Australian Government
Bureau of Meteorology

Service Level Specification for Flood Forecasting and Warning Services for Tasmania – Version 3.2

This document outlines the Service Level Specification for Flood Forecasting and Warning Services provided by the Commonwealth of Australia through the Bureau of Meteorology for the State of Tasmania in consultation with the Tasmanian Flood Warning Consultative Committee

Service Level Specification for Flood Forecasting and Warning Services for Tasmania

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Cover image: Major flooding on the Huon River at Tahune Bridge in August 2003. Photo courtesy of Forestry Tasmania.

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1 Introduction

1.1 The purpose of this Service Level Specification is to document and describe the flood forecasting and warning services provided by the Bureau of Meteorology (the Bureau) in Tasmania.

1.2 The Bureau's flood forecasting and warning services are provided within the context of the Total Flood Warning System as defined in the Australian Emergency Manuals Series, Manual 21 Flood Warning (Australian Government, 2009 and illustrated in Figure 1).

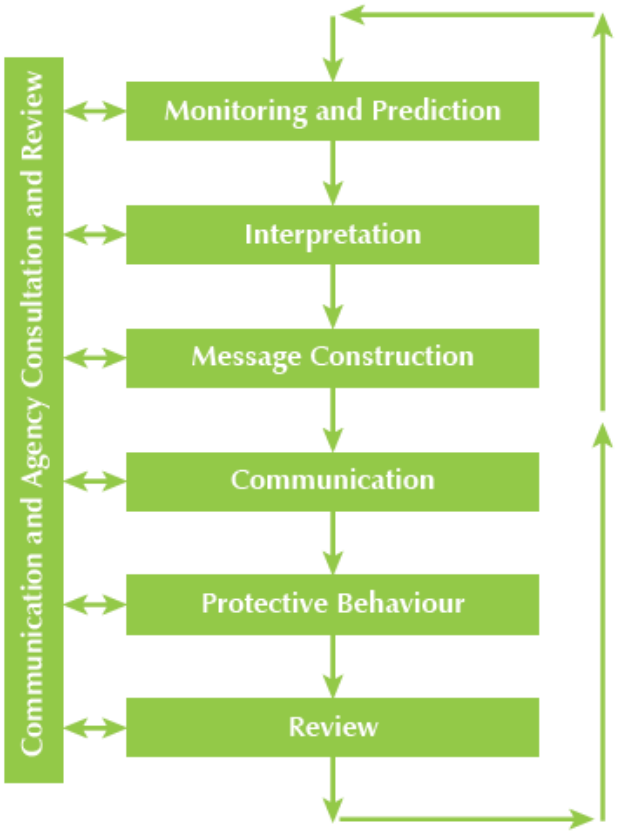

Figure 1: The components of the Total Flood Warning System (Australian Emergency Manual Series, Manual 21 Flood Warning, Australian Government 2009)

1.3 The Total Flood Warning System recognises that a fully effective flood warning service is multi-faceted in nature and its development and operation involves input from a number of agencies each with specialised roles to play. It is vital that the agencies involved work in close cooperation through all stages of developing and operating the system. The services described here are the Bureau's contribution to the Total Flood Warning System.

1.4 The Bureau's main role in the Total Flood Warning System is focussed on monitoring and prediction, and to a lesser extent interpretation, message construction, and communication components (see Appendix A for descriptions). The Bureau also contributes to review activities and takes a role in the planning and coordination activities associated with ensuring that the activities of all agencies and appropriate linkages are well coordinated. The roles and responsibilities of all key stakeholders involved in the provision of a flood warning

service in Tasmania are described in the National Arrangements for Flood Forecasting and Warning (Bureau of Meteorology, 2015).[1]

1.5 This Service Level Specification is concerned with describing the Bureau's role in the Total Flood Warning System and its interaction with other stakeholders as described in the National Arrangements. This is to ensure that the service the Bureau is providing in support of each of the relevant components of the Total Flood Warning System is understood by the Bureau and other stakeholders.

1.6 A description of the activities that make up the Bureau's flood forecasting and warning services for Tasmania is given in Section 3. This set of activities, associated products and target levels of service constitute the current standard services provided freely by the Bureau. The Bureau also provides supplementary services on a commercial or cost recovery basis but they are not covered in this document.

1.7 Additionally, and unique to Tasmania, a river and rainfall alert service is sponsored by the Tasmanian State Emergency Services (see Section 3.6).

[1] The National Arrangements for Flood Forecasting and Warning (2015) is available on the Bureau's website: http://www.bom.gov.au/water/floods/index.shtml

2 Flood Warning Consultative Committee

2.1 The Tasmanian Flood Warning Consultative Committee provides the Bureau's key stakeholders with a consultation mechanism for its flood forecasting and warning services. As such, the committee is responsible for reviewing this Service Level Specification on an annual basis or as required.

2.2 The overall role of the Tasmanian Flood Warning Consultative Committee is to coordinate the development and operation of flood forecasting and warning services in Tasmania, acting as an advisory body to the Bureau and participating State and local government agencies. Membership and terms of reference for this committee in Tasmania are detailed in Schedule 1.

2.3 The Bureau chairs and provides secretariat support to the Tasmanian Flood Warning Consultative Committee, which meets six monthly depending on need and activity.

3 Bureau flood forecasting and warning services

3.1 The scope of services covered by this Service Level Specification is confined to those dealing with riverine flooding caused by rainfall where typical rain-to-flood times are six hours or more. Flash flooding (rain-to-flood times less than six hours) and flooding caused purely by elevated sea levels are not covered, nor are the weather forecasting and other services the Bureau provides that contribute to the flood forecasting and warning service, including Severe Weather and Severe Thunderstorm Warnings, Tropical Cyclone Warnings, provision of radar data and rainfall forecasts.

3.2 The nature of the services covered by this Service Level Specification include undertaking the routine catchment monitoring and river height prediction activities necessary for operation of the Total Flood Warning System, as well as issuing and publishing specific warning and data products. These activities are listed below with further detail and associated performance measures provided in subsequent sections.

- Collect and publish rainfall and river level data
- Routine monitoring of flood potential
- Flood modelling and prediction
- Automated information and alerting
- Issue flood watches
- Issue flood warnings
- Communication of flood warnings and flood watches
- Data networks, communications and storage
- Operations
- Maintain systems to collect data and flood information
- Planning and liaison
- Support for emergency management training and exercises

3.3 Collect and publish rainfall and river level data

3.3.1 The collection and publishing of rainfall and river level data is an important component of the overall service. Apart from use by the Bureau for data analysis and its hydrological modelling for flood predictions, the data is also used by the emergency service agencies, numerous operational agencies, businesses and the public to monitor rainfall and river conditions. To assist in describing the service, the locations where river height; dam, weir or lake level; and tidal observations are made are categorised into three types; namely forecast location (Schedule 2), information location (Schedule 3) and data location (Schedule 4).

- **Forecast location** is a location for which the Bureau provides a forecast of future water level either as the class of flood that is predicted (minor, moderate or major) or as a level and class – refer to Appendix A for definitions. At these locations observed data, flood classifications and additional qualifying information will also be available (Schedule 2).

- **Information location** is a location at which flood classifications are defined and observations of water level data are provided. At these locations forecasts of future water level are not produced. Other key thresholds may be defined and reported against (Schedule 3a and 3b).

- **Data location** is a location for which just the observed water level data is provided. Flood classifications are not available for these locations and forecasts of future water level are not produced (Schedule 4).

3.3.2 An indicative level of priority has been assigned to each observing site and key communication infrastructure such as radio repeaters (Schedules 2-4 and 7-9) based on a three tiered scheme (Table **1**). The priority level is based on the expected impact to the Bureau's services. The impacts identified are the expected outcome of a service outage at that site during a flood emergency. Impact is described in terms of forecast performance and the Bureau's ability to provide a flood warning service. Note that the scope of this priority scheme is limited to consideration of the requirements of forecasting and prediction only and should not be confused with any other priority assigned to that site by third party owners or other users.

Table 1 Site priority

Priority Level	Impact on performance	Impact on service delivery	Description
High	Very difficult to meet target	Direct and significant high level impact for the site and/or downstream locations	Degradation of service highly likely
Medium	Difficult to meet target	Some impact for the site and/or downstream locations.	Possible degradation of service.
Low	Not likely to affect meeting targets	Little impact on the site and/or downstream location	No change in service. Lower possibility of degradation of service.

Note*:* Multiple outages within a given network will lead to a higher impact levels and greater service degradation. Table 1 indicates the effect of a single site failure within an otherwise functional network.

3.4 Routine monitoring of flood potential

3.4.1 The Bureau will maintain an awareness of catchment conditions and monitor the potential for riverine flooding. This monitoring activity will be supported by the Bureau's weather services as required and is an activity undertaken to plan future flood operations.

3.5 Flood modelling and prediction

3.5.1 The Bureau will develop and maintain prediction systems for the forecast locations listed in Schedule 2.

3.5.2 The Bureau prediction systems can include real-time hydrologic models, simple peak to peak correlations and other hydrologic techniques as appropriate.

3.5.3 The Bureau prediction systems will be maintained and updated following significant events or when new data becomes available.

3.5.4 The target level of performance for the prediction at each forecast location is given in Schedule 2.

3.6 Automated information and alerting

3.6.1 In Tasmania, the Bureau provides a threshold-based rainfall and river alerting service for the sites listed in Schedule 3b. This service involves the preparation of alerts in the form of a short message which is transmitted to an agreed list of users

(not included in this document) immediately the pre-set threshold is exceeded at a site. This service is provided on behalf of the Tasmanian State Emergency Service who are responsible for this service.

3.7 Issue flood watches

3.7.1 The Bureau will issue flood watches when the combination of forecast rainfall and catchment conditions indicates flooding is possible. The catchments and basins covered by flood watches include all those listed in Schedule 10. Note that flood watches may cover catchments that do not have established flood warning services.

3.7.2 The primary purpose of a flood watch is to provide early advice to communities and the relevant emergency service organisations of the potential threat from a developing weather situation. Typically, a flood watch is issued 1 to 4 days before an anticipated flood event depending on the confidence in rainfall forecasts.

3.7.3 Flood watches will be communicated by the Bureau using the dissemination methods detailed in Section 3.9.

3.8 Issue flood warnings

3.8.1 In general flood warnings are issued based on the following criteria:

- The river level of at least one formal forecast location (listed in Schedule 2) is expected to reach and or exceed or has exceeded the minor flood level;
- The flood class levels or trigger heights defined at forecast locations are expected to be exceeded (refer to Schedule 2);
- The flood class levels defined at information locations are exceeded (refer to Schedule 3).

This specific initiating criteria, if any, for each flood warning product is listed in Schedule 10.

3.8.2 Flood warnings may include either **qualitative** or **quantitative** predictions at forecast locations or a statement about future flooding in more **generalised** terms as outlined in Table 2. The type of prediction included is commensurate with user requirements, the availability of real time rainfall and river level data, and the capability of available flood prediction systems. A flood warning may contain **generalised, quantitative** and **qualitative** predictions and typically start with more **generalised** information and become more specific as data becomes available as the event develops and progresses.

3.8.3 **Quantitative** predictions include expected flood class (minor, moderate or major) with more specific information on the height and time of water levels at the forecast locations identified in Schedule 2. A **quantitative** prediction can be a specific level, or a range of levels, and has detailed timing down to blocks of a minimum of three to six hours. **Quantitative** predictions are based on all available information at that time of warning issue. The target lead time of the river height prediction for each forecast location where **quantitative** predictions are provided is given in Schedule 2. For an example of a **quantitative** prediction refer to Table 2.

3.8.3.1 For the Bureau to be able to provide a **quantitative** prediction at a location, it is essential to have a suitable network of rainfall and river level sites upstream with data coming in real time, sufficient historical data to

calibrate the flood forecasting model, a reliable rating table and documented flood impacts and flood classifications.

3.8.4 **Qualitative** predictions include expected flood class (minor, moderate or major) and timing of flooding at the forecast locations identified in Schedule 2. The timing is indicated in blocks of six, 12 or 24 hours, using the terms such as early morning, afternoon or overnight. Such predictions are based on all available information at that time and may include advice on the peak classification that is expected or has occurred at that location. The target lead time for each forecast location where only **qualitative** predictions are provided are given in Schedule 2a. For an example of a **qualitative** prediction refer to Table 2.

3.8.4.1 For the Bureau to be able to provide a **qualitative** prediction at a location, it is essential to have at least some rainfall and river level sites upstream of the location with data coming in real time, at least some historical flood data to calibrate the flood forecasting model, a reasonable rating table and documented flood impacts and flood classifications.

3.8.5 The Bureau may also issue flood warnings with more **generalised** predictions and information when there are not enough data to make specific predictions or in the developing stages of a flood. These warnings contain generalised statements advising that flooding is expected and may include forecast trend (rising or falling) (for examples refer to Table 2).

3.8.6 The typical target accuracy of a **quantitative** water level prediction is that 70% are within 0.3 or 0.6 metres of the observed water level. Specific accuracy targets by location are defined in Schedule 2. Achievement of these targets is not possible in all floods or at all locations. In general predictions of a flood peak are more accurate than "reach" or "exceed" predictions that are issued during the developing stages of a flood. This is due to uncertainty of future rainfall rates and/or upstream floodplain behaviour that are used when making those predictions.

3.8.7 A list of the flood warnings issued in Tasmania, along with the basin/river to which they apply is included in Schedule 10. Details about forecast locations in each basin/river are included in Schedule 2.

3.8.8 Flood warning summaries – A summary of flood watches and warnings that are current is provided to help media and other users readily access information.

Table 2. Prediction type description

Prediction type	Height prediction	Time of prediction	Example
Quantitative	Numerical prediction - Any Height - Peak Height Can refer to flood class	More specific, typically in blocks of 3 to 6 hours	The South Esk River at Perth is likely to exceed the Minor Flood Level (4.3 metres) by 3pm Saturday before peaking late Saturday night The South Esk River at Perth is expected to peak near 9.2 metres (major flooding) about 6pm Sunday
Qualitative	Refers to flood class (minor, moderate or major)	Range of times (6, 12 or 24 hour blocks)	Minor flooding is expected in the Meander River at Meander during Saturday afternoon The Meander River at Meander is expected to peak above the major flood level during Sunday evening

Generalised	No height prediction - forecast trend (rising or falling)	Range of times (24 hour blocks)	Flooding is expected in the Coal River during Saturday the 18th of December with further rises possible due to forecast rainfall.

3.9 Communication of flood warnings and flood watches

3.9.1 Flood watches and warnings will be issued directly to a list of stakeholders with emergency management responsibilities. This list is maintained by the Bureau but is not detailed in this document. The direct dissemination methods supported include email, fax and the internet protocols such as File Transfer Protocol (FTP).

3.9.2 The format of messaging in flood related products will conform to a nationally consistent standard determined by the Bureau, in consultation with the Flood Warning Consultative Committee.

3.9.3 Flood watches and warnings are also communicated by the Bureau via:

3.9.3.1 **Radio:** Radio stations, particularly the ABC, broadcast flood warning information as part of their news bulletins, or whenever practicable. This form of broadcast may be covered in separate agreements between the Bureau and broadcasters.

3.9.3.2 **Weather warning service:** Flood warning information is recorded on a contracted telephone information service. Calls to this service incur a fee-for-service charge.

3.9.3.3 **Internet:** Flood watches and warnings are published on the Bureau's public web site and available by File Transfer Protocol (FTP) and Rich Site Summary (RSS) along with related rainfall and river level information (see 3.12).

3.9.3.4 **Social Media:** The Bureau endeavours to issue Tweets related to flood watches, flood warnings and relevant information, subject to operational constraints and in connection with other weather information. The Bureau website remains the main platform for the publishing of flood information.

3.9.4 Emergency management partners[2] and media can also access flood level and warning information directly from the Bureau Flood Warning Centre and Bureau National Operations Centre, subject to operational constraints. The Bureau does not publish to the public the contact details of its operational centres.

3.10 Data networks, communications and storage

3.10.1 The services to be provided by the Bureau under this Service Level Specification depend on provision of data from networks of stations owned and operated by the Bureau and partner agencies. Permanent or temporary loss of real time data may necessitate a downgrading of the flood warning service from **quantitative** predictions to **qualitative** or **generalised.**

3.10.2 The Bureau contribution to this network of stations includes:

[2] Emergency management partners include those organisations that have an emergency management responsibility for the wider community (e.g. State Emergency Services)

- the operation and maintenance of equipment at the sites which are fully owned and maintained by the Bureau as listed in Schedule 7.
- assisting with maintenance of equipment for other agencies at the sites listed in Schedule 8.
- operating and maintaining Bureau-owned equipment at sites where this equipment is co-located at a site owned by another agency Schedule 9.

3.10.3 Where the site is owned or operated by other parties, installation, maintenance and repairs of Bureau equipment will depend on adequate access being provided to the Bureau and any of its contractors. The Bureau will confirm access arrangements with relevant land owners before entering the premises. The Bureau also requires that the site operators provide timely advice regarding any possible faults or other issues affecting the performance of the data network.

3.10.4 The flood forecasting and warning service for Tasmania also depends on the provision of data from partner agency data networks. The provision of these data for each of the agencies concerned is detailed in a Data Sharing Agreement between the Bureau and each partner (Schedule 6).

3.10.5 The Bureau will maintain the essential set of metadata describing the network of stations and related infrastructure regarding the Bureau's component of the data network, along with metadata required to inform the data ingest process for partner agency related networks and sites.

3.10.6 The Data Sharing Agreements are intended to reflect operational arrangements and are not legally binding and allow multiple agreements between individual and/or multiple agencies.

3.10.7 The parties agree to the provision of data as set out in the Data Sharing Agreements during periods of routine site operation and increased frequency during flood periods.

3.10.8 Data transfer protocols and conditions regarding fitness for purpose as provided by each stakeholder will be adhered to as set out in the Data Sharing Agreements for data provision.

3.10.9 The sharing of data as set out in the Data Sharing Agreements can be amended by following the process described in the agreement.

3.10.10 The Bureau has developed special purpose software (Enviromon) for collecting, alarming, storing, on-forwarding and display of data from Event-Reporting Radio Telemetry Systems (ERRTS) (field equipment) based on Automated Local Evaluation in Real Time (ALERT) data protocol.

3.10.11 The Bureau provides a range of supplementary services associated with Enviromon, including: installation of Enviromon software; the commissioning of an Enviromon base station or maintenance and support; and onsite Enviromon training. Software licensing and limited support for Enviromon base stations listed in Schedule 5 is currently a standard service (free of charge).

3.11 Operations

3.11.1 The Bureau will use reasonable endeavours to provide a 24 hours a day, seven

days a week operational systems capability necessary to support flood warning operations in Tasmania. This will include on-line computer and data ingestion systems, along with appropriate communications infrastructure. This will be subject to event requirements and operational constraints. The Bureau will advise its key emergency management clients of any impact in services if it is unable to provide sufficient staff coverage to meet the service levels set out in this Service Level Specification (see also 4.2).

3.11.2 The Bureau will maintain an internal catchment guide for each catchment where a warning service is provided. The catchment guide documents and describes the forecast process for the particular catchment and includes flood intelligence information, flood history, contact details for partners with local knowledge and warning issue criteria.

3.11.3 The operation of the Flood Warning service will endeavour to be compliant with the fatigue management guidelines developed under the Bureau's Work Health and Safety Procedures. Particular attention to fatigue management will be provided during the management of extreme events. The requirement to comply with these guidelines applies to all personnel present at these centres.

3.11.4 The Bureau will assist in meeting the needs of the Australian Government's National Crisis Coordination Centre. The Bureau will use reasonable endeavours to support and participate in relevant critical event briefings as resources permit.

3.12 Maintain systems to collect data and flood information

3.12.1 The Bureau will maintain the systems to ingest all data being gathered through the special purpose flood warning data network.

3.12.2 The river height and rainfall data received by the Bureau will be published as soon as practicable (the data are supplied at different frequencies and by various methods) upon receipt into Bureau operational systems. The data will be published in the form of tables, maps and plots and will also be included in warnings and alerting messages and used in modelling systems.

3.12.3 Data collected in Bureau systems will be available for use by the Bureau as it requires and for distribution to the public on suitable open source licence terms[3].

3.12.4 The Bureau will continue to collect and update the flood background information contained on its website. These include survey information, flood history and flood event reports, catchment maps and brochures.

3.13 Planning and liaison

3.13.1 The Bureau undertakes a range of routine planning, maintenance and liaison activities that support the Total Flood Warning System. This includes contributing to related flood risk management activities within the State or Territory impacting on, or related to flood warning along with the ongoing coordination and liaison activities essential to the smooth operation of the Total Flood Warning System.

[3] Please refer to the Creative Commons License:
http://www.bom.gov.au/water/regulations/dataLicensing/ccLicense.shtml

3.14 Support for emergency management training and exercises

3.14.1 The Bureau will, within operational constraints, endeavour to support and participate in relevant disaster management activities outside of flood operational periods, including training exercises and flood response planning.

4 Level of service and performance reporting

4.1 Achievable levels of service provided by the Bureau are dependent on many factors including adequate access to Bureau equipment where located on sites owned by other agencies, data availability in near real time from Bureau and partner agencies, modelling and prediction capability, geomorphology of the catchment and meteorological considerations such as rainfall patterns.

4.2 If during a flood event the achievable service level is expected to be reduced, for any reason below the target level as stated in this Service Level Specification, the Bureau will inform the key emergency management clients in Tasmania of the reduced service level via email and phone.

4.3 The Bureau's performance of service will be reviewed and reported on within the context of the Total Flood Warning System annually using a standard report performance structure based on the performance indicators and the service levels defined in Schedule 2.

4.4 The annual performance of service report will be tabled at the last Flood Warning Consultative Committee meeting of the calendar year. This report will be published on the Bureau website.

4.5 Event based performance reports with more detailed technical information may also be produced for significant and high profile events.

5 Limitations of service

5.1 Performance of services provided under this document are subject to:

(a) The availability of funds and human resources of the Bureau and its partner agencies and changes to organisational policies that may affect the terms and conditions of the Service Level Specification.

(b) Circumstances beyond the control of the Bureau including where the performance is the responsibility of another entity.

(c) The existence of a reliable and ongoing supply of quality real time rainfall, water level and flow data.

(d) The reliable and ongoing availability of the computing and communication infrastructure required for the performance of the services.

(e) Adequate communication between the Bureau and all relevant partners under this Service Level Specification and related Data Sharing Agreements and any other agreement relevant to it including on any faults or issues.

5.2 In Tasmania there are several other documents and agreements that describe the State's arrangements for flood warning and flood risk management. This Service Level Specification does not replace or reduce the value of these documents. The documents include:

(a) Tasmanian Emergency Management Plan – Issue 8 – 2015

(b) *Emergency Management Act 2006*

(c) Tasmanian Flood State Special Emergency Management Plan - Issue 1 - 2017

6 Service Level Specification consultation, review and updating

6.1 The initial and annual process for acceptance of this Service Level Specification will be:

6.1.1 The Flood Warning Consultative Committee members will be provided with the draft or amended Service Level Specification in advance of a special or scheduled committee meeting.

6.1.2 The members of the Flood Warning Consultative Committee will distribute the draft or amended Service Level Specification within their organisations and provide feedback from their organisation at the committee meeting.

6.1.3 After consultation and discussion at the Flood Warning Consultative Committee meeting, the Bureau will update the Service Level Specification.

6.1.4 The Chair of the Flood Warning Consultative Committee (Bureau's Manager Hazard Preparedness and Response South or delegate) will accept and sign the document on behalf of the committee.

6.1.5 The General Manager Decision Support Services and the General Manager Environmental Prediction Services will sign the Service Level Specification on behalf of the CEO and Director of Meteorology.

6.1.6 The Bureau will then distribute the Service Level Specification to all members of the Flood Warning Consultative Committee and publish a copy on the Bureau website.

6.2 The schedules of this Service Level Specification will be reviewed annually and either updated following review, or when a significant change is made that impacts on the level of services described in this document. Updates to this document will be recorded in Schedule 11.

6.3 Any changes to the categorisation of a location into data, information or forecast location or to the level of services described in this document will be through a consultative process using agreed arrangements in Tasmania and when required coordinated by the Flood Warning Consultative Committee.

7 Signature of parties

7.1 This Service Level Specification has been prepared by the Bureau of Meteorology in consultation with the Tasmanian Flood Warning Consultative Committee.

Approval from the relevant managers have been obtained on the dates shown below:

Simon McCulloch — Date 1/10/2020
Chair of Tasmanian Flood Warning Consultative Committee, and
Manager Hazard Preparedness and Response South
Bureau of Meteorology

Sandy Whight — Date 15/10/2020
General Manager, Decision Support Services
Bureau of Meteorology

Jeff Perkins — Date 09/10/2020
General Manager, Environmental Prediction Services
Bureau of Meteorology

Schedule 1: Flood Warning Consultative Committee

The Tasmanian Flood Warning Consultative Committee was formed in 1988. The Committee's role is to coordinate the development and operations of the State's flood forecasting and warning services. It is an advisory body and reports to the Bureau and participating State and local government agencies twice each year. The membership includes

- Bureau of Meteorology (Chair/Secretariat)
- State Emergency Services
- Tasmanian Farmers and Graziers Association
- Hydro Tasmania
- Department of Primary Industries, Parks, Water and Environment (DPIPWE)
- Launceston City Council
- Northern Midlands Council
- Huon Valley Council
- Central Coast Council
- Kentish Council
- Local Government Association of Tasmania
- TasWater

The nationally consistent Terms of Reference for Flood Warning Consultative Committees are:

1. Identify requirements and review requests for new and upgraded forecasting and warning services
2. Establish the priorities for the requirements that have been identified using risk based analyses of the Total Flood Warning System.
3. Review and provide feedback on the Service Level Specification for the Bureau's Flood Forecasting and Warning services on an annual basis
4. Coordinate the implementation of flood warning systems in accordance with appropriate standards.
5. Promote effective means of communication of flood warning information to the affected communities
6. Monitor and review the performance of flood forecasting and warning services.
7. Build awareness and promote the Total Flood Warning System concept.

Schedule 2: Forecast locations and levels of service

Column definitions:

Bureau number: Refers to the unique number assigned to a particular station by the Bureau

Forecast location: Is the specific location that will be referred to in flood warnings (refer 3.3.1)

Station owner: Refers to the owning and operating agency of the station. The Bureau may co-own stations. (refer Schedules 7 and 8)

Gauge type: Either manual (read by human) or automatic (consisting of either ALERT or telemeter gauges)

Flood classification: For definitions please refer to Appendix A.2.

Prediction type: The type of warning service that particular location can expect. (refer 3.8)

Target warning lead time: The minimum lead time that will be provided before the height or the flood class level given is exceeded (refer 3.8)

Target peak accuracy: The error within which peak river level height is predicted (refer 3.8.7)

Priority: The impact a temporary or permanent loss of a site will have on service delivery and in meeting performance targets (refer **Error! Reference source not found.**)

Bureau number	Forecast location	Station owner	Gauge type	Flood classification (m)			Prediction type	Target warning lead time		70% of peak forecasts within	Priority
				Minor	Moderate	Major		Time (hours)	Trigger height (m)		
304.1 – Derwent River											
095049	Ashton	Hydro Tasmania	Automatic	2.4	n/a	n/a	Qualitative	12	Minor	n/a	High
595006	Ouse	Bureau	Manual	4.0	5.2	5.7	Qualitative	12	Minor	n/a	High
095046	Bothwell	DPIPWE	Automatic	2.0	3.0	4.0	Qualitative	12	Minor	n/a	High
095062	Hamilton	Bureau	Manual	2.4	3.5	4.5	Qualitative	12	Minor	n/a	High
595012	Below Meadowbank	Hydro Tasmania	Automatic	4.1	6.1	7.3	Quantitative	12	>4.0	+/- 0.3 m	High
095042	Macquarie Plains	Bureau/ Derwent Valley Council	Automatic	4.0	5.0	6.7	Quantitative	24	>4.0	+/- 0.3 m	High

Bureau number	Forecast location	Station owner	Gauge type	Flood classification (m)			Prediction type	Target warning lead time		70% of peak forecasts within	Priority
				Minor	Moderate	Major		Time (hours)	Trigger height (m)		
095066	New Norfolk	Bureau / Derwent Valley Council	Automatic	2.0	4.0	6.0	Quantitative	24	>2.0	+/- 0.3 m	High
304.2 – Jordan River											
094143	Mauriceton	DPIPWE	Automatic	0.9	2.0	2.5	Quantitative	12	>2.0	+/- 0.3 m	High
306 – Huon River											
597500	Tahune Bridge	Huon Valley Council / Bureau	Automatic	4.0	n/a	n/a	Quantitative	6	>4.0	+/- 0.3 m	High
094179	Judbury	Huon Valley Council / DPIPWE / Bureau	Automatic	4.0	6.0	7.0	Quantitative	12	>4.0	+/- 0.3 m	High
094180	Huonville	Huon Valley Council / Bureau	Automatic	3.0	3.8	4.2	Quantitative	12	>3.0	+/- 0.3 m	High
315 – Forth River											
591036	Below Wilmot	Hydro Tasmania	Automatic	4.3	5.9	7.5	Quantitative	12	>4.3	+/- 0.3 m	High
316 – Mersey River											
591034	Liena	Hydro Tasmania	Automatic	2.4	n/a	n/a	Qualitative	6	Minor	n/a	High
091266	Kimberley	Bureau	Automatic	2.6	3.3	4.0	Quantitative	12	>2.6	+/- 0.3 m	High
091279	Latrobe Bridge	Bureau	Automatic	3.1*	3.6*	4.0*	Quantitative	12	> 3.1	+/- 0.3 m	High
318.1 South Esk River											
092091	Fingal	Bureau	Automatic	4.0	5.0	7.0	Quantitative	12	>4.0	+/- 0.3 m	High
092020	Lewis Hill	Bureau	Automatic	1.7	2.6	3.5	Qualitative	12	Minor	n/a	High
093044	Llewellyn	Hydro Tasmania	Automatic	4.0	5.0	8.5	Quantitative	24	>4.0	+/- 0.3 m	High
591031	Perth	DPIPWE	Automatic	4.3	7.2	8.9	Quantitative	24	>4.3	+/- 0.3 m	High
091207	Longford	Bureau	Automatic	3.5	5.0	7.0	Quantitative	24	>3.5	+/- 0.3 m	High
591037	Trevallyn Dam (AHD)	Hydro Tasmania	Automatic	128.2	129.4**	130.0**	Quantitative	24	>128.2	+/- 0.3 m	High
591037	Trevallyn Dam (Flow)	Hydro Tasmania	Automatic	420	1100**	1486**	Quantitative	24	>420	n/a	High
318.2 – Macquarie River											
092079	Tooms Lake	Bureau	Automatic	4.4	n/a	n/a	Qualitative	6	Minor	n/a	High
093052	Mt Morriston	Bureau	Automatic	1.5	2.0	3.0	Qualitative	12	Minor	n/a	High
093051	Ross	Bureau	Automatic	2.0	2.5	3.2	Quantitative	12	>2.0	+/- 0.3 m	High
092146	Lake Leake Lake Level	Bureau	Automatic	5.0	n/a	n/a	Qualitative	6	Minor	n/a	High

092146	Lake Leake Below Lake	Bureau	Automatic	0.8	2.0	2.5	Qualitative	6	Minor	n/a	High
093026	Morningside	DPIPWE	Automatic	3.5	5.5	6.5	Quantitative	12	>3.5	+/- 0.3 m	High
Bureau number	**Forecast location**	**Station owner**	**Gauge type**	**Flood classification (m)**			**Prediction type**	**Target warning lead time**		**70% of peak forecasts within**	**Priority**
				Minor	**Moderate**	**Major**		**Time (hours)**	**Trigger height (m)**		
318.2 – Macquarie River (continued)											
***591013	***Westmoor	Hydro Tasmania	Automatic	n/a	n/a	n/a	Quantitative	12	>2.0	+/- 0.3 m	High
591049	Cressy Pumps	Hydro Tasmania	Automatic	3.0	4.0	5.0	Quantitative	24	>3.0	+/- 0.3 m	High
318.3 – Meander River											
091267	Meander	Bureau	Automatic	2.0	3.0	3.5	Qualitative	6	Minor	n/a	High
091227	Deloraine	Hydro Tasmania	Automatic	2.0	2.5	3.0	Quantitative	12	>2.0	+/- 0.3 m	High
091260	Strathbridge	DPIPWE	Automatic	5.0	6.5	7.0	Quantitative	24	>5.0	+/- 0.3 m	High
091303	Westwood	Bureau	Automatic	4.0	6.0	7.0	Quantitative	24	>4.0	+/- 0.3 m	High
318.4 – North Esk River											
091271	Nunamara	Bureau	Automatic	1.5	3.0	5.0	Qualitative	12	Minor	n/a	High
091263	Corra Linn	Bureau	Automatic	2.7	3.6	4.9	Quantitative	12	>2.7	+/- 0.3 m	High

Notes:

- All levels are in meters to local gauge datum unless indicated otherwise.
- AHD - Australian Height Datum. See Geoscience Australia for further information.
- Forecasts for Trevallyn Dam will be in both height (AHD) and flow (m^3/sec).
- All flow rates are in cubic meters per second (m^3/sec) unless indicated otherwise.
- DPIPWE: Department of Primary Industries, Parks, Water and Environment.
- * Interim flood classification levels are defined for Mersey River at Latrobe Bridge, pending further investigation led by SES and Latrobe Council
- ** Interim flood classification levels and flows are defined for South Esk River at Trevallyn Dam, pending completion of remedial works on the Invermay levee
- *** Macquarie River at Westmoor station (591013) will be replaced by Macquarie River upstream Lake River (591056) station. An equivalent flood classification will be developed using data from the new station.

Schedule 3a: Information locations with flood class levels defined

Bureau number	Station name	Station owner	Gauge type	Flood classification (m)			Priority
				Minor	Moderate	Major	
304.1 – Derwent River							
595021	Styx River at Bruces Bridge	Derwent Valley Council	Automatic	2.0	n/a	n/a	Medium
304.2 – Jordan River							
093024	Jordan Rv at Lower Marshes	Bureau	Manual	0.2	0.5	1.0	Low
094001	Jordan Rv at Apsley	Bureau	Manual	0.9	2.0	2.5	Low
306 – Huon River							
597501	Huon Rv at Harrison's Opening	Huon Valley Council / Bureau	Automatic	5.0	n/a	n/a	Medium
597505	Picton Rv abv Farmhouse Ck	Huon Valley Council / Bureau	Automatic	3.0	n/a	n/a	Medium
318.1 – South Esk River							
092106	South Esk Rv at Mathinna	Bureau	Automatic	n/a	n/a	n/a	High
092009	Break O'Day Rv at Cullenswood	Bureau	Manual	2.0	3.0	3.5	Low
092117	South Esk Rv at Avoca	Bureau	Manual	4.0	5.0	8.0	Low
091326	Nile Rv at Deddington	DPIPWE	Automatic	2.5	n/a	n/a	High
091192	South Esk Rv at Symmons Plains	Bureau	Manual	3.5	4.5	5.0	Low
318.2 – Macquarie River							
093033	Elizabeth Rv at Campbell Town	Bureau	Manual	2.0	2.5	3.5	Low
093020	Isis Rv at Barton	Bureau	Automatic	1.5	2.5	n/a	Medium
593000	Parknook (Lake River)	Hydro Tasmania	Automatic	2.0	2.5	3.0	Medium
091019	Lake Rv at Connorville	Bureau	Manual	1.7	4.0	5.0	Low
318.4 – North Esk River							
591033	North Esk Rv at Ballroom	DPIPWE	Automatic	2.0	3.0	4.0	Medium

Notes:

- All levels are in meters to local gauge datum unless indicated otherwise.
- N/A indicates flood class levels not yet determined.
- All levels indicate flooding in the local reaches of the stream.
- AHD - Australian Height Datum. See Geoscience Australia for further information.
- Manual sites may not have data available in (near) real time.
- DPIPWE: Department of Primary Industries, Parks, Water and Environment

Schedule 3b: River and rainfall alert conditions

River height alerting stations

Basin	Station name	Criteria	Priority
Mersey	Liena	2.4 m	High
Meander	Meander	1.8m	High
North Esk	Corra Linn	2.7 m	High
South Esk	Mathinna	0.8 m, 1.2 m	High
South Esk	Fingal	2.7 m, 3.5 m, 4.0 m, 5.0 m	High
St. Pauls	Lewis Hill	0.9 m	High
South Esk	Llewellyn	2.7 m, 5.0 m	High
Nile	Deddington	2.0m	High
Macquarie	Mt. Morriston	1.2 m, 2.0 m	High
Elizabeth	Below Lake Leake	0.8 m, 2.0 m	High
Macquarie	Morningside	2.0 m, 5.5 m	High
Isis	Barton	1.1 m	Medium
Lake	Parknook	2.0 m	Medium
Macquarie	Cressy Pumps	2.5 m	High
Ouse	Ashton	2.0 m	High
Clyde	Bothwell	0.9 m	High
Clyde	Hamilton	2.4 m	High
Derwent	Below Meadowbank Dam	4.1 m	High
Derwent	Macquarie Plains	4.0 m	High
Jordan	Apsley	0.9 m	Low
Jordan	Mauriceton	0.9 m	High
Huon	Harrisons Opening	5.0 m	Medium
Huon	Judbury	3.0 m	High
Huon	Huonville	2.5m	High

Notes:

- All levels are in meters to local gauge datum unless indicated otherwise.

Rainfall alerting stations

Basin	Station name	Criteria	Priority
South Esk	Gray	25 mm in 24 hours	High
Macquarie	Tooms Lake	25 mm in 24 hours	High
Macquarie	Lake Leake	25 mm in 24 hours	High
Macquarie	Hummocky Hills	25 mm in 24 hours	High
Macquarie	Interlaken	25 mm in 24 hours	High
South Esk	Mt Victoria	25 mm in 24 hours	High
Huon	Cannells Hill	25 mm in 24 hours	High
Macquarie	The Den	25 mm in 24 hours	High
Macquarie	Verwood	25 mm in 24 hours	Medium
North Esk	Mt Barrow	25 mm in 24 hours	High
Forth	Cradle Valley	25 mm in 24 hours	High

Schedule 4: River data locations

Bureau number	Station name	Owner	Gauge type	Priority
302 – East Coast				
592006	U/S SCAMANDER WATER (SCAMANDER)	DPIPWE	AUTOMATIC	Low
592007	U/S TASMAN HIGHWAY (DOUGLAS RIVER)	DPIPWE	AUTOMATIC	Low
592021	SWAN RIVER AT THE GRANGE	DPIPWE	AUTOMATIC	Low
592023	SWAN RIVER UPSTREAM HARDINGS FALLS	DPIPWE	AUTOMATIC	Low
593001	ST HELENS INTAKE (GEORGE RIVER)	DPIPWE	AUTOMATIC	Low
592020	MEREDITH RIVER AT SWANSEA	Hydro Tasmania	AUTOMATIC	Low
303 – Coal River				
094182	CRAIGBOURNE DAM (COAL RIVER)	DPIPWE	AUTOMATIC	Medium
094183	RICHMOND (COAL RIVER)	DPIPWE	AUTOMATIC	Medium
594018	COAL RIVER JUNCTION (WHITE KAN)	DPIPWE	AUTOMATIC	Low
304.1 – Derwent River				
095040	MEADOWBANK HEC	Hydro Tasmania	AUTOMATIC	Medium
096070	HERMITAGE (SHANNON RIVER)	Hydro Tasmania	AUTOMATIC	Medium
591040	DEE RV (ABV DERWENT RV)	Hydro Tasmania	AUTOMATIC	Medium
594004	CASCADE GARDENS	Hobart City Council	AUTOMATIC	Low
594005	GORE STREET	Hobart City Council	AUTOMATIC	Low
594012	PARLIAMENT STREET	Hobart City Council	AUTOMATIC	Low
594013	NEWTOWN HIGH SCHOOL	Glenorchy City Council	AUTOMATIC	Low
595009	NIVE RIVER (TUNGATINAH)	Hydro Tasmania	AUTOMATIC	High
595011	BELOW DEE (DERWENT RIVER)	Hydro Tasmania	AUTOMATIC	High
595013	NEWBURY (TYENNA RV)	DPIPWE	AUTOMATIC	Medium
595015	FLORENTINE RV (ABV DERWENT RV)	Hydro Tasmania	AUTOMATIC	Medium
595018	ABV NEW NORFOLK BRIDGE	DPIPWE	AUTOMATIC	Medium
595025	FEILTON (PLENTY RIVER)	Derwent Valley Council	AUTOMATIC	Medium
595028	FLORENTINE RIVER AT ELEVEN ROAD	Hydro Tasmania	AUTOMATIC	Low
595029	OUSE RIVER AT 3B WEIR	Hydro Tasmania	AUTOMATIC	High
596012	PINE TREE RIVULET (LAKE HWAY)	Hydro Tasmania	AUTOMATIC	Low
596050	LAKE AUGUSTA AT INTAKE	Hydro Tasmania	AUTOMATIC	High
596051	LIAWENEE CANAL (OUSE RIVER)	Hydro Tasmania	AUTOMATIC	Low
596055	BLW LAKE ST CLAIR (DERWENT RV)	Hydro Tasmania	AUTOMATIC	Low
596058	MONPEELYATA WEIR (OUSE RV)	Hydro Tasmania	AUTOMATIC	Low
596060	OUSE RIVER (BLW LIAWENEE CANAL	Hydro Tasmania	AUTOMATIC	Medium
596061	SHANNON RV (ST PATRICKS PLAINS)	Hydro Tasmania	AUTOMATIC	Low
596063	BELOW PUMP INTAKE (DERWENT RV)	Hydro Tasmania	AUTOMATIC	Low
596068	D/S LAKE CRESCENT (CLYDE RIVER)	DPIPWE	AUTOMATIC	Low
596075	St.CLAIR LAKE AT DAM	Hydro Tasmania	AUTOMATIC	Low
596074	KING WILLIAM LAKE AT DAM	Hydro Tasmania	AUTOMATIC	Medium
595014	DERWENT RV (ABV NIVE RV)	Hydro Tasmania	AUTOMATIC	High
596080	LITTLE PINE LAGOON AT DAM	Hydro Tasmania	AUTOMATIC	Low
596062	PINE TIER DAM	Hydro Tasmania	AUTOMATIC	Medium
TBA	CLARENCE RIVER AT WEIR	Hydro Tasmania	AUTOMATIC	Low
596084	LIAPOOTAH POND AT DAM	Hydro Tasmania	AUTOMATIC	Low
595031	WAYATINAH LAGOON AT INTAKE	Hydro Tasmania	AUTOMATIC	Low
595033	CATAGUNYA LAKE AT DAM	Hydro Tasmania	AUTOMATIC	Low
595032	REPULSE LAKE AT DAM	Hydro Tasmania	AUTOMATIC	Low
595017	CLUNY LAGOON DAM (DERWENT RV)	Hydro Tasmania	AUTOMATIC	Low
596077	ECHO LAKE AT DAM	Hydro Tasmania	AUTOMATIC	Medium
306 – Huon River				
594019	MOUNTAIN RIVER 600M UPSTREAM HUON RIVER	DPIPWE	AUTOMATIC	Low

Bureau number	Station name	Owner	Gauge type	Priority
310 – Pieman River				
597049	PIEMAN RIVER BELOW STRINGERS CREEK	Hydro Tasmania	AUTOMATIC	Low
312 – Arthur River				
597048	HELLYER RIVER AT GUILDFORD	Hydro Tasmania	AUTOMATIC	Low
314 – Smithton – Burnie Coast				
591035	SCOTCHTOWN (DUCK RIVER)	DPIPWE	AUTOMATIC	Low
315 – Forth River				
591017	LAKE CETHANA DAM	Hydro Tasmania	AUTOMATIC	Low
591041	LAKE BARRINGTON DAM	Hydro Tasmania	AUTOMATIC	Low
591042	WILMOT RV (ABV FORTH RV)	Hydro Tasmania	AUTOMATIC	High
591044	LAKE PALOONA DAM (FORTH RV)	Hydro Tasmania	AUTOMATIC	High
591046	LAKE GAIRDNER DAM	Hydro Tasmania	AUTOMATIC	Medium
591051	MIDDLESEX PLAIN (IRIS RV)	Hydro Tasmania	AUTOMATIC	Low
596057	FORTH RV (ABV LEMONTHYME PS)	Hydro Tasmania	AUTOMATIC	Medium
316 – Mersey River				
591032	SHALE ROAD (MERSEY RIVER)	DPIPWE	AUTOMATIC	Medium
596035	MERSEY RIVER (ABOVE ARM)	Hydro Tasmania	AUTOMATIC	Low
596037	PARANGANA DAM	Hydro Tasmania	AUTOMATIC	High
596042	ROWALLAN DAM	Hydro Tasmania	AUTOMATIC	Medium
596056	ABV MERSEY RIVER (ARM RIVER)	Hydro Tasmania	AUTOMATIC	Low
596070	FISHER RIVER ABOVE LAKE MACKENZIE	Hydro Tasmania	AUTOMATIC	Low
318.1 – South Esk River				
592002	KILLYMOON (BREAK O'DAY RIVER)	DPIPWE	AUTOMATIC	High
592003	ABOVE AVOCA (ST. PAULS RIVER)	DPIPWE	AUTOMATIC	Medium
592019	UPPER ESK BRIDGE (SOUTH ESK RIVER)	DPIPWE	AUTOMATIC	Low
318.2 – Macquarie River				
093059	FOSTERVILLE	DPIPWE	AUTOMATIC	High
596081	ARTHURS LAKE AT PUMP STATION	Hydro Tasmania	AUTOMATIC	Low
591039	BRUMBYS CK (NO 3 WEIR)	Hydro Tasmania	AUTOMATIC	Medium
591045	BELOW PALMERS RT (BRUMBYS CK)	Hydro Tasmania	AUTOMATIC	Low
591048	U/S WILMORES LANE (BACK CREEK)	DPIPWE	AUTOMATIC	Low
591055	LAKE RIVER AT LAKE HOUSE	Hydro Tasmania	AUTOMATIC	Low
591056	U/S LAKE RIVER	DPIPWE	AUTOMATIC	Low
592008	D/S TOOMS LAKE (TOOMS RIVER)	DPIPWE	AUTOMATIC	Medium
592009	D/S LAKE LEAKE (ELIZABETH RIVER)	DPIPWE	AUTOMATIC	Medium
593003	TREFUSIS	DPIPWE	AUTOMATIC	Medium
596043	WOODS LAKE	Hydro Tasmania	AUTOMATIC	Low
318.3 – Meander River				
591047	U/S WEST CHANNEL (LIFFEY RIVER)	DPIPWE	AUTOMATIC	Low
591052	CARRICK (LIFFEY RIVER)	DPIPWE	AUTOMATIC	Low
318.4 – North Esk River				
591064	NORTH ESK RIVER AT JOHNSTON RD PIPELINE BRIDGE	Launceston City Council	AUTOMATIC	Low
591065	NORTH ESK RIVER AT HENRY ST BRIDGE	Launceston City Council	AUTOMATIC	Low
591063	NORTH ESK AT HOBLERS BRIDGE	Launceston City Council	AUTOMATIC	Low
591066	NORTH ESK RIVER AT TAMAR ST BRIDGE	Launceston City Council	AUTOMATIC	Low
319 – Piper-Ringarooma River				
591054	RINGAROOMA RIVER UPSTREAM BRANXHOLM WATER SUPPLY	DPIPWE	AUTOMATIC	Low
592005	MOORINA BDGE (RINGAROOMA RIVER)	DPIPWE	AUTOMATIC	Low
591053	LEGERWOOD RIVULET D/S RINGAROOMA	Hydro Tasmania	AUTOMATIC	Low

Notes:

- Data from manual stations are not available in (near) real time.
- DPIPWE: Department of Primary Industries, Parks, Water and Environment.

Schedule 5: Enviromon base stations installed in Tasmania

Owner	City/town	License number	Number of users	Date of registration	License version
Bureau	Hobart	61040001	10	6/10/2004	3
	Hobart	61040002	10	6/10/2004	3
	Hobart	61040003	3	6/10/2004	3
	Hobart	61040007	10	12/11/2008	3
	Hobart	61040008	1	27/11/2009	3
Glenorchy City Council – Roads and Recreation	Glenorchy	61040004	3	8/12/2004	3
Hobart City Council – Hydraulic Engineering Unit	Hobart	61040005	3	8/12/2004	3
Launceston City Council - Infrastructure	Launceston	61040006	3	13/12/2004	3

Schedule 6: List of Data Sharing Agreements for data provision

A Data Sharing Agreement for data provision has been set up or is in development for the following agencies.

Agency	Status	Current Version	Number of sites
Hydro Tasmania	Complete	Signed December 2017	105
Department of Primary Industries, Parks, Water and Environment (DPIPWE)	Complete	Signed October 2016	50
CSIRO	On hold	TBA	10
Tasmanian Irrigation	In progress	TBA	TBA

Schedule 7: List of sites owned and maintained by the Bureau

Bureau number	Station name	Gauge type	Data type	Priority
302 - East Coast				
092149	GRINDSTONE	AUTOMATIC	RAINFALL	High - SREP
092150	MOUNT MURRAY	AUTOMATIC	REPEATER	High - SREP
092152	BUCKLAND (FIRE STATION)	AUTOMATIC	BASE STATION	Critical - SREP
094253	MOUNT HOBBS	AUTOMATIC	REPEATER	High - SREP
092154	LITTLE SWANPORT (LISDILLON FARM)	AUTOMATIC	RAINFALL	High - SREP
092155	BUCKLAND (BROCKLEY ROAD)	AUTOMATIC	RAINFALL	High - SREP
092157	TRIABUNNA (SALMONS FLATS)	AUTOMATIC	RAINFALL	High - SREP
092158	NUGENT (TWILIGHT VALLEY TBRG)	AUTOMATIC	RAINFALL	High - SREP
094257	CLIFTON BEACH ROAD	AUTOMATIC	RAINFALL	High - SREP
304.1 – Derwent River				
095042	MACQUARIE PLAINS (DERWENT RIVER)	AUTOMATIC	RIVER	High
095062	HAMILTON	MANUAL	RIVER	High
095066	NEW NORFOLK (DERWENT RIVER)	AUTOMATIC	RIVER	High
095082	ABBOTTS LOOKOUT (EAGLES EYRIE)	AUTOMATIC	BASE STATION	Critical - High
595006	OUSE RIVER	MANUAL	RIVER	High
596049	INTERLAKEN	AUTOMATIC	RAINFALL	High
304.2 – Jordan River				
093024	LOWER MARSHES (JORDAN RIVER)	MANUAL	RIVER	Low
094001	APSLEY (PARKI)	MANUAL	RIVER	Low
094204	TEA TREE POINT	AUTOMATIC	RAINFALL	High
306 – Huon River				
094179	JUDBURY	AUTOMATIC	RAINFALL	Medium
094180	HUONVILLE (HUON RIVER)	AUTOMATIC	RIVER	High
097024	WARRA	AUTOMATIC	BASE STATION	Critical - High
316 – Mersey River				
091168	GOWRIE PARK	AUTOMATIC	RAINFALL	High
091266	KIMBERLEY (MERSEY RIVER)	AUTOMATIC	RIVER	High
091266	KIMBERLEY (MERSEY RIVER)	AUTOMATIC	RAINFALL	High
091279	LATROBE BRIDGE (MERSEY RIVER)	AUTOMATIC	RIVER	High
318.1 – South Esk River				
091184	MOUNT VICTORIA (UNA PLAIN)	AUTOMATIC	RAINFALL	High
091207	LONGFORD (SOUTH ESK RIVER)	AUTOMATIC	RIVER	High
092009	ST MARYS (CULLENSWOOD)	MANUAL	RIVER	Low
092020	LEWIS HILL (ST. PAULS RIVER)	AUTOMATIC	RIVER	High
092020	LEWIS HILL (ST. PAULS RIVER)	AUTOMATIC	RAINFALL	High
092091	FINGAL (SOUTH ESK RIVER)	AUTOMATIC	RIVER	High
092106	MATHINNA (SOUTH ESK RIVER)	AUTOMATIC	RIVER	High
092106	MATHINNA (SOUTH ESK RIVER)	AUTOMATIC	RAINFALL	Medium
092111	UPPER ESK (SOUTH ESK RIVER)	AUTOMATIC	RAINFALL	Medium
092141	GRAY (DALMAYNE RD)	AUTOMATIC	RAINFALL	High
092144	MONAMETA (MATHINNA ROAD)	AUTOMATIC	RAINFALL	Medium
260099	TOWER HILL	AUTOMATIC	REPEATER	Critical - High
318.2 – Macquarie River				
091325	HUMMOCKY HILLS	AUTOMATIC	RAINFALL	High
092079	TOOMS LAKE (TOOMS RIVER)	AUTOMATIC	RIVER	High
092079	TOOMS LAKE (TOOMS RIVER)	AUTOMATIC	RAINFALL	Medium
092146	LAKE LEAKE (FWS) LAKE LEVEL	AUTOMATIC	RIVER	High
092146	LAKE LEAKE (FWS)	AUTOMATIC	RAINFALL	High
092146	LAKE LEAKE (FWS) BELOW LAKE	AUTOMATIC	RIVER	High
093020	BARTON (ISIS RIVER)	AUTOMATIC	RIVER	Medium
093033	CAMPBELL TOWN (ELIZABETH RIVER)	MANUAL	RIVER	Low
093046	BIRRALEE CREEK	AUTOMATIC	RAINFALL	Medium
093049	MOUNT SEYMOUR	AUTOMATIC	RAINFALL	High
093051	ROSS (MACQUARIE RIVER)	AUTOMATIC	RAINFALL	High
093051	ROSS (MACQUARIE RIVER)	AUTOMATIC	RIVER	High
093052	MT MORRISTON (MACQUARIE RIVER)	AUTOMATIC	RAINFALL	Medium

Bureau number	Station name	Gauge type	Data type	Priority
318.2 – Macquarie River (continued)				
093052	MT MORRISTON (MACQUARIE RIVER)	AUTOMATIC	RIVER	High
096038	VERWOOD	AUTOMATIC	RAINFALL	High
096082	FROG HILL	AUTOMATIC	REPEATER	Critical - High
096083	THE DEN	AUTOMATIC	RAINFALL	High
260092	MOANERS TIER	AUTOMATIC	REPEATER	High
260100	RATHARNEY	AUTOMATIC	REPEATER	High
318.3 – Meander River				
091267	MEANDER (MEANDER RIVER)	AUTOMATIC	RIVER	High
091267	MEANDER (MEANDER RIVER)	AUTOMATIC	RAINFALL	High
091303	WESTWOOD BRIDGE (MEANDER RIVER)	AUTOMATIC	RIVER	High
091303	WESTWOOD BRIDGE (MEANDER RIVER)	AUTOMATIC	RAINFALL	Medium
318.4 – North Esk River				
091198	MT BARROW	AUTOMATIC	RAINFALL	High
091263	CORRA LINN (NORTH ESK RIVER)	AUTOMATIC	RIVER	High
091263	CORRA LINN (NORTH ESK RIVER)	AUTOMATIC	RAINFALL	Medium
091271	NUNAMARA (ST PATRICKS RIVER)	AUTOMATIC	RIVER	High
091271	NUNAMARA (ST PATRICKS RIVER)	AUTOMATIC	RAINFALL	High
091338	MOUNT ARTHUR SUMMIT	AUTOMATIC	RAINFALL	High
091338	MOUNT ARTHUR SUMMIT	AUTOMATIC	REPEATER	Critical - High
092109	UPPER BLESSINGTON	AUTOMATIC	RAINFALL	High
260097	LAUNCESTON AIRPORT	AUTOMATIC	BASE STATION	Critical - High

Notes:

- Does not include daily rainfall, automatic weather stations and other Bureau synoptic stations.

Schedule 8: List of sites where the Bureau assists other agencies with maintenance

Bureau number	Station name	Owner	Gauge type	Data type	Priority
304.1 – Derwent River					
595021	BRUCES BRIDGE (STYX RIVER)	Derwent Valley Council	AUTOMATIC	RIVER	Medium
595022	MURTS HILL (MOOGARA)	Derwent Valley Council	AUTOMATIC	RAINFALL	Medium
595023	NATIONAL PARK (WEIR ROAD)	Derwent Valley Council	AUTOMATIC	RAINFALL	High
595024	STYX (WATERFALL CREEK ROAD)	Derwent Valley Council	AUTOMATIC	AWS	Medium
595025	FEILTON (PLENTY RIVER)	Derwent Valley Council	AUTOMATIC	RIVER	Medium
595026	MOUNT LLOYD ROAD	Derwent Valley Council	AUTOMATIC	RAINFALL	Medium
595027	MOUNT BELMONT	Derwent Valley Council	AUTOMATIC	RAINFALL	Medium
306 – Huon River					
094180	HUONVILLE (HUON RIVER)	Bureau / Huon Valley Council	AUTOMATIC	RIVER	High
594017	CANNELLS HILL	Huon Valley Council	AUTOMATIC	RAINFALL	High
595500	MUELLER RIDGE (LAKE GORDON)	Huon Valley Council	AUTOMATIC	AWS	Medium
597046	UPPER RUSSELL	Huon Valley Council	AUTOMATIC	AWS	Medium
597046	UPPER RUSSELL	Huon Valley Council	AUTOMATIC	REPEATER	High
597500	TAHUNE BRIDGE (HUON RIVER)	Huon Valley Council	AUTOMATIC	RIVER	High
597501	HARRISONS OPENING (HUON RIVER)	Huon Valley Council	AUTOMATIC	RIVER	Medium
597502	FOOLS RIDGE (MT PICTON)	Huon Valley Council	AUTOMATIC	RAINFALL	Medium
597502	FOOLS RIDGE (MT PICTON)	Huon Valley Council	AUTOMATIC	REPEATER	High
597503	MT FREDERICK	Huon Valley Council	AUTOMATIC	REPEATER	High
597504	RAZORBACK (MCKAYS TRACK)	Huon Valley Council	AUTOMATIC	AWS	High
597505	ABV FARMHOUSE CK (PICTON RIVER)	Huon Valley Council	AUTOMATIC	RIVER	Medium
597506	NORTH BOOMERANG (MT BOBS)	Huon Valley Council	AUTOMATIC	RAINFALL	Medium

Notes:

- Does not include daily rainfall and other Bureau synoptic stations.
- AWS: Automatic Weather Stations

Schedule 9: List of sites where the Bureau co-locates equipment and the site is owned by another agency

Bureau number	Station name	Owner	Gauge type	Data type	Priority
318.1 – South Esk River					
091326	DEDDINGTON (NILE RIVER)	DPIPWE	AUTOMATIC	RAINFALL	High
091326	DEDDINGTON (NILE RIVER)	DPIPWE	AUTOMATIC	RIVER	High
591031	SOUTH ESK RIVER ABOVE MACQUARIE RIVER (PERTH)	DPIPWE	AUTOMATIC	RIVER	High
306 – Huon River					
94179	JUDBURY	DPIPWE	AUTOMATIC	RIVER	High
094179	JUDBURY	DPIPWE	AUTOMATIC	RAINFALL	High

Notes:

- Does not include daily rainfall, automatic weather stations and other Bureau synoptic stations.
- DPIPWE: Department of Primary Industries, Parks, Water and Environment

Schedule 10: List of flood warning related products issued by the Bureau in Tasmania (warnings, watches, bulletins, river alerts)

Flood warnings

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT20611	South Esk River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.
IDT20610	North Esk River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.
IDT20612	Macquarie River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.
IDT20609	Meander River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT20605	Mersey River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.
IDT20604	Forth River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.
IDT20616	Huon River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.
IDT20613	Derwent River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT20614	Jordan River	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded at forecast locations.	Minor: Minimum once a day. Re-issues when significant changes occur. Moderate and major: Minimum twice a day. More frequent updates every 3 to 6 hours during the developing stages of a flood. Re-issues when significant changes occur. Less frequent updates apply when the situation is stable.	When river levels for all forecast locations are below the moderate flood level and falling, with no further significant rainfall or river level rises expected.
IDT20615	Coal River	Generalised Warning to be issued in potential or actual developing flood situations.	Minimum once a day. Re-issues when significant changes occur.	When no further significant rainfall or river level rises expected.

Note:

- Examples of when it may be appropriate to issue flood warnings at the minimum update frequency include: 1) before the start of the rainfall and flooding, when flood warnings are based entirely on forecast rainfall, 2) during the recession, when river levels are falling and no further significant rainfall or river rises are expected.

Flood watches

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT20625	Flood watch 1 (TAS)	To be issued when flood impacts are possible in one or more catchments/areas covered by Flood Watch service	Minimum once a day. Re-issues when significant changes occur.	Once either the risk of flooding has passed, or Flood Warning products have been issued for all catchments/areas covered by the Flood Watch.
IDT20630	Flood Watch 2 (TAS)	To be issued when flood impacts are possible in one or more catchments/areas covered by Flood Watch service	Minimum once a day. Re-issues when significant changes occur.	Once either the risk of flooding has passed, or Flood Warning products have been issued for all catchments/areas covered by the Flood Watch.

Note:

- Flood watch title (Flood Watch 1/Flood Watch 2) will be adjusted to reflect the catchments or areas at risk of flooding by the particular weather event in question
- Areas covered by Flood Watch service in Tasmania are available at: http://www.bom.gov.au/water/floods/image/BOM_Flood_Watch_Areas_map_Tasmania_2017.pdf?=v3

River alerts

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT10630	River alert – Bothwell at 0.9 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10631	River alert – Hamilton at 2.4 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10632	River alert – Macquarie Plains at 4.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10633	River alert – Below Meadowbank Dam at 4.1 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10634	River alert – Below Lake Leake at 0.8 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10635	River alert – Below Lake Leake at 2.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10637	River alert – Judbury at 3.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10638	River alert – Barton at 1.1 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10639	River alert – Apsley at 0.9 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10640	River alert – Mauriceton at 0.9m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10641	River alert – Parknook at 2.0m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10642	River alert – Cressy Pumps at 2.5 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT10643	River alert – Morningside at 2.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10644	River alert – Morningside at 5.5 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10645	River alert – Mt Morriston at 1.2 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10646	River alert – Mt Morriston at 2.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10647	River alert – Meander at 1.8 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10648	River alert – Liena at 2.4 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10649	River alert – Ashton at 2.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10651	River alert – Fingal at 2.7 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10652	River alert – Fingal at 3.5 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10653	River alert – Fingal at 4.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10654	River alert – Fingal at 5.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10655	River alert – Llewellyn at 2.7 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT10656	River alert – Llewellyn at 5.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10657	River alert – Mathinna at 0.8 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10658	River alert – Mathinna at 1.2 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10659	River alert – Lewis Hill at 0.9 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10667	River alert – Deddington at 2.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10669	River alert – Huonville at 2.5 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10671	River alert – Corra Linn at 2.7 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.
IDT10673	River alert – Harrisons Opening at 5.0 m	To be issued when water level at station has exceeded the indicated threshold.	Every 24 hours. Re-issued if river level is still exceeding alert level.	After 24 hours, if river level is below alert level.

River (rainfall) alerts

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT10661	River alert – Gray at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Every 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hours, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10662	River alert – Interlaken at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Every 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hours, if total rainfall accumulated in the previous 24-hours is lower than alert level.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT10663	River alert – Lake Leake at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Every 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hours, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10664	River Alert – Tooms Lake at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10666	River Alert – Hummocky Hills at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10674	River Alert – Mt Victoria at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10675	River Alert – Cannells Hill at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10676	River Alert – The Den at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10670	River Alert – Verwood at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10677	River Alert – Mt Barrow at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.
IDT10668	River Alert – Cradle Valley at 25 mm	To be issued when total rainfall accumulated in the previous 24-hours at the station has exceeded the indicated threshold.	Each 24 hours. Re-issued if total rainfall accumulated in the previous 24-hours is still exceeding alert level.	After 24 hrs, if total rainfall accumulated in the previous 24-hours is lower than alert level.

River and rainfall bulletins

Product ID	Product name	Initiating criteria	Updated	Finalising
IDT60150	Latest river heights for the North Western Rivers	None	Every 30-minutes	Never
IDT60151	Latest river heights for the Northern Rivers	None	Every 30-minutes	Never
IDT60152	Latest river heights for the Southern Rivers	None	Every 30-minutes	Never
IDT60171	One hourly rainfall bulletin for North Western Rivers	None	Hourly	Never
IDT60172	One hourly rainfall bulletin for Northern Rivers	None	Hourly	Never
IDT60173	One hourly rainfall bulletin for Southern Rivers	None	Hourly	Never
IDT60174	Three hourly rainfall bulletin for North Western Rivers	None	Every three hours	Never
IDT60175	Three hourly rainfall bulletin for Northern Rivers	None	Every three hours	Never
IDT60176	Three hourly rainfall bulletin for Southern Rivers	None	Every three hours	Never
IDT60177	Daily rainfall bulletin for North Western Rivers	None	Hourly	Never
IDT60178	Daily rainfall bulletin for Northern Rivers	None	Hourly	Never
IDT60179	Daily rainfall Bulletin for Southern Rivers	None	Hourly	Never

Schedule 11: List of changes to this Service Level Specification

Version	Date	Name	Update
1.0	10/10/2013	Nicole Pana	SLS 2013 version signed
1.1	19/11/13	Nicole Pana	Changes to schedule 10 – River (Rainfall) alerts added
1.2	21/01/14	Nicole Pana	Changes to schedule 3 – Station added
2.0	March 2015	Nicole Pana	Additional sentence to clause 1.6 highlighting supplementary services
			Addition of priorities to stations in schedules 2-4 and 7-9. This is defined in clause 3.3.2 and Table 1 which are also new additions.
			Quantitative and Qualitative clauses better described (3.8.3 and 3.8.4)
	July 2015	Charlotte Hart	Changes throughout schedules to account for station updates
	August 2015	Carlos Velasco	Minor amendments after consultation of draft version with FWCC members Changes to Schedule 2 to indicate the future replacement of Macquarie River above Westmoor station (591013) by Macquarie River upstream Lake River (591056) station during 2015-2016 FY.
3.1	June 2018	Nicole Pana Ann Conroy	Clause 3.2 - minor wording change to opening sentence and one of the dot points.
			Clause 3.7.1 - change of wording from 'likely' to 'possible' at end of first sentence.
			Clause 3.9.3.4 - new paragraph on use of social media for communicating flood watches and warnings.
			Clause 3.10.1 - deleted 'then' from second sentence.
			Clause 3.10.11 - minor wording change to second sentence.
			Clause 3.12 – minor wording change to title.
			Clause 3.12.4 - minor wording change to first sentence.
			Clause 4.3 – minor wording change
			Clause 4.4 – minor wording change
			Clause 5.2 – updated issue/year; added Tasmanian Flood State Special Emergency Management Plan
			Clause 7 – updated title blocks of signatories
			Schedule 1 – added TasWater to FWCC membership list
			Schedule 2 Mersey River: • Latrobe Bridge FCL changed – new (3.1, 3.6, 4.0), previous (3.9, n/a, n/a) South Esk River: • Travellyn Dam AHD FCL changed – new (128.2, 129.4, 130.0), previous (128.2, 130.0, 130.8) • Travellyn Dam flow FCL changed – new (420, 110, 1486), previous (420, 1500, 2000) Notes - updated
			Schedule 6 Updated with the current versions of DSAs.
			Schedule 10 Flood Warnings

<table>
<tr><td></td><td></td><td></td><td>

- Amendments to updates and frequency of issuing flood warnings as presented and endorsed at TAS FWCC meeting in May 2018.

Flood Watches

- Updated table to include 2 flood watch products Flood watch 1 and Flood Watch 2 (IDT20625 and IDT20630).
- Amendments to initiating criteria, update time and finalising.

Added explanatory note for Flood Watch and a link to flood watch areas map on the Bureau's website.
</td></tr>
<tr><td rowspan="3">3.2</td><td rowspan="3">August 2020</td><td rowspan="3">Karen Hudson
Ann Conroy</td><td>Clauses 6.1.4 and 6.1.5 updated to reflect the new Chair of the Flood Warning Consultative Committee under the Bureau's amended structure and also the new signatories who sign off on the document on behalf of the FWCC and the CEO and Director of Meteorology.</td></tr>
<tr><td>Schedule 2
Macquarie River:
• Westmoor minor FCL (2.0 m) removed – new FCLs under review.</td></tr>
<tr><td>Schedule 3a
Huon River:
• Harrison's Opening minor FCL raised from 3.0 m to 5.0 m.</td></tr>
</table>

Appendix A: Glossary of terms

A.1. General

Bureau Flood Warning Centre: an operational area set aside in each capital city to fulfil the Bureau's role in the Total Flood Warning System specifically flood forecasting and warning.

Bureau National Operations Centre: The principal role of the National Operations Centre is to augment regional flood forecasting teams during major floods and to provide operational system support. The National Operations Centre is also responsible for leading new initiatives to enhance the quality of operations and services.

Catchment Directive: A catchment directive provides guidance specific to a catchment to help develop forecasting and warning products.

Flood warning: A written product to provide advice on impending flooding so people can take action to minimise its negative impact. This will involve some people taking action on their own behalf and others doing so as part of agency responsibilities.

Flood watch: A written product that alerts when the combination of forecast rainfall and catchment conditions indicates the flooding is likely.

National Crisis Coordination Centre: The Australian Government Crisis Coordination Centre has been designed to connect relevant Australian Government, State and Territory agencies to centralise Australian Government actions during complex national crises, to develop a single, timely and consistent picture or understanding of a crisis, its implications and the national capacity to respond.

National Flood Warning Arrangements: The National Arrangements outline the general roles and responsibilities of each level of Government in providing and supporting an effective flood warning service and includes separate chapters describing the specific arrangements and agency roles that apply in each jurisdiction.

Protective behaviour: generating appropriate and timely actions and behaviours from the agencies involved and from the threatened community.

Severe Thunderstorm: A thunderstorm is characterised by sudden electrical discharges, each manifested by a flash of light (lightning) and a sharp rumbling sound. Thunderstorms are associated with convective clouds (cumulonimbus) and are usually accompanied by precipitation. Thunderstorms are often short-lived and impact on only a small area. Severe thunderstorms may last for an hour or more and can have a more widespread impact.

A severe thunderstorm will also have one or more of the following phenomena:

- Tornado
- Wind gust of 90 km/h (49 knots) or more
- Hailstones with diameter of 2 cm or larger
- Very heavy rain sufficient to cause flash flooding

Weather warnings: Weather warnings are messages sent out by the Bureau to warn the community of potentially hazardous or dangerous weather conditions. Such warnings include but are not limited to: road weather alerts, severe thunderstorm warnings, severe weather warnings for heavy rain, strong or gale force winds, marine wind warnings, warnings for sheep graziers and frost warnings. More information on weather terms is given in the Bureau's glossary.

A.2 The components of the Total Flood Warning System

Based on the Manual 21 Australian Emergency Manual Series, Australian Government 2009 (see the Manual for more details).

Communication: disseminating warning information in a timely fashion to people and organisations likely to be affected by the flood (see Chapter 6).

Interpretation: identifying in advance the impacts of the predicted flood levels on communities at risk (see Chapter 4).

Message construction: devising the content of the message which will warn people of impending flooding (see Chapter 5).

Monitoring and prediction: detecting environmental conditions that lead to flooding, and predicting river levels during the flood (see Chapter 3),

Review: examining the various aspects of the system with a view to improving its performance (see Chapter 7).

A.3 Flood classifications

The classification of minor, moderate and major flood levels at key river height stations is based upon the effect of flooding for some distance upstream and downstream of that station. These levels are determined using the following descriptive categories of flooding, historical data or relevant local information.

The process for establishing flood class levels involves determining local flood effects, review and endorsement by relevant stakeholders and passing recommendations to the Bureau for inclusion in forecast and warning procedures. The process for establishment of flood class levels specific to each State and Territory is documented in the National Arrangements.

- Minor flooding - Causes inconvenience. Low-lying areas next to watercourses are inundated. Minor roads may be closed and low-level bridges submerged. In urban areas inundation may affect some backyards and buildings below the floor level as well as bicycle and pedestrian paths. In rural areas removal of stock and equipment may be required.

- Moderate flooding - In addition to the above, the area of inundation is more substantial. Main traffic routes may be affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be required. In rural areas removal of stock is required.

- Major flooding - In addition to the above, extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated and major rail and traffic routes closed. Evacuation of flood affected areas may be required. Utility services may be impacted.

Appendix B: References

1. Emergency Management Australia 2009, *Flood Warning Manual,* Series 21.

2. Bureau of Meteorology 2013, *National Flood Warning Arrangements*

3. Bureau of Meteorology 2013, *National Flood Directive* (unpublished - internal use)

4. Bureau of Meteorology 2013, *Catchment Flood Directives* (unpublished - internal use)

5. Data Sharing Agreements