



# Preparing the South Australian Dairy Industry for the Impacts of Compounding and Complex Disasters

**A Pilot Project on the Fleurieu Peninsula**

## Table of Contents

Background.....	3
Intended outcomes .....	3
Project Design.....	4
Risk assessment and evaluation .....	5
Stage 1 - Scope .....	5
Stage 2 Producer engagement .....	6
Stage 3 – Control assessment.....	8
Stage 4 – Validation .....	9
Disaster Risk Reduction Key insights and Actions.....	10
Priority Improvement Measures to Prepare.....	<b>Error! Bookmark not defined.</b>
HIGH PRIORITIES.....	<b>Error! Bookmark not defined.</b>
Key Insights.....	10
Key Insights.....	12
Key Insights.....	14
Key insights.....	15
Key Stakeholders .....	18
Governance arrangements.....	19
Funding acknowledgement .....	19
APPENDIX 2: Risk and Control Assessment Tools .....	21
APPENDIX 3: Control Strength, Vulnerability Ratings and Priorities .....	24
At risk: Livestock Health and Safety.....	24
At risk: Farm assets and infrastructure.....	29
At risk: People and community welfare.....	34
At risk: Farm Business operations.....	36
At risk: Milk Processing and Supply Capacity .....	39
APPENDIX 4: Farm Consultant and Processor Feedback .....	41

## Background

Australia's exposure to disaster risk continues to increase, with new risks emerging at an accelerated pace. Disasters such as bushfire, heatwaves, flood, dust storms, storms and tropical cyclones (including ex tropical cyclones), severe thunderstorms, hailstorms, and sea level change are increasingly impacting the wellbeing and functioning of communities, the environment and the economy.

These disasters are increasingly occurring as compounding and cascading events resulting in consequences that may range from modest to substantial. Recent examples include the 2017-2019 drought followed by the 2019/20 bushfires and the COVID pandemic.

Investment in disaster risk reduction contributes to strengthening resilience and risk-informed sustainable development. Research demonstrates that for every \$1 invested in disaster risk reduction, up to \$9.60 can be saved in post-disaster recovery and loss. However, between 2005 and 2022, 98 per cent of Australian government funding invested in disasters went towards recovery and relief rather than building resilience.

Recognising the increasing threat of compounding and complex disasters, the Department of Primary Industries and Regions (PIRSA) worked in partnership with Primary Producers SA (PPSA) to secure \$770,000 in funding from the Disaster Ready Fund through the South Australian Fire and Emergency Services Commission (SAFECOM). This funding was used to deliver the *Preparing primary industries for the impacts of compounding and complex disasters* project. This was a pilot project focusing on the South Australian dairy, winegrape and forestry industries at a regional level.

PPSA and PIRSA co-designed and delivered an industry-led approach to explore the risks of compounding and complex disasters on people, production, profitability and supply chains. The project recognises that primary producers are on the frontline of climate change, facing an increasing number of natural disasters every year which are also becoming increasingly severe.

Government, primary industries and primary producers understand hazards and have experience dealing with single disaster events. Lived experience of responding to and recovering from multiple disasters is rapidly becoming challenging but also "normal" with the shift to more frequent and severe disasters already happening. The vulnerability of primary producers and the primary industries sector to this more frequent response and recovery experience is less understood.

Disaster risk reduction decisions and actions are needed to mitigate impacts on the agriculture sector, minimise disruptions to food supply and maintain vibrancy of regional communities.

## Intended outcomes

The project's primary outcome was to deliver an increased understanding of industry vulnerabilities and a commitment to shared responsibility between government and industry to address gaps. In addition, the project aimed to:

- Apply national frameworks for strategic decisions on climate and disaster risk in a South Australian context.
- Improve readiness for recovery through increased understanding of industry vulnerabilities and gaps and a commitment to shared responsibility with industry.
- Provide a clearer rationale for when and how recovery assistance is provided to primary producers.

- Increase awareness and preparation of primary producers and supply chain businesses for the effects of disaster events on themselves, their businesses, families and communities.
- Deepen state government and industries' understanding of the vulnerability of the agricultural sector to disaster.
- Identify disaster risk reduction strategies, tactics and actions to cater for a range of disasters, emergencies and the effects of climate change.
- Include risk reduction actions, strategies and tactics in business planning by primary producers and primary industry groups.
- Better inform and better prepare communities for mitigating the effects of disasters on primary producers, primary industries and rural communities.
- Develop networks and connections among industries and agencies involved in disaster risk reduction.

## Project Design

The co-designed project set out to deliver on the priorities of the National Disaster Risk Reduction Framework:

- Understand disaster risk
- Accountable decisions
- Enhanced investment
- Governance, ownership and responsibility

The project draws on the process outlined in the National Emergency Risk Assessment Guidelines (NERAG) to identify and assess risk controls. This involves examining the effectiveness, robustness, and resilience of control measures in managing or mitigating the impacts of various hazards, including natural disasters.

NERAG provides a structured approach to evaluate these controls, focusing on their strengths and vulnerabilities to assist in assessing the dairy industry's ability to respond to risks and protect livestock, production, and infrastructure.

## Risk assessment and evaluation

The risk assessment and evaluation process for the dairy industry took place over four stages as outlined below.

### Stage 1 - Scope

#### Region

Initial discussions with the SADA Executive determined that the pilot should focus on the **Fleurieu Peninsula** as a case study for subsequent application in other regions. The Fleurieu is a major sources of milk production alongside the Limestone Coast and its terrain, high fire fuel loads, relatively dense population and land tenures renders it vulnerable to bushfires.

- The Fleurieu Peninsula is home to approximately 30 per cent of the state's dairy farms and milk production.
- Significant investments in farm and processing capacity has occurred in recent years with increasing efficiency and diversity in the market.

**Does SADA / PIRSA have data to add here?**

#### Climate change projections

The climate change projections from the *DEW SA Climate Projections Viewer* were used to assess risks and show rising daily temperatures, more hot days, and a significant reduction of rainfall across seasons as shown at **APPENDIX 1: Climate Change forecasts and data for the Fleurieu**.

With these climate change forecasts preparedness for a natural disaster is compromised, where it is likely that the increasing occurrence of hot days and declining rainfall poses significant challenges for dairy farming operations including;

- Reduced pasture growth and quality, resulting in increased reliance on purchased feed.
- Increased transport costs if feed is to be sourced from further away
- Restricted water availability for both livestock and irrigation while the need for both increases.
- more reliance on water and feed storage capacity,
- Heat stress in cows leads to decreased milk production and lower fertility rates,
- Higher incidence of heat-related diseases, such as mastitis and metabolic disorders
- new pressures on protecting and maintaining the built assets.
- additional pressures on health, wellbeing and safety issues for farmers, families, workforce and communities, disrupting workforce availability and productivity, and pressure on volunteering,
- higher insurance premiums, and
- added costs to business across the board

#### And for the focus of this project

- an increased risk of extended heat waves and fire seasons, with higher likelihood of bushfires with higher fire intensity.

## Assessment and prioritisation of natural disaster risks

The natural disaster risks were assessed based on the region's climate change forecasts, with **bushfires** and **heatwaves** identified and agreed on as the highest priority risks for the Fleurieu Peninsula. The level of risk is assessed by combining the likelihood and consequence of natural disasters.

Natural Disasters	Likelihood	Consequence	Risk
Bushfire	Very Likely	Catastrophic	Extreme
Heatwaves	Very Likely	Catastrophic	Extreme
Storm	Very Likely	Moderate	Very High
Severe Thunderstorms	Very Likely	Minor	High
Flood	Unlikely	Moderate	Medium
Hailstorm	Likely	Minor	Medium
Dust Storm	Possible	Insignificant	Low
Tropical Cyclone	Unlikely	Moderate	Low

## Priority areas of impact

It was agreed that control measures relating to both **industry** and **community** preparedness would be identified and assessed.

## Compounding and complex disaster scenario

The following scenario was developed for workshop participants' consideration.

*You're standing on your farm on 12 January 2027, South Australia is into its eighth day of a forecasted 11-day heatwave where the temperature has been over 45°C. There's a strong north-westerly blowing, the CFS have declared this as the third catastrophic fire danger day in a row, and SA Power Networks have flagged that power is likely to be cut at any time. The milking herd is showing visible signs of distress, and many have gone off their feed. You can now see smoke on the horizon and the smell of fire is in the air. There's a strong possibility a major fire is over the hill.*

## Stage 2 Producer engagement

### Workshop participation

SADA invited a number of dairy producers from the Fleurieu Peninsula to attend workshops at Mount Compass on 5 August and 18 September 2024. The workshops were attended by:

- Warren Jacobs, Mount Compass
- Perrin Hicks, Tooperang
- Michael Connor, Nangkita
- Ben McHugh, Mosquito Hill
- Wes Hurrell, Torrens Vale
- Andrew Curtis, SADA
- John Elferink, SADA

They were supported by the project team which included PIRSA project officer Rebecca McCall, PPSA NRM policy officer Greg Cock, PIRSA program evaluation manager Kelly Menadue, and workshop facilitator Rebecca Lang

### **Workshop summaries**

Through structured discussions, workshop participants were asked to identify and evaluate existing bushfire and heatwave risk control measures.

This **first workshop** was an opportunity to introduce the project and present climate change forecasts from the Department of Environment and Water's (DEW) South Australian Climate Projections Viewer to the producers in attendance. This model showed the impacts on water supplies and natural ecosystems, temperature and rainfall changes, and the likely impact on the frequency and severity of natural disasters. The attending farmers then reviewed and verified the risks developed in stage 1.

Participants then reviewed the current control measures for preparing for, responding to and recovering from bushfires and heatwaves. The group added additional measures based on their personal knowledge and experience.

### **Control Identification**

The process began by identifying all current controls to reduce the likelihood or consequences of the disaster scenario. These were grouped into four (five?) areas: people, livestock, assets and business operations and Milk Processing and Supply.

Types of controls identified included;

Preparedness controls: Plans, resources, or systems in place to respond to a hazard.

Response controls: Measures for immediate actions during an event to limit harm.

Recovery controls: Actions that support recovery and reduce long-term impacts.

These are recorded in the following section: **Control Assessment and Key Insights**

### **Supply Chain Engagement**

A supplementary process engaged with stakeholders in the supply chain, to understand the impact of the scenario on their businesses and the overall impact on the industry. The participants were asked to consider the following:

1. What would be the impact on your sector of a natural disaster on Fleurieu dairy farms?
2. What measures does your sector currently have to prepare for disaster scenarios?
3. Where is your sector most vulnerable and what can be done to be better prepared?
4. What additional actions are necessary to improve disaster readiness?

Responses were provided by:

- Sam Acheson, Business consultant, 21C Agribiz Advisory Services
- Chris Nel, Lactalis Australia
- Adam Wilkinson, HR / WHS Compliance Manager, Fleurieu Milk Company

A summary of their responses are included at **APPENDIX 4**

The Business Consultant's concerns mirrored those of the farmers at the workshops, particularly around water and power, people and livestock wellbeing and access for feed delivery and milk pickup.

A number of additional measures were proposed including;

- investing in more dependable backup power options,
- more thorough fire prevention: routine removal of combustibles and installation of sprinkler systems in key locations.
- crafting and practicing evacuation procedures for animals.
- unified effort among government entities, SADA and agricultural producers.
- pooling of resources for emergency apparatus and training.
- investments in early detection technologies and the remote surveillance of conditions.
- Fortifying the communication network and channels
- integrating risk management into strategic business planning
- conduct consistent risk evaluations and refresh their emergency strategies

Of the processors, the larger metro-based company is acutely aware of the risks associated with the scenario and has business continuity and disaster readiness plans in place. The Fleurieu-based company participates in regional resilience planning programs and works closely with the CFS in designing bushfire preparedness plans. Each reported plans to source alternative milk supplies should farm production and transport logistics be interrupted.

To improve preparedness, they advocated for;

- Further refinement of their action plan and scenario planning.
- Getting buy-in from their logistics partners and service providers for contingencies.
- Ensuring competitors in the processing space mutually agree to support each other during a major industry shock.
- Community lead action plans involving all cohorts within the region, local emergency services having the latest equipment technology, particularly communication links.

These considerations were incorporated into the Control Assessment and Key Insights sections of this report.

### Stage 3 – Control assessment

The **second** workshop focussed on the compounding and complex disaster scenario and presented a series of questions to tease out where farms and industry are at the most risk, how strong existing measures are, where there is the most vulnerability and what should or could be done to be better prepared. An initial discussion of reflections from workshop 1 included the following observations:

- The top of mind is the supply and accessibility of water for stock and firefighting.
- The importance of SADA considering the outcomes of this project and sharing across the industry.
- The importance of sharing data from PIRSA and CFS.
- The need for an industry/regional plan, communication and coordination.
- And, that the costs for preparedness are significant.

To test these, the workshop explored:

1. What are the top three elements of the system (on or off-farm) that are most vulnerable in this compounding natural disaster scenario?

2. For those areas at most risk, how strong are current measures in preparing for the scenario?
3. Where is the industry/SADA most vulnerable in the event of a compounding natural disaster and climate change?
4. What should be done and by whom to build preparedness?

The consensus was that generally off-farm measures provided by public agencies beyond farmers' control represent the greatest vulnerabilities, highlighting power supplies and telecommunications as key areas of concern. On farm, the workshop considered the priorities were for:

- the welfare of people and the need for people to 'know what to do' in the event of the scenario,
- the welfare of the dairy herd, with the need for designated and accessible safe havens with access to water supplies and;
- addressing key vulnerabilities relating to water supplies, lack of disaster preparedness plans and 'internal' communications.

An analytical process was then used to assess the overall strength of current measures by their effectiveness and application as outlined below, using criteria set out at **ATTACHMENT 3**.

### Evaluation of Control Effectiveness

Each identified control was evaluated for its effectiveness in managing risk. The evaluation criteria included:

- Coverage: extent to which the control addresses the hazard in the scenario.
- Timeliness: ability of each control to be quickly and effectively activated in the scenario.
- Quality and Robustness: consistency and dependability of the control in the scenario.
- Capacity and Resources: The availability and sufficiency of resources to support the control effectively in the scenario.

### Rating the Control Effectiveness and Vulnerability:

Following the assessment, controls were rated using a qualitative scale:

Effectiveness: Each control was rated as High, Medium, or Low based on its reliability and robustness.

Vulnerability was rated based on the likelihood of failure under the scenario, with ratings of High, Medium, or Low.

### Identification of Gaps and Recommendations for Improvement

The gaps or weaknesses that could reduce the effectiveness of existing controls were identified, and recommendations for improvement were made. These recommendations will be prioritised based on their potential impact on risk reduction, available resources, and implementation feasibility.

The outcome of the process is set out in **APPENDIX 3 CONTROL STRENGTH, VULNERABILITY RATINGS and PRIORITIES**: it elaborates on where there are priorities for action based on their vulnerabilities in recovery and preparedness modes.

### Stage 4 – Validation

To be completed once process finalised.

## Disaster Risk Reduction Key Insights and Actions

The forecasted impacts of climate change are expected to heighten the frequency and severity of disaster scenarios, necessitating additional preparedness measures. These impacts include increased risks of infrastructure damage, operational disruptions, and higher costs associated with upgrading and maintaining facilities to withstand extreme weather events.

To address these risks, the focus is on the control measures that have been rated as "HIGH" priorities, as assessed at **Appendix 3**. This section provides additional context to the priority rating, outlines a rationale for needed improvements, and identifies key organisations that can play a role in their implementation.

Control measures assessed as "MODERATE" and "LOW" priority are required to be monitored and maintained but are not considered to require any major improvements unless there are available resources or changing conditions that justify enhancement.

### Livestock Health & Wellbeing

#### Key Insights

Dairy farmers in the Fleurieu region will likely face growing challenges in ensuring livestock health and welfare. Prioritising animal welfare can significantly mitigate the economic impacts associated with reduced milk production, higher feed costs, and increased veterinary care, as well as the need to replace livestock that may be lost due to extreme weather conditions.

The strain on veterinary services during prolonged heatwaves and bushfire events can be significantly compounded by demand from multiple industries and hobby farmers. This highlights the critical need to ensure that farmers are well-equipped with appropriate knowledge and training in heat management strategies.

From discussions during the workshop, it was clear that while Fleurieu dairy farms are generally well-prepared to manage stock welfare during heatwaves and bushfires, concerns remain about capacity to provide emergency feed supplies and reliability of water supplies during and after such events.

#### Actions

##### 1. Cooling systems/infrastructure to mitigate heat stress impacts

Cooling systems and infrastructure are vital for mitigating heat stress impacts on dairy cows, particularly during prolonged heatwaves. As high-producing ruminants, dairy cows are highly sensitive to extreme heat, and failure to manage their environment can lead to significant health and productivity issues. Heat stress can reduce milk production, impair reproductive performance, and increase the likelihood of diseases. In extreme cases, it can cause severe dehydration and even death.

These systems are vulnerable during extreme heatwaves or bushfires, with power outages, water supply disruptions, and fire damage to infrastructure potentially compromising these systems.

*Industry can:*

- Collaborate with Dairy Australia to disseminate knowledge and best practices for implementing effective heat stress reduction techniques across the sector.
- Work with Dairy SA and service providers to encourage farms to

- install/upgrade sprinkler systems over yards (safe havens) constructed of fire-resistant materials,
- ensure backup power system is available and capable of supporting cooling operations during prolonged heatwaves or emergencies,
- train staff to operate and monitor cooling systems effectively and understand heat stress reduction techniques, and
- develop contingency plans for shaded areas or temporary shelters if systems are inoperable.

**Key stakeholders:** *Dairyfarmers, Dairy Australia, Dairy SA*

## 2. Emergency feed supply from on-farm stores and 'donated' from outside of the region

Previous incidents have shown that emergency fodder is often donated and distributed reactively rather than readily available as part of a proactive preparedness plan.

Limited fodder availability during hotter months or dry conditions further exacerbates this risk, particularly as demand spikes and availability diminishes.

*Industry can:*

- Consider establishing regional fodder banks in strategic locations that can provide rapid response supplies.
- Streamline logistics plan for distributing emergency feed to ensure feed reaches farms in a timely manner.
- Encourage farms to establish on-farm emergency feed reserves stored in fire-resistant facilities in multiple locations and to;
- consider diversifying feed suppliers and securing agreements with multiple providers to reduce reliance on a single source and ensure quicker access in emergencies.

**Key stakeholders:** *local authorities, industry bodies, and emergency services*

## 3. Access to water for stock drinking and cooling

A comprehensive water system across the farm is essential for ensuring reliable access to water for livestock, especially during extreme heat and bushfire conditions. However, these systems are vulnerable when above-ground pipes, pumps, and tanks are exposed to extreme heat, power is interrupted, or access is blocked.

Furthermore, high demand for water during heatwaves can deplete storage more rapidly than usual, especially if water sources dry up due to prolonged drought or extreme temperatures.

On top of contingencies for the supply and storage of water, the reticulation systems need to cover the needs of livestock across the farm, particularly for safe havens. Pipes, pumps and headworks need to be heat and fire-resistant.

### *Industry can:*

Encourage farms to review and upgrade water distribution systems such that it is:

- comprehensive across the farm, particularly to strategic points in an emergency,
- is heat and fireproof: buried and or resistant materials,
- linked to emergency water storages and power supplies (or not reliant on power), and
- potentially enable the use of mobile water tanks for flexibility

### *Key stakeholders:*

## Farm Assets and Infrastructure

### Key Insights

Of the preparedness measures, the areas of most vulnerability arise from

- not being engaged with the regional planning (Zone Emergency Management Plans and Bushfire Management Plans) for its preparedness for the scenario.
- Farms often not having a current document register of assets,
- The fire risk of roadsides and neighbouring properties
- Need to have designated provisions for emergency water supplies

A strength is that Fleurieu dairy farms are well-serviced by emergency warning systems.

Of some concern is that though farms are set up with fire breaks which, apart from irrigated pastures, are considered will be less effective in the scenario. There is some concern for the coverage and coordination of farm fighting units, which are considered very effective locally and for spot fires, but less so in the scenario.

Industry is concerned with the adequacy of local and industry knowledge in CFS Brigades as farmers are increasingly busy and unable to volunteer at levels expected by the CFS model. The adequacy of farms having multiple access points for emergency services is assessed as needing some attention.

### Actions

1. Coordinated bushfire response strategies between farm and broader emergency services.

The Fleurieu region, along with the broader state, is covered by emergency management and bushfire response plans established by the Zone Emergency Management Committee (ZEMC) and the Bushfire Management Committee (BMC). These committees develop strategic-level frameworks to guide preparedness, response, and recovery efforts during emergencies, providing a basis for local action and coordination across various sectors.

During consultations with dairy industry leaders in the region, it became evident that while these emergency and bushfire plans are in place, there is a lack of awareness among dairy producers about their content and how these plans can be utilised effectively. The regional approach to managing such scenarios was seen as critical, but industry leaders expressed a need for greater engagement and understanding of the existing plans. This gap in awareness was identified as a key area for improvement to ensure better preparedness and coordination during emergencies.

Furthermore, the consultation highlighted issues regarding the interaction between farm fire-fighting units (FFU) and the Country Fire Service (CFS). These conflicts have led to inefficiencies in firefighting

efforts, with different groups sometimes working at cross purposes or lacking clear communication and coordination during fire events. Addressing these challenges and fostering better collaboration between farm units and the CFS is crucial to enhancing response effectiveness and minimising potential damage to farm assets and surrounding communities during fire events.

*Industry can:*

- actively engage with ZEMC and BMC to better understand their scope and actions and to have industry input to their development and implementation.
- encourage **registered** farm firefighting units and enable communications with CFS in an emergency
- engage with community-led action plans like the Yankalilla RediCommunities project to participate in a broader regional preparedness.

**Key stakeholders:** *Zone Emergency Management Committee (ZEMC) and Bushfire Management Committee (BMC), Local Government, Farmers, CFS*

2. Maintain a centralised and up-to-date inventory of all response equipment and resources (e.g., fire-fighting pumps, water tanks, fire extinguishers, generators).

An asset register and its content being familiar to the workforce will be important when triaging efforts to provide protections leading up to and during a disaster event. More critical is having such register if/when insurance claims are made, with documented records of what might be lost/damaged and in need of replacement or repair.

*Industry can:*

- encourage farms to develop and maintain a documented asset register shared with and understood by the workforce,
- work with insurers to better understand their needs to expedite claims processes

**Key stakeholders:** *Farms, Farm Consultants, Insurers*

3. Roadside and neighbours' fuel reduction

While dairy farms typically have low levels of fire risk from vegetation on their own properties, they remain vulnerable to high fuel loads in surrounding areas such as roadways, neighbouring hobby farms, and conservation parks. As these properties are often outside the direct control of farmers, they rely on the surrounding community's fire management practices.

Collaboration between local fire services, governments, and farmers is key to improving the resilience of farms against bushfire threats.

*Industry can:*

- work with local councils, the Country Fire Service (CFS), the Zone Emergency Management Committees (ZEMC), and Bushfire Management Committees (BMC) to develop and implement fire management plans that include fuel reduction strategies along key roadside areas and around neighbouring properties, such as hobby farms and conservation parks. These plans

should focus on priority sites based on local knowledge of high-risk assets and their proximity to fire-prone areas

**Key stakeholders:** SADA, CFS, the ZEMC and BMC and farmers

#### 4. Designated water tanks and hydrants for emergency use

Dairy farms are set up well with infrastructure and water storage for irrigation, and many have contingency arrangements for fighting fires. With a heat wave and bushfire scenario, it was assessed that these are likely in many cases to be inadequate or vulnerable. Header tanks may be too small or not filled, reticulation infrastructure may be vulnerable to heat and fire, and indeed, given it may have been a dry preceding season, water supplies are limited.

This critical vulnerability is a high priority for evaluating the risk by farmers and may require significant planning and commitment to be better prepared.

*Industry can:*

- Advocate for funding for farmers to encourage investment in infrastructure resilient to extreme conditions.
- Develop guidelines on best practices water storage, including fire-resistant storage and water supply management in extreme conditions.
- Publish guidelines, promote widely and follow up at workshops and meeting

Farms to be encouraged to place priority on having

- designated sources of water supplies and accessibility for preparedness for a long heat wave and compounding bushfire: including accessibility by the CFS, and
- fire and heat-resistant reticulation systems.

**Key stakeholders:** SADA, Dairy SA , farm consultants, farmers

## People and Community Welfare

### Key Insights

The increasing frequency and intensity of extreme weather events will affect not only the productivity and viability of dairy businesses but also the health, safety, and resilience of farmers, their families, the workforce, and surrounding communities. These events are expected to disrupt workforce availability and productivity, strain volunteer resources, and increase business operational costs, compounding existing pressures on the sector.

Participants identified that the region is well served by emergency services provided by the health system and ambulance services. However, this report recognises that the capacity of mental health services could be significantly stretched in the event of a major incident. While these services are generally well-established, ensuring farm employers have sufficient awareness and understanding of the resources available to support their responsibilities and assist their workforce would enhance the industry's overall resilience.

A notable concern is the insufficient development of emergency action plans and worksite safety plans on many farms. These plans are critical for defining roles and responsibilities during disasters, ensuring the safety and well-being of individuals on the farm and within the broader community as they respond to and recover from crises. Proactive measures in these areas would significantly enhance disaster preparedness and recovery capacity.

### Actions

The assessment process identified a need for both::

WorkSafe plans to clarify roles and responsibilities in emergencies. and clear workplace agreements with roles and responsibilities in emergencies.

Effective workplace safety management during emergencies is critical for protecting people, maximising response effectiveness, and facilitating recovery. On dairy farms, the complexity of operations, the size of the workforce, and the presence of visiting service providers necessitate comprehensive, documented work safety and emergency action plans. These plans must establish clear roles, responsibilities, and actions to ensure the safety and well-being of all individuals on-site.

The traditional “she’ll be right” mindset is no longer appropriate in managing workforce safety during disasters. Relying on an informal, unwritten plan—often confined to the employer’s knowledge—is insufficient. Formalised, communicated, and practised plans are essential to meet modern safety expectations.

*Industry can:*

- Engage with WorkSafe SA to develop targeted training programs and conduct regular audits of farm workplace safety.
- Advocate for every farm to create detailed, written emergency action plans tailored to their specific operations and workforce structure.
- Encourage farms to conduct frequent workplace safety training sessions and drills

*Key stakeholders: SADA, WorkSafe SA, farm businesses*

## Farm Business Operations

### Key insights

Forecast climate changes, will bring new pressures on the operations of the farm business. These may reduce cow productivity due to heat stress, lower reproductive rates, and reduced feed quality. It may also see a decreased water supply and increased water demand for stock and irrigation, requiring an increased need for water storage and conservation measures.

With that, there will likely be increased energy demands with a consequential greater reliance on renewable energy or backup generators. Across the board, these new pressures will come at increased costs for the farm to be better prepared for a natural disaster.

With the scenario playing out, road closures or fire-damaged infrastructure preventing milk collection, feed deliveries, or veterinary services from reaching the farm will arise, as will impacts on power and water supplies

Business and production continuity in the event of the scenario is where the most vulnerability lies. There are concerns for reliability of access to the road network to provide for the industry's stock and milk movements. In an emergency such as in the scenario, adequate access to specialist services may be limited. With the inevitable prolonged shutdown of power, the capacity, longevity and reliability of alternative back up power supplies: of generator and batteries will be critical.

The key vulnerability is access to water supplies to keep the whole business operating. The complete reliance on mobile phones for important communications and the work and time pressures on key technical service providers to enable recovery are priority vulnerabilities.

#### 5. Access to water sources and storage pumped by backup power supplies

Access to reliable water sources and storage is critical for the operation and resilience of dairy businesses. Water is essential not only for daily operations such as watering stock and managing heat stress but also for emergency needs like fire-fighting and irrigating pastures to create fire breaks. While power supplies are often well-prepared with contingencies, water access remains a key vulnerability exacerbated by increasing costs, reduced allocations, and infrastructure limitations.

*Industry can:*

- encouraged farms to have dedicated water storages for emergency heat and fire control
- maintain header tanks full and reticulation equipment heat and fire proof (buried or insulated.)
- engage with water policy on provisions for emergency water use beyond licenced allocations.

**Key stakeholders:** SADA and producers,

#### 6. Availability of specialist technical services

Technical service providers such as electricians, milking infrastructure technicians, construction contractors and plumbers/irrigation specialists will likely be in short supply following the disaster event to enable recovery.

It will be critical to have established relationships, agreements and protocols in place for supporting a 'just in time' industry like dairy farming: cows cant wait, milk cant wait and businesses cant wait for a protracted recovery

*Industry can:*

- Industry identify and engage critical service provider for the dairy industry to raise awareness of needs of dairy in an emergency.
- Explore opportunities to engage with critical service providers to establish understandings of the critical need for rapid responses following a disaster event.

**Key stakeholders:** SADA and identified critical service providers,

## Mobile communication backup

### Emergency backup communications plans

Mobile phone networks are a vital communication tool for farms and rural communities. Maintaining communication during disasters is critical for safety, coordination, and response effectiveness. However, these networks are vulnerable to damage, especially from extreme weather events that can disrupt infrastructure, such as mobile towers.

For many farmers, it is unlikely they have alternative backup communication methods in place during emergencies. The primary challenge lies in the cost and complexity of establishing backup systems. Alternative communication options, such as satellite phones, two-way radios, or private radio towers, can be expensive and may require significant ongoing maintenance.

It is noted that Telecommunications companies and the Australian government have undertaken several initiatives to reduce the risk of mobile tower outages during disasters and improve overall communication network resilience. Strengthened collaboration between government bodies, telcos, and local communities is required to continue to address these vulnerabilities and improve preparedness.

#### *Industry can:*

- Engage with telecommunications providers to prioritise installing more resilient mobile infrastructure in rural and high-risk areas.
- Advocate for backup power systems with extended capacity to support mobile towers during prolonged emergencies.
- Encourage the use of UHF radios on farms as a reliable alternative to mobile phones during emergencies.

**Key stakeholders:** Telecommunication providers, Farm owners, State & Federal Governments

## Key Stakeholders

Who	Role	Key Agencies
Industry Bodies	Advocate for fire prevention funding, develop industry-wide standards for fire risk management, and collaborate with other sectors to enhance preparedness.	Primary Producers SA (PPSA) South Australian Forest Products Association ( SADA)
State government agencies	Provision of funding, legislation, and coordination of fire prevention.  Emergency support, advice, recovery services, and financial assistance for businesses and communities.  Oversee animal and plant biosecurity, fire management and climate adaptation.	Department of Environment and Water , Country Fire Service  National Park and Wildlife Services Primary Industries and Regions (PIRSA) South Australian State Emergency Service  The Bureau of Meteorology (BOM)
Local Council	Land use planning / development controls engaging with local communities, coordinate local emergency responses	Victor Harbour, Yankalilla and Alexandrina Councils
Fire Services	Execute fire prevention and response strategies, provide training, and lead coordinated efforts during fire events.	Country Fire Service (CFS), Country Fire Authority (CFA), Forest Industry Brigades (FIB), and farm firefighting units
Research Institutions	Research on fire behaviour, fire mitigation technologies, and the development of fire-resistant plantation species.	Universities, forestry research bodies, and environmental agencies.
Local Community	Participate in fire prevention campaigns, follow fire safety guidelines, and assist in early reporting and detection.	Residents of fire-prone areas, local community organisations, and landowners.
Landscape Boards SA	Manage public and private land across regional areas and are responsible for implementing fire management strategies in these landscapes	Hills and Fleurieu Landscape Board
Non-Government Organisations	Health and wellbeing, financial and business planning counselling and coaching	Rural Business Support, Beyond Blue, Baptist Care, Centre Care, Uniting SA, Lifeline etc
Law Enforcement	Coordinate public safety, law enforcement, emergency evacuations, search and rescue operations, and maintain order during disaster response and recovery.	South Australia Police (SAPOL)

## Governance arrangements








The project was overseen by a Steering Committee composed of Brett Bartel (PIRSA), Caroline Rhodes (PPSA) and Nicole Westbury (SAFECOME). Following PIRSA's analysis of industry's risk profiles, executives of the SADA, SAFPA and WGCSA joined the committee. The committee was supported by the PIRSA/PPSA Working Group of Kelly Menadue, Rebecca McCall, Greg Cock and Alyssa Stockwell. Meetings were also attended by Alistair Lawson of AgCommunicators, contracted by PPSA to deliver communications products.

## Funding acknowledgement

This project was conducted by Primary Producers SA under an Grant Agreement with Primary Industries and Regions SA that was a successful applicant to the Disaster Risk Reduction Grants Program of the South Australian (SA Fire and Emergency Services Commission) and Commonwealth governments.

## ATTACHMENT 1: Climate Change forecasts and data for the Fleurieu

### [DEW- Latest climate projections](#)

	<b>Higher temperatures</b>	Maximum, minimum and average temperatures will increase.
	<b>Warmer spring temperatures</b>	Warming in spring is likely to be greater than in any other season.
	<b>Hotter and more frequent hot days</b>	The frequency of very hot days will continue to increase, and periods of hot weather will get longer and hotter.
	<b>Fewer frosts</b>	The frequency of frost events will remain comparable until 2030. In the longer-term, frosts are expected to decrease as the climate warms.
	<b>Declining rainfall</b>	Average annual rainfall will decline.
	<b>Lower spring rainfall</b>	Spring rainfall declines will be greater than any other season.
	<b>More drought</b>	Time spent in drought will increase.
	<b>More intense heavy rainfall events</b>	The number and intensity of heavy rainfall events will increase.
	<b>Increased potential evapotranspiration</b>	Potential evapotranspiration is projected to increase across all seasons.
	<b>Wind</b>	Wind speeds will remain comparable until 2030. In the longer-term, a pattern of winter wind speed decrease is likely.
	<b>More dangerous fire weather</b>	Harsher fire weather will be experienced, and fuels will be drier and more ready to burn.
	<b>Rising sea levels</b>	Sea levels will continue to rise.
	<b>Warmer and more acidic ocean waters</b>	Sea surface temperatures will continue to rise, and acidity will continue to increase.

More specifically for Fleurieu, the forecasts are for the following.

	1986 – 2005	2020 - 2039	2040 - 2059
<b>TEMPERATURE</b>			
Av daily max temp	19.8	20.9	21.3
Av daily min temp	9.2	9.9	10.2
Av hot days (>35)	8	12	15
Av daily max temp			
Annual	19.8	20.9	21.3
Summer	25.7	27.1	27.4
Autumn	20.7	21.7	22
Winter	13.7	14.7	15
Spring	18.9	20.1	20.9
Av hot days	8	12	15
Av hot nights (>20)	6	8	9
<b>RAINFALL</b>			
Annual	784	693	677
Summer	114	104.88	103.74
Autumn	188	167.32	169.2
Winter	279	253.89	220.41
Spring	199	171.14	157.21

## APPENDIX 2: Risk and Control Assessment Tools

### CONTROL EFFECTIVENESS

Rating	LEVEL		Action Required
highly effective	HIGH	The control is well designed, fully implemented, and mitigates the risk with no significant weaknesses or gaps.	Continue monitoring, no action required.
effective	MEDIUM	The control is generally effective but has some minor gaps or weaknesses that may reduce its effectiveness.	Minor improvements can optimize the control but it's still adequate
some effect	LOW	The control addresses the risk but has considerable gaps or weaknesses that limit its effectiveness.	Significant improvements needed to enhance risk mitigation.

### CONTROL APPLICATION

Rating	LEVEL	Description	Action Required
fully applied	HIGH	The control has been fully implemented and consistently applied. It is functioning as intended with no gaps.	No immediate action is required. Continue monitoring for consistency.
mostly applied	MEDIUM	The control has been largely implemented, but there may be minor gaps in its consistent application.	Address minor gaps to ensure full application.
partially applied	LOW	The control has been implemented in some areas, but its application has notable inconsistencies or gaps.	Significant improvements are needed to ensure broader application.

**CONTROL STRENGTH**

STRENGTH	Application		
Effectiveness	low	medium	High
high	medium	High	High
medium	medium	Medium	High
low	low	Medium	Medium

**CONTROL VULNERABILITY RATNGS**

Rating	Description	Characteristics
<b>HIGH</b>	High susceptibility to risks with minimal or ineffective controls in place. Likely heavily impacted by adverse events.	Limited or no mitigation strategies. High exposure to threats. Significant resource constraints
<b>MEDIUM</b>	Moderate susceptibility to risks with some controls in place. Can manage adverse events but may still experience moderate impacts	Partial or moderately effective controls. Moderate resource availability. Some exposure to threats
<b>LOW</b>	Low susceptibility to risks with strong controls in place. Well-prepared to handle adverse events with minimal impact	Robust and effective mitigation strategies. Sufficient resources and contingency plans. Low exposure to threats

**Considerations for Assessing Vulnerability**

Control Design and Implementation	Effectiveness of design Quality of implementation Scope and coverage of the control
Operational and Environmental Factors	Consistency of application Suitability for environmental conditions Adaptability and flexibility
Resilience and Robustness	Presence of redundancies Stress testing against adverse events Availability of resources
Management and Monitoring	Adequate oversight and governance Processes for monitoring and reporting Feedback and continuous improvement
Dependency on External Factors	Reliance on external resources or organisations Supply chain vulnerabilities

**CONTROL PRIORITISATION MATRIX**

<b>Strength</b>	High	Medium	Low
<b>Vulnerability</b>			
High	Moderate Priority	High Priority	High Priority
Medium	Low Priority	Moderate Priority	High Priority
Low	Low Priority	Low Priority	Moderate Priority

High Priority Controls: Immediate focus for improvement. Strengthen these controls by investing in additional resources, training, or technology upgrades.

Moderate Priority Controls: Consider for near-term improvements; assess whether moderate interventions could close gaps without significant cost or resource allocation.

Low Priority Controls: Monitor and maintain, but defer major improvements unless there are available resources or changing conditions that justify enhancement.

## APPENDIX 3: Control Strength, Vulnerability Ratings and Priorities

The following tables identify the existing controls, evaluates their effectiveness, and highlights key vulnerabilities and gaps. The insights from this assessment provide a clear understanding of where improvements are needed and help prioritise areas for enhancing preparedness and overall risk management.

### At risk: Livestock Health and Safety

CONTROL MEASURE	B	H	CONTROL STRENGTH	VULNERABILITY RATING	PRIORITY
At Risk: Livestock health and safety					
Designated safe havens for milking stock to protect livestock during bushfires and heatwaves.  PREPARE	X	X	MEDIUM  Safe havens can provide critical protection for livestock, though there may be access issues during a crisis.  Many farms have designated areas but may lack adequate arrangements during crises.	LOW  The milking herd will be in close proximity to milking sheds/irrigated pastures.  Capacity limits for full herd shelter and challenges relocating livestock in emergencies if routes are limited or blocked.  May expose livestock to increased risk if not adequately safeguarded.	<p>LOW PRIORITY</p> <p>Promote, with DA a program to encourage producers to:</p> <ul style="list-style-type: none"> <li>develop plans that outline alternative safe havens if the primary site is compromised.</li> <li>monitoring and early warning systems to aid in proactive measures</li> </ul>
Designated safe havens for dry stock to protect livestock during bushfires and heatwaves  PREPARE			MEDIUM  Dry and young stock away from the dairy can get forgotten or paid less attention.	MEDIUM  May have limited access to water, feed or shade for extended periods.  May have limited access to water, feed or shade for extended periods.  Inadequate personnel for relocation.  Staff preparedness	

CONTROL MEASURE	B	H	CONTROL STRENGTH	VULNERABILITY RATING	PRIORITY
At Risk: Livestock health and safety					
Evacuation plans to facilitate movement to safe havens.  PREPARE	X	X	MEDIUM  Drafting plans facilitate safe movement, but their effectiveness may depend on farm layout and staff readiness.	MEDIUM  Considerations of different species/ages of livestock in emergencies.  Prioritisation of livestock based on their welfare requirements  Untrained staff or lack of practice may hinder rapid response.  Availability of people	MODERATE PRIORITY  Crafting and practising evacuation procedures
Regular stocktakes of particularly dry and young livestock to ensure accurate tracking and management in crises.  PREPARE	X	X	MEDIUM  Provides an accurate count and location of all livestock, enabling emergency responders to prioritise and organise the safe evacuation  Farm owners can better plan for feed, water, and transportation resources required to shelter or evacuate animals.  Stocktakes allow for full accounting of risks/losses  Regular stocktakes are typically well-established.	LOW  Gaps in record maintenance or shared knowledge can limit response effectiveness during crises.  Accessibility of records – Digital record systems are vulnerable to power outages, and paper records may be inaccessible.	LOW PRIORITY  Enable RFID systems to track livestock. Ensure back-up power to run RFID system and staff are trained to utilise.

CONTROL MEASURE	B	H	CONTROL STRENGTH	VULNERABILITY RATING	PRIORITY
At Risk: Livestock health and safety					
<p>Access to veterinary services for timely treatment of livestock during crises.</p> <p>RESPOND</p>	X	X	<p><b>MEDIUM</b></p> <p>Veterinary services are essential, but their availability may be limited in remote or crisis-hit areas.</p> <p>Effective safe havens and management of stock will obviate high vet requirements.</p> <p>Farmers will generally have a good relationship with Vet.</p>	<p><b>MEDIUM</b></p> <p>Access may vary depending on location and the severity of the crisis, and farms may face challenges getting timely veterinary care during large-scale emergencies (capacity).</p> <p>Other livestock producers and hobby farms will also have high demands</p>	<p><b>MODERATE PRIORITY</b></p> <p>Establishment of on-site first aid measures that farm personnel can implement.</p> <p>Training of farm personnel in basic livestock first aid.</p> <p>Store supplies of emergency medicines on-site.</p> <p>Alternative services - mobile response unit or telehealth.</p>
<p>Cooling systems/infrastructure to mitigate heat stress impacts on livestock.</p> <p>PREPARE</p>		X	<p><b>MEDIUM</b></p> <p>Effective for <b>heatwaves</b>, though unreliable during bushfires due to potential power or water supply issues.</p>	<p><b>HIGH</b></p> <p>Cooling infrastructure may not withstand flames or power outages, limiting its usefulness in direct bushfire scenarios.</p> <p>Increased costs of installing/operating systems and the required scale for large herd management.</p> <p>Awareness gaps in implementing effective heat stress reduction techniques.</p>	<p><b>HIGH PRIORITY</b></p> <p>Protective barriers (sprinklers over yards) and fire-resistant materials.</p> <p>Backup power that are available and capable of supporting cooling operations during prolonged heatwaves or emergencies.</p> <p>Staff are trained to operate and monitor cooling systems effectively and understand heat stress reduction techniques.</p> <p>Contingency plans – shaded areas or temporary shelter if systems inoperable.</p> <p>Backup water sources.</p>

CONTROL MEASURE	B	H	CONTROL STRENGTH	VULNERABILITY RATING	PRIORITY
<b>At Risk: Livestock health and safety</b>					
<p>Emergency feed supply from on-farm stores and 'donated' from outside of the region</p> <p>PREPARE</p>	X	X	<p><b>MEDIUM</b></p> <p>Emergency feed is vital but requires pre-planning to address seasonal and crisis-specific needs.</p> <p>On farms stores of hay, but these are vulnerable to a fire.</p> <p>Fire safe grain silos and buried silage pits provide some emergency feed supplies.</p> <p>Processes are established to provide emergency fodder.</p> <p>In a emergency there is an option to 'dry off' the herd</p>	<p><b>HIGH</b></p> <p>Adequacy of on-farm stores and arrangements to buy in.</p> <p>Storage areas can be vulnerable to extreme conditions.</p> <p>Access or transport of stores can be difficult.</p> <p>Availability of feed due to scale of emergency or seasonal conditions.</p> <p>Feed quality meeting nutritional requirements in the longer term</p> <p>Biosecurity risk (systems in place to track fodder donations)</p>	<p><b>HIGH PRIORITY</b></p> <p>Feed strategies tailored to seasonal variations and potential disasters.</p> <p>The ability for feed storages to withstand extreme weather (eg: buried silage pits</p> <p>Back-up supply arrangements or feed alternative.</p> <p>Noting demand might outstrip supply during a large-scale crisis coupled with seasonal conditions.</p>
<p>Water Access</p> <p>PREPARE</p>	X	X	<p><b>MEDIUM</b></p> <p>Comprehensive water infrastructure/sources across the farm is essential but may not be reliable during a crisis.</p>	<p><b>HIGH</b></p> <p>Limited water access points and power outages can disrupt supply in an emergency.</p> <p>Above-ground pipes or tanks are vulnerable to fire damage.</p>	<p><b>HIGH PRIORITY</b></p> <p>Multiple access points to reduce reliance on a single point of access.</p> <p>Options for systems that don't rely on power.</p> <p>Drought-tolerant and fireproofing measures for infrastructure.</p> <p>Mobile water tanks</p>
<p>Access to remote dryland blocks (For recovery)</p> <p>PREPARE</p>	X		<p><b>HIGH</b></p> <p>Remote dryland blocks provide safe zones for livestock</p>	<p><b>LOW</b></p> <p>Can be limited by potential inaccessibility and lack of facilities,</p>	<p><b>LOW PRIORITY</b></p> <p>Alternative arrangements for longer term recovery</p>

CONTROL MEASURE	B	H	CONTROL STRENGTH	VULNERABILITY RATING	PRIORITY
At Risk: Livestock health and safety					
			during <b>recovery phases</b> Most farms have established this practice.	especially for prolonged use.	such as offsite agistment and destocking

## At risk: Farm assets and infrastructure

Disaster scenario considerations

- Damage to essential infrastructure (milking sheds, feed storage, fences, water systems)
- Destruction of grazing land and stored feed

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
At Risk Farm assets and infrastructure					
Install and regularly monitor emergency warning systems, such as phone apps (e.g., Emergency+ or the CFS Fire App) and radio broadcasts that provide real-time updates.  PREPARE	X	X	<b>HIGH</b>  Accurate and timely warning systems are well-established and widely used	<b>LOW</b>  Vulnerability due to potential network issues or app delays, especially in remote or rural areas with limited connectivity through radio/television provide backup.  Insufficient monitoring can result in missed early warning signs.	<b>LOW PRIORITY</b>  Advocate for investment in early detection and remote surveillance of conditions
Coordinated bushfire response strategies between farm and broader emergency services.  PREPARE	X	X	<b>MEDIUM</b>  Critical for disaster response coordination but there is currently a low awareness of external bushfire strategies by industry.  Disconnect between CFS & Farm firefighting units.	<b>HIGH</b>  Lack of awareness of the Regional Disaster Plan developed by the Zone Emergency Management Committee (ZEMC) <a href="#">adelaide hills fleurieu ki zemp</a> , and Fleurieu Bushfire Plan developed by the Bushfire Management Committee( <a href="#">Fleurieu Bushfire Management Area Plan</a> ) into the farm's bushfire response strategy, ensuring alignment with broader emergency services. ) can confuse or delay response efforts.	<b>HIGH PRIORITY</b>  Industry to actively engage with ZEMC and BMC.  Farmers encouraged to have <b>registered</b> farm firefighting units and enable communications with CFS in an emergency  Industry to engage with community lead action plans like the Yankalilla RediCommunities project
Well-trained and resourced Country Fire Service (CFS).	X		<b>MEDIUM</b>  Farmer knowledge and experience is	<b>MEDIUM</b>  The efficacy of the CFS is limited by:	<b>MODERATE PRIORITY</b>  Investigate different models to standard

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
At Risk Farm assets and infrastructure					
PREPARE			valuable but undervalued.	<ul style="list-style-type: none"> <li>professionals and volunteer tensions</li> <li>underutilised local knowledge and experience.</li> </ul>	volunteering to enable farmers to engage with the CFS
Incident Control Centres (ICC) for logistics and coordination. RESPOND	X		<b>HIGH</b> The ICC is operating at the strategic level and has high level of skills and knowledge but impeded by incomplete knowledge of the fire ground and dairy industry needs.	<b>LOW</b> ICC operations diminished by lack of local knowledge with less effective response actions	<b>LOW PRIORITY</b> Advocate for a mechanism to enable greater industry/farmer knowledge to be engaged at the ICC.
Maintain a centralised and up-to-date inventory of all response equipment and resources (e.g., fire-fighting pumps, water tanks, fire extinguishers, generators). PREPARE	X	X	<b>LOW</b> Developed by some but generally not documented on farm. Region has not had exposure to a bushfire event for sometime.	<b>LOW</b> Inventories not documented or shared with the workforce. Disconnect between CFS and farm fire units. Without a current asset register, lodging insurance claims for damage or destruction of assets and property and/or disruption of the business are difficult and protracted	<b>MODERATE PRIORITY</b> Encourage farms to develop and maintain a documented asset register. Inclusion in staff induction/Regular training.
Establish and maintain <u>strategically located</u> fire breaks around critical infrastructure and areas with high fire risk (e.g., around livestock enclosures,	X	X	<b>MEDIUM</b> Has some effect in a bushfire in preventing spread. Pasture productivity trade-offs	<b>MEDIUM</b> Capability and disconnect with hobby farmers/neighbours in preparedness.	<b>MODERATE PRIORITY</b> Encourage farms to have thorough farm fire prevention strategies, including clearing of vegetation and setting

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
At Risk Farm assets and infrastructure					
crop fields, and buildings). PREPARE				Maintenance requirements. Reduction of appropriate days to conduct burn offs.	up sprinklers around key assets.
Roadside fuel reduction PREPARE	X		LOW Fuel reduction activities around farms can limit fire intensity Limited resources and vegetation laws limit fuel reduction. Uncertainty around responsibilities of different agencies	HIGH Risks increase if efforts are infrequent or delayed due to resourcing. Reduction of available burn off days.	MODERATE PRIORITY Industry work with Councils, CFS, the ZEMC and BMC to monitor roadside vegetation hazards and recommend action at priority sites.
Irrigated pastures (protection) PREPARE	X	X	HIGH Irrigated pastures provide effective fire control, and many farmers have this in place.	LOW Destruction of infrastructure or unreliability of power ( post fire) Spike water demand for livestock and fire protection in a heatwave and fire can, potentially overtax water supplies and limit irrigation. Increasing water costs and costs of maintenance and operations	LOW PRIORITY Irrigated pastures are generally part of Fleurieu farms and a key part of preparedness for a disaster.
Store feedstocks in strategic locations PREPARE	X	X	MEDIUM Distributing feed across locations minimizes the risk of	MEDIUM Moderate vulnerability due to potential access issues if storage sites	MODERATE PRIORITY To spread risks of losing all feed supplies, encourage farms to

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
At Risk Farm assets and infrastructure					
			total loss and helps maintain reserves after a bushfire.	are affected by the fire or if transport routes become obstructed.  Reduced pasture growth or quality may result in increased capacity requirement for feed storage	locate hay stacks, feed silos at various strategically safe locations around the farm.
Access to firefighting equipment on farms PREPARE/RESPOND	X		MEDIUM  Critical for spot fires  Many farms have farm firefighting units	LOW  Insufficient coordination with CFS	LOW PRIORITY  Priority is for farms to register with the CFS and open opportunities for coordination.
Multiple access points to farm for emergency services PREPARE/RESPOND	X		MEDIUM  Most farms have multiple access points, though may require additional points of access in a disaster.  Multiple access points has implications for biosecurity	MEDIUM  Single access points restricts emergency services capacity to fight fires across the farm and exacerbate impacts.  Biosecurity risks of multiple points of access need consideration.	MODERATE PRIORITY  Farms to be encouraged to plan and implement multiple points of access for firefighting, with consideration of how to minimise any biosecurity risks from unauthorised entries.  Virtual fencing
CFS knowledge of farm water access points PREPARE/RESPOND	X		HIGH  Water sources are mostly accessible by the CFS	LOW  Responsive firefighting is limited by access to water but farms generally have dams and standpipes accessible to CFS	LOW PRIORITY  Could be improved but CFS generally aware of water sources
Designated water sources for emergency use. PREPARE	X		MEDIUM  Water reticulation designed for disaster is different to just for irrigation and stock water.	MEDIUM  Vulnerable to fire damage or depletion; requires consistent maintenance and protection to remain	MEDIUM PRIORITY  Farms to be encouraged to have <ul style="list-style-type: none"> <li>designated sources of water supplies accessible to CFS</li> </ul>

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
At Risk Farm assets and infrastructure					
			Most have storages but poly pipes , pumps, irrigation infrastructure is vulnerable	reliable, especially during crises.	<ul style="list-style-type: none"> <li>• fire and heat resistant reticulation systems.</li> </ul>

## At risk: People and community welfare

Safety and well-being of farm workers and community members

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
At Risk People and Community Welfare					
Farm emergency action plans that include procedures for staff and visitors during disasters. PREPARE/RESPOND	X	X	MEDIUM Action plans that outline evacuation routes, communication protocols, and role assignments are highly effective in guiding swift and organized responses, reducing risk of injury or fatality. Clear plans also help minimize panic and confusion during a bushfire.  Developed by some farms	MEDIUM Lack of Emergency Action Plan and knowledge and application. Reliance on key personnel Failure of identified communication channels Staff turnover	MODERATE PRIORITY Integrate risk management into strategic business planning Conduct consistent risk evaluations and refresh emergency strategies. Regular training for staff on emergency procedures
Access to mental health services for farm workers to support their wellbeing, especially post-disaster. RECOVER	X	X	MEDIUM Important post-disaster recovery	LOW Service may be stretched by demand from the disaster. Limited awareness of services available or how to access	LOW PRIORITY Farmers to be aware of the many mental health service available and be accepting of help. Industry conduct awareness and training sessions with farmers.
Access to safety resources for employers (training programs, emergency equipment and health and safety guidelines) RECOVER			MEDIUM Information available though not widely known or used Dairy Australia's "People in Dairy" guide for employers	MEDIUM Lack of awareness of available resources. Cost and availability of safety equipment	LOW PRIORITY Industry engage with WorkSafe SA to develop and deliver training and audits of work site safety.

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
				Inconsistent training/frequent staff turnover	
Timely access to ambulance services for emergencies.  RESPONSE	X	X	HIGH Available	LOW Ambulance services are generally available and accessible but can be stretched during large-scale emergencies.	LOW PRIORITY Industry engage Ambulance Service to understand response to a rural emergency.
Emergency departments are prepared and available to respond  RESPONSE	X	X	HIGH Available to respond	LOW Community well served but potential stretched by the scenario	LOW PRIORITY The capacity of emergency departments is beyond farmers are industry to influence
Clear roles and responsibilities of staff in emergencies.  PREPARE	X		MEDIUM Farms are obligated to have WorkSafe plans.	MEDIUM Frequently not written down or regularly communicated.	<b>MODERATE PRIORITY</b> Industry engage with WorkSafe SA to develop and deliver training and audits of work site safety.  Regulate staff taringin and drills  Inductions
Communication protocols for emergencies, including preferred and alternative platforms.  PREPARE	X		HIGH Multiple platforms available	MEDIUM Reliance on a single platform or understanding of IT infrastructure can be problematic.	LOW PRIORITY Farms encouraged to explore UHF as an alternative to mobile phones in an emergency.  Continued investment in the telecommunications network/infrastructure to build capacity.

## At risk: Farm Business operations

### Disaster Scenario Considerations

- Supply chain interruptions (milk collection, feed deliveries, critical services)
- Damage to infrastructure

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	Priority
<b>At Risk: Farm Business Operations</b>					
Access to water sources pumped by backup power supplies RECOVER			<b>MEDIUM</b> Most have backup power supplies in place.	<b>HIGH</b> Water is critical and header tanks and pipes are vulnerable to heat and fire. Power outages Prolonged heat waves put extra pressure on cooling and other critical infrastructure Timing to restore damaged infrastructure and access to materials.	<b>HIGH PRIORITY</b> Farms are encouraged to <ul style="list-style-type: none"> <li>• have dedicated water storages for emergency heat and fire control</li> <li>• maintain header tanks full and reticulation equipment heat and fireproof (buried or insulated.)</li> </ul>
Communication plans with milk processors and transporters PREPARE/RESPOND	X	X	<b>HIGH</b> Farms have sound relationships with carriers and processors that enable communications in a disaster scenario.	<b>MEDIUM</b> Network disruptions or road closures Mobile and internet service may be disrupted by fire, creating communication blackouts Risk of delays if multiple farms in the area are affected, stretching resources.	<b>LOW PRIORITY</b> Industry share scenario planning with carriers and processes, including preferred communication protocols.
Adequate access to on farm water storages. PREPARE	X	X	<b>LOW</b> Adequate supplies and access to water are critical, and while most farms	<b>MEDIUM</b> Infrastructure may be vulnerable to damage	<b>HIGH PRIORITY</b> Industry engage with water policy on provisions for emergency

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	Priority
At Risk: Farm Business Operations					
			have storage facilities, they may not have sufficient reserves during prolonged fire or extreme heat events.	Risk of water depletion during prolonged fires or extreme heat	water use beyond licenced allocations. Farms encouraged to <ul style="list-style-type: none"> <li>• have dedicated water storages for emergency heat and fire control</li> <li>• maintain header tanks full and reticulation equipment heat and fire proof (buried or insulated.)</li> </ul>
Back-up power sources (Generators and batteries)  PREPARE/RESPOND			MEDIUM  If comprehensive across the farm, it can keep systems operational to minimise the effect of impacts on livestock and milk supply.  Farms have systems to keep parts of the farm operational for limited time.	MEDIUM  Fuel availability (limited or inaccessible during an emergency)  Diesel storage limitations  Equipment failure due to lack of maintenance or prolonged usage.  Batteries offer limited power and may be depleted quickly in a prolonged outage  High costs and uncertainty regarding longevity.	MODERATE PRIORITY  Farms encouraged to revisit the adequacy of the output, longevity and reliability of backup generators and invest in more dependable backup options
Alternative routes for logistics during emergencies mapped and identified  PREPARE			MEDIUM  Disruption to transport networks can delay the collection of milk/feed/service providers.	MEDIUM  May be limited by rural infrastructure and fire-related road closures.	MODERATE PRIORITY  Google Maps is now giving reliable advice on the condition and accessibility of roads.  Industry engage SAPOL on protocols for milk

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	Priority
At Risk: Farm Business Operations					
					carriers needing access in an emergency.
CFS is familiar with industry-specific transport issues PREPARE			LOW CFS understanding of industry need is critical but limited by knowledge and skills of volunteers	LOW Declining farmer representation amongst CFS brigades limits understanding.	MODERATE PRIORITY Specific need of regionally important dairy herds and infrastructure to the economy and community are a priority.
Safe and sufficient storage for fuel and vehicles PREPARE			MEDIUM Most farms have good supplies of fuel for an emergency	LOW Emergency supplies of fuel are expensive and add to fire risk	LOW PRIORITY
Comprehensive insurance coverage, property, livestock, equipment, and infrastructure. PREPARE/RECOVER	X	X	MEDIUM It provides financial relief post-event but does not affect active risk reduction or fire prevention.	MEDIUM Vulnerabilities include high costs, complex terms, and limited incentives for safe farm practices.	MODERATE PRIORITY Consider the implication of the KPMG report commissioned by PIRSA.
Availability of specialist technical services RECOVER			LOW Critical services (electricians, stock agents) are overwhelmed by the disaster.	MEDIUM Dependence on specific service providers who may also be affected by the bushfire.	HIGH PRIORITY Industry identify and engage critical service providers for the dairy industry to raise awareness of the needs of dairy in an emergency
Mobile communication backup PREPARE			MEDIUM Mobile towers have backup power, but potential failure is of significant concern.	HIGH Failure in mobile infrastructure during a disaster may occur	HIGH PRIORITY Industry work with telco to fortify the network and channels
Emergency backup communications plans PREPARE			LOW There are limited options now in lieu of mobile phone	MEDIUM Reliance on mobile phones	HIGH PRIORITY Industry encourage farmers to enable UHF communications from

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	Priority
At Risk: Farm Business Operations					
			communication failures. Few if any have plans for alternative communications	Black spots jeopardising communications	multiple locations for emergency communication
Timely identification of affected properties by industry group to enable effective communication during emergencies			MEDIUM Dependant on reliability and completeness of data in CRM.	MEDIUM Privacy rules limit ability for sharing of data between organisations.	MODERATE PRIORITY SADA to enable its CRM to identify all PIC details for communications in fire ground.

### At risk: Milk Processing and Supply Capacity

Supply chain interruptions (milk collection, feed deliveries, critical services) and damage to infrastructure

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY Improvement Measures
At Risk: Milk Processing and Supply Capacity					
Access to alternative milk supplies  PREPARE / RESPOND	X		HIGH Companies have contingencies to source milk from other regions	LOW Disruption to usual supplies, extra logistics and high retail prices	LOW PRIORITY Seek buy-in from logistics partners for alternative supply arrangements and agreements with competitors to support each other.  Implement 'co-packing' arrangement with companies not affected by the disaster
Business continuity disaster readiness plans  PREPARE / RESPOND / RECOVER	X		HIGH Companies have contingencies to source milk from other regions	LOW Failure of the processing site unrelated but	LOW Further refinement by companies of business continuity and disaster readiness plan

CONTROL MEASURE	B	H	STRENGTH	VULNERABILITY	PRIORITY
At Risk: Milk Processing and Supply Capacity					
				compounding to the on-farm disaster	
Regional processor participation in community resilience workshops PREPARE			MEDIUM Participation in regional disaster planning strengthens individual company preparedness	MEDIUM Regional planning is not specific enough for preparing an individual processors preparedness	MODERATE PRIORITY Industry to promote regional processors to engage with local resilience planning
On-site training for processor staff with CFS PREPARE			HIGH Joint exercises with the CFS greatly enhances preparedness	MODERATE	MODERATE PRIORITY

## APPENDIX 4: Farm Consultant and Processor Feedback

### FARM CONSULTANT

#### Impacts

- repercussions are profound and varied
- welfare of the livestock diminished milk production
- power outages could severely disrupt milking processes, cooling systems, and water supplies,
- Access issues could also impede the delivery of feed and collection of milk,
- financial setbacks for farmers and potential disruptions in the supply chain

#### Measures

- water reserves to secure supply amidst power failures
- creation of firebreaks
- certain farms may have allocated funds for backup generators

#### Vulnerability

The dairy sector's Achilles' heel lies in its dependence on uninterrupted power, water access, and the safeguarding of livestock and infrastructure

#### Improvements

- investing in more dependable backup power options,
- more thorough fire prevention tactics: routine removal of combustible and installation of sprinkler systems in key locations.
- crafting and practicing evacuation procedures for animals
- unified effort among government entities, SADA and agricultural producers.
- pooling of resources for emergency apparatus and training
- investments in early detection technologies and the remote surveillance of conditions.
- Fortifying the network and communication channels
- integrating risk management into strategic business planning
- conduct consistent risk evaluations and refresh their emergency strategies

### PROCESSORS

#### Impacts

##### Lactalis

- would make every attempt to continue to collect milk
- maintains a regional spread of raw milk supply for this reason able to draw from our supply pool in the southeast, the Murray River and mid North as well as processed milk from Victoria.
- ability to supply certain finished products to our markets could be reduced

##### Fleurieu

- Dairy Processors would face immediate financial hardship

- the emotional toll on employees and their families
- shortages of local dairy product with higher prices for consumers processors and a need to import milk or reduce production,

### Current Measures

#### Lactalis

- Company has business continuity procedures and plans in place to cover a range of scenarios and an internal process to review disaster readiness in any event.
- Has relationships with other processors in similar markets to co pack for Lactalis.

#### Fleurieu

- Yankalilla Council hold community led disaster resilience Workshops –,
- yearly training sessions on site with the Myponga CFS and have a CFS Fire Plan.

### Vulnerability

#### Lactalis

- adequately equipped to source raw milk from our broader pool biggest local risk in SA is most likely a major failure at our processing site, While this would add major cost and be a disruption. It would ensure core products remain available to our customers in SA

#### Fleurieu

- in a suitable position to best protect the business against fire heatwave etc, but in the event that the milk quality or supply chain is disrupted, we would be **forced to source milk from other farms throughout the state or further**

### Improvements

#### Lactalis

- Further refinement of the action plan, and scenario planning.
- Get buy in from our logistics partners and service providers as much reliance would be placed on transport resources.
- Ensure competitors in the processing space mutually agree to support each other in event of a major industry shock.

#### Fleurieu

- Community lead action plans involving all cohorts within the region, local emergency services having the latest up to date equipment technology to best service the area, communication links.