

Review of Blue-Green Algae Governance Arrangements in Victoria.

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Introduction

In recent years, blue-green algal blooms have been occurring more frequently, due to the prolonged drought, reduced flows in waterways and higher than normal temperatures. It is essential the blooms are coordinated and managed to secure water supplies and maintain recreational access. This requires a good governance arrangement to monitor blooms, collect information and develop processes and systems. This paper outlines a recent review commissioned by the Victorian Department of Sustainability and Environment (DSE) to better coordinate and manage the State's blue-green algal blooms. It outlines the roles and responsibilities for a management framework based on a structure of State-wide Coordinator, Regional Coordinator, Local Water Manager and Support Agency, and functions based on the emergency management concepts of prevention, preparedness, response and recovery. This addresses many of the identified disadvantages of the current system by clarifying the management framework and responsibilities, incorporating the review/audit functions and adding key areas of prevention and preparedness. Allocation criteria has also been developed for the Regional Coordinator and Local Water Manager roles based on management responsibility for a waterway, agency with bigger socio/economic interest or bigger risk should blooms occur, local presence, adequate resources and ability to address blue-green algae prevention.

Either naturally, or through human activities, many of our lakes and waterways have become enriched with nitrogen and phosphorous. Increasing this nutrient load in the aquatic environment can result in a dramatic increase in diversity and richness of freshwater flora. A diverse group of aquatic plants, most types of algae are essential to maintaining the health of a water body. However, cyanobacteria or as they are more commonly referred, blue-green algae in high concentrations can be potentially toxic to humans and animals. When blue-green algae increase to levels that have the potential to cause harm it is called a bloom. Blue-green algal blooms can persist for weeks, months, and even an entire summer period. Blooms can be cyclical in nature, resulting in a number of continual re-blooms. Blue-green algal blooms can adversely affect water quality by causing offensive tastes and odours, discolouration and unsightly scums. As a bloom dies, the decaying algal cells can reduce the oxygen concentration in the water.

Ingestion of water contaminated with blue-green algae may cause nausea, vomiting, abdominal pain, diarrhoea and muscle weakness. Direct skin contact with blue-green algae affected water through showering, bathing, swimming, water skiing and other recreational activities may result in a variety of symptoms. These could include skin irritation and rashes, swollen lips, eye and ear irritation, sore throat, hay fever-like symptoms and asthma. The severity of symptoms is proportional to several factors, as well as an individual's susceptibility.

The potential risks associated with blue-green algal blooms tend to be greatest over summer and early autumn, when water usage and water based recreation are generally high. Although blue-green algal blooms can occur during winter, the availability of alternative water supplies tends to minimise the impacts of blue-green algal blooms during this period.

Blue-green algal blooms are a common seasonal occurrence in Victoria. Many factors contribute to the formation of a bloom, including, but not limited to, increased nutrient levels, low water flows and warm weather conditions. Due to the prolonged drought, reduced flows in waterways and higher than normal temperatures in Victoria, the risk of algal blooms has increased and are occurring longer into the season. Due to this higher risk and increased occurrences, it is essential that the blooms are coordinated and managed to secure water supplies. This requires a good governance arrangement to monitor blooms, collect information and develop processes and systems based on concepts of prevention, preparedness, response and recovery.

Background to the Victorian Blue-Green Algae Framework

The Victorian Blue-Green Algae Coordination Framework was originally set up in response to a regional bloom (a bloom affecting multiple interconnected water bodies) in the lower Goulburn and Murray Rivers in May 1992 which disrupted water supplies. Many parties have legislative responsibilities for waterway management in Victoria. These include DSE, Department of Human Services (DHS), catchment management authorities, regional and urban water corporations, Parks Victoria and local government. All these parties have a role in the management of blue-green algae in Victoria.

DSE is responsible for the state-wide coordination of blue-green algae management and currently relies on a system of ten Regional Coordinators (convening agencies) for coordinating the management of local blooms (a bloom confined to a single water body) by Local Water Managers, as well as coordinating regional emergency planning and preparedness for the management of regional blooms. Local Water Managers are responsible for the management of blooms within their local storages/waterways.

The legislative responsibilities of parties in Victoria include the following:

- **Department of Sustainability and Environment** has responsibilities for the management of Crown land and associated waterways under the *Forests Act 1958*, the *Crown Land (Reserves) Act 1978* and the *Water Act 1989* and responsibilities under the *Flora, Fauna and Guarantee Act 1988*.
DSE administers the Statement of Obligations for catchment management authorities and water corporations under the *Water Act 1989* and the *Water Industry Act 1994*.
In the Emergency Management Manual Victoria, DSE will be notified of an algal bloom with potential to create a major impact on drinking water supplies and/or recreational water bodies. DSE has a supporting role in providing advice.
- **Department of Human Services** has responsibilities for water contamination under the *Public Health and Wellbeing Act 2008* (commences operation 2010), *Food Act 1984*, the *Safe Drinking Water Act 2003* and the *Safe Drinking Water Regulations 2005*.
PrimeSafe is the Statutory Authority operating under the *Seafood Safety Act 2003* to regulate the safety of commercial seafood across Victoria. PrimeSafe acts on the advice of the Chief Health Officer of DHS about the potential public health effects of blue-green algae which impact on seafood safety.
In the Emergency Management Manual Victoria, DHS is nominated as the Control Agency for food/drinking water contamination.
- **Catchment management authorities** have responsibilities under the *Water Act 1989* for management of designated waterways within Waterway Management Districts, and as caretakers of river health. This includes implementation of water quality plans incorporated within Regional River Health Strategies.
Catchment management authorities under the *Water Act 1989* Statement of Obligations are required to participate in the development of regional blue-green algal blooms contingency plans.

- **Regional and urban water corporations** (including Melbourne Water) have responsibilities under the *Water Act 1989* and *Safe Drinking Water Act 2003* for management of large headwork's and bulk supplies, and provision of reticulated water supply and sewage services within Waterway Management Districts. Water corporations under the *Water Industry Act 1994* Statement of Obligations are required to report any blue-green algal blooms impacting on water supply services to DHS and the relevant Regional Coordinator (convening agency). If the corporation is a Regional Coordinator (convening agency), the corporation must develop and maintain on an annual basis a contingency plan for regional blue-green algal blooms and undertake its duties as a Regional Coordinator (convening agency) in accordance with that contingency plan.
- **Parks Victoria** has responsibilities for the management of Crown land and associated waterways under the *National Parks Act 1975*. In the Emergency Management Manual Victoria, Park Victoria is required to respond to blue-green algal blooms where it is the designated local waterway manager.
- **Environment Protection Authority** has responsibility under the *Environment Protection Act 1970* to investigate pollution and other events that have a detrimental impact on the waterway.
- **Department of Primary Industry** has responsibilities for fisheries as defined in the *Fisheries Act 1995*.
- **Local Government** has responsibilities under more than 40 Victorian Acts including the management of Crown land and associated waterways. Under the *Emergency Management Act 1986*, each council is required to prepare a municipal emergency management plan.

Objective of the Blue-Green Algae Coordination Framework

The objective of the Blue-Green Algae Coordination Framework is for parties to cooperatively and effectively manage blue-green algae incidents to achieve:

- minimal impact of a blue-green algae incident on waterways, public health and safety and local amenity
- coordinated response
- effective and timely communication with water/waterway users of potential risk
- effective investigation and information sharing as the likely cause and actions that could be taken to prevent future occurrences
- effective communication with the broader community
- where appropriate, timely and effective communication to the relevant Minister.

The Emergency Management Manual of Victoria established under the *Emergency Management Act 1986* sets out the need for Emergency Response Plans for public agencies to develop for their operation. The aims of these plans are to detail the agreed arrangements for the prevention of, the response to, and the recovery from, emergencies that could occur in the operational area of a municipal council or other management authority. These plans:

- document measures to prevent or reduce the causes or effects of emergencies
- manage arrangements for the utilisation and implementation of resources in response to emergencies
- assist the affected community to recover following an emergency
- complement other local, regional and state planning arrangements.

These plans are based on a hazard analysis to identify the major risks to the organisation and the public in their area. They adopt the framework of the Emergency Management Manual Victoria concepts of preparedness, response and recovery. Although blue-green algae blooms

may not be considered an “emergency”, the Review recommended this approach be adopted by blue-green algae response plans for consistency and because it provides a robust framework for response to an event.

Analysis of Roles and Responsibilities

An analysis of the existing roles and responsibilities, undertaken with the assistance of stakeholders through workshops, identified disadvantages of the current Blue-Green Algae Coordination Framework including no overall management framework, great variation in the way agencies approach their regional/local roles, many parties are involved with some not aware of their roles and responsibilities, no review or audit process and a focus on blue-green algae response rather than prevention. While there are other existing frameworks for managing waterway incidents, the relative frequency of blooms, the wide range of waterways that may be affected, the range of agencies involved and the work that has already been in the preparation of coordination and implementation plans warranted the continuation of the existing coordination arrangements with some refinement and enhancements.

Improvements adopted from the Review were the Coordination Framework structure be based around roles of State-wide Coordinator, Regional Coordinator, Local Water Manager and Support Agency as shown in Figure 1.

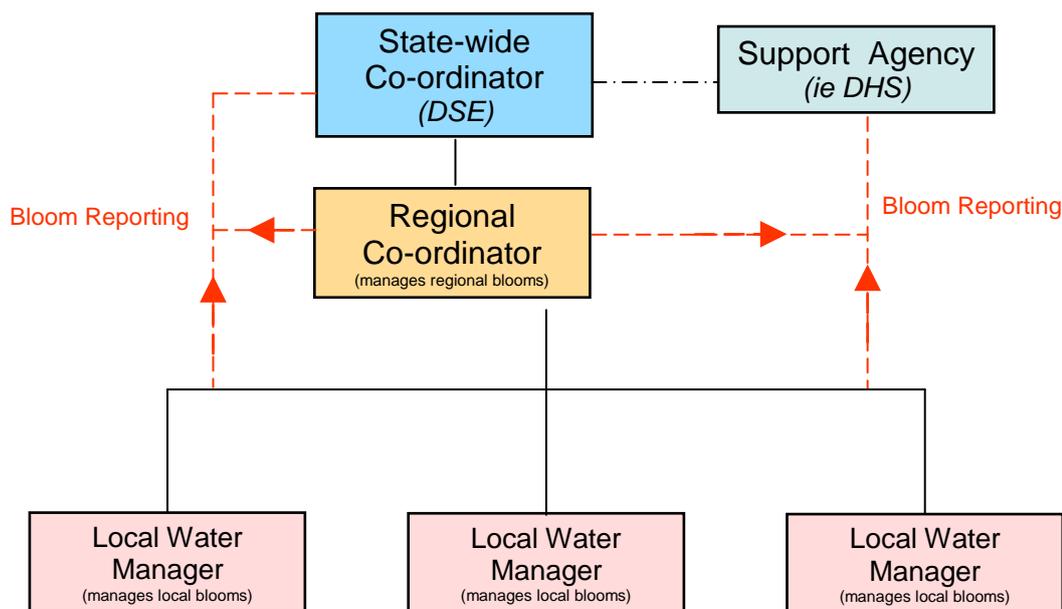


Figure 1 - Improved blue-green algae coordination organisation chart

The roles and responsibilities of parties within this structure, based on the functions of prevention, preparedness, response and recovery are summarised in Figure 2.

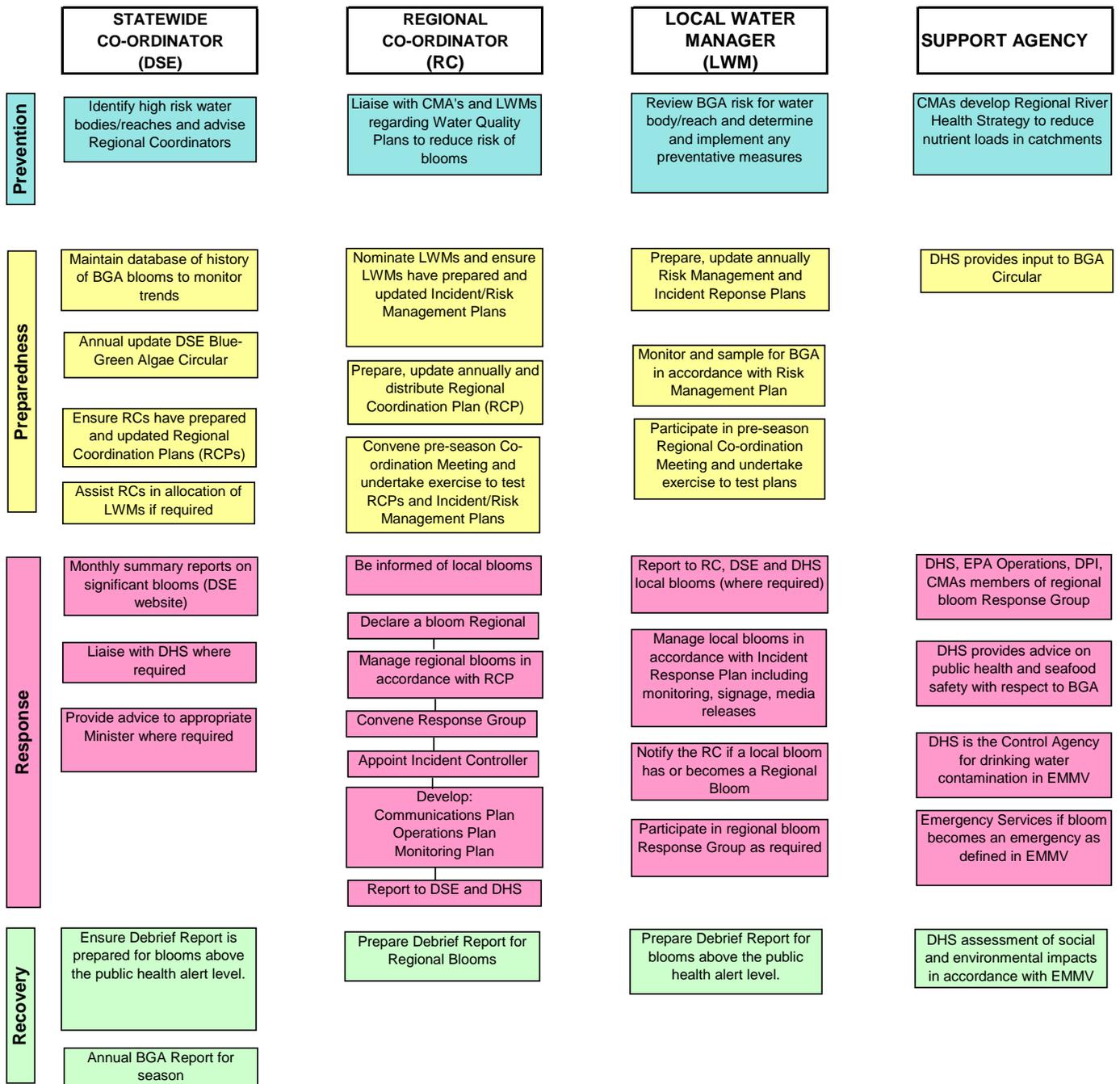


Figure 2 - Summary of improved blue-green algae coordination roles and responsibilities

This definition of the structure and the roles addresses many of the identified disadvantages by clarifying the management framework and responsibilities, incorporating the review/audit functions and adding the key areas of prevention and preparedness. The Review recommended that the Convening Agency role change in both title and emphasis. The Convening Agency name be changed to Regional Coordinator in recognition that in most cases their primary role is to coordinate the Local Water Manager's rather than manage a regional bloom. A small but significant change in their role was also adopted to allow for the chairing (Incident Controller) of the Response Group for a regional bloom to be delegated with agreement. This would allow the sharing of resources if a bloom continued for a significant period.

Allocation of Roles

Regional Coordinator

Due to the low occurrence of regional blooms, the main role of the Regional Coordinator is the coordination of the Local Water Managers for preparedness for a bloom. The Regional Coordinator is responsible for nominating the Local Water Manager's for a waterway, ensuring that the Local Water Manager's have prepared and updated Incident Response Plans and Local Water Manager's are aware of their responsibilities under the Regional Coordination Plan.

The Review found the allocation of a Regional Coordinator should be based on drainage basins, to allow a whole of catchment approach to blue-green algae prevention and response.

On this basis the main proposed allocation criteria for the Regional Coordinator role is as follows:

- Agency who has greater regional influence on waterways within a drainage basin.
- Agency who has bigger socio/economic interest and/or bigger risk should blooms occur.
- Working relationship with Local Water Manager's.
- Adequate resources both experience and number.
- Able to address prevention of blue-green algae.
- Relevance to core business.

It was recommended that each drainage basin should be examined for the agency that best fits the role of Regional Coordinator, as the suitability of an agency may vary across drainage basins.

Local Water Manager

The Review proposed that all waterways within a drainage area are assigned a Local Water Manager for the purpose of blue-green algae management. A Local Water Manager is proposed to fulfil all the following criteria for allocation to a waterway:

- Management responsibility for the waterway at a location. If there are multiple responsibilities the agency with:
 - a. the bigger socio/economic interest; and/or
 - b. bigger risk should blooms occur.
- Local presence (office and field crew).
- Adequate resources both experience and number.

Conclusion

While no fundamental change was recommended to the basic objectives and roles of the Blue-Green Algae Coordination Framework, the key improvement from the Review is that the Framework be based on the Emergency Management Manual Victoria concepts of prevention, preparedness, response and recovery. The roles and responsibilities are defined within this Framework based on a structure of State-wide Coordinator, Regional Coordinator, Local Water Manager and Support Agency. This definition of roles and structure addresses many of the identified disadvantages by clarifying the management framework and responsibilities, incorporating the review/audit functions and adding the key areas of prevention and preparedness.

References

Gilbert, D., Lloyd, L. and Feehan, P. 2008. Review of Blue Green Algae Coordination Framework for Victoria. SCA Management Consultants Report to DSE, Melbourne, Victoria.