Change will increase intensity of rainfall and flooding but less frequent overall rainfall potentially causing more extensive damage to assets, infrastructure and the landscape of the region	D - Sustain and enhance the physical and natural environment	Infrastructure & Assets	Local Emergency Management Plan	Mostly beneficial (reduces consequence)	Possible	Minor	Med	No



ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
RBC10	A reduction in rainfall could decrease in Snow cover, impacting on the winter tourism activities; duration and season length leading to significant economic impact	B - Protect and enhance the local economy	Community Services	None	Not Implemented	Possible	Major	High	Yes



Scenario for FIRE WEATHER

FIRE WEATHER = Days above 50 in the Forest Fire Danger Index (FFDI) score (Stations at Nowra and Canberra)

CURRENT
 Number of days when the FFDI is above 50 is 1.4 days annually
 Note the highest FFDI score for the region is in Summer at 11.4 (Canberra)

PROJECTIONS
 By 2030 1.8; By 2070 2.7

The South East and Tablelands regions expected to experience an increase in average and severe fire weather; projected mainly in Spring and Summer
 Severe fire weather projected to decrease in Autumn

ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
FWCI4	Climate change will lead to an increase in average and severe fire weather that will affect Council's ability to deliver services.	C - Protect existing community structures and the lifestyle enjoyed by the local people	Infrastructure & Assets	Emergency and Bush Fire Management Plans	Mostly beneficial (reduces consequence)	Almost Certain	Minor	Med	No
FWEI5	Climate change will lead to an increase in bush fire activity that will affect local transport infrastructure and access impacting on Council's services.	E - Ensure sound public administration and governance	Infrastructure & Assets	Emergency and Bush Fire Management Plans	Mostly beneficial (reduces consequence)	Likely	Moderate	High	Yes
FWEI6	Climate change will lead to an increase in bush fire activity that will affect local communication network impacting on Council's service delivery.	E - Ensure sound public administration and governance	Infrastructure & Assets	Emergency and Bush Fire Management Plans	Mostly beneficial (reduces consequence)	Likely	Moderate	High	Yes



ID	Risk Statement	Impact on Council's ability to:	Functional Area	Current Controls	Adequacy of Control	Likelihood	Consequence	Rating	Requires Future Adaptation Initiative/s YES / NO
FWEI7	Climate change will lead to an increase in bush fire activity that will increase demand for Council's heavy plant, equipment and resources.	E - Ensure sound public administration and governance	Infrastructure & Assets	Emergency and Bush Fire Management Plans	Mostly beneficial (reduces consequence)	Likely	Moderate	High	Yes



2020 ADAPTATION INITIATIVES ACTION PLAN

The following details the adaptation initiatives identified.

This is a working table. The responsibility for the specific actions may be delegated to Operational level however, it is encouraged to assign the accountability to a Senior Management/ Director level.

TEMPERATURE

	Risk Statement	Rating	Proposed Adaptation Initiative	Effectiveness	Likelihood	Consequence	Residual Rating	Actions to implement Initiative	Accountability	Timeframe
TDE3	An increase in annual average temperature could lead to an increase in both pest and weeds species impacting on the overall natural environment of the region.	High	<ul style="list-style-type: none"> Review Weeds Management Plan and adapt to new infestation; Seek additional funding from State Govt; Monitor advice from other Govt Depts. 	Some Benefit (reduces likelihood)	Possible	Moderate	Medium	<ul style="list-style-type: none"> Part of operational actions by Biosecurity Officer (G&D); Need identified - Manager to action; Monitor regular Advice through relevant channels 	Manager Growth & Development	Ongoing - in place
TAI5	An increase in average temperature could result in Council recreational facilities and public parks becoming too hot to use impacting on the public safety and enjoyment	High	<ul style="list-style-type: none"> Consider adaptive measures on facilities to reduce/ manage the impact Ensure procurement strategy considers adequate materials/ colours that absorb heat Install suitable signage to inform public of risk Formalise consideration of shading methods 	Mostly beneficial (reduces consequence)	Unlikely	Insignificant	Low	<ul style="list-style-type: none"> Review of Service Management Plan to incorporate these strategies 	Manager Technical Services	During next scheduled Plan review



HOT DAYS

	Risk Statement	Rating	Proposed Adaptation Initiative	Effectiveness	Likelihood	Consequence	Residual Rating	Actions to implement Initiative	Accountability	Timeframe
HDCI1	There is a risk that as a result of an increased number of hot days, there may be greater incidents of bitumen bleeding on roads infrastructure within the LGA	Medium	<ul style="list-style-type: none"> Review elements of seal design in conjunction with RMS Monitor best practice of seal design Monitor quality assurance of the contractor 	Mostly beneficial (reduces consequence)	Likely	Minor	Medium	<ul style="list-style-type: none"> Manager of Works Delivery to undertake actions 	Manager Works Delivery	incorporate in annual review
HDED 2	There is a risk that as a result of an increase in the number of hot days within the LGA, combined with ageing electricity supply infrastructure, power outages and brown outs may occur with far greater regularity.	Medium	<ul style="list-style-type: none"> Finalise and maintain current Council's BCP Review effectiveness of BCP strategies (i.e. alt power supply) Review arrangements for alternative power for essential assets (i.e. WTP) 	Mostly beneficial (reduces consequence)	Possible	Minor	Medium	<ul style="list-style-type: none"> Risk Management Officer to undertake review and finalisation of BCP 	Executive Chief of Staff	end 2020
HDEI4	As a result of an increase in the number of hot days annually there would be reduced stream flow into the catchment, greater evaporation at water storage areas as well as a significant increase demand on potable water supplies. <i>(this will apply to Temperature as well)</i>	Medium	<ul style="list-style-type: none"> Finalise BCP sub plan and ensure it includes strategy for responding to events relating to water supply; Implement a Public Education campaign on responsible water use 	Mostly beneficial (reduces consequence)	Possible	Minor	Medium	<ul style="list-style-type: none"> Risk Management Officer to undertake review and finalisation of BCP 	Executive Chief of Staff	end 2020



RAINFALL

	Risk Statement	Rating	Proposed Adaptation Initiative	Effectiveness	Likelihood	Consequence	Residual Rating	Actions to implement Initiative	Accountability	Timeframe
RCI1	As a result of a reduction in average rainfall annually there would be reduced stream flow into the catchment, water storage would be significantly reduced with adverse follow on consequences for potable water supply.	High	<ul style="list-style-type: none"> Finalise sub plan for water supply; Inform and involve all relevant areas of Council of this impact for consideration in future strategies 	Mostly beneficial (reduces consequence)	Possible	Minor	Medium	<ul style="list-style-type: none"> Risk Management Officer to undertake review and finalisation of BCP Manager of Utilities and Waste business to action 	Executive Director of Infrastructure	End 2020
RBL5	As a result of a decreased annual average rainfall, local industry such as forestry, viticulture, who are reliant on a consistent water supply, would be adversely impacted (Economic Development consideration)	High	<ul style="list-style-type: none"> Ensure that Planning and Development area is aware of the impact; diversification of industry Education on water usage Review Economic development strategy Council is an end user 	Some Benefit (reduces likelihood)	Possible	Major	High	<ul style="list-style-type: none"> Coordinate Place Activation - to increase awareness of effect and encourage diversification of industry; Ensure Governance considerations are observed 	Executive Director Community and Corporate	In line with Economic Development strategy review due 2022
RAD6	Due to reduced rainfall levels there will be a reduction in firefighting capacity within town, rural, remote and village areas (Strategic planning consideration)	High	<ul style="list-style-type: none"> Consideration in Strategic Planning decisions; Council awareness in relevant areas 	Some Benefit (reduces likelihood)	Possible	Major	High	<ul style="list-style-type: none"> Refer to Climate Change Committee (yet to be established) 	Executive Director Community and Corporate	Ongoing - part of Management Planning cycle
RBC10	A reduction in rainfall could decrease in Snow cover, impacting on the winter tourism activities; duration and season length leading to significant economic impact	High	<ul style="list-style-type: none"> Promote and support diversification of winter tourism opportunities; 	Some Benefit (reduces likelihood)	Possible	Minor	Medium	<ul style="list-style-type: none"> Work with local businesses; Investigate opportunities 	Executive Director Community and Corporate	Ongoing



FIRE WEATHER

	Risk Statement	Rating	Proposed Adaptation Initiative	Effectiveness	Likelihood	Consequence	Residual Rating	Actions to implement Initiative	Accountability	Timeframe
FWEI5	Climate change will lead to an increase in bush fire activity that will affect local transport infrastructure and access impacting on Council's services.	High	<ul style="list-style-type: none"> Finalise BCP and ensure it reflects strategies to respond to such events; 	Mostly beneficial (reduces consequence)	Unlikely	Minor	Low	<ul style="list-style-type: none"> Risk Management Officer to undertake review and finalisation of BCP 	Executive chief of staff	end 2020
FWEI6	Climate change will lead to an increase in bush fire activity that will affect local communication network impacting on Council's service delivery	High	<ul style="list-style-type: none"> Ongoing review of communication equipment and communication lines, including establishing alternate lines of communication; Internally - continued ICT upgrades and links between offices; multiple services providers and redundant networks; Develop a suitable Communication strategy within BCP and that staff are well trained in its application 	Highly beneficial	Possible	Minor	Medium	<ul style="list-style-type: none"> Risk Management Officer to undertake review and finalisation of BCP; ICT component a sub plan with the BCP 	Manager of Customer and Tech	end 2020



	Risk Statement	Rating	Proposed Adaptation Initiative	Effectiveness	Likelihood	Consequence	Residual Rating	Actions to implement Initiative	Accountability	Timeframe
FWEI7	Climate change will lead to an increase in bush fire activity that will increase demand for Council's heavy plant, equipment and (staff and other) resources as well as demand for water for firefighting efforts.	High	<ul style="list-style-type: none"> Council to liaise with RFS for the provision of appropriate Bushfire Awareness training of staff; Council to ensure staff have appropriate PPE and equipment to go on the fire ground Understand the potential future need by RFS and or SES for Council resources to assist Council plan and ensure it can meet the demand 	Mostly beneficial (reduces consequence)	Likely	Moderate	(High) Rating to be confirmed	<ul style="list-style-type: none"> ?? 	??	??

NOTE- The above adaptation initiatives, like the risk assessments, should be continually monitored and amended/ improved on as the need and opportunity. Council should reconsider initiatives where the risk rating remains "High" and explore other options that will reduce the residual risk rating to an acceptable level.



WHAT IS NEXT

The nature of Local Government, its services functions and obligations, means that it will feel the impacts of climate change considerably and directly. Many impacts of climate change present risks that require treatment at a 'local' level. Others, due to their scope may require collaboration with key stakeholders, private and public.

Snowy Valleys Council clearly understands the importance of being aware of the potential impact of Climate Change on its assets, operations and community and is commended for not only actively driving the implementation of initiatives identified in the original assessment but choosing to once again take steps to revisit the risks and develop new adaptation initiatives.

In this assessment, Council continues to build on its work through ongoing climate change adaptation planning.

However, your work does not stop here. It just begins.

It is imperative that the valuable work already conducted becomes integrated in all the relevant areas of the organisation and that it is actively used to inform management planning decisions with clear regard of the identified threats and proposed adaptation strategies.

Recommendations

The following general recommendations are offered for Council consideration and implementation:

1. Consider the new adaptation initiatives with a view to implement within recommended timeframes, or earlier if deemed necessary.

2. Categorise adaptation initiatives and integrate these into Council's medium and long term planning programs e.g. 4, 10 and 20 years to inform future planning.
3. Include climate change risk management and adaptation plans into strategic (e.g. Council's Community Strategic Plan) and other relevant management planning and decision making processes.
4. Consider lobbying external stakeholders as appropriate to achieve agreed initiatives.
5. Map vulnerable areas in line with Climate projections and where relevant, review LEP and DCP controls as necessary.
6. Investigate the use of Section 94 and Voluntary Planning Agreements to contribute to required infrastructure implementation to reduce the impacts of climate change.
7. Review all risk assessments including the low and medium risks on a periodic basis in line with updated projections.
8. Stay informed and consider any changes in relevant climate change data, operating environment, legislation, economy, demographics, and other relevant factors when reviewing adaptation plans and risk assessments.
9. Any other relevant action.



APPENDICES

Appendix 1 – Participation

The following Council personnel participated in the CCRA workshop held on 26 February 2020 and in the Adaptation Planning workshop on 10 June 2020. Their contribution was central to the success of the project.

Name	Position
Paul Holton	Executive Director Community and Corporate
Kylie Bradley	Coordinator of Place Activation
Brook Penfold	Coordinator Governance and Risk
Matthew Suter	Risk Management Officer
Glen McGrath	Manager Technical Services
Justin Epps	Open Spaces and Facilities Technical Officer
Martin Canteros-Paz	Resource Recovery Officer



Appendix 2: Consequence and Likelihood Descriptors

Success Criteria	Consequence Rating				
	Insignificant	Minor	Moderate	Major	Catastrophic
A Maintain public safety	Appearance of a threat but no actual harm	Serious near misses or minor injuries	Small numbers of injuries	Isolated instances of serious injuries or loss of lives	Large numbers of serious injuries or loss of lives
B Protect and enhance the local economy	Minor shortfall relative to current forecasts	Individually significant but isolated areas of reduction in economic performance relative to current forecasts	Significant general reduction in economic performance relative to current forecasts	Regional stagnation such that businesses are unable to thrive and employment does not keep pace with population growth	Regional decline leading to widespread business failure, loss of employment and hardship
C Protect existing community structures and the lifestyle enjoyed by the local people	There would be minor areas in which the region was unable to maintain its current services	Isolated but noticeable examples of decline in services	General appreciable decline in services	Severe and widespread decline in services and quality of life within the community	The region would be seen as very unattractive, moribund and unable to support its community
D Sustain and enhance the physical and natural environment	No environmental damage	Minor instances of environmental damage that could be reversed	Isolated but significant instances of environmental damage that might be reversed with intensive efforts	Severe loss of environmental amenity and a danger of continuing environmental damage	Major widespread loss of environmental amenity and progressive irrecoverable environmental damage
E Ensure sound public administration and governance	There would be minor instances of public administration being under more than usual stress but it could be managed	Isolated instances of public administration being under severe pressure	Public administration would be under severe pressure on several fronts	Public administration would struggle to remain effective and would be seen to be in danger of failing completely	Public administration would fall into decay and cease to be effective



Appendix 3 - Likelihood Descriptors

Likelihood Rating	Recurrent Risks	Single Events
Almost Certain	Could occur several times per year	More likely than not - Probability greater than 50%
Likely	May arise about once a year	As likely as not - 50/50 chance
Possible	May arise once in ten years	Less likely than not but still appreciable - Probability less than 50% but still quite high
Unlikely	May arise once in ten to 25 years	Unlikely but not negligible - Probability low but noticeably greater than zero
Rare	Unlikely during the next 25 years	Negligible - Probability very small, close to zero.



Appendix 3: Risk Evaluation Matrix

	CONSEQUENCE					KEY
	Insignificant	Minor	Moderate	Major	Catastrophic	
Almost Certain	Yellow	Yellow	Orange	Red	Red	EXTREME
Likely	Green	Yellow	Orange	Orange	Red	HIGH
Possible	Green	Yellow	Yellow	Orange	Orange	MEDIUM
Unlikely	Green	Green	Yellow	Yellow	Yellow	LOW
Rare	Green	Green	Green	Green	Yellow	LOW

EXTREME	Extreme risks demand/require urgent attention at the most senior level and action plans and management responses are required; cannot be simply accepted as a part of routine operations.
HIGH	High risks are the most severe that can be accepted as a part of routine operations but must be managed by a senior manager who reports on progress to the Executive.
MEDIUM	Medium risks can be expected to form part of routine operations where specific monitoring and response procedures exist. Management will be assigned to a particular manager and reported on at senior management level.
LOW	Low risks will be part of routine operations and expected to be managed by existing controls.



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