NSW GOVERNMENT

Manly Hydraulics Laboratory

BRUNSWICK, WILSONS AND RICHMOND RIVERS FLOOD SUMMARY

March/April 2022

Report MHL2895
August 2022

Prepared for:

NSW GOVERNMENT Planning and Environment

Biodiversity and Conservation Division

Additional data provided by:

Australian Government Bureau of Meteorology

ballina shire council

Byron Shire Council

lismore city council

North Byron Parklands

WaterNSW

Cover Photograph: Jonson Street, Byron Bay on 30 March 2022. Photo courtesy of Paul Blackmore, obtained from Byron Shire Council's Facebook page.

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☒	Public	Report existence and contents publicly available.
☐	Release by consent only	Report existence is known but contents are available only with consent by MHL's client and the MHL Director.
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Foreword

New South Wales (NSW) government's specialist advisor, Manly Hydraulics Laboratory (MHL) was commissioned by the Biodiversity and Conservation Division within the NSW Department of Planning and Environment (DPE BCD) to summarise the March/April 2022 flood event on the northern rivers of NSW. The areas of focus for this flood report includes the Brunswick River, Wilsons River and Richmond River. MHL operates and maintains an extensive NSW coastal zone hydrometric monitoring network on behalf of DPE BCD.

Additional flood data is provided by the Bureau of Meteorology (BoM), Ballina Shire Council, Byron Shire Council, Lismore City Council, North Byron Parklands and WaterNSW.

An electronic copy of this report can be downloaded at www.mhl.nsw.gov.au.

Please note that DPE BCD and WaterNSW quality controlled data is presented where possible. In some cases the data presented in this report have had preliminary data checks only and are not quality controlled to a specified quality code. Further data sourced from the BoM and local councils are not quality reviewed.

Quality controlled data for MHL maintained stations can be supplied through data request to MHL (data-request@mhl.nsw.gov.au) once post flood event status checks have been conducted. Water level values in this report are reported to 2 decimal places, which is not necessarily an indication of accuracy. Data are excluded from this report if preliminary checks show an issue or if advised by the data custodian. The water level data for DPE BCD and WaterNSW stations are presented as 15 minute time series data, while all other data is event based. Data received from the BoM have been adjusted from Australian Eastern Daylight Time (AEDT), such that all data in this report are presented in Australian Eastern Standard Time (AEST).

This report presents only a subset (selected stations per region) of all the stations managed by each of the organisations mentioned. Each contributing organisation has checked and confirmed its own information within this report.

The February/March 2022 NSW north coast flood event was more severe, with higher rainfalls and flood peaks observed than the event presented in this report. Please refer to *MHL report 2880 north coast flood summary February/March 2022* (MHL, 2022) for details of this earlier event.

Executive summary

On 28, 29 and 30 March 2022 a low pressure system off the northern NSW coast brought rain, storms and high winds through the southern and coastal part of the NSW Northern Rivers area. La Nina conditions persisted through the summer of 2021/22, returning to neutral conditions in March 2022. Many communities had recently been impacted by the February/March 2022 flood event and the saturated catchments caused the creeks and rivers to respond quickly to the heavy rainfall. This event did not reach the severity seen in the February/March 2022 event (MHL, 2022).

Based on the NSW State Emergency Service (SES) flood height classifications, major floods were experienced on the Wilsons River at Lismore, and on the Richmond River at Coraki, Bungawalbin Creek and Woodburn.

The Lismore levee was overtopped at approximately 8am on Wednesday 30 March 2022. Byron Bay reported flash flooding and received 164mm at Cape Byron automatic weather station; 282mm at Belongil Creek Bridge; and, 252mm at Tallow Creek Bridge.

During the flood period, MHL staff monitored the flood situation via telemetry and provided clients and the public with near real time access to the rainfall and water levels via customised client webpages and MHL's public webpage at www.mhl.nsw.gov.au, BoM website www.bom.gov.au/nsw/flood and NSW Government's Floods Near Me app http://floodsnearme.manly.hydraulics.works/, which displays latest recordings for water level recording stations.

During the flood event, the BoM and State Emergency Service (SES) used water level and rainfall data, quantitative precipitation forecasts and radar information to generate predicted water levels at warning locations on the flood-affected rivers. The water level predictions were used by the BoM to issue flood watches, flood warnings and severe weather warnings for heavy rain and local flooding.

This report presents a select group of wave, water level and rainfall hydrometric data collected from 20 March to 20 April 2022 in the Brunswick, Wilsons and Richmond River catchments. This report incorporates water level and rainfall data provided by the BoM, Ballina Shire Council, Byron Shire Council, Lismore City Council, North Byron Parklands and WaterNSW. Data presentation was undertaken by MHL for DPE BCD.

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1 Introduction

During the March/April 2022 flood event, high rainfalls were experienced on the east coast of NSW particularly in the Brunswick, Wilsons and Richmond River. The rainfall system was generated by a low pressure system off the northern NSW coast. **Figure 1-1** and **Figure 1-2** display the mean sea level pressure (MSLP) maps and radar images showing the movement of the pressure systems over NSW from 28 to 29 March 2022.

The Lismore levee was overtopped at approximately 8am on Wednesday 30 March 2022. Byron Bay reported flash flooding and received 164mm at Cape Byron AWS; 282mm at Belongil Creek Bridge; and, 252mm at Tallow Creek Bridge. At Alstonville rain gauge in the Wilsons River catchment the 1% AEP was exceeded for 6 hour durations and above. Ballina Airport AWS rain gauge recorded intensities exceeding the 1% AEP for 48 hour durations and above.

Major flooding was experienced on the Wilsons River at Lismore and on the Richmond River at Coraki, Bungawalbin Creek and Woodburn. **Figure 1-3** shows the rainfall analysis map of NSW which presents the total rainfall recorded across NSW for March and April 2022, respectively.

Figure 1-4 and **Figure 1-5** present wind roses for Byron Bay (Cape Byron) (058216), Ballina Airport (058198) and Evans Head RAAF Bombing Range (058212) for 20 March to 20 April 2022. At the Cape Byron automatic weather station the average of the maximum wind gust speeds over the peak of the event (20 March to 20 April 2022) was 52 km/h.

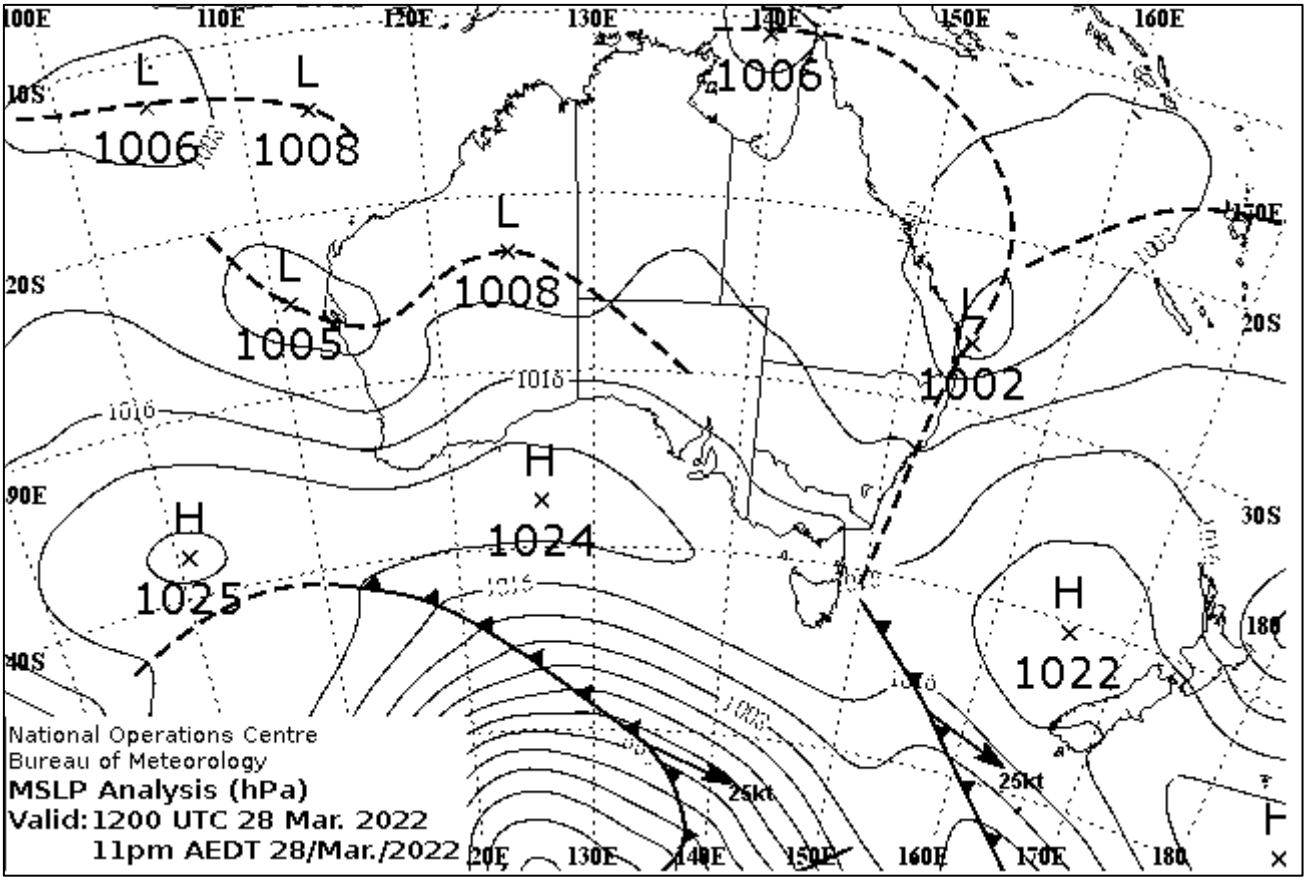
During the flood event, the monitoring networks of water level recorders and rainfall gauges operated by MHL, on behalf of DPE BCD, were used extensively by the BoM, the SES and the local councils to generate flood warnings, emergency response and delivery of flood related services. Wave, water level and rainfall data captured during the flood event are summarised in the subsequent sections of this report. Station performance during the event is summarised in **Appendix A** .

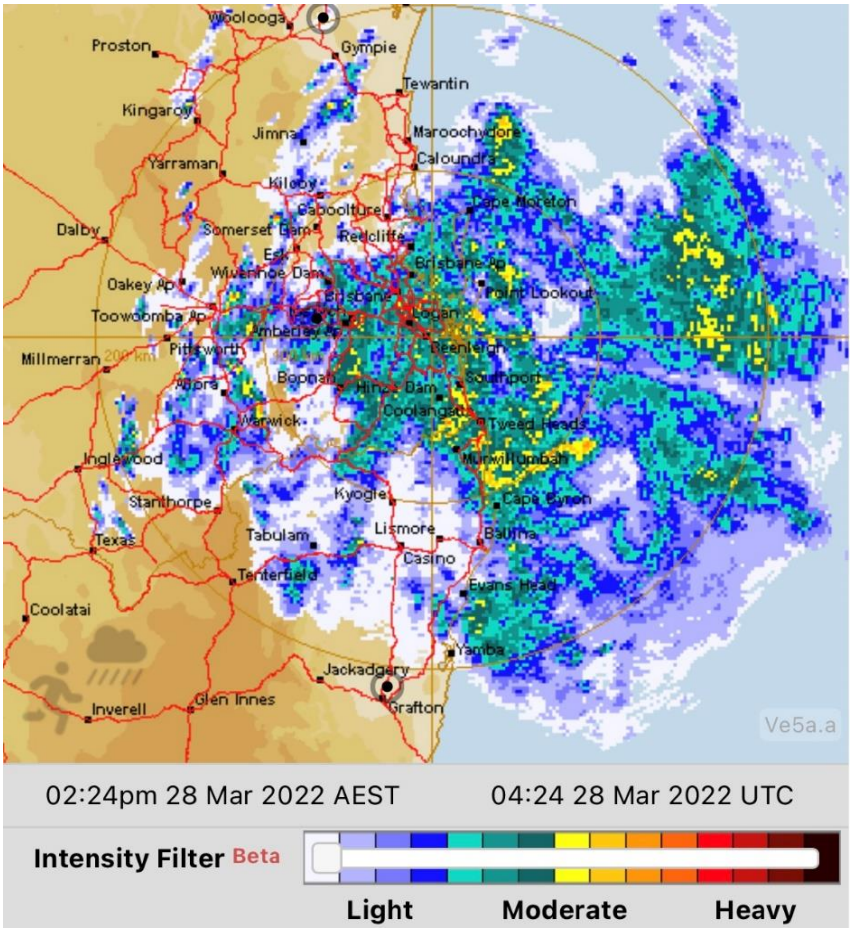
DPE BCD commissioned MHL to prepare this report to summarise the March/April 2022 flood event, which includes supplementary flood data provided from the BoM, Ballina Shire Council, Byron Shire Council, Lismore City Council, North Byron Parklands and WaterNSW.

Rainfall intensity frequency duration (IFD) curves have been generated using the Australian Rainfall and Runoff 2019 (ARR2019) format in millimetres per hour for durations up to and including 168 hours. In addition, IFD curves have been generated using the previous IFD format, Australian Rainfall and Runoff 1987 (ARR1987), with results in millimetres per hour for durations up to and including 72 hours (refer to **Appendix B**). This will allow this flood summary report to be comparable with past and future reports as organisations transition the IFD format to the ARR2019 version. It is noted that data from a number of rainfall stations are affected by a loss of resolution, possibly caused by interruptions to radio signals during the event, and for two stations only 24-hour totals could be provided and no IFD analysis is undertaken. In cases where this loss of resolution has affected the intensity frequency duration curves, the short duration event values have been removed as they could be misinterpreted. Impacted stations are noted. In addition, missing or incomplete supplied data

is also noted. For third party stations, including those supplied by the BoM, it is recommended that further quality assurance checks are undertaken prior to interpretation and use of this data for decision making. Please contact the BoM for short duration rainfall statistics.

Please refer to **Appendix C** for the conversion of WaterNSW's water level gauges from local gauge datum to Australian Height Datum (AHD) where available.





Source: Australian Bureau of Meteorology, 2022; radar image archived by theweatherchaser.com

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MEAN SEA LEVEL PRESSURE AND RADAR IMAGE
28 MARCH 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
1.1

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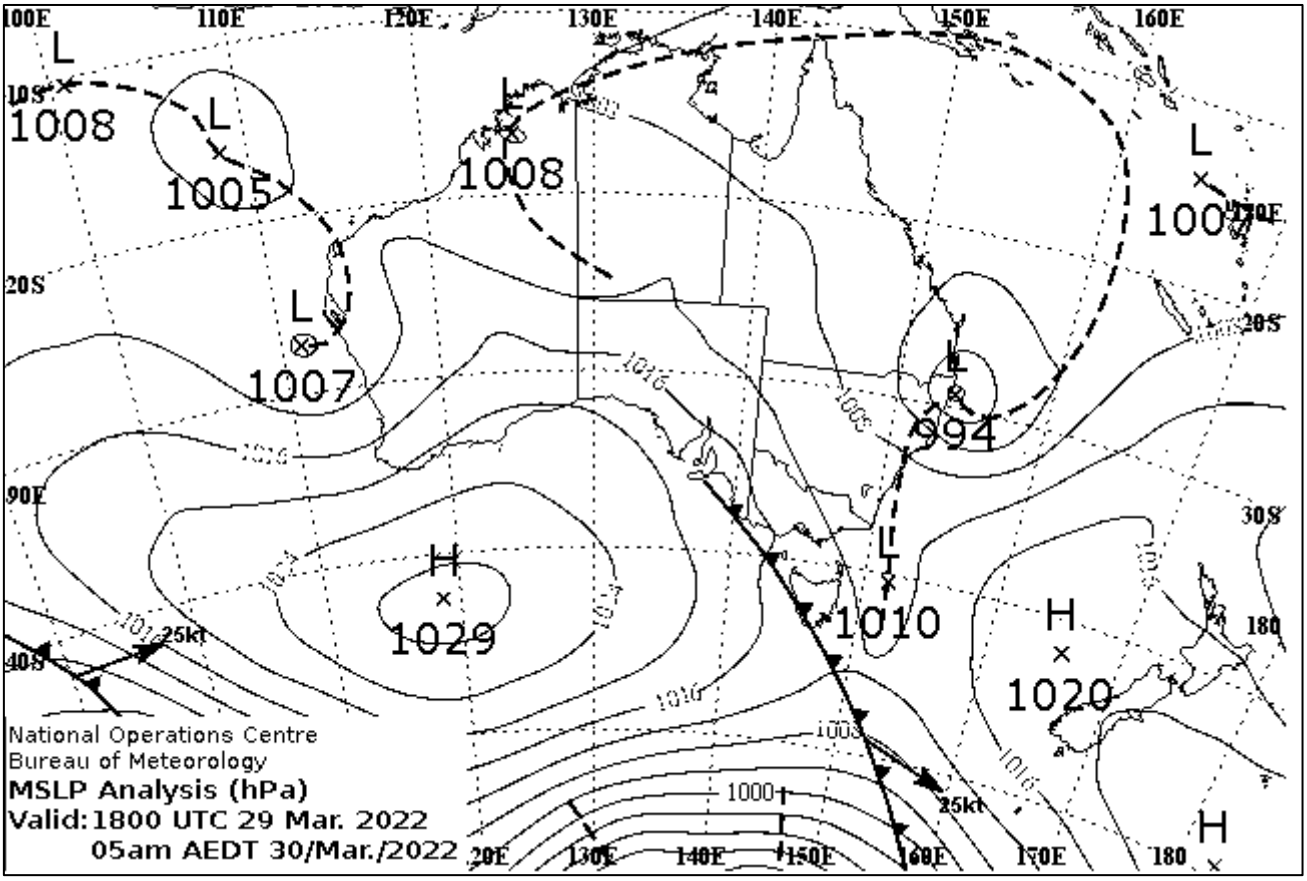

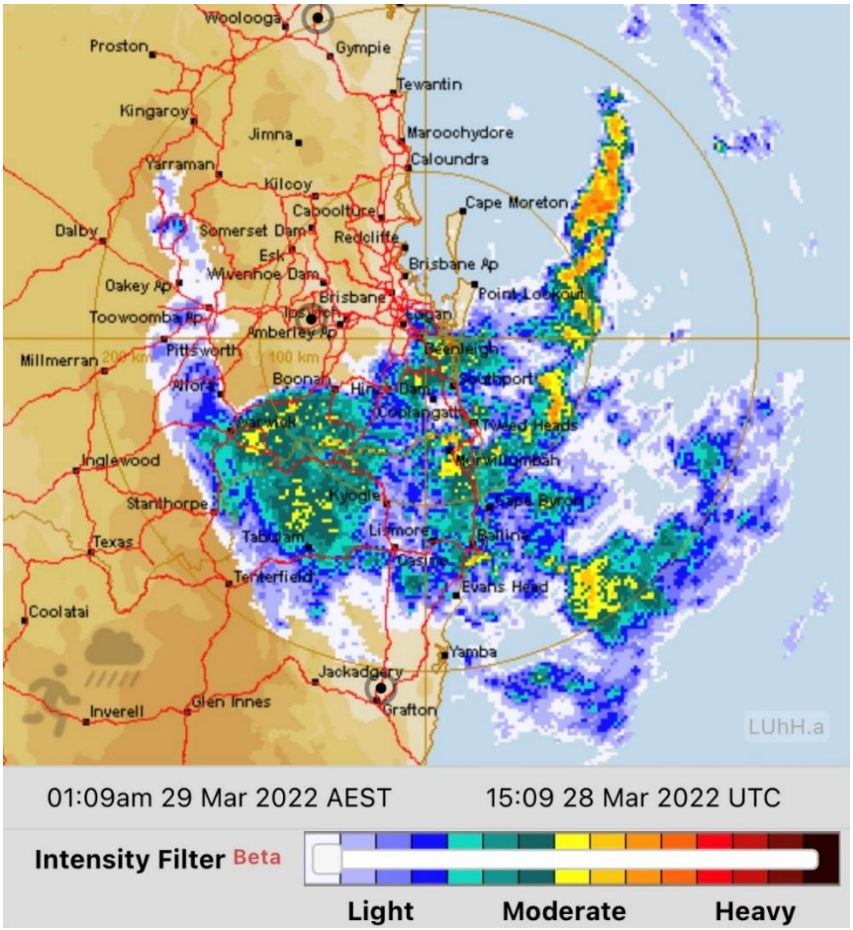

Source: Australian Bureau of Meteorology, 2022; radar image archived by theweatherchaser.com

NSW GOVERNMENT

MEAN SEA LEVEL PRESSURE AND RADAR IMAGE
29 MARCH 2022

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Figure
1.2

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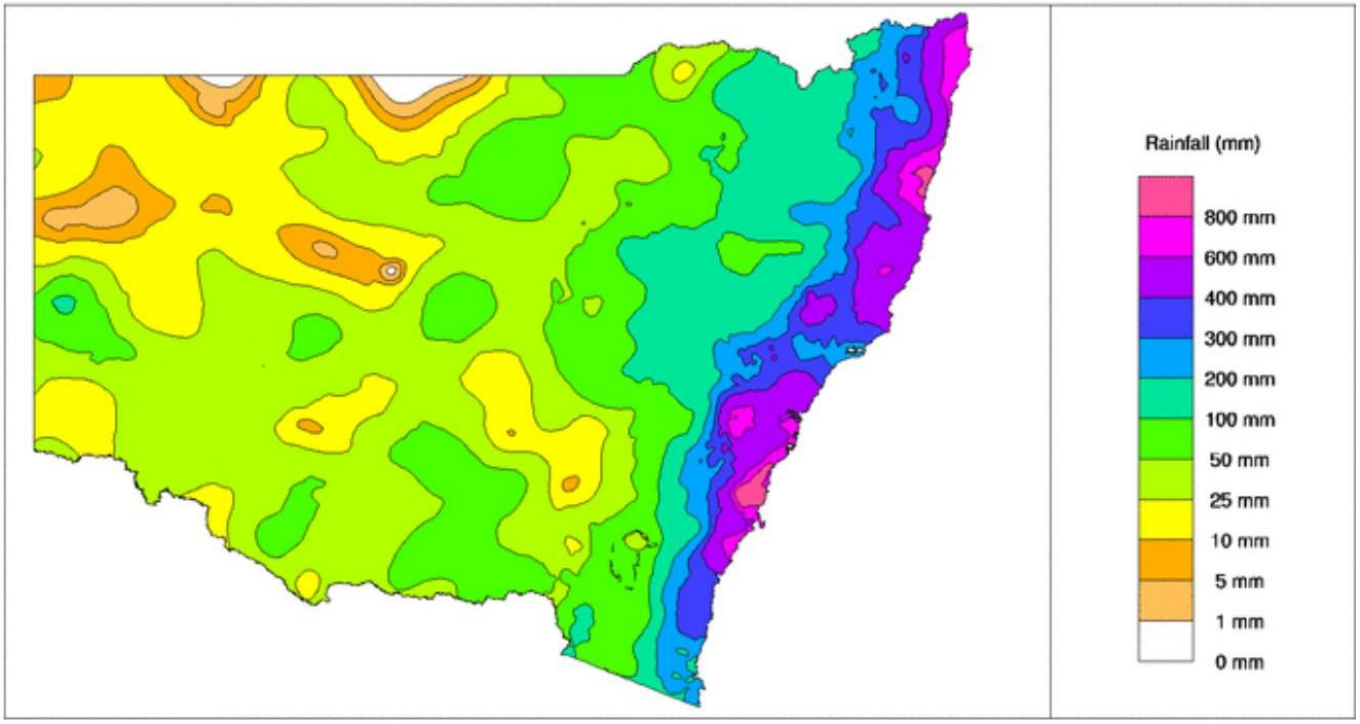
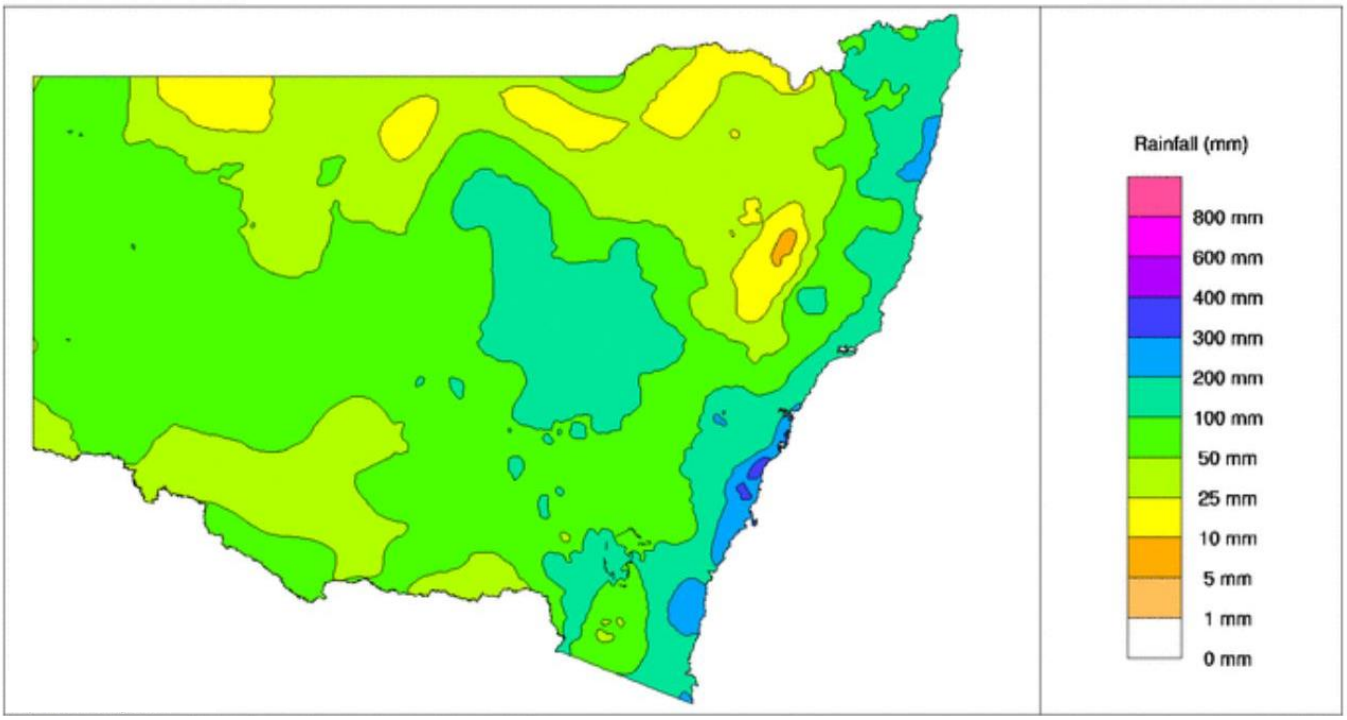
New South Wales Rainfall totals (mm) March 2022



 Issued: 19/06/2022

New South Wales Rainfall totals (mm) April 2022



 Issued: 20/06/2022

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NEW SOUTH WALES RAINFALL ANALYSIS
MARCH AND APRIL 2022

Manly Hydraulics Laboratory

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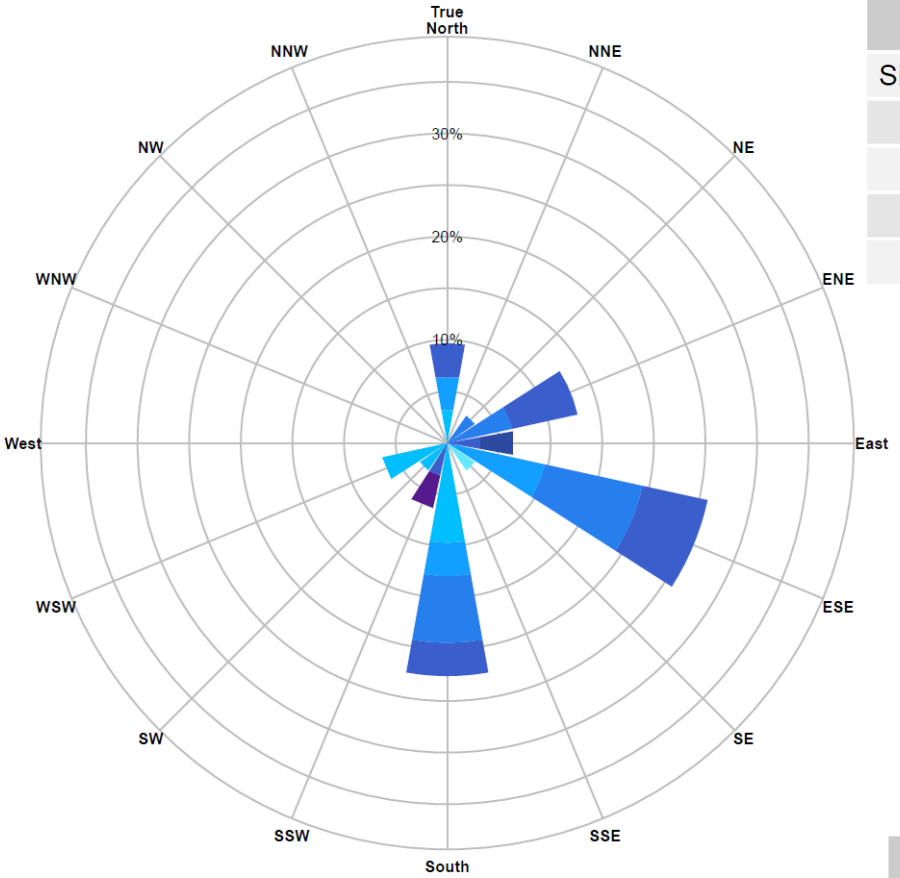
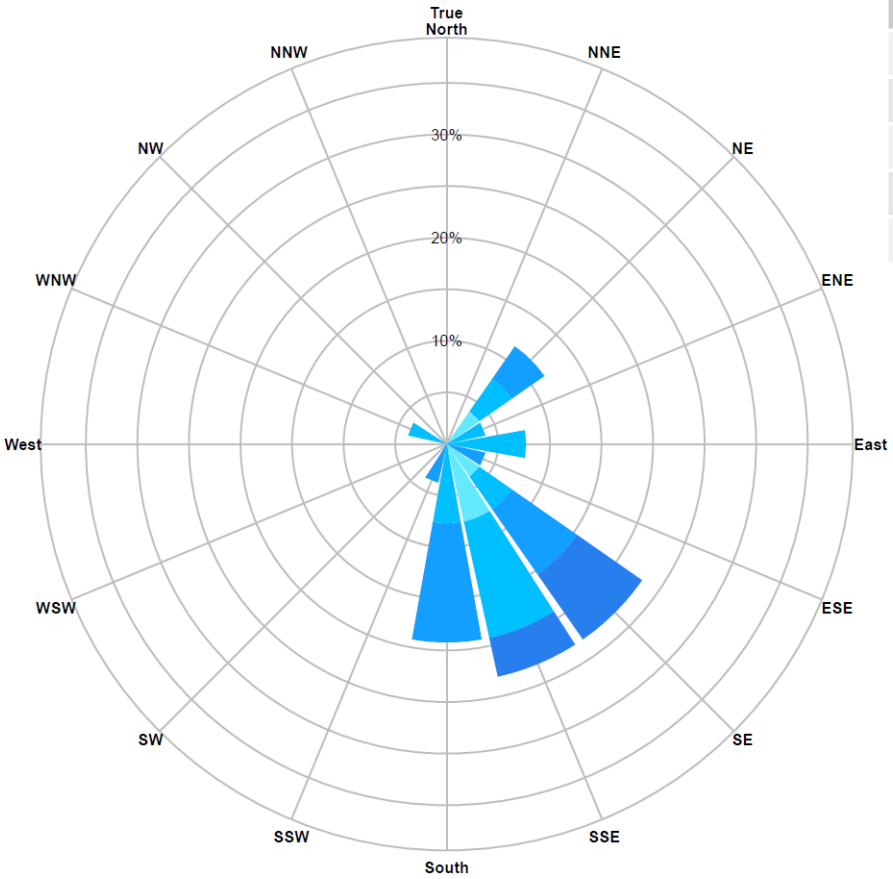
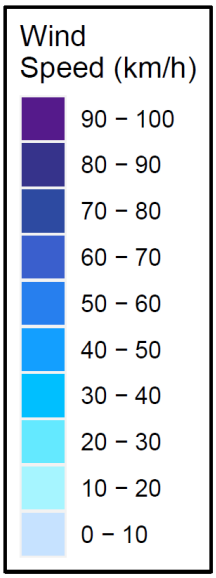


Wind Speed vs. Direction Rose
Site: Byron Bay (Cape Byron AWS)
Start: 20 March 2022
Finish: 20 April 2022
Record Length (days): 31
N° of Records: 31



Wind Speed vs. Direction Rose
Site: Ballina Airport AWS
Start: 20 March 2022
Finish: 20 April 2022
Record Length (days): 31
N° of Records: 26



Source: Wind data collected by the Australian Bureau of Meteorology, 2022

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WIND ROSE FROM BYRON BAY (CAPE BYRON AWS)
AND BALLINA AIRPORT AWS
20 MARCH – 20 APRIL 2022

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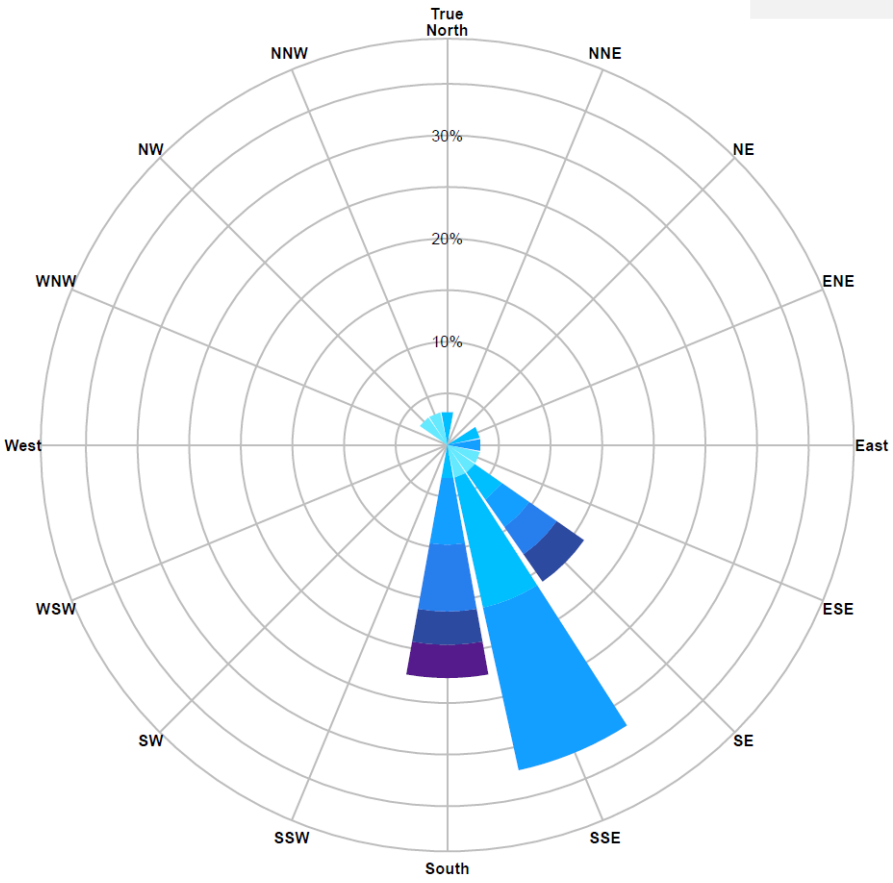
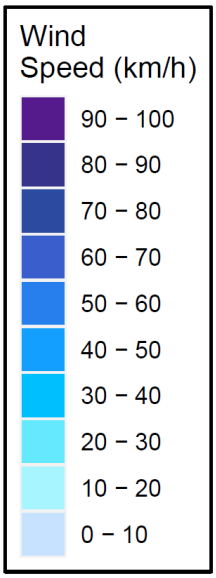
Figure
1.4

Figures_MHL2895.pptx

Wind Speed vs. Direction Rose	
Site:	Evans Head RAAF Bombing Range AWS
Start:	20 March 2022
Finish:	20 April 2022
Record Length (days):	31
N° of Records:	31





Source: Wind data collected by the Australian Bureau of Meteorology, 2022

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WIND ROSE FROM
EVANS HEAD RAAF BOMBING RANGE AWS
20 MARCH – 20 APRIL 2022

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2 Offshore wave data

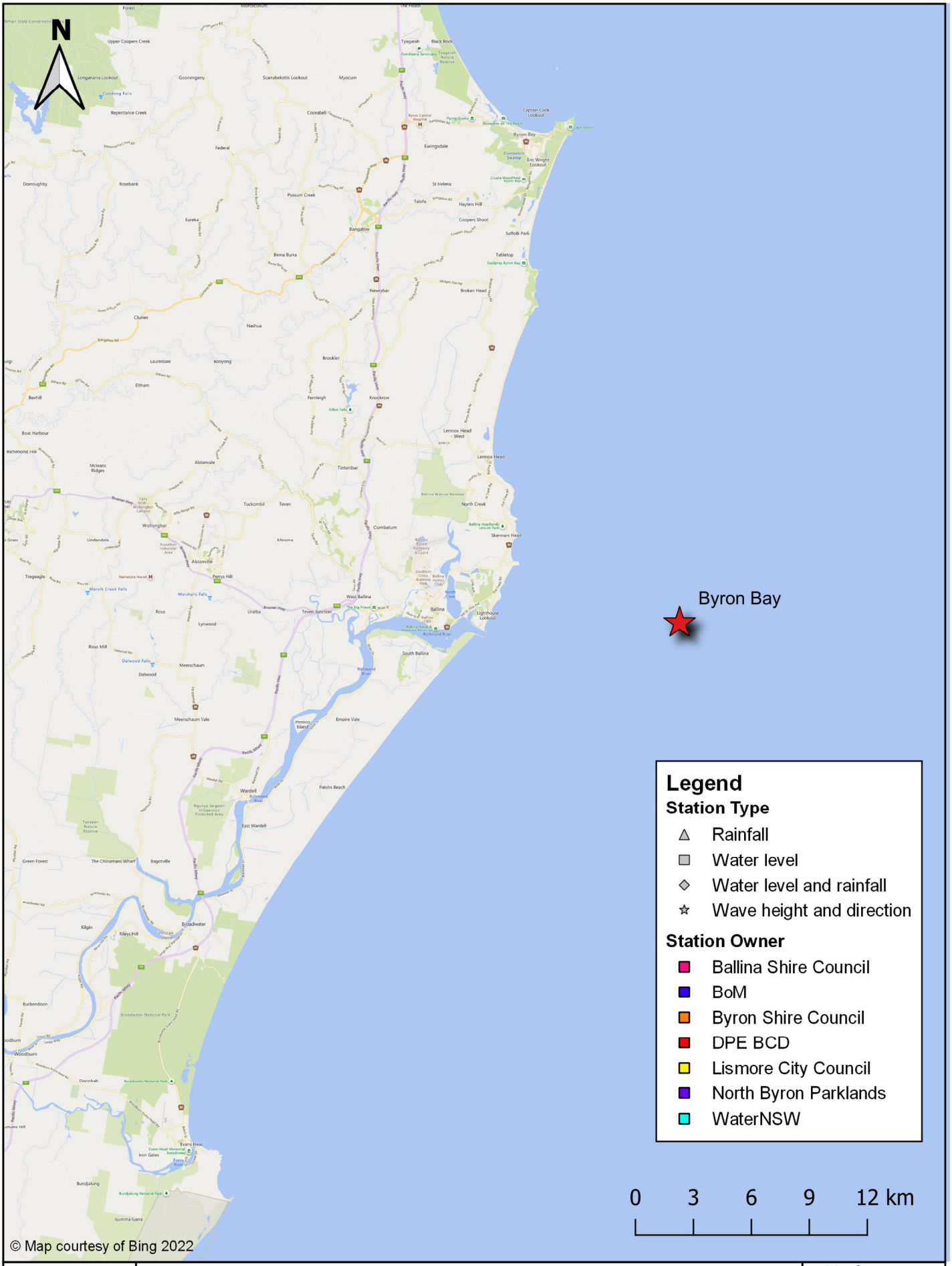
The NSW Waverider buoy network monitors ocean wave conditions along the NSW coast using an accelerometer mounted in a loose tethered buoy to measure the vertical accelerations of the buoy. It is a network of seven Waverider stations operated by MHL on behalf of DPE BCD. Wave data have been collected since 1974 when the first Waverider buoy was deployed by MHL off Port Kembla. Meteorological conditions during the March/April 2022 flood event also generated moderate storm wave activity along the NSW north coast.

A summary of the ocean wave conditions recorded by the Byron Bay Waverider buoy during the March/April 2022 flood event is presented in **Table 2.1**. The location of the Byron Bay Waverider buoy is shown in **Figure 2-1**. Time series plots of wave height, direction and period during the flood event are presented in **Figure 2-2**.

Table 2.1 Ocean wave storm summary 20 March to 20 April 2022

Wave conditions	Byron Bay Waverider buoy
Peak significant wave height (m)	4.98
Date and time of peak significant wave height (hrs AEST)	29/3/2022 23:00
Peak maximum wave height (m)	8.20
Spectral peak wave period at storm peak (secs)	10.3
Wave direction at storm peak (ºTN)	120
Storm duration for Hsig greater than 3m (hrs)	64
Storm duration for Hsig greater than 4m (hrs)	6
Average Recurrence Interval for storm peak Hsig (years)	< 1.0

Based on over 40 years of wave data recorded at the Byron Bay Waverider buoy station, the Average Recurrence Interval (ARI) for the 4.98 m storm peak Significant Wave Height (H_{sig}) is less than one year.



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WAVE STATIONS

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Figure
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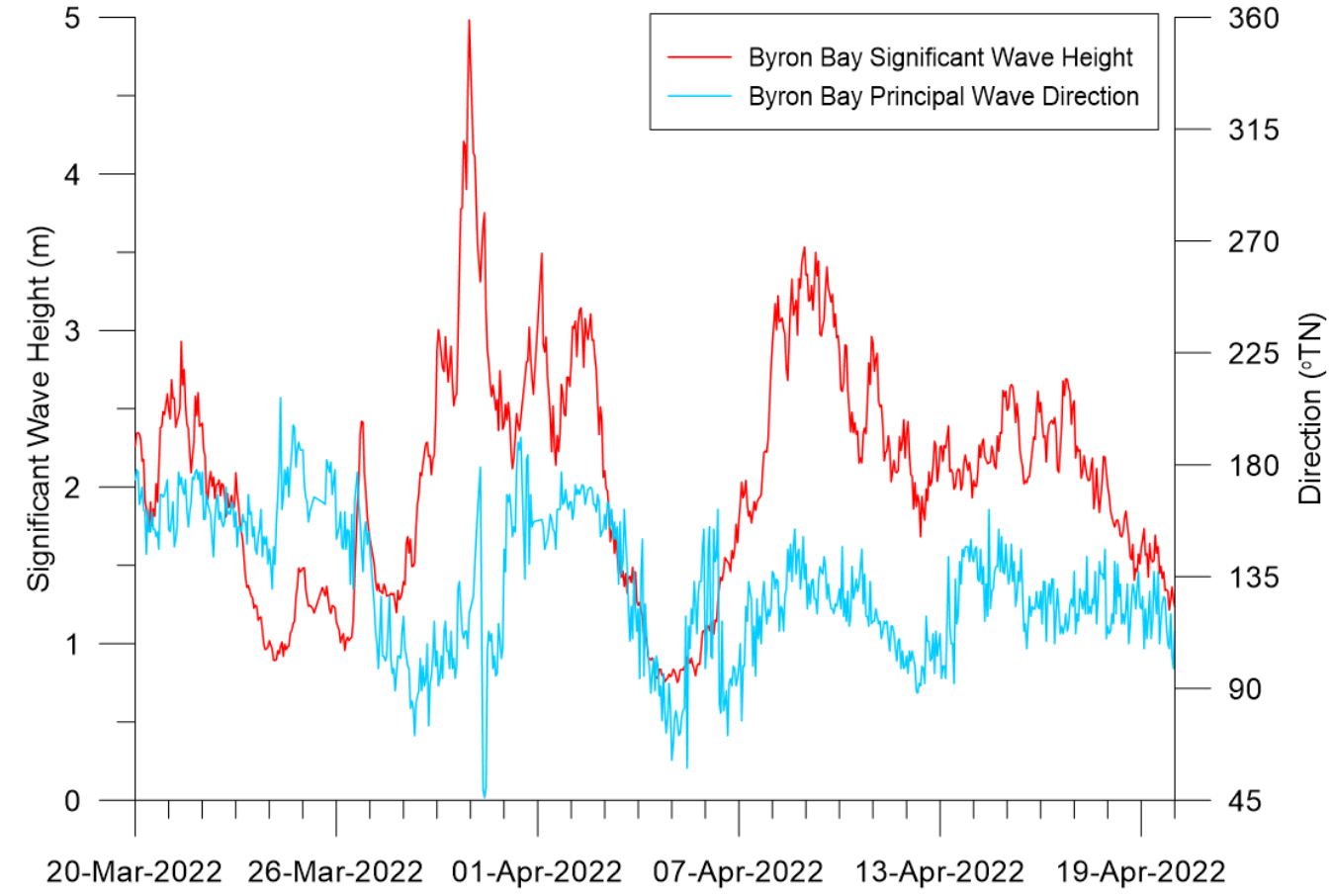

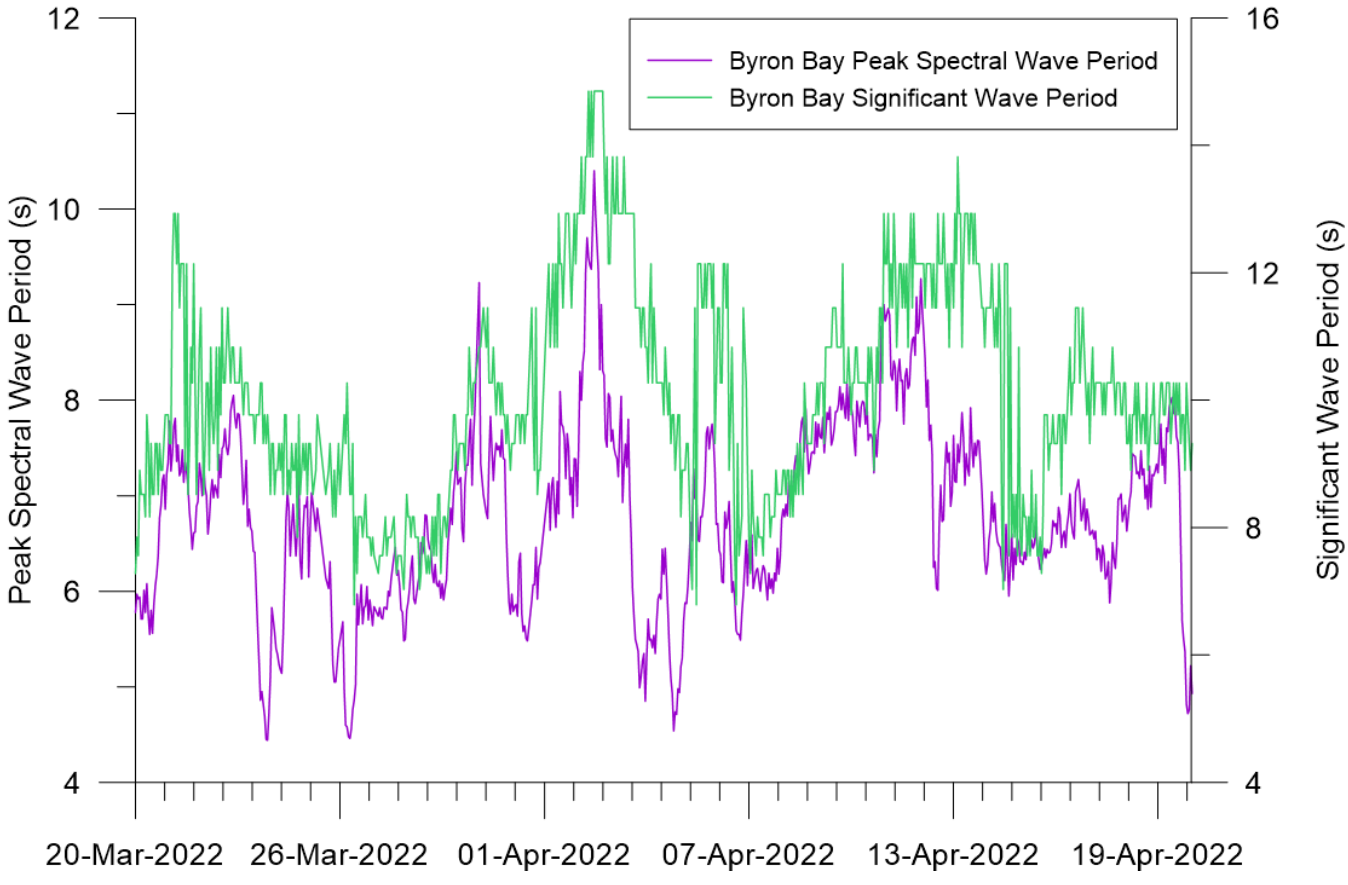

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BYRON BAY WAVERIDER BUOY
WAVE HEIGHT, DIRECTION AND PERIOD
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
2.2

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3 Water level and rainfall data

3.1 Water level and rainfall overview

A number of hydrometric stations are maintained by organisations in the NSW coastal region including MHL on behalf of DPE BCD, BoM, Ballina Shire Council, Byron Shire Council, Lismore City Council, North Byron Parklands and WaterNSW. In this report, there are 88 stations presented and **Table 3.1** provides the number of stations operated by each organisation. A full list of stations for which data is presented in this summary report is provided in **Appendix A** . The station counts shown in **Table 3.1** are only a subset and does not present all the stations managed by the various agencies and local councils.

Table 3.1 Water level, rainfall and wave station summary

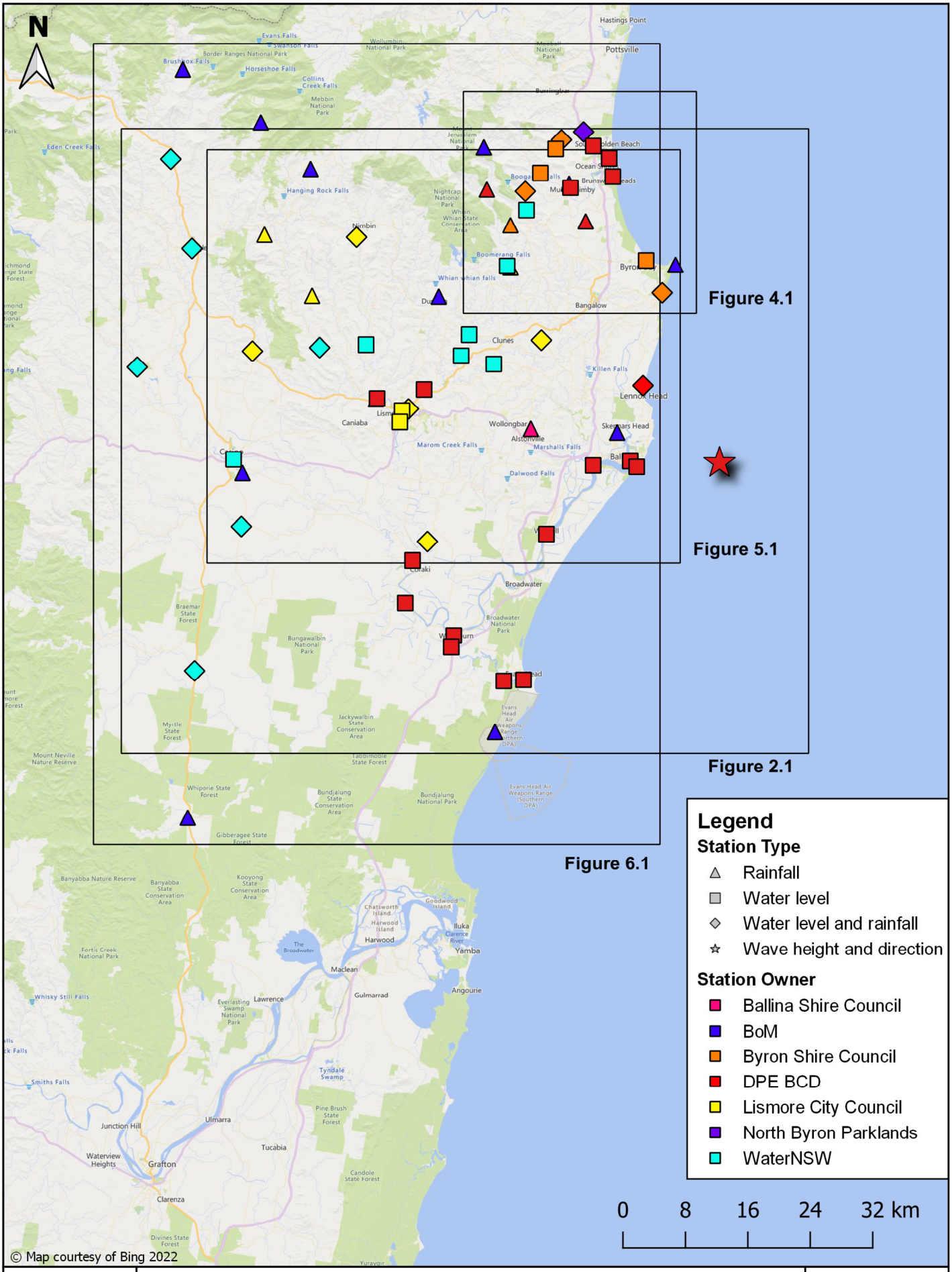
Agency^	Station type		
	Water level	Rainfall	Wave
Ballina Shire Council	0	2	0
BoM	0	12	0
Byron Shire Council	5	4	0
DPE BCD	20	4	1
Lismore City Council	7	11	0
North Byron Parklands	1	1	0
WaterNSW	14	6	0

^Please note this table does not represent all hydrometric stations owned by the various organisations, only a subset selected for presentation in this report.

3.2 River region overview

An overview of water level and rainfall stations in the NSW coast is provided in **Figure 3-1** in the maps at the start of each section. The river regions are grouped as follows:

- **Figure 4-1** – Brunswick River region
- **Figure 5-1** – Wilsons River region
- **Figure 6-1** – Richmond River region



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OVERALL VIEW OF STATIONS

Manly Hydraulics Laboratory

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Figure
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4 Brunswick River region

4.1 Brunswick River region – water level

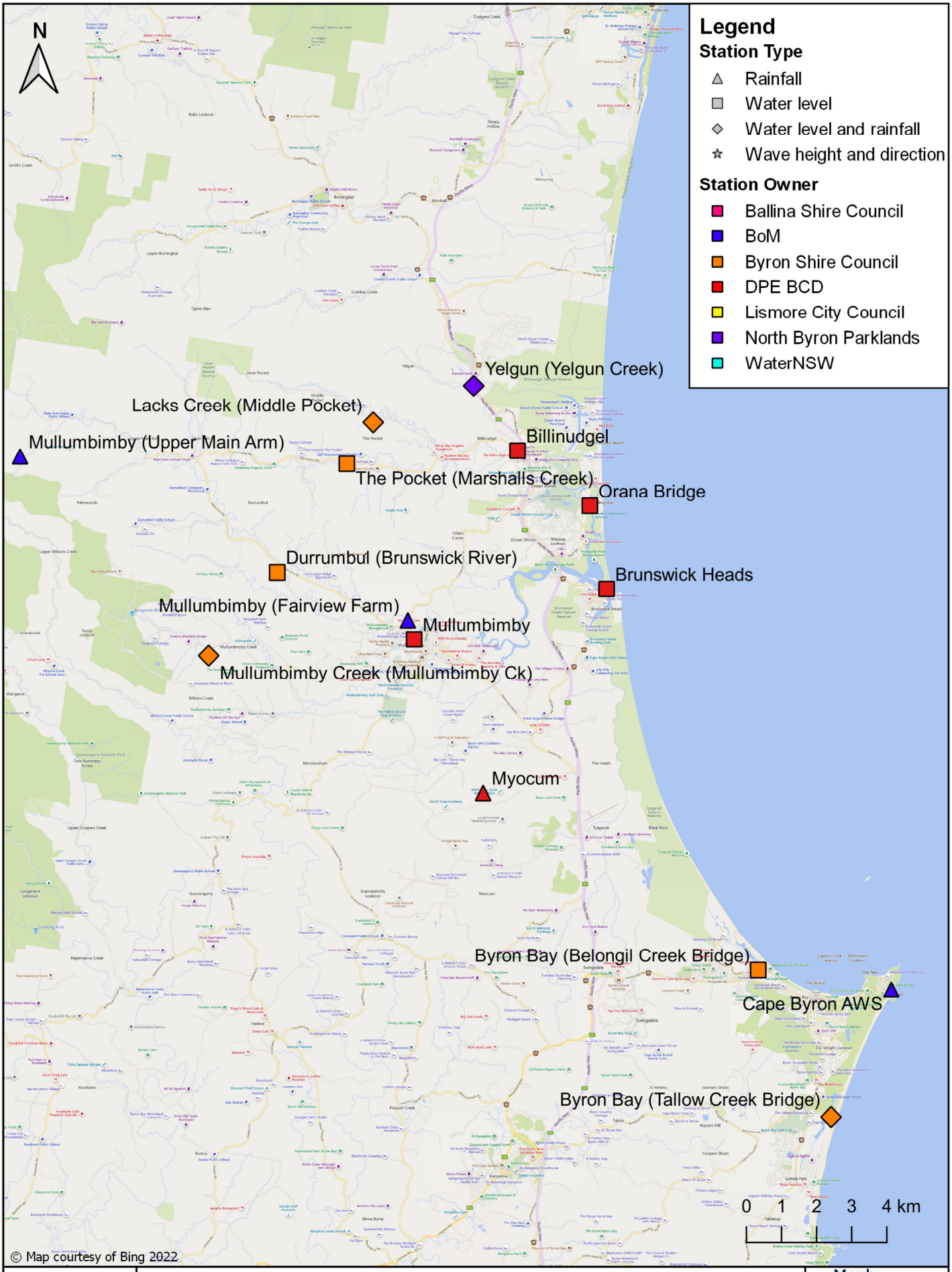
The peak observed water levels for the Brunswick River region are listed in **Table 4.1**. **Table 4.2** lists the SES flood classifications for Billinudgel and Mullumbimby (BoM, 2013). The locations of water level stations within the Brunswick River region are shown in **Figure 4-1**. The water level data for the period 20 March to 20 April 2022 are displayed graphically in **Figure 4-2** to **Figure 4-10**.

Table 4.1 Brunswick River region flood peaks

Station name	Station number	Owner	Datum	Level (m)	Date and time of flood peak
Yelgun (Yelgun Creek)	558096	North Byron Parklands	Local	4.16	29/03/2022 00:26
Lacks Creek (Middle Pocket)	558005	Byron Shire Council	Local	3.78	29/03/2022 00:19
Billinudgel	202400	DPE BCD	AHD	3.20	29/03/2022 03:15
The Pocket (Marshalls Creek)	558004	Byron Shire Council	Local	3.77	29/03/2022 00:44
Orana Bridge	202475	DPE BCD	AHD	1.62	30/03/2022 08:00
Durrumbul (Brunswick River)	202001	WaterNSW	Local	4.09	29/03/2022 02:30
Brunswick Heads	202403	DPE BCD	AHD	1.33	30/03/2022 07:30
Mullumbimby	202402	DPE BCD	AHD	3.64	29/03/2022 05:00
Mullumbimby Creek (Mullumbimby Creek)	558008	Byron Shire Council	Local	2.35	29/03/2022 02:18
Byron Bay (Belongil Creek Bridge)	558099	Byron Shire Council	Local	2.01	30/03/2022 07:32
Byron Bay (Tallow Creek Bridge)	558098	Byron Shire Council	Local	1.59	30/03/2022 06:43

Table 4.2 SES flood classification for Brunswick River region stations

Station name	Station number		Flood classification			Flood peak (m)	Datum	Flood event classification
	Bureau number	AWRC number	Minor	Moderate	Major			
			Water level (m)					
Billinudgel	558020	202400	2.48	2.98	3.48	3.20	AHD	Moderate
Mullumbimby	558006	202402	2.49	3.49	4.49	3.64	AHD	Moderate



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BRUNSWICK RIVER STATIONS

Manly Hydraulics Laboratory

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Figure
4.1

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4.2 Brunswick River region – rainfall

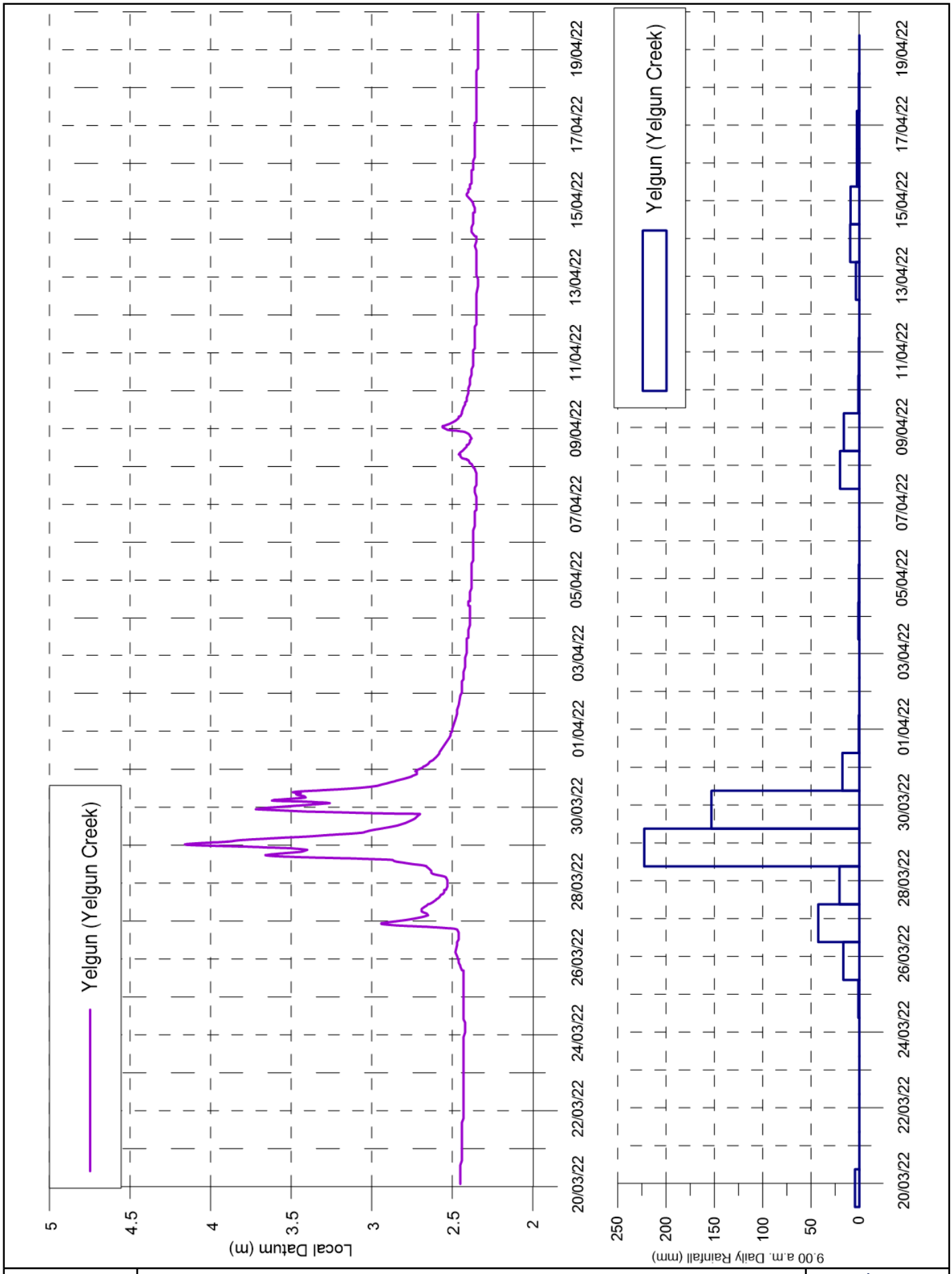
24-hour rainfall totals up until 9:00 a.m. are displayed in **Table 4.3** and **Table 4.4** for the period 20 March to 20 April 2022. The water level and rainfall data for the period 20 March to 20 April 2022 are displayed graphically in **Figure 4-2** to **Figure 4-10**. The rainfall intensities are displayed graphically in **Figure 4-11** to **Figure 4-17**, in ARR2019 format (Australian Rainfall and Runoff, 2019). **Appendix B** provides ARR1987 format. Brunswick River region station data losses are reported in **Appendix A** .

Table 4.3 Brunswick River region daily rainfall totals

Date	Yelgun (Yelgun Creek) 558096 (mm)	Lacks Creek (Middle Pocket) 558005 (mm)	Mullumbimby (Upper Main Arm) 558034 (mm)	Mullumbimby (Fairview Farm) 58040 (mm)
	North Byron Parklands	Byron Shire Council	BoM	BoM
20/03/2022	4.5	1.0	2.0	1.2
21/03/2022	0.0	0.0	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.0	0.0	0.0
24/03/2022	0.0	0.0	0.0	0.0
25/03/2022	1.0	2.0	4.0	6.0
26/03/2022	16.5	16.0	21.0	14.8
27/03/2022	42.5	37.0	17.0	52.8
28/03/2022	20.5	12.0	9.0	17.2
29/03/2022	222.5	207.0	186.0	206.0
30/03/2022	153.0	112.0	111.0	166.0
31/03/2022	17.5	15.0	55.0	10.0
01/04/2022	0.5	0.0	7.0	1.4
02/04/2022	0.0	0.0	0.0	---
03/04/2022	0.0	0.0	0.0	---
04/04/2022	1.0	5.0	2.0	4.8
05/04/2022	0.5	0.0	1.0	0.6
06/04/2022	0.0	0.0	0.0	0.0
07/04/2022	0.0	0.0	2.0	0.0
08/04/2022	20.0	18.0	21.0	25.8
09/04/2022	16.0	16.0	10.0	12.2
10/04/2022	1.0	3.0	11.0	2.2
11/04/2022	0.5	0.0	0.0	0.0
12/04/2022	0.0	0.0	0.0	0.0
13/04/2022	3.5	2.0	4.0	3.5
14/04/2022	9.5	5.0	15.0	10.5
15/04/2022	9.0	3.0	4.0	6.8
16/04/2022	2.5	1.0	1.0	2.8
17/04/2022	2.5	1.0	9.0	1.6
18/04/2022	0.5	1.0	1.0	0.1
19/04/2022	0.0	0.0	0.0	2.0
20/04/2022	0.0	0.0	0.0	0.0

Table 4.4 Brunswick River region daily rainfall totals (cont.)

Date	Mullumbimby Creek (Mullumbimby Creek)	Myocum	Cape Byron AWS	Byron Bay (Tallow Creek Bridge)
	558008 (mm)	558036 (mm)	58216 (mm)	558098 (mm)
	Byron Shire Council	DPE BCD	BoM	Byron Shire Council
20/03/2022	2.0	0.5	0.0	4.0
21/03/2022	0.0	0.0	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.0	0.0	0.0
24/03/2022	0.0	0.0	0.0	0.0
25/03/2022	25.0	1.0	7.0	13.5
26/03/2022	51.0	12.0	36.6	25.0
27/03/2022	29.0	77.5	56.6	82.5
28/03/2022	8.0	22.0	30.2	33.5
29/03/2022	201.0	176.5	128.0	142.5
30/03/2022	206.0	209.5	164.0	254.0
31/03/2022	19.0	12.5	27.4	14.0
01/04/2022	2.0	1.5	2.4	3.5
02/04/2022	0.0	0.0	0.0	0.0
03/04/2022	0.0	0.0	0.0	0.0
04/04/2022	1.0	1.0	1.0	0.5
05/04/2022	0.0	0.5	0.6	0.5
06/04/2022	0.0	0.0	0.0	0.0
07/04/2022	0.0	0.0	0.0	0.0
08/04/2022	26.0	24.5	14.6	15.5
09/04/2022	8.0	8.5	6.8	5.5
10/04/2022	9.0	2.5	0.4	2.0
11/04/2022	0.0	0.0	0.0	0.0
12/04/2022	0.0	0.0	0.0	0.0
13/04/2022	4.0	3.5	7.4	7.0
14/04/2022	10.0	14.5	11.0	15.5
15/04/2022	6.0	5.0	4.8	4.5
16/04/2022	1.0	2.0	1.6	3.5
17/04/2022	5.0	2.0	3.8	0.5
18/04/2022	0.0	0.5	0.2	1.5
19/04/2022	0.0	0.0	0.2	0.0
20/04/2022	0.0	0.0	0.0	0.0



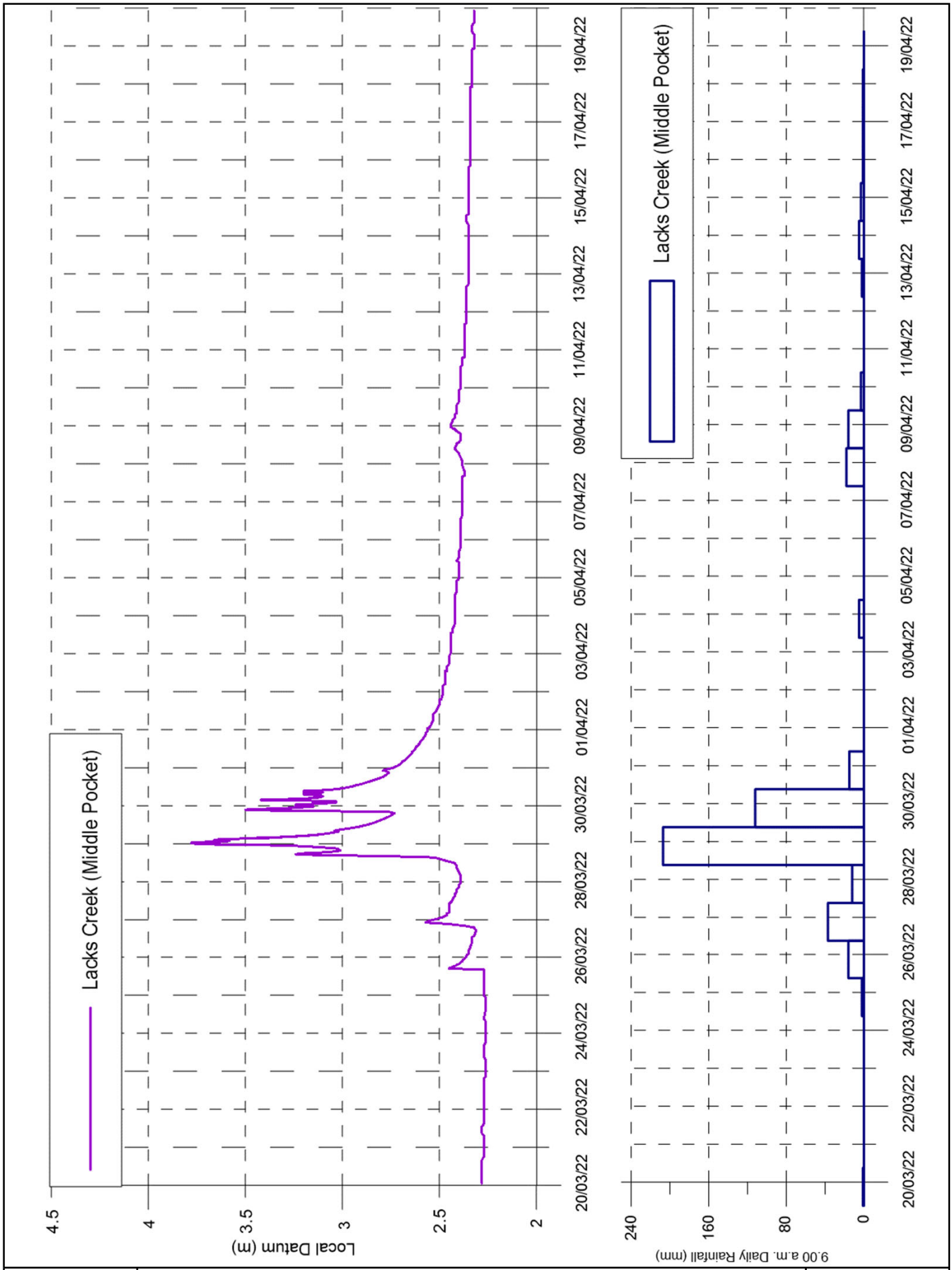
NSW GOVERNMENT

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
4.2

4.2.GRF



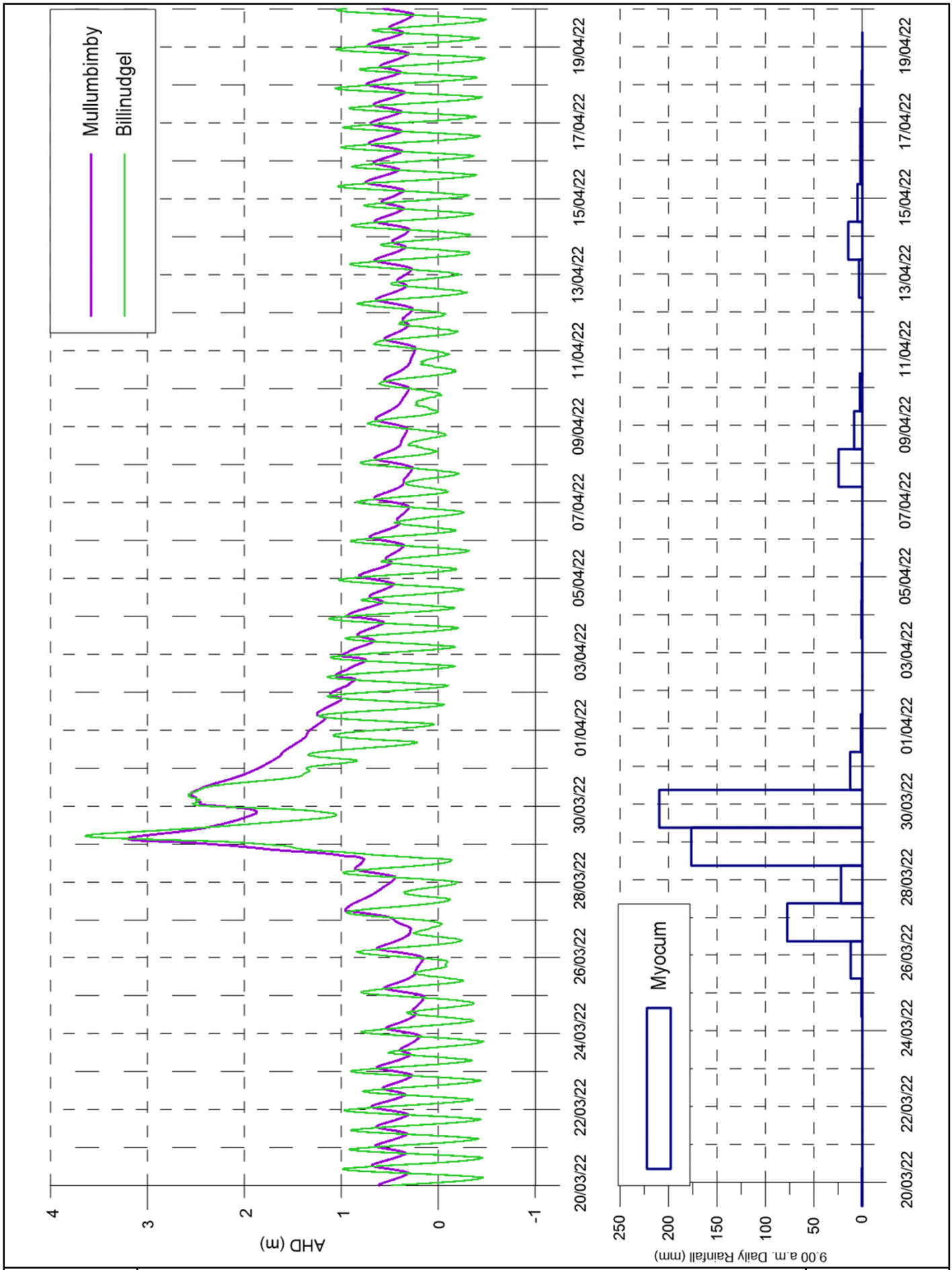
NSW GOVERNMENT

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
4.3

4.3.GRF



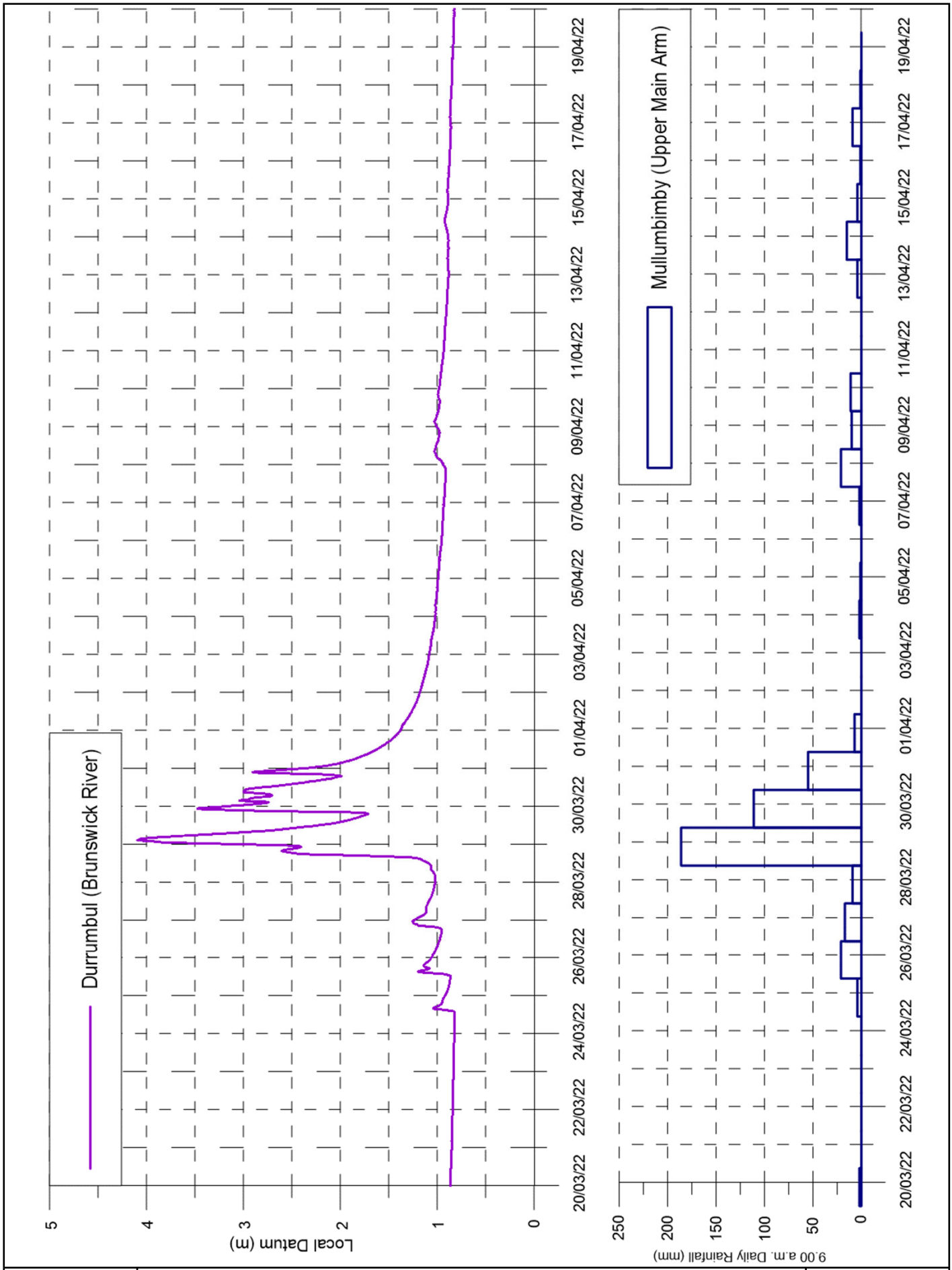
NSW GOVERNMENT

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
4.4

4.4.GRF



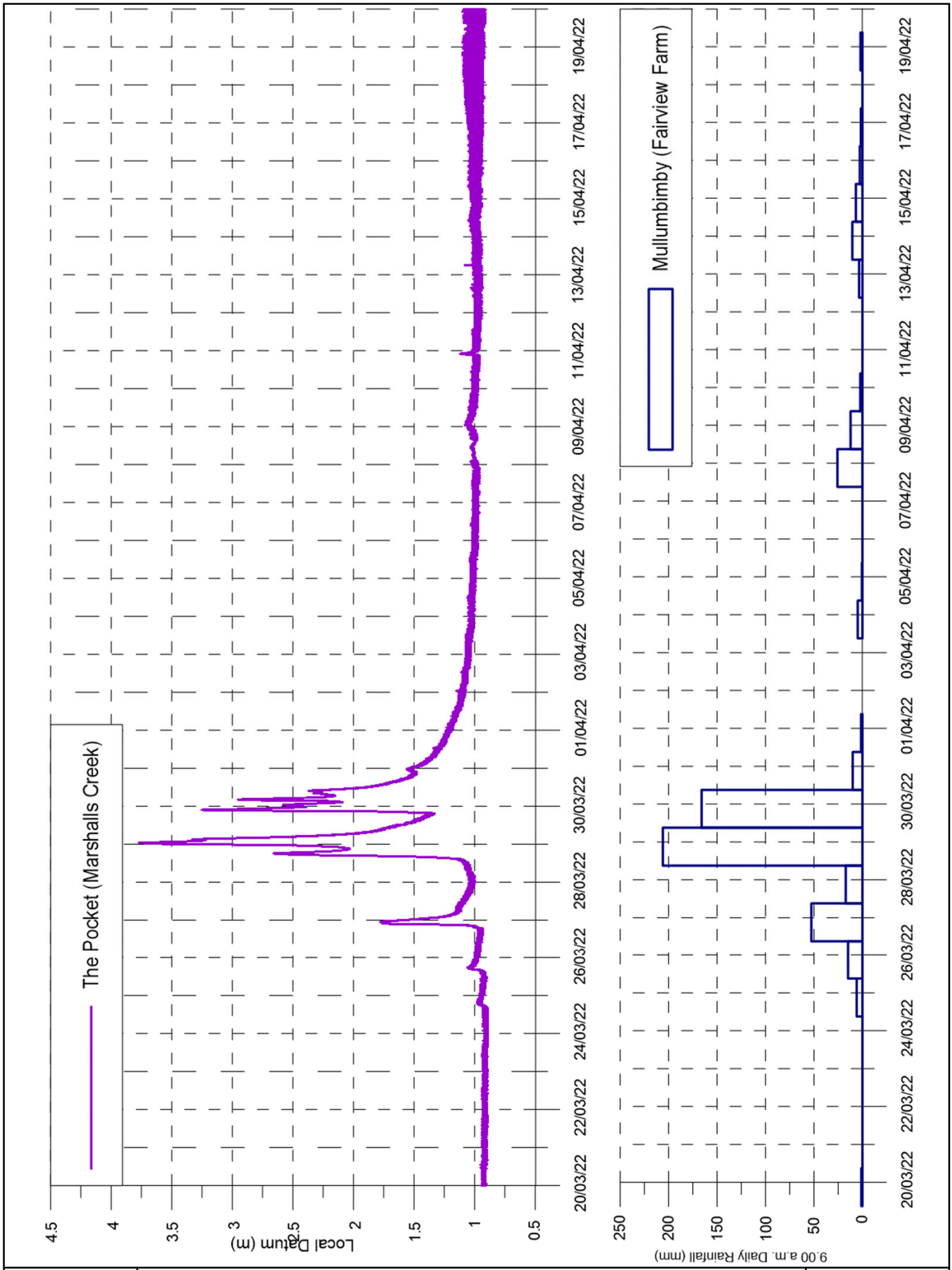
NSW GOVERNMENT

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
4.5

4.5.GRF



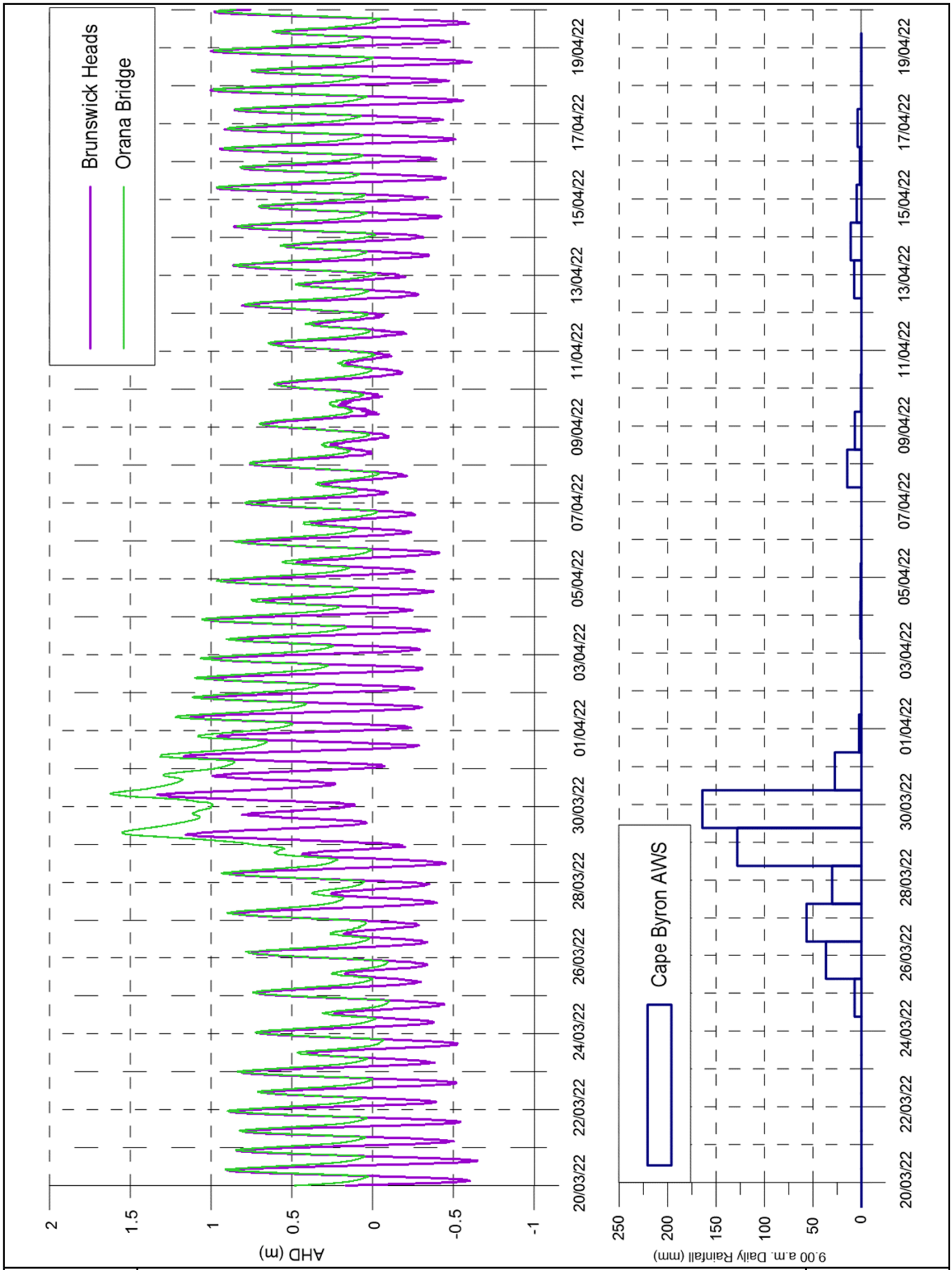
NSW GOVERNMENT

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
4.6

4.6.GRF



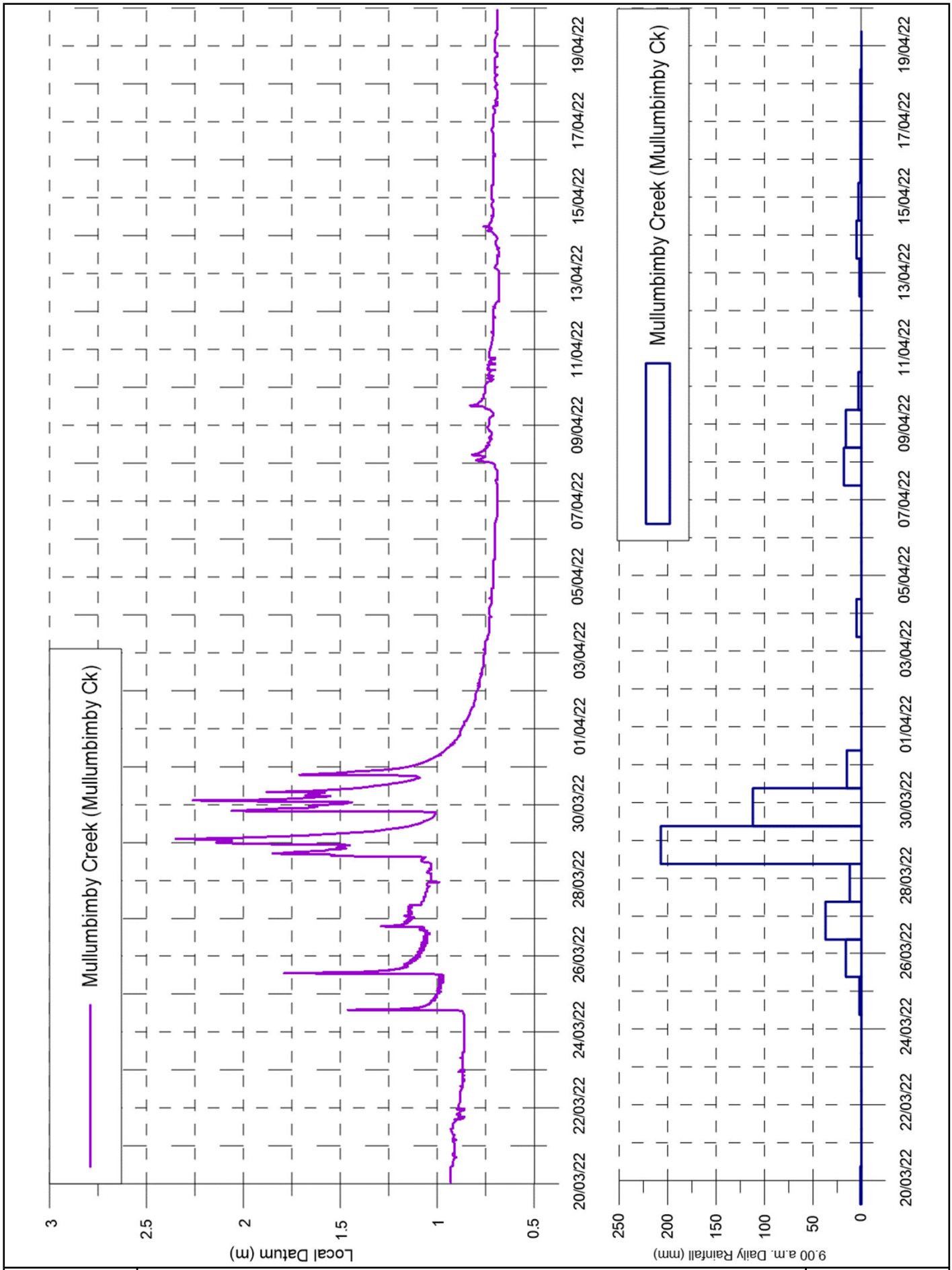
NSW GOVERNMENT

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
4.7

4.7.GRF



NSW GOVERNMENT

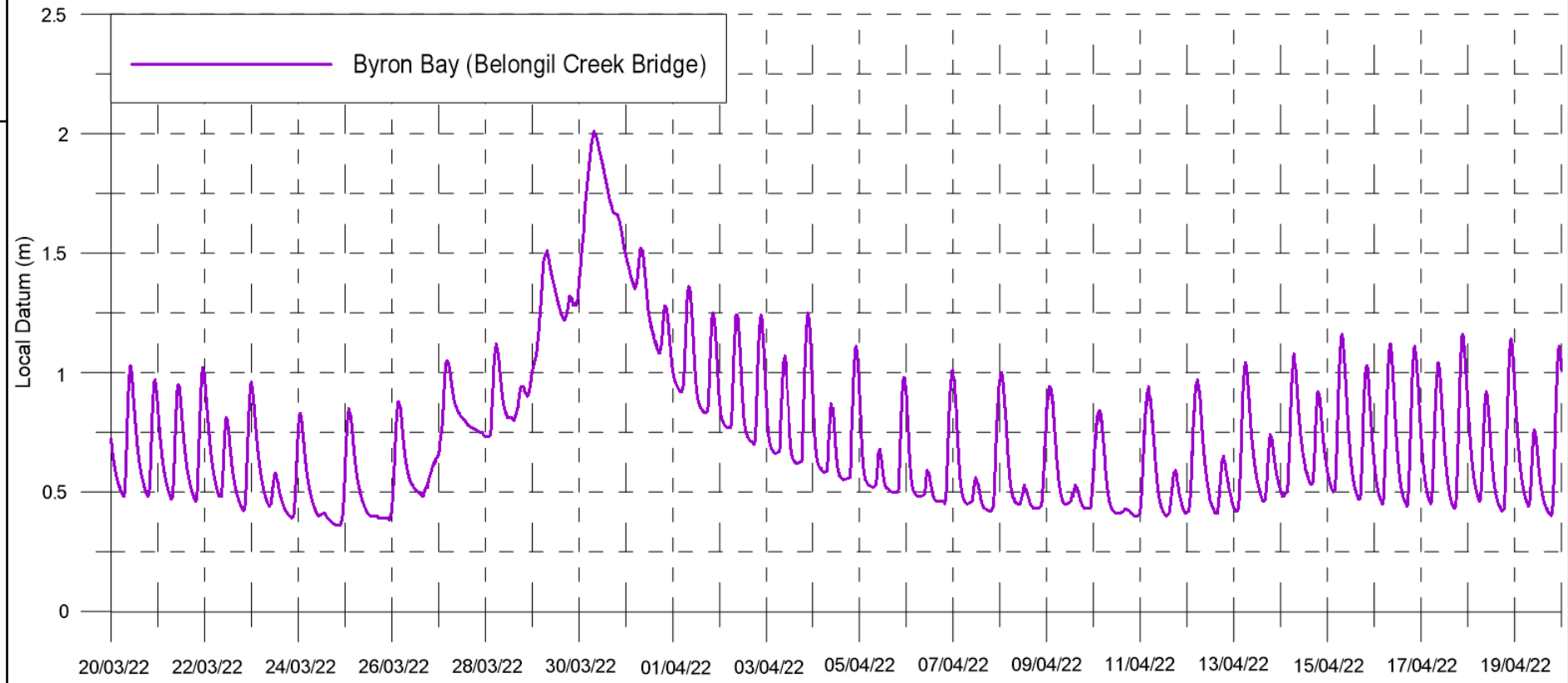
BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

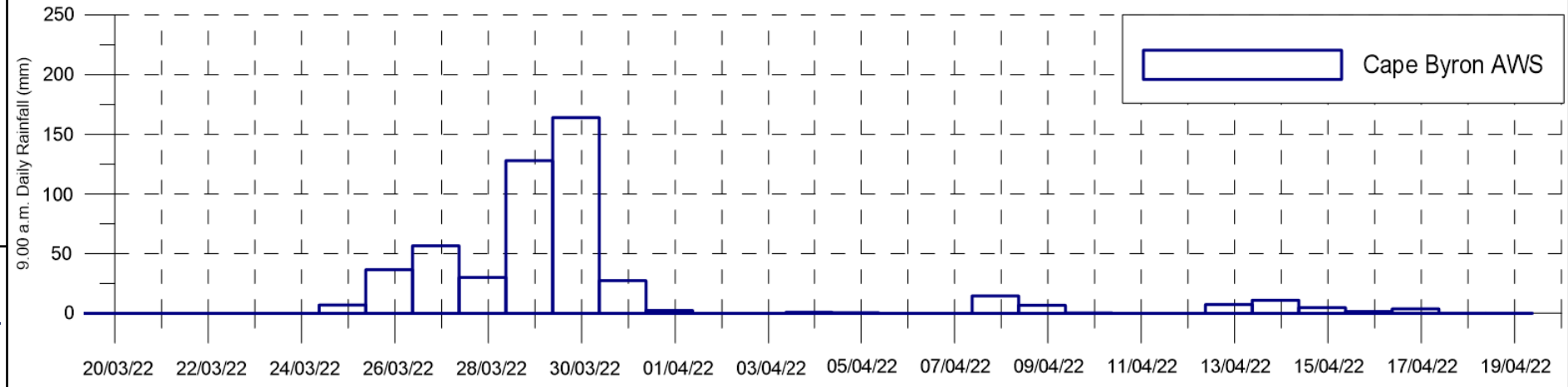
Manly Hydraulics Laboratory

Report MHL2895
Figure
4.8

4.8.GRF

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022





Manly Hydraulics Laboratory

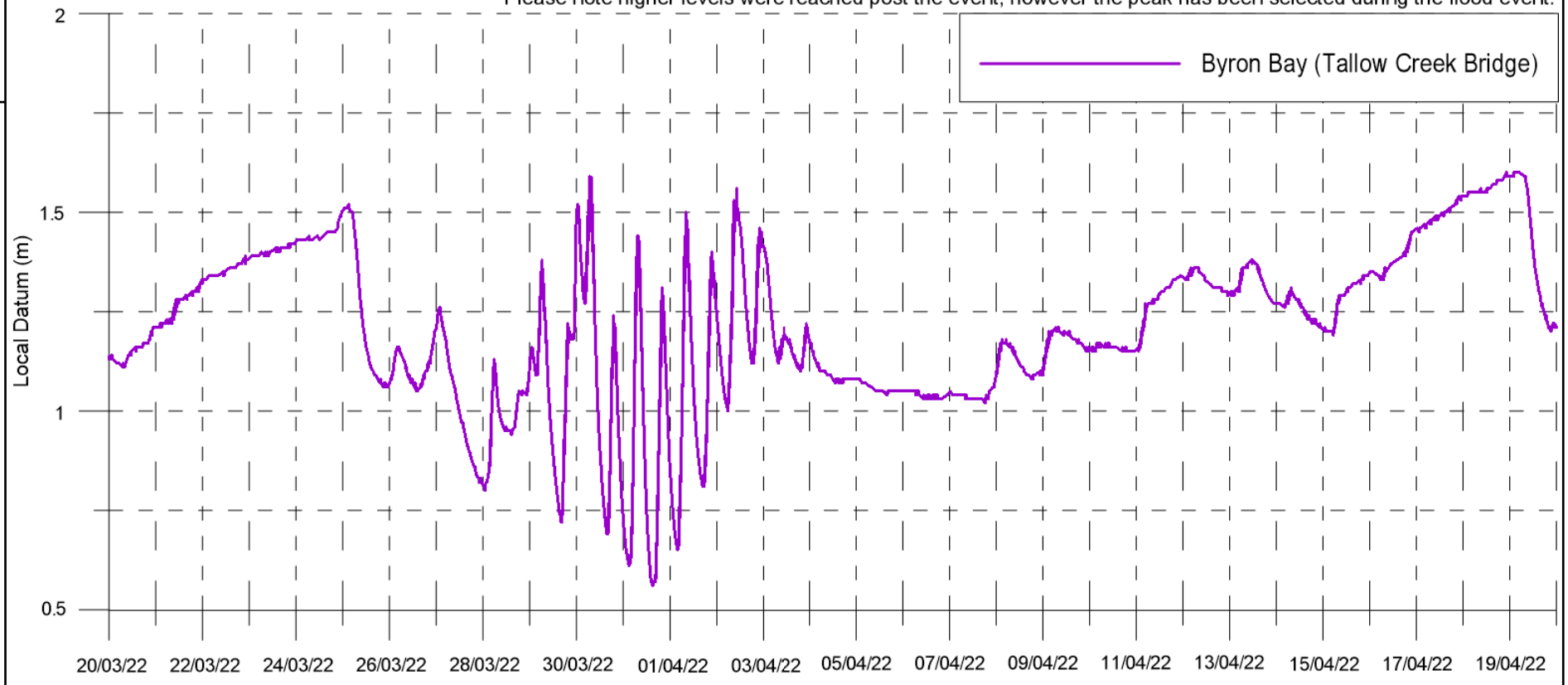
Report MHL2895
Figure 4.9

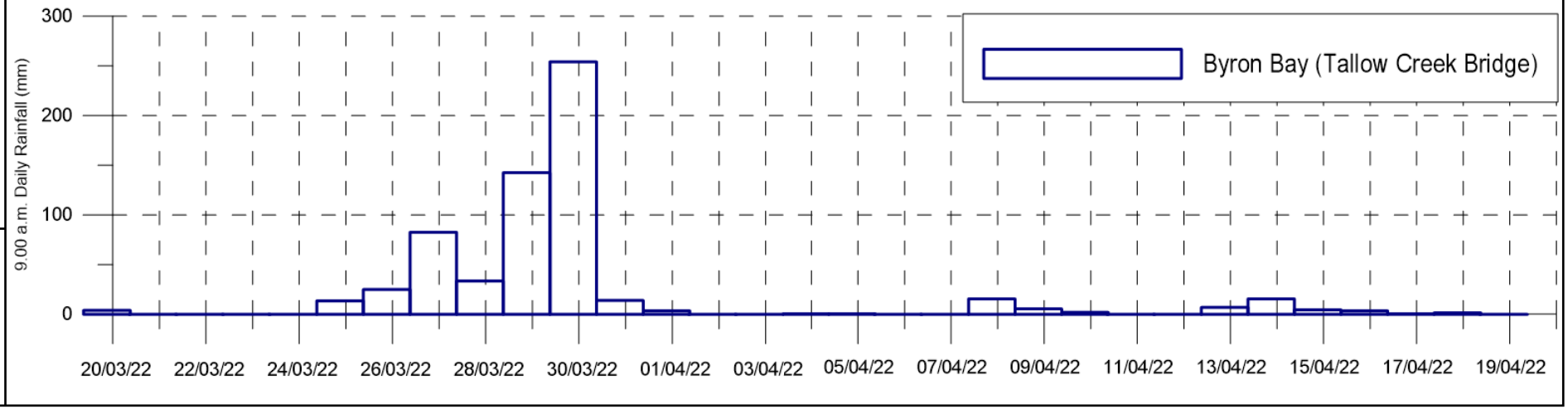
4.9.GRF

NSW GOVERNMENT

BRUNSWICK RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

*Please note higher levels were reached post the event, however the peak has been selected during the flood event.





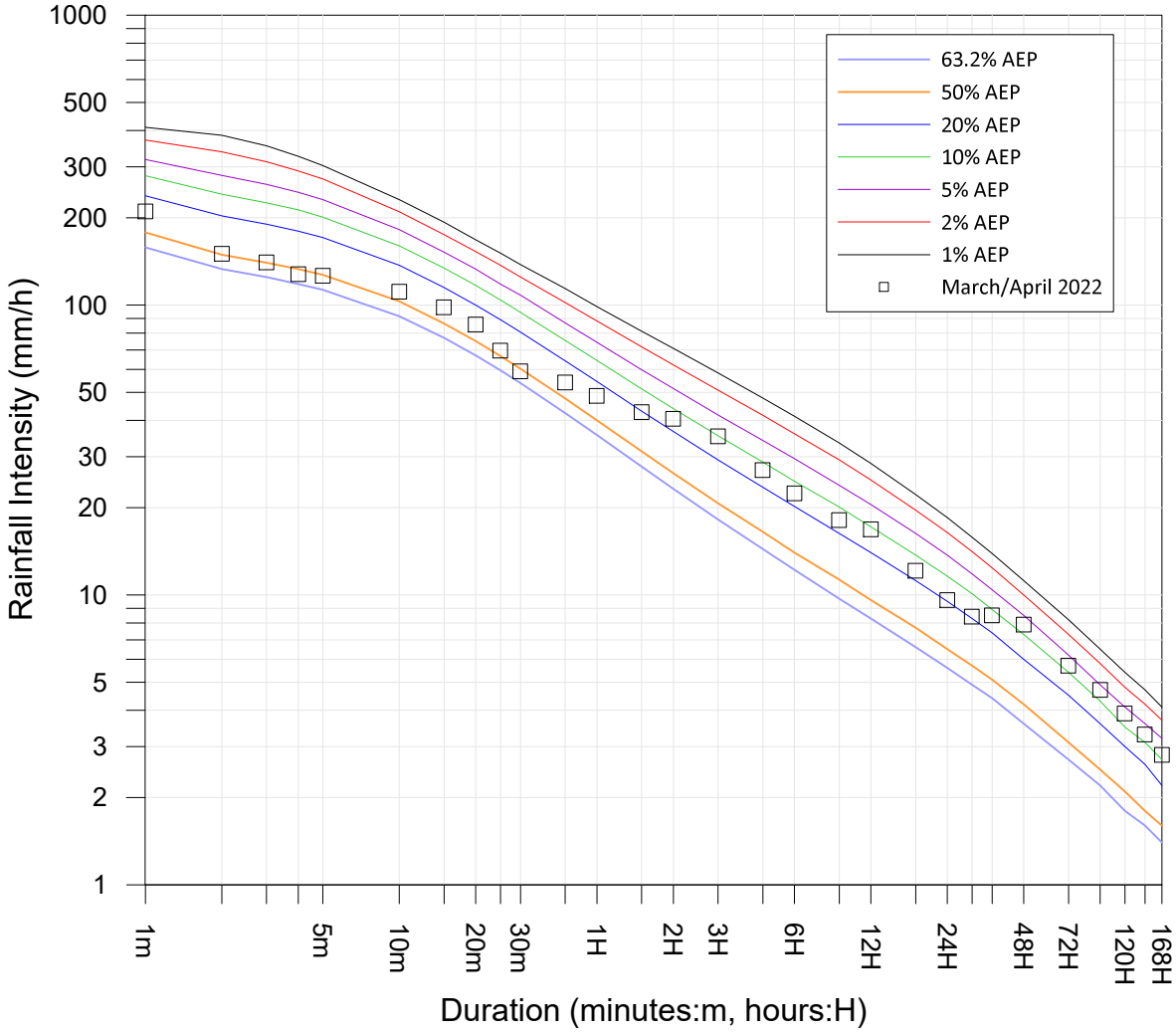
Manly Hydraulics Laboratory

Report MHL2895
Figure
4.10

4.10.GRF

Site Owner: North Byron Parklands
Latitude: -28.485 Longitude:153.514

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	210	22:55 28 Mar 2022
2m	150	19:42 29 Mar 2022
3m	140	19:42 29 Mar 2022
4m	127.5	19:44 29 Mar 2022
5m	126	19:44 29 Mar 2022
10m	111	19:48 29 Mar 2022
15m	98	19:48 29 Mar 2022
20m	85.5	19:50 29 Mar 2022
25m	69.6	19:55 29 Mar 2022
30m	59	20:00 29 Mar 2022
45m	54	23:28 28 Mar 2022
1H	48.5	23:48 28 Mar 2022
1.5H	42.7	23:33 28 Mar 2022
2H	40.5	23:48 28 Mar 2022
3H	35.2	23:57 28 Mar 2022
5H	26.9	01:27 29 Mar 2022
6H	22.4	01:50 29 Mar 2022
9H	18.1	00:00 29 Mar 2022
12H	16.8	02:14 29 Mar 2022
18H	12.1	03:18 29 Mar 2022
24H	9.6	03:18 29 Mar 2022
30H	8.4	21:27 29 Mar 2022
36H	8.5	03:03 30 Mar 2022
48H	7.9	08:09 30 Mar 2022
72H	5.7	22:55 30 Mar 2022
96H	4.7	15:13 30 Mar 2022
120H	3.9	15:09 30 Mar 2022
144H	3.3	13:18 31 Mar 2022
168H	2.8	16:07 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

YELGUN (YELGUN CREEK) (558096) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

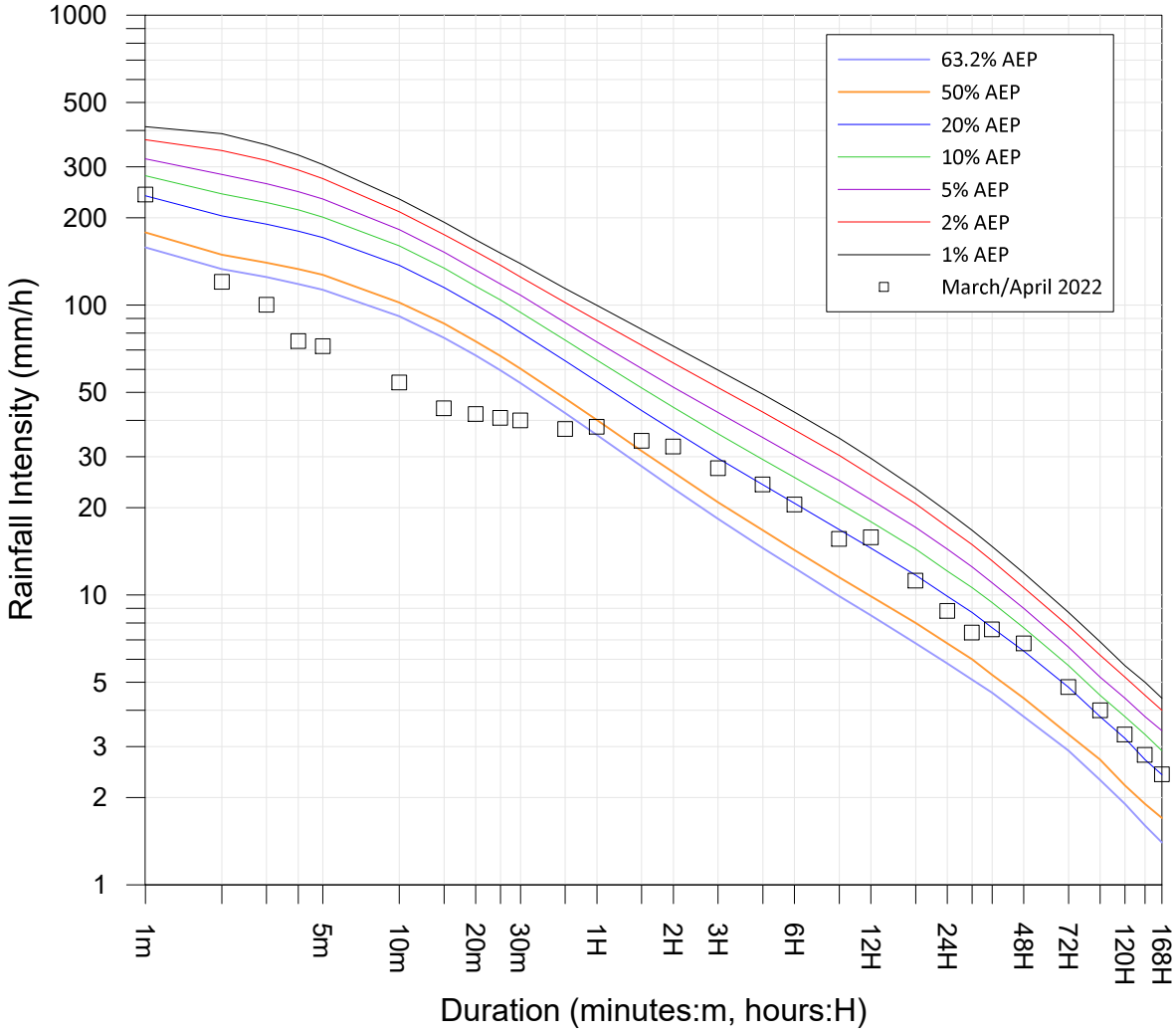
Manly Hydraulics Laboratory

Report MHL2895
Figure
4.11

IFD_558096_Figure 4.11.pdf

Site Owner: Byron Shire Council
Latitude: -28.4944 Longitude:153.4847

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	240	22:55 28 Mar 2022
2m	120	22:56 28 Mar 2022
3m	100	22:57 28 Mar 2022
4m	75	23:55 28 Mar 2022
5m	72	22:59 28 Mar 2022
10m	54	23:04 28 Mar 2022
15m	44	23:09 28 Mar 2022
20m	42	23:14 28 Mar 2022
25m	40.8	23:43 28 Mar 2022
30m	40	23:43 28 Mar 2022
45m	37.3	00:03 29 Mar 2022
1H	38	23:54 28 Mar 2022
1.5H	34	00:24 29 Mar 2022
2H	32.5	00:11 29 Mar 2022
3H	27.3	00:22 29 Mar 2022
5H	24	02:10 29 Mar 2022
6H	20.5	02:55 29 Mar 2022
9H	15.6	02:56 29 Mar 2022
12H	15.8	02:30 29 Mar 2022
18H	11.2	04:28 29 Mar 2022
24H	8.8	03:20 29 Mar 2022
30H	7.4	20:30 29 Mar 2022
36H	7.6	02:30 30 Mar 2022
48H	6.8	10:28 30 Mar 2022
72H	4.8	00:57 31 Mar 2022
96H	4	16:20 30 Mar 2022
120H	3.3	12:49 30 Mar 2022
144H	2.8	12:49 31 Mar 2022
168H	2.4	15:57 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

LACKS CREEK (MIDDLE POCKET) (558005) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

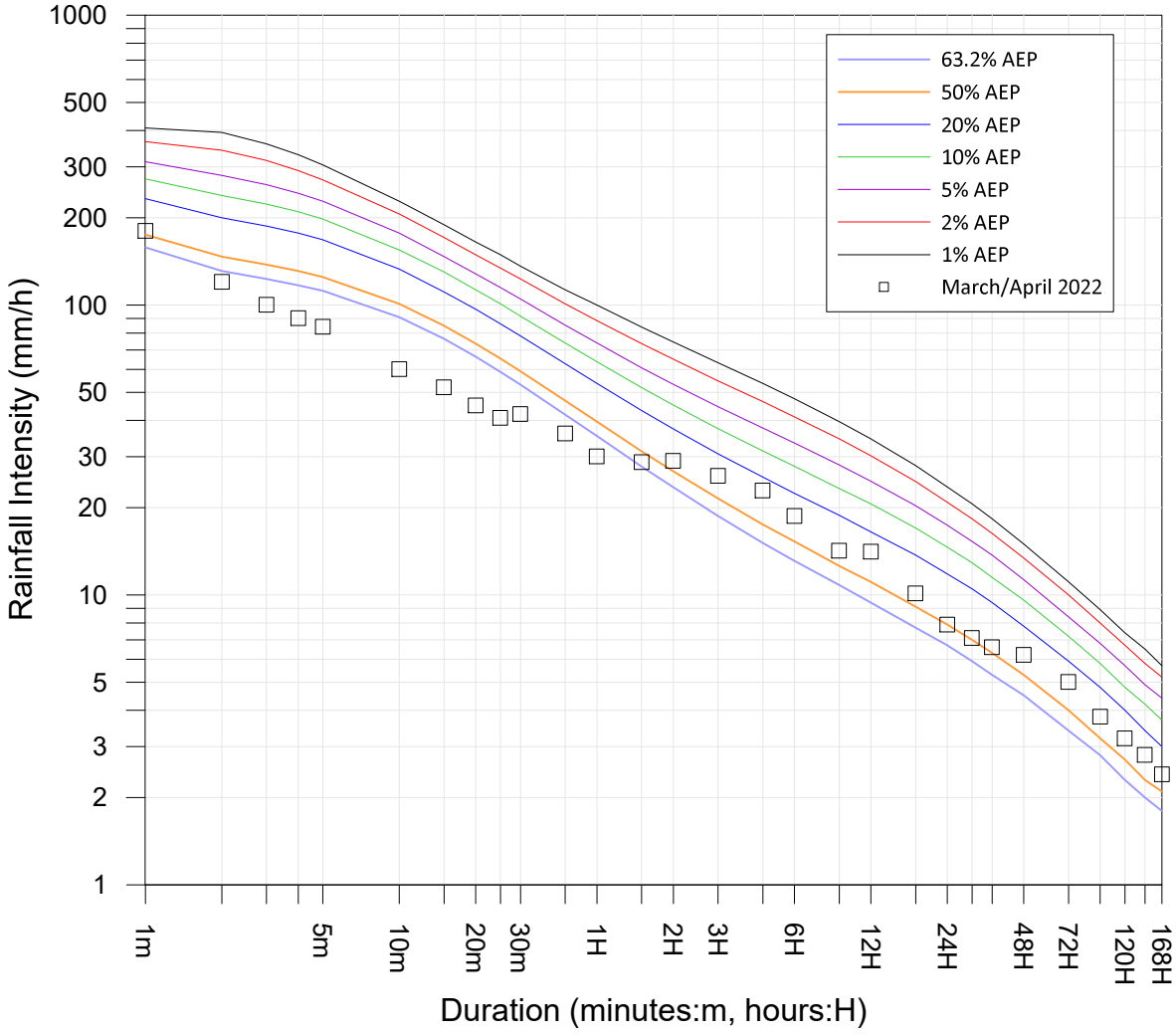
Manly Hydraulics Laboratory

Report MHL2895 Figure 4.12

IFD_558005_Figure 4.12.pdf

Site Owner: BoM
Latitude: -28.5031 Longitude:153.3817

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	180	07:48 30 Mar 2022
2m	120	15:05 28 Mar 2022
3m	100	19:58 29 Mar 2022
4m	90	19:59 29 Mar 2022
5m	84	20:00 29 Mar 2022
10m	60	20:05 29 Mar 2022
15m	52	20:06 29 Mar 2022
20m	45	20:10 29 Mar 2022
25m	40.8	20:20 29 Mar 2022
30m	42	20:25 29 Mar 2022
45m	36	20:30 29 Mar 2022
1H	30	20:45 29 Mar 2022
1.5H	28.7	01:57 29 Mar 2022
2H	29	01:56 29 Mar 2022
3H	25.7	02:29 29 Mar 2022
5H	22.9	02:40 29 Mar 2022
6H	18.7	02:58 29 Mar 2022
9H	14.2	02:46 29 Mar 2022
12H	14.1	02:49 29 Mar 2022
18H	10.1	04:14 29 Mar 2022
24H	7.9	03:54 29 Mar 2022
30H	7.1	20:49 29 Mar 2022
36H	6.6	02:34 30 Mar 2022
48H	6.2	10:46 30 Mar 2022
72H	5	02:53 31 Mar 2022
96H	3.8	02:53 01 Apr 2022
120H	3.2	14:23 31 Mar 2022
144H	2.8	11:46 31 Mar 2022
168H	2.4	11:46 01 Apr 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

MULLUMBIMBY (UPPER MAIN ARM) (558034) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

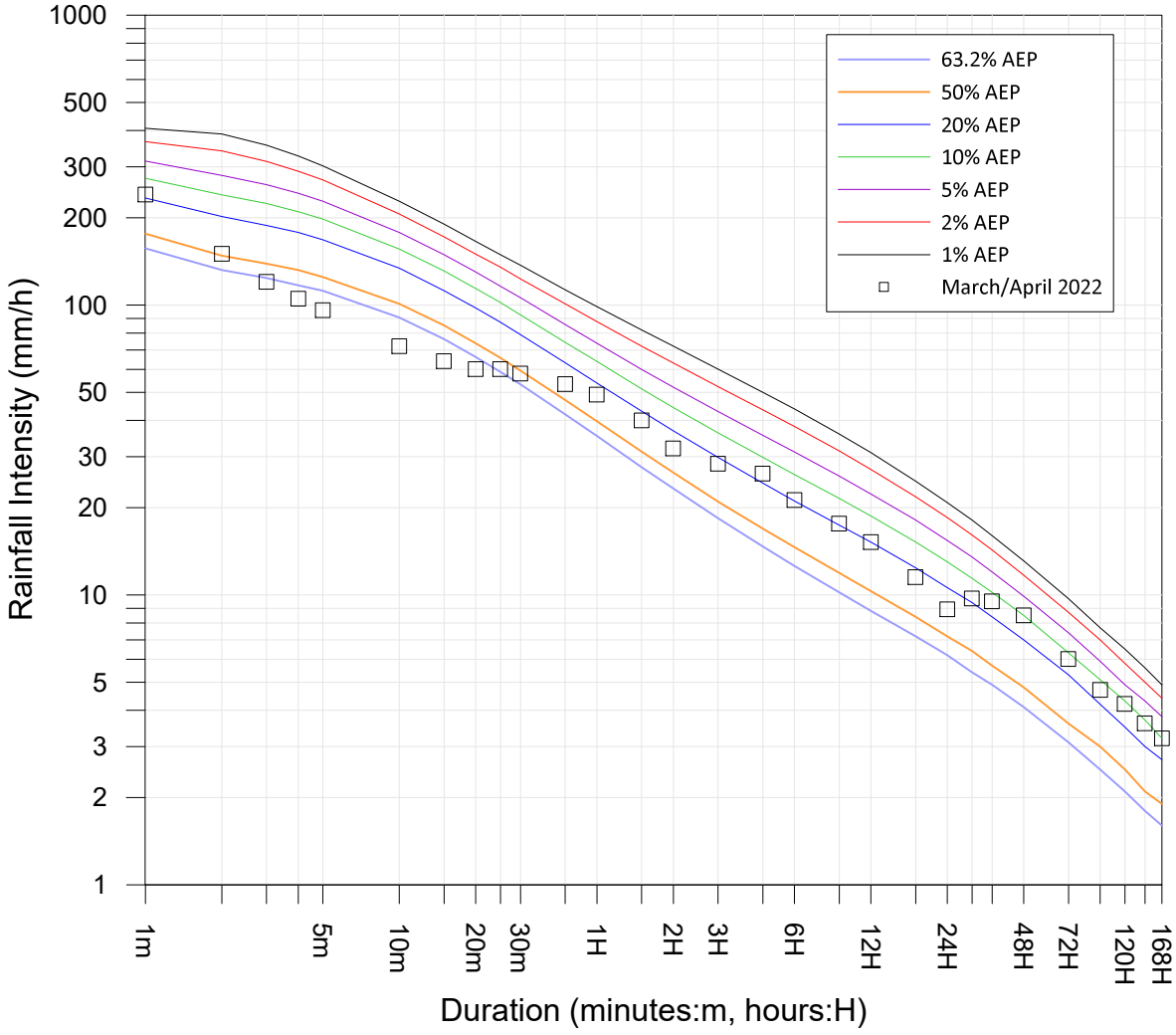
Manly Hydraulics Laboratory

Report MHL2895 Figure 4.13

IFD_558034_Figure 4.13.pdf

Site Owner: Byron Shire Council
Latitude: -28.5542 Longitude:153.4367

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	240	00:57 29 Mar 2022
2m	150	00:58 29 Mar 2022
3m	120	07:37 30 Mar 2022
4m	105	19:40 29 Mar 2022
5m	96	19:41 29 Mar 2022
10m	72	12:35 25 Mar 2022
15m	64	19:51 29 Mar 2022
20m	60	19:56 29 Mar 2022
25m	60	20:01 29 Mar 2022
30m	58	20:06 29 Mar 2022
45m	53.3	02:24 30 Mar 2022
1H	49	02:35 30 Mar 2022
1.5H	40	02:51 30 Mar 2022
2H	32	03:21 30 Mar 2022
3H	28.3	02:15 29 Mar 2022
5H	26.2	02:34 29 Mar 2022
6H	21.2	03:39 29 Mar 2022
9H	17.6	03:53 30 Mar 2022
12H	15.2	06:47 30 Mar 2022
18H	11.5	12:47 30 Mar 2022
24H	8.9	19:06 30 Mar 2022
30H	9.7	03:39 30 Mar 2022
36H	9.5	08:04 30 Mar 2022
48H	8.5	10:55 30 Mar 2022
72H	6	01:11 31 Mar 2022
96H	4.7	15:27 30 Mar 2022
120H	4.2	11:45 30 Mar 2022
144H	3.6	12:55 30 Mar 2022
168H	3.2	12:55 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

MULLUMBIMBY CREEK (MULLUMBIMBY CK) (558008)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

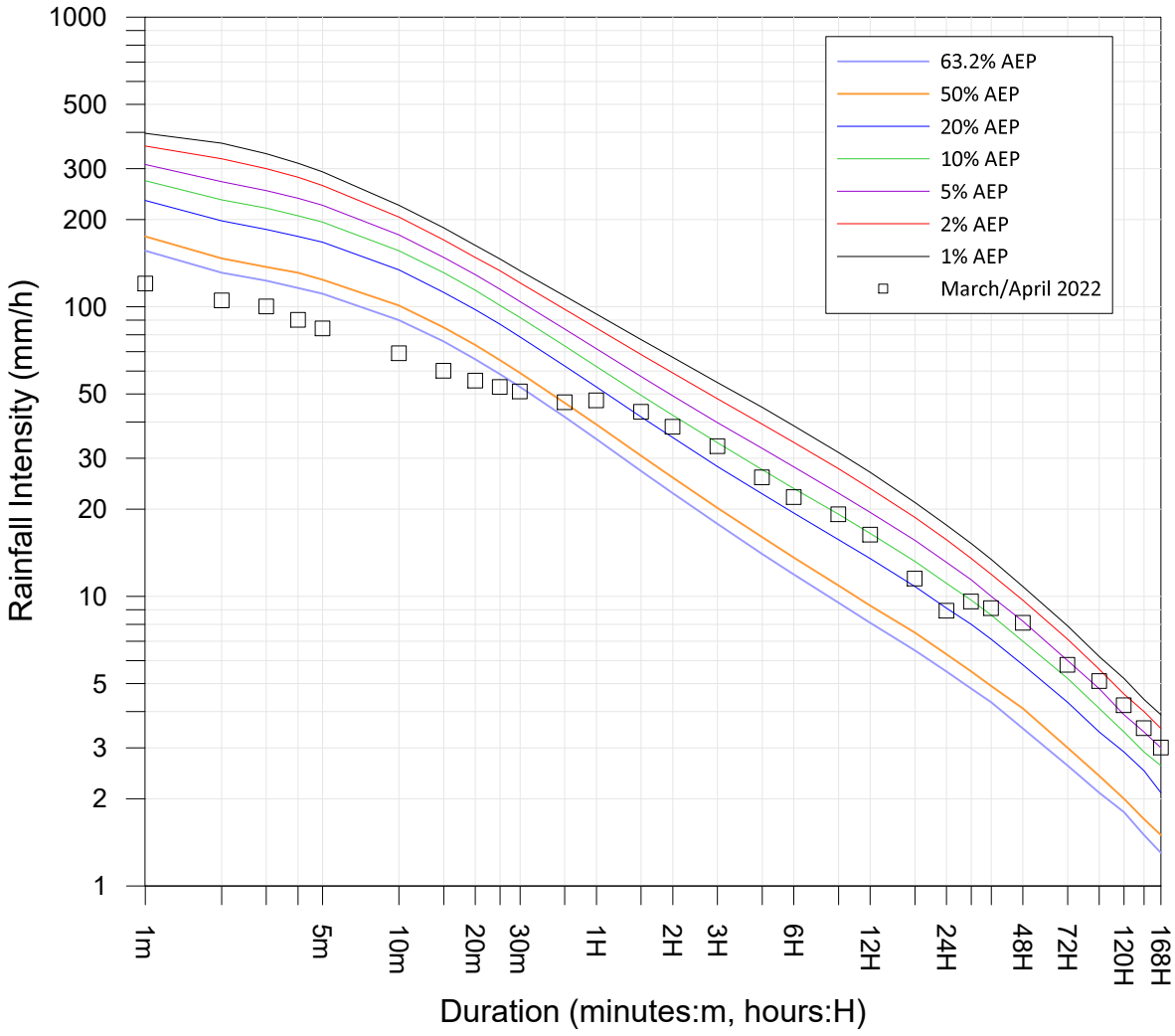
Manly Hydraulics Laboratory

Report MHL2895
Figure
4.14

IFD_558008_Figure 4.14.pdf

Site Owner: DPE BCD
Latitude: -28.5894 Longitude:153.5167

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	120	20:04 07 Apr 2022
2m	105	22:42 29 Mar 2022
3m	100	22:43 29 Mar 2022
4m	90	22:44 29 Mar 2022
5m	84	22:45 29 Mar 2022
10m	69	02:34 30 Mar 2022
15m	60	02:34 30 Mar 2022
20m	55.5	21:47 29 Mar 2022
25m	52.8	21:47 29 Mar 2022
30m	51	21:49 29 Mar 2022
45m	46.7	21:49 29 Mar 2022
1H	47.5	21:38 29 Mar 2022
1.5H	43.3	21:52 29 Mar 2022
2H	38.5	21:56 29 Mar 2022
3H	33	23:03 29 Mar 2022
5H	25.7	00:26 30 Mar 2022
6H	22	02:36 30 Mar 2022
9H	19.2	03:55 30 Mar 2022
12H	16.3	07:56 30 Mar 2022
18H	11.5	12:29 30 Mar 2022
24H	8.9	12:28 30 Mar 2022
30H	9.6	03:43 30 Mar 2022
36H	9.1	07:52 30 Mar 2022
48H	8.1	08:00 30 Mar 2022
72H	5.8	22:08 30 Mar 2022
96H	5.1	14:07 30 Mar 2022
120H	4.2	12:06 30 Mar 2022
144H	3.5	12:02 31 Mar 2022
168H	3	12:02 01 Apr 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

MYOCUM (558036)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

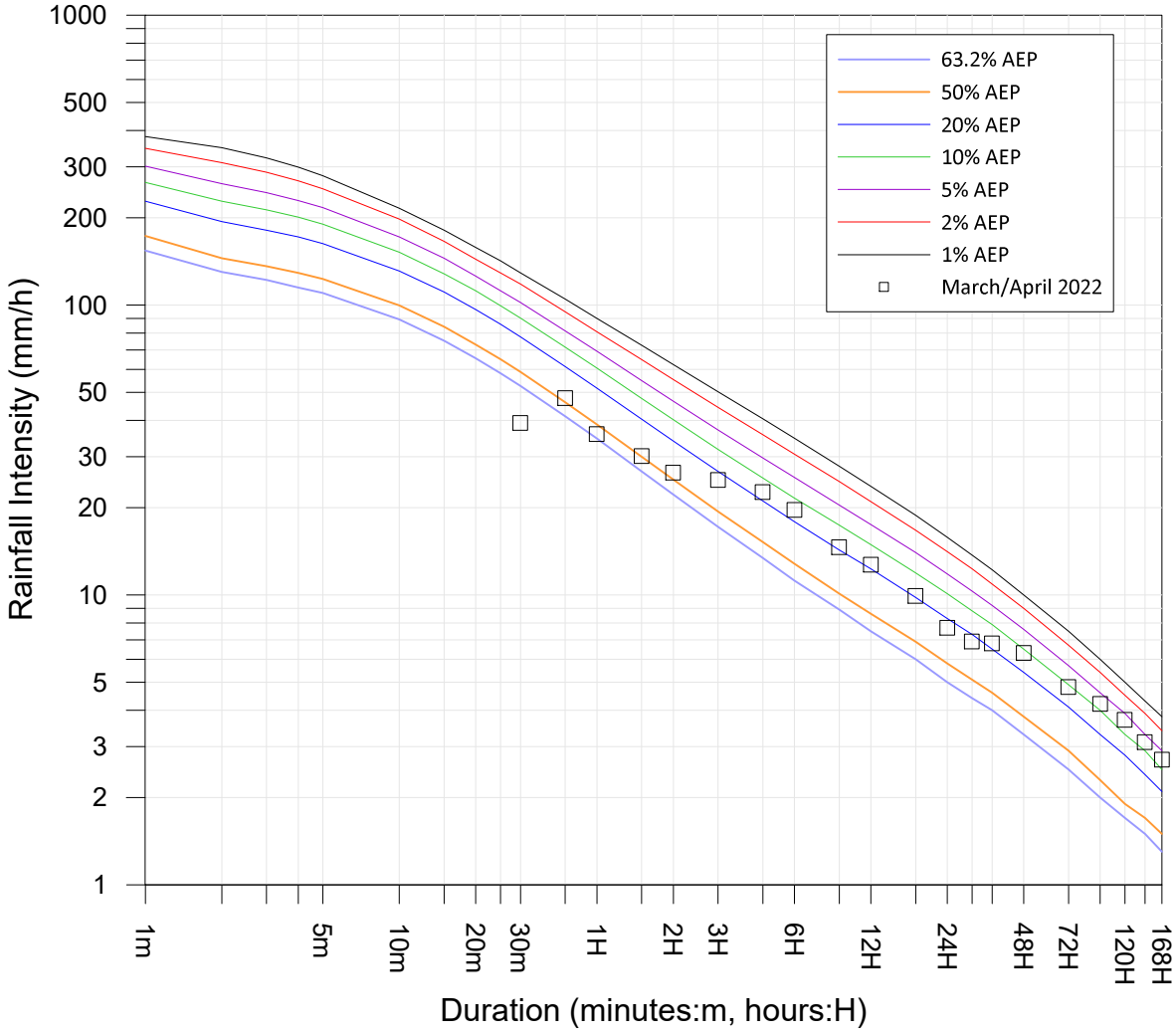
Manly Hydraulics Laboratory

Report MHL2895
Figure
4.15

IFD_558036_Figure 4.15.pdf

Site Owner: BoM
Latitude: -28.6399 Longitude:153.6358

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	-	-
2m	-	-
3m	-	-
4m	-	-
5m	-	-
10m	-	-
15m	-	-
20m	-	-
25m	-	-
30m	39.2	23:59 29 Mar 2022
45m	47.7	23:44 29 Mar 2022
1H	35.8	23:59 29 Mar 2022
1.5H	30.1	23:59 29 Mar 2022
2H	26.4	23:59 29 Mar 2022
3H	24.9	00:29 30 Mar 2022
5H	22.6	01:59 30 Mar 2022
6H	19.6	03:29 30 Mar 2022
9H	14.6	06:29 30 Mar 2022
12H	12.7	09:29 30 Mar 2022
18H	9.9	11:59 30 Mar 2022
24H	7.7	11:59 30 Mar 2022
30H	6.9	03:59 30 Mar 2022
36H	6.8	09:59 30 Mar 2022
48H	6.3	11:59 30 Mar 2022
72H	4.8	21:59 30 Mar 2022
96H	4.2	16:29 30 Mar 2022
120H	3.7	12:59 30 Mar 2022
144H	3.1	21:59 30 Mar 2022
168H	2.7	21:59 31 Mar 2022

Rainfall is totalised at 30 minute intervals.
Short duration IFD results removed.

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

CAPE BYRON AWS (58216)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

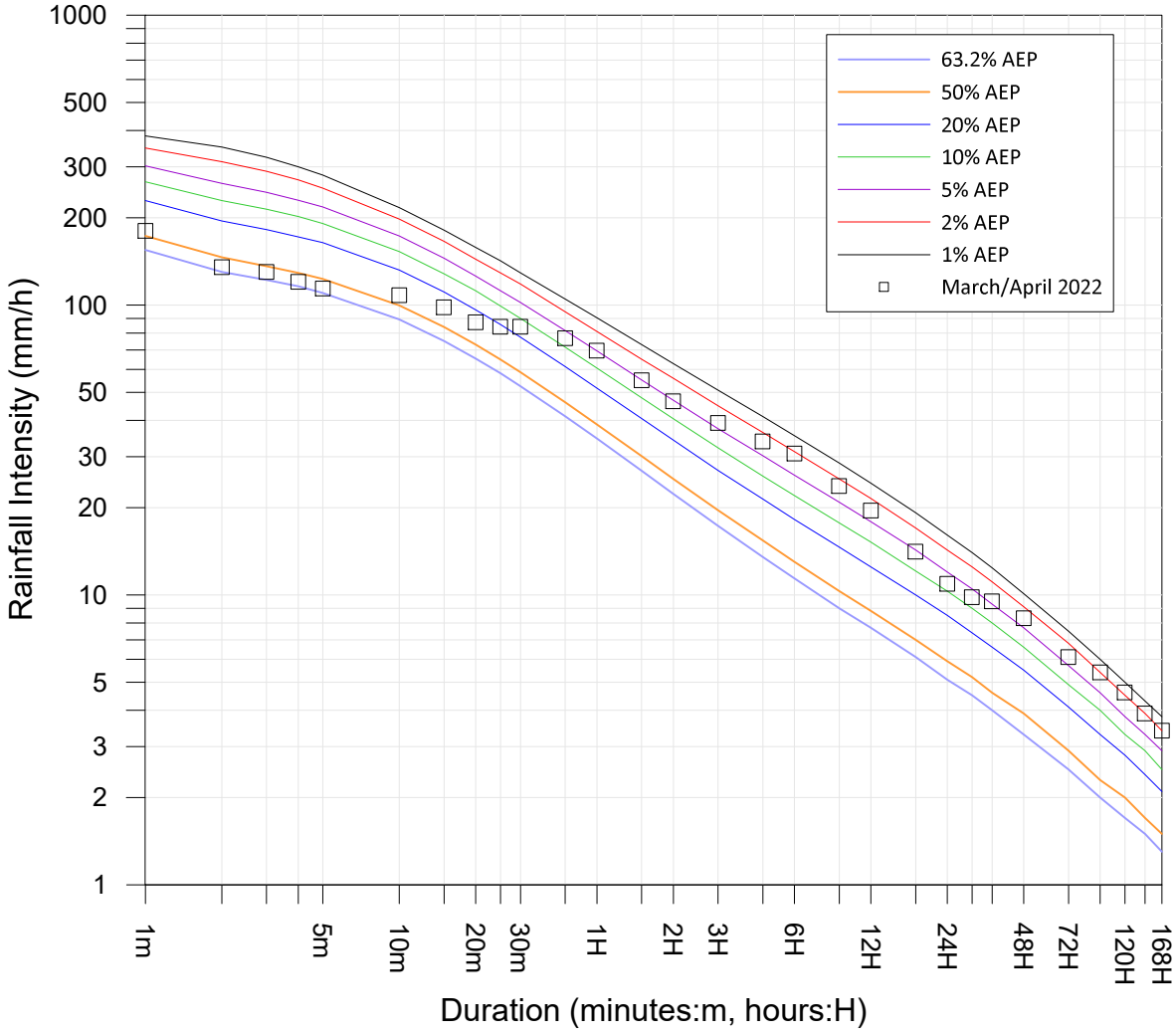
Manly Hydraulics Laboratory

Report MHL2895
Figure
4.16

IFD_58216_Figure 4.16.pdf

Site Owner: Byron Shire Council
Latitude: -28.6725 Longitude:153.6182

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	180	02:08 30 Mar 2022
2m	135	02:09 30 Mar 2022
3m	130	23:03 29 Mar 2022
4m	120	23:04 29 Mar 2022
5m	114	23:05 29 Mar 2022
10m	108	23:05 29 Mar 2022
15m	98	23:07 29 Mar 2022
20m	87	23:12 29 Mar 2022
25m	84	23:04 29 Mar 2022
30m	84	23:05 29 Mar 2022
45m	76.7	23:22 29 Mar 2022
1H	69.5	23:35 29 Mar 2022
1.5H	55	23:48 29 Mar 2022
2H	46.5	23:38 29 Mar 2022
3H	39.2	01:18 30 Mar 2022
5H	33.8	02:48 30 Mar 2022
6H	30.7	02:57 30 Mar 2022
9H	23.7	05:59 30 Mar 2022
12H	19.5	08:57 30 Mar 2022
18H	14.1	11:10 30 Mar 2022
24H	10.9	12:20 30 Mar 2022
30H	9.8	03:44 30 Mar 2022
36H	9.5	07:31 30 Mar 2022
48H	8.3	08:11 30 Mar 2022
72H	6.1	22:09 30 Mar 2022
96H	5.4	15:51 30 Mar 2022
120H	4.6	23:59 30 Mar 2022
144H	3.9	21:17 30 Mar 2022
168H	3.4	21:17 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

BYRON BAY (TALLOW CREEK BRIDGE) (558098) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895 Figure 4.17

IFD_558098_Figure 4.17.pdf

5 Wilsons River region

5.1 Wilsons River region – water level

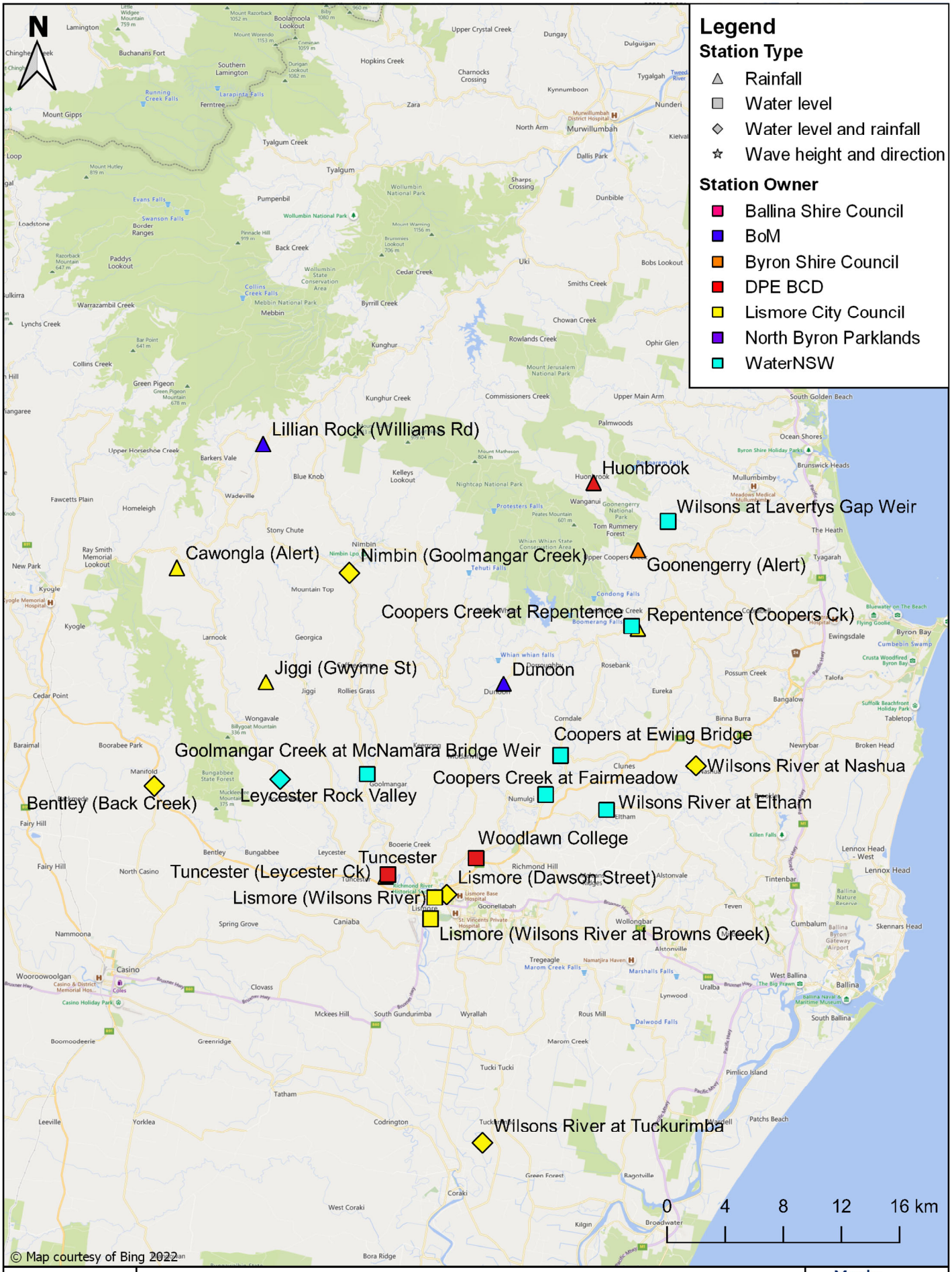
The peak observed water levels for the Wilsons River region are listed in **Table 5.1**. **Table 5.2** lists the SES flood classifications for Lismore (BoM, 2013). The locations of water level stations within the Wilsons River region are shown in **Figure 5-1**. The water level data for the period 20 March to 20 April 2022 are displayed graphically in **Figure 5-2** to **Figure 5-16**. WaterNSW local datum conversions to AHD are provided in **Appendix C** .

Table 5.1 Wilsons River region flood peaks

Station name	Station number	Owner	Datum	Level (m)	Date and time of flood peak
Wilsons at Lavertys Gap Weir	203062	WaterNSW	Local	2.98	29/03/2022 02:45
Nimbin (Goolmangar Creek)	58180	Lismore City Council	Local	7.31	29/03/2022 04:05
Coopers Creek at Repentence	203002	WaterNSW	Local	4.28	29/03/2022 01:30
Coopers at Ewing Bridge	203024	WaterNSW	Local	10.37	30/03/2022 08:00
Wilsons River at Nashua	58162	Lismore City Council	Local	9.56	30/03/2022 05:24
Goolmangar Creek at McNamara Bridge Weir	203061	WaterNSW	Local	8.77	29/03/2022 12:15
Leycester Rock Valley	203010	WaterNSW	Local	9.36	29/03/2022 10:15
Bentley (Back Creek)	58202	Lismore City Council	Local	10.12	29/03/2022 08:54
Coopers Creek at Fairmeadow	203060	WaterNSW	Local	9.86	30/03/2022 08:30
Wilsons River at Eltham	203014	WaterNSW	Local	10.43	30/03/2022 07:30
Woodlawn College	203402	DPE BCD	AHD	11.89	30/03/2022 14:00
Tuncester (Leycester Creek)	203443	DPE BCD	AHD	12.09	30/03/2022 19:00
Lismore (Dawson Street)	558087	Lismore City Council	Local	10.48	31/03/2022 02:02
Lismore (Wilson River)	58176	Lismore City Council	AHD	11.40	30/03/2022 16:04
Lismore (Wilsons River at Browns Creek)	558100	Lismore City Council	Local	11.34	30/03/2022 15:34
Wilsons River at Tuckurimba	558076	Lismore City Council	Local	7.09	31/03/2022 05:06

Table 5.2 SES flood classification for Wilsons River region stations

Station name	Station number		Flood classification			Flood peak (m)	Datum	Flood event classification
	Bureau number	AWRC number	Minor	Moderate	Major			
			Water level (m)					
Lismore	58176	203904	4.2	7.2	9.7	11.40	AHD	Major



NSW GOVERNMENT

WILSONS RIVER STATIONS

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Report MHL2895
Figure
5.1

Figures_MHL2895.qgs

5.2 Wilsons River region – rainfall

24-hour rainfall totals up until 9:00 a.m. are displayed in **Table 5.3** to **Table 5.5** for the period 20 March to 20 April 2022. The water level and rainfall data for the period 20 March to 20 April 2022 are displayed graphically in **Figure 5-2** to **Figure 5-16**. The rainfall intensities are displayed graphically in **Figure 5-17** to **Figure 5-27**, in ARR2019 format. **Appendix B** provides ARR1987 format. Wilsons River region station data losses are reported in **Appendix A** .

Table 5.3 Wilsons River region daily rainfall totals

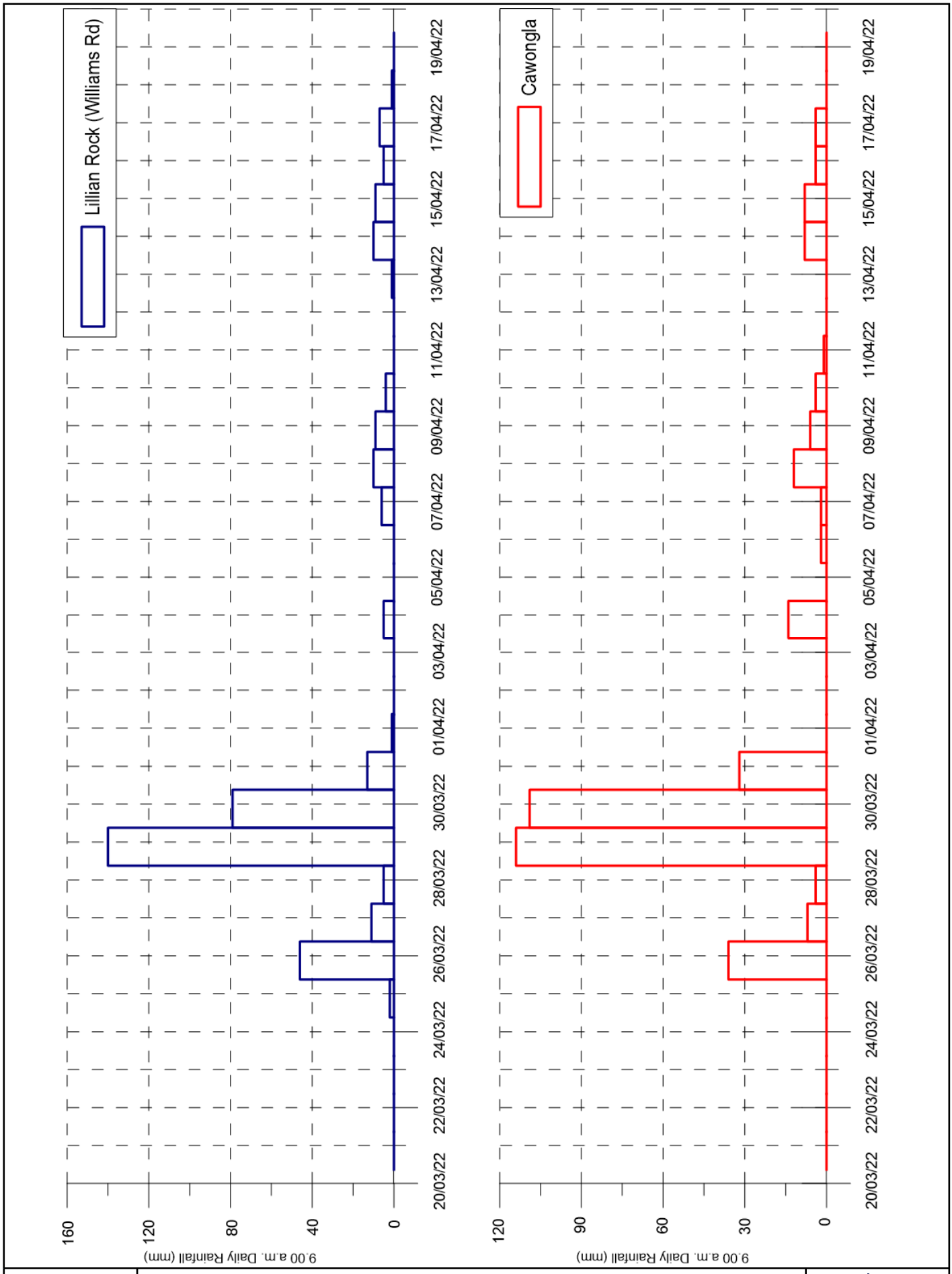
Date	Lillian Rock (Williams Road) 58148 (mm) BoM	Huonbrook 558049 (mm) DPE BCD	Goonengerry (Alert) 558033 (mm) Byron Shire Council	Cawongla (Alert) 558024 (mm) Lismore City Council
20/03/2022	5.0	0.5	3.0	2.0
21/03/2022	0.0	0.5	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.0	0.0	0.0
24/03/2022	0.0	0.0	0.0	0.0
25/03/2022	2.0	5.5	8.0	0.0
26/03/2022	46.0	65.5	69.0	36.0
27/03/2022	11.0	27.0	48.0	7.0
28/03/2022	5.0	11.5	11.0	4.0
29/03/2022	140.0	183.5	214.0	114.0
30/03/2022	79.0	84.0	152.0	109.0
31/03/2022	13.0	58.5	53.0	32.0
01/04/2022	1.0	2.5	3.0	0.0
02/04/2022	0.0	0.5	0.0	0.0
03/04/2022	0.0	0.0	0.0	0.0
04/04/2022	5.0	1.5	2.0	14.0
05/04/2022	0.0	0.5	0.0	0.0
06/04/2022	0.0	0.0	0.0	2.0
07/04/2022	6.0	0.0	0.0	2.0
08/04/2022	10.0	24.0	35.0	12.0
09/04/2022	9.0	12.5	12.0	6.0
10/04/2022	4.0	11.5	9.0	4.0
11/04/2022	0.0	0.0	0.0	1.0
12/04/2022	0.0	0.0	0.0	0.0
13/04/2022	1.0	3.5	10.0	0.0
14/04/2022	10.0	11.5	16.0	8.0
15/04/2022	9.0	5.0	9.0	8.0
16/04/2022	5.0	2.5	1.0	4.0
17/04/2022	7.0	7.5	13.0	4.0
18/04/2022	1.0	1.0	0.0	0.0
19/04/2022	0.0	0.0	0.0	0.0
20/04/2022	0.0	0.5	0.0	0.0

Table 5.4 Wilsons River region daily rainfall totals (cont.)

Date	Nimbin (Goolmangar Creek) 58180 (mm)	Repentence (Coopers Creek) 558000 (mm)	Jiggi (Gwynne Street) 558086 (mm)	Dunoon 558031 (mm)
	Lismore City Council	Lismore City Council	Lismore City Council	BoM
20/03/2022	5.0	5.0	4.0	4.0
21/03/2022	0.0	0.0	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.0	0.0	0.0
24/03/2022	0.0	0.0	0.0	0.0
25/03/2022	6.0	16.0	1.0	5.0
26/03/2022	52.0	18.0	27.0	30.0
27/03/2022	18.0	56.0	16.0	53.0
28/03/2022	4.0	10.0	6.0	8.0
29/03/2022	133.0	150.0	117.0	144.0
30/03/2022	100.0	247.0	94.0	183.0
31/03/2022	12.0	61.0	12.0	14.0
01/04/2022	1.0	2.0	0.0	0.0
02/04/2022	0.0	0.0	0.0	0.0
03/04/2022	0.0	0.0	0.0	0.0
04/04/2022	6.0	0.0	8.0	2.0
05/04/2022	1.0	2.0	0.0	0.0
06/04/2022	0.0	1.0	0.0	0.0
07/04/2022	1.0	0.0	20.0	0.0
08/04/2022	10.0	22.0	17.0	17.0
09/04/2022	5.0	19.0	14.0	14.0
10/04/2022	4.0	3.0	23.0	15.0
11/04/2022	0.0	1.0	1.0	0.0
12/04/2022	0.0	0.0	0.0	0.0
13/04/2022	3.0	7.0	0.0	4.0
14/04/2022	21.0	4.0	11.0	7.0
15/04/2022	7.0	4.0	7.0	12.0
16/04/2022	5.0	3.0	5.0	3.0
17/04/2022	5.0	9.0	5.0	8.0
18/04/2022	0.0	2.0	1.0	0.0
19/04/2022	0.0	0.0	0.0	0.0
20/04/2022	1.0	0.0	0.0	0.0

Table 5.5 Wilsons River region daily rainfall totals (cont.)

Date	Leycester Rock Valley 203010 (mm) WaterNSW	Bentley (Back Creek) 58202 (mm) Lismore City Council	Tuncester 58201 (mm) Lismore City Council	Wilsons River at Tuckurimba 558076 (mm) Lismore City Council
20/03/2022	1.0	3.0	2.0	5.0
21/03/2022	0.0	0.0	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.0	0.0	0.0
24/03/2022	0.0	0.0	0.0	0.0
25/03/2022	0.0	1.0	11.0	71.0
26/03/2022	112.0	71.0	18.0	18.0
27/03/2022	9.0	8.0	12.0	81.0
28/03/2022	3.0	5.0	5.0	35.0
29/03/2022	105.5	139.0	116.0	103.0
30/03/2022	93.5	103.0	179.0	340.0
31/03/2022	8.5	12.0	4.0	6.0
01/04/2022	0.0	0.0	1.0	0.0
02/04/2022	0.0	0.0	0.0	0.0
03/04/2022	0.0	0.0	0.0	0.0
04/04/2022	10.5	21.0	5.0	6.0
05/04/2022	0.5	0.0	1.0	0.0
06/04/2022	0.0	0.0	0.0	0.0
07/04/2022	5.0	18.0	3.0	1.0
08/04/2022	10.5	8.0	10.0	12.0
09/04/2022	14.0	16.0	12.0	12.0
10/04/2022	23.5	5.0	4.0	2.0
11/04/2022	0.0	1.0	1.0	0.0
12/04/2022	0.0	0.0	0.0	0.0
13/04/2022	0.5	1.0	0.0	5.0
14/04/2022	7.5	14.0	5.0	9.0
15/04/2022	8.0	17.0	4.0	5.0
16/04/2022	6.5	4.0	3.0	2.0
17/04/2022	4.5	5.0	4.0	2.0
18/04/2022	0.0	0.0	0.0	0.0
19/04/2022	0.0	1.0	0.0	0.0
20/04/2022	0.0	0.0	0.0	0.0



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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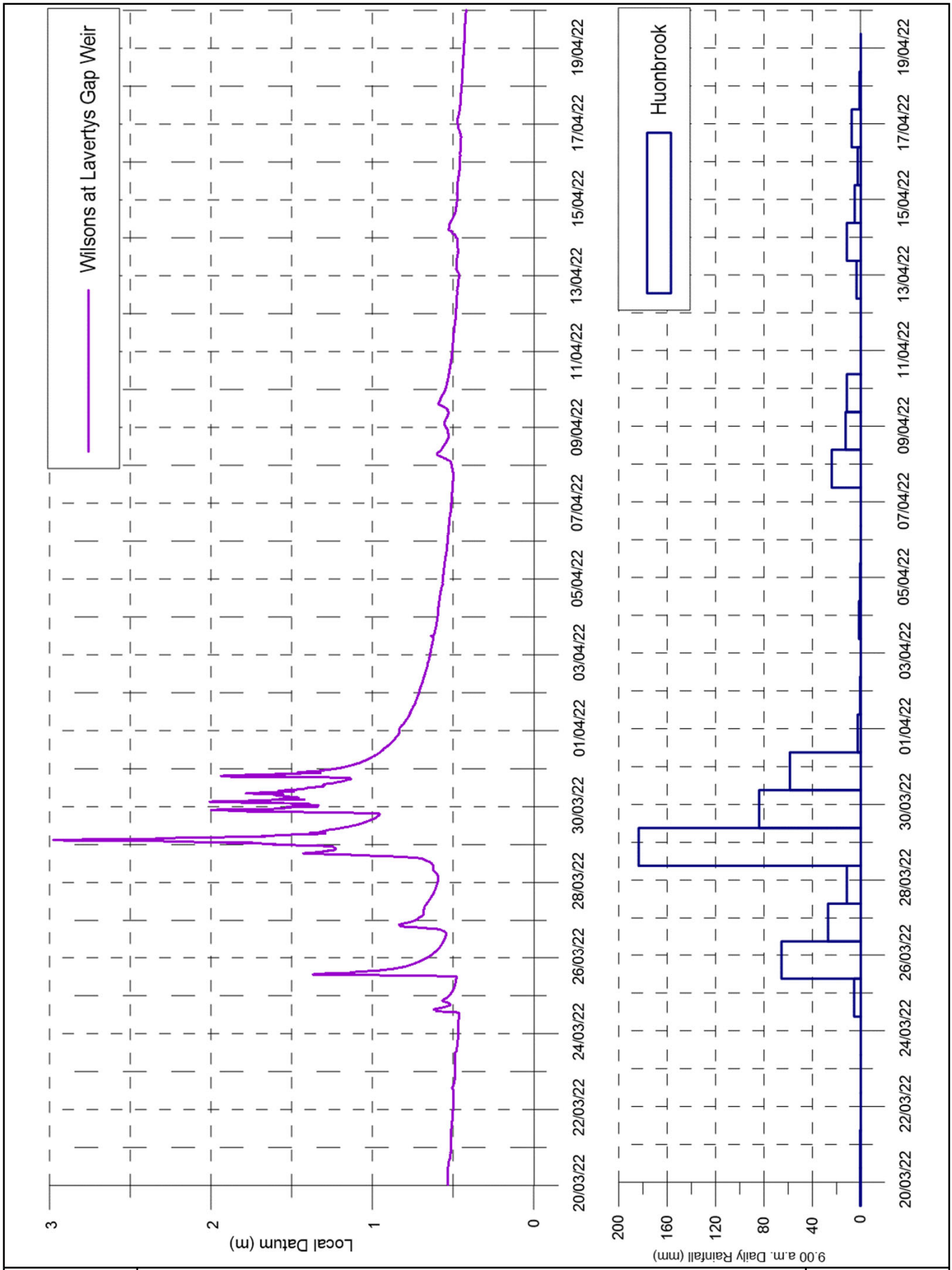
Figure
5.2

5.2.GRF



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WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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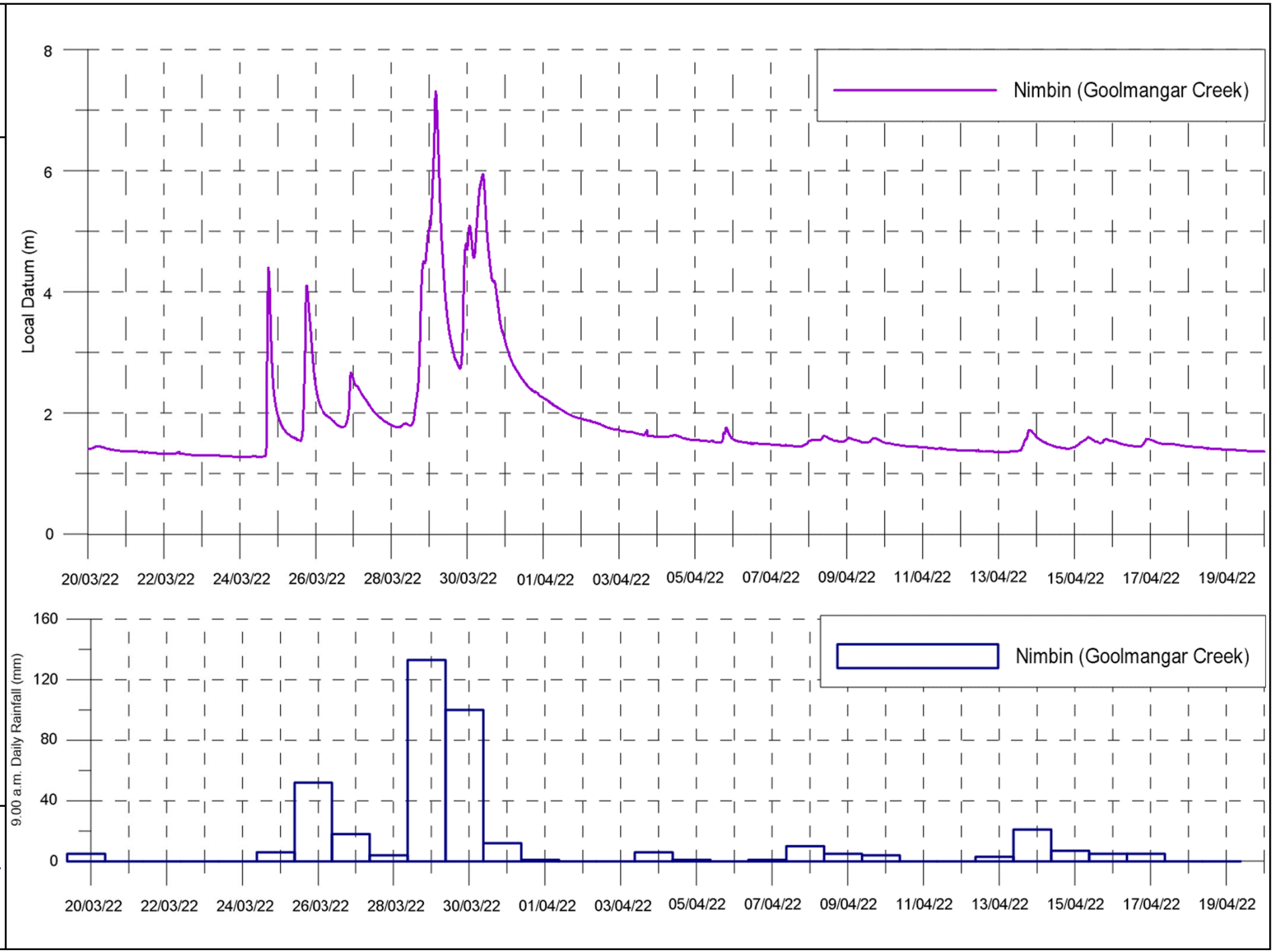
Figure
5.3

5.3.GRF



WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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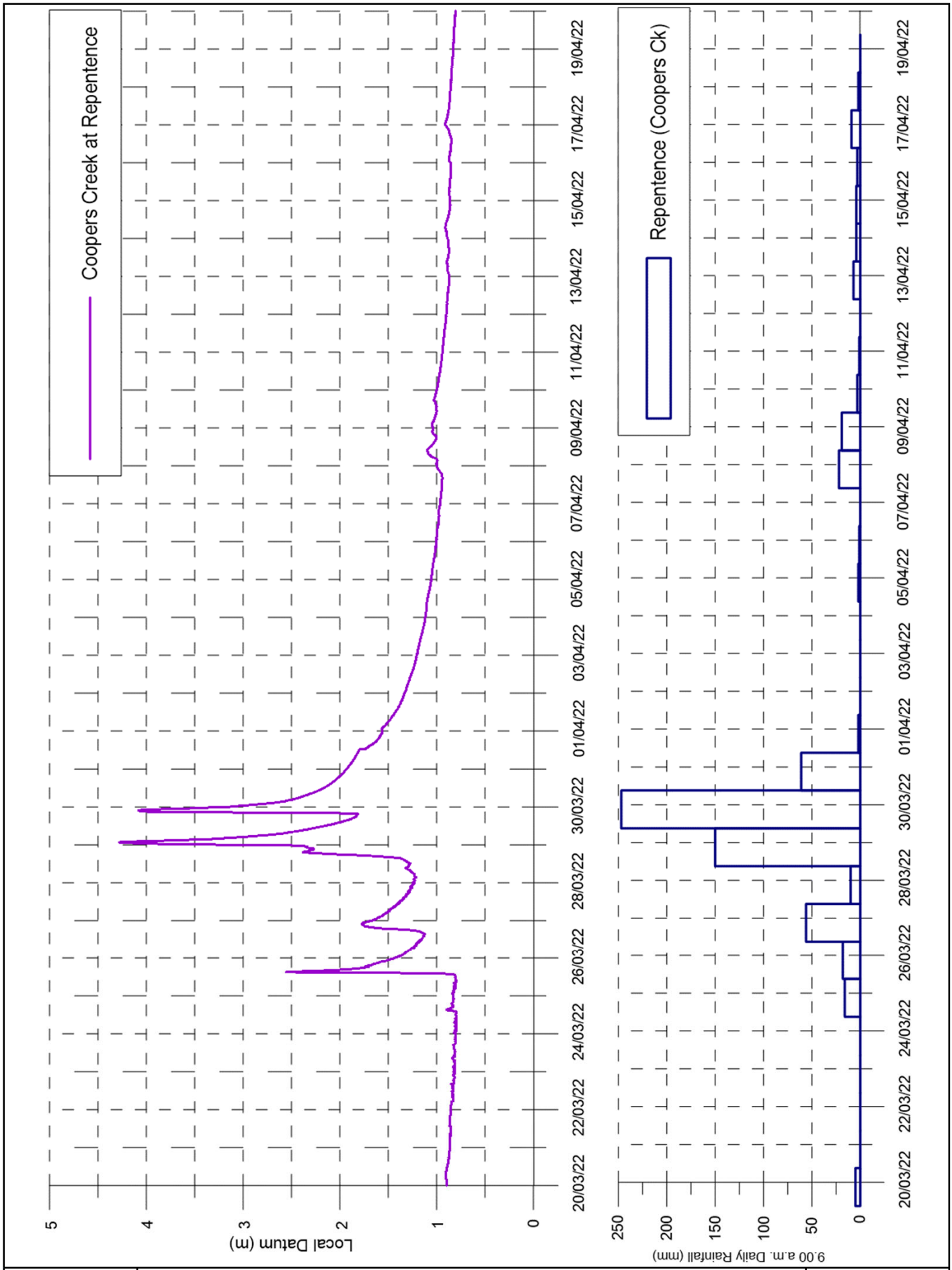
Figure 5.4

5.4.GRF



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WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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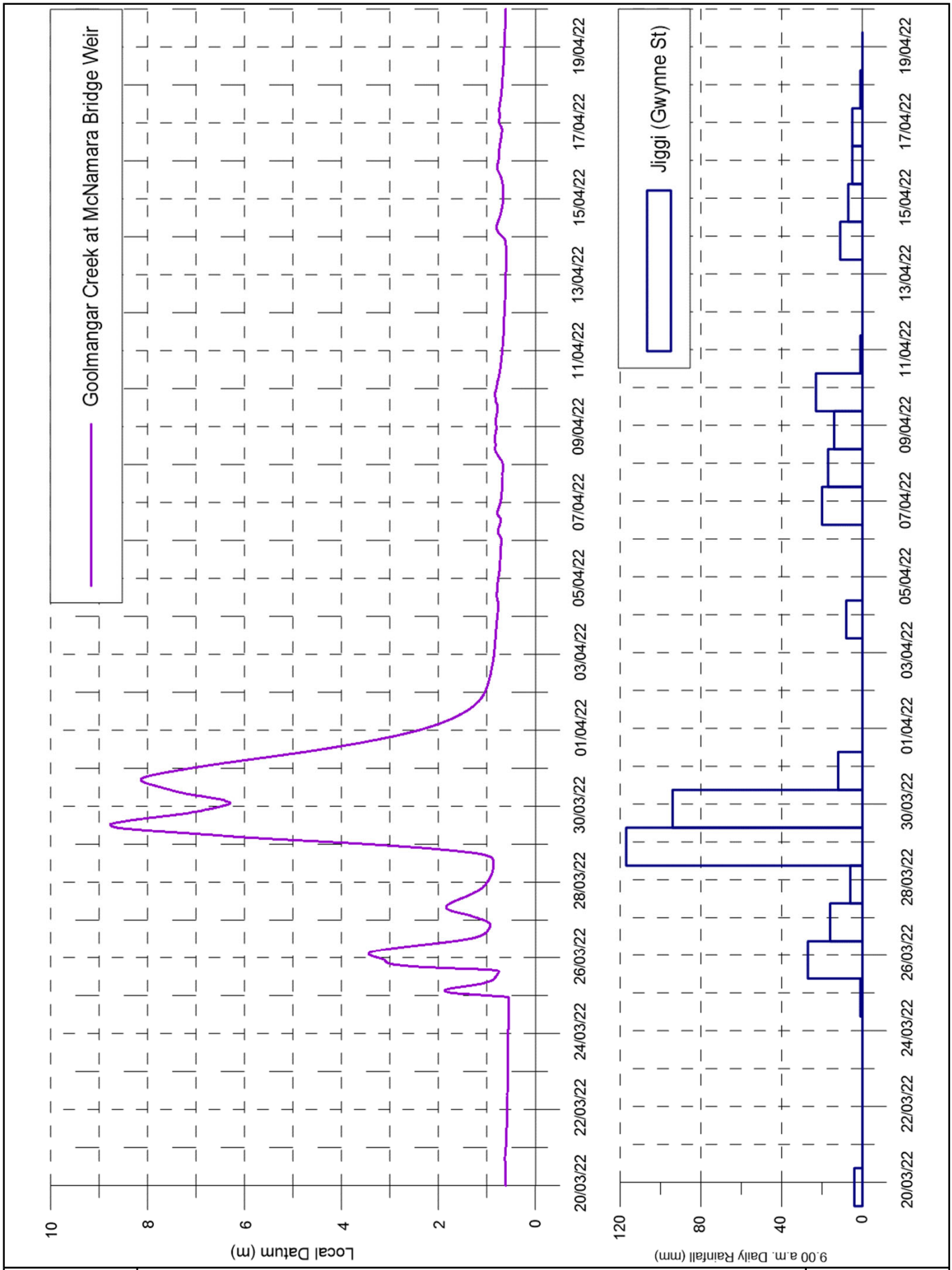
Figure
5.5

5.5.GRF



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WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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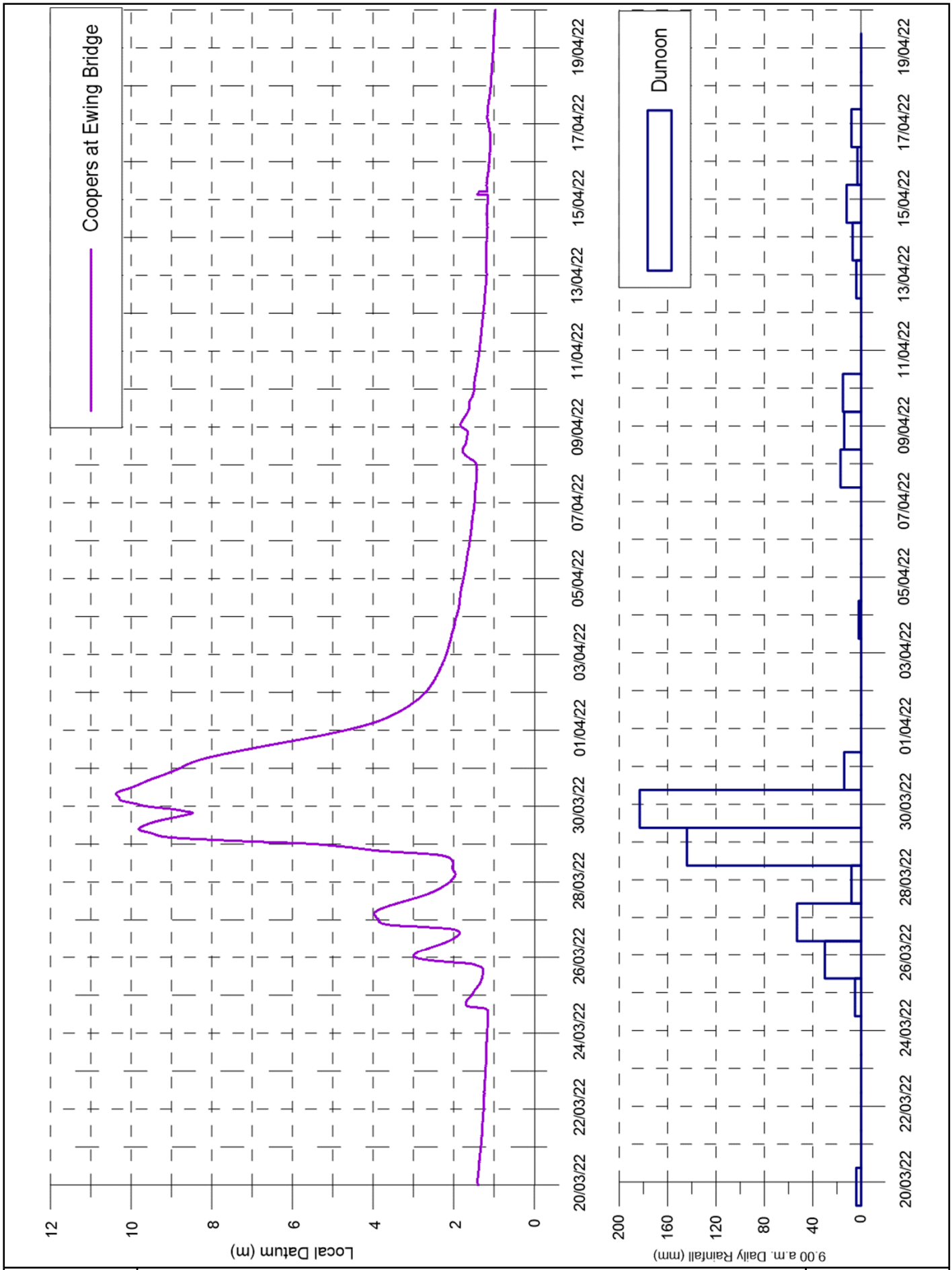
Figure
5.6

5.6.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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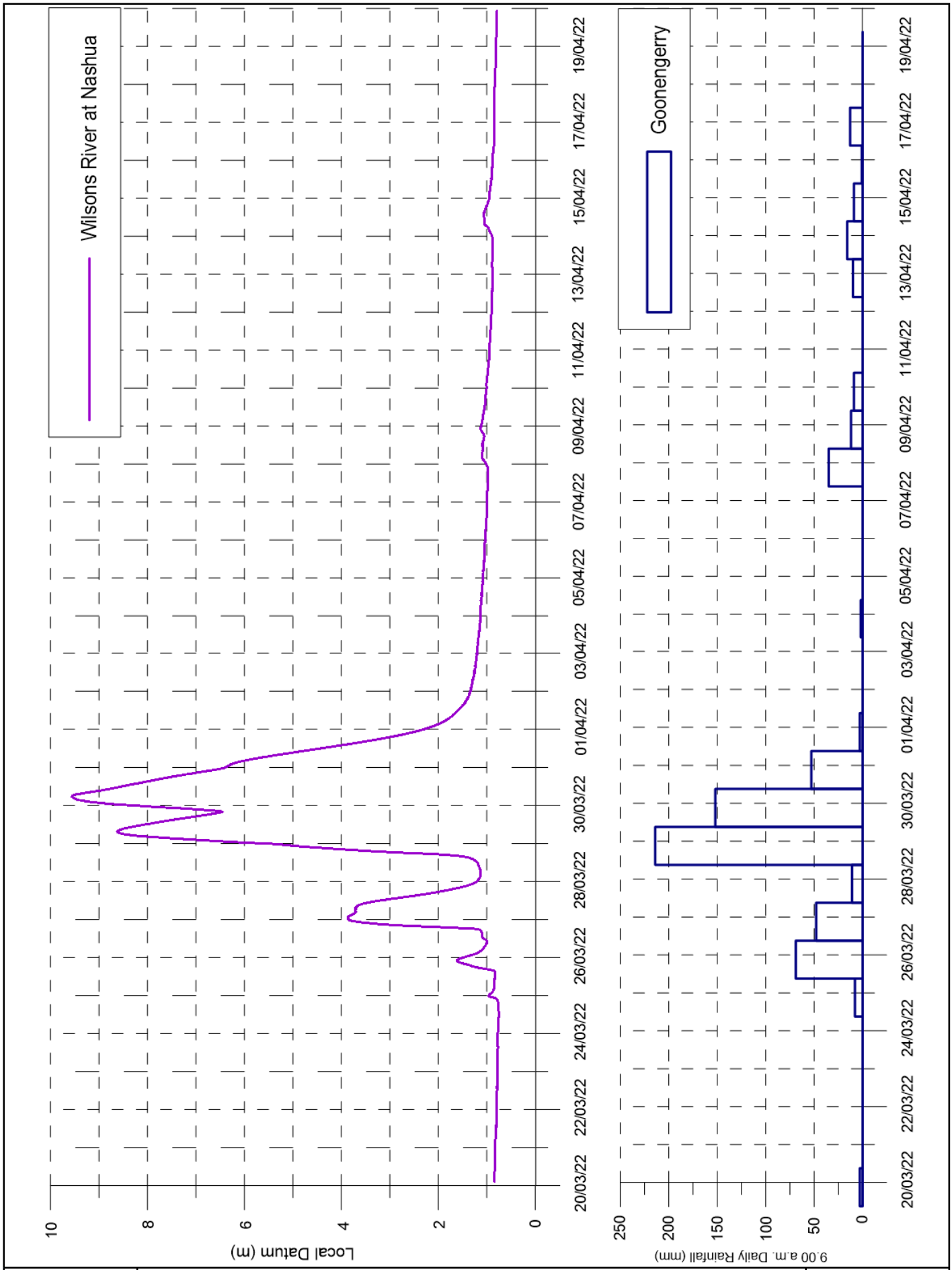
Figure
5.7

5.7.GRF



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WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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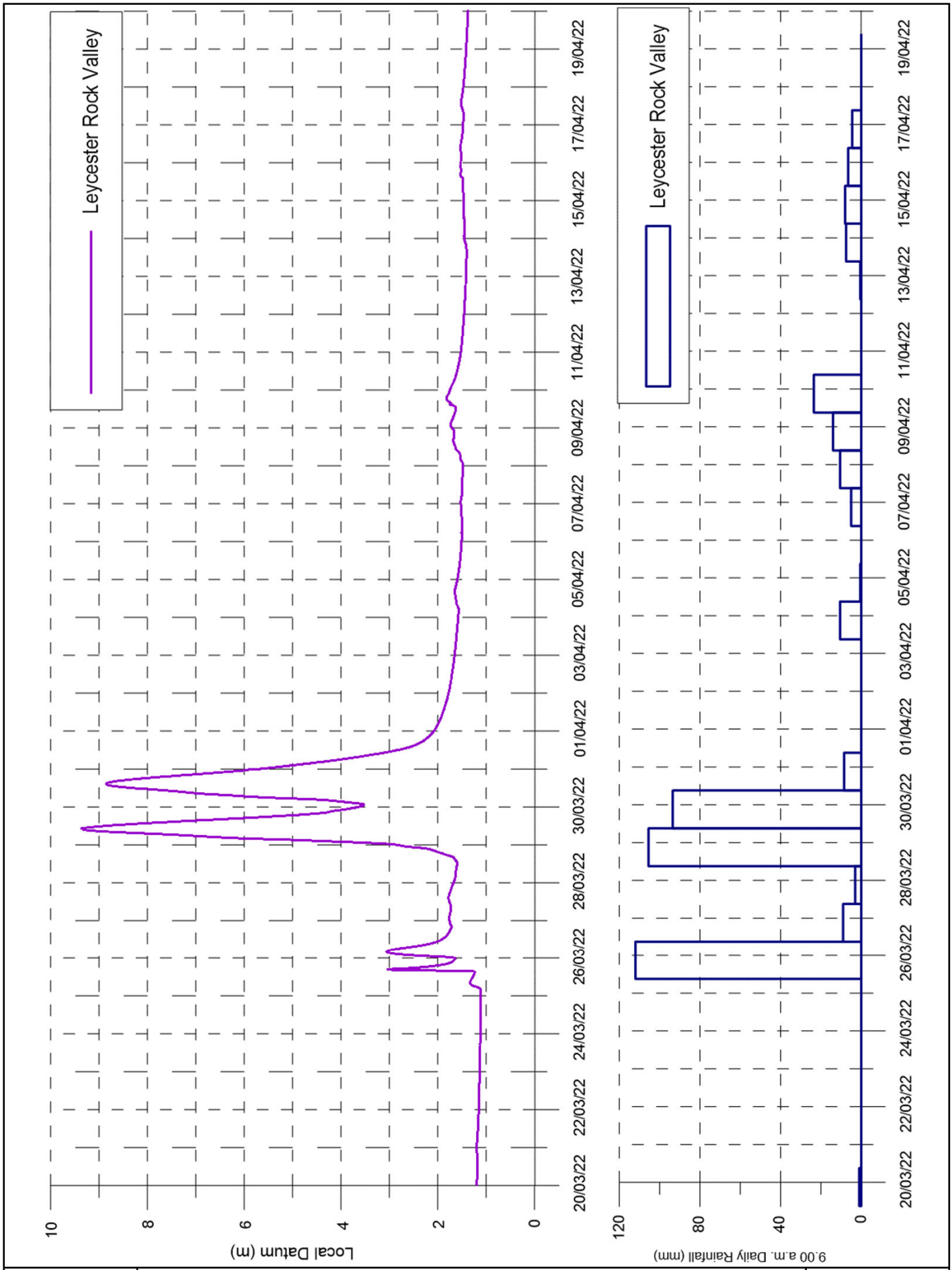
Figure
5.8

5.8.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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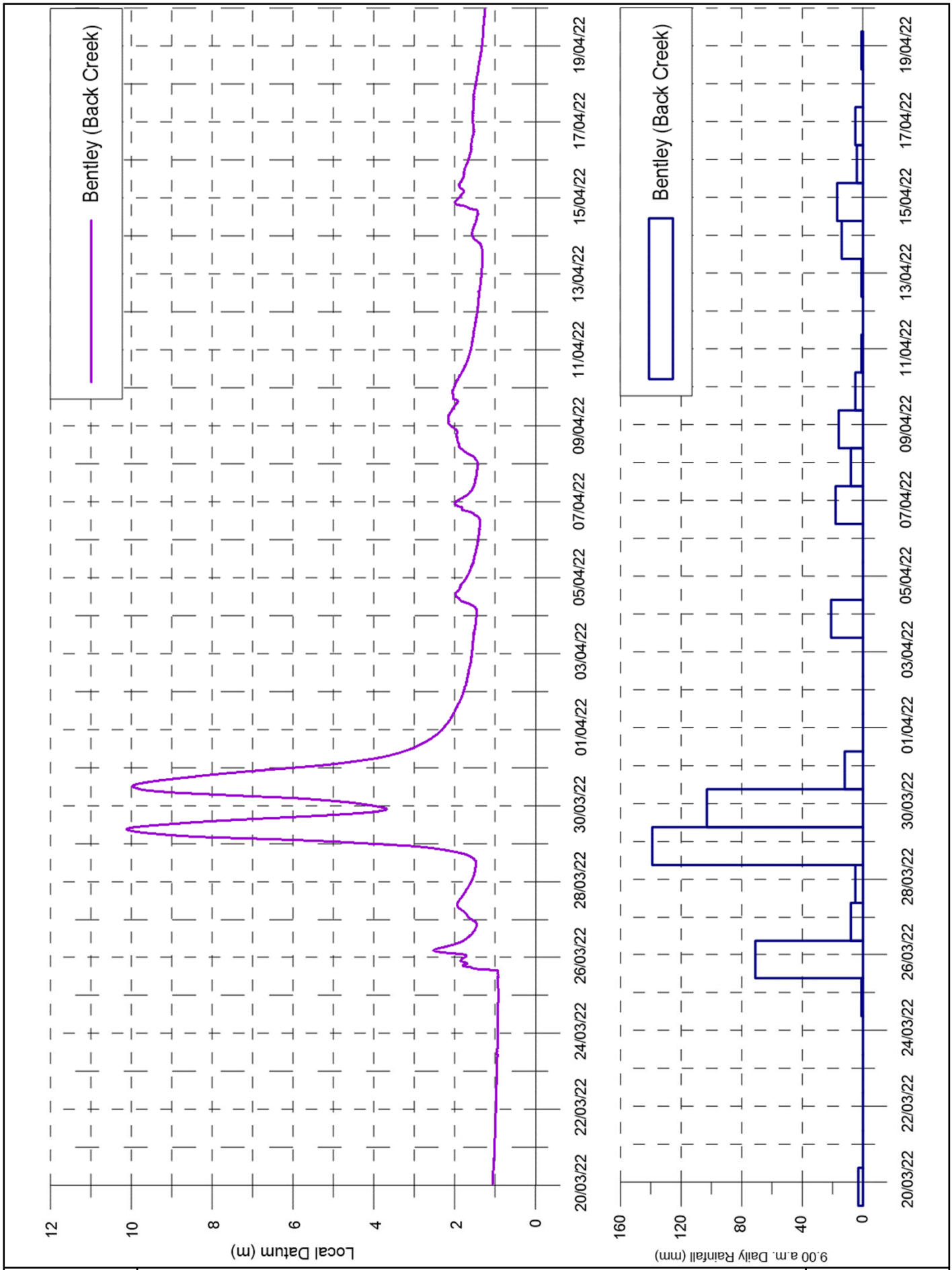
Figure
5.9

5.9.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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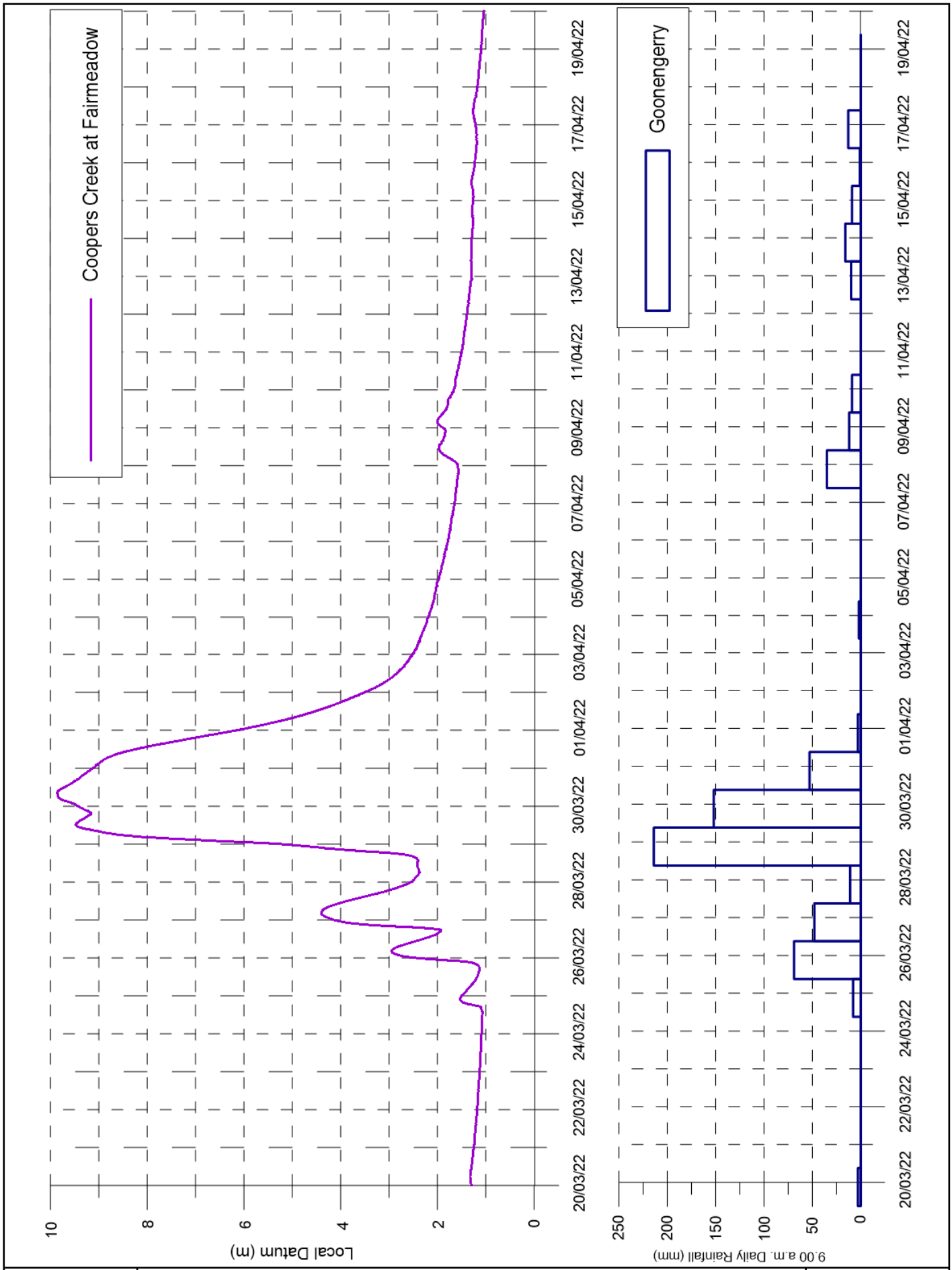
Figure
5.10

5.10.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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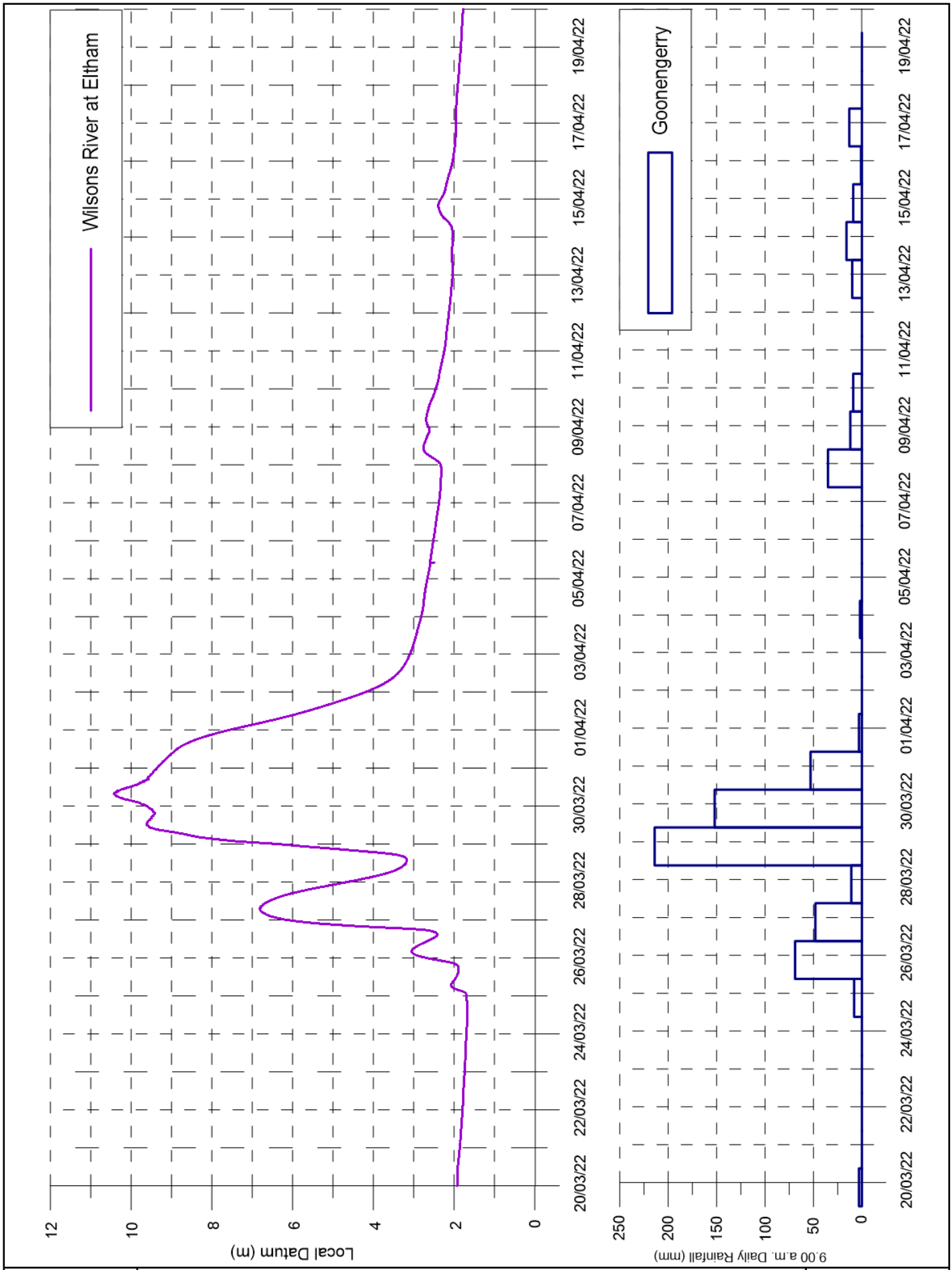
Report MHL2895
Figure
5.11

5.11.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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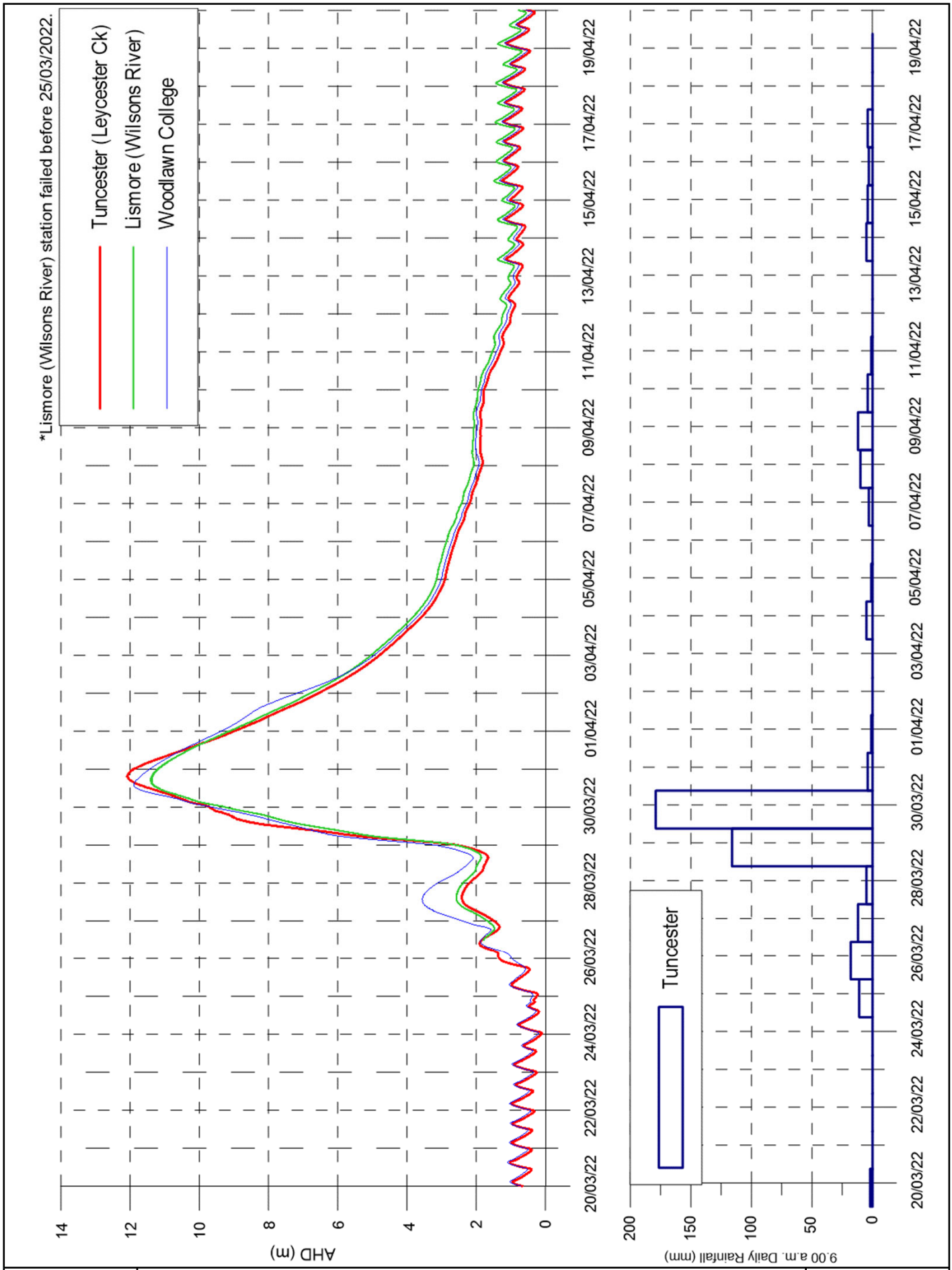
Figure
5.12

5.12.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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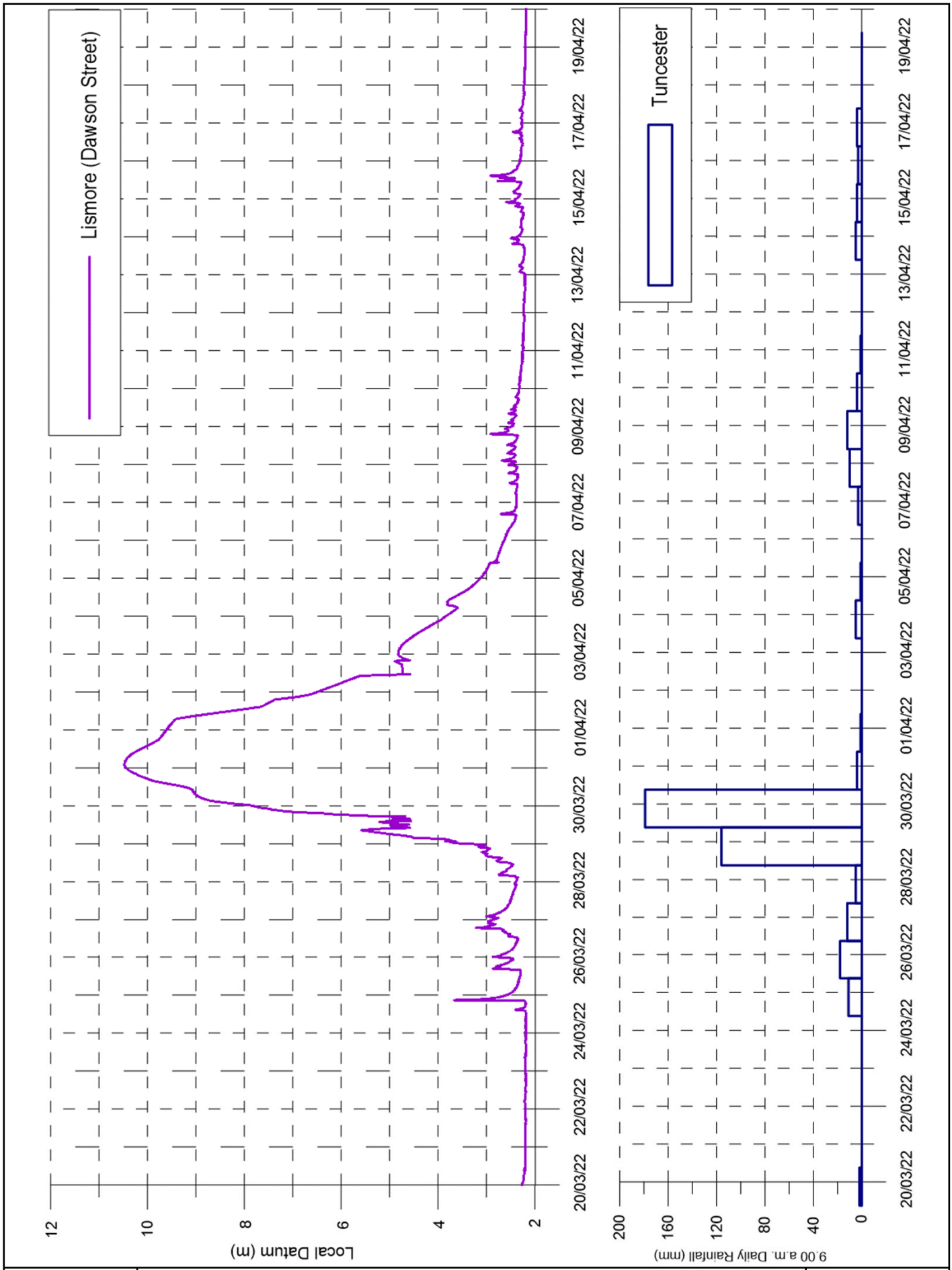
Figure
5.13

5.13.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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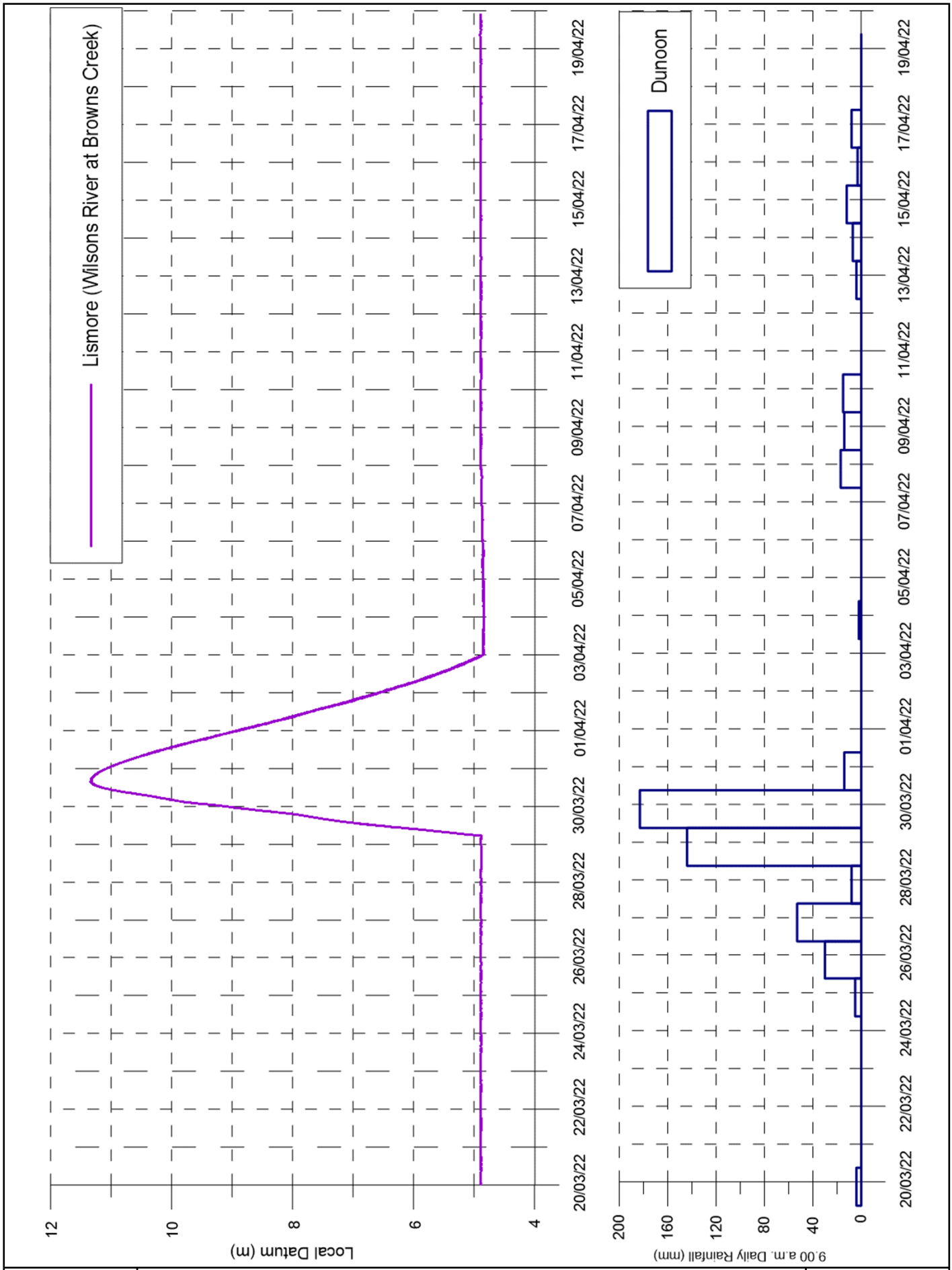
Figure
5.14

5.14.GRF



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WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

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Figure
5.15

5.15.GRF

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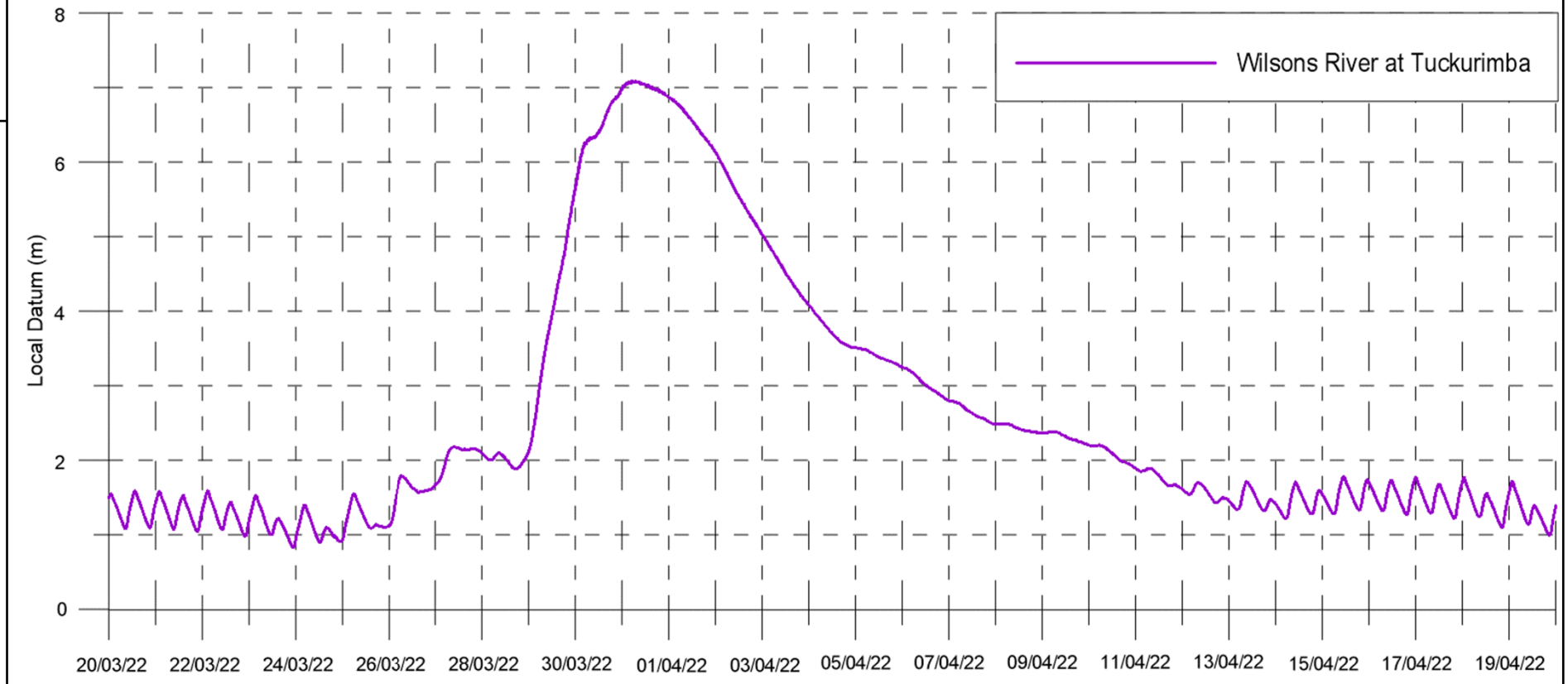
WILSONS RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022



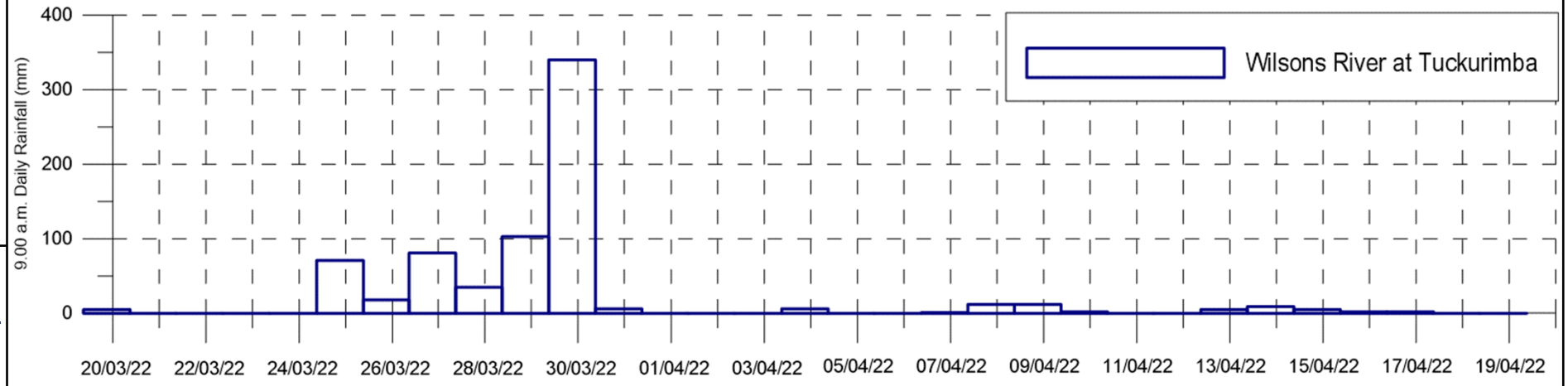


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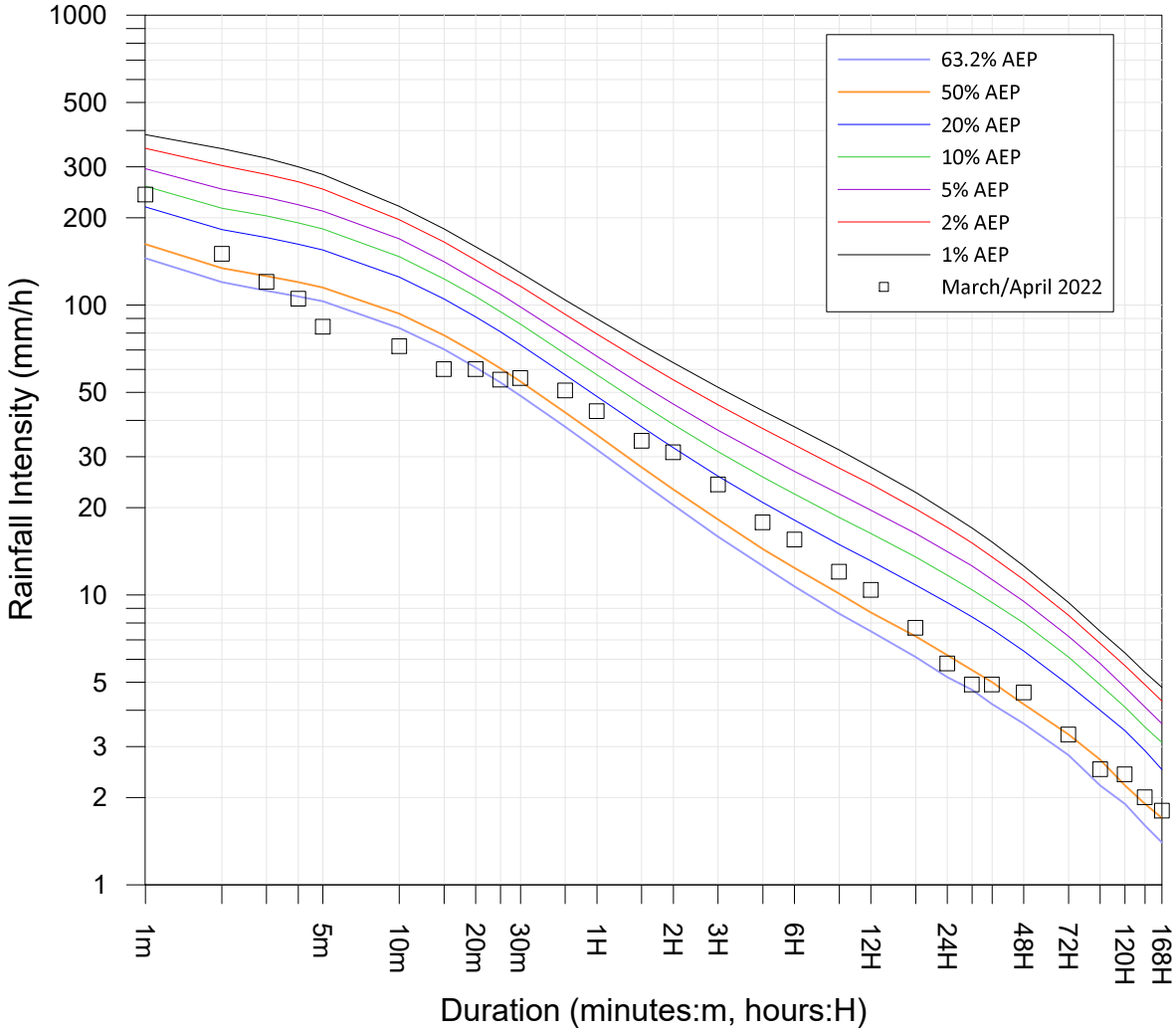
Figure 5.16

5.16.GRF

Site Owner: BoM
Latitude: -28.528 Longitude:153.152

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	240	07:39 30 Mar 2022
2m	150	02:04 29 Mar 2022
3m	120	01:55 29 Mar 2022
4m	105	02:06 29 Mar 2022
5m	84	02:07 29 Mar 2022
10m	72	02:12 29 Mar 2022
15m	60	02:07 29 Mar 2022
20m	60	02:12 29 Mar 2022
25m	55.2	02:13 29 Mar 2022
30m	56	02:13 29 Mar 2022
45m	50.7	02:24 29 Mar 2022
1H	43	02:24 29 Mar 2022
1.5H	34	02:25 29 Mar 2022
2H	31	02:25 29 Mar 2022
3H	24	02:33 29 Mar 2022
5H	17.8	03:15 29 Mar 2022
6H	15.5	02:53 29 Mar 2022
9H	12	02:31 29 Mar 2022
12H	10.4	03:58 29 Mar 2022
18H	7.7	04:48 29 Mar 2022
24H	5.8	10:48 29 Mar 2022
30H	4.9	21:05 29 Mar 2022
36H	4.9	08:53 30 Mar 2022
48H	4.6	11:09 30 Mar 2022
72H	3.3	02:48 31 Mar 2022
96H	2.5	18:34 30 Mar 2022
120H	2.4	13:25 30 Mar 2022
144H	2	13:25 31 Mar 2022
168H	1.8	15:08 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

LILLIAN ROCK (WILLIAMS RD) (58148)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

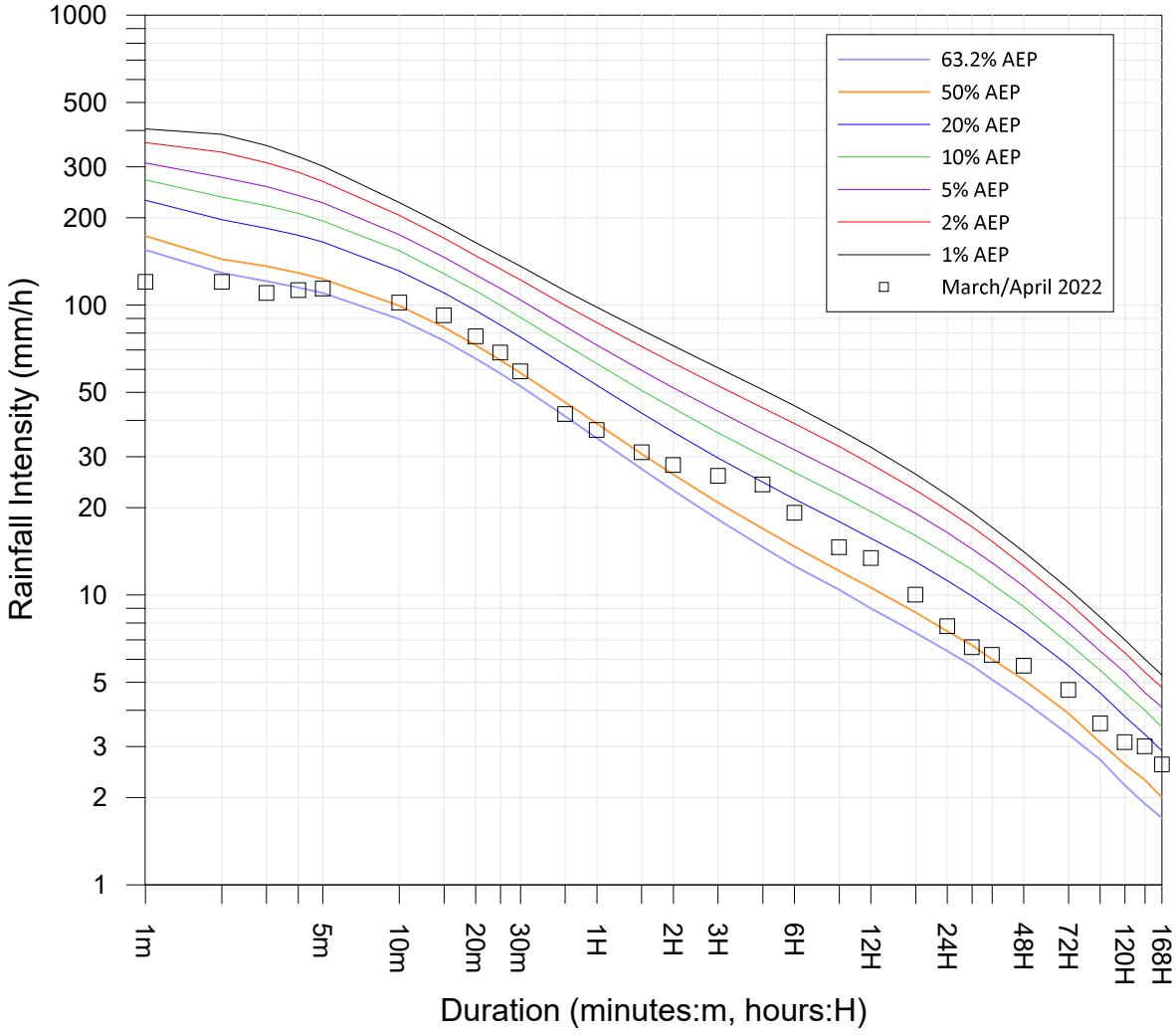
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.17

IFD_58148_Figure : 5.17.pdf

Site Owner: DPE BCD
Latitude: -28.5521 Longitude:153.3856

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	120	17:08 30 Mar 2022
2m	120	11:36 25 Mar 2022
3m	110	11:37 25 Mar 2022
4m	112.5	11:36 25 Mar 2022
5m	114	11:36 25 Mar 2022
10m	102	11:38 25 Mar 2022
15m	92	11:39 25 Mar 2022
20m	78	11:41 25 Mar 2022
25m	68.4	11:41 25 Mar 2022
30m	59	11:46 25 Mar 2022
45m	42	12:01 25 Mar 2022
1H	37	12:22 25 Mar 2022
1.5H	31	12:48 25 Mar 2022
2H	28	02:21 29 Mar 2022
3H	25.7	02:38 29 Mar 2022
5H	24	02:54 29 Mar 2022
6H	19.2	03:06 29 Mar 2022
9H	14.6	03:46 29 Mar 2022
12H	13.4	02:52 29 Mar 2022
18H	10	04:02 29 Mar 2022
24H	7.8	03:30 29 Mar 2022
30H	6.6	20:37 29 Mar 2022
36H	6.2	02:29 30 Mar 2022
48H	5.7	19:01 30 Mar 2022
72H	4.7	00:18 31 Mar 2022
96H	3.6	21:16 30 Mar 2022
120H	3.1	11:17 30 Mar 2022
144H	3	04:56 31 Mar 2022
168H	2.6	13:04 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

HUONBROOK (558049)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

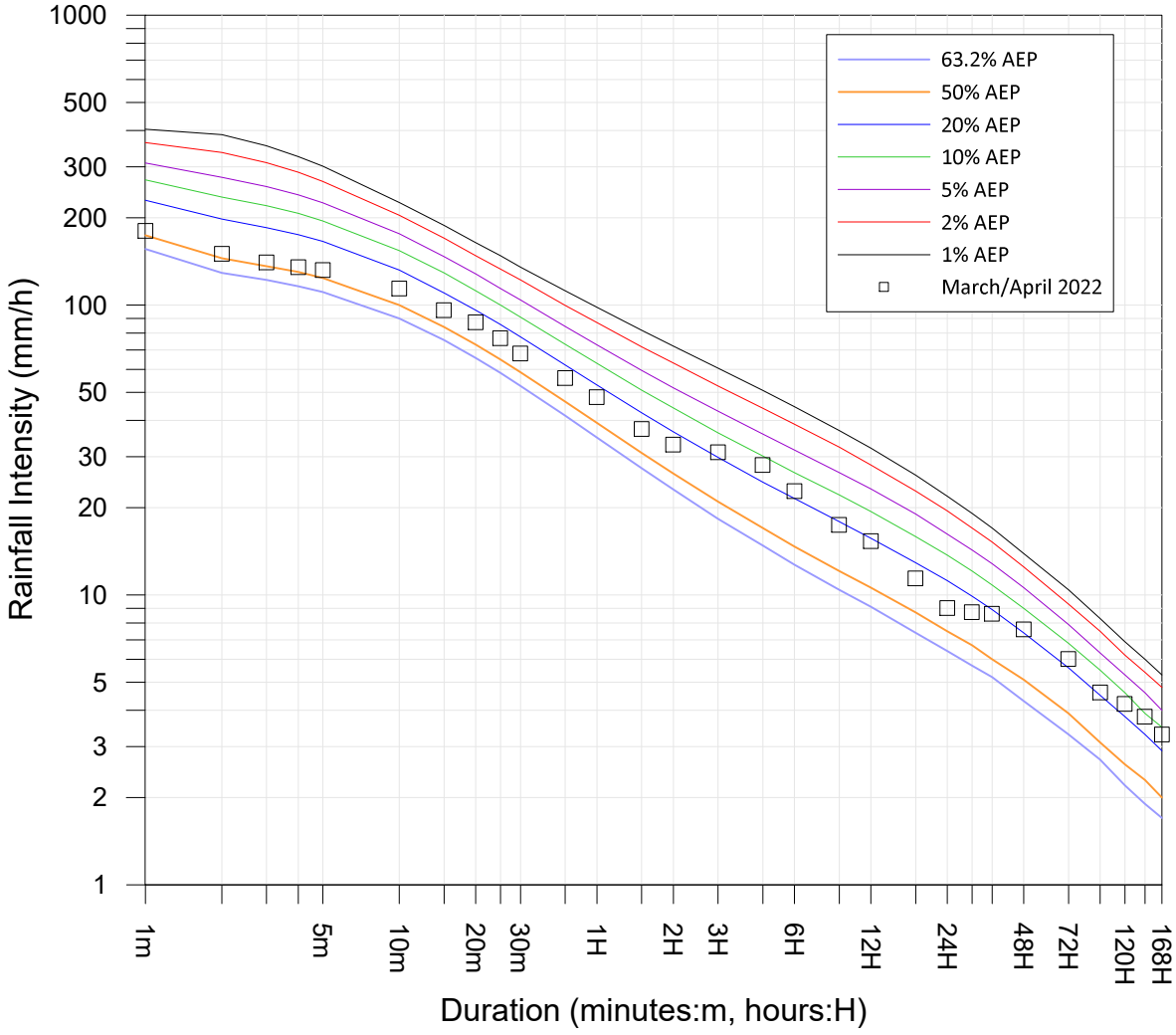
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.18

IFD_558049_Figure 5.18.pdf

Site Owner: Byron Shire Council
Latitude: -28.594 Longitude:153.417

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	180	08:17 30 Mar 2022
2m	150	12:12 25 Mar 2022
3m	140	12:13 25 Mar 2022
4m	135	12:14 25 Mar 2022
5m	132	12:14 25 Mar 2022
10m	114	12:14 25 Mar 2022
15m	96	12:19 25 Mar 2022
20m	87	12:22 25 Mar 2022
25m	76.8	12:28 25 Mar 2022
30m	68	12:32 25 Mar 2022
45m	56	12:24 25 Mar 2022
1H	48	12:39 25 Mar 2022
1.5H	37.3	02:28 29 Mar 2022
2H	33	02:29 29 Mar 2022
3H	31	02:22 29 Mar 2022
5H	28	03:07 29 Mar 2022
6H	22.8	03:25 29 Mar 2022
9H	17.4	03:52 29 Mar 2022
12H	15.3	03:12 29 Mar 2022
18H	11.4	04:01 29 Mar 2022
24H	9	08:43 29 Mar 2022
30H	8.7	03:25 30 Mar 2022
36H	8.6	02:58 30 Mar 2022
48H	7.6	10:47 30 Mar 2022
72H	6	01:18 31 Mar 2022
96H	4.6	20:51 30 Mar 2022
120H	4.2	11:39 30 Mar 2022
144H	3.8	11:33 31 Mar 2022
168H	3.3	12:41 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

GOONENGERRY (ALERT) (558033) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

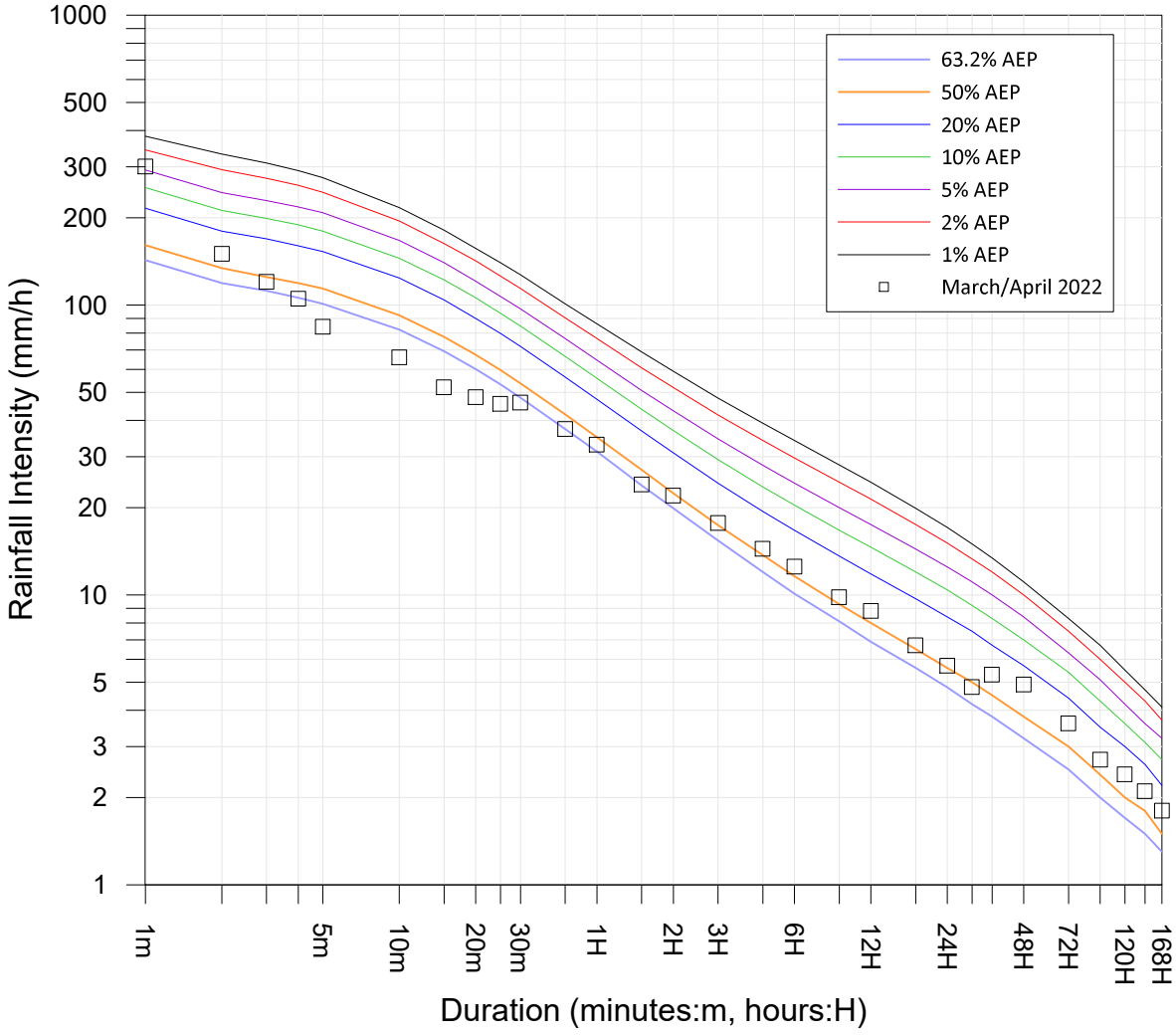
Manly Hydraulics Laboratory

Report MHL2895 Figure 5.19

IFD_558033_Figure 5.19.pdf

Site Owner: Lismore City Council
Latitude: -28.605 Longitude:153.091

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	300	19:57 28 Mar 2022
2m	150	19:58 28 Mar 2022
3m	120	02:33 29 Mar 2022
4m	105	02:34 29 Mar 2022
5m	84	02:35 29 Mar 2022
10m	66	02:35 29 Mar 2022
15m	52	07:38 30 Mar 2022
20m	48	02:37 29 Mar 2022
25m	45.6	02:36 29 Mar 2022
30m	46	02:36 29 Mar 2022
45m	37.3	02:35 29 Mar 2022
1H	33	02:43 29 Mar 2022
1.5H	24	03:06 29 Mar 2022
2H	22	02:51 29 Mar 2022
3H	17.7	07:38 30 Mar 2022
5H	14.4	08:07 30 Mar 2022
6H	12.5	08:38 30 Mar 2022
9H	9.8	09:16 30 Mar 2022
12H	8.8	09:49 30 Mar 2022
18H	6.7	13:37 30 Mar 2022
24H	5.7	17:41 30 Mar 2022
30H	4.8	07:45 30 Mar 2022
36H	5.3	07:56 30 Mar 2022
48H	4.9	17:30 30 Mar 2022
72H	3.6	03:38 31 Mar 2022
96H	2.7	19:11 30 Mar 2022
120H	2.4	14:16 30 Mar 2022
144H	2.1	14:16 31 Mar 2022
168H	1.8	14:16 01 Apr 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

CAWONGLA (ALERT) (558024)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

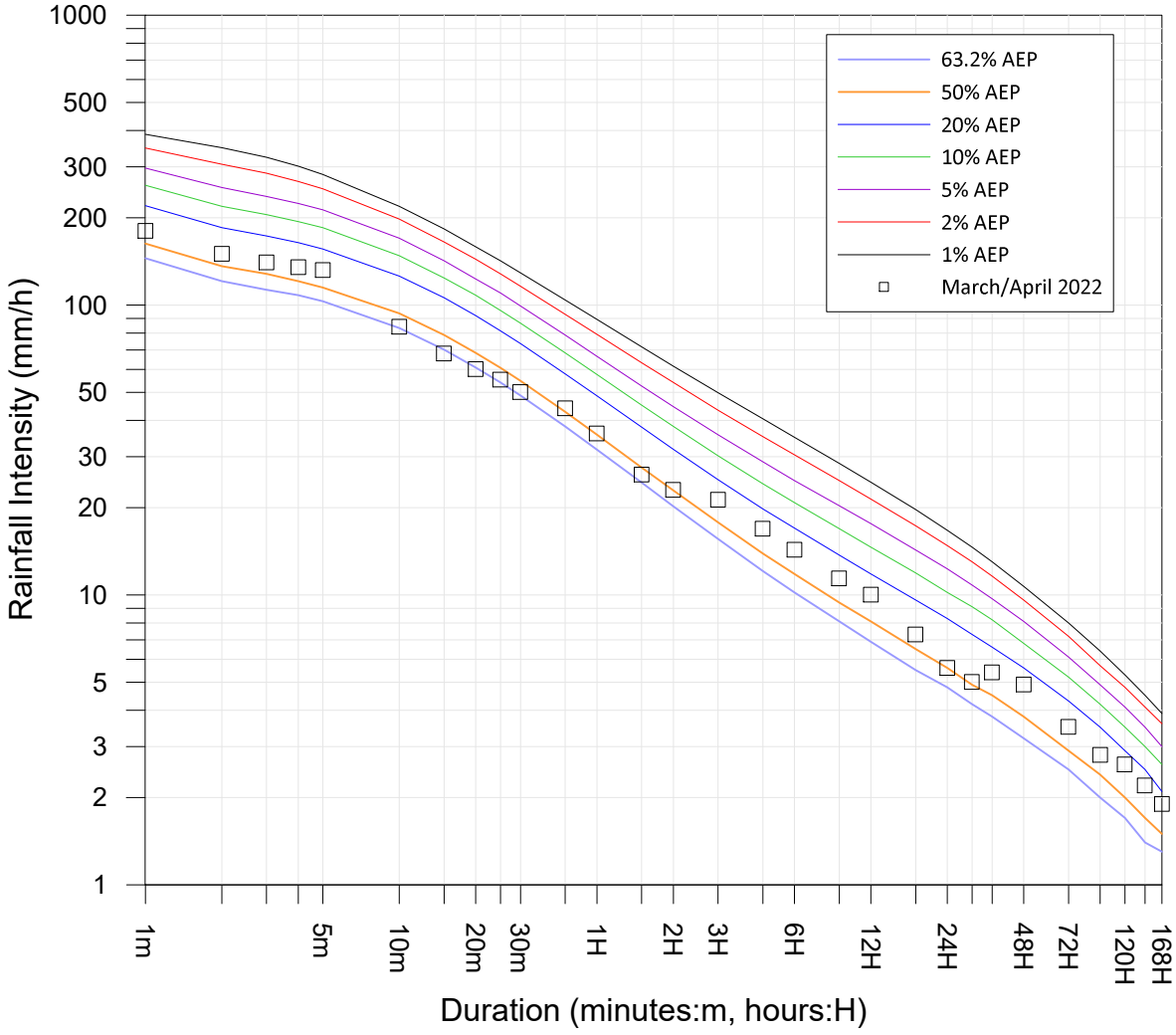
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.20

IFD_558024_Figure 5.20.pdf

Site Owner: Lismore City Council
Latitude: -28.608 Longitude:153.213

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	180	14:45 25 Mar 2022
2m	150	14:46 25 Mar 2022
3m	140	14:46 25 Mar 2022
4m	135	14:46 25 Mar 2022
5m	132	14:46 25 Mar 2022
10m	84	14:50 25 Mar 2022
15m	68	14:55 25 Mar 2022
20m	60	15:01 25 Mar 2022
25m	55.2	15:04 25 Mar 2022
30m	50	15:10 25 Mar 2022
45m	44	15:22 25 Mar 2022
1H	36	15:37 25 Mar 2022
1.5H	26	02:59 29 Mar 2022
2H	23	02:50 29 Mar 2022
3H	21.3	02:54 29 Mar 2022
5H	16.9	03:48 29 Mar 2022
6H	14.3	03:14 29 Mar 2022
9H	11.4	03:37 29 Mar 2022
12H	10	03:20 29 Mar 2022
18H	7.3	04:59 29 Mar 2022
24H	5.6	08:10 29 Mar 2022
30H	5	05:43 30 Mar 2022
36H	5.4	08:32 30 Mar 2022
48H	4.9	12:05 30 Mar 2022
72H	3.5	02:27 31 Mar 2022
96H	2.8	17:57 30 Mar 2022
120H	2.6	14:37 30 Mar 2022
144H	2.2	14:29 30 Mar 2022
168H	1.9	14:29 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

NIMBIN (GOOLMANGAR CREEK) (58180) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

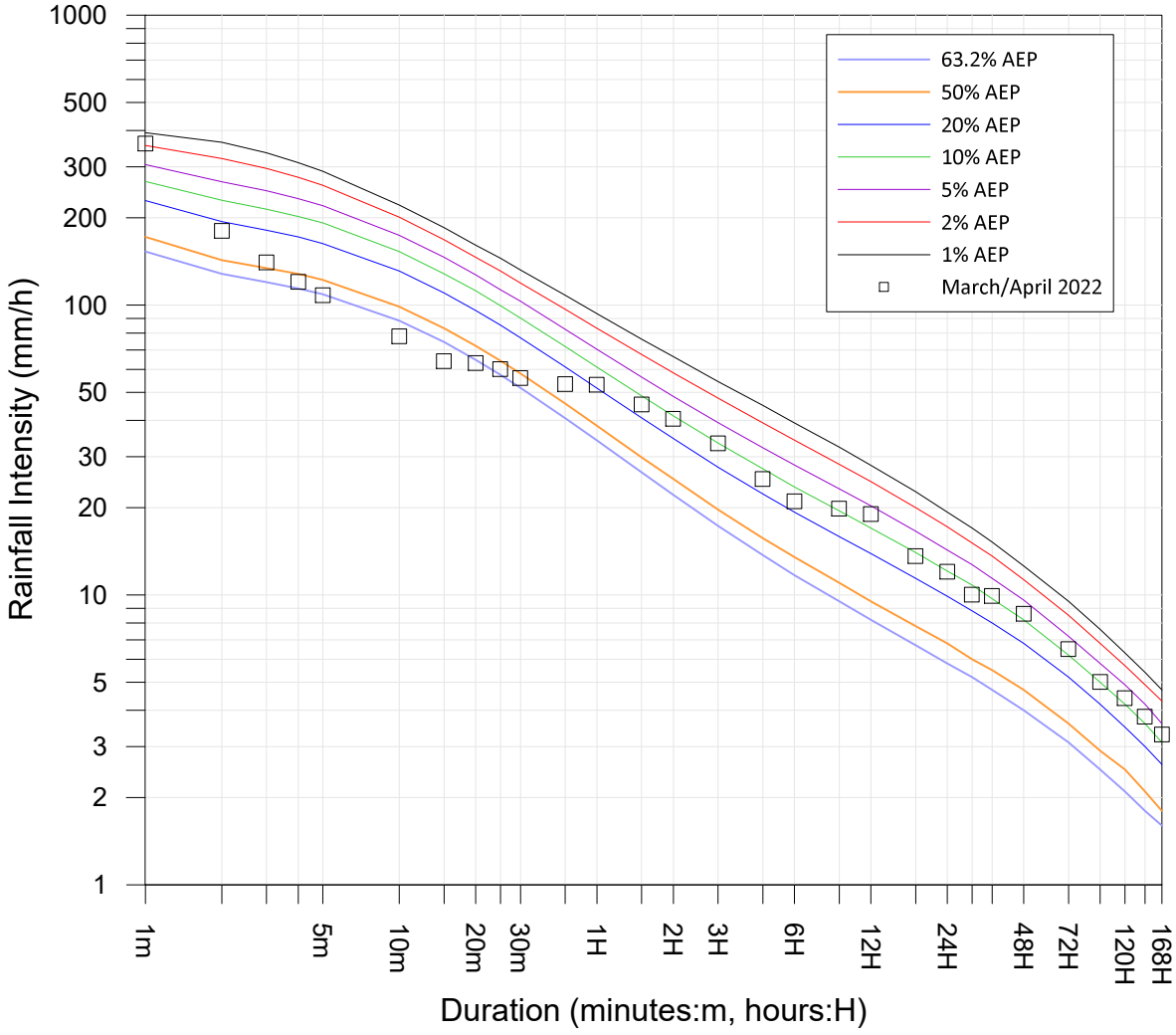
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.21

IFD_58180_Figure 5.21.pdf

Site Owner: Lismore City Council
Latitude: -28.643 Longitude:153.417

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	360	22:00 29 Mar 2022
2m	180	22:01 29 Mar 2022
3m	140	22:00 29 Mar 2022
4m	120	20:33 29 Mar 2022
5m	108	20:33 29 Mar 2022
10m	78	20:38 29 Mar 2022
15m	64	20:44 29 Mar 2022
20m	63	20:33 29 Mar 2022
25m	60	20:38 29 Mar 2022
30m	56	20:44 29 Mar 2022
45m	53.3	20:20 29 Mar 2022
1H	53	20:36 29 Mar 2022
1.5H	45.3	21:06 29 Mar 2022
2H	40.5	21:34 29 Mar 2022
3H	33.3	22:34 29 Mar 2022
5H	25.1	23:29 29 Mar 2022
6H	21	01:24 30 Mar 2022
9H	19.8	04:24 30 Mar 2022
12H	19	07:34 30 Mar 2022
18H	13.6	10:33 30 Mar 2022
24H	12	18:37 30 Mar 2022
30H	10	23:02 30 Mar 2022
36H	9.9	08:07 30 Mar 2022
48H	8.6	18:49 30 Mar 2022
72H	6.5	03:05 31 Mar 2022
96H	5	18:06 30 Mar 2022
120H	4.4	10:41 31 Mar 2022
144H	3.8	15:36 31 Mar 2022
168H	3.3	14:06 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

REPENTANCE (COOPERS CK) (558000)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

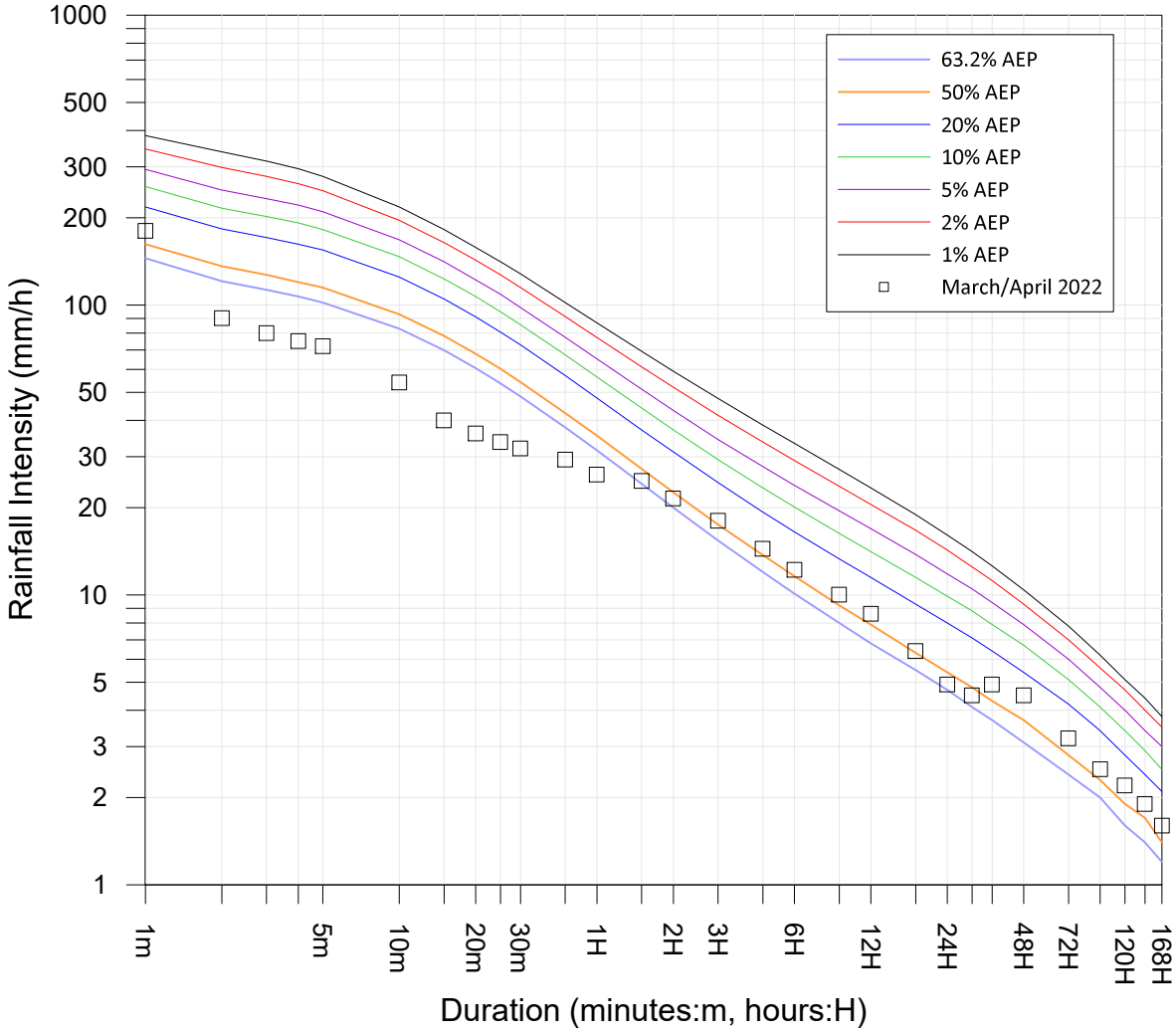
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.22

IFD_558000_Figure 5.22.pdf

Site Owner: Lismore City Council
Latitude: -28.676 Longitude:153.154

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	180	13:12 09 Apr 2022
2m	90	13:13 09 Apr 2022
3m	80	16:36 06 Apr 2022
4m	75	16:34 06 Apr 2022
5m	72	16:35 06 Apr 2022
10m	54	16:39 06 Apr 2022
15m	40	16:42 06 Apr 2022
20m	36	02:59 29 Mar 2022
25m	33.6	03:02 29 Mar 2022
30m	32	03:02 29 Mar 2022
45m	29.3	03:02 29 Mar 2022
1H	26	03:10 29 Mar 2022
1.5H	24.7	03:08 29 Mar 2022
2H	21.5	03:28 29 Mar 2022
3H	18	03:20 29 Mar 2022
5H	14.4	04:18 29 Mar 2022
6H	12.2	04:06 29 Mar 2022
9H	10	04:40 29 Mar 2022
12H	8.6	04:23 29 Mar 2022
18H	6.4	04:52 29 Mar 2022
24H	4.9	10:52 29 Mar 2022
30H	4.5	06:20 30 Mar 2022
36H	4.9	08:58 30 Mar 2022
48H	4.5	10:52 30 Mar 2022
72H	3.2	02:22 31 Mar 2022
96H	2.5	15:53 30 Mar 2022
120H	2.2	14:46 30 Mar 2022
144H	1.9	02:37 31 Mar 2022
168H	1.6	02:37 01 Apr 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

JIGGI (GWYNNE ST) (558086)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

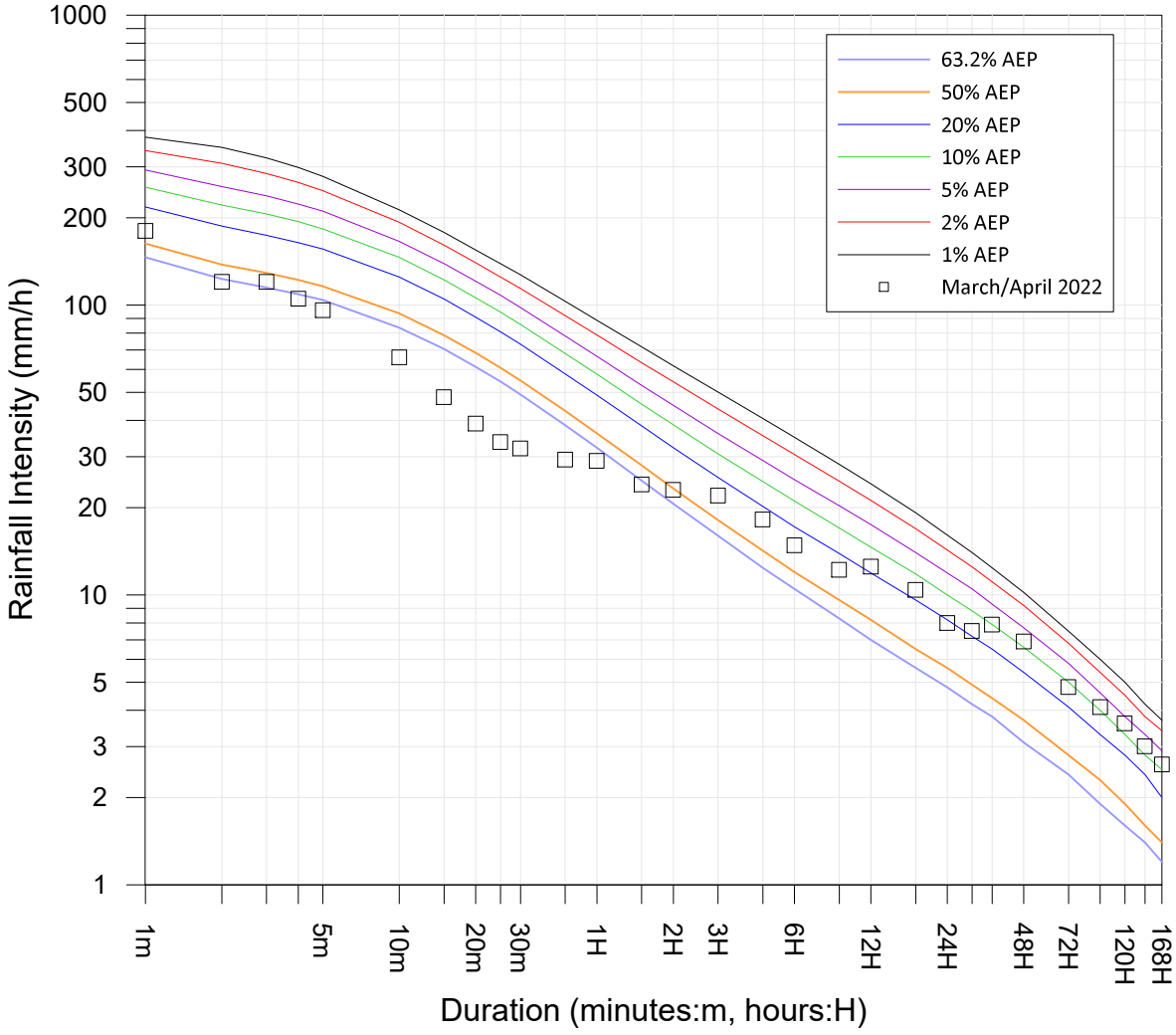
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.23

IFD_558086_Figure 5.23.pdf

Site Owner: BoM
Latitude: -28.677 Longitude:153.322

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	180	00:52 30 Mar 2022
2m	120	14:30 25 Mar 2022
3m	120	14:30 25 Mar 2022
4m	105	14:31 25 Mar 2022
5m	96	14:32 25 Mar 2022
10m	66	14:37 25 Mar 2022
15m	48	14:42 25 Mar 2022
20m	39	14:47 25 Mar 2022
25m	33.6	01:39 29 Mar 2022
30m	32	18:33 26 Mar 2022
45m	29.3	00:14 29 Mar 2022
1H	29	00:29 29 Mar 2022
1.5H	24	00:51 29 Mar 2022
2H	23	01:32 29 Mar 2022
3H	22	02:30 29 Mar 2022
5H	18.2	03:51 29 Mar 2022
6H	14.8	02:49 29 Mar 2022
9H	12.2	06:21 30 Mar 2022
12H	12.5	07:53 30 Mar 2022
18H	10.4	11:02 30 Mar 2022
24H	8	15:22 30 Mar 2022
30H	7.5	05:29 30 Mar 2022
36H	7.9	08:41 30 Mar 2022
48H	6.9	10:19 30 Mar 2022
72H	4.8	21:01 30 Mar 2022
96H	4.1	13:38 30 Mar 2022
120H	3.6	14:27 30 Mar 2022
144H	3	14:27 31 Mar 2022
168H	2.6	14:28 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

DUNOON (558031)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

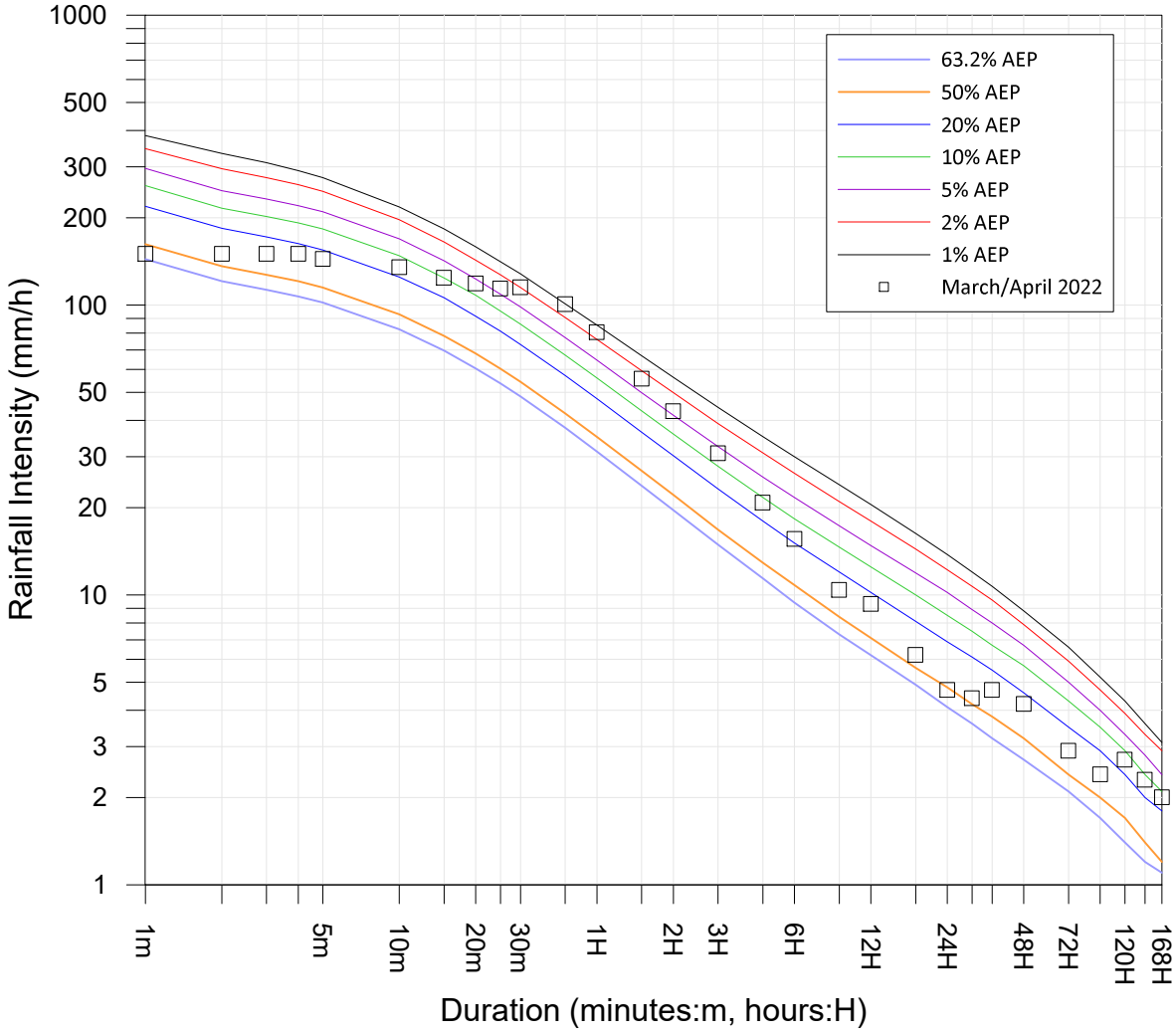
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.24

IFD_558031_Figure 5.24.pdf

Site Owner: WaterNSW
Latitude: -28.7365 Longitude:153.164

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	150	15:46 25 Mar 2022
2m	150	15:46 25 Mar 2022
3m	150	15:46 25 Mar 2022
4m	150	15:42 25 Mar 2022
5m	144	15:46 25 Mar 2022
10m	135	15:46 25 Mar 2022
15m	124	15:46 25 Mar 2022
20m	118.5	15:46 25 Mar 2022
25m	114	15:46 25 Mar 2022
30m	115	15:46 25 Mar 2022
45m	100.7	15:53 25 Mar 2022
1H	80.5	16:07 25 Mar 2022
1.5H	55.7	16:33 25 Mar 2022
2H	43	17:03 25 Mar 2022
3H	30.8	18:03 25 Mar 2022
5H	20.8	18:31 25 Mar 2022
6H	15.6	20:01 25 Mar 2022
9H	10.4	00:03 26 Mar 2022
12H	9.3	02:01 26 Mar 2022
18H	6.2	08:01 26 Mar 2022
24H	4.7	14:24 26 Mar 2022
30H	4.4	05:59 30 Mar 2022
36H	4.7	07:43 30 Mar 2022
48H	4.2	11:14 30 Mar 2022
72H	2.9	21:52 30 Mar 2022
96H	2.4	14:01 29 Mar 2022
120H	2.7	15:03 30 Mar 2022
144H	2.3	14:01 31 Mar 2022
168H	2	14:01 01 Apr 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

LEYCESTER ROCK VALLEY (203010) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

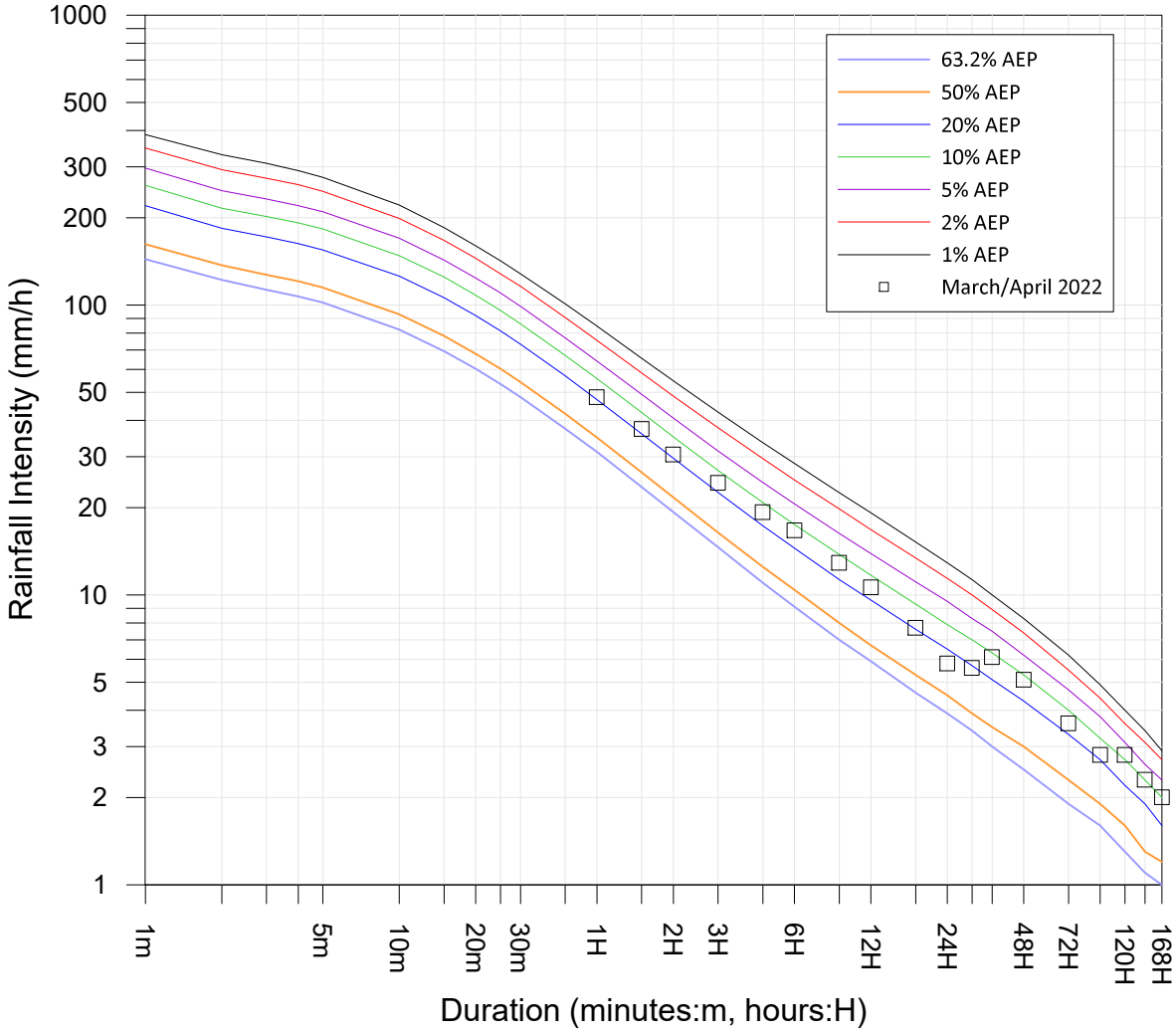
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.25

IFD_203010_Figure 5.25.pdf

Site Owner: Lismore City Council
Latitude: -28.7406 Longitude:153.075

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	-	-
2m	-	-
3m	-	-
4m	-	-
5m	-	-
10m	-	-
15m	-	-
20m	-	-
25m	-	-
30m	-	-
45m	-	-
1H	48	16:19 25 Mar 2022
1.5H	37.3	16:49 25 Mar 2022
2H	30.5	17:19 25 Mar 2022
3H	24.3	03:26 29 Mar 2022
5H	19.3	03:58 29 Mar 2022
6H	16.7	03:56 29 Mar 2022
9H	12.9	04:54 29 Mar 2022
12H	10.6	04:54 29 Mar 2022
18H	7.7	05:30 29 Mar 2022
24H	5.8	11:30 29 Mar 2022
30H	5.6	07:45 30 Mar 2022
36H	6.1	07:54 30 Mar 2022
48H	5.1	12:23 30 Mar 2022
72H	3.6	02:51 31 Mar 2022
96H	2.8	15:59 30 Mar 2022
120H	2.8	15:14 30 Mar 2022
144H	2.3	15:14 31 Mar 2022
168H	2	17:33 31 Mar 2022

Short duration rainfall impacted by possible radio transfer interruptions.
Suspect short duration IFD results removed by observation.

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

BENTLEY (BACK CREEK) (58202)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

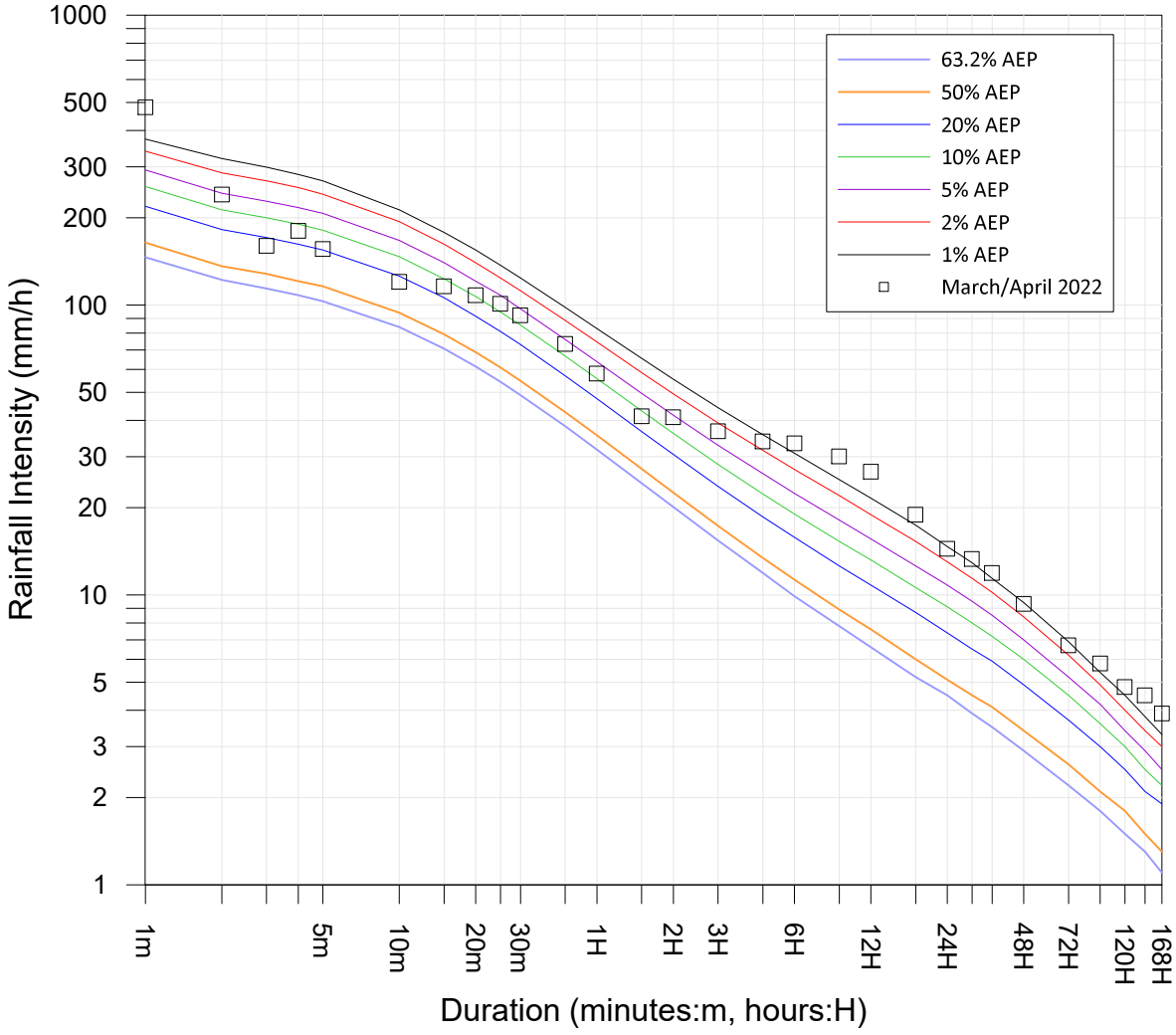
Manly Hydraulics Laboratory

Report MHL2895
Figure
5.26

IFD_58202_Figure 5.26.pdf

Site Owner: Lismore City Council
Latitude: -28.962 Longitude:153.307

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	480	20:13 29 Mar 2022
2m	240	20:14 29 Mar 2022
3m	160	01:08 30 Mar 2022
4m	180	20:16 29 Mar 2022
5m	156	20:17 29 Mar 2022
10m	120	19:56 24 Mar 2022
15m	116	19:56 24 Mar 2022
20m	108	20:00 24 Mar 2022
25m	100.8	20:03 24 Mar 2022
30m	92	20:03 24 Mar 2022
45m	73.3	20:11 24 Mar 2022
1H	58	20:22 24 Mar 2022
1.5H	41.3	00:40 30 Mar 2022
2H	41	01:14 30 Mar 2022
3H	36.7	02:24 30 Mar 2022
5H	33.8	01:33 30 Mar 2022
6H	33.3	02:12 30 Mar 2022
9H	30	03:37 30 Mar 2022
12H	26.6	05:07 30 Mar 2022
18H	18.9	11:07 30 Mar 2022
24H	14.4	07:30 30 Mar 2022
30H	13.3	06:03 30 Mar 2022
36H	11.9	07:08 30 Mar 2022
48H	9.3	10:59 30 Mar 2022
72H	6.7	14:35 30 Mar 2022
96H	5.8	11:44 30 Mar 2022
120H	4.8	16:28 30 Mar 2022
144H	4.5	12:50 30 Mar 2022
168H	3.9	12:50 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

WILSONS RIVER AT TUCKURIMBA (558076)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
5.27

IFD_558076_Figure 5.27.pdf

6 Richmond River region

6.1 Richmond River region – water level

The peak observed water levels for the Richmond River region are listed in **Table 6.1**. **Table 6.2** lists the SES flood classifications for Wiangaree, Casino, Kyogle, Coraki, Bungawalbin and Woodburn (BoM, 2013). The locations of water level stations within the Wilsons River region are shown in **Figure 6-1**. The water level data for the period 20 March to 20 April 2022 are displayed graphically in **Figure 6-2** to **Figure 6-12**. WaterNSW local datum conversions to AHD are provided in **Appendix C** .

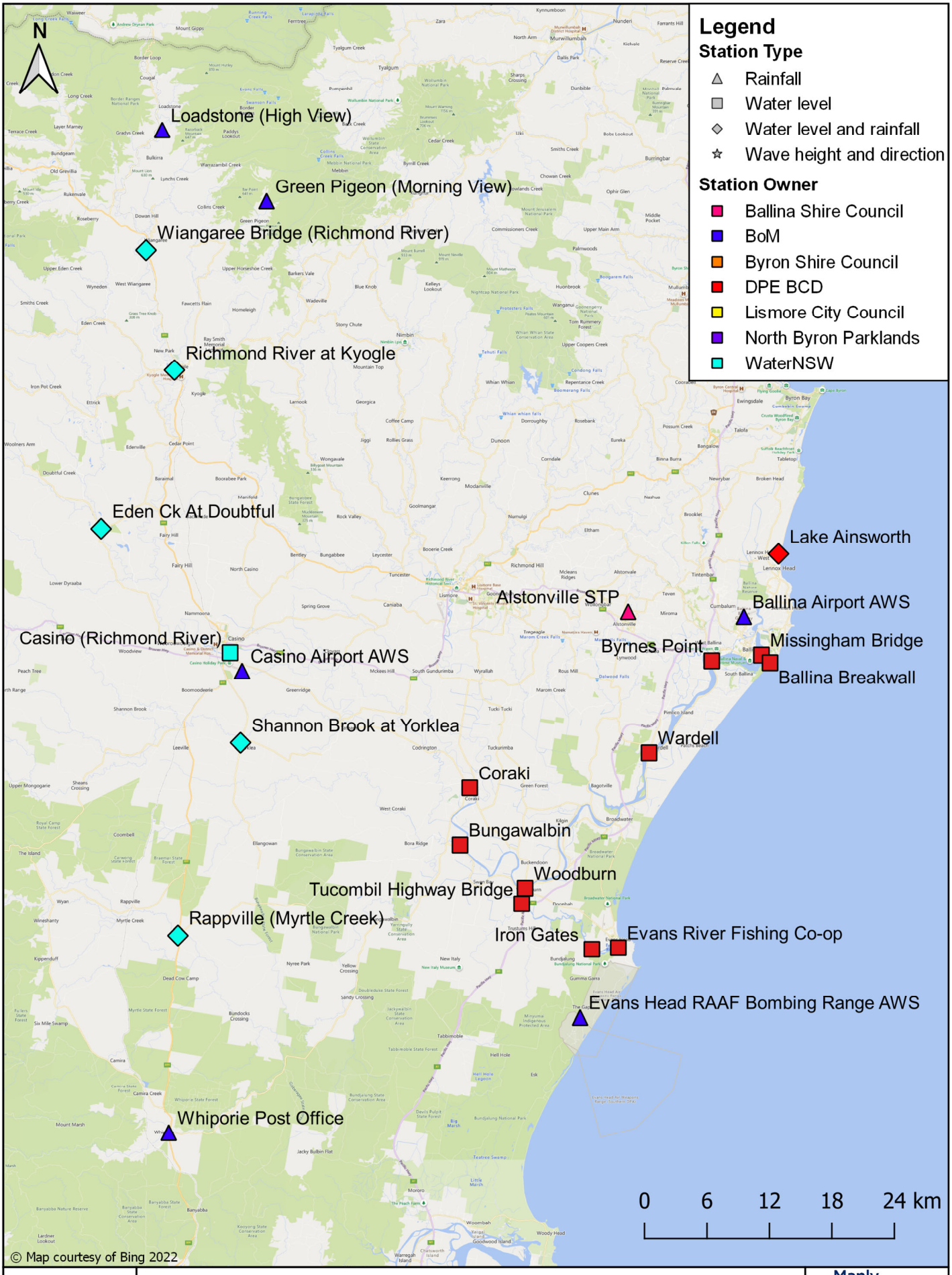
Table 6.1 Richmond River region flood peaks

Station name	Station number	Owner	Datum	Level (m)	Date and time of flood peak
Wiangaree Bridge (Richmond River)	203005	WaterNSW	Local	11.09	29/03/2022 07:00
Eden Creek at Doubtful	203034	WaterNSW	Local	12.95	29/03/2022 13:15
Lake Ainsworth	203455	DPE BCD	AHD	4.14	03/04/2022 08:30
Casino (Richmond River)	203004	WaterNSW	Local	11.75	31/03/2022 01:00
Richmond River at Kyogle	203900	WaterNSW	Local	13.93	29/03/2022 14:15
Missingham Bridge	203465	DPE BCD	AHD	1.47	30/03/2022 06:45
Byrnes Point	203461	DPE BCD	AHD	1.52	30/03/2022 07:30
Ballina Breakwall*	203425	DPE BCD	AHD	-	-
Shannon Brook at Yorklea	203041	WaterNSW	Local	9.50	30/03/2022 02:45
Wardell	203468	DPE BCD	AHD	1.89	02/04/2022 10:15
Coraki	203403	DPE BCD	AHD	5.99	31/03/2022 06:45
Bungawalbin	203450	DPE BCD	AHD	4.72	01/04/2022 02:00
Woodburn	2034134	DPE BCD	AHD	3.65	01/04/2022 12:15
Tucombil Highway Bridge	203480	DPE BCD	AHD	4.06	01/04/2022 09:45
Rappville (Myrtle Creek)	203030	WaterNSW	Local	6.02	30/03/2022 16:30
Evans River Fishing Co-op	203462	DPE BCD	AHD	1.58	30/03/2022 07:00
Iron Gates	203475	DPE BCD	AHD	1.82	02/04/2022 09:30

*Flood peak not captured due to station failure.

Table 6.2 SES flood classification for Richmond River region stations

Station name	Station number		Flood classification			Flood peak (m)	Datum	Flood event classification
	Bureau number	AWRC number	Minor	Moderate	Major			
			Water level (m)					
Wiangaree	558001	203005	11.0	15.5	n/a	11.09	Local	Minor
Casino	203004	203004	11.9	14.9	17.7	11.75	Local	Below Minor
Kyogle	558002	203900	12.0	14.4	16.0	13.93	Local	Minor
Coraki	58175	203403	2.59	4.19	4.89	5.99	AHD	Major
Bungawalbin	58184	203450	2.19	3.69	4.19	4.72	AHD	Major
Woodburn	58061	2034134	2.39	2.89	3.39	3.65	AHD	Major



NSW GOVERNMENT

RICHMOND RIVER STATIONS

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.1

Figures_MHL2895.qgs

6.2 Richmond River region – rainfall

24-hour rainfall totals up until 9:00 a.m. are displayed in **Table 6.3** to **Table 6.5** for the period 20 March to 20 April 2022. The water level and rainfall data for the period 20 March to 20 April 2022 are displayed graphically in **Figure 6-2** to **Figure 6-12**. The rainfall intensities are displayed graphically in **Figure 6-13** to **Figure 6-23**, in ARR2019 format. **Appendix B** provides ARR1987 format. Richmond River region station data losses are reported in **Appendix A** .

Table 6.3 Richmond River region daily rainfall totals

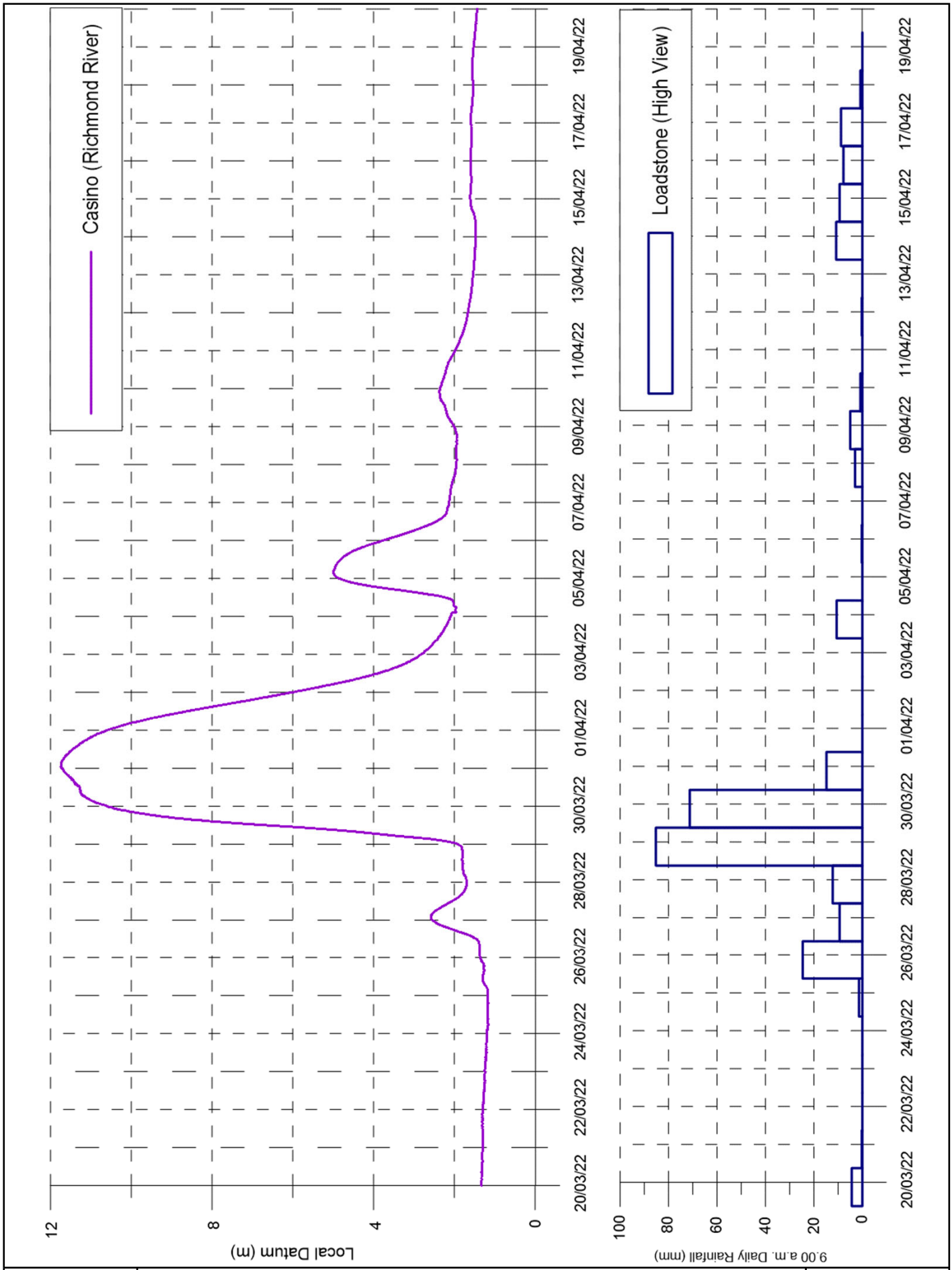
Date	Loadstone (High View) 58141 (mm) BoM	Green Pigeon (Morning View) 58113 (mm) BoM	Wiangaree Bridge (Richmond River) 203005 (mm) WaterNSW	Richmond River at Kyogle 203900 (mm) WaterNSW	Eden Creek at Doubtful 203034 (mm) WaterNSW
20/03/2022	4.4	7.4	0.4	0.0	0.0
21/03/2022	0.2	0.0	0.0	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.2	0.0	0.0	0.0
24/03/2022	0.0	0.0	0.0	0.0	0.0
25/03/2022	1.4	4.4	0.0	0.4	5.0
26/03/2022	24.6	39.8	14.4	22.8	5.5
27/03/2022	9.4	18.6	8.0	5.4	3.0
28/03/2022	12.2	6.8	9.2	3.4	7.5
29/03/2022	85.2	106.0	84.4	89.8	83.5
30/03/2022	71.2	98.6	59.0	58.2	41.5
31/03/2022	14.8	28.4	20.6	16.8	4.0
01/04/2022	0.0	0.8	0.2	0.0	0.0
02/04/2022	0.0	0.2	0.0	0.0	0.0
03/04/2022	0.0	0.0	0.0	0.0	0.0
04/04/2022	10.6	9.0	12.0	13.2	25.0
05/04/2022	0.0	0.4	0.0	0.0	0.0
06/04/2022	0.2	0.0	0.0	0.0	0.0
07/04/2022	0.0	2.6	4.4	14.6	13.0
08/04/2022	3.0	8.4	8.0	9.2	11.5
09/04/2022	5.0	10.0	5.4	3.8	8.5
10/04/2022	0.8	1.8	2.6	1.0	2.0
11/04/2022	0.0	0.4	0.0	0.0	0.0
12/04/2022	0.2	0.2	0.0	0.0	0.0
13/04/2022	0.0	0.2	0.0	0.0	0.5
14/04/2022	10.8	13.6	9.8	7.0	9.5
15/04/2022	9.4	5.0	7.0	8.2	6.5
16/04/2022	7.8	7.0	2.0	2.0	1.5
17/04/2022	8.8	11.0	3.6	3.2	3.0
18/04/2022	0.8	1.8	0.0	0.0	0.0
19/04/2022	0.0	0.2	0.0	0.0	0.0
20/04/2022	0.2	0.2	0.0	0.0	0.0

Table 6.4 Richmond River region daily rainfall totals (cont.)

Date	Lake Ainsworth 203455 (mm)	Alstonville STP 558072 (mm)	Ballina Airport AWS 58198 (mm)	Casino Airport AWS 58208 (mm)
	DPE BCD	Ballina Shire Council	BoM	BoM
20/03/2022	1.5	18.4	0.0	0.0
21/03/2022	0.0	0.0	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.2	0.0	0.0
24/03/2022	0.0	0.0	0.0	0.2
25/03/2022	37.0	9.0	4.8	1.4
26/03/2022	12.5	40.2	38.2	12.2
27/03/2022	68.5	207.8	79.2	4.6
28/03/2022	29.5	24.6	30.6	7.2
29/03/2022	158.5	209.6	152.0	---
30/03/2022	---	428.4	280.8	---
31/03/2022	---	45.8	120.8	---
01/04/2022	---	4.0	0.0	---
02/04/2022	---	0.0	0.0	---
03/04/2022	---	0.0	0.0	---
04/04/2022	---	2.6	2.8	---
05/04/2022	---	0.4	0.2	---
06/04/2022	---	0.0	0.0	---
07/04/2022	---	0.4	0.0	---
08/04/2022	---	18.0	4.4	---
09/04/2022	---	7.6	3.0	---
10/04/2022	---	2.0	0.2	---
11/04/2022	---	0.4	0.0	---
12/04/2022	---	0.2	0.0	---
13/04/2022	---	7.8	15.4	---
14/04/2022	---	11.0	26.6	---
15/04/2022	---	8.0	3.8	---
16/04/2022	---	6.0	1.4	---
17/04/2022	---	9.6	5.0	---
18/04/2022	---	0.4	0.2	---
19/04/2022	---	0.2	0.0	---
20/04/2022	---	0.0	0.0	---

Table 6.5 Richmond River region daily rainfall totals (cont.)

Date	Shannon Brook at Yorklea 203041 (mm)	Rappville (Myrtle Creek) 203030 (mm)	Evans Head RAAF Bombing Range AWS 58212 (mm)	Whiporie Post Office 58099 (mm)
	WaterNSW	WaterNSW	BoM	BoM
20/03/2022	1.6	0.6	0.0	2.2
21/03/2022	0.2	0.0	0.0	0.0
22/03/2022	0.0	0.0	0.0	0.0
23/03/2022	0.0	0.0	0.0	0.0
24/03/2022	0.2	0.2	0.2	0.6
25/03/2022	15.8	30.4	13.2	63.0
26/03/2022	40.2	46.0	110.2	21.0
27/03/2022	5.6	4.4	57.2	5.0
28/03/2022	5.0	5.0	15.2	6.4
29/03/2022	91.2	72.4	89.0	48.0
30/03/2022	125.2	84.6	272.2	104.8
31/03/2022	2.4	10.8	7.6	3.0
01/04/2022	0.0	0.2	1.4	0.0
02/04/2022	0.0	2.8	0.0	1.4
03/04/2022	0.0	0.0	0.0	0.2
04/04/2022	17.4	28.0	6.6	55.4
05/04/2022	0.2	0.0	0.0	0.2
06/04/2022	0.0	0.0	0.0	0.0
07/04/2022	9.2	2.8	3.2	3.8
08/04/2022	15.6	10.0	34.8	9.4
09/04/2022	8.2	2.8	6.0	2.8
10/04/2022	0.6	1.2	1.0	2.4
11/04/2022	0.0	0.2	0.0	0.2
12/04/2022	0.0	0.0	0.0	0.0
13/04/2022	0.0	0.0	9.2	0.0
14/04/2022	8.6	5.6	13.8	8.0
15/04/2022	4.4	6.4	2.2	12.0
16/04/2022	2.8	3.2	7.4	0.0
17/04/2022	2.2	4.2	5.4	4.2
18/04/2022	0.2	0.8	0.4	0.2
19/04/2022	0.2	0.0	0.0	0.0
20/04/2022	0.0	0.0	0.0	0.0



NSW GOVERNMENT

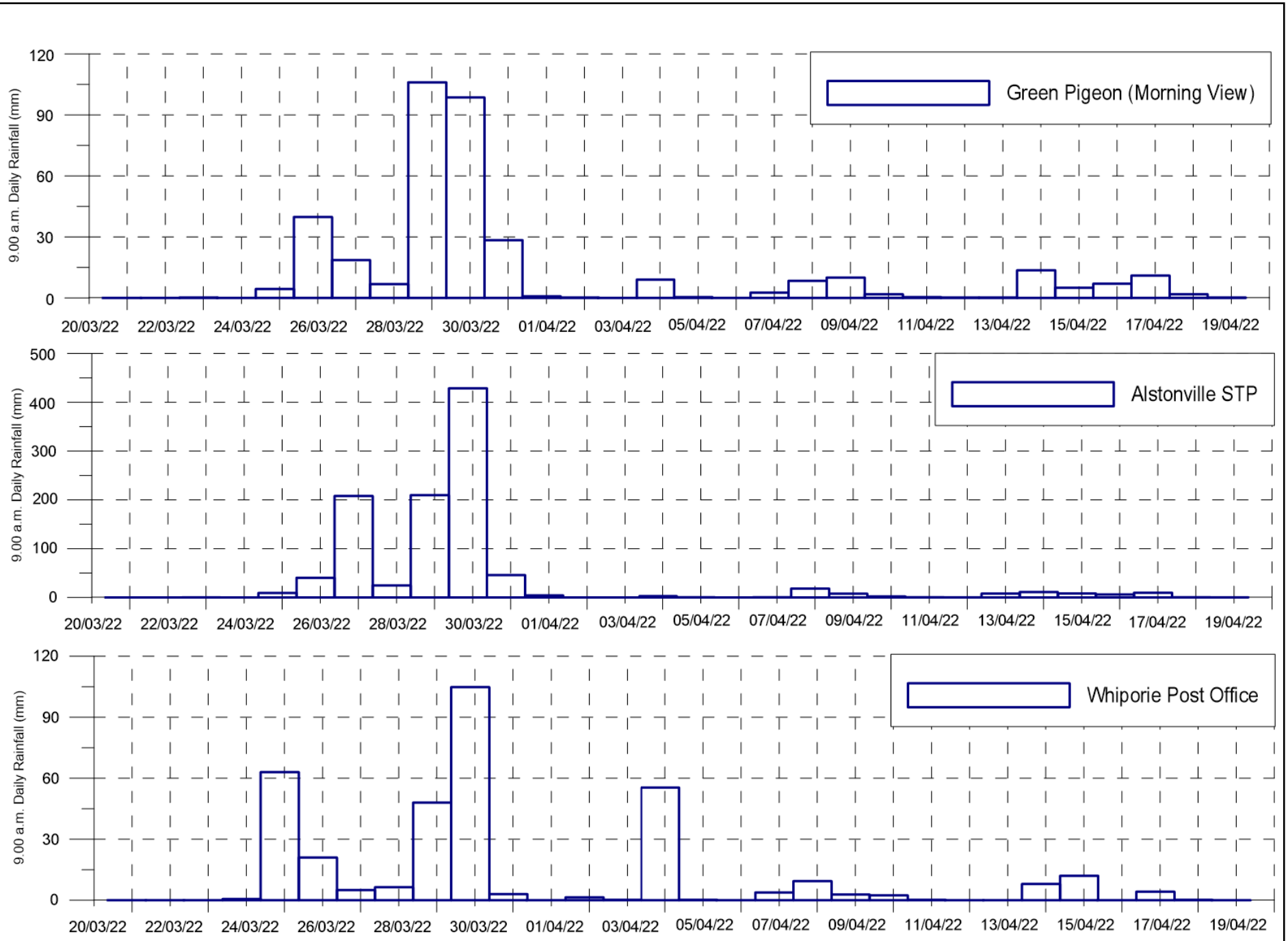
RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.2

6.2.GRF

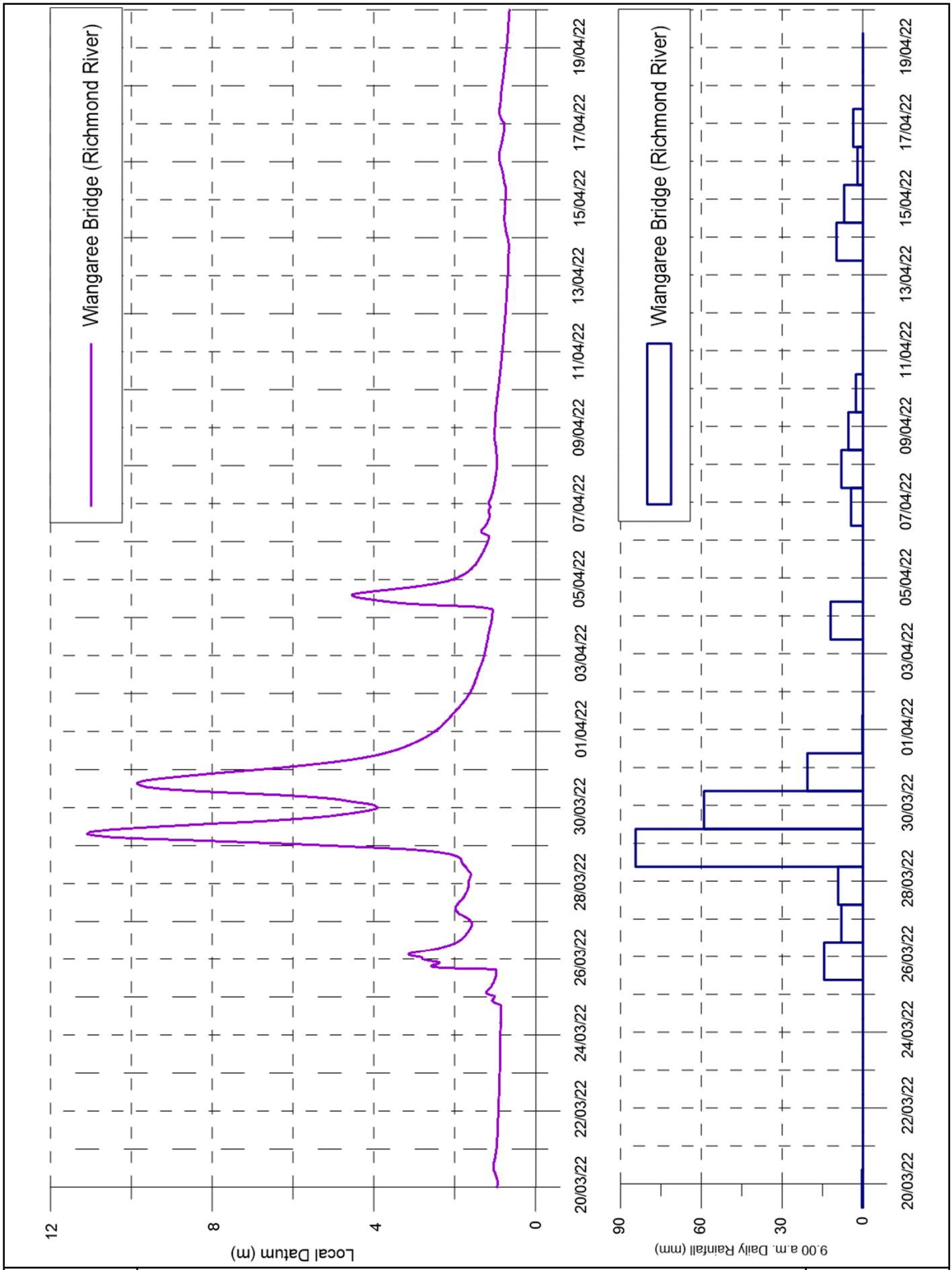
RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022



Manly Hydraulics Laboratory

Report MHL2895
Figure
6.3

6.3.GRF



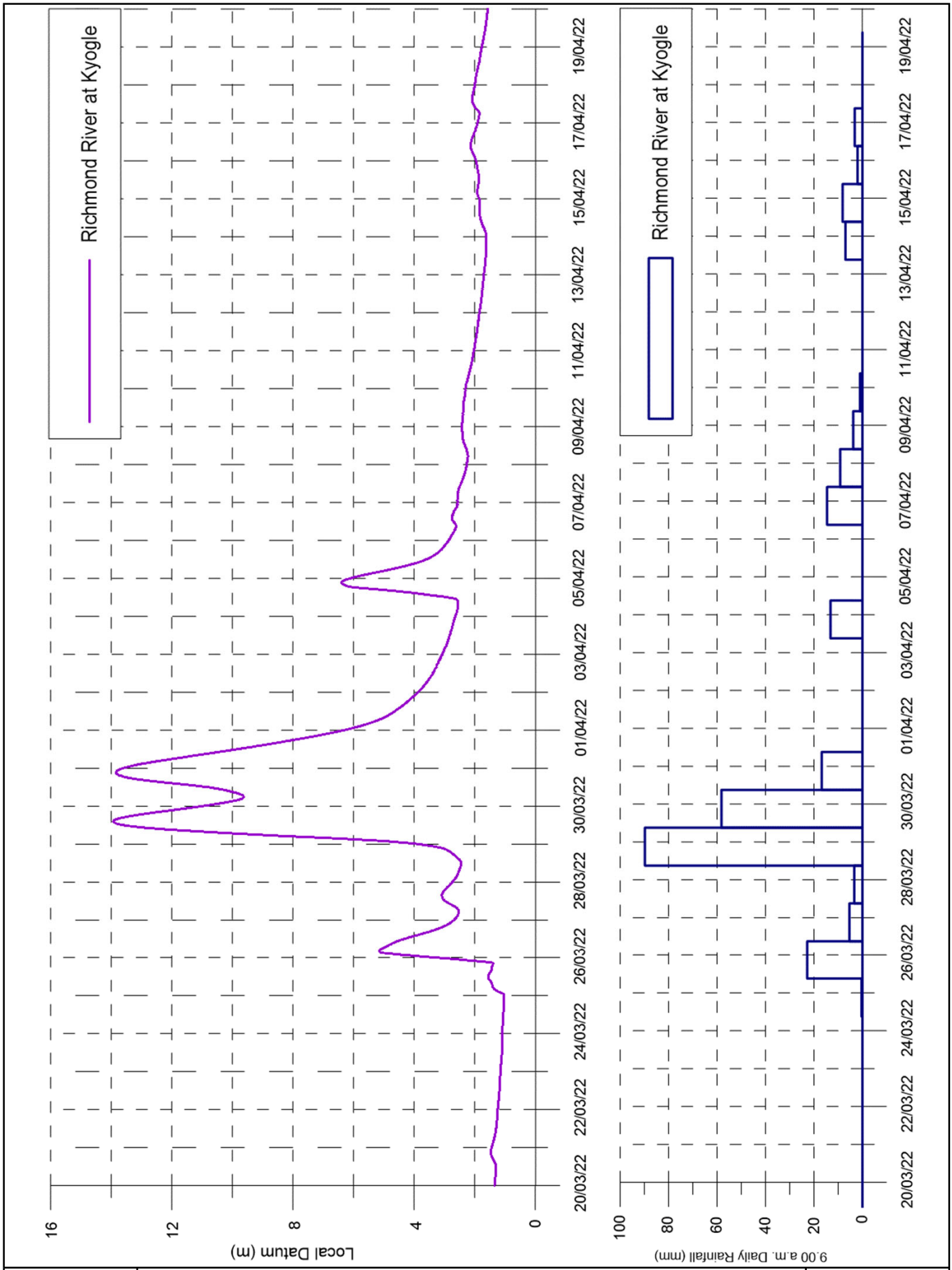
NSW GOVERNMENT

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.4

6.4.GRF



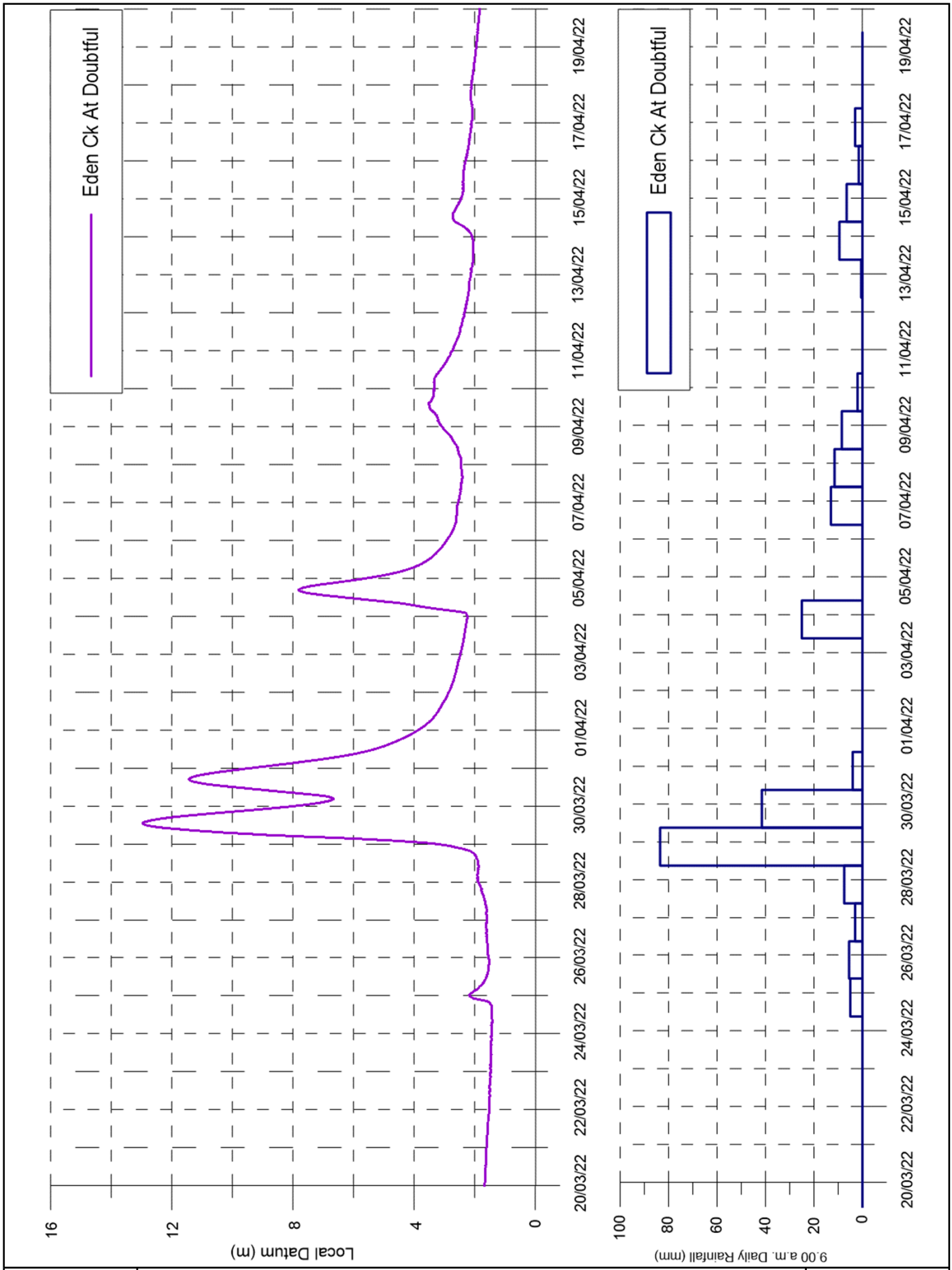
NSW GOVERNMENT

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.5

6.5.GRF



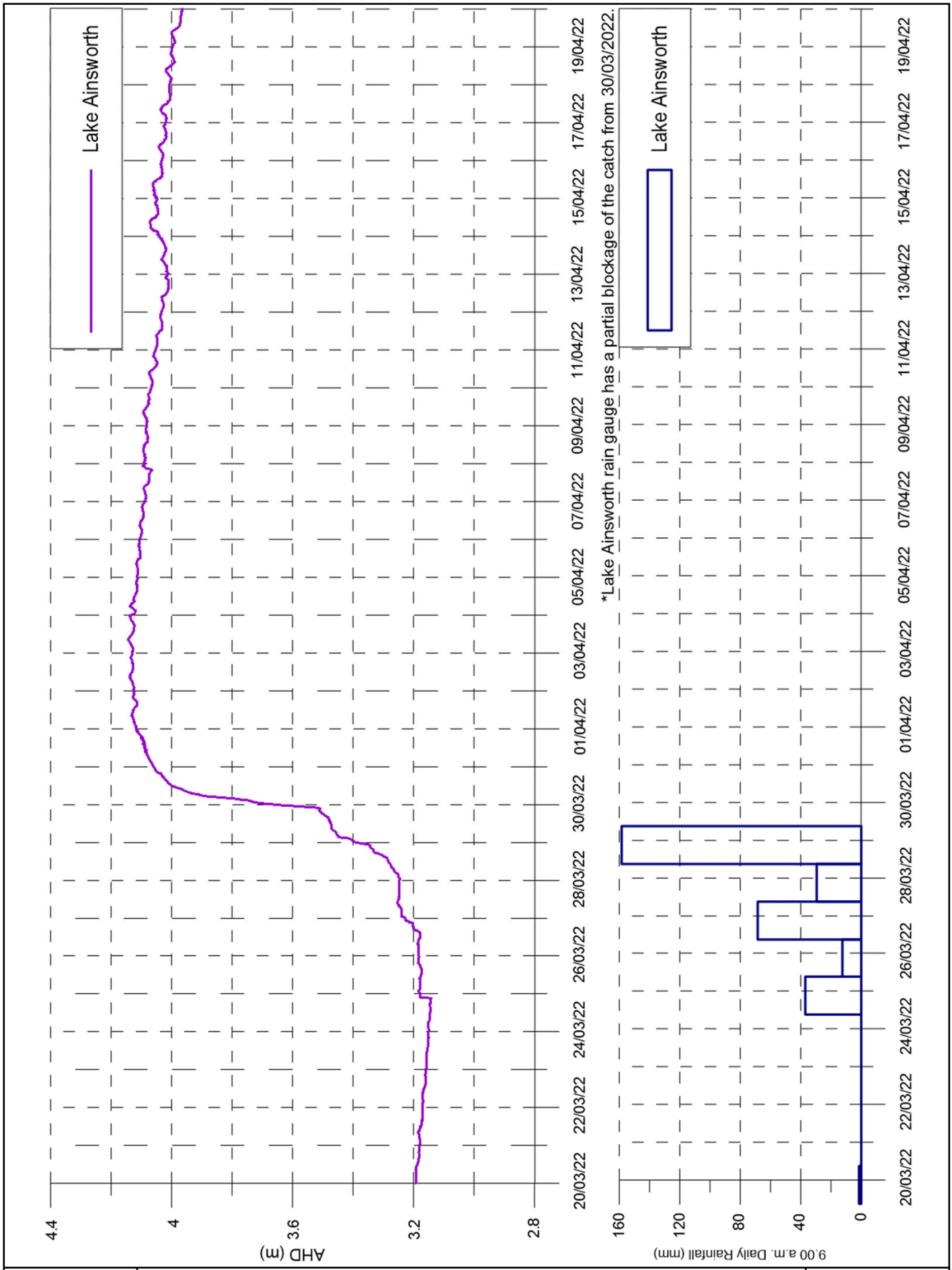
NSW GOVERNMENT

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.6

6.6.GRF



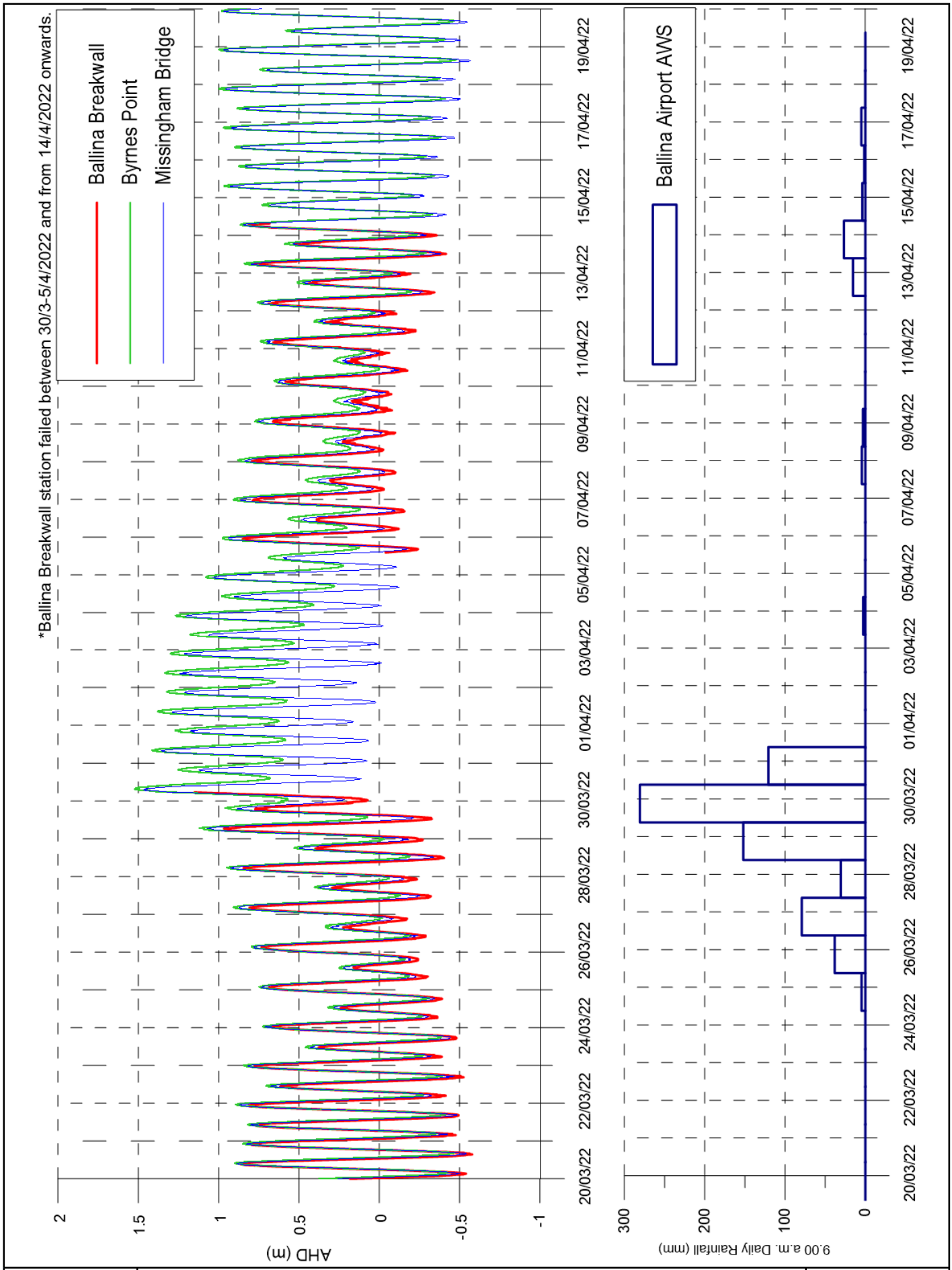
NSW GOVERNMENT

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.7

6.7.GRF



NSW GOVERNMENT

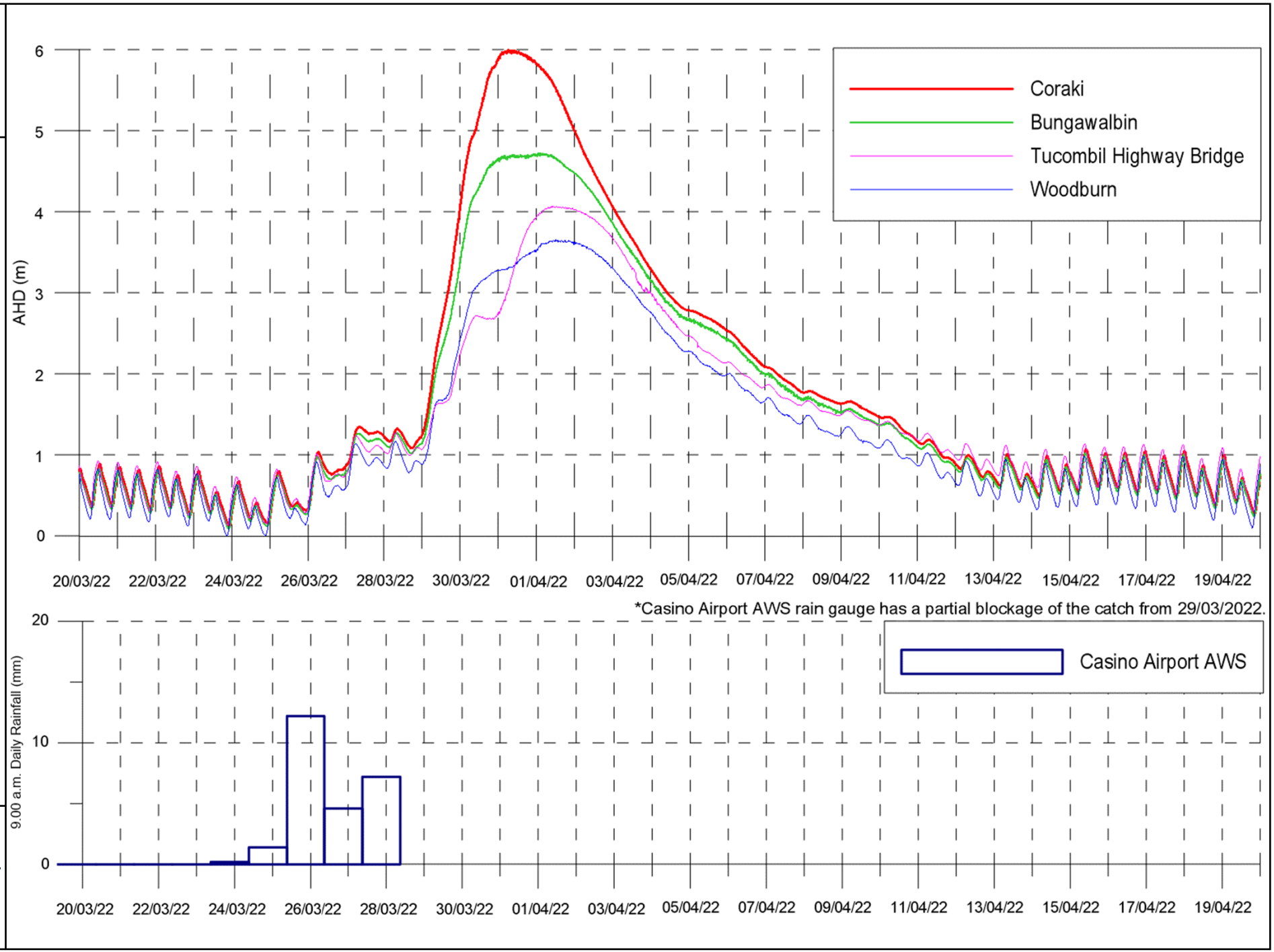
RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

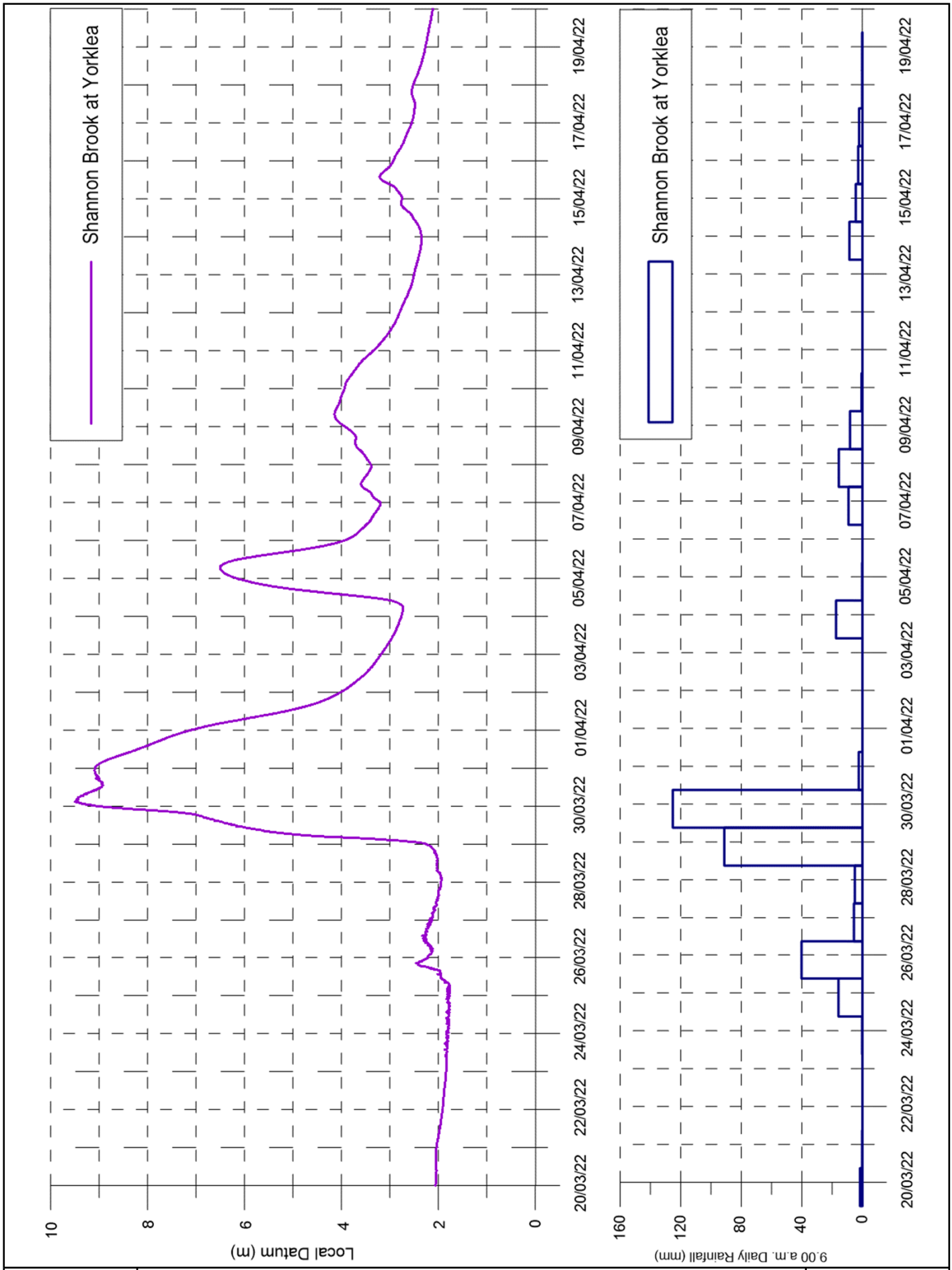
Report MHL2895
Figure
6.8

6.8.GRF

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022



Manly Hydraulics Laboratory
Report MHL2895
Figure 6.9
6.9.GRF



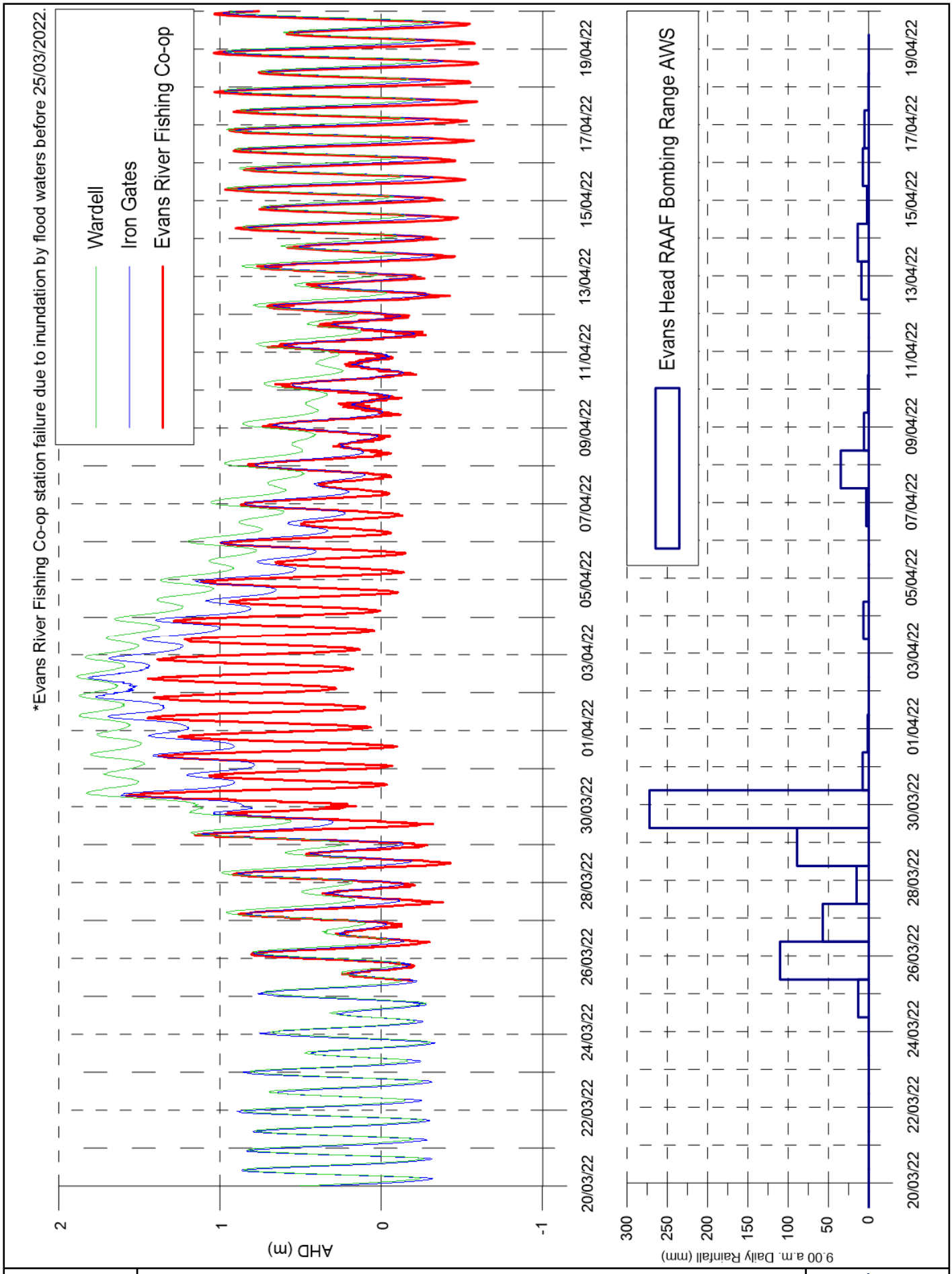
NSW GOVERNMENT

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.10

6.10.GRF



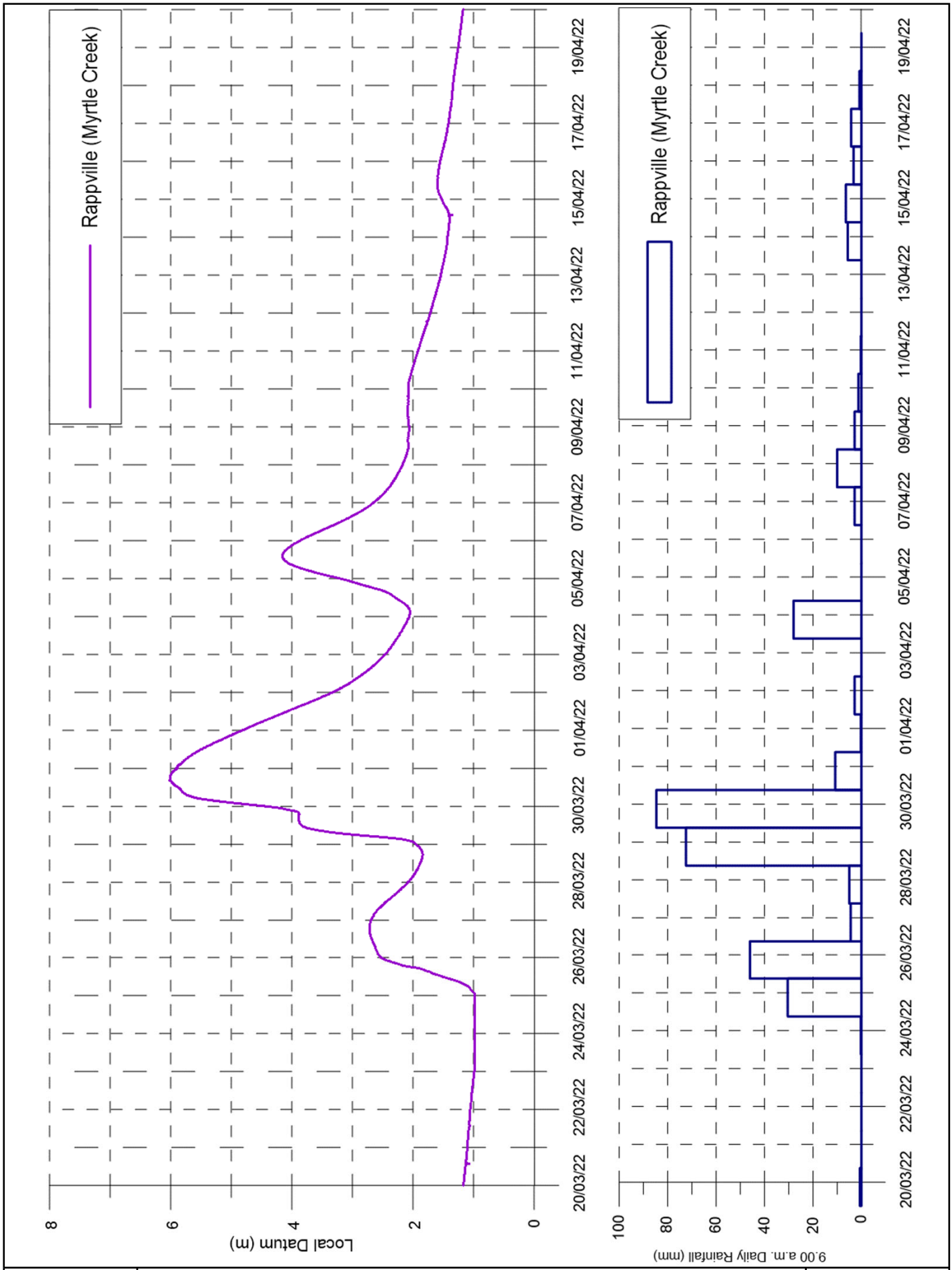
NSW GOVERNMENT

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
6.11

6.11.GRF



NSW GOVERNMENT

RICHMOND RIVER REGION
WATER LEVEL AND RAINFALL DATA
20 MARCH – 20 APRIL 2022

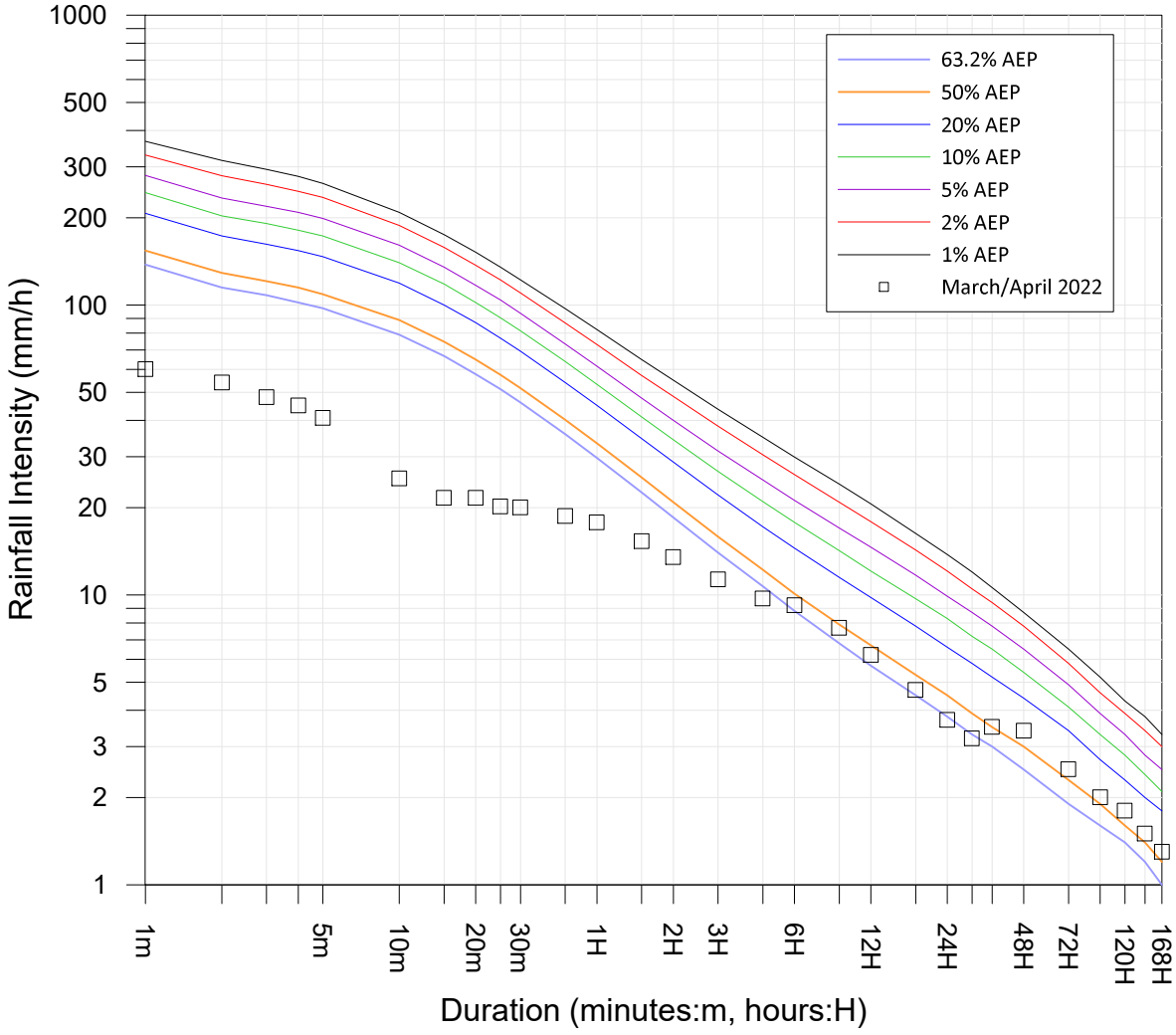
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.12

6.12.GRF

Site Owner: BoM
Latitude: -28.4119 Longitude:152.9827

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	60	14:18 30 Mar 2022
2m	54	14:18 30 Mar 2022
3m	48	14:19 30 Mar 2022
4m	45	08:18 30 Mar 2022
5m	40.8	08:18 30 Mar 2022
10m	25.2	08:22 30 Mar 2022
15m	21.6	01:21 29 Mar 2022
20m	21.6	14:48 25 Mar 2022
25m	20.2	14:53 25 Mar 2022
30m	20	01:37 29 Mar 2022
45m	18.7	01:40 29 Mar 2022
1H	17.8	01:41 29 Mar 2022
1.5H	15.3	01:44 29 Mar 2022
2H	13.5	01:46 29 Mar 2022
3H	11.3	01:44 29 Mar 2022
5H	9.7	01:48 29 Mar 2022
6H	9.2	01:46 29 Mar 2022
9H	7.7	02:46 29 Mar 2022
12H	6.2	02:44 29 Mar 2022
18H	4.7	04:43 29 Mar 2022
24H	3.7	02:21 29 Mar 2022
30H	3.2	05:10 29 Mar 2022
36H	3.5	08:20 30 Mar 2022
48H	3.4	14:28 30 Mar 2022
72H	2.5	23:10 30 Mar 2022
96H	2	15:17 30 Mar 2022
120H	1.8	14:25 30 Mar 2022
144H	1.5	15:18 30 Mar 2022
168H	1.3	13:50 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

LOADSTONE (HIGH VIEW) (58141) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

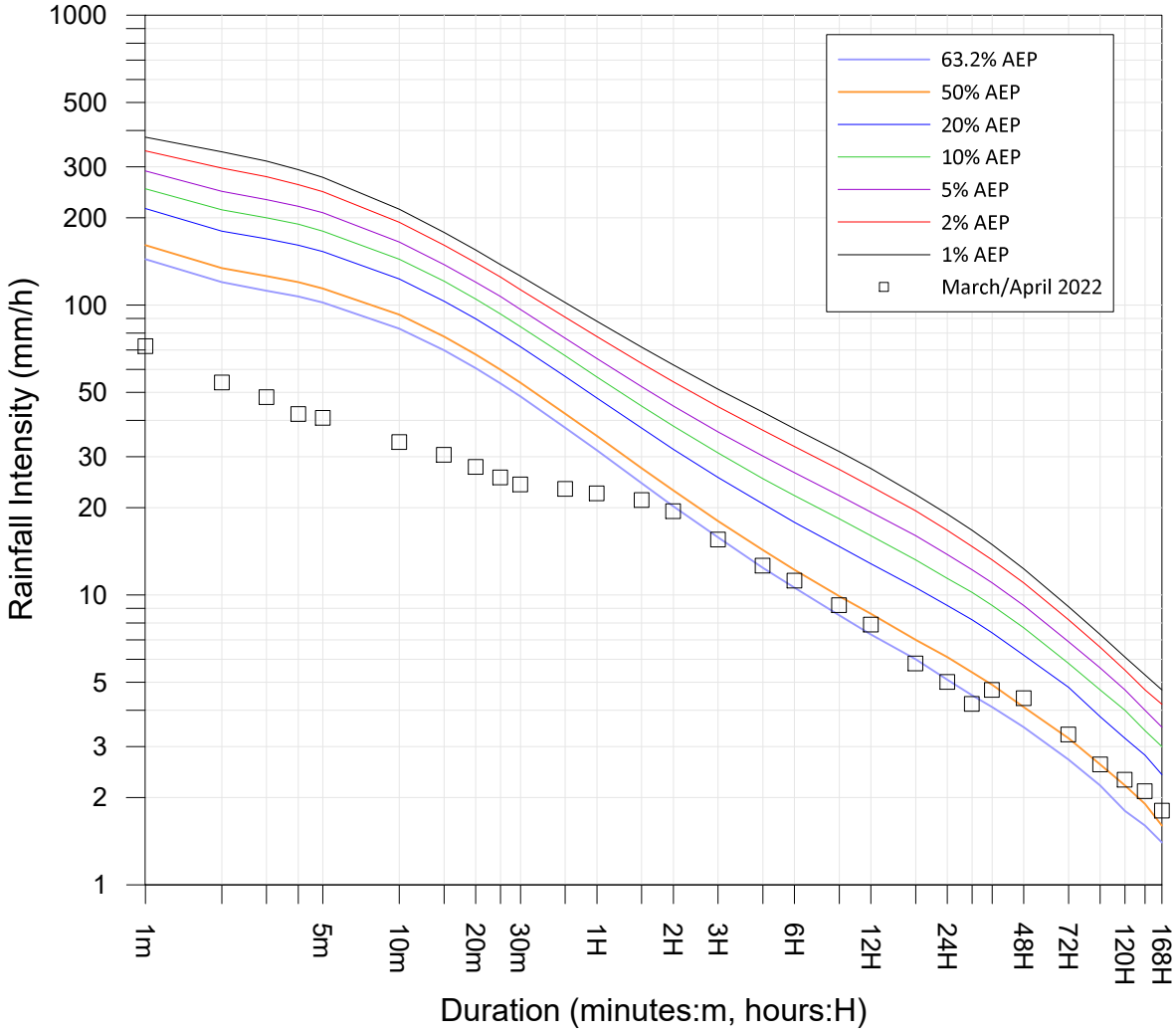
Manly Hydraulics Laboratory

Report MHL2895 Figure 6.13

IFD_58141_Figure 6.13.pdf

Site Owner: BoM
Latitude: -28.4738 Longitude:153.0861

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	72	13:02 13 Apr 2022
2m	54	13:03 13 Apr 2022
3m	48	13:04 13 Apr 2022
4m	42	17:25 30 Mar 2022
5m	40.8	17:26 30 Mar 2022
10m	33.6	17:27 30 Mar 2022
15m	30.4	05:22 30 Mar 2022
20m	27.6	05:23 30 Mar 2022
25m	25.4	05:28 30 Mar 2022
30m	24	01:16 29 Mar 2022
45m	23.2	01:25 29 Mar 2022
1H	22.4	01:25 29 Mar 2022
1.5H	21.2	01:47 29 Mar 2022
2H	19.4	01:51 29 Mar 2022
3H	15.5	01:51 29 Mar 2022
5H	12.6	01:59 29 Mar 2022
6H	11.2	02:02 29 Mar 2022
9H	9.2	02:06 29 Mar 2022
12H	7.9	02:46 29 Mar 2022
18H	5.8	05:03 29 Mar 2022
24H	5	18:00 30 Mar 2022
30H	4.2	19:06 30 Mar 2022
36H	4.7	08:33 30 Mar 2022
48H	4.4	17:35 30 Mar 2022
72H	3.3	01:57 31 Mar 2022
96H	2.6	17:46 30 Mar 2022
120H	2.3	13:56 30 Mar 2022
144H	2.1	04:56 31 Mar 2022
168H	1.8	13:17 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

GREEN PIGEON (MORNING VIEW) (58113) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

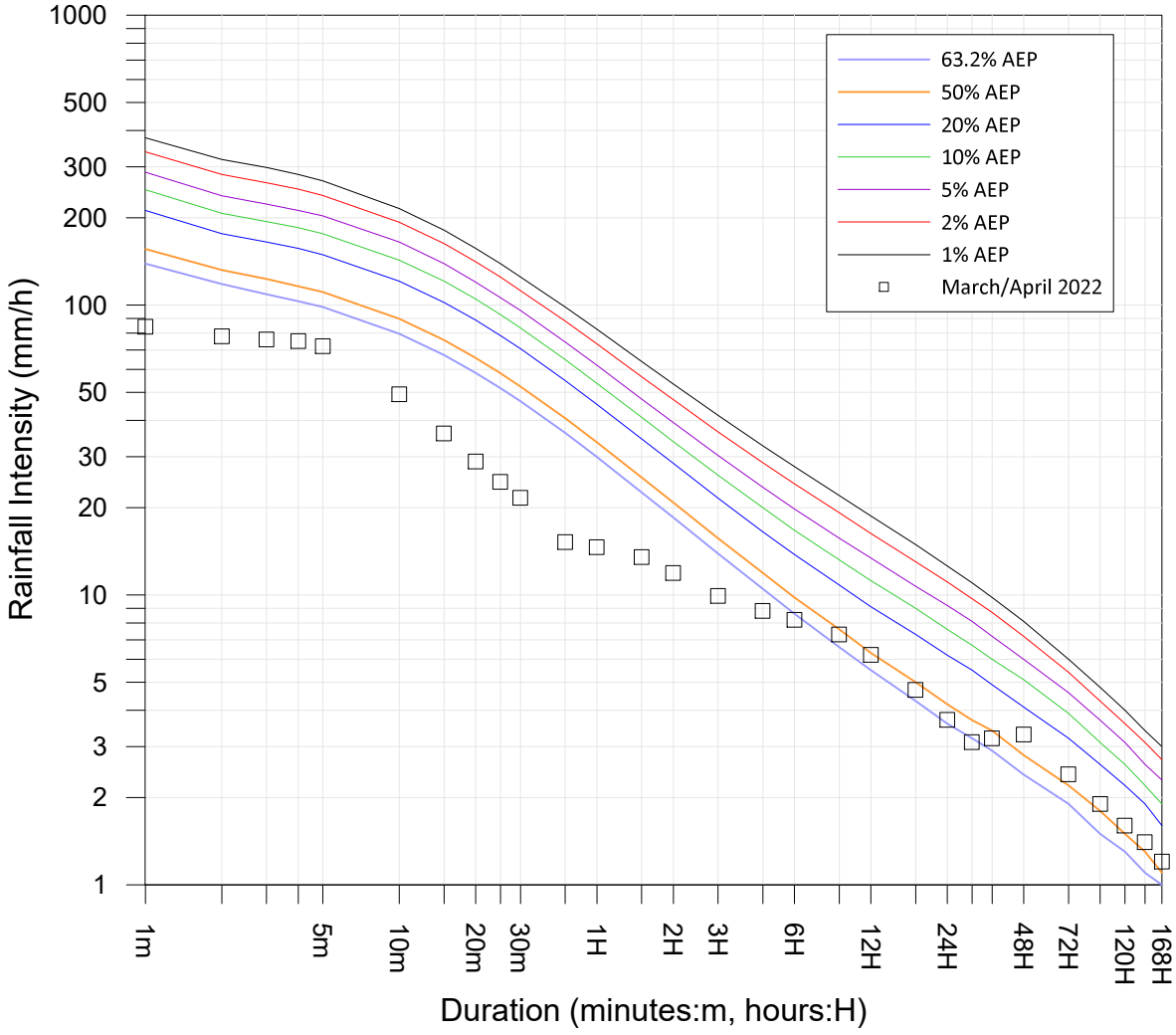
Manly Hydraulics Laboratory

Report MHL2895 Figure 6.14

IFD_58113_Figure 6.14.pdf

Site Owner: WaterNSW
Latitude: -28.5167 Longitude:152.9667

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	84	14:08 30 Mar 2022
2m	78	14:09 30 Mar 2022
3m	76	14:09 30 Mar 2022
4m	75	14:09 30 Mar 2022
5m	72	14:09 30 Mar 2022
10m	49.2	14:13 30 Mar 2022
15m	36	14:13 30 Mar 2022
20m	28.8	14:16 30 Mar 2022
25m	24.5	14:13 30 Mar 2022
30m	21.6	14:13 30 Mar 2022
45m	15.2	02:01 29 Mar 2022
1H	14.6	01:59 29 Mar 2022
1.5H	13.5	02:10 29 Mar 2022
2H	11.9	02:27 29 Mar 2022
3H	9.9	02:32 29 Mar 2022
5H	8.8	02:18 29 Mar 2022
6H	8.2	02:58 29 Mar 2022
9H	7.3	02:29 29 Mar 2022
12H	6.2	03:38 29 Mar 2022
18H	4.7	04:53 29 Mar 2022
24H	3.7	05:08 29 Mar 2022
30H	3.1	07:46 29 Mar 2022
36H	3.2	06:42 30 Mar 2022
48H	3.3	14:12 30 Mar 2022
72H	2.4	01:46 31 Mar 2022
96H	1.9	14:31 30 Mar 2022
120H	1.6	14:23 30 Mar 2022
144H	1.4	14:23 31 Mar 2022
168H	1.2	14:23 01 Apr 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

WIANGAREE BRIDGE (RICHMOND RIVER) (203005)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

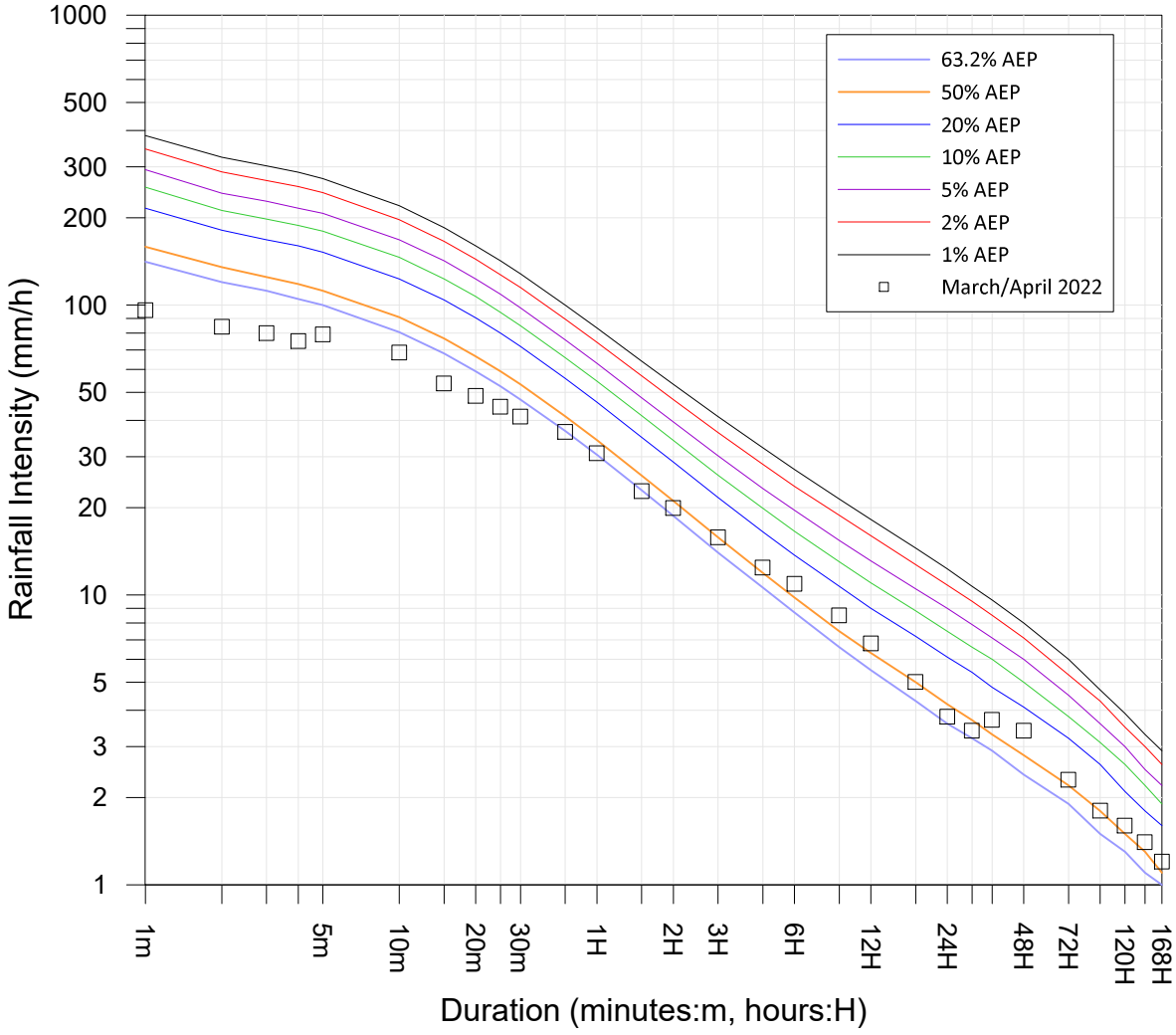
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.15

IFD_203005_Figure 6.15.pdf

Site Owner: WaterNSW
Latitude: -28.621 Longitude:152.9948

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	96	17:33 06 Apr 2022
2m	84	17:34 06 Apr 2022
3m	80	17:34 06 Apr 2022
4m	75	17:35 06 Apr 2022
5m	79.2	17:33 06 Apr 2022
10m	68.4	17:35 06 Apr 2022
15m	53.6	02:39 29 Mar 2022
20m	48.6	02:39 29 Mar 2022
25m	44.6	02:40 29 Mar 2022
30m	41.2	02:41 29 Mar 2022
45m	36.5	02:41 29 Mar 2022
1H	30.8	02:50 29 Mar 2022
1.5H	22.8	02:47 29 Mar 2022
2H	19.9	02:50 29 Mar 2022
3H	15.8	02:56 29 Mar 2022
5H	12.4	02:55 29 Mar 2022
6H	10.9	03:04 29 Mar 2022
9H	8.5	04:18 29 Mar 2022
12H	6.8	05:14 29 Mar 2022
18H	5	05:07 29 Mar 2022
24H	3.8	06:28 29 Mar 2022
30H	3.4	05:56 30 Mar 2022
36H	3.7	07:31 30 Mar 2022
48H	3.4	14:19 30 Mar 2022
72H	2.3	02:58 31 Mar 2022
96H	1.8	14:02 30 Mar 2022
120H	1.6	14:02 30 Mar 2022
144H	1.4	20:25 30 Mar 2022
168H	1.2	20:25 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

RICHMOND RIVER AT KYOGLE (203900)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

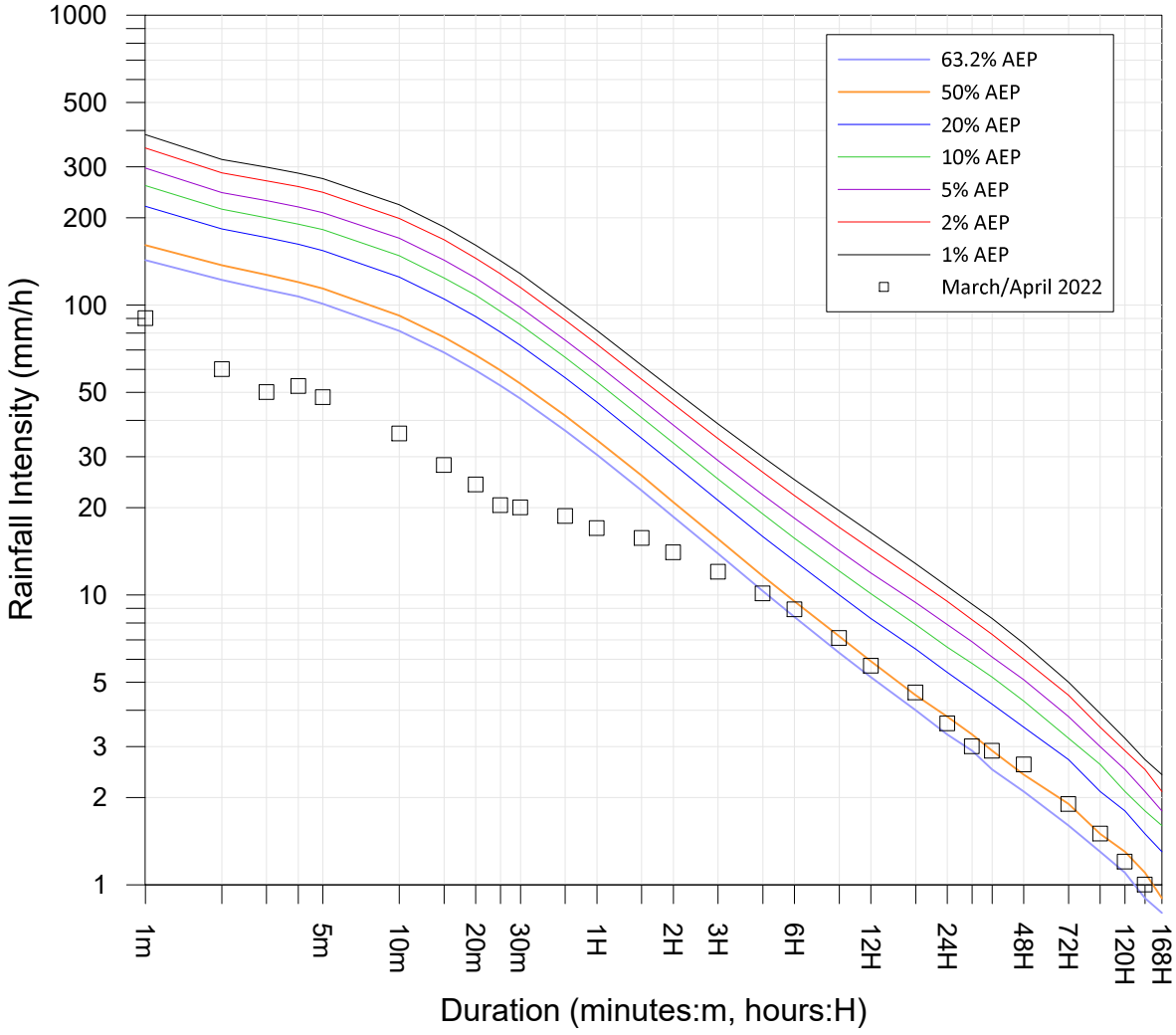
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.16

IFD_203900_Figure 6.16.pdf

Site Owner: WaterNSW
Latitude: -28.7591 Longitude:152.9222

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	90	12:15 06 Apr 2022
2m	60	17:13 14 Apr 2022
3m	50	12:17 06 Apr 2022
4m	52.5	12:15 06 Apr 2022
5m	48	12:16 06 Apr 2022
10m	36	12:20 06 Apr 2022
15m	28	12:24 06 Apr 2022
20m	24	12:29 06 Apr 2022
25m	20.4	12:34 06 Apr 2022
30m	20	03:21 29 Mar 2022
45m	18.7	03:23 29 Mar 2022
1H	17	03:23 29 Mar 2022
1.5H	15.7	03:27 29 Mar 2022
2H	14	03:22 29 Mar 2022
3H	12	03:26 29 Mar 2022
5H	10.1	04:12 29 Mar 2022
6H	8.9	04:32 29 Mar 2022
9H	7.1	04:39 29 Mar 2022
12H	5.7	04:46 29 Mar 2022
18H	4.6	05:09 29 Mar 2022
24H	3.6	05:26 29 Mar 2022
30H	3	08:45 29 Mar 2022
36H	2.9	07:23 30 Mar 2022
48H	2.6	11:13 30 Mar 2022
72H	1.9	02:45 31 Mar 2022
96H	1.5	20:28 30 Mar 2022
120H	1.2	14:51 30 Mar 2022
144H	1	16:45 30 Mar 2022
168H	0.9	11:09 04 Apr 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

EDEN CK AT DOUBTFUL (203034)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

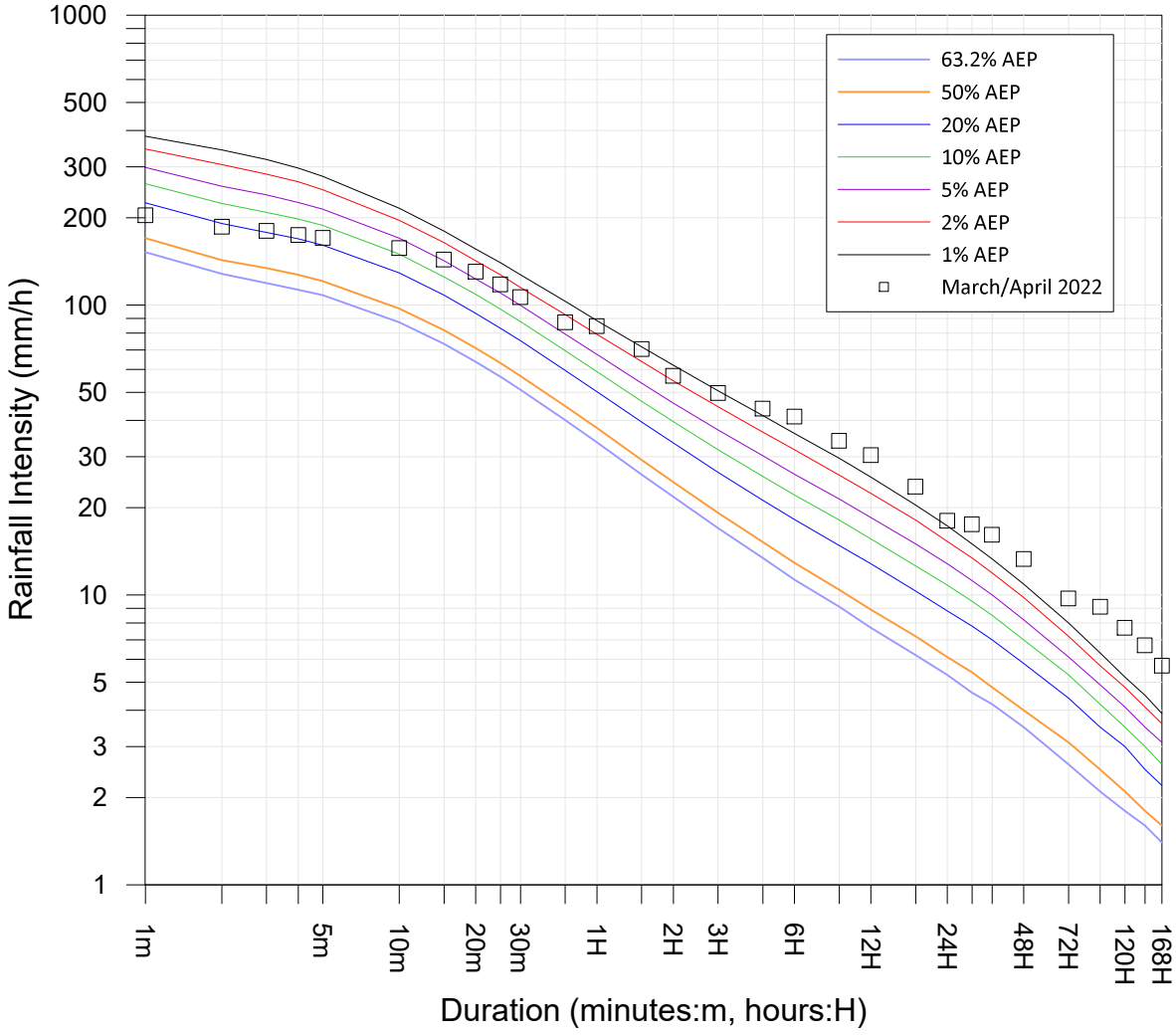
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.17

IFD_203034_Figure 6.17.pdf

Site Owner: Ballina Shire Council
Latitude: -28.831 Longitude:153.444

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	204	23:42 29 Mar 2022
2m	186	23:42 29 Mar 2022
3m	180	23:42 29 Mar 2022
4m	174	23:43 29 Mar 2022
5m	170.4	23:44 29 Mar 2022
10m	157.2	23:44 29 Mar 2022
15m	143.2	23:47 29 Mar 2022
20m	130.2	23:47 29 Mar 2022
25m	117.6	23:50 29 Mar 2022
30m	106.4	23:52 29 Mar 2022
45m	87.2	00:15 30 Mar 2022
1H	84.4	00:25 30 Mar 2022
1.5H	70.5	00:51 30 Mar 2022
2H	56.9	01:21 30 Mar 2022
3H	49.7	00:39 30 Mar 2022
5H	43.9	00:35 30 Mar 2022
6H	41.2	00:58 30 Mar 2022
9H	34	03:58 30 Mar 2022
12H	30.3	06:01 30 Mar 2022
18H	23.6	07:49 30 Mar 2022
24H	18	07:49 30 Mar 2022
30H	17.5	05:10 30 Mar 2022
36H	16.1	07:52 30 Mar 2022
48H	13.3	07:50 30 Mar 2022
72H	9.7	01:44 31 Mar 2022
96H	9.1	11:49 30 Mar 2022
120H	7.7	21:22 30 Mar 2022
144H	6.7	19:30 30 Mar 2022
168H	5.7	20:41 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

ALSTONVILLE STP (558072)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

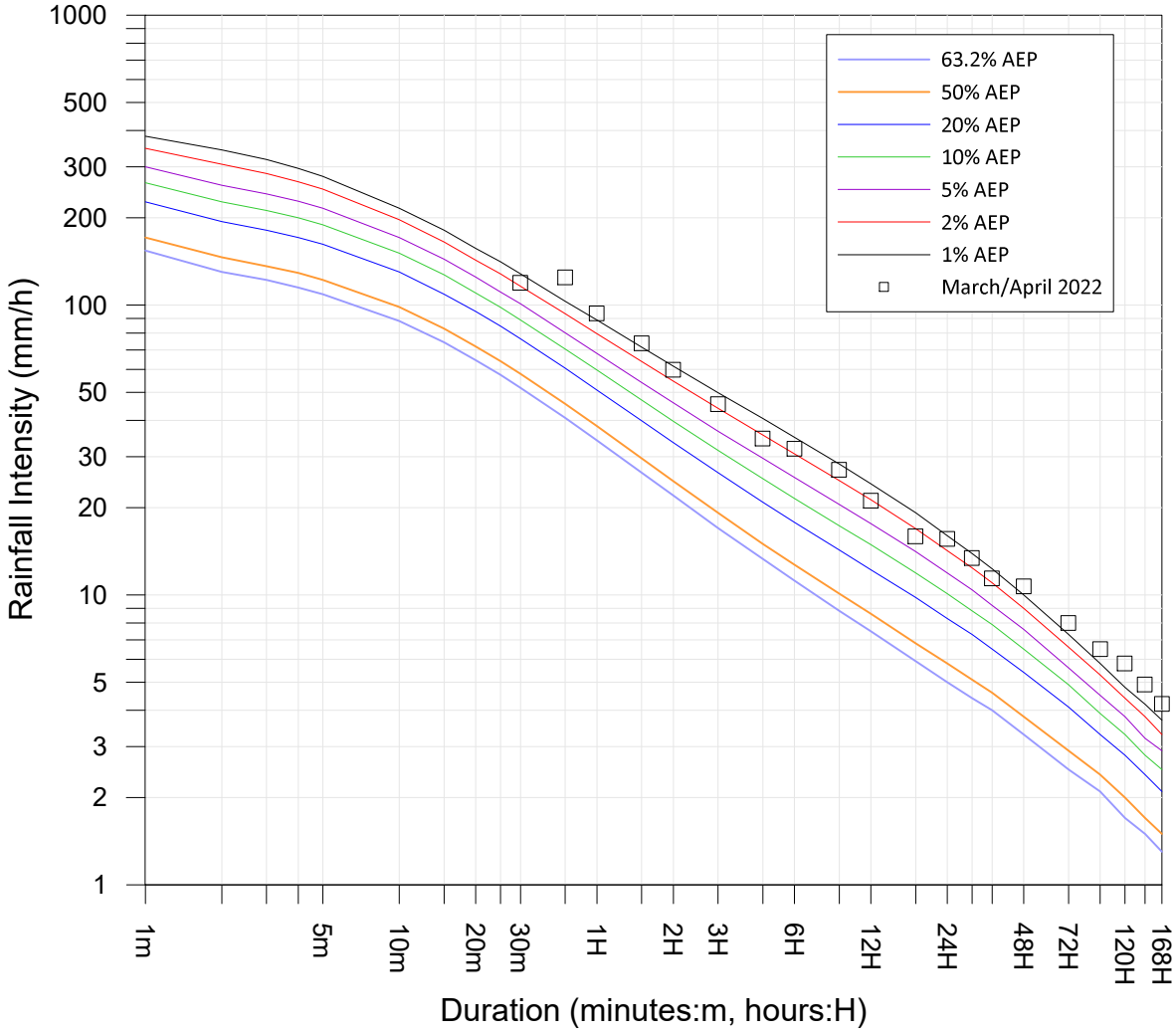
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.18

IFD_558072_Figure 6.18.pdf

Site Owner: BoM
Latitude: -28.8353 Longitude:153.5585

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	-	-
2m	-	-
3m	-	-
4m	-	-
5m	-	-
10m	-	-
15m	-	-
20m	-	-
25m	-	-
30m	119.2	23:59 29 Mar 2022
45m	124.5	00:14 30 Mar 2022
1H	93.4	00:29 30 Mar 2022
1.5H	73.7	00:59 30 Mar 2022
2H	59.7	00:59 30 Mar 2022
3H	45.5	00:59 30 Mar 2022
5H	34.6	01:30 30 Mar 2022
6H	31.9	05:29 30 Mar 2022
9H	27	06:00 30 Mar 2022
12H	21.1	05:59 30 Mar 2022
18H	15.9	16:59 30 Mar 2022
24H	15.6	18:29 30 Mar 2022
30H	13.4	18:29 30 Mar 2022
36H	11.4	18:59 30 Mar 2022
48H	10.7	18:29 30 Mar 2022
72H	8	22:59 30 Mar 2022
96H	6.5	18:29 30 Mar 2022
120H	5.8	18:29 30 Mar 2022
144H	4.9	21:29 30 Mar 2022
168H	4.2	21:29 31 Mar 2022

Rainfall is totalised at 30 minute intervals.
Short duration IFD results removed.

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

BALLINA AIRPORT AWS (58198) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

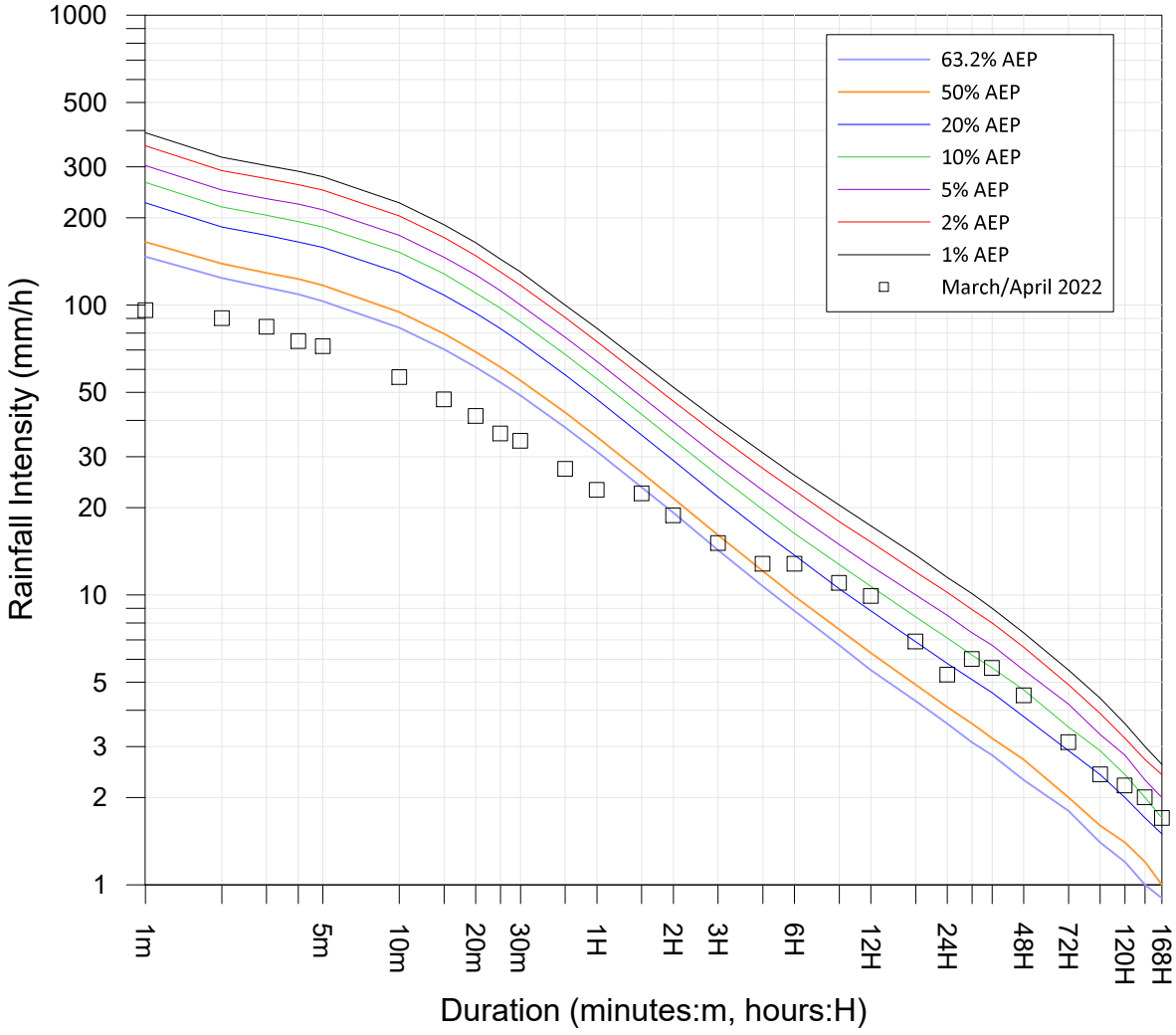
Manly Hydraulics Laboratory

Report MHL2895 Figure 6.19

IFD_58198_Figure 6.19.pdf

Site Owner: WaterNSW
Latitude: -28.9447 Longitude:153.0603

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	96	16:11 25 Mar 2022
2m	90	16:12 25 Mar 2022
3m	84	16:12 25 Mar 2022
4m	75	16:13 25 Mar 2022
5m	72	16:12 25 Mar 2022
10m	56.4	16:16 25 Mar 2022
15m	47.2	16:21 25 Mar 2022
20m	41.4	16:25 25 Mar 2022
25m	36	16:21 25 Mar 2022
30m	34	16:25 25 Mar 2022
45m	27.2	16:32 25 Mar 2022
1H	23	01:54 30 Mar 2022
1.5H	22.4	01:58 30 Mar 2022
2H	18.8	02:29 30 Mar 2022
3H	15.1	02:07 30 Mar 2022
5H	12.8	04:49 29 Mar 2022
6H	12.8	02:23 30 Mar 2022
9H	11	05:07 30 Mar 2022
12H	9.9	06:54 30 Mar 2022
18H	6.9	11:49 30 Mar 2022
24H	5.3	02:14 30 Mar 2022
30H	6	06:53 30 Mar 2022
36H	5.6	06:56 30 Mar 2022
48H	4.5	11:36 30 Mar 2022
72H	3.1	23:39 30 Mar 2022
96H	2.4	14:24 30 Mar 2022
120H	2.2	15:29 30 Mar 2022
144H	2	18:23 30 Mar 2022
168H	1.7	18:23 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

SHANNON BROOK AT YORKLEA (203041)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

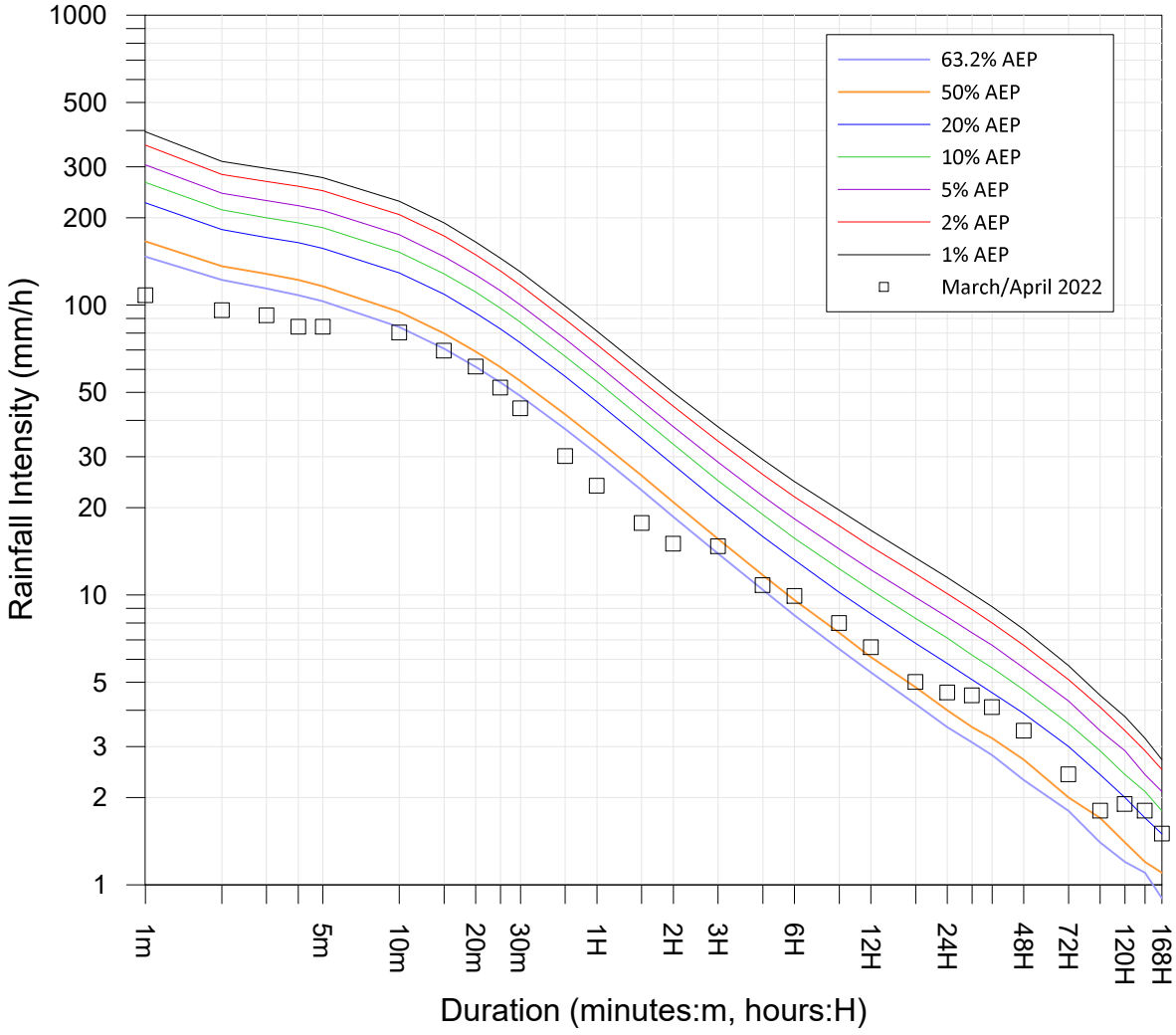
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.20

IFD_203041_Figure 6.20.pdf

Site Owner: WaterNSW
Latitude: -29.1119 Longitude:152.9983

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	108	18:57 24 Mar 2022
2m	96	18:57 24 Mar 2022
3m	92	18:57 24 Mar 2022
4m	84	18:58 24 Mar 2022
5m	84	18:59 24 Mar 2022
10m	80.4	19:04 24 Mar 2022
15m	69.6	17:20 25 Mar 2022
20m	61.2	17:23 25 Mar 2022
25m	51.8	17:28 25 Mar 2022
30m	44	17:33 25 Mar 2022
45m	30.1	17:36 25 Mar 2022
1H	23.8	19:31 24 Mar 2022
1.5H	17.7	21:46 29 Mar 2022
2H	15	22:15 29 Mar 2022
3H	14.7	17:43 25 Mar 2022
5H	10.8	00:45 30 Mar 2022
6H	9.9	02:11 30 Mar 2022
9H	8	04:06 30 Mar 2022
12H	6.6	06:42 30 Mar 2022
18H	5	12:47 30 Mar 2022
24H	4.6	00:43 30 Mar 2022
30H	4.5	06:26 30 Mar 2022
36H	4.1	12:11 30 Mar 2022
48H	3.4	12:51 30 Mar 2022
72H	2.4	16:36 30 Mar 2022
96H	1.8	17:01 30 Mar 2022
120H	1.9	14:43 30 Mar 2022
144H	1.8	14:19 30 Mar 2022
168H	1.5	14:19 31 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

RAPPVILLE (MYRTLE CREEK) (203030) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

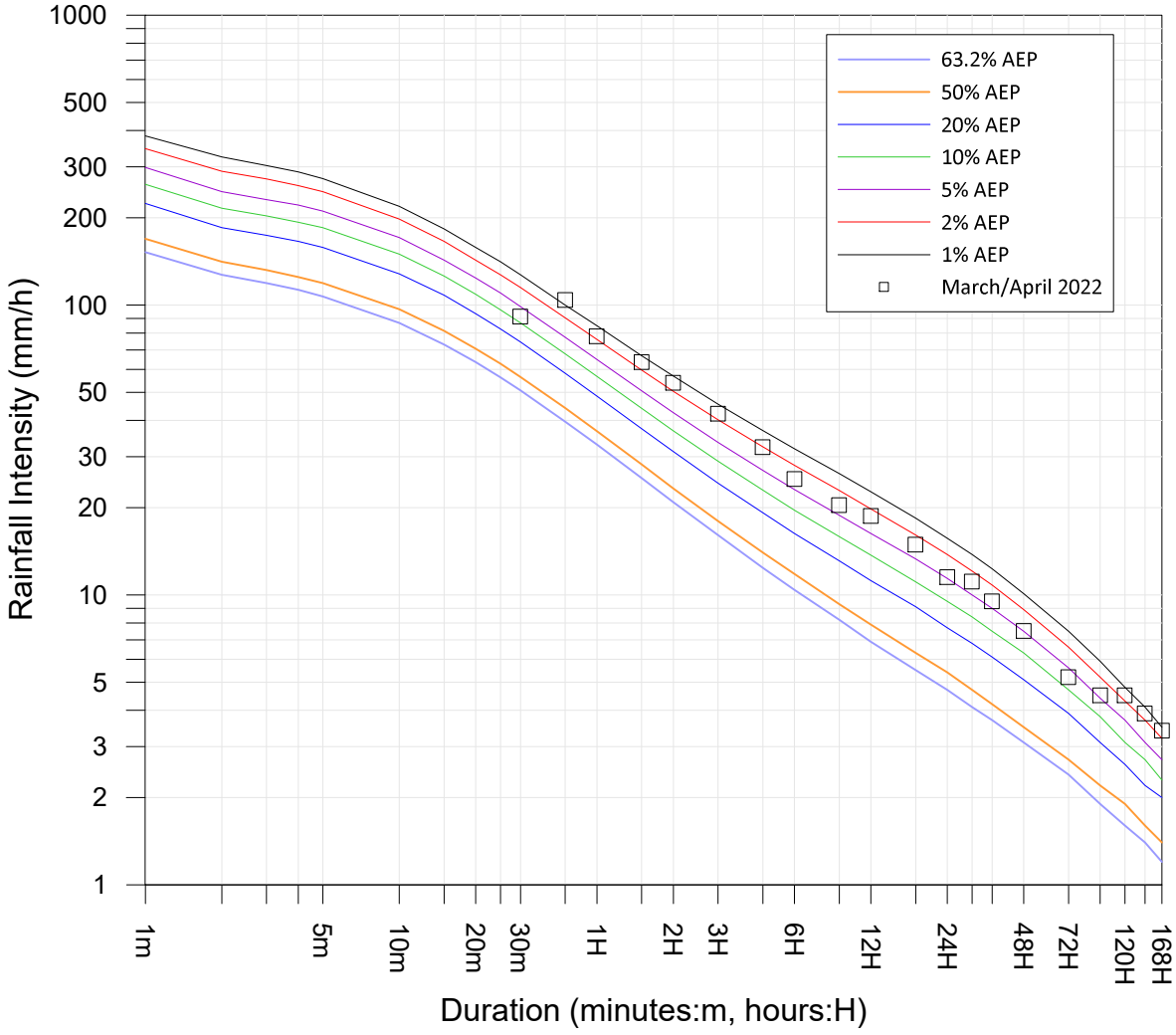
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.21

IFD_203030_Figure 6.21.pdf

Site Owner: BoM
Latitude: -29.183 Longitude:153.3964

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	-	-
2m	-	-
3m	-	-
4m	-	-
5m	-	-
10m	-	-
15m	-	-
20m	-	-
25m	-	-
30m	91.2	18:59 29 Mar 2022
45m	104	19:14 29 Mar 2022
1H	78	19:29 29 Mar 2022
1.5H	63.5	19:59 29 Mar 2022
2H	53.8	20:29 29 Mar 2022
3H	42.1	19:59 29 Mar 2022
5H	32.3	20:29 29 Mar 2022
6H	25.1	20:59 29 Mar 2022
9H	20.4	01:29 30 Mar 2022
12H	18.7	05:59 30 Mar 2022
18H	14.9	07:59 30 Mar 2022
24H	11.5	05:59 30 Mar 2022
30H	11.1	06:59 30 Mar 2022
36H	9.5	07:59 30 Mar 2022
48H	7.5	07:59 30 Mar 2022
72H	5.2	23:59 30 Mar 2022
96H	4.5	07:59 30 Mar 2022
120H	4.5	15:59 30 Mar 2022
144H	3.9	19:29 30 Mar 2022
168H	3.4	06:29 31 Mar 2022

Rainfall is totalised at 30 minute intervals.
Short duration IFD results removed.

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

EVANS HEAD RAAF BOMBING RANGE AWS (58212)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

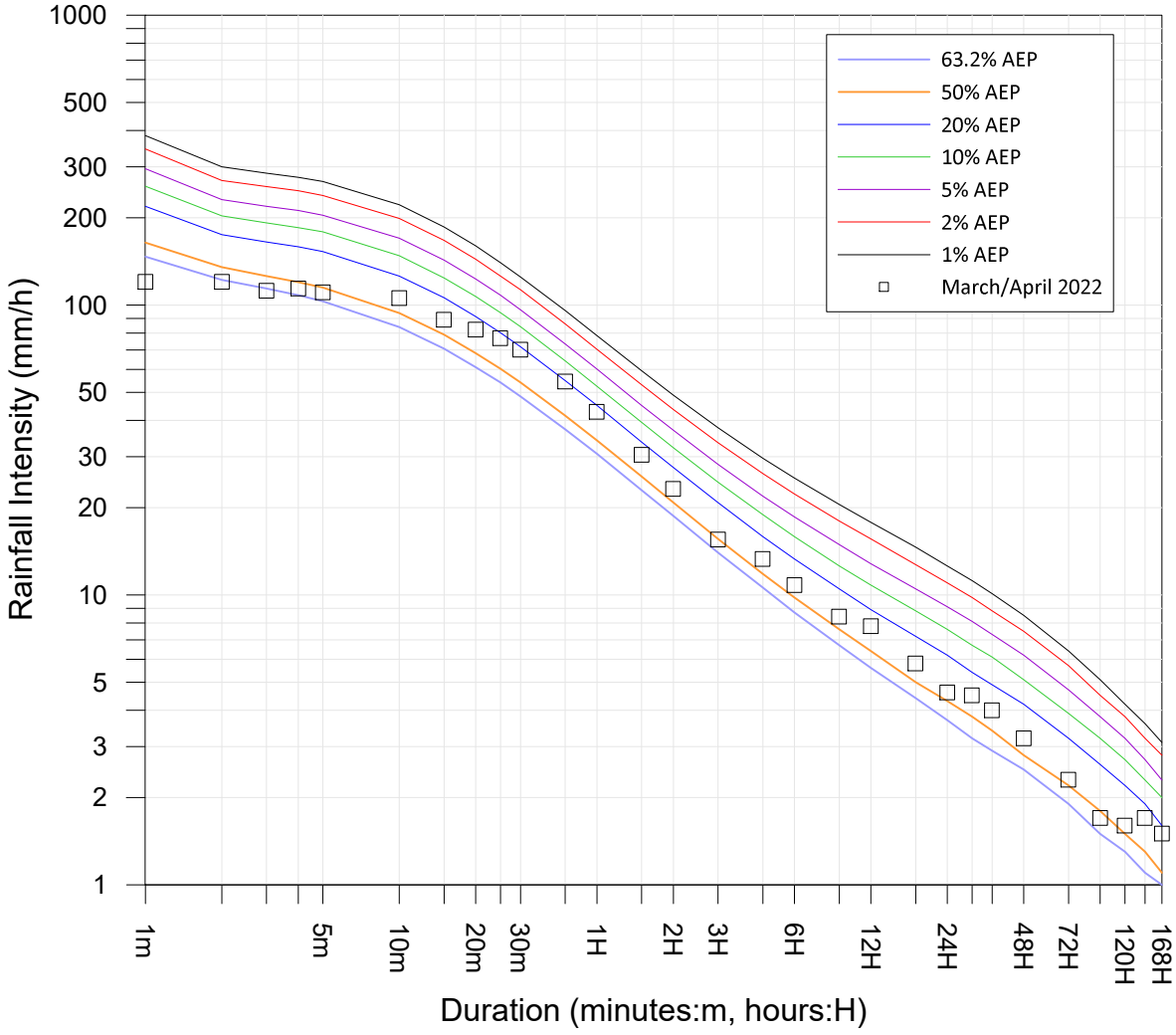
Manly Hydraulics Laboratory

Report MHL2895
Figure
6.22

IFD_58212_Figure 6.22.pdf

Site Owner: BoM
Latitude: -29.2825 Longitude:152.9892

AEP = Annual Exceedance Probability



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
1m	120	18:44 24 Mar 2022
2m	120	18:44 24 Mar 2022
3m	112	18:46 24 Mar 2022
4m	114	18:46 24 Mar 2022
5m	110.4	18:46 24 Mar 2022
10m	105.6	18:49 24 Mar 2022
15m	88.8	18:53 24 Mar 2022
20m	82.2	18:59 24 Mar 2022
25m	76.8	19:03 24 Mar 2022
30m	70	19:08 24 Mar 2022
45m	54.4	19:20 24 Mar 2022
1H	42.8	19:32 24 Mar 2022
1.5H	30.4	20:02 24 Mar 2022
2H	23.2	20:32 24 Mar 2022
3H	15.5	21:32 24 Mar 2022
5H	13.3	19:55 24 Mar 2022
6H	10.8	01:43 30 Mar 2022
9H	8.4	03:59 30 Mar 2022
12H	7.8	07:14 30 Mar 2022
18H	5.8	11:04 30 Mar 2022
24H	4.6	02:04 30 Mar 2022
30H	4.5	07:14 30 Mar 2022
36H	4	11:00 30 Mar 2022
48H	3.2	11:18 30 Mar 2022
72H	2.3	16:27 30 Mar 2022
96H	1.7	11:55 30 Mar 2022
120H	1.6	14:23 30 Mar 2022
144H	1.7	15:25 30 Mar 2022
168H	1.5	20:38 30 Mar 2022

Reference: Australian Rainfall and Runoff (2019)

NSW GOVERNMENT

WHIPORIE POST OFFICE (58099) INTENSITY-FREQUENCY-DURATION MARCH/APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895 Figure 6.23

IFD_58099_Figure 6.23.pdf

References

Australian Rainfall and Runoff. (2019). *Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors). Australian Rainfall and Runoff: A Guide to Flood Estimation.* © Commonwealth of Australia (Geoscience Australia).

BoM. (2013). *Service Level Specification for Flood Forecasting and Warning Services for New South Wales and the Australian Capital Territory – Version 3.13.* Melbourne VIC 3001: Bureau of Meteorology.

MHL. (2022). *North coast flood summary February/March 2022; Report MHL2880.* Manly Vale: Manly Hydraulics Laboratory.

Appendix A Station performance

Appendix A provides an overview of data capture percentages of all stations proposed to be included (with reasons as to why they could not be presented) and those that are presented in this report. In total, stations recorded an average of 86.4% data recovery during the March/April 2022 flood event.

Table A.1 Station metadata and performance

Station Name	Station code	Station Type	Owner	Latitude	Longitude	Datum	Data recovery %	Comment
Wave								
Byron Bay	BYRBOW	Wave	DPE BCD	-28.87055556	153.69416667	NA	100%	
Brunswick River								
Yelgun (Yelgun Creek)	558096	Water level and rainfall	North Byron Parklands	-28.48500000	153.51400000	Local datum	100%	
Lacks Creek (Middle Pocket)	558005	Water level and rainfall	Byron Shire Council	-28.49440000	153.48470000	Local datum	100%	
Main Arm	558053	Rainfall	DPE BCD	-28.50008632	153.43321753	NA	24%	Rainfall catch was blocked from 13:25 26 February 2022 to 11:32 12 April 2022. No IFD or rainfall plot.
Billinudgel	202400	Water level	DPE BCD	-28.50161532	153.52679111	AHD	100%	
Mullumbimby (Upper Main Arm)	558034	Rainfall	BoM	-28.50310000	153.38170000	NA	100%	
The Pocket (Marshalls Creek)	558004	Water level	Byron Shire Council	-28.50500000	153.47700000	Local datum	100%	
Orana Bridge	202475	Water level	DPE BCD	-28.51581170	153.54788303	AHD	100%	
Durrumbul (Brunswick River)	202001	Water level	WaterNSW	-28.53117400	153.45818300	Local datum	100%	
Brunswick Heads	202403	Water level	DPE BCD	-28.53702500	153.55276900	AHD	100%	
Mullumbimby (Fairview Farm)	58040	Rainfall	BoM	-28.54510000	153.49480000	NA	94%	Daily rainfall only, no IFD plot.
Mullumbimby	202402	Water level	DPE BCD	-28.55002021	153.49662932	AHD	100%	
Mullumbimby Creek (Mullumbimby Creek)	558008	Water level and rainfall	Byron Shire Council	-28.55420000	153.43670000	Local datum	100%	
Myocum	558036	Rainfall	DPE BCD	-28.58944445	153.51673585	NA	100%	
Byron Bay (Belongil Creek Bridge)	558099	Water level	Byron Shire Council	-28.63485323	153.59698049	Local datum	100%	
Cape Byron AWS	58216	Rainfall	BoM	-28.63990000	153.63580000	NA	100%	Rainfall is totalised at 30 minute intervals. Short duration IFD results removed.
Byron Bay (Tallow Creek Bridge)	558098	Water level and rainfall	Byron Shire Council	-28.67254718	153.61824797	Local datum	100%	
Wilsons River								
Lillian Rock (Williams Road)	58148	Rainfall	BoM	-28.528	153.152	NA	100%	
Huonbrook	558049	Rainfall	DPE BCD	-28.55212291	153.3856478	NA	100%	
Wilsons at Lavertys Gap Weir	203062	Water level	WaterNSW	-28.576278	153.438248	Local datum	100%	
Terania Creek	558078	Rainfall	Lismore City Council	-28.588	153.299	NA	0%	No data available. No IFD or rainfall plot.
Goonengerry (Alert)	558033	Rainfall	Byron Shire Council	-28.594	153.417	NA	100%	
Cawongla (Alert)	558024	Rainfall	Lismore City Council	-28.605	153.091	NA	100%	
Nimbin (Goolmangar Creek)	58180	Water level and rainfall	Lismore City Council	-28.608	153.213	Local datum	100%	
Coopers Creek at Repentence	203002	Water level	WaterNSW	-28.641292	153.412585	Local datum	100%	
Repentence (Coopers Creek)	558000	Rainfall	Lismore City Council	-28.643	153.417	NA	100%	
The Channon	58147	Rainfall	Lismore City Council	-28.672	153.278	NA	0%	Rainfall station failed from 04:24 28 February 2022 onwards. No IFD or rainfall plot.
Jiggi (Gwynne Street)	558086	Rainfall	Lismore City Council	-28.676	153.154	NA	100%	
Dunoon	558031	Rainfall	BoM	-28.677	153.322	NA	100%	
Coopers at Ewing Bridge	203024	Water level	WaterNSW	-28.721535	153.362272	Local datum	100%	
Wilsons River at Nashua	58162	Water level and rainfall	Lismore City Council	-28.728	153.458	Local datum	100% water level; 0% rainfall	Rainfall station is blocked throughout the event. No IFD or rainfall plot.
Goolmangar Creek at McNamara Bridge Weir	203061	Water level	WaterNSW	-28.733144	153.225572	Local datum	100%	
Leycester Rock Valley	203010	Water level and rainfall	WaterNSW	-28.7365	153.164	Local datum	100%	

Station Name	Station code	Station Type	Owner	Latitude	Longitude	Datum	Data recovery %	Comment
Bentley (Back Creek)	58202	Water level and rainfall	Lismore City Council	-28.7406	153.075	Local datum	100%	Short duration rainfall impacted by possible radio transfer interruptions. Suspect short duration IFD results removed by observation.
Coopers Creek at Fairmeadow	203060	Water level	WaterNSW	-28.745973	153.351676	Local datum	100%	
Wilsons River at Eltham	203014	Water level	WaterNSW	-28.755574	153.394827	Local datum	100%	
Houghlahans Creek	558069	Rainfall	Ballina Shire Council	-28.785	153.474	NA	0%	Rainfall bucket was blocked throughout the event. No IFD or rainfall plot.
Woodlawn College	203402	Water level	DPE BCD	-28.78541179	153.3025389	AHD	100%	
Tuncester (Leycester Creek)	203443	Water level	DPE BCD	-28.79575471	153.2401965	AHD	100%	
Tuncester	58201	Rainfall	Lismore City Council	-28.7967	153.2386	NA	100%	Daily rainfall only; no IFD plot.
Lismore (Dawson Street)	558087	Water level and rainfall	Lismore City Council	-28.8081	153.2818	Local datum	100% water level; 0% rainfall	Rainfall station failed from 27 February 2022 onwards. No IFD or rainfall plot.
Lismore (Wilson River)	58176	Water level	Lismore City Council	-28.81	153.2733	AHD	79%	Station failed before 26 March 2022. Data started at 11:38 26 March 2022.
Lismore (Wilsons River at Browns Creek)	558100	Water level	Lismore City Council	-28.82323709	153.2703873	Local datum	100%	
Lismore Airport AWS	58214	Rainfall	BoM	-28.83	153.26	NA	0%	Hourly rainfall station failed from 02:40 28 February 2022. No IFD or rainfall plot.
East Gundurimba	203427	Water level	DPE BCD	-28.84570949	153.2668938	AHD	0%	Station inundated by flood waters and failed from 07:45 28 February 2022. No water level plot.
Wilsons River at Tuckurimba	558076	Water level and rainfall	Lismore City Council	-28.962	153.307	Local datum	100%	
Richmond River								
Loadstone (High View)	58141	Rainfall	BoM	-28.41190000	152.98270000	NA	100%	
Green Pigeon (Morning View)	58113	Rainfall	BoM	-28.47380000	153.08610000	NA	100%	
Wiangaree Bridge (Richmond River)	203005	Water level and rainfall	WaterNSW	-28.51670000	152.96670000	Local datum	100%	
Richmond River at Kyogle	203900	Water level and rainfall	WaterNSW	-28.621042	152.994844	Local datum	100%	
Eden Creek at Doubtful	203034	Water level and rainfall	WaterNSW	-28.75910000	152.92220000	Local datum	100%	
Lake Ainsworth	203455	Water level and rainfall	DPE BCD	-28.78075797	153.59282403	AHD	100% water level; 32% rainfall	Rain gauge has a partial blockage of the catch from 30 March 2022 onwards. No IFD plot.
Alstonville STP	558072	Rainfall	Ballina Shire Council	-28.831	153.444	NA	100%	
Ballina Airport AWS	58198	Rainfall	BoM	-28.83530000	153.55850000	NA	100%	Rainfall is totalised at 30 minute intervals. Short duration IFD results removed.
Casino (Richmond River)	203004	Water level	WaterNSW	-28.86670000	153.05000000	Local datum	100%	
Missingham Bridge	203465	Water level	DPE BCD	-28.86874414	153.57587082	AHD	100%	
Byrnes Point	203461	Water level	DPE BCD	-28.87376511	153.52668832	AHD	100%	
Ballina Breakwall	203425	Water level	DPE BCD	-28.87537745	153.58442879	AHD	59%	The orifice on this ocean tide level station was damaged due to vandalism. Data not available from 30 March 2022 to 5 April 2022 and from 14 April 2022 onwards.
Casino Airport AWS	58208	Rainfall	BoM	-28.88240000	153.06180000	NA	29%	Rain gauge has a partial blockage of the catch from 29 March 2022 onwards. No IFD plot.
Shannon Brook at Yorklea	203041	Water level and rainfall	WaterNSW	-28.94470000	153.06030000	Local datum	100%	
Wardell	203468	Water level	DPE BCD	-28.95341219	153.46469697	AHD	100%	
Coraki	203403	Water level	DPE BCD	-28.98380196	153.28723405	AHD	100%	
Bungawalbin	203450	Water level	DPE BCD	-29.03345559	153.27761472	AHD	100%	
Woodburn	2034134	Water level	DPE BCD	-29.07102616	153.34192721	AHD	100%	
Tucombil Highway Bridge	203480	Water level	DPE BCD	-29.08458239	153.33856060	AHD	100%	
Rocky Mouth Creek	203432	Water level	DPE BCD	-29.09603047	153.32625613	AHD	0%	Station inundated by flood waters and failed from 21:15 28 February 2022 onwards. No water level plot
Rappville (Myrtle Creek)	203030	Water level and rainfall	WaterNSW	-29.11190000	152.99830000	Local datum	100%	
Evans River Fishing Co-op	203462	Water level	DPE BCD	-29.12240415	153.43428897	AHD	83%	Station inundated by flood waters and failed at 06:12 1 March 2022. Equipment was reinstated at 09:45 25 March 2022.

Station Name	Station code	Station Type	Owner	Latitude	Longitude	Datum	Data recovery %	Comment
Iron Gates	203475	Water level	DPE BCD	-29.12369592	153.40808279	AHD	100%	
Bungawalbin Creek	2034133	Water level	DPE BCD	-29.13985053	153.17026047	AHD	0%	Station inundated by flood waters and failed from 10:15 28 February 2022 onwards. No water level plot
Evans Head RAAF Bombing Range AWS	58212	Rainfall	BoM	-29.18300000	153.39640000	NA	100%	Rainfall is totalised at 30 minute intervals. Short duration IFD results removed.
Whiporie Post Office	58099	Rainfall	BoM	-29.28245567	152.98916675	NA	100%	

Appendix B 1987 Intensity-frequency-duration

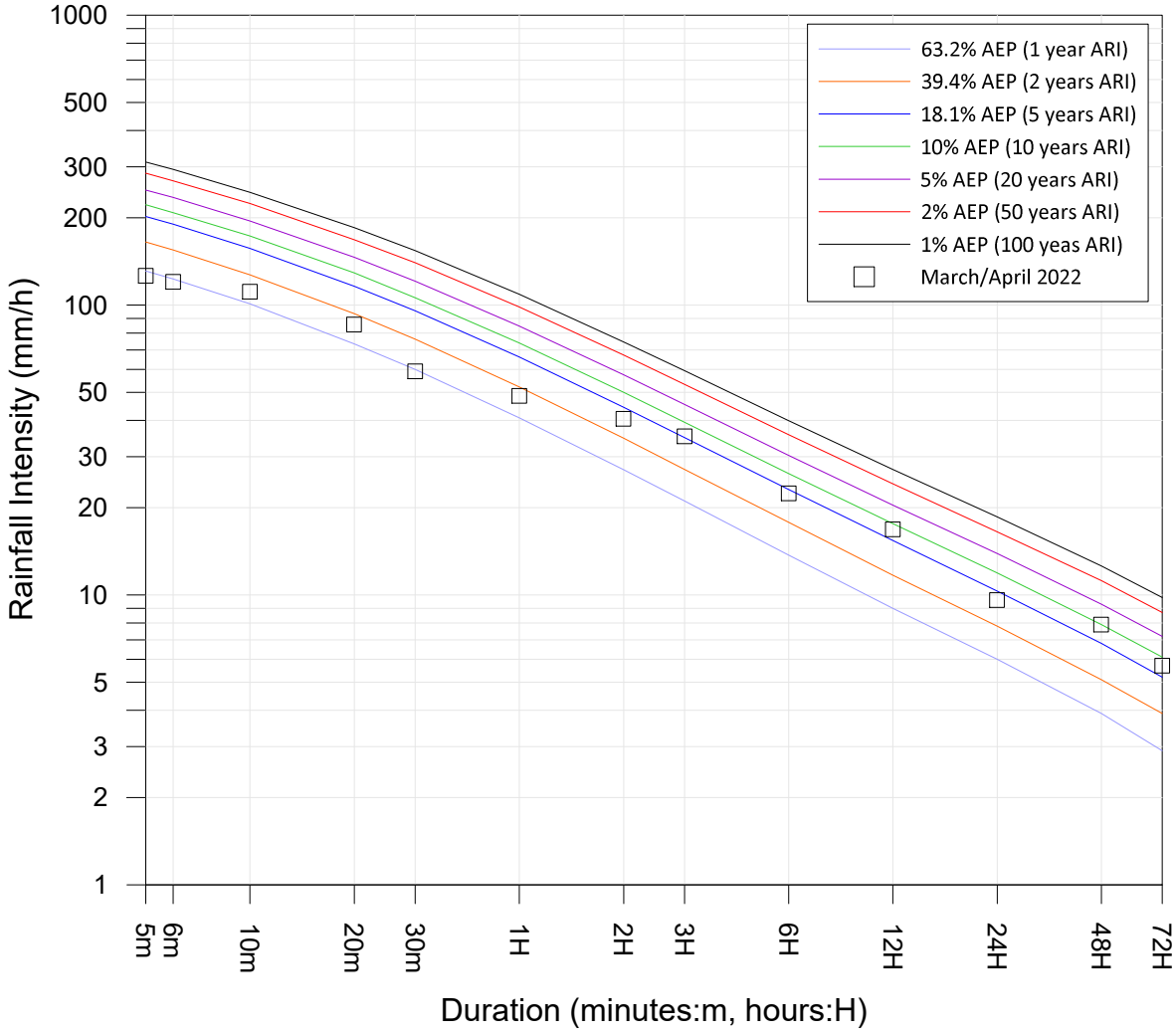
Appendix B displays the rainfall intensities in the ARR1987 format. Refer to Table B.1 for a reference list of the 1987 intensity-frequency-duration (IFD) curves.

Table B.1 1987 IFD figure reference list

Figure reference	Station	Figure reference	Station
B.1	Yelgun (Yelgun Creek)	B.16	Leycester Rock Valley
B.2	Lacks Creek (Middle Pocket)	B.17	Bentley (Back Creek)
B.3	Mullumbimby (Upper Main Arm)	B.18	Wilsons River at Tuckurimba
B.4	Mullumbimby Creek (Mullumbimby Creek)	B.19	Loadstone (High View)
B.5	Myocum	B.20	Green Pigeon (Morning View)
B.6	Cape Byron AWS	B.21	Wiangaree Bridge (Richmond River)
B.7	Byron Bay (Tallow Creek Bridge)	B.22	Richmond River at Kyogle
B.8	Lillian Rock (Williams Road)	B.23	Eden Creek at Doubtful
B.9	Huonbrook	B.24	Alstonville STP
B.10	Goonengerry (Alert)	B.25	Ballina Airport AWS
B.11	Cawongla (Alert)	B.26	Shannon Brook at Yorklea
B.12	Nimbin (Goolmangar Creek)	B.27	Rappville (Myrtle Creek)
B.13	Repentence (Coopers Creek)	B.28	Evans Head RAAF Bombing Range AWS
B.14	Jiggi (Gwynne Street)	B.29	Whiporie Post Office
B.15	Dunoon		

Site Owner: North Byron Parklands
Latitude: -28.485 Longitude:153.514

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	126	19:44 29 Mar 2022
6m	120	19:45 29 Mar 2022
10m	111	19:48 29 Mar 2022
20m	85.5	19:50 29 Mar 2022
30m	59	20:00 29 Mar 2022
1H	48.5	23:48 28 Mar 2022
2H	40.5	23:48 28 Mar 2022
3H	35.2	23:57 28 Mar 2022
6H	22.4	01:50 29 Mar 2022
12H	16.8	02:14 29 Mar 2022
24H	9.6	03:18 29 Mar 2022
48H	7.9	08:09 30 Mar 2022
72H	5.7	22:55 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

YELGUN (YELGUN CREEK) (558096)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

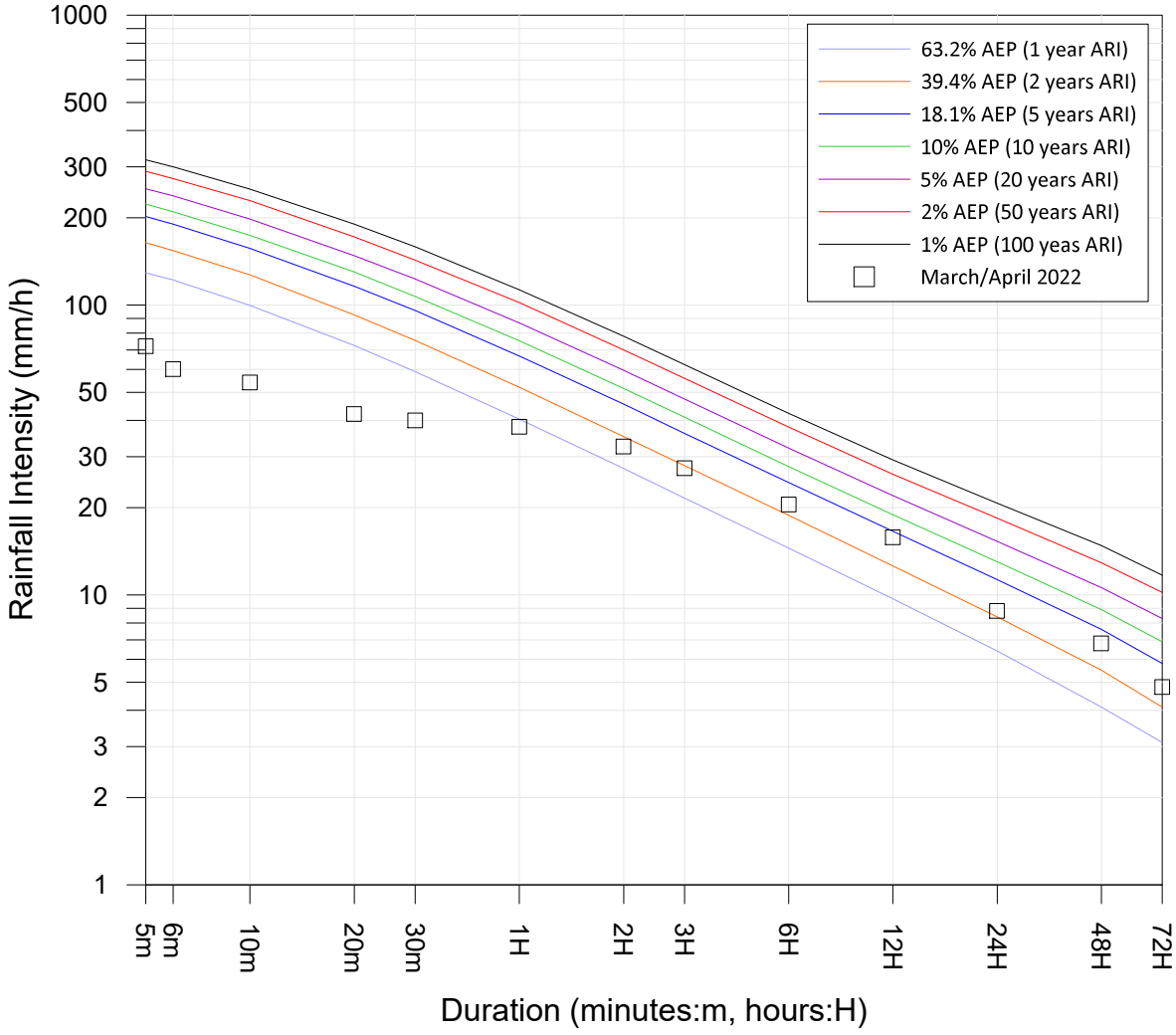
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.1

IFD_558096_Figure B.1.pdf

Site Owner: Byron Shire Council
Latitude: -28.4944 Longitude:153.4847

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	72	22:59 28 Mar 2022
6m	60	23:57 28 Mar 2022
10m	54	23:04 28 Mar 2022
20m	42	23:14 28 Mar 2022
30m	40	23:43 28 Mar 2022
1H	38	23:54 28 Mar 2022
2H	32.5	00:11 29 Mar 2022
3H	27.3	00:22 29 Mar 2022
6H	20.5	02:55 29 Mar 2022
12H	15.8	02:30 29 Mar 2022
24H	8.8	03:20 29 Mar 2022
48H	6.8	10:28 30 Mar 2022
72H	4.8	00:57 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

LACKS CREEK (MIDDLE POCKET) (558005)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

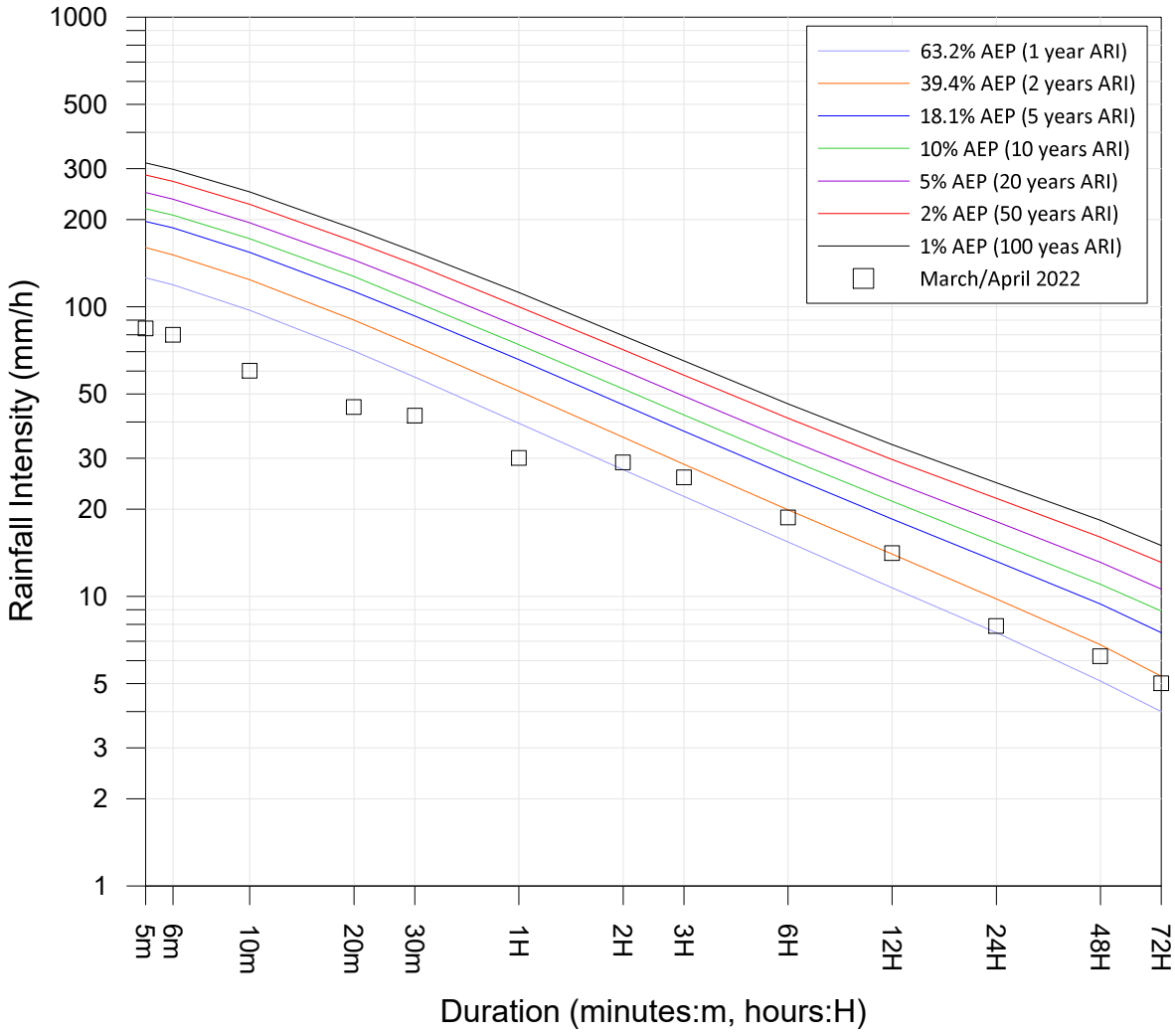
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.2

IFD_558005_Figure B.2.pdf

Site Owner: BoM
Latitude: -28.5031 Longitude:153.3817

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	84	20:00 29 Mar 2022
6m	80	20:01 29 Mar 2022
10m	60	20:05 29 Mar 2022
20m	45	20:10 29 Mar 2022
30m	42	20:25 29 Mar 2022
1H	30	20:45 29 Mar 2022
2H	29	01:56 29 Mar 2022
3H	25.7	02:29 29 Mar 2022
6H	18.7	02:58 29 Mar 2022
12H	14.1	02:49 29 Mar 2022
24H	7.9	03:54 29 Mar 2022
48H	6.2	10:46 30 Mar 2022
72H	5	02:53 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

MULLUMBIMBY (UPPER MAIN ARM) (558034)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

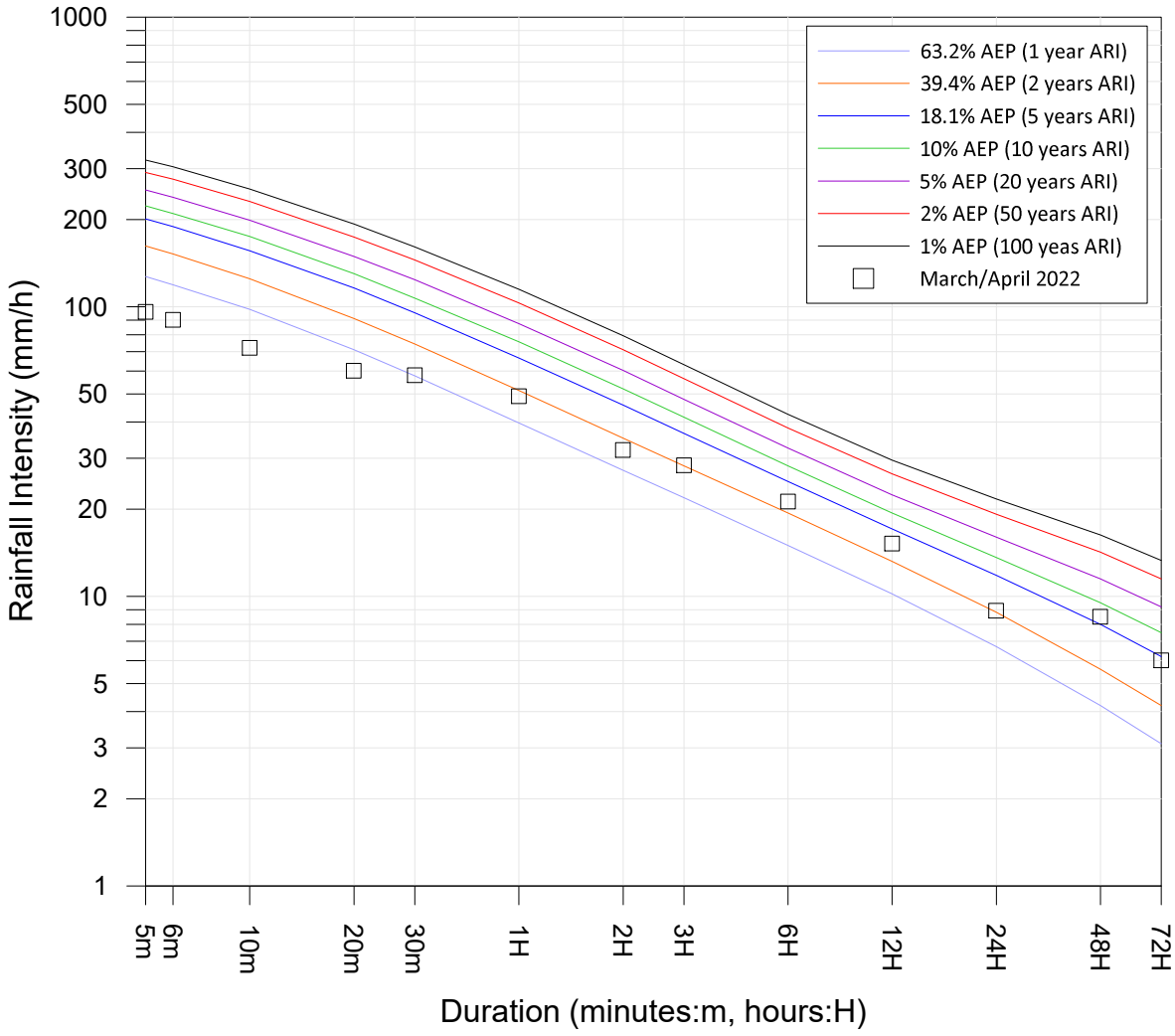
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.3

IFD_558034_Figure B.3.pdf

Site Owner: Byron Shire Council
Latitude: -28.5542 Longitude:153.4367

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	96	19:41 29 Mar 2022
6m	90	13:04 24 Mar 2022
10m	72	12:35 25 Mar 2022
20m	60	19:56 29 Mar 2022
30m	58	20:06 29 Mar 2022
1H	49	02:35 30 Mar 2022
2H	32	03:21 30 Mar 2022
3H	28.3	02:15 29 Mar 2022
6H	21.2	03:39 29 Mar 2022
12H	15.2	06:47 30 Mar 2022
24H	8.9	19:06 30 Mar 2022
48H	8.5	10:55 30 Mar 2022
72H	6	01:11 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

MULLUMBIMBY CREEK (MULLUMBIMBY CK) (558008)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

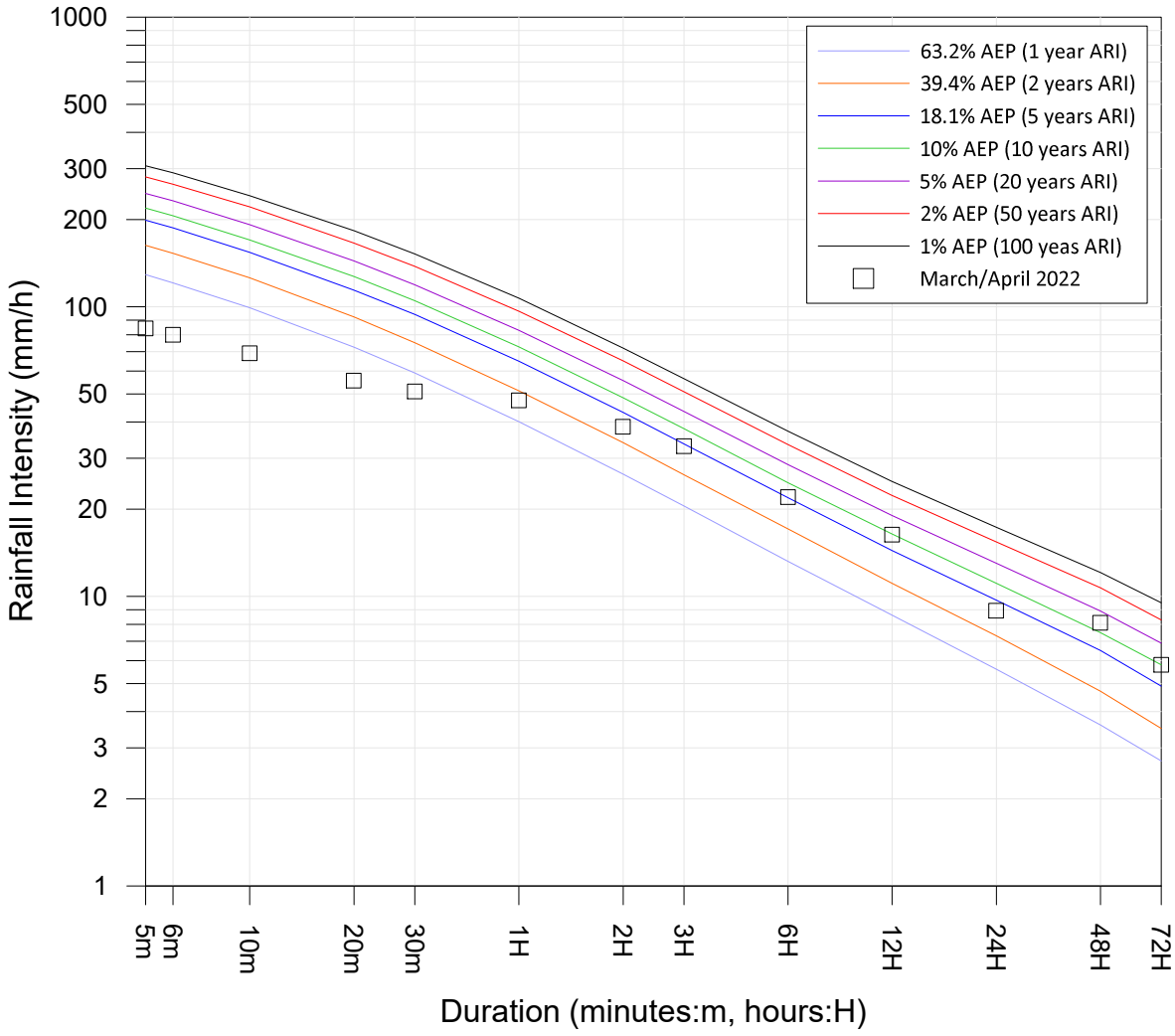
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.4

IFD_558008_Figure B.4.pdf

Site Owner: DPE BCD
Latitude: -28.5894 Longitude:153.5167

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	84	22:45 29 Mar 2022
6m	80	22:45 29 Mar 2022
10m	69	02:34 30 Mar 2022
20m	55.5	21:47 29 Mar 2022
30m	51	21:49 29 Mar 2022
1H	47.5	21:38 29 Mar 2022
2H	38.5	21:56 29 Mar 2022
3H	33	23:03 29 Mar 2022
6H	22	02:36 30 Mar 2022
12H	16.3	07:56 30 Mar 2022
24H	8.9	12:28 30 Mar 2022
48H	8.1	08:00 30 Mar 2022
72H	5.8	22:08 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

MYOCUM (558036)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

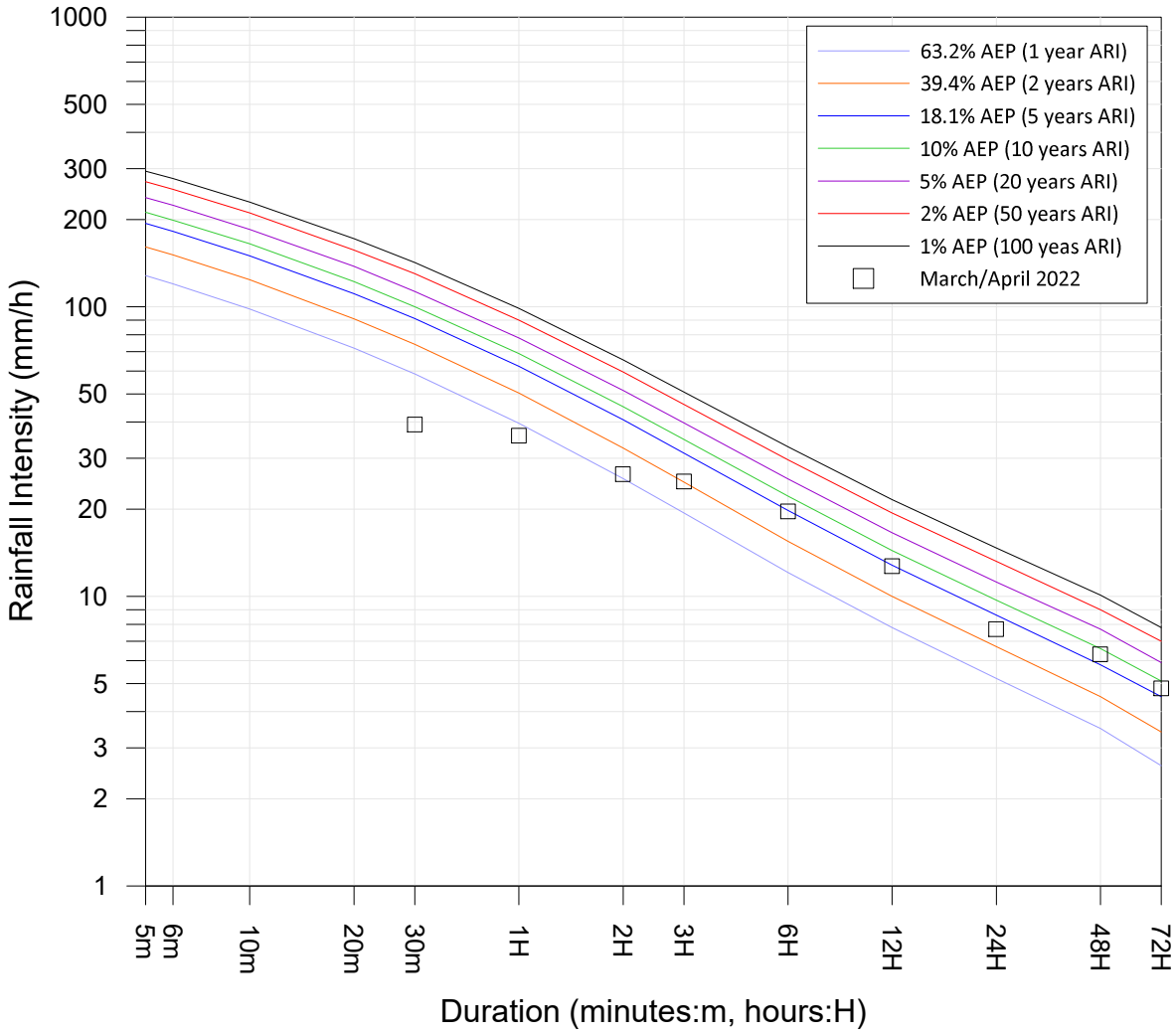
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.5

IFD_558036_Figure B.5.pdf

Site Owner: BoM
Latitude: -28.6399 Longitude:153.6358

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	-	-
6m	-	-
10m	-	-
20m	-	-
30m	39.2	23:59 29 Mar 2022
1H	35.8	23:59 29 Mar 2022
2H	26.4	23:59 29 Mar 2022
3H	24.9	00:29 30 Mar 2022
6H	19.6	03:29 30 Mar 2022
12H	12.7	09:29 30 Mar 2022
24H	7.7	11:59 30 Mar 2022
48H	6.3	11:59 30 Mar 2022
72H	4.8	21:59 30 Mar 2022

Rainfall is totalised at 30 minute intervals.
Short duration IFD results removed.

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

CAPE BYRON AWS (58216)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

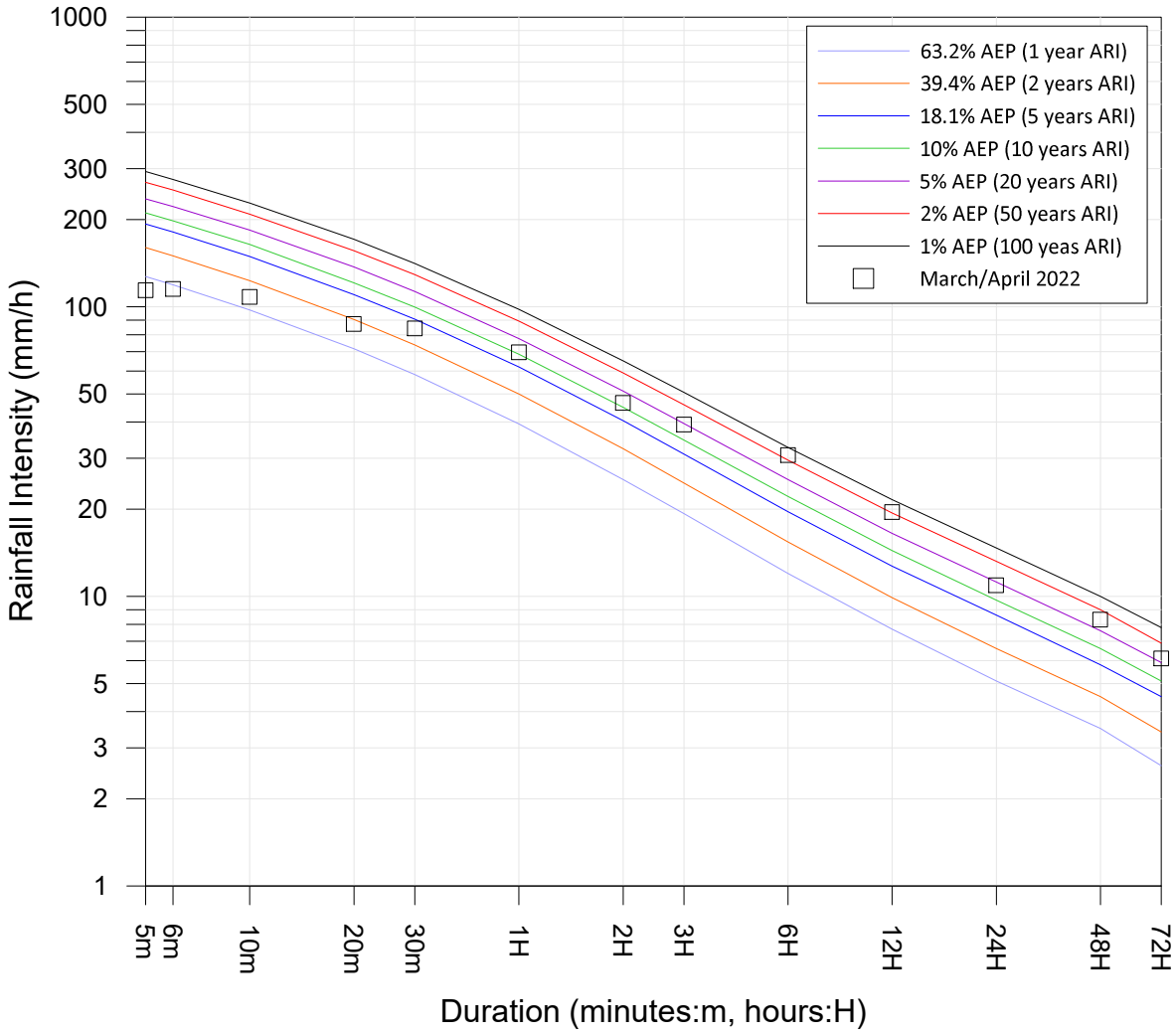
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.6

IFD_58216_Figure B.6.pdf

Site Owner: Byron Shire Council
Latitude: -28.6725 Longitude:153.6182

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	114	23:05 29 Mar 2022
6m	115	23:03 29 Mar 2022
10m	108	23:05 29 Mar 2022
20m	87	23:12 29 Mar 2022
30m	84	23:05 29 Mar 2022
1H	69.5	23:35 29 Mar 2022
2H	46.5	23:38 29 Mar 2022
3H	39.2	01:18 30 Mar 2022
6H	30.7	02:57 30 Mar 2022
12H	19.5	08:57 30 Mar 2022
24H	10.9	12:20 30 Mar 2022
48H	8.3	08:11 30 Mar 2022
72H	6.1	22:09 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

BYRON BAY (TALLOW CREEK BRIDGE) (558098)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

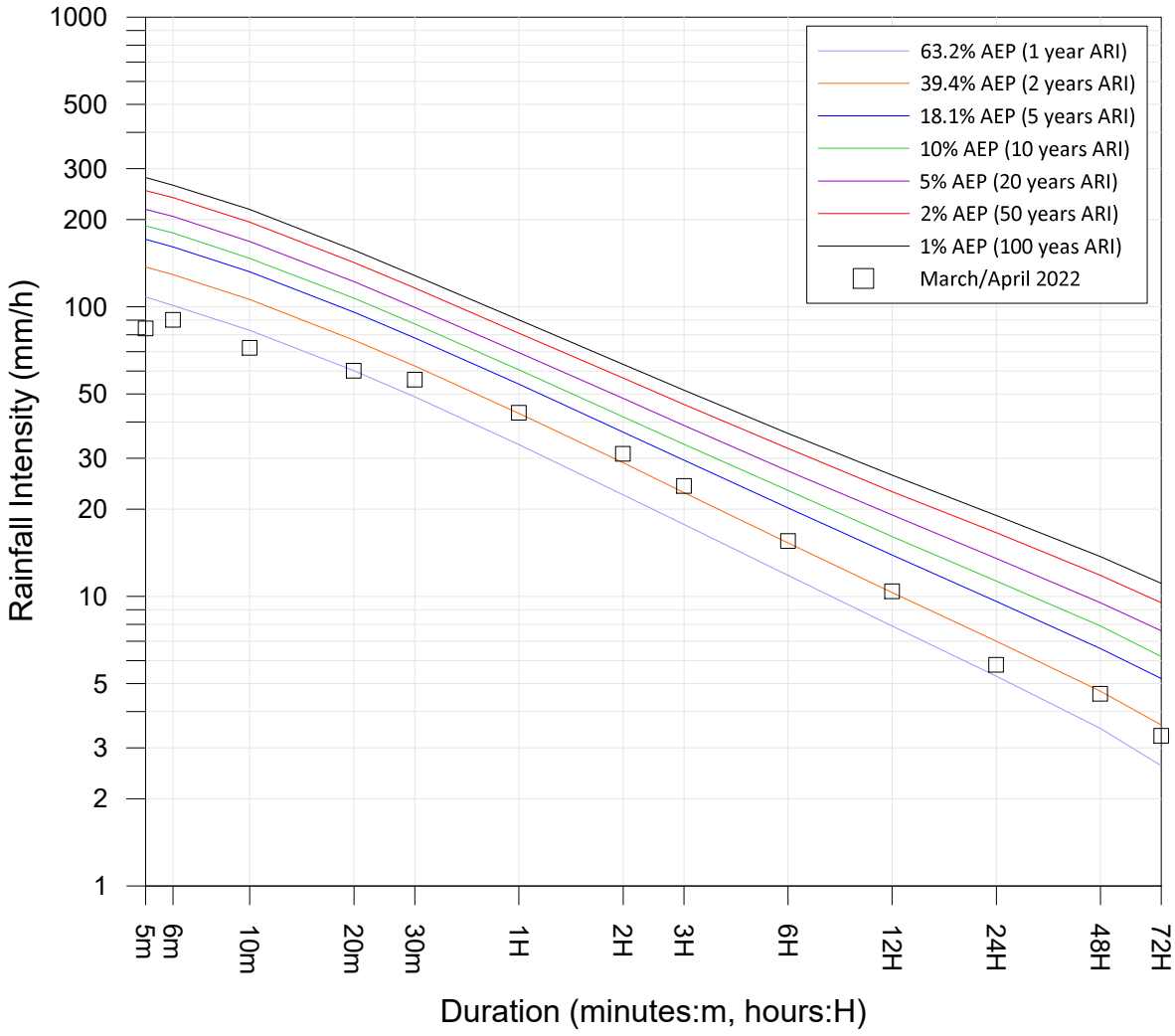
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.7

IFD_558098_Figure B.7.pdf

Site Owner: BoM
Latitude: -28.528 Longitude:153.152

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	84	02:07 29 Mar 2022
6m	90	02:08 29 Mar 2022
10m	72	02:12 29 Mar 2022
20m	60	02:12 29 Mar 2022
30m	56	02:13 29 Mar 2022
1H	43	02:24 29 Mar 2022
2H	31	02:25 29 Mar 2022
3H	24	02:33 29 Mar 2022
6H	15.5	02:53 29 Mar 2022
12H	10.4	03:58 29 Mar 2022
24H	5.8	10:48 29 Mar 2022
48H	4.6	11:09 30 Mar 2022
72H	3.3	02:48 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

LILLIAN ROCK (WILLIAMS RD) (58148)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

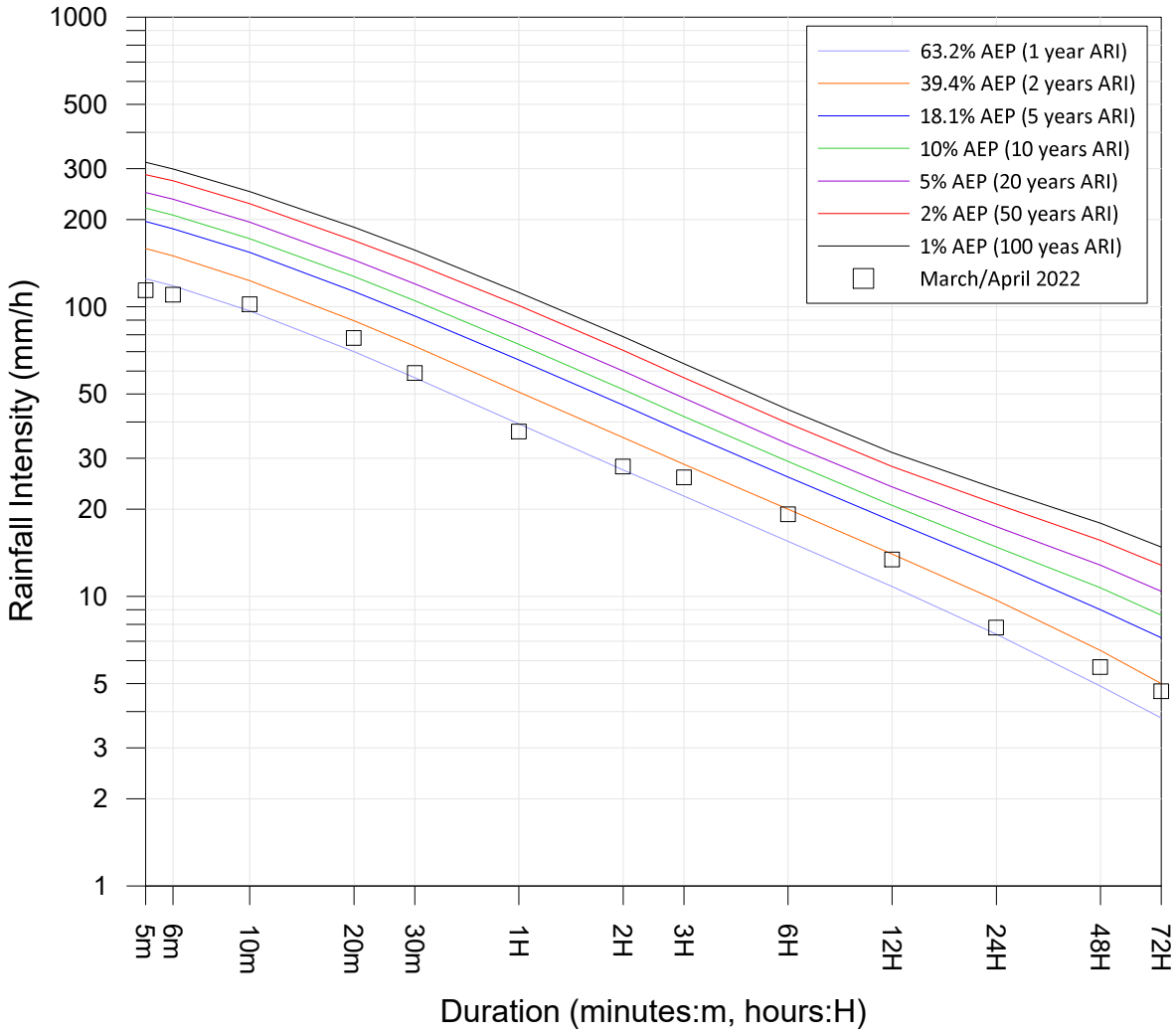
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.8

IFD_58148_Figure B.8.pdf

Site Owner: DPE BCD
Latitude: -28.5521 Longitude:153.3856

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	114	11:36 25 Mar 2022
6m	110	11:37 25 Mar 2022
10m	102	11:38 25 Mar 2022
20m	78	11:41 25 Mar 2022
30m	59	11:46 25 Mar 2022
1H	37	12:22 25 Mar 2022
2H	28	02:21 29 Mar 2022
3H	25.7	02:38 29 Mar 2022
6H	19.2	03:06 29 Mar 2022
12H	13.4	02:52 29 Mar 2022
24H	7.8	03:30 29 Mar 2022
48H	5.7	19:01 30 Mar 2022
72H	4.7	00:18 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

HUONBROOK (558049)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

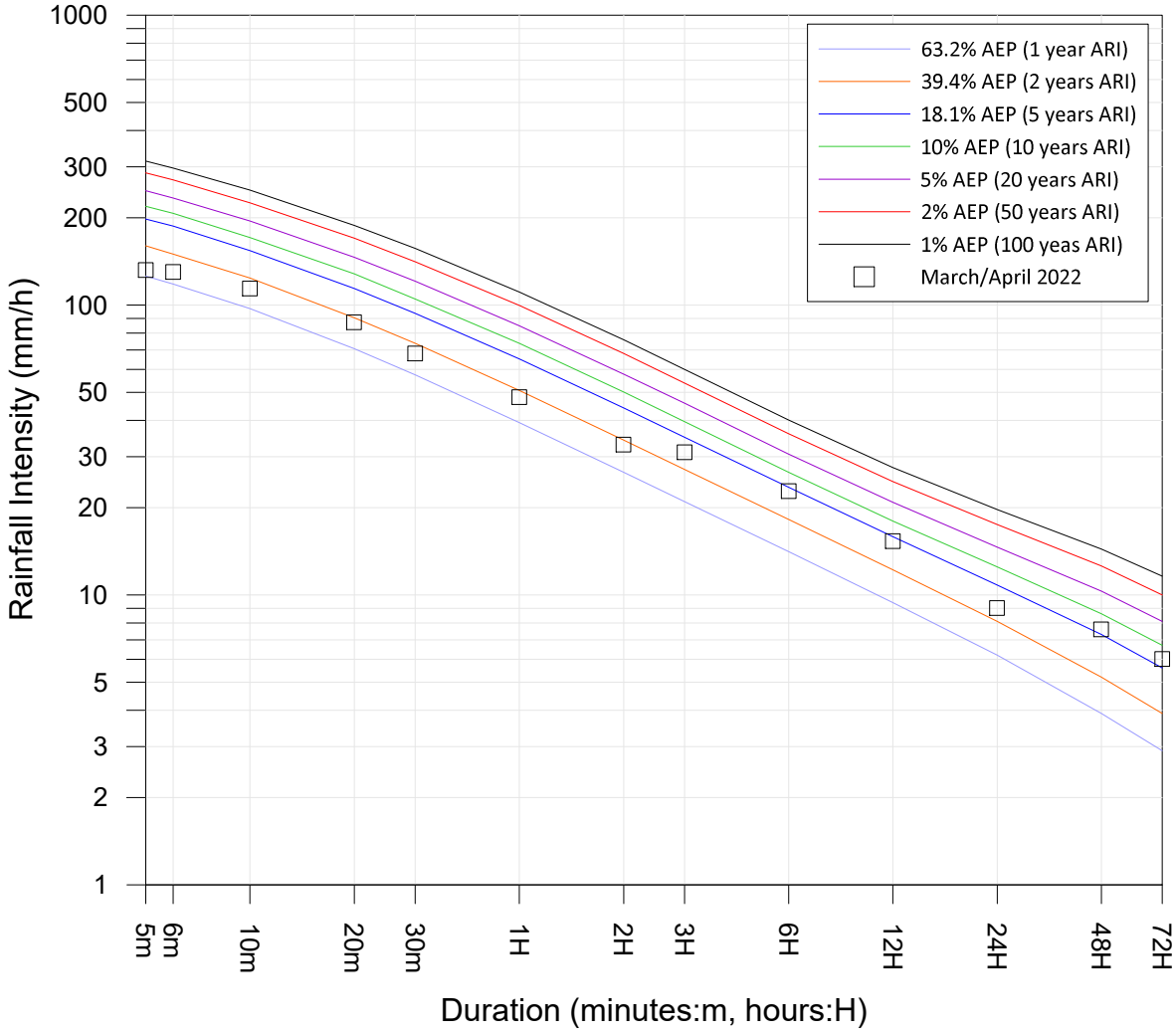
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.9

IFD_558049_Figure B.9.pdf

Site Owner: Byron Shire Council
Latitude: -28.594 Longitude:153.417

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	132	12:14 25 Mar 2022
6m	130	12:14 25 Mar 2022
10m	114	12:14 25 Mar 2022
20m	87	12:22 25 Mar 2022
30m	68	12:32 25 Mar 2022
1H	48	12:39 25 Mar 2022
2H	33	02:29 29 Mar 2022
3H	31	02:22 29 Mar 2022
6H	22.8	03:25 29 Mar 2022
12H	15.3	03:12 29 Mar 2022
24H	9	08:43 29 Mar 2022
48H	7.6	10:47 30 Mar 2022
72H	6	01:18 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

GOONENGERRY (ALERT) (558033)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

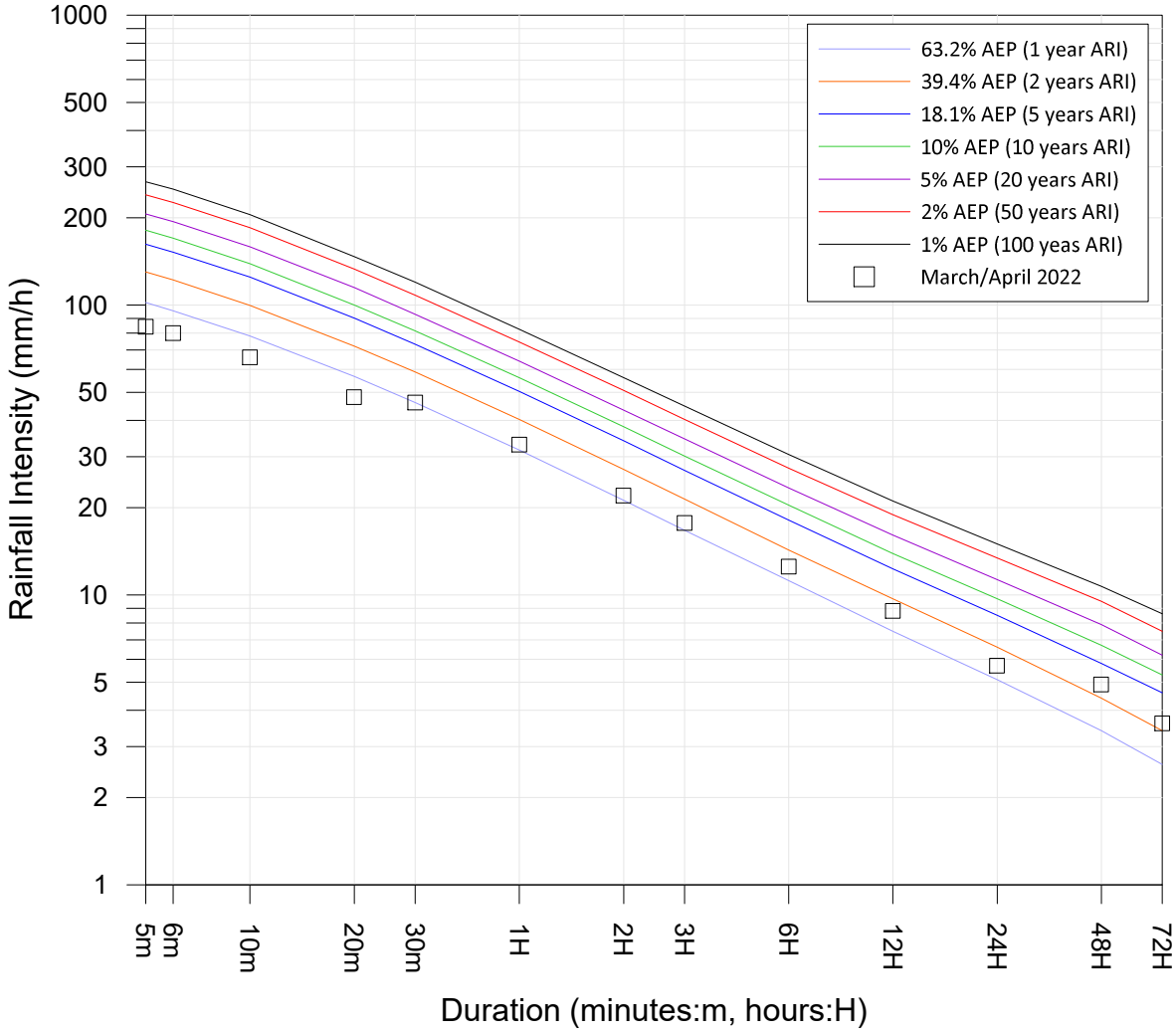
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.10

IFD_558033_Figure B.10.pdf

Site Owner: Lismore City Council
Latitude: -28.605 Longitude:153.091

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	84	02:35 29 Mar 2022
6m	80	02:36 29 Mar 2022
10m	66	02:35 29 Mar 2022
20m	48	02:37 29 Mar 2022
30m	46	02:36 29 Mar 2022
1H	33	02:43 29 Mar 2022
2H	22	02:51 29 Mar 2022
3H	17.7	07:38 30 Mar 2022
6H	12.5	08:38 30 Mar 2022
12H	8.8	09:49 30 Mar 2022
24H	5.7	17:41 30 Mar 2022
48H	4.9	17:30 30 Mar 2022
72H	3.6	03:38 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

CAWONGLA (ALERT) (558024)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

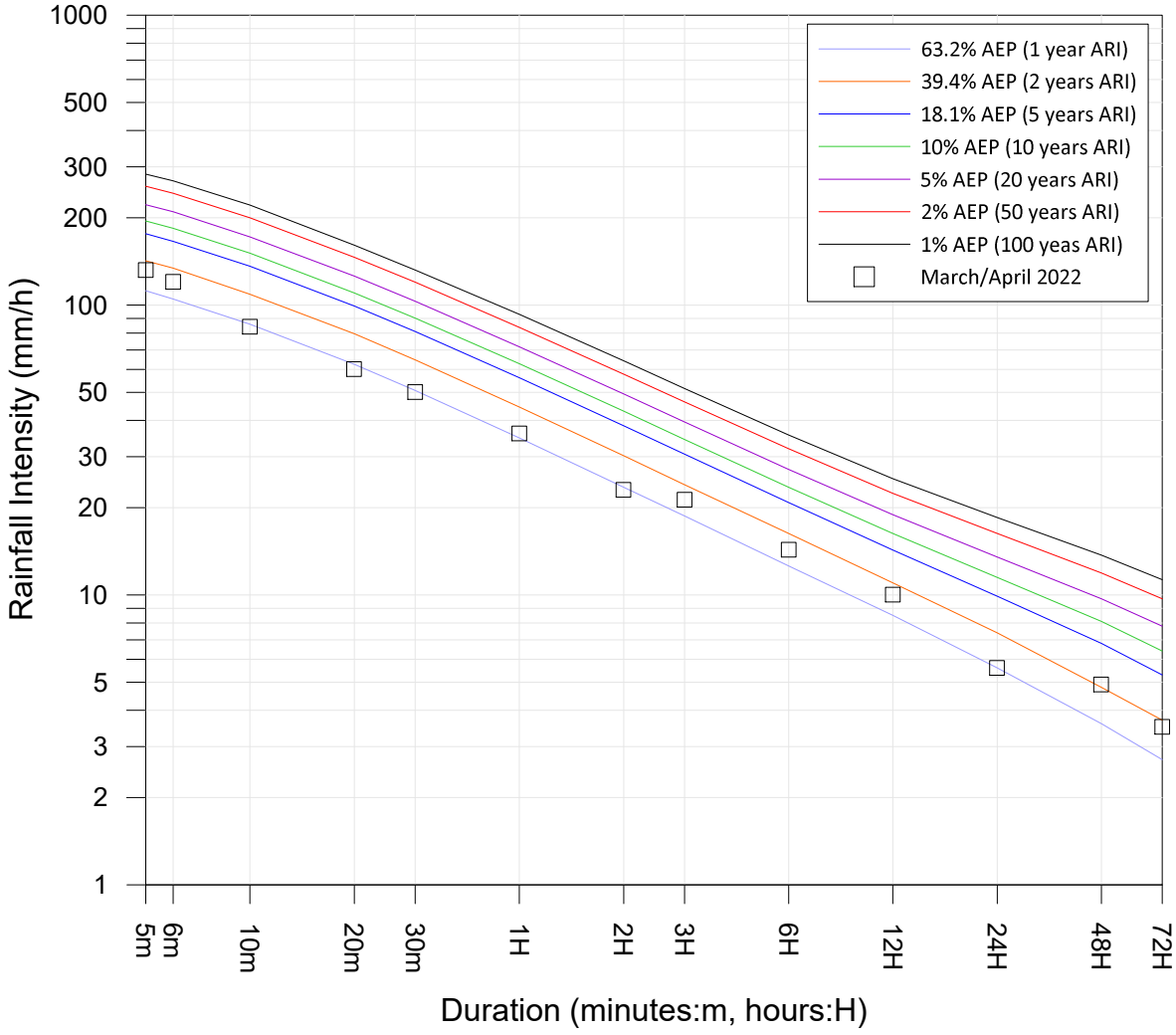
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.11

IFD_558024_Figure B.11.pdf

Site Owner: Lismore City Council
Latitude: -28.608 Longitude:153.213

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	132	14:46 25 Mar 2022
6m	120	14:46 25 Mar 2022
10m	84	14:50 25 Mar 2022
20m	60	15:01 25 Mar 2022
30m	50	15:10 25 Mar 2022
1H	36	15:37 25 Mar 2022
2H	23	02:50 29 Mar 2022
3H	21.3	02:54 29 Mar 2022
6H	14.3	03:14 29 Mar 2022
12H	10	03:20 29 Mar 2022
24H	5.6	08:10 29 Mar 2022
48H	4.9	12:05 30 Mar 2022
72H	3.5	02:27 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

NIMBIN (GOOLMANGAR CREEK) (58180)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

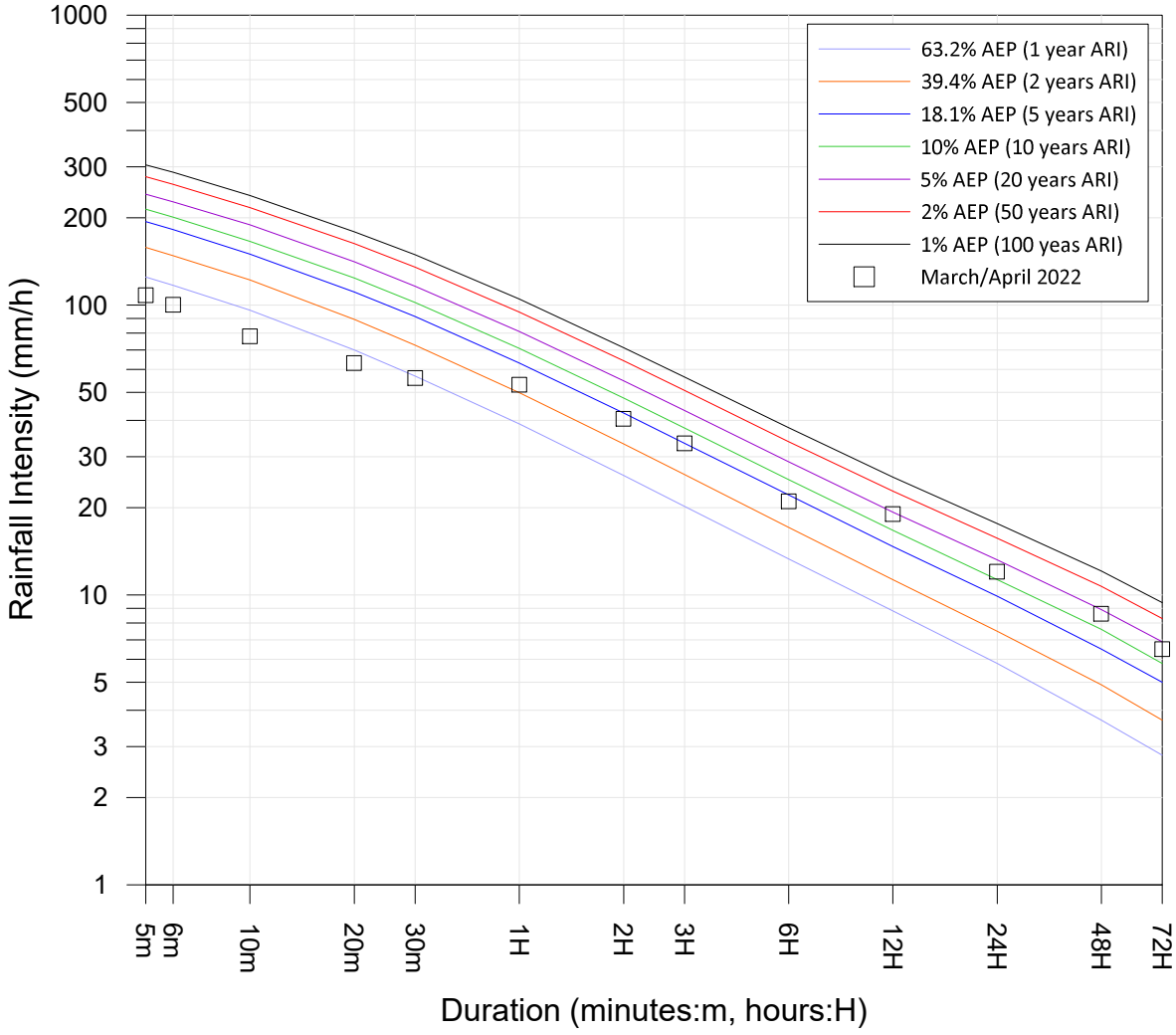
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.12

IFD_58180_Figure B.12.pdf

Site Owner: Lismore City Council
Latitude: -28.643 Longitude:153.417

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	108	20:33 29 Mar 2022
6m	100	20:33 29 Mar 2022
10m	78	20:38 29 Mar 2022
20m	63	20:33 29 Mar 2022
30m	56	20:44 29 Mar 2022
1H	53	20:36 29 Mar 2022
2H	40.5	21:34 29 Mar 2022
3H	33.3	22:34 29 Mar 2022
6H	21	01:24 30 Mar 2022
12H	19	07:34 30 Mar 2022
24H	12	18:37 30 Mar 2022
48H	8.6	18:49 30 Mar 2022
72H	6.5	03:05 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

REPENTANCE (COOPERS CK) (558000)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

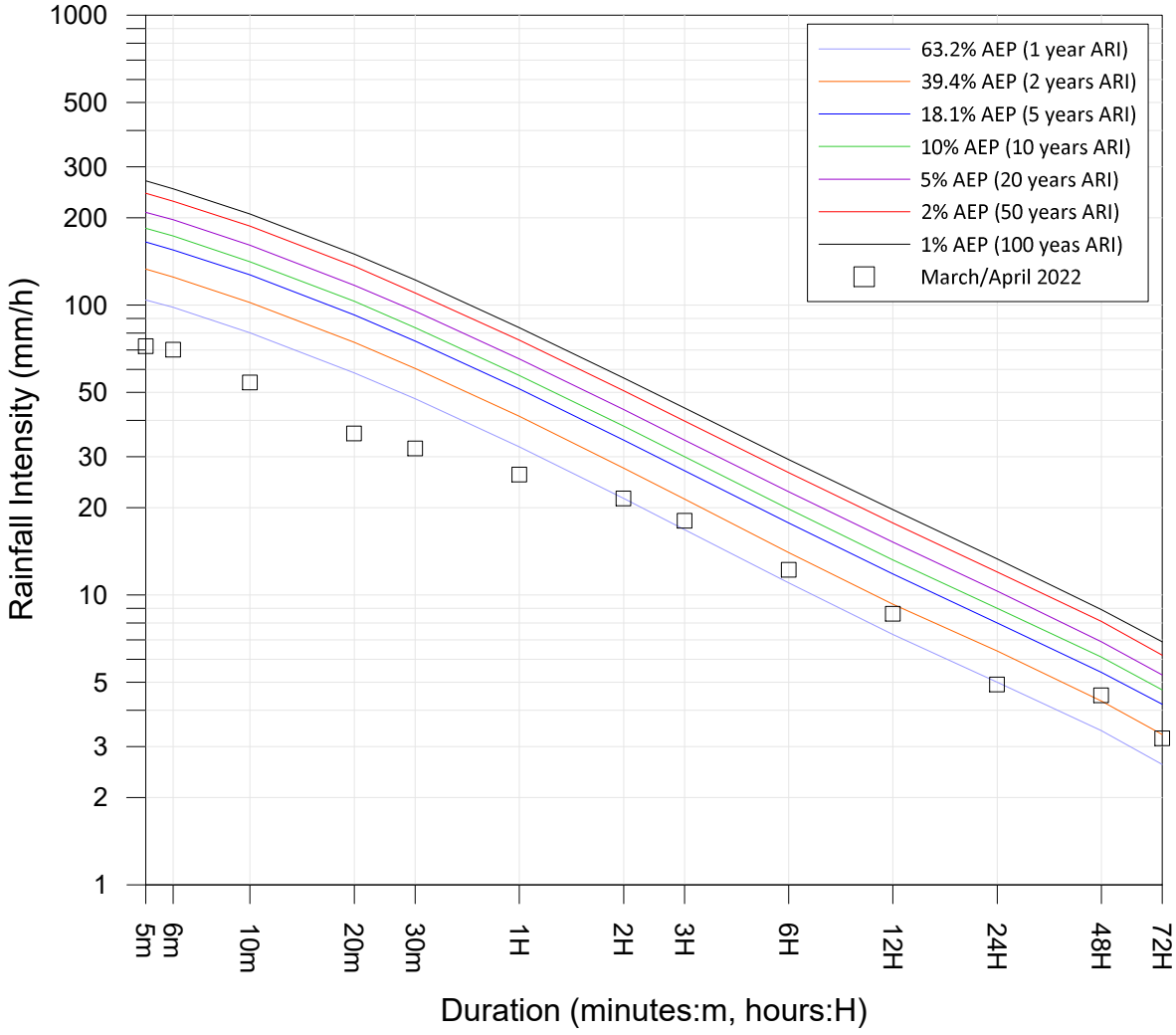
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.13

IFD_558000_Figure B.13.pdf

Site Owner: Lismore City Council
Latitude: -28.676 Longitude:153.154

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	72	16:35 06 Apr 2022
6m	70	16:36 06 Apr 2022
10m	54	16:39 06 Apr 2022
20m	36	02:59 29 Mar 2022
30m	32	03:02 29 Mar 2022
1H	26	03:10 29 Mar 2022
2H	21.5	03:28 29 Mar 2022
3H	18	03:20 29 Mar 2022
6H	12.2	04:06 29 Mar 2022
12H	8.6	04:23 29 Mar 2022
24H	4.9	10:52 29 Mar 2022
48H	4.5	10:52 30 Mar 2022
72H	3.2	02:22 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

JIGGI (GWYNNE ST) (558086)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

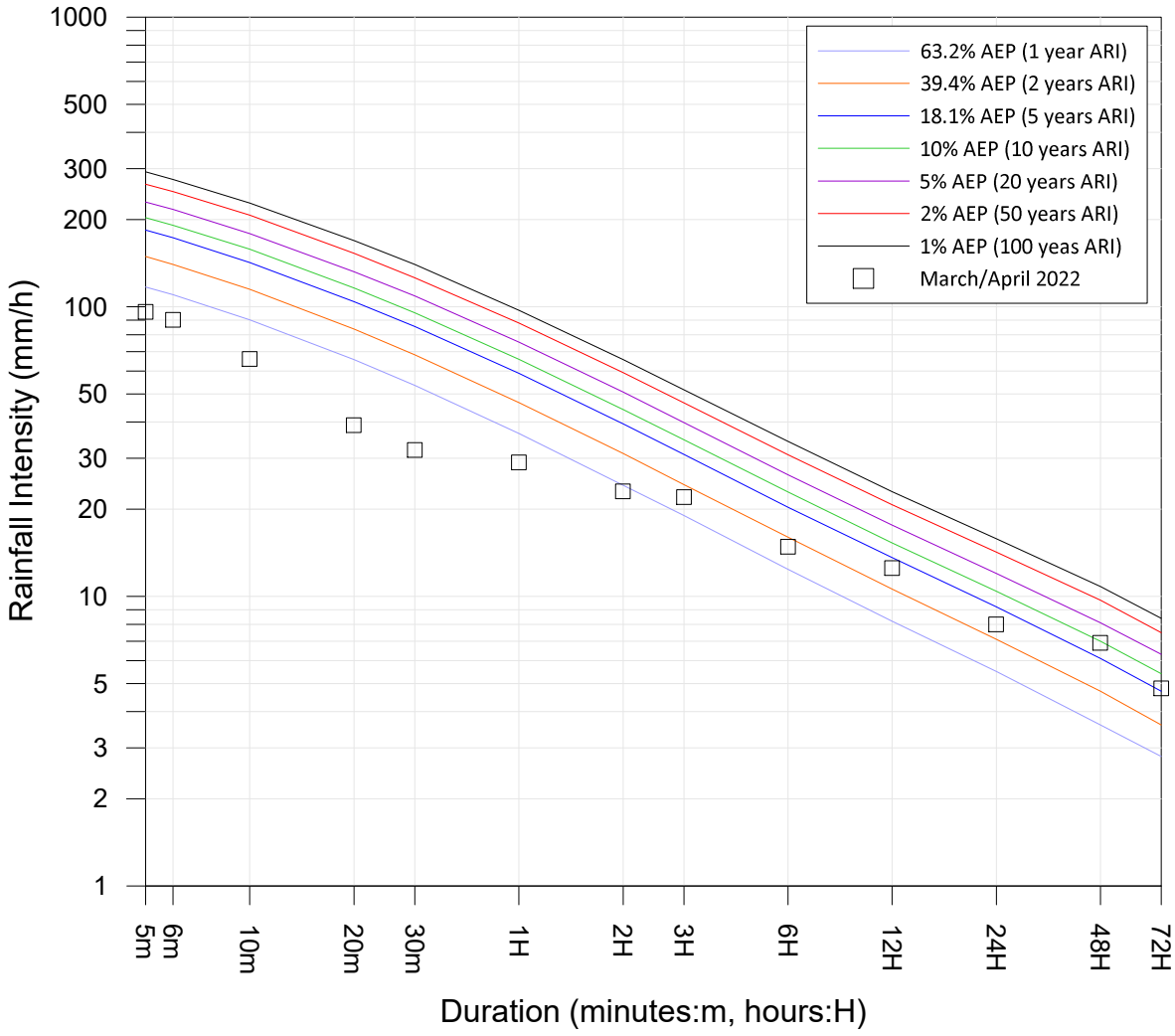
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.14

IFD_558086_Figure B.14.pdf

Site Owner: BoM
Latitude: -28.677 Longitude:153.322

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	96	14:32 25 Mar 2022
6m	90	14:33 25 Mar 2022
10m	66	14:37 25 Mar 2022
20m	39	14:47 25 Mar 2022
30m	32	18:33 26 Mar 2022
1H	29	00:29 29 Mar 2022
2H	23	01:32 29 Mar 2022
3H	22	02:30 29 Mar 2022
6H	14.8	02:49 29 Mar 2022
12H	12.5	07:53 30 Mar 2022
24H	8	15:22 30 Mar 2022
48H	6.9	10:19 30 Mar 2022
72H	4.8	21:01 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

DUNOON (558031)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

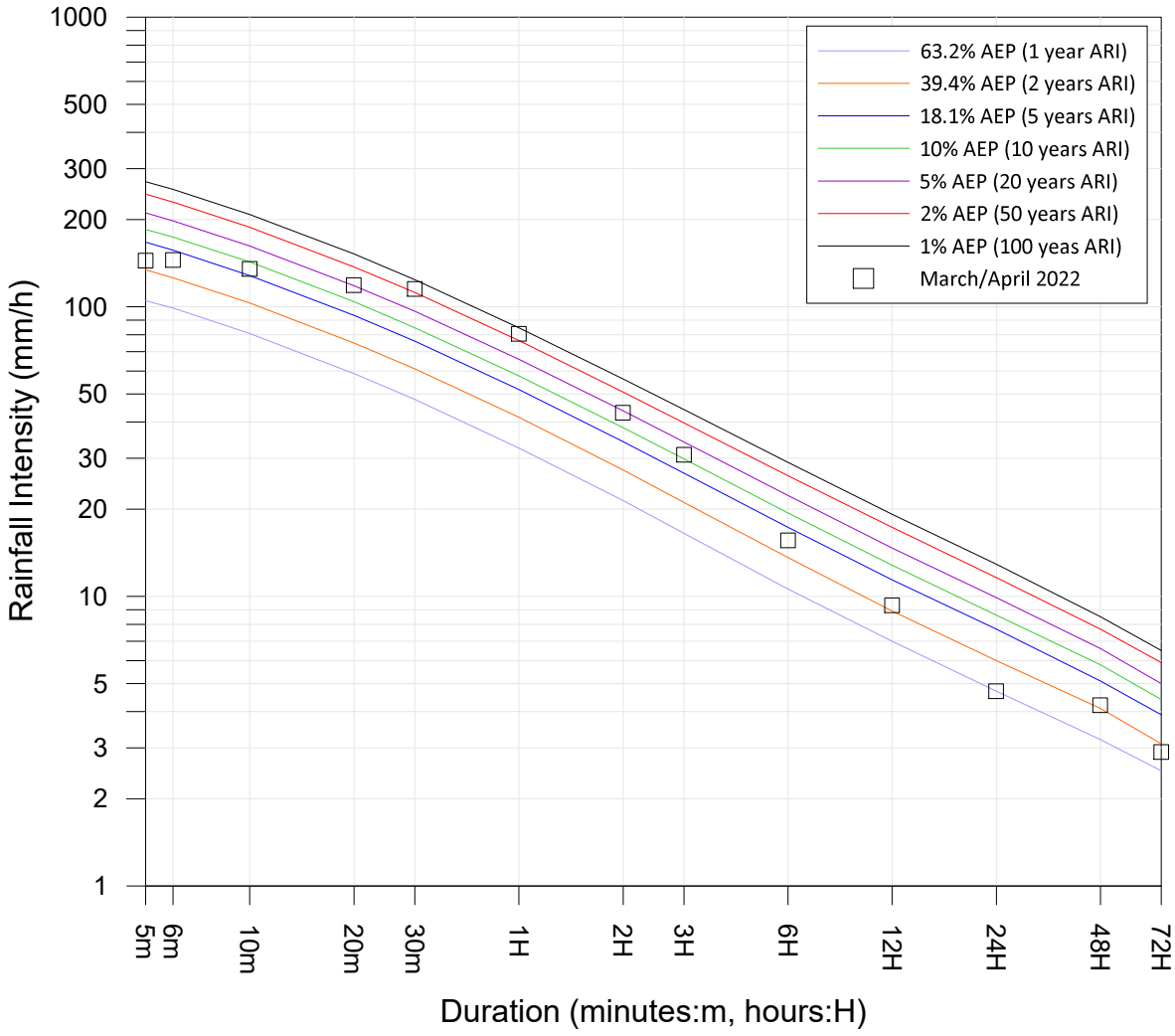
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.15

IFD_558031_Figure B.15.pdf

Site Owner: WaterNSW
Latitude: -28.7365 Longitude:153.164

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	144	15:46 25 Mar 2022
6m	145	15:46 25 Mar 2022
10m	135	15:46 25 Mar 2022
20m	118.5	15:46 25 Mar 2022
30m	115	15:46 25 Mar 2022
1H	80.5	16:07 25 Mar 2022
2H	43	17:03 25 Mar 2022
3H	30.8	18:03 25 Mar 2022
6H	15.6	20:01 25 Mar 2022
12H	9.3	02:01 26 Mar 2022
24H	4.7	14:24 26 Mar 2022
48H	4.2	11:14 30 Mar 2022
72H	2.9	21:52 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

LEYCESTER ROCK VALLEY (203010)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

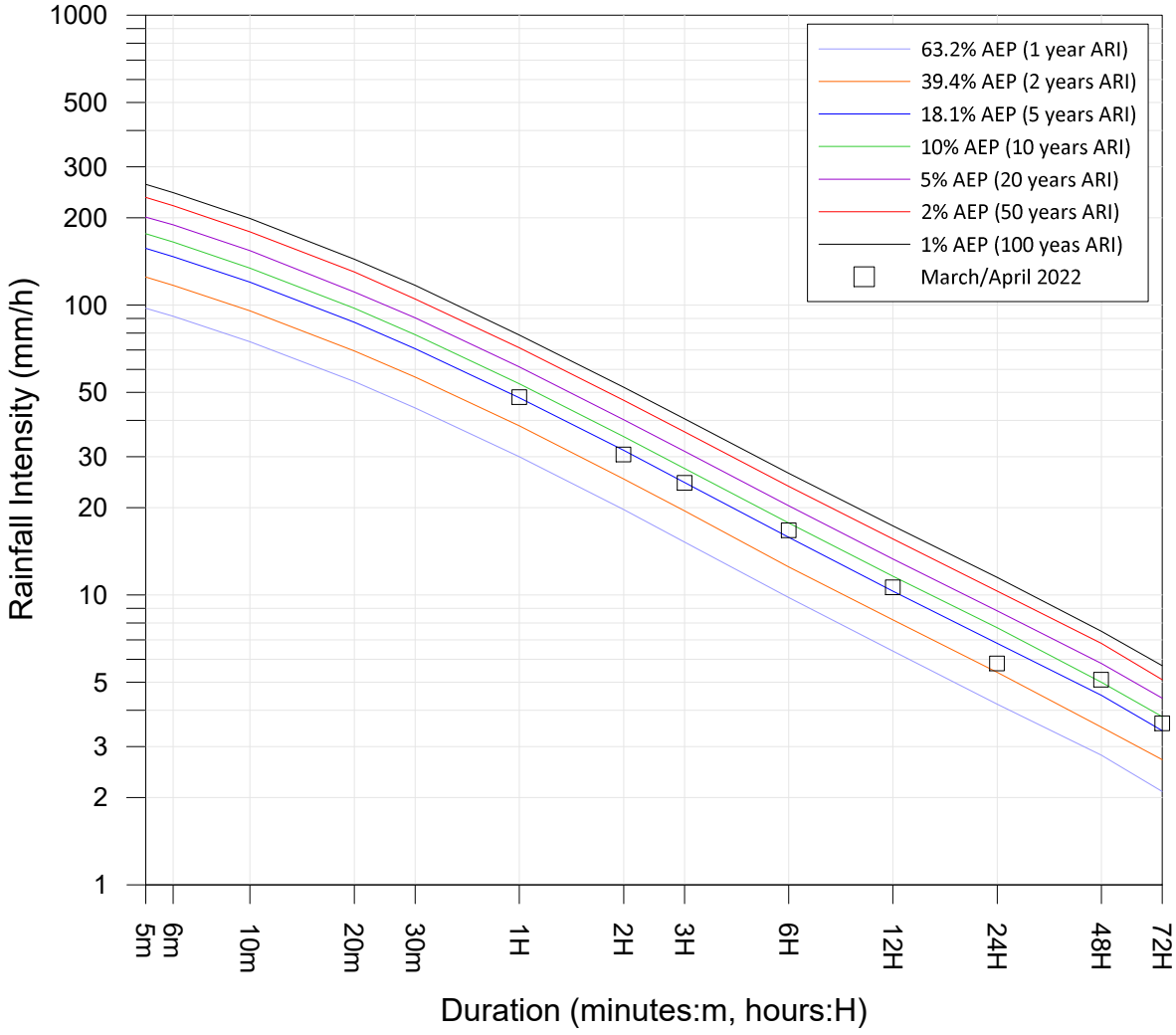
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.16

IFD_203010_Figure B.16.pdf

Site Owner: Lismore City Council
Latitude: -28.7406 Longitude:153.075

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	-	-
6m	-	-
10m	-	-
20m	-	-
30m	-	-
1H	48	16:19 25 Mar 2022
2H	30.5	17:19 25 Mar 2022
3H	24.3	03:26 29 Mar 2022
6H	16.7	03:56 29 Mar 2022
12H	10.6	04:54 29 Mar 2022
24H	5.8	11:30 29 Mar 2022
48H	5.1	12:23 30 Mar 2022
72H	3.6	02:51 31 Mar 2022

Short duration rainfall impacted by possible radio transfer interruptions. Suspect short duration IFD results removed by observation.

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

BENTLEY (BACK CREEK) (58202)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

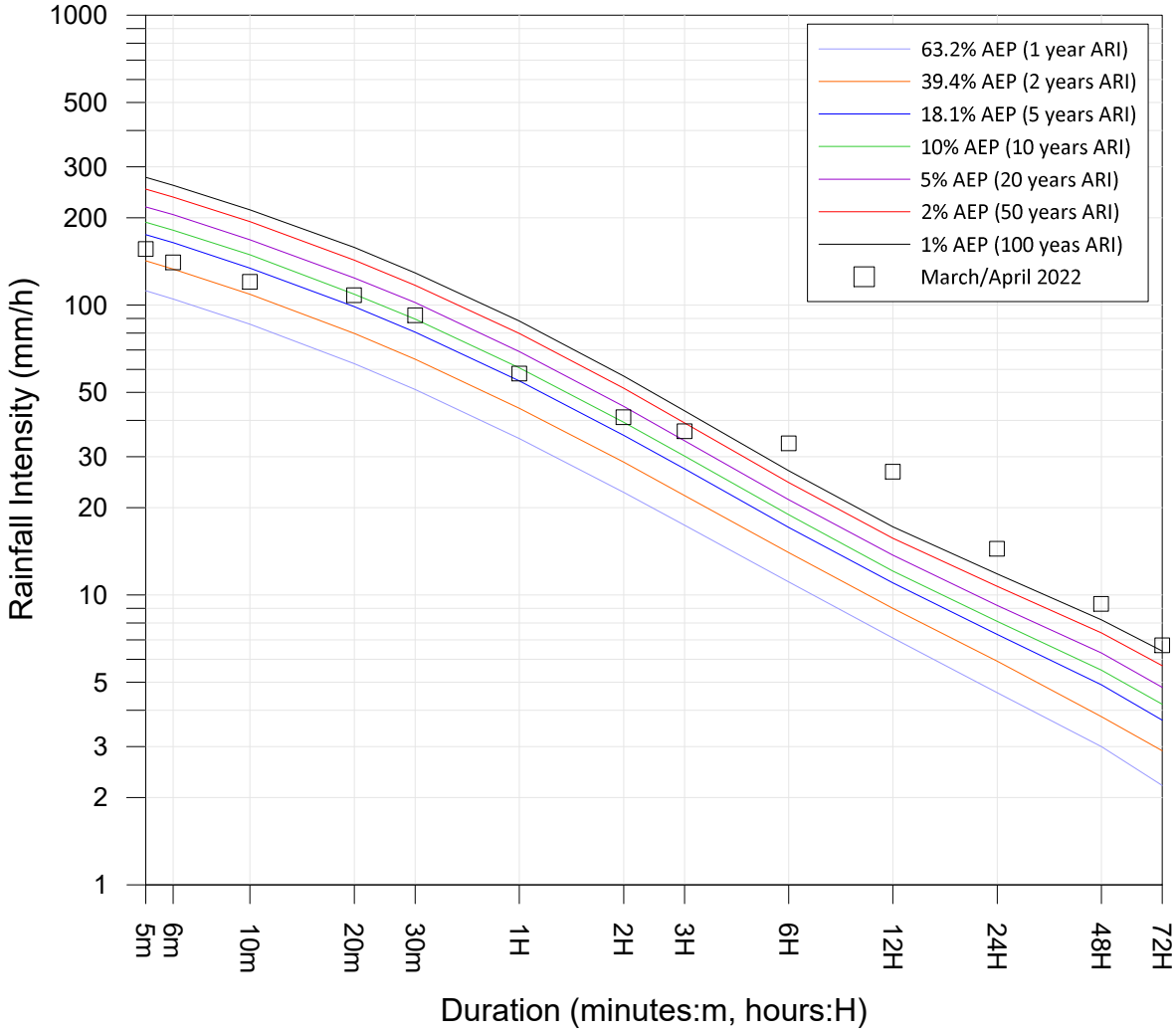
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.17

IFD_58202_Figure B.17.pdf

Site Owner: Lismore City Council
Latitude: -28.962 Longitude:153.307

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	156	20:17 29 Mar 2022
6m	140	20:18 29 Mar 2022
10m	120	19:56 24 Mar 2022
20m	108	20:00 24 Mar 2022
30m	92	20:03 24 Mar 2022
1H	58	20:22 24 Mar 2022
2H	41	01:14 30 Mar 2022
3H	36.7	02:24 30 Mar 2022
6H	33.3	02:12 30 Mar 2022
12H	26.6	05:07 30 Mar 2022
24H	14.4	07:30 30 Mar 2022
48H	9.3	10:59 30 Mar 2022
72H	6.7	14:35 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

WILSONS RIVER AT TUCKURIMBA (558076)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

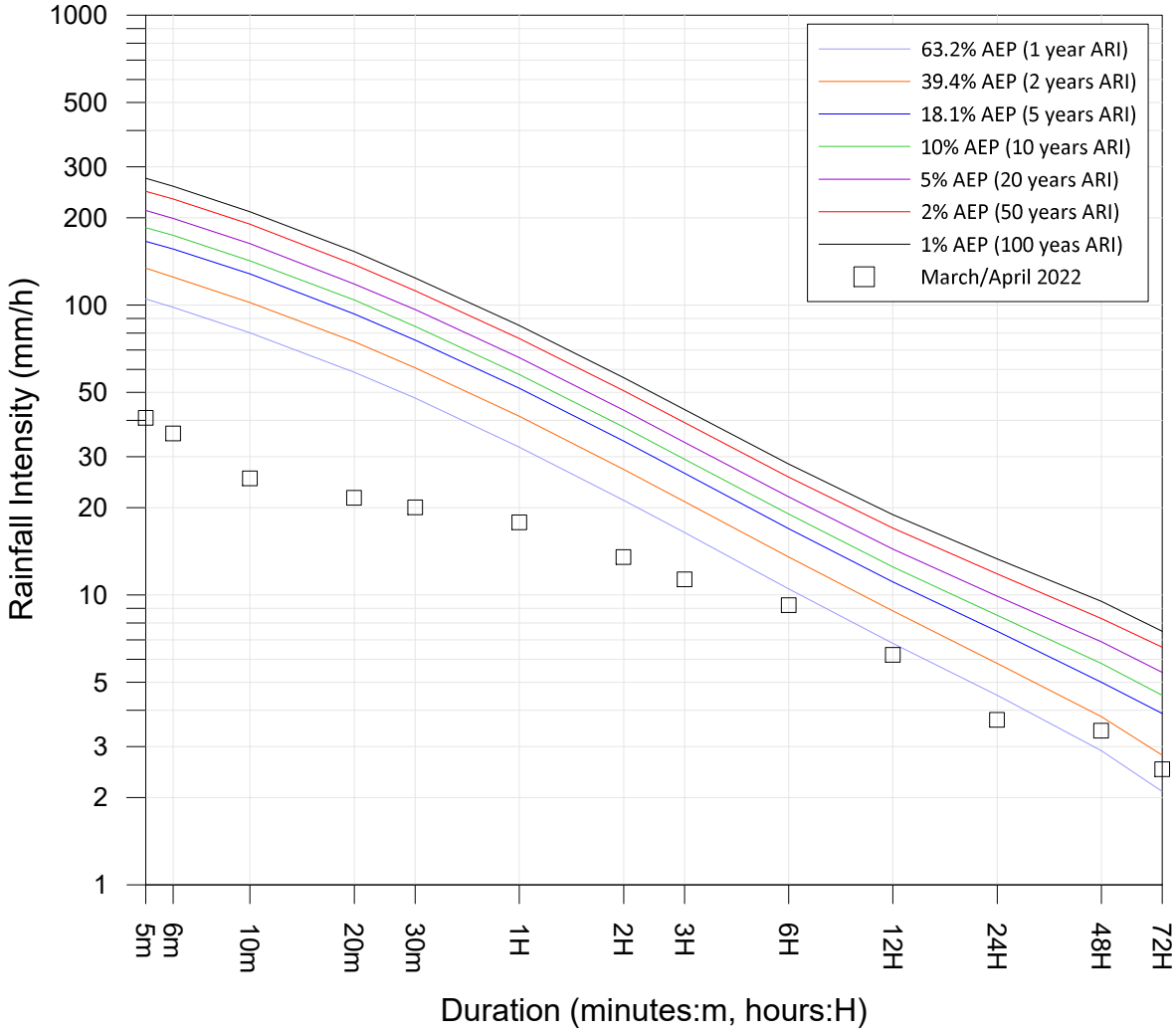
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.18

IFD_558076_Figure B.18.pdf

Site Owner: BoM
Latitude: -28.4119 Longitude:152.9827

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	40.8	08:18 30 Mar 2022
6m	36	08:19 30 Mar 2022
10m	25.2	08:22 30 Mar 2022
20m	21.6	14:48 25 Mar 2022
30m	20	01:37 29 Mar 2022
1H	17.8	01:41 29 Mar 2022
2H	13.5	01:46 29 Mar 2022
3H	11.3	01:44 29 Mar 2022
6H	9.2	01:46 29 Mar 2022
12H	6.2	02:44 29 Mar 2022
24H	3.7	02:21 29 Mar 2022
48H	3.4	14:28 30 Mar 2022
72H	2.5	23:10 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

LOADSTONE (HIGH VIEW) (58141)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

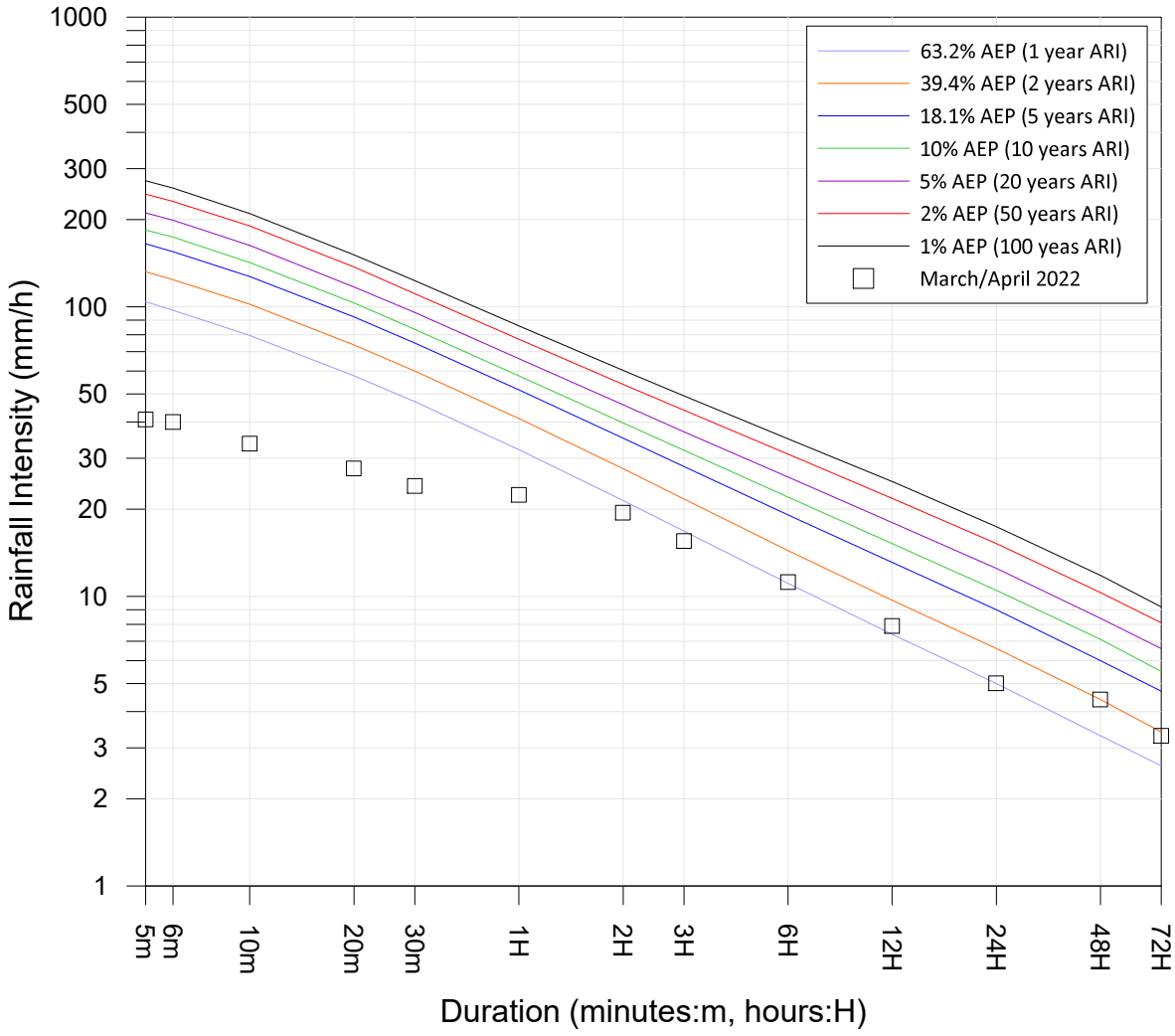
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.19

IFD_58141_Figure B.19.pdf

Site Owner: BoM
Latitude: -28.4738 Longitude:153.0861

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	40.8	17:26 30 Mar 2022
6m	40	17:27 30 Mar 2022
10m	33.6	17:27 30 Mar 2022
20m	27.6	05:23 30 Mar 2022
30m	24	01:16 29 Mar 2022
1H	22.4	01:25 29 Mar 2022
2H	19.4	01:51 29 Mar 2022
3H	15.5	01:51 29 Mar 2022
6H	11.2	02:02 29 Mar 2022
12H	7.9	02:46 29 Mar 2022
24H	5	18:00 30 Mar 2022
48H	4.4	17:35 30 Mar 2022
72H	3.3	01:57 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

GREEN PIGEON (MORNING VIEW) (58113)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

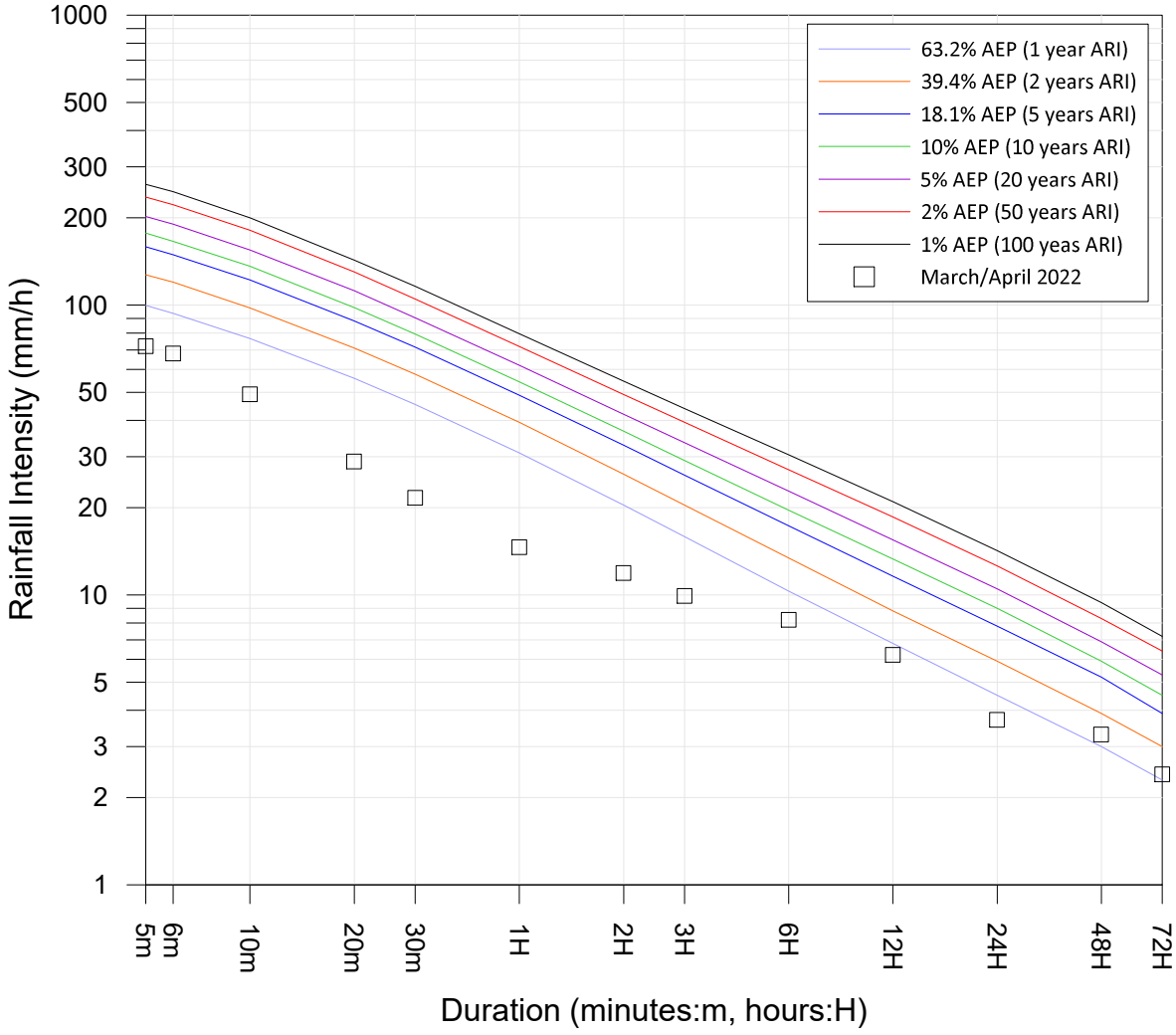
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.20

IFD_58113_Figure B.20.pdf

Site Owner: WaterNSW
Latitude: -28.5167 Longitude:152.9667

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	72	14:09 30 Mar 2022
6m	68	14:10 30 Mar 2022
10m	49.2	14:13 30 Mar 2022
20m	28.8	14:16 30 Mar 2022
30m	21.6	14:13 30 Mar 2022
1H	14.6	01:59 29 Mar 2022
2H	11.9	02:27 29 Mar 2022
3H	9.9	02:32 29 Mar 2022
6H	8.2	02:58 29 Mar 2022
12H	6.2	03:38 29 Mar 2022
24H	3.7	05:08 29 Mar 2022
48H	3.3	14:12 30 Mar 2022
72H	2.4	01:46 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

WIANGAREE BRIDGE (RICHMOND RIVER) (203005)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

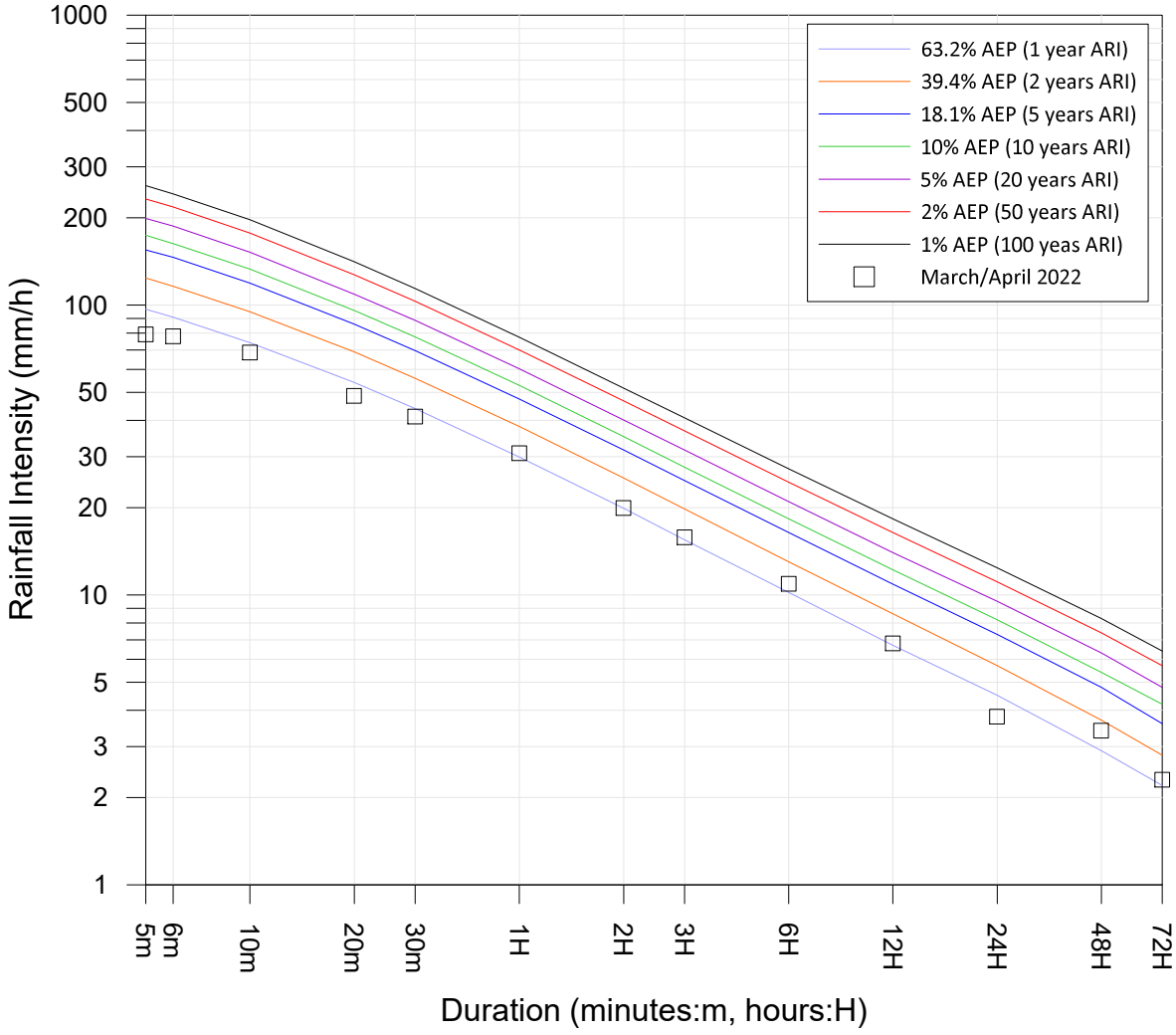
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.21

IFD_203005_Figure B.21.pdf

Site Owner: WaterNSW
Latitude: -28.621 Longitude:152.9948

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	79.2	17:33 06 Apr 2022
6m	78	17:34 06 Apr 2022
10m	68.4	17:35 06 Apr 2022
20m	48.6	02:39 29 Mar 2022
30m	41.2	02:41 29 Mar 2022
1H	30.8	02:50 29 Mar 2022
2H	19.9	02:50 29 Mar 2022
3H	15.8	02:56 29 Mar 2022
6H	10.9	03:04 29 Mar 2022
12H	6.8	05:14 29 Mar 2022
24H	3.8	06:28 29 Mar 2022
48H	3.4	14:19 30 Mar 2022
72H	2.3	02:58 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

RICHMOND RIVER AT KYOGLE (203900)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

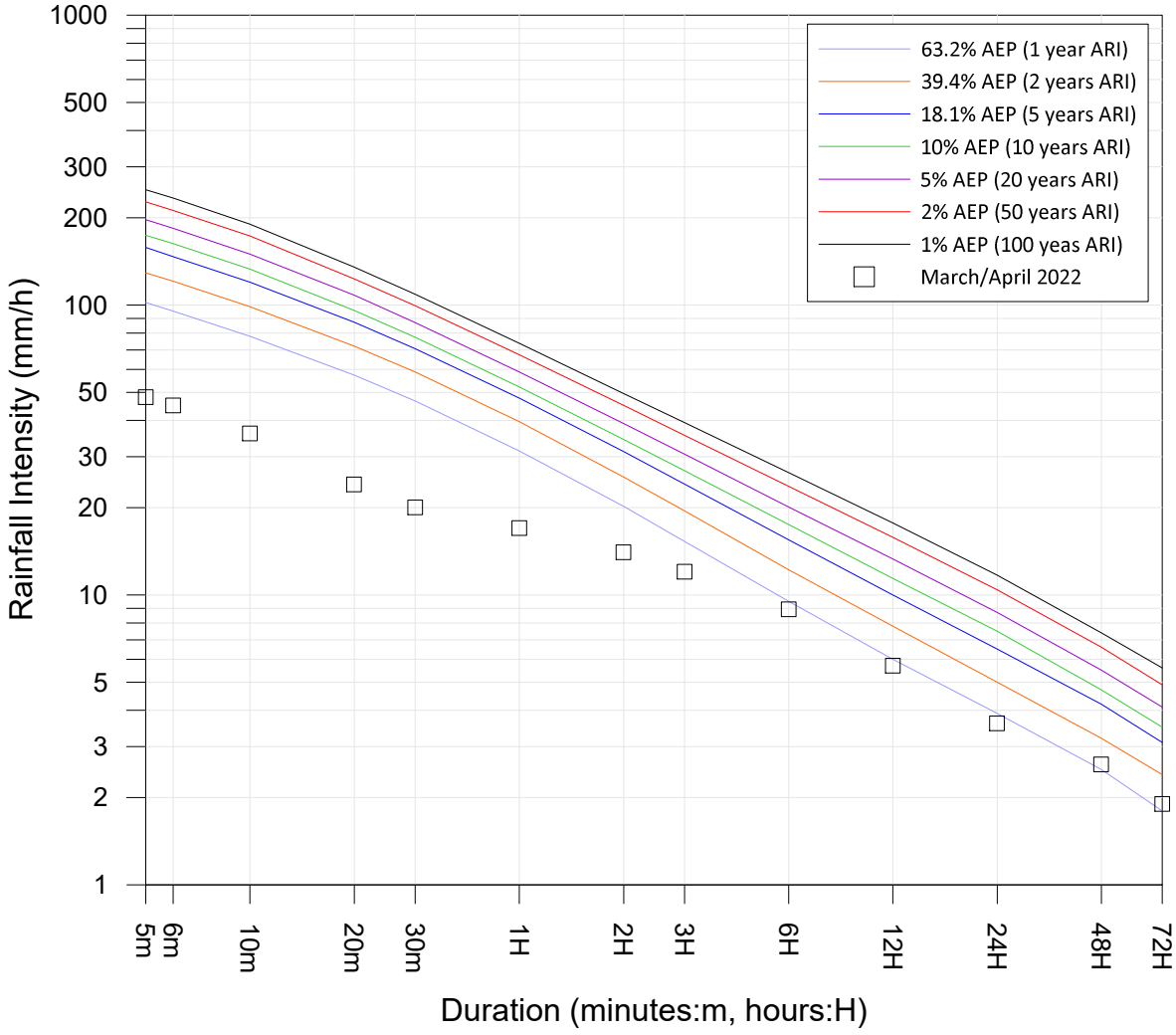
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.22

IFD_203900_Figure B.22.pdf

Site Owner: WaterNSW
Latitude: -28.7591 Longitude:152.9222

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	48	12:16 06 Apr 2022
6m	45	12:17 06 Apr 2022
10m	36	12:20 06 Apr 2022
20m	24	12:29 06 Apr 2022
30m	20	03:21 29 Mar 2022
1H	17	03:23 29 Mar 2022
2H	14	03:22 29 Mar 2022
3H	12	03:26 29 Mar 2022
6H	8.9	04:32 29 Mar 2022
12H	5.7	04:46 29 Mar 2022
24H	3.6	05:26 29 Mar 2022
48H	2.6	11:13 30 Mar 2022
72H	1.9	02:45 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

EDEN CK AT DOUBTFUL (203034)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

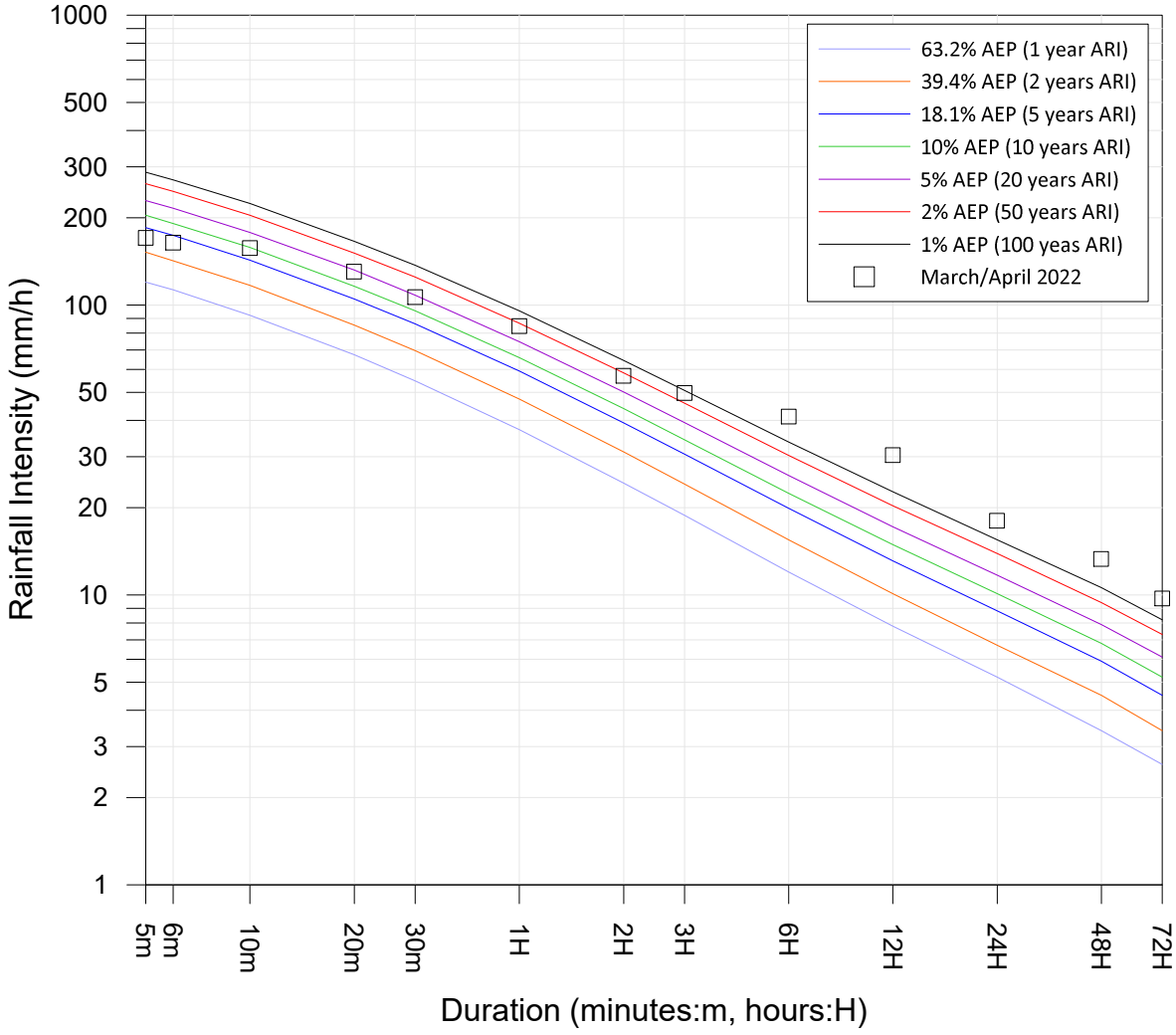
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.23

IFD_203034_Figure B.23.pdf

Site Owner: Ballina Shire Council
Latitude: -28.831 Longitude:153.444

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	170.4	23:44 29 Mar 2022
6m	164	23:45 29 Mar 2022
10m	157.2	23:44 29 Mar 2022
20m	130.2	23:47 29 Mar 2022
30m	106.4	23:52 29 Mar 2022
1H	84.4	00:25 30 Mar 2022
2H	56.9	01:21 30 Mar 2022
3H	49.7	00:39 30 Mar 2022
6H	41.2	00:58 30 Mar 2022
12H	30.3	06:01 30 Mar 2022
24H	18	07:49 30 Mar 2022
48H	13.3	07:50 30 Mar 2022
72H	9.7	01:44 31 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

ALSTONVILLE STP (558072)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

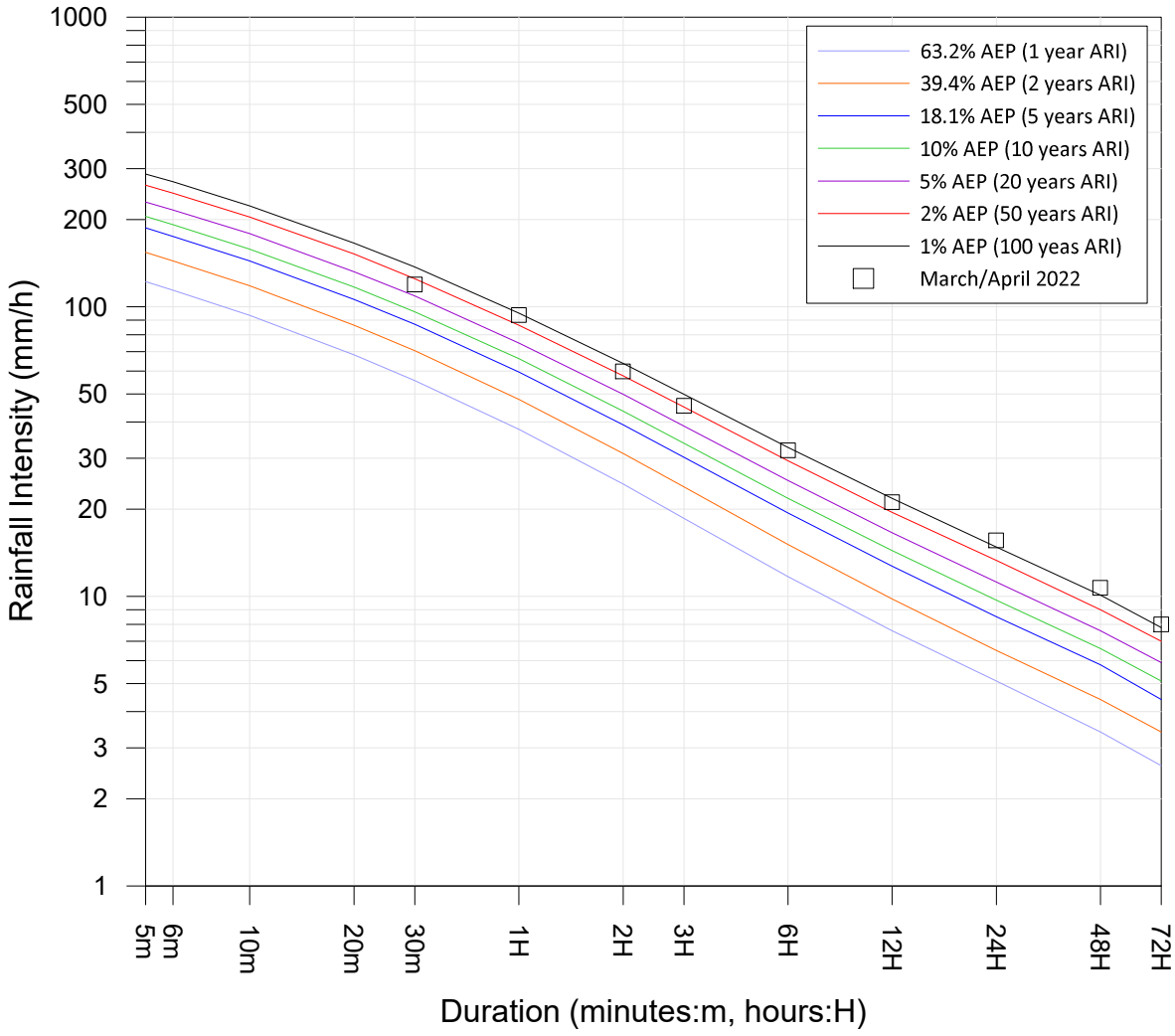
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.24

IFD_558072_Figure B.24.pdf

Site Owner: BoM
Latitude: -28.8353 Longitude:153.5585

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	-	-
6m	-	-
10m	-	-
20m	-	-
30m	119.2	23:59 29 Mar 2022
1H	93.4	00:29 30 Mar 2022
2H	59.7	00:59 30 Mar 2022
3H	45.5	00:59 30 Mar 2022
6H	31.9	05:29 30 Mar 2022
12H	21.1	05:59 30 Mar 2022
24H	15.6	18:29 30 Mar 2022
48H	10.7	18:29 30 Mar 2022
72H	8	22:59 30 Mar 2022

Rainfall is totalised at 30 minute intervals.
Short duration IFD results removed.

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

BALLINA AIRPORT AWS (58198)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

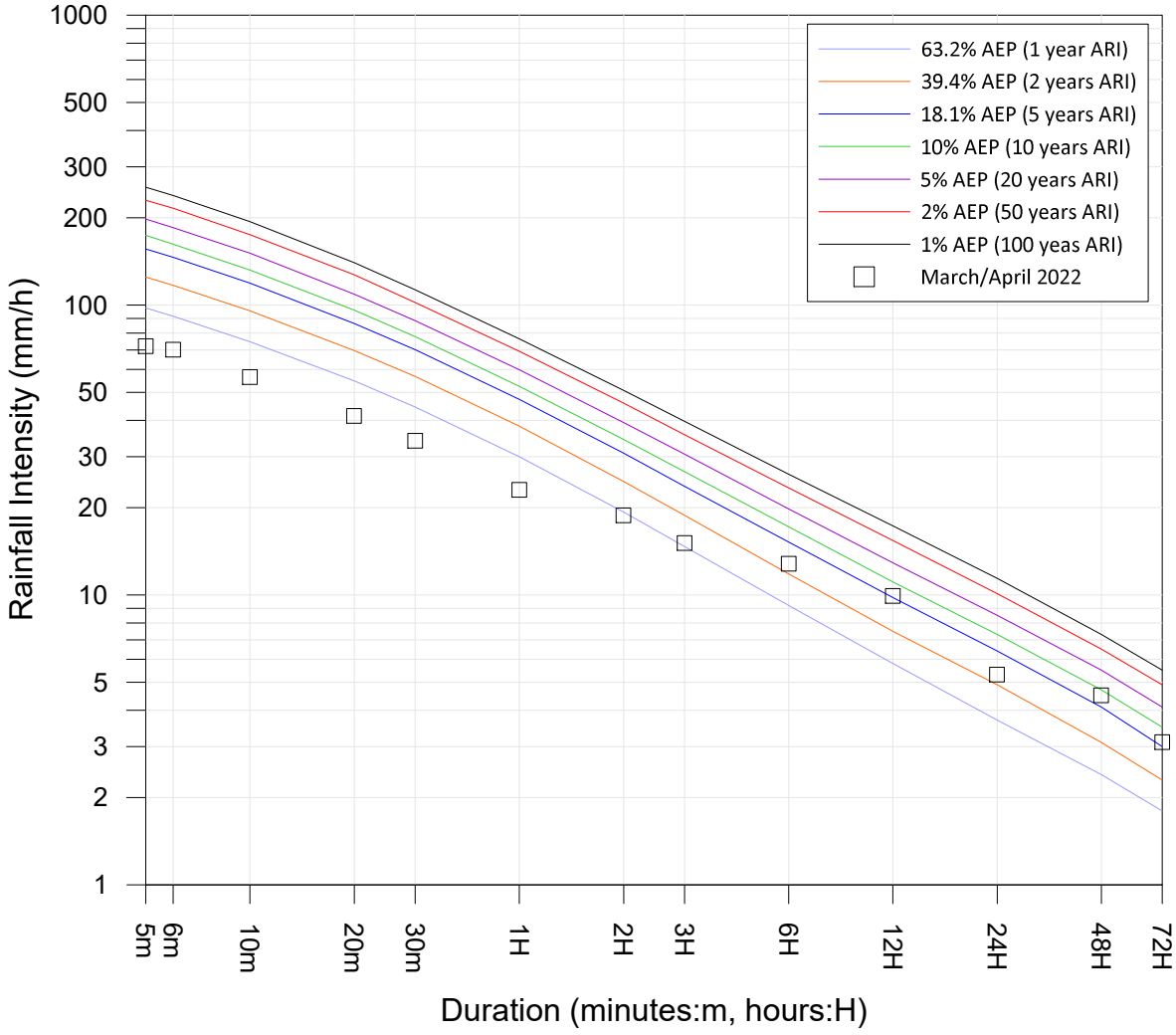
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.25

IFD_58198_Figure B.25.pdf

Site Owner: WaterNSW
Latitude: -28.9447 Longitude:153.0603

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	72	16:12 25 Mar 2022
6m	70	16:12 25 Mar 2022
10m	56.4	16:16 25 Mar 2022
20m	41.4	16:25 25 Mar 2022
30m	34	16:25 25 Mar 2022
1H	23	01:54 30 Mar 2022
2H	18.8	02:29 30 Mar 2022
3H	15.1	02:07 30 Mar 2022
6H	12.8	02:23 30 Mar 2022
12H	9.9	06:54 30 Mar 2022
24H	5.3	02:14 30 Mar 2022
48H	4.5	11:36 30 Mar 2022
72H	3.1	23:39 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

SHANNON BROOK AT YORKLEA (203041)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

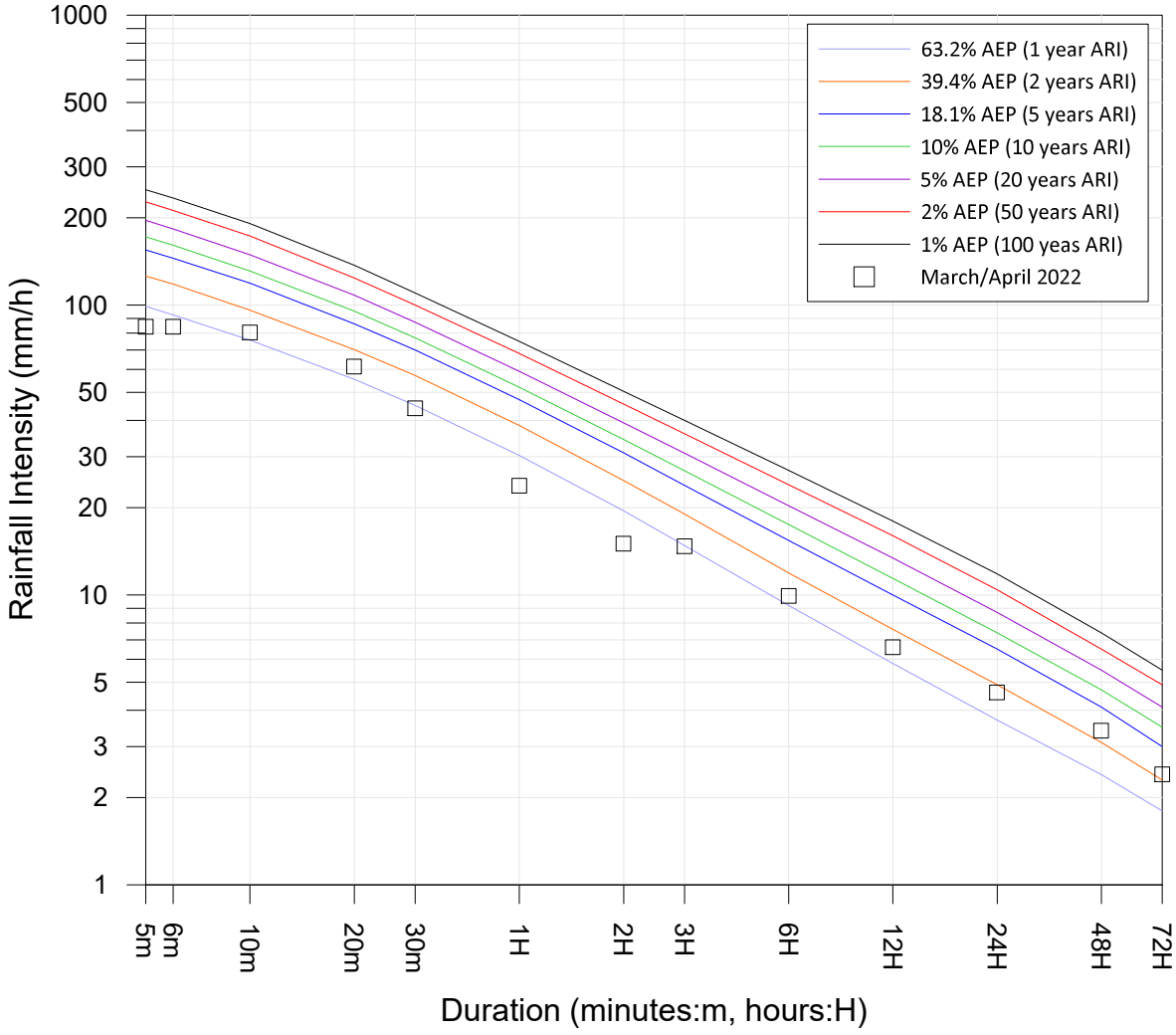
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.26

IFD_203041_Figure B.26.pdf

Site Owner: WaterNSW
Latitude: -29.1119 Longitude:152.9983

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	84	18:59 24 Mar 2022
6m	84	19:00 24 Mar 2022
10m	80.4	19:04 24 Mar 2022
20m	61.2	17:23 25 Mar 2022
30m	44	17:33 25 Mar 2022
1H	23.8	19:31 24 Mar 2022
2H	15	22:15 29 Mar 2022
3H	14.7	17:43 25 Mar 2022
6H	9.9	02:11 30 Mar 2022
12H	6.6	06:42 30 Mar 2022
24H	4.6	00:43 30 Mar 2022
48H	3.4	12:51 30 Mar 2022
72H	2.4	16:36 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

RAPPVILLE (MYRTLE CREEK) (203030)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

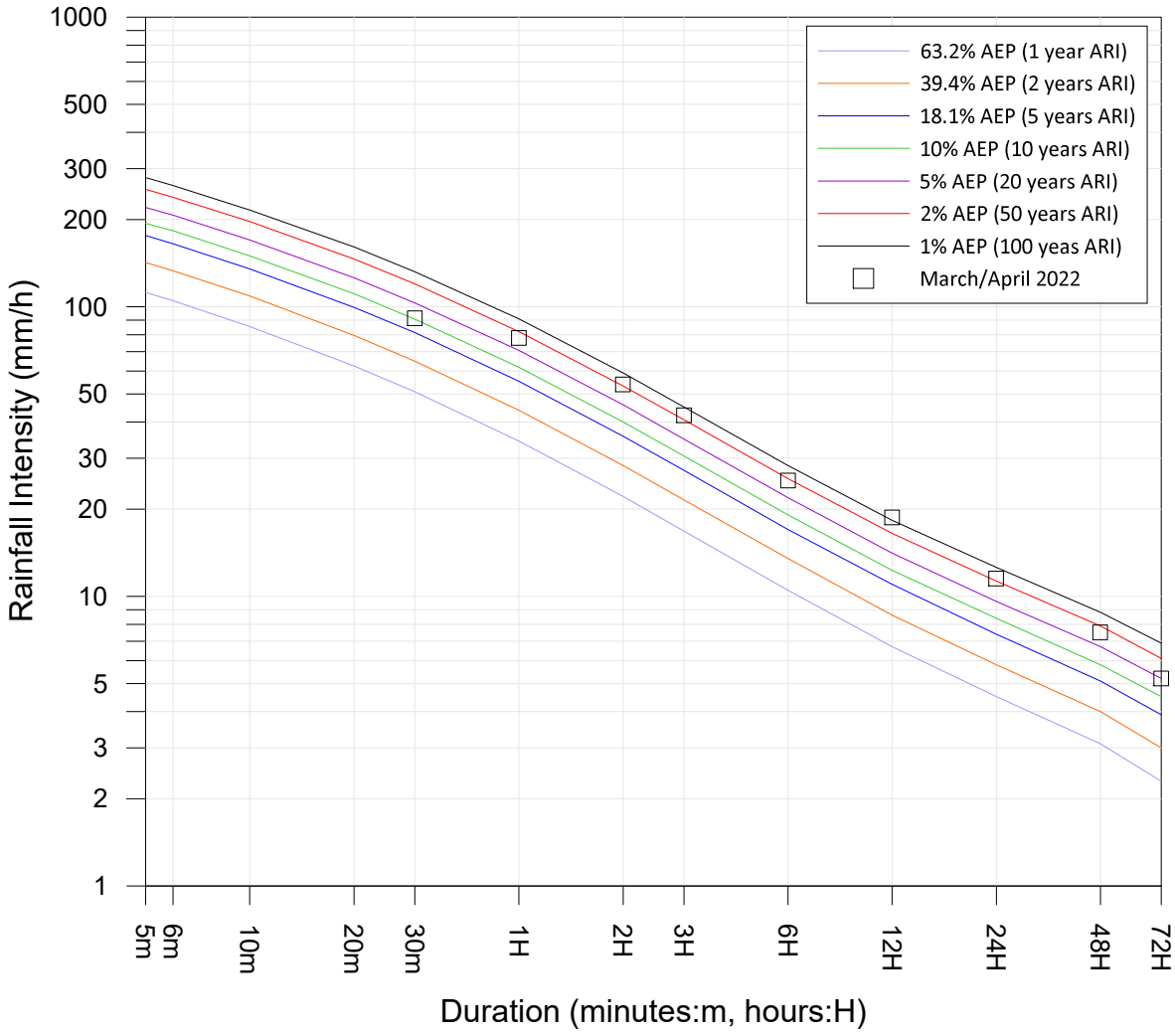
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.27

IFD_203030_Figure B.27.pdf

Site Owner: BoM
Latitude: -29.183 Longitude:153.3964

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	-	-
6m	-	-
10m	-	-
20m	-	-
30m	91.2	18:59 29 Mar 2022
1H	78	19:29 29 Mar 2022
2H	53.8	20:29 29 Mar 2022
3H	42.1	19:59 29 Mar 2022
6H	25.1	20:59 29 Mar 2022
12H	18.7	05:59 30 Mar 2022
24H	11.5	05:59 30 Mar 2022
48H	7.5	07:59 30 Mar 2022
72H	5.2	23:59 30 Mar 2022

Rainfall is totalised at 30 minute intervals.
Short duration IFD results removed.

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

EVANS HEAD RAAF BOMBING RANGE AWS (58212)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

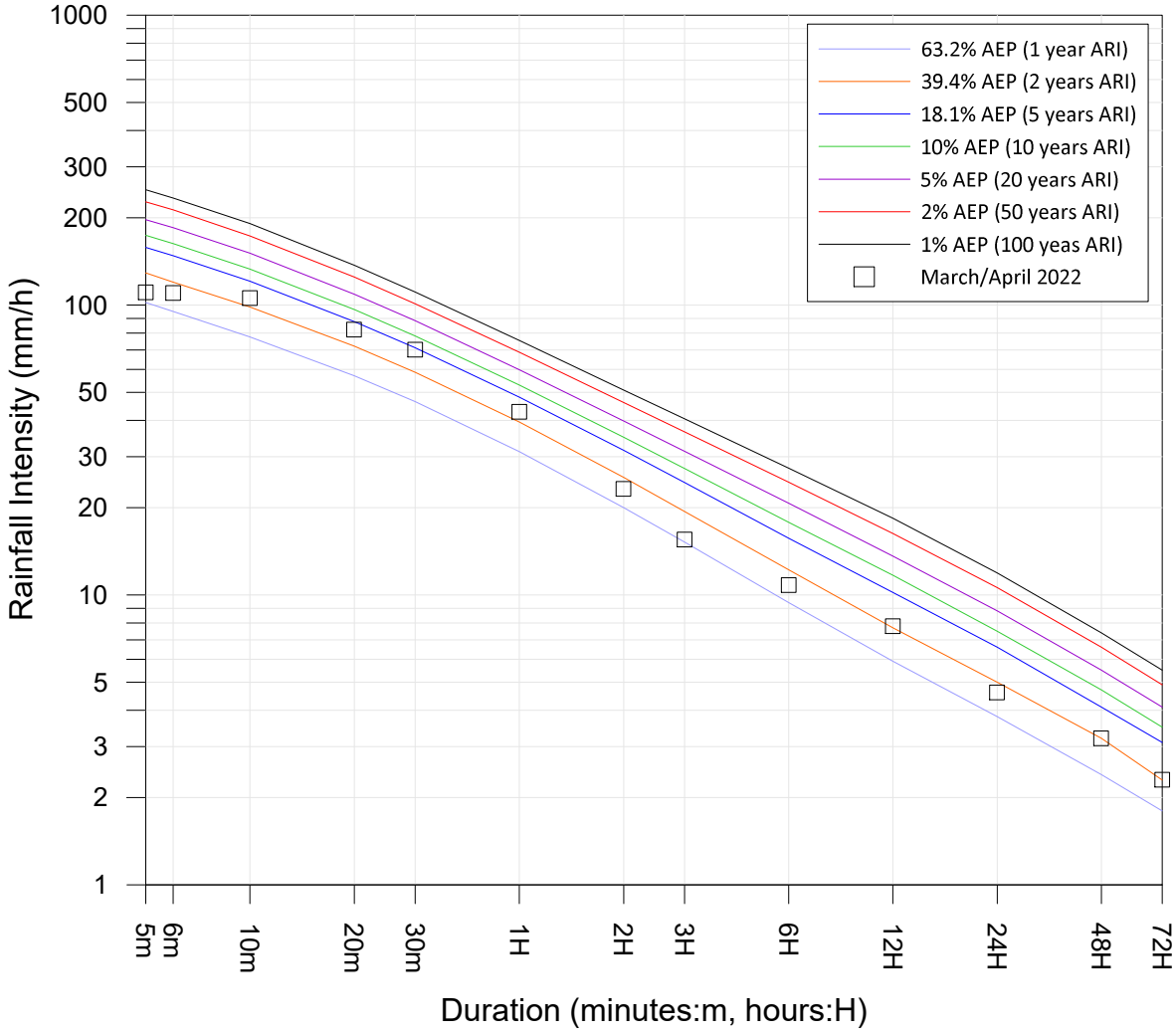
Manly Hydraulics Laboratory

Report MHL2895
Figure
B.28

IFD_58212_Figure B.28.pdf

Site Owner: BoM
Latitude: -29.2825 Longitude:152.9892

AEP = Annual Exceedance Probability
ARI = Average Recurrence Interval



Duration (minutes:m) (hours:H)	Rainfall Intensity (mm/hr)	Time/Date
5m	110.4	18:46 24 Mar 2022
6m	110	18:48 24 Mar 2022
10m	105.6	18:49 24 Mar 2022
20m	82.2	18:59 24 Mar 2022
30m	70	19:08 24 Mar 2022
1H	42.8	19:32 24 Mar 2022
2H	23.2	20:32 24 Mar 2022
3H	15.5	21:32 24 Mar 2022
6H	10.8	01:43 30 Mar 2022
12H	7.8	07:14 30 Mar 2022
24H	4.6	02:04 30 Mar 2022
48H	3.2	11:18 30 Mar 2022
72H	2.3	16:27 30 Mar 2022

Reference: Australian Rainfall and Runoff (1987)

NSW GOVERNMENT

WHIPORIE POST OFFICE (58099)
INTENSITY-FREQUENCY-DURATION
MARCH/APRIL 2022

Manly Hydraulics Laboratory

Report MHL2895
Figure
B.29

IFD_58099_Figure B.29.pdf

Appendix C WaterNSW water level station local datum to AHD conversion

Appendix C provides the conversion from local gauge datum to Australian Height Datum for stations managed by WaterNSW.

Table C.1 WaterNSW station conversion to AHD

Station name	Station number	Datum conversion	AHD gauge zero (m)
Wilsons at Lavertys Gap Weir	203062	Local datum to AHD	116.029
Richmond River at Kyogle	203900	Local datum to AHD	40.251
Coopers Creek at Repentence	203002	Local datum to AHD	42.938
Coopers at Ewing Bridge	203024	Local datum to AHD	9.588
Goolmangar Creek at McNamara Bridge Weir	203061	Local datum to AHD	9.36
Leycester Rock Valley	203010	Local datum to AHD	13.196
Coopers Creek at Fairmeadow	203060	Local datum to AHD	6.77
Wilsons River at Eltham	203014	Local datum to AHD	6.455
Wiangaree Bridge (Richmond River)	203005	Local datum to AHD	61.44
Eden Creek at Doubtful	203034	Local datum to AHD	27.037
Casino (Richmond River)	203004	Local datum to AHD	5.02
Shannon Brook at Yorklea	203041	Local datum to AHD	13.133
Rappville (Myrtle Creek)	203030	Local datum to AHD	31.380

110B King Street

Manly Vale NSW 2093