

MAY 2022

EXTREME HEAT:

Preparedness for Provincial
Ministries and Agencies

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SECTION 1: Introduction

Introduction

British Columbia is experiencing the effects of global climate change as evidenced by the 2021 heat dome, the 2021 atmospheric river events, and recent wildfire seasons. Average temperatures are increasing, and extreme weather events are becoming more frequent, lasting longer and reaching higher intensity. Scientists expect these changes to accelerate and intensify in the years ahead, creating additional risks to society, natural resources, ecosystems, and critical infrastructure. **In Canada, extreme heat events, along with extreme cold, are the leading cause of weather-related deaths.**

In recognition of a changing climate and the impacts of extreme heat events, the Province is committed to developing policies and capabilities to support partners in preparation for and in response to extreme heat. That includes BC's draft [Climate Preparedness and Adaptation Strategy \(CPAS\)](#), which will help British Columbians stay safe and respond effectively in a changing climate, as well as this Extreme Heat Preparedness document. This document identifies some of these provincial actions and capabilities and provides the foundation for future planning efforts that will be co-developed with Indigenous Peoples and support organizations to honour commitments made through the Declaration on the Rights of Indigenous Peoples Act and the United Nations (UN) Declaration on the Rights of Indigenous Peoples and through engagement with local governments, non-government organizations (NGOs), and federal partners.

This Extreme Heat Preparedness document has been informed by a series of engagement sessions that brought together individuals with lived experience during the 2021 heat dome and who experienced increased susceptibility during the event due to marginalization. Marginalizing factors included living with a disability, dealing with homelessness, living as a senior in social isolation or economic marginalization, and living with mental health or substance use challenges. These engagement sessions provided invaluable insight into the unique needs, strengths, and barriers faced by diverse populations, and offer opportunities for improving or developing more equitable service delivery models.

Section 1 introduces the document's purpose, scope and audience, as well as provincial responsibilities. The Province's relevant legislations and authorities are also defined. Section 2 provides a definition of an extreme heat event and describes some of the observed impacts of extreme heat on various populations and sectors in BC. Section 3 describes at a high level how the BC Heat Alert and Response System (HARS) will function and how it will guide an all-of-society response. Section 4 discusses the Provincial approach to responding to extreme heat events. Section 5 looks ahead to future planning considerations that could be based on the contents of this planning guidance. Appendices include a list of acronyms (A), information regarding States of Provincial Emergency (SOPE) and emergency powers (B), and additional resources compiled during literature review (C).

Purpose

The purpose of this extreme heat planning guidance is:

1. To summarize the impacts of extreme heat in BC;
2. To introduce the BC Heat Alert and Response System (BC HARS); and
3. To outline the Provincial approach to responding to extreme heat events.

Scope

The extreme heat planning guidance document addresses how the Province will lead and coordinate activities in response to an extreme heat event impacting one or more regions in BC, and:

- **IDENTIFIES** relevant legislation, regulations, and authorities that may be utilized to support the Provincial response to an extreme heat event (pp. 7-11);
- **DEFINES** an extreme heat event and discusses the impacts of such events on different socio-economic sectors, including populations that may be particularly susceptible (pp. 12-20);
- **INTRODUCES** the BC HARS (pp. 21-24);
- **ARTICULATES** the Province's response actions following receipt of a HARS notification, including sector-specific roles and responsibilities (pp. 25-30);
- **PROVIDES** a foundation for future extreme heat response planning initiatives (p. 31).

In addition, this document builds on existing collaborative initiatives that aim to strengthen linkages between BC's work to reduce disaster risk and adapt to a changing climate, including the Climate Risk Assessment and the forthcoming Climate Preparedness and Adaptation Strategy.

Audience

The primary audience for this extreme heat planning guidance document is Provincial ministries and agencies.

Provincial Responsibilities

This document articulates provincial-level actions that will be taken in response to extreme heat events as per **Section 4: Provincial Actions In Response to Extreme Heat**. Recognizing that the impacts of extreme heat are varied and extend across multiple sectors, additional provincial actions have been included for the following sectors: People and Communities, Environment, Economy, and Infrastructure. These actions may require multiple ministries and agencies to work collaboratively in the lead up to, during, and following extreme heat events. There will be a need to develop additional coordination and response plans to supplement this document, and partners at varying levels of government may need to develop sector-specific response plans.

PROVINCIAL MINISTRIES AND AGENCIES ARE RESPONSIBLE FOR ACTIVATING SECTOR-SPECIFIC RESPONSE PLANS AS APPROPRIATE. THE MINISTRY OF HEALTH WILL COORDINATE THE RESPONSE TO PUBLIC HEALTH IMPACTS AND EMCR WILL COORDINATE THE PROVINCIAL RESPONSE TO NON-HEALTH RELATED IMPACTS AS PER THE BC EMERGENCY MANAGEMENT SYSTEM.



Legislation & Authority

Two key provincial Acts provide the legislative authority for the Province to respond to a heat emergency event, as follows:

1. The *Emergency Program Act* (EPA) and associated regulations establish the responsibility for Provincial ministries to develop hazard-specific plans and the responsibility of local authorities to develop emergency plans based on hazards and vulnerabilities in their communities.

Related to extreme heat events, the EPA authorizes the declaration of States of Provincial Emergencies (SOPE) and States of Local Emergency (SOLE), the use of emergency powers such as implementing heat response plans, acquiring or using land or facilities such as for cooling centres, controlling prices of essential items such as fans, air conditioning units, and bottled water, among other actions. Additional information related to emergency powers available under the EPA, and examples of how these could be used during an extreme heat event, is available in Appendix B: State of Provincial Emergency Matrix.

THE MODERNIZED EMERGENCY PROGRAM ACT

THE EMERGENCY PROGRAM ACT (EPA) IS CURRENTLY UNDERGOING **EXTENSIVE REVIEW AND MODERNIZATION**. THESE HEAT-RELATED PLANNING CONSIDERATIONS WILL BE REVIEWED FOLLOWING ADOPTION OF MODERNIZED EMERGENCY MANAGEMENT LEGISLATION TO ENSURE ALIGNMENT.

2. The *Public Health Act* (PHA) supports dealing with current and emerging public health issues including communicable disease prevention and control, health promotion and health protection, chronic disease and injury prevention, poisonings and bioterrorism threats. The PHA provides the minister, public health officials, regional health authorities, local governments, and others with important tools to respond to public health emergencies.

The PHA authorizes the Provincial Health Officer to declare a public health emergency and to make orders to protect public health. In addition, if a local public health emergency exists, medical health officers and environmental health officers may make orders or take specified actions, such as inspecting facilities. Public health orders may require persons to take preventative measures or to report on specified health hazards. Related to extreme heat events, public health actions may include:

- Inspecting facilities to ensure cooling infrastructure is in place;
- Ordering that people or organizations take appropriate measures to protect others, such as employees or clients, from extreme heat; or
- Ordering that activities that expose people to dangerous heat levels cease temporarily.



Important Considerations

INDIGENOUS PERSPECTIVES AND AGREEMENTS

EMCR recognizes the essential role of Indigenous Peoples, leaders, communities, and support organizations, particularly those focused on emergency management, in addressing the complex and multi-faceted emergency management issues and opportunities facing Indigenous Peoples.

Indigenous Peoples and communities are disproportionately impacted by disasters and emergency events. For Indigenous Peoples living in remote and rural settings, this is often due to the relative remoteness of communities, delayed protection, jurisdictional challenges, limited access to emergency services, and discrepancies in the delivery of available services. These disproportionate impacts are also felt by Indigenous Peoples living in urban environments, because while services may be more readily available, systemic barriers may limit access to these services and culturally-appropriate support networks present in-community may be more difficult to access.

The Province's renewed and enriched commitment to reconciliation formally recognizes Indigenous Peoples as full partners in the governance and operations of emergency management, as demonstrated through the 2019 [Emergency Management Services Tripartite Memorandum of Understanding](#) between the First Nations Leadership Council, the Province, and Canada. Additional agreements that will guide EMCR's approach to cultural safety and culturally-appropriate responses include:

- First Nations Health Authority (FNHA)-EMCR [Declaration of Commitment](#);
- FNHA-EMCR [Letter of Understanding](#);
- EMCR-Indigenous Services Canada Bilateral Emergency Services Agreement; and,
- Nation-based Collaborative Emergency Management Agreements.



Indigenous Peoples and communities have the knowledge and history of how to prepare for, respond to, and recover from disasters in their territories since time immemorial. Indigenous communities have an inherent and constitutionally protected right to self-determination over their citizens and territories, rights that are grounded in their world views and local knowledge rooted in ancestral laws and principles of relationality and interconnectedness. This planning guidance considers, wherever possible, the disproportionate impacts of extreme heat events on Indigenous Peoples and communities and co-development will be a foundational principle for future planning efforts, sector-related response plans, and guidance related to extreme heat.

DISASTER RISK REDUCTION AND CLIMATE ADAPTATION

In 2018, the Province of BC adopted the [United Nations Sendai Framework for Disaster Risk Reduction 2015-2030 \(Sendai Framework\)](#), which advocates for the substantial reduction of disaster risk and losses in lives, livelihoods, and health, and in the economic, physical, social, cultural, and environmental assets of people, businesses, communities, and countries.

The Province recognizes four phases of emergency management: mitigation, preparedness, response, and recovery. These phases are interconnected, and activities within each phase can take place concurrently and in support of each other. For example, recovery should begin shortly after response activities are initiated, and mitigation activities are often integrated with recovery activities. The four phases are defined as:

- **MITIGATION** – The phase of emergency management in which proactive steps are taken to prevent a hazardous event from occurring by eliminating the hazard, or to reduce the severity or potential impact of such event before it occurs. Mitigation protects lives, property, cultural sites, and the environment, and reduces vulnerabilities to emergencies and economic and social disruption.
- **PREPAREDNESS** – The phase of emergency management during which action is taken to ensure readiness to undertake emergency response and recovery. It includes, but is not limited to, hazard, risk, and vulnerability assessment, planning, resource planning, volunteer management, training, exercises, public/stakeholder education, and continuous improvement.
- **RESPONSE** – The phase of emergency management during which actions are taken in direct response to an imminent or occurring emergency to prevent, limit and manage impacts. Response includes the initiation of plans and actions to support recovery and may include deployment of registered volunteer resources.
- **RECOVERY** – The phase of emergency management during which action is taken to re-establish social, cultural, physical, economic, personal and community well-being through inclusive measures that reduce vulnerability to emergencies, while enhancing sustainability and resilience. It includes taking steps to repair a community impacted by an emergency and restore conditions to a level that could withstand a potential future event or, when feasible, improve them to increase resilience in individuals, families, organizations, and communities.



The Sendai Framework recognizes climate change as a driver of disaster risk in two key ways: first, through increasing frequency and severity of weather- and climate-related events, such as extreme heat and extreme cold, and second, through increasing community vulnerability to the impacts of disasters due to the degradation of natural protections, food and water insecurity, and increased risk of floods impacting those living in coastal areas and river floodplains, among other risk factors.

GENDER-BASED ANALYSIS PLUS

To support the Province's disaster risk reduction approach to planning, a GBA+ framework was applied in reviewing all sections of this document. GBA+ is an analytical tool used to assess how diverse groups of people may experience policies, programs, and initiatives. The "plus" in GBA+ acknowledges that this is an intersectional analysis that goes beyond biological (sex) and socio-cultural (gender) differences. GBA+ is closely aligned with the Sendai Framework, which acknowledges that disasters and emergencies have differential impacts for varying segments of the population, and advocates for activities across the four phases of emergency management to specifically address these diverse impacts and needs.

In alignment with both the Sendai Framework and GBA+, this planning guidance incorporates considerations specific to populations who may be susceptible to extreme heat. Impacts vary greatly between individuals and groups, and is experienced in different ways, but it is widely acknowledged that populations who may be susceptible are disproportionately impacted by such events. For example, emergencies can disrupt support services for populations who may be susceptible, and new services established during response operations may be inadvertently inaccessible due to the urgency of meeting immediate needs.



SECTION 2: Heat Events – Definition and Impacts

Definition of an Extreme Heat Event

For the purposes of this document, the following definition will be used:

- **EXTREME HEAT EVENT:** An extreme heat event, commonly known as a “heat wave,” is a period of unusually hot weather that typically lasts two or more days with extended periods of high day and nighttime temperatures. These increased temperatures create cumulative physiological stress on the human body. To be considered an extreme heat event, temperatures have to be outside the historical averages for a given area. Extreme heat events typically happen in the summer, between June and September.

THE 2021 “HEAT DOME”

IN JUNE-JULY 2021, A PARTICULARLY SEVERE HIGH-PRESSURE RIDGE STALLED OVER MUCH OF BC AND CREATED A PROLONGED PERIOD OF STRONG WARMING ATMOSPHERIC CONDITIONS. THIS PRODUCED WHAT THE MEDIA CALLED AN “INTENSE HEAT DOME” AND LED TO VAST AREAS OF SWELTERING HEAT ACROSS THE PROVINCE FOR ALMOST A WEEK. TEMPERATURES ACROSS BC REACHED RECORD LEVELS AND LED TO **THE DEADLIEST WEATHER EVENT IN THE PROVINCE’S HISTORY.**

Recent Heat Events in BC

In recent history, BC has experienced two extreme heat events. A 2009 heat wave that affected Metro Vancouver was linked with elevated mortality with estimates of 110 excess deaths, primarily impacting those from ages 65-74 and those susceptible to extreme heat. The 2009 heat wave was accompanied by poor air quality, an increased number of emergency room visits, and higher energy consumption related to the use of air conditioning and temperature regulating systems.

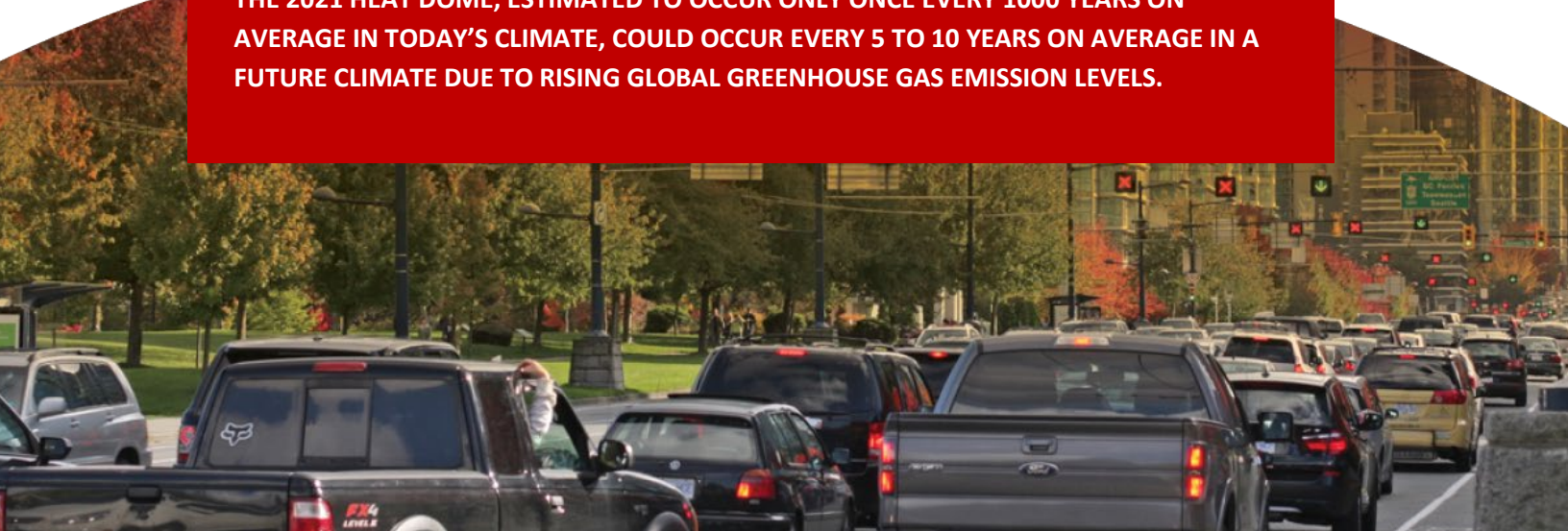
During the 2021 heat dome, the Village of Lytton experienced the highest recorded temperatures in Canadian history for three consecutive days, creating conditions that contributed to a devastating wildfire that destroyed numerous structures in the Village and in the territory of Lytton First Nation. The BC Emergency Health Services (BCEHS) responded to 22 times as many heat-related emergency calls compared to the same timeframe in 2020. The BC Centre for Disease Control (BCCDC) estimated that 740 excess deaths occurred during the heat dome. And the BC Coroners Service attributed more than 600 deaths as being heat-related during the 2021 heat dome.

The uneven mortality and structurally-specific vulnerabilities people experienced during the 2021 extreme heat event demonstrate that those most susceptible to the impacts of extreme heat require special consideration to ensure mitigative measures, preparedness activities, and response actions are inclusive of all British Columbians. Beyond the public health-related consequences, agriculture, aquaculture, livestock, and critical infrastructure in BC were all negatively impacted by the heat dome.

While weather projection models identified the 2021 heat dome as an extremely rare event, new modelling incorporating climate change and future climate scenarios suggests such events will occur more frequently.

LIKELIHOOD OF FUTURE HEAT DOMES

THE 2021 HEAT DOME, ESTIMATED TO OCCUR ONLY ONCE EVERY 1000 YEARS ON AVERAGE IN TODAY'S CLIMATE, COULD OCCUR EVERY 5 TO 10 YEARS ON AVERAGE IN A FUTURE CLIMATE DUE TO RISING GLOBAL GREENHOUSE GAS EMISSION LEVELS.



Impacts of Extreme Heat Events

IMPACTS TO SUSCEPTIBLE POPULATIONS

i. Populations Susceptible to Extreme Heat Events

Based on experiences during recent extreme heat events and through the application of GBA+, certain populations have been identified as being particularly susceptible to the impacts of extreme heat if they do not have access to a safe indoor environment. These include, but are not limited to:

- Seniors aged 65 years or older
- People who live alone
- People with pre-existing health conditions such as diabetes, heart disease or respiratory disease
- People with mental illness such as schizophrenia, depression, or anxiety
- People with dementia and other cognitive diseases or impairments
- People with substance use disorders
- People who are marginally housed
- People who work in hot environments
- People who are pregnant
- Infants and young children
- People with limited mobility

Those experiencing multiple aspects of susceptibility are particularly at risk of morbidity or mortality during extreme heat events and may require additional supports, including targeted and early outreach and customized interventions.



ii. Impacts to Susceptible Populations

Extreme heat events are associated with increases in morbidity and mortality, particularly among populations with pre-existing and compounding susceptibilities. Impacts noted during recent extreme heat events include:

- Increased risk of mortality, particularly among older adults, those with chronic physical or mental health conditions, and socially marginalized or isolated people. Most deaths occurred in the community (outside of healthcare or supervised settings) particularly in private residences located in neighborhoods that were materially and/or socially deprived. Following the 2021 heat dome, the event continued to result in increased mortality even after the extreme weather had passed, as physical injuries suffered during the extreme heat impacted the health of the most susceptible over the following weeks and months, leading to further deaths.
- Those with mental illnesses and substance use disorders also experienced increased morbidity and mortality rates, likely due to a number of factors, such as altered perception of risk, lack of access to cooling infrastructure, social marginalization, and the compounding impacts of using certain medications or drugs or substances.
- Those living in remote or isolated areas did not have easy access to cooling facilities due to lack of public transit.
- Those utilizing community support services, such as transition houses, often do so in older buildings that are not equipped with appropriate cooling infrastructure, and may be unable to access cooling services provided through public venues such as parks or community centres.



- Many were reluctant to cook at home, resulting in increased reliance on eating out or ordering pre-cooked meals. That led to additional financial pressure, particularly for those with limited incomes.
- Childcare and other care facilities that were not adequately equipped with cooling amenities were temporarily closed, resulting in caregivers needing to take additional time away from work.
- Those who were required to work outdoors during the heat event experienced significant heat-related stress and/or the need for workplaces to adopt new procedures to minimize impacts on staff. For example, the BC Wildfire Service was actively engaged in wildfire response at the time of the 2021 heat dome. To protect staff, it was necessary to produce internal guidance for working in extreme heat, leading to the need to reduce hours and ensure proper rest for frontline staff.
- Thousands of travellers and tourists were vacationing in BC at the time of the 2021 heat dome. Destination BC disseminated official heat-mitigation information directly to visitors via social media and through industry partners such as visitor information centres. Many residents sought overnight relief from heat by booking into local air-conditioned hotels, limiting their availability for travellers and tourists, and others requiring temporary accommodation.

Many communities and community-based organisations developed unique and targeted interventions to support residents, such as establishing cooling centres, distributing bottled water and cooled food, communicating regularly with isolated seniors and unhoused individuals, and leveraging existing community networks to share information. Community-level interventions have been and continue to be an essential component in responding to extreme heat events.



IMPACTS TO AGRICULTURE, LIVESTOCK AND FOOD SUPPLY CHAINS

The 2021 heat dome adversely impacted agriculture in BC, causing crop losses and reduced grade. For example, certain cherry farms in the South Okanagan lost seventy percent of their producing trees, and berry farmers in the Central and Eastern Fraser Valley lost between ten and sixty percent of their crops.

The welfare of livestock animals was also significantly impacted by the extreme heat. A dramatic decrease in poultry egg-laying occurred, with some flocks producing at thirty percent of their normal capacity, as well as substantial increases in mortality across poultry species as more than 661,000 birds were lost during the heat dome. Dairy production during the heat dome was reduced by nearly twenty percent, with large quantities of remaining milk produced having to be discarded due to the inability to maintain it at a cool temperature.

While the impacts to fish and game have not yet been assessed, it is anticipated that the 2021 heat dome resulted in increased mortality for both. Similarly, other traditional food sources and food-gathering activities may have been impacted.

These outcomes have both short and long-term effects. In the short term, food production operations may see reduced incomes due to lower production rates, and those who rely on hunting, fishing, and gathering traditional foods may experience food shortages as reserves are depleted more quickly. Over the longer term, there may be increased instability in the food supply chain as the generational impacts of this event result in decreased production over time due to damage to crops and animal mortality.



IMPACTS TO ENVIRONMENT AND ECOSYSTEMS

In 2021 there was a strong increase in early season harmful algae blooms that had the potential to impact drinking source water. Depending on lake characteristics, warm water and algae production could lead to fish death and water contamination; should these occur during a future extreme heat event, they may prevent use of lakes as natural cooling infrastructure.

A lengthy period of extreme heat may also cause lower river and stream flows that could lead to elevated stream temperatures that adversely impact aquatic life and impair aquatic migration.

During the 2021 heat dome it was estimated that vital populations of seaweed, crustaceans, and shellfish were adversely impacted as marine temperatures soared above 40°C. These elevated temperatures and large tidal changes left vulnerable sea life exposed to the extreme heat.

While any direct impacts that the 2021 heat dome had on terrestrial ecosystems have yet to be identified, there are strong correlations connecting the heat dome with increased vulnerability to wildfires in forest ecosystems. The BC Wildfire Service identified that the heat dome significantly accelerated the drying and curing of wildfire fuels. The total land area burned by wildfires in 2021 more than doubled the annual average of the last 14 years and was surpassed only by the catastrophic seasons of 2017 and 2018. The Intergovernmental Panel on Climate Change reported in 2022 that increases in extreme heat events have had widespread and pervasive impacts on ecosystems globally and have led directly to species extinctions in some cases.



IMPACTS TO CRITICAL INFRASTRUCTURE

In the transportation sector, extreme heat resulted in damage to and distortion in roadways and intermittent malfunctioning of the electronics that control traffic signals. The considerable thermal expansion of some concrete bridge structures resulted in expansion joint damage and subsequent need for replacement.

In some workplaces, heating, ventilation, and air conditioning (HVAC) systems stopped functioning, rendering offices extremely hot and necessitating their closure. In some instances, residential cooling infrastructure was unable to keep up with increased demand.

BC Hydro reported that over 400 distribution transformers failed, although the majority were not overloaded. Overall, substations and transmission lines remained operable, with most challenges occurring in a small number of distribution mechanisms that experienced high loading. Despite this, only a few transmission and distribution systems operated at emergency ratings. To mitigate heat impacts, sunshades were constructed over select electrical power cables; these sunshades, and the increased monitoring of the cables, substantially reduced the risk of future heat waves causing impacts to power distribution infrastructure.

Although the 2021 heat dome resulted in new daily summer records for both energy demand and power distribution capacity, these records were still significantly less than peaks occurring during winter. As a result, energy management during extreme heat events is not as significant of a concern as infrastructure management and protection.



DIFFERENTIAL URBAN AND RURAL IMPACTS

There can be differences in temperature between an urban and surrounding rural area due to the urban heat island (UHI) effect. UHIs occur in areas where the land surface has been altered through the development of buildings, roads, and other infrastructure. Urban spaces can be several degrees hotter than surrounding rural areas due to minimized airflow, less greenspace, limited tree-shaded areas, more concrete surfaces and structures that absorb radiant heat and release it at night, and anthropogenic heat sources. These warmer UHIs can magnify health impacts caused by extreme heat events as higher air temperatures, particularly at night, can limit the body's ability to cool down. In June 2021, the UHI effect and the built environment played a direct role in the heat dome related deaths caused in BC.

Reducing UHI impacts will be of great importance for mitigating future heat events, and different mitigations and interventions are needed for urban and rural areas. Similarly, the level at which heat becomes dangerous and damaging is relative and related to the average seasonal temperatures in a given location; as such, mitigations and interventions may also be regionally-specific. The BC HARS program, discussed further in **Section 3: Heat Alert and Response System**, reflects these distinctions.

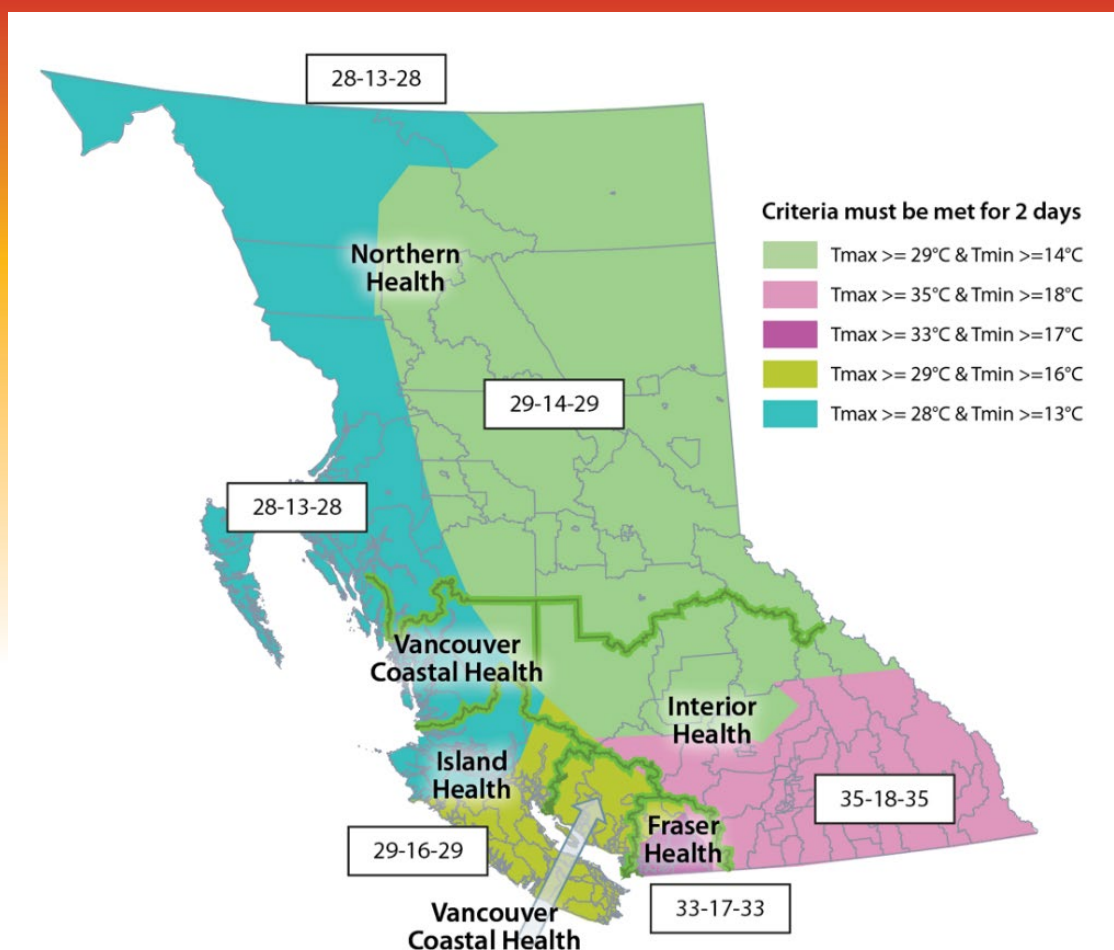


SECTION 3: Heat Alert and Response System

Following the 2021 heat dome, the Ministry of Health and the BCCDC established the BC Health Effects of Anomalous Temperatures Coordinating Committee (BC HEAT Committee) to ensure public health coordination around extreme heat events for summer 2022 and beyond. As part of these efforts, the BC HEAT Committee was tasked with developing a Province-wide [Heat Alert and Response System \(HARS\)](#) to notify the public of heat risks. The BC HARS will be initiated as of June 2022.

Development of the BC HARS was led by the Ministry of Health and supported by the BCCDC, Health Emergency Management BC (HEMBC), BCEHS, EMCR, BC Housing, the First Nations Health Authority (FNHA), Regional Health Authorities, Environment and Climate Change Canada (ECCC), and WorkSafeBC. Additional information about the BC HARS can be found in Appendix C: Resources.

Map of Heat Alert Areas for Geographic Regions, B.C.



Key Components

ALERT LEVELS

The BC HARS is a two-tier alert system incorporating ECCC's existing heat warning criteria for British Columbia. A Heat Warning is currently issued for a region when there are two or more consecutive days where the daytime maximum temperatures are expected to reach or exceed the temperature criteria for the specified region and the nighttime minimum temperatures are expected to only fall to the region-specific temperature or warmer. The more dangerous Extreme Heat Emergency alert criteria are met when the specific region has reached the Heat Warning criteria and there is high certainty that daily temperatures will substantively increase day over day for three or more consecutive days.

The following table outlines regional-specific daytime and nighttime temperature criteria for Heat Warnings and Extreme Heat Emergencies, as well as the degree of public health risk, occurrence, and descriptors for each alert level.

TYPE OF ALERT	<ul style="list-style-type: none"> Heat Warning 	<ul style="list-style-type: none"> Extreme Heat Emergency
PUBLIC HEALTH RISK	<ul style="list-style-type: none"> Moderate (5% increase in mortality) 	<ul style="list-style-type: none"> Very high (20% or more increase in mortality)
DESCRIPTOR	<ul style="list-style-type: none"> Very hot 	<ul style="list-style-type: none"> Dangerously hot
HISTORIC FREQUENCY	<ul style="list-style-type: none"> 1-3 per summer season 	<ul style="list-style-type: none"> 1-2 per decade
CRITERIA	<p>°C Tmax ≥ daytime high, Tmin ≥ nighttime high, Tmax ≥ daytime high</p> <ul style="list-style-type: none"> Southwest = 29-16-29 Fraser = 33-17-33 Southeast = 35-18-35 (Largely Interior region of BC) Northeast = 29-14-29 Northwest = 28-13-28 	<ul style="list-style-type: none"> Heat Warning criteria have been met and forecast indicates that daily highs will substantively increase day-over-day for three or more consecutive days

REGIONAL DISTINCTIONS

In addition to the different and unique challenges rural and urban communities face when protecting people from extreme heat events (see page 20 above), community communication networks vary between urban and rural contexts. While urban residents may access weather-related information through a variety of sources, rural residents may have access to fewer information sources. An effective HARS in the rural context relies on leveraging existing social networks, and extensive community outreach by the proponents to ensure buy-in by the whole community.

HARS IN RURAL AREAS

SINCE 2018, THE VILLAGE OF ASHCROFT HAS HAD A TWO-TIER HARS IN PLACE, WITH LEVEL 1 AND LEVEL 2 HEAT ADVISORIES. THE GEOGRAPHY IN AND AROUND ASHCROFT IS DESERT TERRAIN AND IT EXPERIENCES SOME OF THE HOTTEST TEMPERATURES WITHIN THE SOUTHERN INTERIOR REGION OF B.C. IN PARTNERSHIP WITH THE VILLAGE OF ASHCROFT AND A COMMUNITY STAKEHOLDER COMMITTEE, INTERIOR HEALTH DEVELOPED AND IMPLEMENTED THE HARS TO LESSEN THE NEGATIVE HEALTH IMPACTS OF EXTREME HEAT EVENTS AND FOCUS ON HEAT-SUSCEPTIBLE POPULATIONS. THE VILLAGE OF ASHCROFT IS THE LEAD AGENCY RESPONSIBLE FOR INITIATING THE PLAN ONCE A HEAT ALERT IS ISSUED. THEY UNDERTAKE PRE-HEAT NOTIFICATIONS TO RAISE AWARENESS AT THE START OF THE SEASON – AND ONCE AN ADVISORY IS ISSUED, THEY UTILIZE THE *VOYENT ALERT!* SYSTEM FOR MASS NOTIFICATIONS, FOR WHICH APPROXIMATELY A THIRD OF THE COMMUNITY HAS SIGNED UP. FOR MORE INFORMATION ON THE APPLICATION OF HARS IN A RURAL CONTEXT, PLEASE SEE THE [INTERIOR HEALTH AUTHORITY "INTERIOR HEAT TOOLKIT 2020"](#).

TRIGGERS, ACTIVATION, AND NOTIFICATIONS

Environment and Climate Change Canada (ECCC) monitors and forecasts the occurrence and effects of hot weather across BC, and provides preparedness reviews and anticipated updates for the upcoming seasons. In the instance of an anticipated Heat Warning, ECCC monitors the weather forecast for British Columbia. Before issuing that warning, ECCC may send a “Weather Notification” via email to their health sector distribution list as early as possible, and will issue a Heat Warning when established thresholds are met. Each health authority, organization, facility, or municipality will respond to a Heat Warning event as determined by their individual heat plans and processes, with coordination calls occurring as needed.

Should it be indicated that the Heat Warning event could possibly transition to an Extreme Heat Emergency, ECCC will advise the Provincial Health Duty Officer (PHDO) to arrange for a coordination call with the BC HEAT Committee to discuss issuing an Extreme Heat Emergency notification. Once there is

confirmation that the Heat Warning criteria for a specific region has been met and there is high certainty that high temperatures would increase substantially each day for three or more consecutive days, an Extreme Heat Emergency notification will be issued.

Notifications will be issued electronically through ECCC's [WeatherCAN app](#) and through ECCC's [weather alerts webpage](#); special weather bulletins may be issued as appropriate. On the advice of the BC HEAT Committee, EMCR will issue a broadcast intrusive alert for an Extreme Heat Emergency. Additional information about triggers, activation, and notifications can be found in Appendix C: Resources.

OUTCOMES

Once an Extreme Heat Emergency notification is issued, the BC HEAT Committee and partners including EMCR and other Provincial ministries will initiate their specific response actions. These include establishing coordination calls, developing and issuing joint Provincial and region-specific press releases, regular weather briefings, as well as response actions outlined in **Section 4: Provincial Actions in Response to Extreme Heat**.

The BC HARS includes key messages and recommended actions from a public health perspective that Provincial ministries, local authorities, public health organizations and professionals, and the general public may take when advised of an anticipated Heat Warning or Extreme Heat Emergency. Additional resources and information about these key messages and recommendations can be found in Appendix C: Resources.



SECTION 4: Provincial Actions in Response to Extreme Heat

The following section details actions that have been and/or will be taken in response to, and to support other entities responding to, extreme heat events by Provincial ministries. These actions are described by sector and in alignment with the [Interim Provincial Disaster Recovery Framework](#), recognizing that Ministry roles and mandates in relation to heat response continue to evolve. These actions are preliminary and not exhaustive. **It is anticipated that these actions will continue to develop based on lessons learned from future responses to extreme heat events and further extreme heat response planning.**

As per the BC HARS, ECCC is responsible for monitoring and advising on Heat Warning and Extreme Heat Emergency notifications. In the event that a Heat Warning may transition into an Extreme Heat Emergency, the BC HEAT Committee is responsible for convening appropriate subject matter experts, decision-makers, and regional representatives to make decisions regarding issuing an Extreme Heat Emergency notification. The Ministry of Health will coordinate the response to public health impacts from an extreme heat event and the Ministry of Public Safety and Solicitor General/EMCR will lead the coordination of the provincial response to the non-health related impacts of extreme heat emergencies.

Once an Extreme Heat Emergency notification is issued, EMCR will initiate a response as per the BC Emergency Management System, including:

- **ACTIVATE** the Provincial Emergency Coordination Centre (PECC) and Provincial Regional Emergency Operations Centres (PREOCs), and support any activated Ministry Operations Centres (MOCs), to ensure there is a coordinated Provincial response;
- **ENSURE** communication and coordinate information-sharing beyond the health sector regarding the likelihood, severity, and duration of the heat hazard, sharing this information with Indigenous Peoples, Provincial ministries, local authorities, industry, the public and other sectors of society to enable effective response actions through provincial and regional coordination calls;
- **ADVISE** on declaring a SOPE and using specific emergency powers through Ministerial orders;
- **IN PARTNERSHIP** with the Ministry of Health, BCCDC, and Office of the Provincial Health Officer, prepare and issue joint provincial press releases and communicate steps that the public can take to prepared for an extreme heat event as per the Prepared BC Extreme Heat Preparedness Guide; and,
- **REIMBURSE** First Nations and local authorities for eligible response costs as per the *Emergency Management Service Funding Agreement* and the EPA, respectively.

Once an Extreme Heat Emergency notification is issued, recommended Provincial ministry and agency actions include:

- **MONITOR** the health and safety of employees, and communicate to external partners about protecting the health and safety of employees, including issuing sector-specific advice where appropriate;
- **DETERMINE** whether to activate their MOCs, any Business Continuity Plans, any heat-specific response plans, and any other procedures or protocols necessary to support heat response;
- **PARTICIPATE** in coordination calls and, where necessary, assigning a liaison to the PECC and/or PREOC;
- **DISSEMINATE AND AMPLIFYING INFORMATION** by bridging relationships across communities, agencies, and organizations to assist Indigenous Peoples and local authority emergency management efforts and to improve public health and safety outcomes;
- **FOR PUBLIC-FACING MINISTRIES** with office locations in impacted communities, prepare to provide information on the location of local cooling centres to members of the public who arrive seeking relief from extreme heat;
- **MAINTAIN AND SHARE SITUATIONAL AWARENESS** about impacts to Ministry clients, sectors, programs and services;
- **SHARE LESSONS** learned following extreme heat events.



Provincial ministries and agencies may also have responsibilities/actions as they relate to the following sectors:

People and Communities Sector

This sector considers impacts on the physical, mental, spiritual and social well-being of the population. This sector primarily concerns, but is not limited to, health and safety, mental health, community psychosocial, emotional, cultural, and spiritual well-being, heat-susceptible populations, cultural aspects, and housing.

- In advance of Extreme Heat Emergency notifications, **ASSESS MINISTRY CLIENT BASE** to determine whether any populations susceptible to extreme heat are served, whether any programmatic or service delivery adjustments need to be made to protect heat-susceptible clients, and whether wellness checks and/or direct outreach to isolated clients should be undertaken;
- In advance of Extreme Heat Emergency notifications, **ASSESS MINISTRY OPERATED AND CONTRACTED FACILITIES**, particularly those offering residential care, to ensure appropriate cooling infrastructure and mechanisms are in place;
- **ENSURE FRONT-LINE SERVICES** are provided in cool facilities where water is readily available wherever possible;
- **USE EXISTING COMMUNICATION NETWORKS** to distribute relevant information to clients and other public-facing service delivery partners such as NGOs, including information on cooling services and other supports; and
- **COMMUNICATE WITH STAFF** about signs and symptoms of heat-related health concerns, and empower staff to recognize these signs and symptoms and seek additional health supports for clients as needed.



Environment Sector

This sector considers impacts on the environment and steps needed to maintain a healthy state while mitigating long-term impacts. This sector primarily concerns land degradation and contamination, biodiversity and ecosystem impacts, cultural land use, and natural resource damage/loss.

- **MONITOR EXISTING INDICATORS** to identify environmental risks, particularly those that may compound immediate negative human and animal health outcomes such as air quality and contamination of drinking water and water sources used for cooling, and that may have negative impacts over the longer-term;
- **MONITOR AND MAINTAIN READINESS** among environmental emergency first responders, particularly the BC Wildfire Services and the Environmental Emergency Program, including assessing and mitigating the impacts of extreme heat on the health and safety of first responders;
- **MONITOR THE IMPACTS** of extreme heat on essential environmental infrastructure such as reservoirs and dams, as well as culturally-significant environmental values, and respond to identified risks as needed;
- **ENSURE THE AVAILABILITY OF OUTDOOR SPACES** for cooling while protecting users of outdoor spaces and outdoor spaces themselves; and
- **LIMIT NON-ESSENTIAL FIELDWORK** wherever possible.



Economy Sector

This sector considers direct and indirect impacts on the local economy. This sector primarily concerns small, medium, and large enterprise, tourism and cultural livelihood, agriculture, and the broader economy.

- **EMPLOY THE AGRICULTURE SEASONAL RESPONSE ROSTER** to coordinate support to local authorities and agricultural producers during a heat event;
- Where necessary, **SUPPORT THE SAFE AND TIMELY DISPOSAL OF EXCESS** livestock fatalities and food products that are unsuitable for consumption due to contamination or degradation;
- **SUPPORT ENROLLMENT** in the AgriStability program for agricultural, livestock and agri-food producers;
- Where appropriate, **CONDUCT OPERATIONAL EDUCATION AND COMPLIANCE ACTIVITIES** to ensure heat-related health and safety protocols are being employed; and
- **DISSEMINATE OFFICIAL HEAT MITIGATION INFORMATION** to visitors, travellers and the tourism industry via multiple channels including social media and visitor information centres through Destination BC.



Infrastructure Sector

This sector considers impacts on private and public physical infrastructure. This sector primarily concerns residential and commercial buildings, utilities, and infrastructure planning.

- **MONITOR TRANSPORTATION AND OTHER CRITICAL INFRASTRUCTURE IMPACTS** to ensure networks remain prepared and resilient in response to heat impacts;
- **PLAN TO RESPOND TO DISRUPTIONS**, including ensuring sufficient staff capacity and availability;
- Where disruptions to critical infrastructure occur, quickly **RESPOND TO RESTORE CRITICAL SERVICES**, particularly those services that support responses to extreme heat events such as power distribution to support HVAC systems and communication networks to support distributing up-to-date information and alerts;
- **DISTRIBUTE UP-TO-DATE INFORMATION** about impacts to critical infrastructure through existing communication networks, such as [BC Hydro's Outage Map](#) and [DriveBC](#); and
- **LIMIT NON-ESSENTIAL FIELDWORK** wherever possible.

Additional recommendations for pre-season actions, responses to Heat Warnings and Extreme Heat Emergencies, and post-season actions for a number of sectors are available in the BC HARS document.



SECTION 5: Future Extreme Heat Response Planning

This planning guidance is one element in a coordinated provincial government response to address the impacts of a changing climate.

BC's draft Climate Preparedness and Adaptation Strategy (CPAS) will lay the groundwork to ensure the people and government of BC stay safe and respond effectively to a changing climate. The CPAS builds on the 2019 Climate Risk Assessment which examined some of the greatest risks to BC as a result of climate change. The draft CPAS highlights BC's overall direction and the actions the Province is taking in 2021 to 2022 to help prepare for the impacts of climate change. **A final strategy will be released in 2022 and will include actions for 2022 to 2025.**

Building on the ongoing work detailed in the draft CPAS, this planning guidance provides the foundation for future heat-related planning, sector-specific heat response plans, and heat response guidance for First Nations, local authorities, and other emergency management partners.

Response plans and guidance should include consideration of the impacts of extreme heat on human health, agriculture, livestock, marine ecosystems, wildlife and habitat, the Provincial economy, and critical infrastructure. It is essential for future response planning to apply a GBA+ lens and to prioritize the needs of those populations that are particularly susceptible to the negative impacts of extreme heat. In particular, response plans and guidance must be co-developed with Indigenous Peoples to enhance rights to self-determination throughout response activities, to address their unique needs, and to ensure they are effectively supported by the Province.



APPENDICES

Appendix A: List of Acronyms

BCCDC	British Columbia Centre for Disease Control
CPAS	Climate Preparedness & Adaptation Strategy
ECCC	Environment & Climate Change Canada
EMCR	Emergency Management and Climate Readiness
EPA	Emergency Program Act
GBA+	Gender-Based Analysis Plus
HARS	Heat Alert and Response System
PHA	Public Health Act

Appendix B: State of Provincial Emergency Matrix

Based on the *Emergency Program Act*, the table below identifies the powers available to the Minister of Public Safety and Solicitor General or their delegate in a declared State of Provincial Emergency, with examples of possible actions that may be taken during an extreme heat event. Powers (d) to (l) can also be used by local authorities in a State of Local Emergency.

EMERGENCY POWER	EFFECT / ACTION	CONSIDERATIONS
(a) Implement a provincial emergency plan or any provincial emergency measures	<ul style="list-style-type: none"> Activation of the BC HARS and planning considerations at BC Provincial government level. Activation of Comprehensive Emergency Management Plan. Supports EPA Section 7, the implementation of provincial plans. 	<ul style="list-style-type: none"> Personnel or capacity available to activate relevant plans. Economic impacts due to the implementation of emergency measures.
(b) Authorize a local authority to implement a local emergency plan or emergency measures for all or any part of the jurisdictional area for which the local authority has responsibility	<ul style="list-style-type: none"> Empowers local authorities to implement their extreme heat or emergency response plans. 	<ul style="list-style-type: none"> Personnel, experience or capacity available to safely activate relevant plan or emergency measures. Relative stage of development of local authority plans.
(c) Require a local authority for a municipality or an electoral area to implement a local emergency plan or emergency measures for all or any part of the municipality or electoral area for which the local authority has responsibility	<ul style="list-style-type: none"> Minister may order the head of the local authority to implement local extreme heat or emergency response plans. 	<ul style="list-style-type: none"> Capacity of local authority to implement plan as directed. NOTE: Minister cannot delegate this power.

EMERGENCY POWER	EFFECT / ACTION	CONSIDERATIONS
(d) Acquire or use any land or personal property considered necessary to prevent, respond to or alleviate the effects of an emergency or disaster	<p>For example, but not limited to:</p> <ul style="list-style-type: none"> • Building temporary public works. • Establish Provincial and regional cooling centres. • Red Cross Emergency Response Units (ERUs) sites (e.g.: health, water, sanitation, etc.). 	<ul style="list-style-type: none"> • Compensation for use. • Community impacts and safety. • Safety of employees providing these services. • Disruption to commerce and livelihood.
(e) Authorize or require any person to render assistance of a type that the person is qualified to provide or that otherwise is or may be required to prevent, respond to or alleviate the effects of an emergency or disaster	<ul style="list-style-type: none"> • Increases capacity and human resources to support response operations. • Prioritization of resources required to support response actions. <p>The following are examples but are not limited to:</p> <ul style="list-style-type: none"> • Skilled trades persons. • Social workers • Volunteers • Emergency personnel/first responders/health practitioners. 	<ul style="list-style-type: none"> • Exemption from civil liability. • Availability of personnel. • Compensation and reimbursement for services. • Protection of the conscripted persons' employment (EPA, Section 25).
(f) Control or prohibit travel to or from any area of British Columbia	<ul style="list-style-type: none"> • Restrict unnecessary access to the impact area. • Prioritization of access for impacted individuals within impact area (to workplaces, businesses, homes etc.). • Control access to major transportation hubs (airports and ferries) which are in use for emergency operations. • Control travel routes to/from staging areas to ensure rapid flow of goods and personnel. 	<ul style="list-style-type: none"> • Control the measures necessary for the successful implementation of response plans. • Impacts to tourism. • Impacts to flow of consumer goods. • Need to ensure movement of critical resources into impact areas. • Impacts to civil freedoms.

EMERGENCY POWER	EFFECT / ACTION	CONSIDERATIONS
<p>(g) Provide for the restoration of essential facilities and the distribution of essential supplies and provide, maintain and coordinate emergency medical, welfare and other essential services in any part of British Columbia</p>	<ul style="list-style-type: none"> • Order the deployment of operational resources. • Direct logistics companies and grocers to support response operations. • Prioritize and direct resources for the restoration of facilities for mass care/sheltering, critical transportation routes for logistics, essential facilities, utilities, transportation and telecommunication. 	<ul style="list-style-type: none"> • Competing mandates and legislation. • Competing priorities for critical asset restoration. • Shortage of equipment and personnel to conduct assessment and restoration. • Shortage of specialized materials.
<p>(h) Cause the evacuation of persons and the removal of livestock, animals and personal property from any area of British Columbia that is or may be affected by an emergency or a disaster and make arrangements for the adequate care and protection of those persons, livestock, animals and personal property</p>	<ul style="list-style-type: none"> • Evacuation of unsafe buildings to support public safety. • Activation of mass care services for impacted people and their pets. • Provision of security for areas evacuated. • Ministry of Agriculture to activate plans for mass care to livestock. 	<ul style="list-style-type: none"> • Ensuring coordination of mandates and responsibilities. • Federal and provincial coordination for livestock. • Available security personnel. • Decreased psycho-social implications due to concerns for pets and livestock.
<p>(i) Authorize the entry into any building or on any land, without warrant, by any person in the course of implementing an emergency plan or program or if otherwise considered by the Minister to be necessary to prevent, respond to or alleviate the effects of an emergency or disaster</p>	<ul style="list-style-type: none"> • Exemption for responders from civil liability due to trespass. • Allows for wellness checks. • Allows for access to utility personnel on private property. 	<ul style="list-style-type: none"> • Rationale for accessing private property needed.

EMERGENCY POWER	EFFECT / ACTION	CONSIDERATIONS
(j) Cause the demolition or removal of any trees, structures or crops if the demolition or removal is considered by the Minister to be necessary or appropriate in order to prevent, respond to or alleviate the effects of an emergency or disaster	<ul style="list-style-type: none"> • Protection of the environment. 	<ul style="list-style-type: none"> • Protected and heritage site consideration. • Impacts to community and cultural values. • Loss of income. • Federal/provincial coordination.
(k) Construct works considered by the Minister to be necessary or appropriate to prevent, respond to or alleviate the effects of an emergency or disaster	<ul style="list-style-type: none"> • Construction of temporary housing temporary cooling centres. • Construction of temporary public works. • Installation of cooling infrastructure (fountains, misters, water stations, etc.). 	<ul style="list-style-type: none"> • Easing of building codes to enable quicker restoration. • Access to materials, equipment and personnel. • Safety of personnel. • Business resumption to support community stabilization.
(l) Procure, fix prices for or ration food, clothing, fuel, equipment, medical supplies or other essential supplies and the use of any property, services, resources or equipment within any part of British Columbia for the duration of the state of emergency.	<ul style="list-style-type: none"> • Ensures responders have priority access to limited resources. • Ensures the public has access to essential supplies (water, fans, air conditioners). • Rationing/equitable sharing of critical and/or limited resources. 	<ul style="list-style-type: none"> • Supply and demand and determination of fair prices for both impacted individuals and businesses. • Public confidence. • Economic equity and stabilization. • Potential security considerations to maintain order and ensure fairness.

Appendix C: Resources

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