



Queensland Harmful Algal Bloom

Response Plan

July 2026

Department of the Environment, Tourism
Science and Innovation.

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July 2026

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Foreword

In Queensland, the Department of the Environment, Science and Innovation, Queensland Health, Department of Primary Industries, Department of Local Government, Water and Volunteers, Local Governments, and water storage operators respond to a range of coastal marine, estuarine and freshwater quality incidents within their standard roles, responsibilities, and capabilities. These incidents are generally localised and have limited impact on the community at large. The successful management of incidents effecting water quality is achieved through the application of standard operating procedures by each responding agency, as well as through cooperative efforts between organisations.

The term Harmful Algal Blooms (HABs) is used to describe a diverse array of blooms of both microscopic and macroscopic algae which occur in fresh, estuarine, and coastal marine waters. HABs may pose a direct threat to human, native and farm animals, and aquatic ecosystem health, leading to numerous economic, social, and environmental impacts. The term “bloom” implies algal populations so dense as to be visible, however in some cases very low concentrations of microalgae may produce harmful effects.

The nature of these blooms presents a threat to public and animal health and requires rapid, coordinated whole-of-government management. This document (herein called the HAB Plan) builds on existing capabilities of responding agencies while recognising the special arrangements for managing potential HABs.

The HAB Plan was prepared under the guidance of the Queensland HAB Steering Committee which was comprised of representatives from key State Government agencies, major water service providers, and the Local Government Association of Queensland. The HAB Plan is used by the relevant organisations to manage HAB incidents in Queensland.

Authority

The Harmful Algal Bloom Response Plan was developed in collaborative with the following agencies:

- Department of the Environment, Tourism, Science and Innovation
- Department of Local Government, Water and Volunteers
- Department of Health
- Department of Primary Industries
- Local Government Association

Introduction

The HAB Plan outlines the Queensland Government's contingency plan for responding to HAB incidents. HABs are usually responded to by agencies including the Department of the Environment, Tourism, Science and Innovation, Queensland Health, Department of Primary Industries, Local Governments, and water storage operators. The incidents typically require minimal off-site management and coordination.

HABs are common seasonal phenomena which may occur throughout Queensland in both fresh and coastal marine waters. The organisms responsible for these outbreaks typically include freshwater and marine cyanobacteria (blue-green algae), and microalgae (diatoms and dinoflagellates) (see Glossary).

HABs may be potentially toxic and pose a direct threat to human and animal health. Consequently, a HAB may have economic impacts (significant increase in water supply treatment costs or need to use alternate supplies) and social impacts (disrupt recreational use of the waterway). HABs may also have environmental effects on aquatic ecosystems. Therefore, all HABs need to be treated with caution until their threat is confirmed. Uncertainty of the toxicity of a potential HAB event can cause local communities to be anxious and to seek urgent action from "the authorities". It may take several days to identify algae and/or toxins in water samples.

It is important that potential HABs are quickly referred to an appropriate agency for action. To provide certainty for the public on this issue, it is desirable to have clear separation of roles and responsibilities between various State agencies, Local Governments, and water storage operators. Rapid response will help to allay any public anxiety in relation to potential HABs.

Public education and awareness of HABs will also assist communities to distinguish between potential HABs and harmless water quality or water-weed occurrences. As blooms can occur frequently, particularly during warmed months of the year, it is difficult for local communities to place high priority on their prevention and management. Improved public understanding of the causes and health effects of HABs is desirable.

HABs are generally caused by a combination of conditions, including excess nutrients in the water. These conditions tend to occur in warmer months in farm dams, river pools, dam and weir storages, natural lakes, and shallow estuaries. High nutrient loads in the water body due to sewage effluent, animal waste and agricultural fertilizers in the catchment may increase the intensity and duration of blooms. The greatest risk of HABs occur in early summer, following typically dry winter/ spring conditions and rising water temperatures.

Objectives of the plan

To outline a framework to guide a coordinated response by agencies, Local Governments, and water storage operators to reduce the risk of HABs to humans, livestock, and wildlife.

Application of the plan

The HAB Plan is to be used by any State agency, Local Government or water storage operator receiving an inquiry from the public regarding a possible HAB to ensure the incident is dealt with in a rapid and effective manner.

Principles

The HAB Plan is underpinned by the following principles:

- HAB incidents are treated as potentially harmful until proven otherwise.
- Where necessary, the response to a potential HAB incident is a multi-agency response that recognises the role of the response agency in dealing with the incident in accordance with its procedures, with support as needed from the other agencies.
- Response is preferably provided by relevant response agency staff located nearest to the potential HAB, supported where necessary by state-wide expertise.
- Response should be as rapid as practicable, recognising the potential danger to humans, livestock, and wildlife from extended exposure to a HAB.
- Response to potential incidents and any advice provided should be consistent across response agencies to ensure individuals and communities have confidence in the response framework.
- The HAB Plan is a dynamic document that is reviewed and maintained by the Queensland HAB Steering Committee on a regular basis.
- Training for potential HAB incidents is primarily the responsibility of response agencies. To ensure the effective coordination of response agencies to a potential HAB incident, training programs should involve all response agencies.

Agency responsibilities

Overview of agency responsibilities

Each agency has specific roles during the management of a HAB incident and is responsible for the safety, protection, training, and management of its own personnel (Table 1).

Table 1. Summary of organisational roles in harmful algal bloom response and management

Agency	Water type	Response/Action					
		Receive public enquiry	Provide general advice	Inspect the bloom	Analyse the bloom	Communicate the findings	Mitigation and management
DETSI	Freshwater, marine, and estuarine waters, including within protected areas	+	+	+	+	+	+ Only in or adjacent to Protected Areas
QHealth	Freshwater, marine and estuarine waters (when human health is a consideration)	+	+	-	+	+	-
DPI	Water bodies impacting on health of production animals	+	+	Where a reported bloom poses a sufficient animal disease or welfare risk, an investigation of the incident may be undertaken	As part of a disease investigation water samples may be collected for analysis by a suitably qualified laboratory	+	-
LGA	Ornamental or recreational lakes, bathing reserves, foreshores, recreational waters, natural freshwaters	+	+	+	-	+	+
Water Supply Scheme Operators Drinking Water Service Providers	Reservoirs (including drinking water storages and recreational lakes)	+	+	+	Water Plans and associated Resource Operations Licenses may require collection of water samples for analysis by a suitably qualified laboratory	+	+

Department of the Environment, Tourism, Science and Innovation (DETSI)

DETSI is the lead agency for administering the Environmental Protection Act. The Act provides for the protection of the environment from the effects of contaminants of all kinds. This includes the licensing and regulation of contaminant discharges that may cause or contribute to HABs. Many of the powers under the Act have been shared with Local Governments under delegation arrangements. Water quality objectives are set in the Environmental Protection (Water) Policy. DETSI also administers the Coastal Protection and Management Act, which focus on the sustainable management of the State's coastal beaches and estuaries; Marine Parks Act this act protects and conserves the values of the natural marine environment while allowing for its sustainable use. DETSI also administers the Nature Conservation Act 1992 and the Recreation Areas Management Act 2006 and Forestry Act (part).

Additionally, DETSI provides:

- assessment, of HAB incidents estuarine and marine environments that are raised with DETSI
- notification of possible *Lyngbya* and other marine algal blooms to relevant local regional councils
- erection of information signage and HAB clean-up activities
- provides and installs signage in National Parks (and other protected areas) and on beaches managed under the Recreation Areas Management Act 2006 where the HAB presents a public health threat.
- conducts HAB clean-up activities in National Parks (and other protected areas) and on beaches managed under the Recreation Areas Management Act 2006 where the HAB presents a public health threat.

Queensland Health (QHealth)

QHealth does not administer legislation specific to the management of HABs. QHealth is the key government agency responsible for advising on human and public health issues associated with HABs.

In summary, QHealth's response in the event of a HAB may include:

- provision of advice on human, public health, and analytical issues
- Environmental Health Branch and Public Health Units will assess the health risks that blooms present, determine whether a recreational or potable water supply is safe to use, and assist in the development of public health communication and management strategies.
- Queensland Health Forensic and Scientific Services (FSS) provides analytical services for cyanobacterial identification, enumeration, and toxin levels, as well as technical and scientific information regarding cyanobacteria and their toxins.

Department of Local Government, Water and Volunteers (DLGWV)

Under the Water Act 2000, all water supply scheme operators are required to collect and report Blue-Green algae along with a range of other scheme-specific parameters to DLGWV in accordance with the conditions of the Resource Operations Licence (ROL). ROL holders must ensure that the measurement, collection, analysis, and storage of data is consistent with the Water Monitoring Data Collection

Standards (DNRME 2020a)¹ and data transfer and reporting is consistent with the Water Monitoring Data Reporting Standards (DNRME 2020b)². These standards provide guidance on the HAB monitoring and reporting requirements, including preparation of incident, operational and annual reports.

Under the Water Supply (Safety and Reliability) Act 2008, drinking water service providers are required to monitor and report incidents (which could include HABs) to DLGWV according to a risk-based approach as part of their Drinking Water Quality Management Plan (DWQMP). As part of the DWQMP, service providers must identify all hazards and hazardous events, assess the risks posed by these hazards or hazardous events and demonstrate how they intend to manage these risks. Where HABs have been identified as a risk to drinking water quality, appropriate operational and/or verification monitoring must be identified and included in the DWQMP. This includes parameters to be used for indicating compliance with drinking water quality criteria. Guidelines for preparation of DWQMPs are provided in the Drinking Water Quality Management Plan Guideline (DNRME 2018)³.

Department of Primary Industries (DPI)

DPI works to achieve a productive and profitable agriculture, fisheries, and forestry sector by promoting sustainability and innovation through four core business areas including Agriculture, Fisheries and Forestry and Biosecurity Qld. In addition, DPI provides:

- regulation and advice on issues relating to animal (including fish) health and use of agricultural and veterinary chemicals
- veterinary pathology services for investigating animal health issues, primarily around infectious disease
- advice on protected marine plants

Local Governments (LGs)

LGs are responsible under the Planning Act 2016 for the planning and regulation of development activities to maintain local social, economic, and environmental values provided it aligns with legislation and regulations affecting local government accountabilities. Also, LGs have the responsibility for local management of water quality issues as part of the Environmental Protection Act where LGs regulate environmentally relevant activities (ERAs). LGs may also elect to accept delegated responsibility for sections 31 and 32 of the Environment Protection (Water and Wetland Biodiversity) Policy 2019, which allows LGs to administer and enforce minor water pollution incidents, such as the run-off from building sites. Many LGs provide recreation facilities at ornamental lakes, water supply storages and along waterways.

In addition, LGs provide:

- local/regional contact for HAB enquires from the community
- erection of information signage and HAB clean-up activities in consultation with appropriate State government agencies
- waste disposal facilities (under Environmental Protection Act licence) for HAB material disposal

1 DNRME (2020a) Water Monitoring Data Collection Standards. Prepared by Divisional Support Water, August 2020.

2 DNRME (2020b) Water Monitoring Data Reporting Standards. Prepared by Divisional Support Water, August 2020.

3 DNRME (2018) Drinking Water Quality Management Plan Guideline. Prepared by Water Supply Regulation, November 2018.

Water Supply Scheme Operators (WSSOs) and Drinking Water Service Providers (DWSPs)

WSSOs are responsible for monitoring and reporting HABs within and downstream of water storages in accordance with their licence under the Water Act 2000. In addition, they are required to identify measures to prevent or modify the release of HABs into other waters (called supplemented streams). The main WSSOs in Queensland are Sunwater, Seqwater, and Gladstone Area Water Board. Some LGs also operate water supply storages.

In addition, WSSOs provide:

- routine monitoring of HABs in supplemented freshwater systems within their scheme areas (e.g. reservoirs and weir pools and freshwater immediately downstream of storages)
- information to their water users as required (e.g. warning signs, press releases, phone messages)
- monitoring and reporting HABs in recreational waters (e.g. reservoir)
- community and stakeholder information relating to their operations (e.g. signage, web site, fact sheets, brochures)

DWSPs are responsible for ensuring the delivery of safe drinking water to their customers and must comply with the requirements of the Water Supply (Safety and Reliability) Act, 2008. Where HABs have been identified as a risk to drinking water quality, DWSPs must undertake operational monitoring and/or verification monitoring in accordance with their approved DWQMP and report and investigate incidents.

Operational coordination

Response coordination

The Response Coordination diagram below outlines the broad process within which a range of agencies can receive enquiries from the public regarding a potential HAB incident. The process guides the enquiry to the relevant response agency for action or advice. Action may include investigation, analysis and, if the HAB is identified as a public risk, public warning.

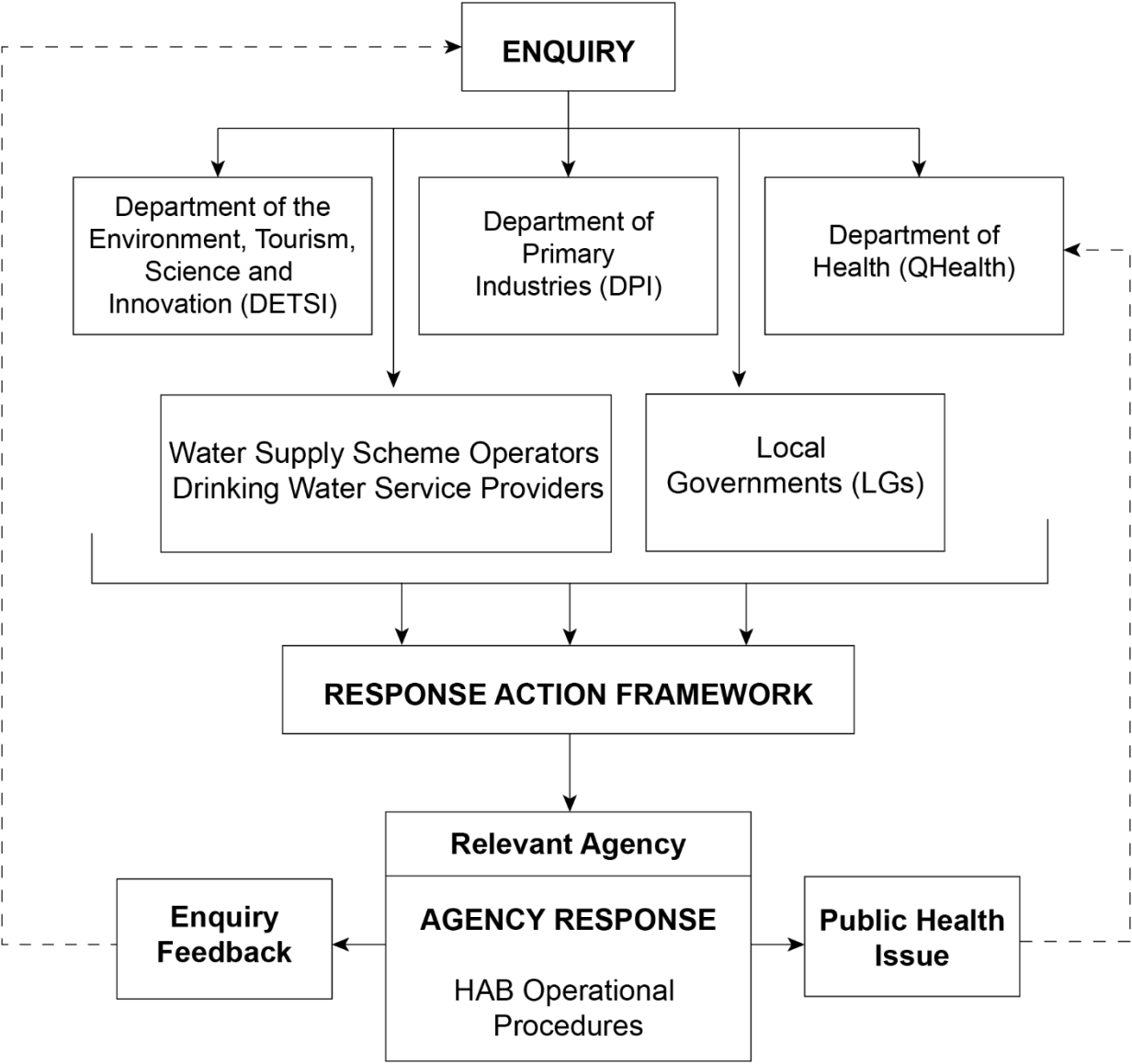


Figure 1. Harmful algal blooms response coordination framework

Response action framework

The Response Action Framework has been developed to assist agencies receiving enquiries to identify the relevant response agency quickly and consistently for action.

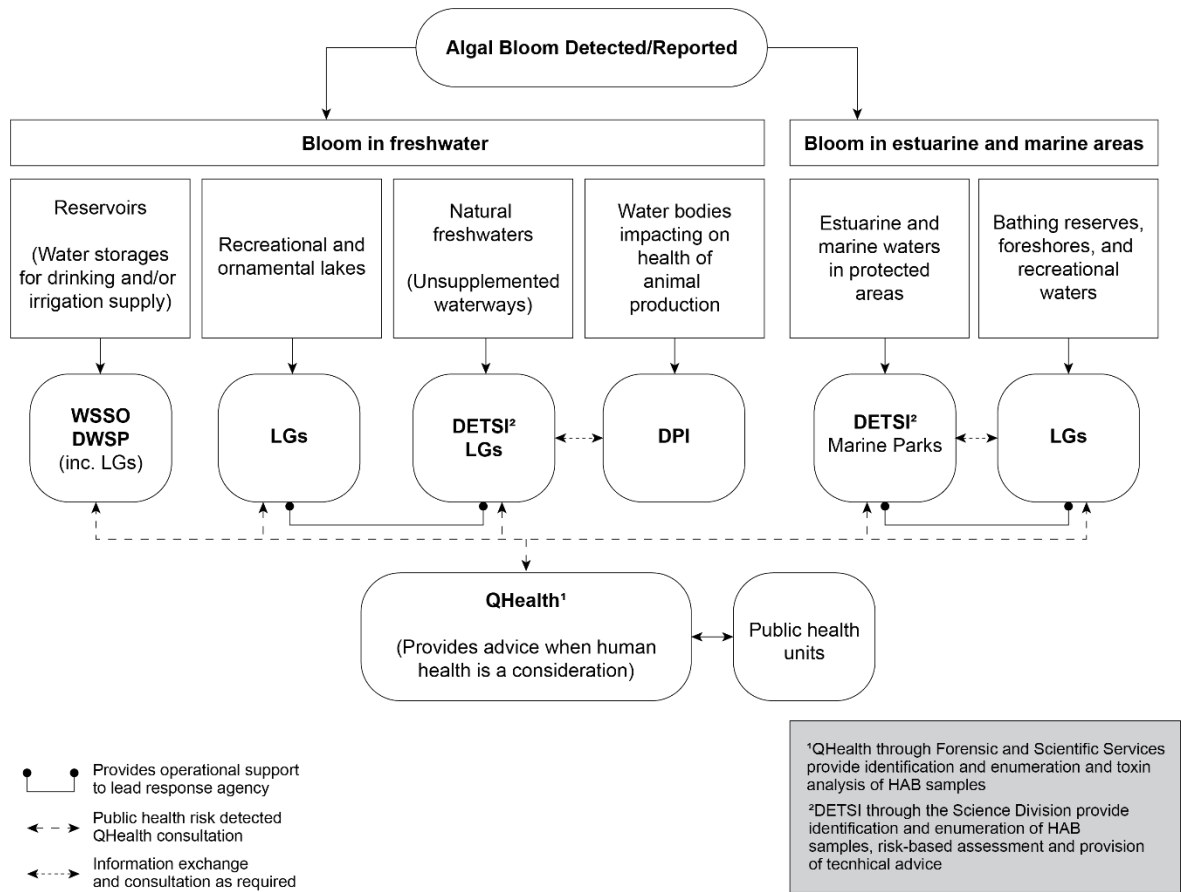


Figure 2. Harmful algal blooms response action framework

At times there will be situations where more than one agency will have primary responsibility to respond to a potential HAB incident, e.g. bloom in natural waters in a National Park. The HAB Operational Procedures will outline appropriate linkages for a range of these situations.

Queensland HAB Operational Procedure

Operational procedures have been developed to assist response agencies to consistently deal with public enquires. The major component of the procedure includes:

- background information on harmful algal species
- a list of agencies contact details for initiating a response to a HAB enquiry
- sampling, storage, transportation, and analysis guidelines to determine the extent of a HAB
- a list of Government laboratories that can diagnose HAB samples
- risk assessment framework assessing urgency and severity of a HAB
- guidelines on preferred actions to respond to a potential HAB
- communication guidelines to advise the enquirer and, where necessary, the community of a HAB, including warning signs, etc.

Media and public information

Event information

The response agency is responsible for informing the enquirer of the result of the HAB investigation. If the response agency believes that the HAB poses significant public risk, it will liaise with QHealth Public Health Units regarding the need for media warnings. The community may be notified through one or more of the following channels:

- warning and information signs at beaches, jetties, lakes, reservoirs, river recreation sites, etc.
- mainstream news media and advertising, including local newspaper, TV, radio, etc.
- pre-recorded telephone information messages
- Queensland Government websites; other relevant websites
- circulation of warning pamphlets

Awareness information

HABs are not well understood by the public, especially the causes of such blooms and their potential danger. Hence there is a need to raise community awareness of the potential risks of encountering a bloom and how to deal with a discovery. Also, general information on the causes of HABs may help to mitigate future occurrences.

The responsibility for raising public awareness lies with the key State agencies and should be coordinated to minimise confusion and duplication.

Awareness may be delivered through one or more of the following channels:

- community newsletters and meetings
- specialist newsletters, e.g. Health Waterways Happenings
- brochures, posters, pamphlets
- Queensland Government websites; other relevant websites
- displays at events
- awards

The strategic release of information, such as the onset of high-risk periods, will maximise its effectiveness. For example, agencies could deliver the following information within their areas of responsibility:

- Just prior to high-risk periods, raise awareness through public media, newsletters, and websites. Focus on the identification of HABs, the dangers they pose, and the local contact arrangements in this plan.
- All year round, raise general awareness of HABs through public media, newsletters, and websites. Focus on the causes and practical measures to mitigate their re-occurrence.

HAB Plan review and maintenance

Responsibility for review

The Queensland HAB Interagency Steering Committee may be reformed to initiate and undertake reviews of the HAB Plan and associated HAB Procedures. The Steering Committee may consist of representatives from the following organisations:

- Department of the Environment, Tourism, Science and Innovation
- Department of Local Government, Water and Volunteers
- Department of Health
- Department of Primary Industries
- Local Government Association of Queensland

Ongoing reviews

A review of the HAB Plan and HAB Operational Procedures is to be conducted when:

- the Steering Committee considers it necessary, based on specific or general experience in implementing the HAB Plan
- the roles or responsibilities of any response agency is altered
- new information or technology for dealing with HAB occurrences becomes available

Training

Each response agency is responsible for the training of its own personnel to perform the roles and responsibilities assigned in the HAB Plan.

Glossary

For the purposes of the HAB Plan, the following terms have the associated meaning

Term	Definition
Bloom	an increase in algal numbers to such an extent as to: discolour the water, impart taste, odours, toxins and/or other compounds to the water, adversely affect the other biotic components of the aquatic ecosystem (i.e. fish, birds, amphibians, etc.) or generally render the water unsuitable for its intended use (i.e. drinking, irrigation, recreation, stock watering, ecosystem maintenance, etc.).
Benthic microalgae	microscopic algae that inhabit sediment surfaces of interstitial water (between sediment grains); mostly diatoms or dinoflagellates.
Cyanobacteria	(formerly known as blue-green algae) a group of photosynthetic bacteria, some species of which commonly produce toxins and form nuisance blooms in Australian waterways.
Diatoms	a division of microalgae with species inhabiting both the water column and sediment surface, some of which can produce toxins known to taint fish and shellfish products.
Dinoflagellates	a division of microalgae characterised by two flagella, some of which are responsible for “red tides”. Some autotrophic, other heterotrophs (cannot photosynthesise).
<i>Lyngbya majuscula</i>	Filamentous marine cyanobacteria capable of forming blooms and producing toxins.
Macroalgae	multicellular algae that are visible to the human eye; includes representatives from the green algae, red algae, and brown algae.
Natural waters	include streams, rivers, wetlands etc., which do not have their flows supplemented by artificial means (i.e. through modifications associated with dams, weirs, irrigation channels, water extraction or supplementation, etc.).
Ornamental and/or recreational lake	artificial lake or pond created as an ornamental feature in a park, garden, or housing estate.
Phytoplankton	microscopic, free-floating algae, which can occur as single cells, colonies, or filaments.
Reservoir	an impounded body of water usually created through the placement of dams and weirs across the path of creeks and rivers. Usually created to store water for either potable or irrigation supply purposes.

Response agency	the government or non-government agency responsible for the direct or coordinated cross-agency response to a potential HAB notification. Response agencies are linked to specific HAB categories (i.e. marine, estuarine, freshwater, etc.) by either their legislative or licensed responsibilities and/or by their expertise and capacity to deal with potential HAB incidents.
Scum	dense accumulation of algal cells at or near the surface of the water forming a layer of distinct discolouration (green, blue, brown, or red).
Water storage operator	body authorised under the Water Act to operate a water supply storage.

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