

24 January 2020
Ref No: 3351-1037

Hazell Bros Group
By email: Chris.Sharpe@hazellbros.com.au

Attention: Mr Chris Sharpe

Dear Chris

Byron Bay Bypass - Stage 1 Post Clearing Report 2

Introduction and Methodology

This letter report presents the results of clearing phase pre and during clearing fauna surveys and supervision undertaken by GeoLINK for Hazell Bros Group (HBG) for Stage 1 (chainage 189-650) of the Byron Bay Bypass Project. Specifically, this document relates to:

- Urban street tree clearing near chainage 650.
- Swamp sclerophyll forest clearing undertaken on the eastern side of the Burns Street/ Butler Street intersection.

Clearing was undertaken in accordance with:

- The HBG Environmental Management Plan (EMP) Flora and Fauna Management Sub-plan, with consideration of the findings of the *Byron Bay Bypass - Stage 1 Pre-clearing Report* (GeoLINK 2019a).
- The *Byron Bay Bypass: Mitchell's Rainforest Snail (MRS) Habitat Clearing Protocol* (GeoLINK 2019b).

The grassy area at the northern end of Byron Bay Bypass Stage 2 (approximate chainage 650) was also subject to periodic nocturnal Mitchell's Rainforest Snail (MRS; *Thersites mitchellae*) surveys.

Key activities undertaken as part of pre/during clearing surveys and inspections included:

- Ensuring clearing limits were delineated.
- Diurnal and nocturnal pre-clearing MRS surveys and phased habitat reduction on the two days and nights immediately prior the Burns Street clearing.
- Clear phase MRS surveys prior to and during the Burns Street clearing and grubbing.
- Pre-clearing flush surveys in areas of dense understorey vegetation.
- Pre-clearing searches through understorey habitat features (including leaf litter, vegetation and fallen timber).
- Canopy inspections pre and during clearing.
- Inspections of fallen timber.
- Ground habitat searches for fauna post tree removal, and pre and during grubbing.
- Fauna rescue and relocation as required.

The survey methodology for each day of clearing is provided in the clearing registers in **Appendix A**. A total of 38.5 person hours of pre/during phase surveys and inspections were undertaken as part of the subject works. No habitat trees were removed during the subject works (therefore no two-stage clearing was required).

Results

The results of the subject pre/ during clearing surveys and inspections are provided in the clearing registers in **Appendix A**. Key findings include:

- No fauna rescue or relocation was required as part of the urban street tree clearing near chainage 650.
- Twenty-three MRS were captured from the Burns Street clearing footprint and relocated within the adjoining swamp sclerophyll forest habitat to the east (refer to **Illustration 1** and Table A3 of **Appendix A**)
- Other fauna capture and relocations included:
 - One Carpet Python (*Morelia spilota*).
 - Two Striped Marsh Frogs (*Limnodynastes peronii*).

These individuals were relocated to the adjoining swamp sclerophyll forest habitat to the east of the site.

- No fauna injuries or mortalities were encountered.
- Salvaged habitat features include:

- Small log.
- Palm fronds.
- Leaf litter deposits.

These were relocated to the edge of the clearing limit, outside of the works footprint.

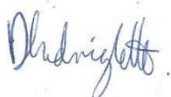
- No MRS were detected in the grassy area at the northern end of Byron Bay Bypass Stage 2 (approximate chainage 650).

The results show that the *Byron Bay Bypass: Mitchell's Rainforest Snail (MRS) Habitat Clearing Protocol (GeoLINK 2019b)* was effective in detecting MRS for capture and relocation.

Please contact the undersigned if you require any further information.

Yours sincerely

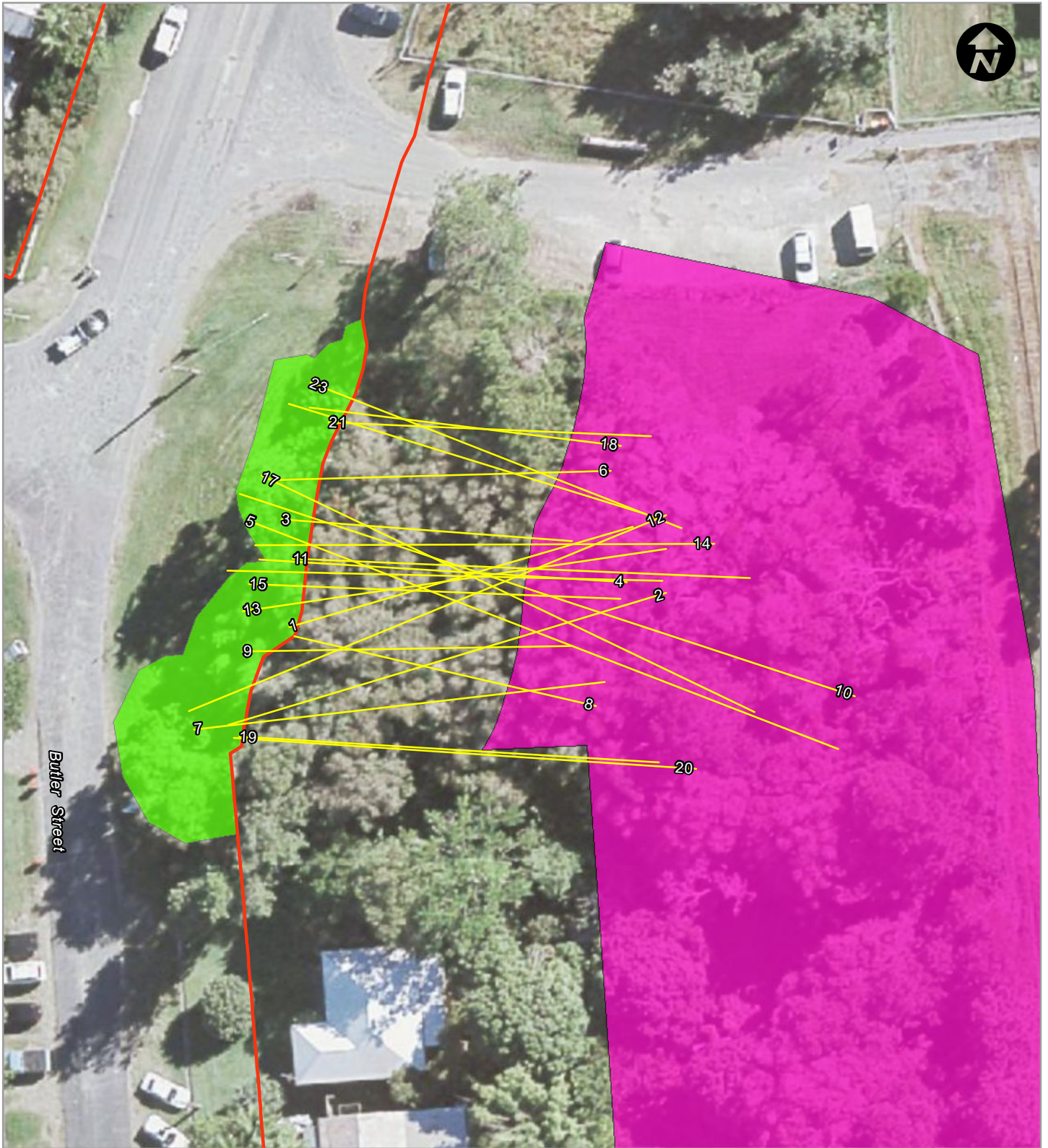
GeoLINK



David Andrighetto

Ecologist

UPR	Description	Date Issued	Issued By
3351-1037	First issue	24/01/2020	David Andrighetto



LEGEND

- MRS relocation
- Clearing limit
- MRS habitat
- Potential MRS relocation habitat

GDA 1994 MGA Zone 56



MRS Relocation - Illustration 1

Appendix A Byron Bay Bypass - Stage 1 Clearing Registers

Table A1 General Clearing Phase Survey Register (excluding MRS surveys)

Survey Date	Surveyor	Location	Habitat	Survey Type	Survey Effort (hrs)	Total Dreys Removed	Total Nests Removed	Total Actual Hollow-bearing Trees Removed	Total Significant Logs Removed	Comment
15/09/2019	David Andrighetto	Chainage 650 Street Trees	Street trees	Clearing phase surveys and supervision	2	0	0	0	0	No fauna rescue or relocation required.
22/01/2020	David Andrighetto and Grant McLean	Stage 1 Burns Street Intersection	Swamp Sclerophyll Forest	Clearing phase survey and supervision	10.5	0	0	0	0	All cleared and grubbed on the same day. Two Striped Marsh Frogs relocated.

Table A2 MRS Relocation Surveys

Date	Survey Location	Weather	Relative Humidity	Survey Type	Area Covered	Total MRS Relocated	Ecologist Present	Time Survey Commenced	Time Surveys Completed	Total Survey Effort (person hours)
20/01/2020	Burns Street	Overcast then storm	-	Pre-clearing Diurnal	636	3	David Andrighetto and David Havilah	5:30	7:45	4
20/01/2020	Burns Street, plus periodic survey of grass area at the northern end of stage 2 (chainage 650)	Overcast then clear	87-95%	Pre-clearing Nocturnal	636 + grass area at the northern end of Stage 2	11	David Andrighetto and David Havilah	8:15	0:15	8
21/01/2020	Burns Street	Sunny	-	Pre-clearing Diurnal	636	0	David Andrighetto and Grant Maclean	10:30	14:15	6
21/01/2020	Burns Street, plus periodic survey of grass area at the northern end of stage 2 (chainage 650)	Overcast then clear	78-88%	Pre-clearing Nocturnal	636 + grass area at the northern end of Stage 2	8	David Andrighetto and Gemma Quick	20:00	0:00	8
22/01/2020	Burns Street	Mostly sunny	-	Clearing Diurnal	636	1	David Andrighetto and Grant McLean	6:45	15:15	10.5

Table A3 MRS Capture/ Relocation Register

MRS No.	Date and Time Detected	Weather	Shell Width (mm)	Age (adult or juvenile)	Capture Location							Relocation Location					Ecologist Signoff
					Easting	Northing	Microhabitat Feature the MRS is on	Dominant vegetation within 5m radius	Coarse Woody Debris Present?	Health/Condition	Comments	Easting	Northing	Dominant vegetation within 5m radius	Habitat salvaged	Comment	
1	20/01/2020 17:54	Rain	33	Adult	559709.5	6831102	Under leaf litter	Broad-leaved Paperbark canopy. Leaf litter understorey	Yes	Fine	-	559741	6831111	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
2	20/01/2020 18:31	Rain	23	Juvenile	559703.9	6831093	Under leaf litter	Broad-leaved Paperbark canopy. Leaf litter understorey	Yes	Fine	-	559744	6831105	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
3	20/01/2020 19:33	Overcast	31	Juvenile	559708.8	6831111	Next to coarse woody debris	Broad-leaved Paperbark and Bangalore palm canopy. Leaf litter	Yes	Fine	Diurnal find	559735.3	6831109	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	Yes. Coarse woody debris (small log)	-	David Andrighetto



MRS No.	Date and Time Detected	Weather	Shell Width (mm)	Age (adult or juvenile)	Capture Location						Relocation Location			Ecologist Signoff			
					Easting	Northing	Microhabitat Feature the MRS is on	Dominant vegetation within 5m radius	Coarse Woody Debris Present?	Health/Condition	Comments	Easting	Northing		Dominant vegetation within 5m radius	Habitat salvaged	Comment
								and grass understorey									
4	20/01/2020 20:46	Overcast	37	Juvenile	559706.7	6831108	On ground amongst grass and leaf litter	Broad-leaved Paperbark canopy, grass understorey	No	Good	-	559740.4	6831106	Broad-leaved Paperbark canopy, leaf litter and grass understorey	No	-	David Andrighetto
5	20/01/2020 20:54	Overcast	37	Adult	559705.6	6831111	Leaf covered ground	Blackwood, cottonwood canopy. Grass and leaf litter ground	No	Good	-	559759.8	6831090	Broad-leaved Paperbark canopy, leaf litter and grass understorey	No	-	David Andrighetto
6	20/01/2020 21:32	Overcast	28	Juvenile	559707.9	6831115	Leaf litter	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter and grass	Yes	Good	-	559738.9	6831116	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
7	20/01/2020 21:39	Overcast	36	Adult	559700.8	6831092	Base of cottonwood	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter	Yes	Good	-	559738.4	6831097	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
8	20/01/2020 22:08	Overcast	32	Adult	559709.9	6831101	On palm frond	Broad-leaved Paperbark canopy. Leaf litter understorey	Yes	Fine	-	559737.6	6831094	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	Yes	-	David Andrighetto
9	20/01/2020 22:10	Overcast	22	Juvenile	559705.3	6831099	Small stick	Broad-leaved Paperbark canopy. Leaf litter understorey	Yes	Fine	-	559735.4	6831100	Broad-leaved Paperbark canopy. Leaf litter and grass understorey	Yes	-	David Andrighetto
10	20/01/2020 22:29	Overcast	28	Juvenile	559705	6831114	Base of exotic shrub	Alexandra and weeds in canopy. Leaf litter and grass	Yes	Good	-	559761.3	6831095	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
11	20/01/2020 22:54	Overcast	30	Juvenile	559709.8	6831108	Leaf litter	Cottonwood and cheese tree canopy, leaf litter understorey	Yes	Good	-	559751.7	6831106	Broad-leaved Paperbark canopy, leaf litter and fern understorey	No	-	David Andrighetto
12	20/01/2020 23:15	Overcast	30	Juvenile	559700.3	6831094	Base of cottonwood	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter	Yes	Good	-	559744	6831112	Broad-leaved Paperbark canopy. Leaf litter, phragmites and fern understorey	No	-	David Andrighetto
13	20/01/2020 23:58	Clear post rain	17	Juvenile	559705.2	6831103	Stick	Alexandra Palm and Broad-leaved Paperbark canopy. Leaf litter and grass	Yes	Good	Probable id	559744	6831109	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
14	21/01/2020 0:03	Clear post rain	35	Adult	559706.3	6831109	Leaf litter	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter and grass	Yes	Good	-	559748.4	6831109	Broad-leaved Paperbark canopy. Leaf litter understorey	No	-	David Andrighetto
15	21/01/2020 20:08	Partly cloudy	28	Juvenile	559705.8	6831106	Leaf litter	Cottonwood and Broad-leaved Paperbark canopy.	No	Good	-	559739.8	6831104	Broad-leaved Paperbark canopy. Leaf litter and	No	-	David Andrighetto



MRS No.	Date and Time Detected	Weather	Shell Width (mm)	Age (adult or juvenile)	Capture Location						Relocation Location					Ecologist Signoff	
					Easting	Northing	Microhabitat Feature the MRS is on	Dominant vegetation within 5m radius	Coarse Woody Debris Present?	Health/Condition	Comments	Easting	Northing	Dominant vegetation within 5m radius	Habitat salvaged		Comment
								Leaf litter and grass						phragmites understorey			
16	21/01/2020 20:18	Partly cloudy	29	Juvenile	559703.8	6831107	Leaf litter under grass	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter and grass	No	Good	-	559743.7	6831106	Broad-leaved Paperbark canopy. Leaf litter and phragmites understorey	No	-	David Andrighetto
17	21/01/2020 20:46	Partly cloudy	30	Juvenile	559706.9	6831115	Trunk of small Alexandra Palm	Alexandra Palm and Broad-leaved Paperbark canopy. Leaf litter	Yes	Good	-	559752.1	6831094	Broad-leaved Paperbark canopy. Leaf litter and grassy understorey	No	-	David Andrighetto
18	21/01/2020 20:56	Partly cloudy	21	Juvenile	559711.3	6831122	Leaf litter	Broad-leaved Paperbark canopy. Leaf litter and grass understorey	No	Good	-	559739.8	6831118	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
19	21/01/2020 21:56	Clear	32	Adult	559704.9	6831092	On empty glass beer bottle at Base of cottonwood.	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter	Yes	Good	-	559743.3	6831089	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	No	-	David Andrighetto
20	21/01/2020 21:56	Clear	39	Adult	559704.4	6831091	Timber at Base of cottonwood.	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter	Yes	Good	-	559746.7	6831089	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	Yes	-	David Andrighetto
20	21/01/2020 21:56	Clear	39	Adult	559704.4	6831091	Timber at Base of cottonwood.	Cottonwood and Broad-leaved Paperbark canopy. Leaf litter	Yes	Good	-	559746.7	6831089	Broad-leaved Paperbark canopy. Leaf litter and fern understorey	Yes	-	David Andrighetto
21	21/01/2020 22:40	Partly cloudy	20	Juvenile	559713.1	6831120	Leaf litter	Broad-leaved Paperbark canopy. Leaf litter and grass understorey	No	Good	-	559742.6	6831119	Broad-leaved Paperbark canopy. Leaf litter, phragmites and fern understorey	No	-	David Andrighetto
22	21/01/2020 23:50	Clear	27	Juvenile	559709.5	6831122	Grass	Broad-leaved Paperbark canopy. grass understorey	No	Good	-	559742.2	6831112	Broad-leaved Paperbark canopy. Leaf litter, phragmites and fern understorey	No	-	David Andrighetto
23	22/01/2020 12:52	Mostly sunny	25	Juvenile	559711.4	6831124	Grass	Broad-leaved Paperbark canopy. Leaf litter and grass understorey	No	Good	-	559745.4	6831111	Broad-leaved Paperbark canopy. Leaf litter, phragmites and fern understorey	No	-	David Andrighetto

Table A4 Fauna Rescue Register (excluding MRS)

Date	Fauna Present	Health (injured during tree felling)	Does it Require Immediate Attention	Wildlife Care Agency Called:	Outcome	Where was the Animal(s) Released	Other Comments	Project Ecologist	Construction Manager
23/01/2020	1 x Carpet Python.	No	No	No	Python was captured during pre-clearing surveys.	Relocated approximately 30m east of the site in swamp sclerophyll forest on public land.	No clearing undertaken on this day	David Andrighetto	Chris Sharpe
22/01/2020	2 x Striped Marsh Frogs.	No	No	No	Frogs were captured during clearing supervision.	Relocated approximately 20m east of the site in swamp sclerophyll forest on public land.	-	David Andrighetto	Chris Sharpe

Appendix B Weather Conditions During Clearing Phase

Table B1 Clearing Phase Weather Conditions – Byron Bypass Weather Station

<i>Date & Time</i>	<i>Temp - °C</i>	<i>Hum - %</i>	<i>Rain - mm</i>
1/20/20 12:00 AM	24	93	0
1/20/20 12:30 AM	23	91	0
1/20/20 1:00 AM	24	92	0
1/20/20 1:30 AM	24	93	0
1/20/20 2:00 AM	23	93	0
1/20/20 2:30 AM	24	92	0
1/20/20 3:00 AM	24	93	0
1/20/20 3:30 AM	24	93	0
1/20/20 4:00 AM	24	93	0
1/20/20 4:30 AM	24	92	0
1/20/20 5:00 AM	24	93	0
1/20/20 5:30 AM	24	93	0
1/20/20 6:00 AM	24	93	0
1/20/20 6:30 AM	24	95	0
1/20/20 7:00 AM	24	95	0
1/20/20 7:30 AM	24	94	0
1/20/20 8:00 AM	25	93	0
1/20/20 8:30 AM	25	92	0
1/20/20 9:00 AM	25	91	0
1/20/20 9:30 AM	25	89	0
1/20/20 10:00 AM	26	87	0
1/20/20 10:30 AM	26	86	0
1/20/20 11:00 AM	27	84	0
1/20/20 11:30 AM	27	82	0
1/20/20 12:00 PM	28	83	0
1/20/20 12:30 PM	28	84	0
1/20/20 1:00 PM	27	85	0
1/20/20 1:30 PM	28	83	0
1/20/20 2:00 PM	28	84	0
1/20/20 2:30 PM	28	82	0
1/20/20 3:00 PM	28	83	0
1/20/20 3:30 PM	27	84	0
1/20/20 4:00 PM	26	86	0
1/20/20 4:30 PM	25	89	0
1/20/20 5:00 PM	25	89	0
1/20/20 5:30 PM	25	91	0
1/20/20 6:00 PM	24	93	7
1/20/20 6:30 PM	24	92	6.2
1/20/20 7:00 PM	24	93	0.2
1/20/20 7:30 PM	24	93	0
1/20/20 8:00 PM	24	95	0
1/20/20 8:30 PM	24	95	0
1/20/20 9:00 PM	23	95	0
1/20/20 9:30 PM	23	95	0
1/20/20 10:00 PM	23	92	0
1/20/20 10:30 PM	23	87	0
1/20/20 11:00 PM	23	90	0

<i>Date & Time</i>	<i>Temp - °C</i>	<i>Hum - %</i>	<i>Rain - mm</i>
1/20/20 11:30 PM	23	90	0
1/21/20 12:00 AM	24	87	0
1/21/20 12:30 AM	24	89	0
1/21/20 1:00 AM	23	90	0
1/21/20 1:30 AM	24	91	0
1/21/20 2:00 AM	24	93	0
1/21/20 2:30 AM	24	93	0
1/21/20 3:00 AM	24	93	0
1/21/20 3:30 AM	24	94	0
1/21/20 4:00 AM	24	94	0
1/21/20 4:30 AM	24	94	0
1/21/20 5:00 AM	24	94	0
1/21/20 5:30 AM	24	95	0
1/21/20 6:00 AM	24	95	0
1/21/20 6:30 AM	23	96	0
1/21/20 7:00 AM	23	95	0
1/21/20 7:30 AM	24	95	0
1/21/20 8:00 AM	24	95	0
1/21/20 8:30 AM	24	93	0
1/21/20 9:00 AM	25	91	0
1/21/20 9:30 AM	26	88	0
1/21/20 10:00 AM	26	88	0
1/21/20 10:30 AM	27	85	0
1/21/20 11:00 AM	27	84	0
1/21/20 11:30 AM	27	84	0
1/21/20 12:00 PM	27	82	0
1/21/20 12:30 PM	28	83	0
1/21/20 1:00 PM	27	84	0
1/21/20 1:30 PM	29	80	0
1/21/20 2:00 PM	28	85	0
1/21/20 2:30 PM	28	82	0
1/21/20 3:00 PM	28	84	0
1/21/20 3:30 PM	28	85	0
1/21/20 4:00 PM	28	83	0
1/21/20 4:30 PM	27	86	0
1/21/20 5:00 PM	27	85	0
1/21/20 5:30 PM	26	88	0
1/21/20 6:00 PM	25	91	0
1/21/20 6:30 PM	25	93	0.8
1/21/20 7:00 PM	25	81	0.4
1/21/20 7:30 PM	25	81	0
1/21/20 8:00 PM	26	75	0
1/21/20 8:30 PM	25	82	0
1/21/20 9:00 PM	25	85	0
1/21/20 9:30 PM	24	88	0
1/21/20 10:00 PM	24	86	0
1/21/20 10:30 PM	24	85	0
1/21/20 11:00 PM	24	84	0
1/21/20 11:30 PM	24	85	0
1/22/20 12:00 AM	23	88	0
1/22/20 12:30 AM	24	91	0

Date & Time	Temp - °C	Hum - %	Rain - mm
1/22/20 1:00 AM	23	92	0
1/22/20 1:30 AM	23	93	0
1/22/20 2:00 AM	24	94	0
1/22/20 2:30 AM	23	93	0
1/22/20 3:00 AM	23	94	0
1/22/20 3:30 AM	23	94	0
1/22/20 4:00 AM	23	94	0
1/22/20 4:30 AM	23	95	0
1/22/20 5:00 AM	22	95	0
1/22/20 5:30 AM	22	96	0
1/22/20 6:00 AM	22	96	0
1/22/20 6:30 AM	22	96	0
1/22/20 7:00 AM	23	96	0
1/22/20 7:30 AM	23	96	0
1/22/20 8:00 AM	24	95	0
1/22/20 8:30 AM	26	88	0
1/22/20 9:00 AM	25	86	0
1/22/20 9:30 AM	26	82	0
1/22/20 10:00 AM	26	82	0
1/22/20 10:30 AM	27	75	0
1/22/20 11:00 AM	27	78	0
1/22/20 11:30 AM	27	77	0
1/22/20 12:00 PM	28	77	0
1/22/20 12:30 PM	28	77	0
1/22/20 1:00 PM	28	76	0
1/22/20 1:30 PM	27	80	0
1/22/20 2:00 PM	28	84	0
1/22/20 2:30 PM	28	85	0
1/22/20 3:00 PM	28	82	0
1/22/20 3:30 PM	28	84	0
1/22/20 4:00 PM	28	84	0
1/22/20 4:30 PM	26	86	0
1/22/20 5:00 PM	26	88	0
1/22/20 5:30 PM	26	88	0
1/22/20 6:00 PM	25	91	0
1/22/20 6:30 PM	24	92	0
1/22/20 7:00 PM	25	92	0
1/22/20 7:30 PM	24	93	0
1/22/20 8:00 PM	24	94	0
1/22/20 8:30 PM	24	94	0
1/22/20 9:00 PM	24	95	0
1/22/20 9:30 PM	24	95	0
1/22/20 10:00 PM	24	95	0
1/22/20 10:30 PM	24	95	0
1/22/20 11:00 PM	24	95	0
1/22/20 11:30 PM	24	95	0
1/23/20 12:00 AM	24	95	0