

APPENDIX

A

SITE BACKGROUND DATA





APPENDIX A – SUMMARY OF SITE BACKGROUND INFORMATION

1.0 INTRODUCTION

1.1 THE SITE

The Duntroon Quarry is located on County Road 91, west of the village of Duntroon on Part Lot 24 and Lot 25, Concession XII in the Township of Clearview, County of Simcoe. Although Duntroon Quarry has been operating since the early 1960s, ownership was transferred to Walker Aggregates Inc. (WAI) in 1995. The existing quarry operates in accordance with Aggregate Resource Act (ARA) license number 3514 and has a licensed area of 57.5 ha (142.1 acres), of which 47.1 ha (116.4 acres) is approved for extraction. The existing and expansion quarry are located on opposite sides of County Road 91 and can be seen in Figure 1.

The Duntroon Quarry produces high quality dolostone that is used to help support the growing communities that surround the quarry. As the communities surrounding the quarry continue to grow the demand for the aggregate will increase. This forecasted demand led to WAI applying for and later receiving approval from the Consolidated Joint Board on June 18, 2012 to expand their quarry operation. The ARA license number 607841, issued August 6, 2014, allowed WAI to extract from the property north of County Road 91 (the expansion quarry). The expansion quarry property encompasses a total land area of 65.9 ha (162.9 acres), within which 58.5 ha (144.5 acres) is approved for extraction. In October 2015 a tunnel was constructed under County Road 91 to link the existing and expansion properties.

Since the both the existing and expansion quarry are licensed to extract aggregate below the water table this results in the accumulation of water on the working floor of the quarry. Environmental Compliance Approval Number 1521-A4VJ4X was issued to allow discharge from sewage Works that collect the water that accumulates in the aggregate extraction area from direct precipitation, surface runoff, snowmelt and groundwater inflow. The sewage Works discharge to a wetland located at the west side of the existing quarry property, and then to twin culverts located on Grey Road 31 (designated as “SW1”) and eventually to the Beaver River South Tributary.

Originally the Permit to Take Water (PTTW No.1168-665NHB) dictated the limitations on flow rate at the twin culverts on Grey Road 31 (‘SW1’). The PTTW was amended on September 22, 2016 and the ECA was issued on October 17, 2016. The Amended PTTW now dictates the maximum water taking from the quarry as measured in the discharge line with a flow meter. The ECA informs the limits on the sewage Works, including the total daily discharge rate and effluent limits based on water quality parameters.

1.2 MONITORING REQUIREMENTS

Walker Aggregates environmental commitment is to manage its lands so that upon reclamation the mine site is in better ecological condition than prior to mining. This will be accomplished through environmental initiatives

detailed on the ARA Site Plans and the Adaptive Management Plan (AMP) to ensure that protection, mitigation, and enhancement measures sustain local environmental resource features and functions for future generations.

Given the extraction that has occurred in the existing quarry, extraction in Phase I of the expansion quarry is not expected to result in any negative impacts to off-site water resources and/or ecological features and functions. Therefore, the monitoring and mitigation requirements during this phase of extraction are such that the response of the natural environment system will be monitored by means of the groundwater, surface water and wetland monitoring network, and results compared to predictions.

Trigger monitoring criteria for water flows, water temperature and wetland water levels will apply during their respective trigger periods as soon as extraction proceeds beyond Phase 1. Groundwater and surface water monitoring data will be used to further update interim triggers as well as build statistically valid relationships between monitoring locations and control points.

1.3 COORDINATED MONITORING REPORT

The AMP consists of four component monitoring programs:

- 1 Performance Indicator Trigger Monitoring Program;
- 2 Long Term Trend Groundwater and Surface Water Monitoring Program;
- 3 Long Term Trend Ecological Monitoring Program;
- 4 Ecological Enhancement and Mitigation Monitoring Program.

The AMP annual summary report includes results, where available, from all four components of the AMP monitoring program.

1.4 WATERSHED AGGREGATE ACTIVITIES

1.4.1 DUNTROON EXPANSION QUARRY

Table 2.3 in the AMP document summarizes the expected timing for extraction in each Phase. The phasing is also detailed on the Site Plan 2B of 4 Operational Plan. Phase 1, Phase 2a and Phase 2b are identified on Figure 2a – Site Sketch.

In October 2015 a tunnel was constructed under County Road 91 to link the existing and expansion properties. Extraction of materials from the expansion quarry began in June 2016, as a result the year of 2016 is the first year for reporting the Adaptive Management Plan. From the tunnel cut the quarry will expand outward in a quasi-radial pattern from the southwest corner to the north and east.

Water managed by the quarry reflects the direct precipitation, surface runoff, snow melt and groundwater inflow that accumulates in the extraction area of the quarry. This accumulated water is managed using the Works outlined below. For information on the current estimated limit of extraction, please see Figure 2a (site sketch). The site sketch is based on conditions in the fall of 2020. Figure 2b is the site plan, including the location of the sumps, flow meter and the tunnel to the expansion lands. Figure 2c is an updated aerial photo from the fall of 2020 which includes the existing and expansion quarries.

1.4.2 DUNTROON MAIN QUARRY

The current water management system consists of two sumps known as Sump 1 and Sump 2, both of which are equipped with submersible pumps (Please see Figure 2b – Site Sketch for sump locations). Currently the water that collects in the expansion quarry area is either pumped or moved via gravity flow to the existing quarry, where the



water is managed with the existing sewage Works. Water from Sump 2 is pumped into the main reservoir for storage. Water movement is controlled using dam boards to channel water as needed to return it to the main sump using a gravity sewer line to Sump 1 (main sump). Sump 1 is equipped with a float switch, has a capacity of approximately 17,050 m³, and discharges either directly off site or to the main reservoir. Water is primarily pumped off site, but if water is need on-site or if there is an issue with water quality, the water is retained on site, in the main reservoir. The amount of flow moving off-site is controlled with a valve. The flow meter is installed downstream of the valve, on the discharge line where it moves off-site. The discharge line is a 10-inch line, which eventually discharges into the wetland located west of the existing quarry, upstream of SW1.

1.4.3 OTHER EXTRACTION OPERATIONS

1.4.3.1 MAQ AGGREGATES HIGHLAND QUARRY

The expansion quarry is located adjacent to the approved (August 24, 2012) MAQ Aggregates Inc. (MAQ) Highland Quarry, an independent third party. The Highland Quarry is operated by CBM St. Marys Cement under the name Osprey Quarry. Aggregate extraction at the Osprey Quarry began in 2014. WAI and MAQ have a data sharing agreement which supports the reporting requirements for the respective quarries.

1.4.3.2 OTHER

Walker Aggregates is unaware of any additional extraction operations in the immediate vicinity of the Duntroon expansion quarry during 2020.

1.5 MONITORING PROGRAM CONTACT NAMES

Matthew McMahon M.Sc. – Environmental Performance Lead, Walker Industries

Jake Maclellon – EPD Coordinator, Walker Industries

Jacqueline Forbes – EPD Coordinator, Walker Industries

Melissa Cameron, M.Sc., M.L.A., OALA – Ecologist/Landscape Architect, Stantec

Craig Leger, M.Sc., C.E.T. – Environmental Consultant, WSP Canada Inc.

1.6 OTHER ACTIVITIES IN LOCAL WATERSHEDS

Walker Aggregates is unaware of any other large scale activities in local watersheds in the vicinity of the Duntroon expansion property during 2020.

TABLE A-1
30 YEAR NORMAL 1971-2000 WATER BUDGET
THORNBURY SLAMA CLIMATOLOGICAL STATION

DUNTROON QUARRY - 2020 AMP SUMMARY REPORT

111-53312-03 100

Month	Mean Temperature (°C)	Total Precipitation (mm)	Calculated Snow Melt (mm)	Pot. E (mm)	Act. E (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)
JANUARY	-6.6	94.2	29.0	1.0	1.0	146.0	46.0	0.0
FEBRUARY	-6.1	63.8	42.0	2.0	2.0	150.0	53.0	0.0
MARCH	-1.6	63.5	86.0	8.0	8.0	150.0	117.0	0.0
APRIL	5.2	62.4	37.0	30.0	30.0	149.0	67.0	0.0
MAY	11.5	70.6	0.0	72.0	72.0	133.0	14.0	0.0
JUNE	16.6	75.7	0.0	106.0	105.0	101.0	2.0	0.0
JULY	19.7	80.9	0.0	128.0	121.0	58.0	3.0	7.0
AUGUST	19.0	85.8	0.0	114.0	103.0	41.0	0.0	11.0
SEPTEMBER	15.1	94.0	0.0	78.0	72.0	58.0	5.0	6.0
OCTOBER	9.0	81.0	0.0	42.0	40.0	93.0	6.0	2.0
NOVEMBER	2.9	97.2	12.0	14.0	14.0	137.0	33.0	0.0
DECEMBER	-3.1	97.0	25.0	3.0	3.0	146.0	42.0	0.0
TOTAL	6.8	966.1	231.0	598.0	571.0			
							SURPLUS:	395.1 mm

NOTES:

- Mean Temperature and Total Precipitation Data as reported by Environment Canada
- Calculated Snow Melt as calculated by Environment Canada
- Pot. E - Potential Evapotranspiration as calculated by Environment Canada
- Act. E - Actual Evapotranspiration as calculated by Environment Canada
- WHC - Water Holding Capacity as calculated by Environment Canada
- Calculated Surplus and Deficit as calculated by Environment Canada
- Data from the Thornbury Slama Climatological Station located at 44 °34'N 80°29'W/O, 213m

TABLE A-2
2015 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION

DUNTROON QUARRY - 2020 AMP SUMMARY REPORT

111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-10.7	0.0	0.0	0.82	0.0	62	150	62	0	62	0.0
FEBRUARY	-14.9	0.0	0.0	0.82	0.0	53	150	53	0	53	0.0
MARCH	-3.5	0.0	0.0	1.03	0.0	24	150	24	0	24	0.0
APRIL	6.2	1.4	25.9	1.12	29.0	61	150	32	0	32	0.0
MAY	15.3	5.4	72.3	1.27	91.9	38	96	0	54	0	0.0
JUNE	17.2	6.5	82.6	1.28	105.8	154	144	48	0	0	0.0
JULY	20.2	8.2	99.2	1.30	128.9	37	52	0	92	0	52
AUGUST	19.5	7.8	95.3	1.20	114.3	106	44	0	8	0	0
SEPTEMBER	18.9	7.4	92.0	1.04	95.6	67	16	0	28	0	16
OCTOBER	9.0	2.4	39.6	0.95	37.6	84	62	46	0	0	0.0
NOVEMBER	6.0	1.3	25.0	0.81	20.2	61	103	41	0	0	0.0
DECEMBER	3.1	0.5	11.8	0.78	9.2	40	133	30	0	0	0.0
TOTAL	7.2	41.0			633	786		336	182	170	68
(POTENTIAL) NET WATER SURPLUS=										154 mm	
ACTUAL SURPLUS=										170 mm	

NOTES:

- WHC - Water Holding Capacity
- Data from the Shanty Bay Climatological Station located at 44°24'N 79°37.8'W/O, 250.0m

FIGURE A-1: SHANTY BAY CLIMATOLOGICAL STATION
 2015 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

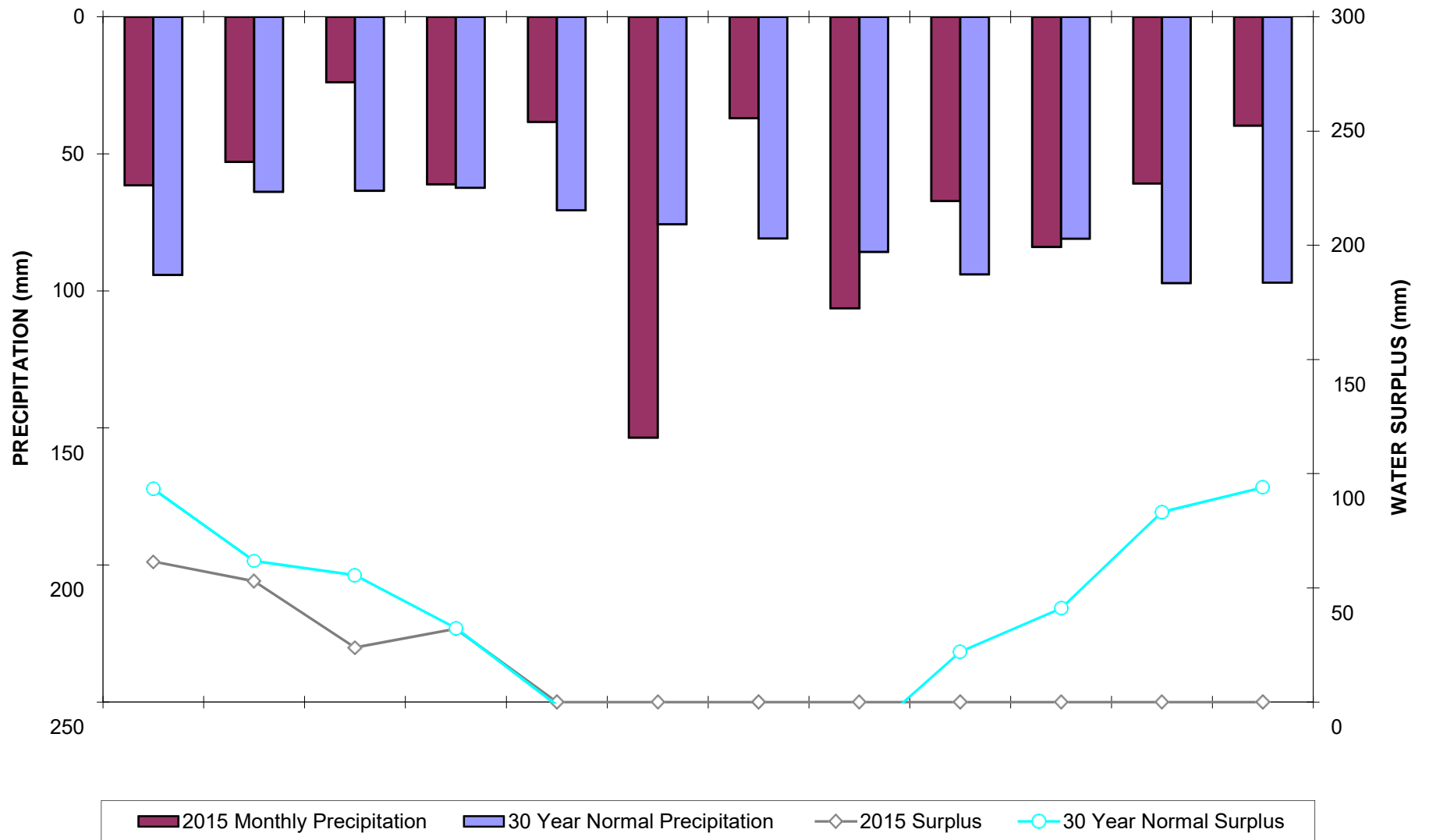


TABLE A-3
2016 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-5.7	0.0	0.0	0.82	0.0	116	150	116	0	116	0.0
FEBRUARY	-5.0	0.0	0.0	0.82	0.0	50	150	50	0	50	0.0
MARCH	0.5	0.0	1.4	1.03	1.4	156	150	155	0	155	0.0
APRIL	3.8	0.7	14.4	1.12	16.1	65	150	49	0	49	0.0
MAY	13.5	4.5	62.1	1.27	78.8	51	122	0	28	0	0.0
JUNE	18.0	6.9	86.4	1.28	110.7	39	50	0	72	0	49.9
JULY	21.9	9.3	108.4	1.30	140.9	54	0	0	87	0	37
AUGUST	22.4	9.6	111.2	1.20	133.5	118	0	0	15	0	15
SEPTEMBER	17.6	6.7	84.2	1.04	87.6	38	0	0	50	0	50
OCTOBER	10.8	3.2	48.0	0.95	45.6	79	33	33	0	0	0.0
NOVEMBER	5.6	1.2	22.5	0.81	18.2	52	66	33	0	0	0.0
DECEMBER	-2.7	0.0	0.0	0.78	0.0	124	150	124	0	40	0.0
TOTAL	8.4	42.1			633	941		560	252	410	152
(POTENTIAL) NET WATER SURPLUS=										308 mm	
ACTUAL SURPLUS=										410 mm	

NOTES:

- WHC - Water Holding Capacity
- Data from the Shanty Bay Climatological Station located at 44°24'N 79°37.8'W/O, 250.0m

FIGURE A-2: SHANTY BAY CLIMATOLOGICAL STATION
 2016 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

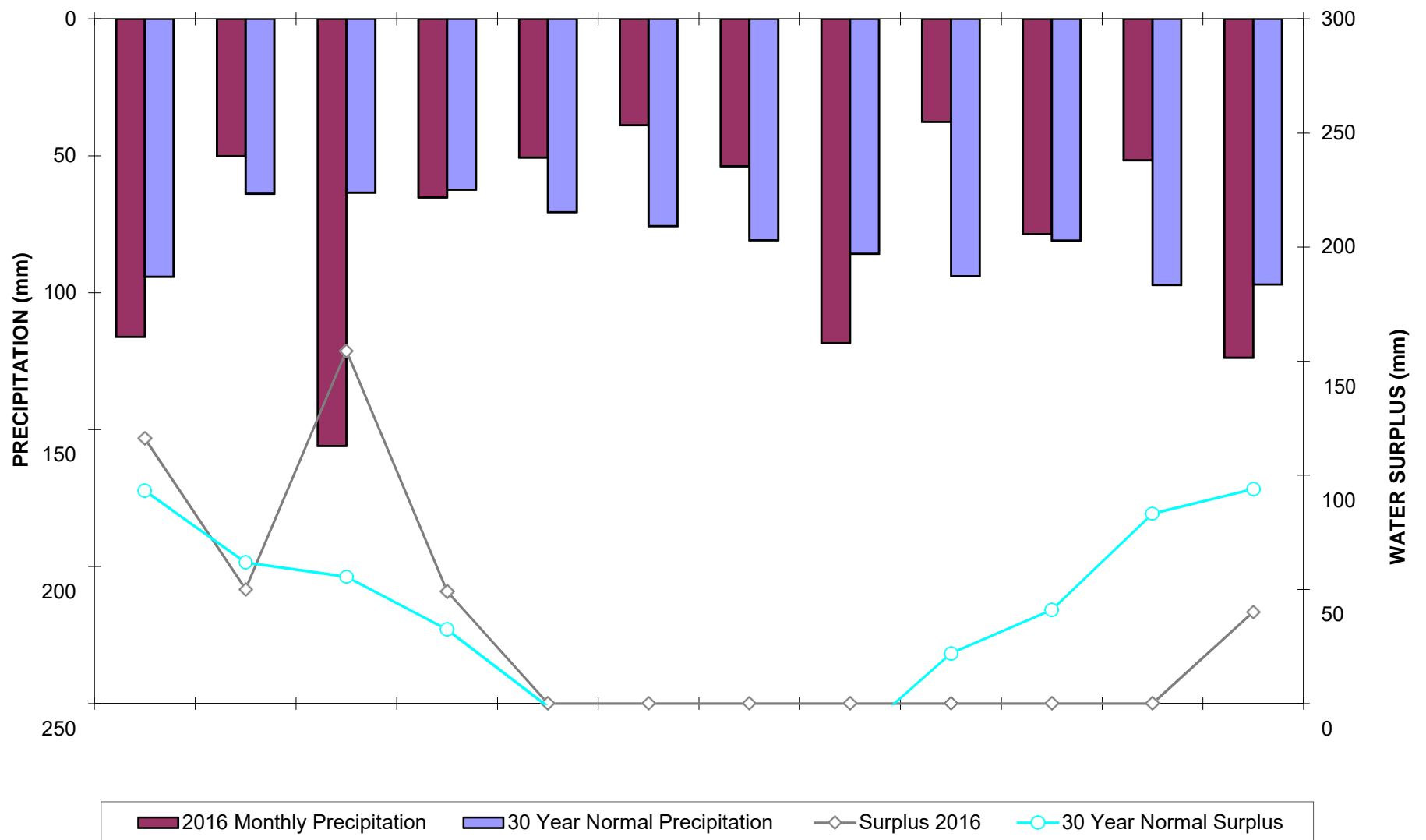


TABLE A-4
2016 WATER BUDGET
WALKER CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-5.7	0.0	0.0	0.82	0.0	64	150	64	0	64	0.0
FEBRUARY	-6.2	0.0	0.0	0.82	0.0	67	150	67	0	67	0.0
MARCH	-0.6	0.0	0.0	1.03	0.0	170	150	170	0	170	0.0
APRIL	4.5	0.9	20.3	1.12	22.7	24	150	1	0	1	0.0
MAY	12.2	3.8	58.9	1.27	74.8	40	115	0	35	0	0.0
JUNE	16.5	6.1	81.4	1.28	104.1	42	53	0	62	0	52.9
JULY	19.9	8.1	99.4	1.30	129.2	28	0	0	102	0	49
AUGUST	20.7	8.5	103.7	1.20	124.4	28	0	0	96	0	96
SEPTEMBER	16.1	5.8	79.2	1.04	82.4	8	0	0	75	0	75
OCTOBER	9.0	2.4	42.6	0.95	40.4	7	0	0	33	0	33.2
NOVEMBER	4.4	0.8	19.8	0.81	16.0	54	38	38	0	0	0.0
DECEMBER	-4.9	0.0	0.0	0.78	0.0	25	63	25	0	0	0.0
TOTAL	7.2	36.5			594	556		364	403	301	306
(POTENTIAL) NET WATER SURPLUS=										-39 mm	
ACTUAL SURPLUS=										301 mm	

NOTES:

- WHC - Water Holding Capacity
- Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-3: WAI CLIMATOLOGICAL STATION
 2016 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

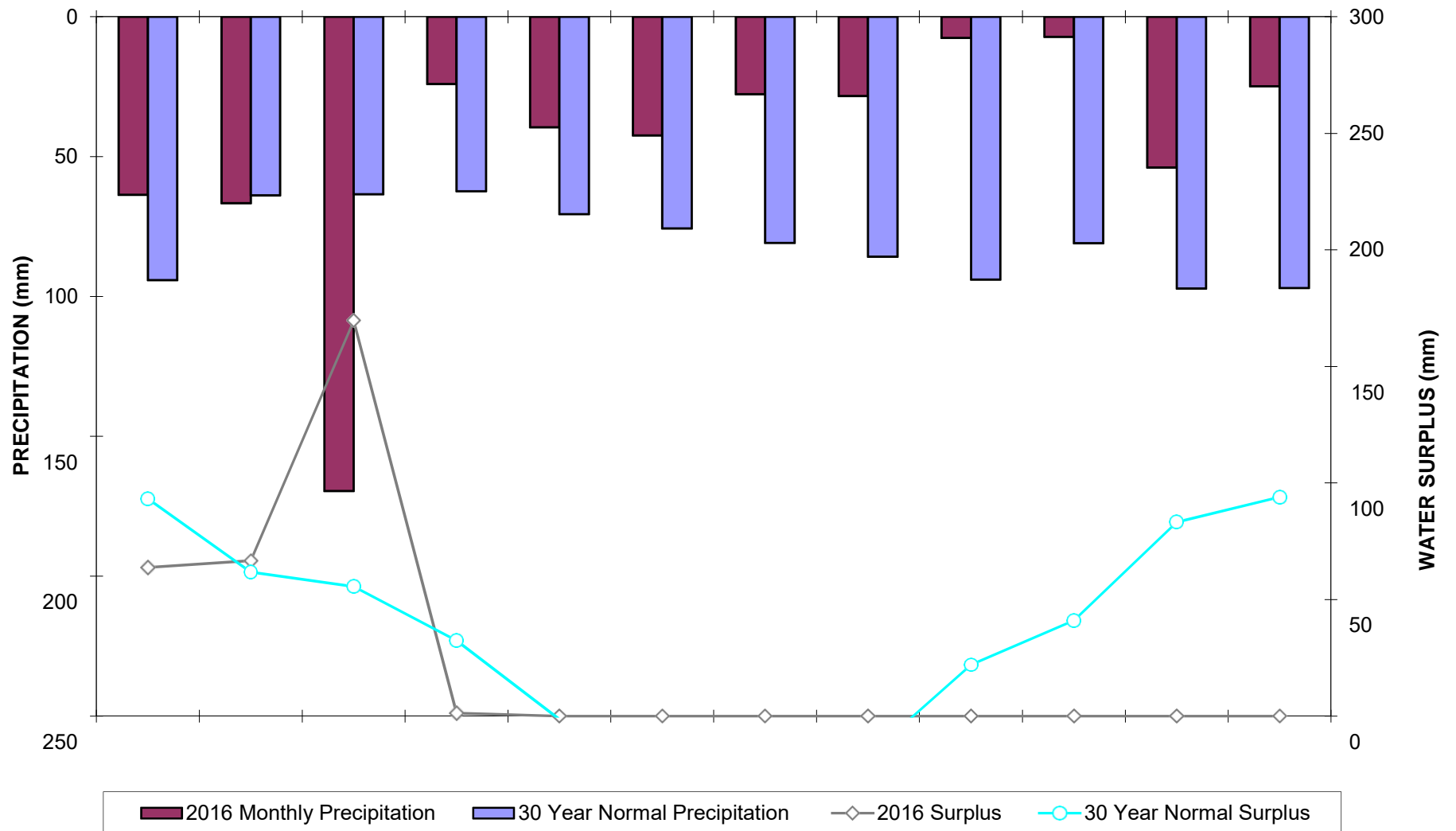


TABLE A-5
2017 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-3.7	0.0	0.0	0.82	0.0	131	150	131	0	131	0.0
FEBRUARY	-2.2	0.0	0.0	0.82	0.0	101	150	101	0	101	0.0
MARCH	-0.3	0.0	0.0	1.03	0.0	75	150	75	0	75	0.0
APRIL	8.0	2.0	36.4	1.12	40.7	122	150	81	0	81	0.0
MAY	11.6	3.6	54.6	1.27	69.4	124	150	54	0	54	0.0
JUNE	17.4	6.6	85.2	1.28	109.0	120	150	11	0	11	0.0
JULY	20.0	8.1	99.2	1.30	129.0	65	86	0	64	0	0
AUGUST	18.8	7.4	92.7	1.20	111.2	74	49	0	37	0	0
SEPTEMBER	17.2	6.5	84.1	1.04	87.5	57	18	0	31	0	18
OCTOBER	12.2	3.8	57.7	0.95	54.8	77	41	23	0	0	0.0
NOVEMBER	2.0	0.3	8.0	0.81	6.5	81	116	75	0	0	0.0
DECEMBER	-6.8	0.0	0.0	0.78	0.0	88	150	88	0	54	0.0
TOTAL	7.9	38.2			608	1115		639	132	507	18
(POTENTIAL) NET WATER SURPLUS=										507 mm	
ACTUAL SURPLUS=										507 mm	

NOTES:

- WHC - Water Holding Capacity
- Data from the Shanty Bay Climatological Station located at 44°24'N 79°37.8'W/O, 250.0m

FIGURE A-4: SHANTY BAY CLIMATOLOGICAL STATION
 2017 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

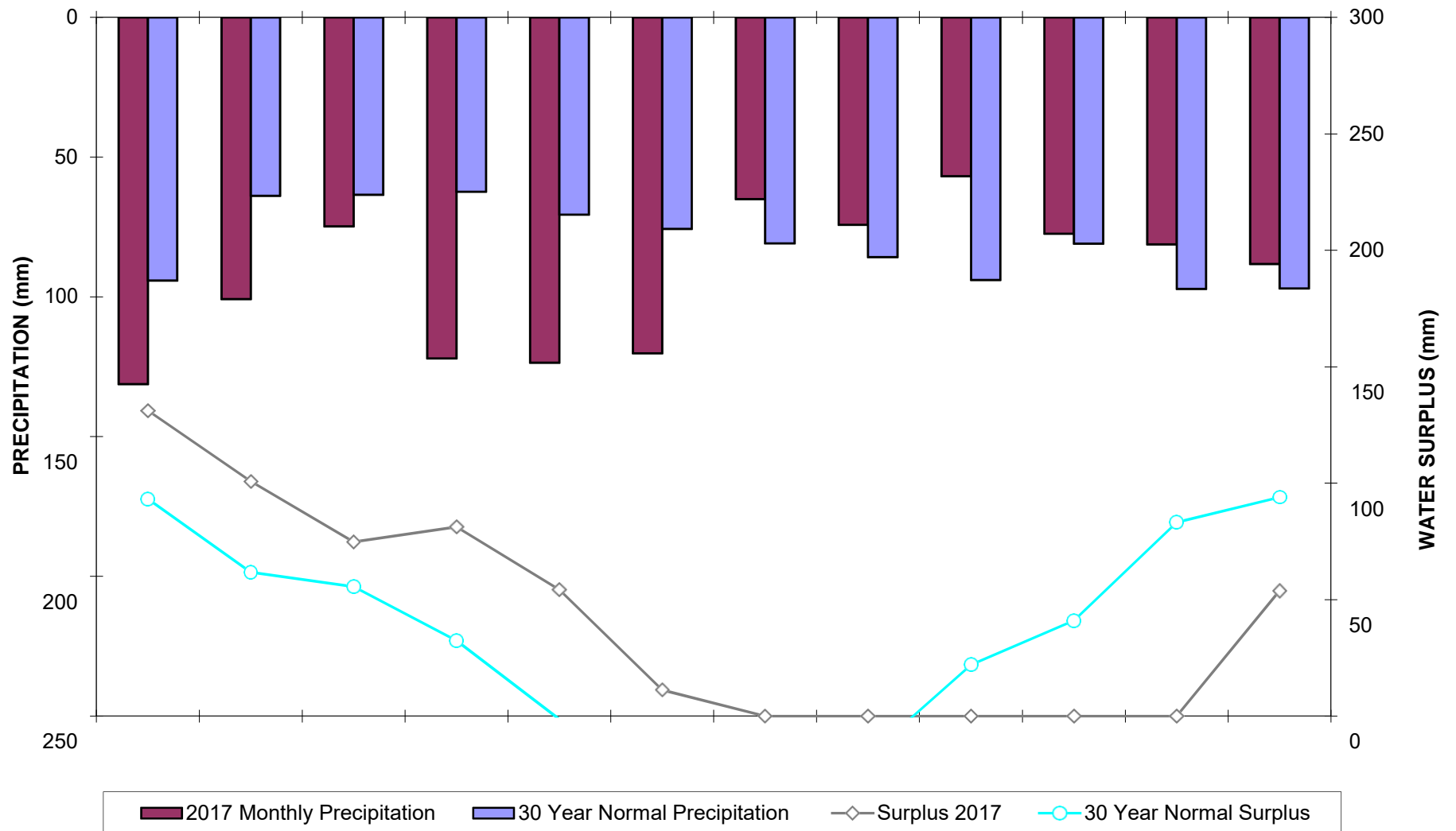


TABLE A-6
2017 WATER BUDGET
WALKER CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-5.0	0.0	0.0	0.82	0.0	86	150	86	0	86	0.0
FEBRUARY	-3.3	0.0	0.0	0.82	0.0	44	150	44	0	44	0.0
MARCH	-3.4	0.0	0.0	1.03	0.0	55	150	55	0	55	0.0
APRIL	6.1	1.3	30.8	1.12	34.5	134	150	100	0	100	0.0
MAY	9.9	2.8	50.2	1.27	63.8	132	150	68	0	68	0.0
JUNE	16.0	5.8	81.6	1.28	104.5	131	150	27	0	27	0.0
JULY	18.2	7.0	92.5	1.30	120.3	58	87	0	63	0	0
AUGUST	16.7	6.2	85.0	1.20	102.0	66	51	0	36	0	0
SEPTEMBER	15.8	5.7	80.4	1.04	83.7	88	55	4	0	0	0
OCTOBER	10.5	3.1	53.4	0.95	50.8	90	94	39	0	0	0.0
NOVEMBER	0.0	0.0	0.0	0.81	0.0	89	150	89	0	33	0.0
DECEMBER	-7.9	0.0	0.0	0.78	0.0	46	150	46	0	46	0.0
TOTAL	6.1	31.9			559	1018		557	99	458	0
(POTENTIAL) NET WATER SURPLUS=										458 mm	
ACTUAL SURPLUS=										458 mm	

NOTES:

- WHC - Water Holding Capacity
- Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-5: WAI CLIMATOLOGICAL STATION
 2017 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

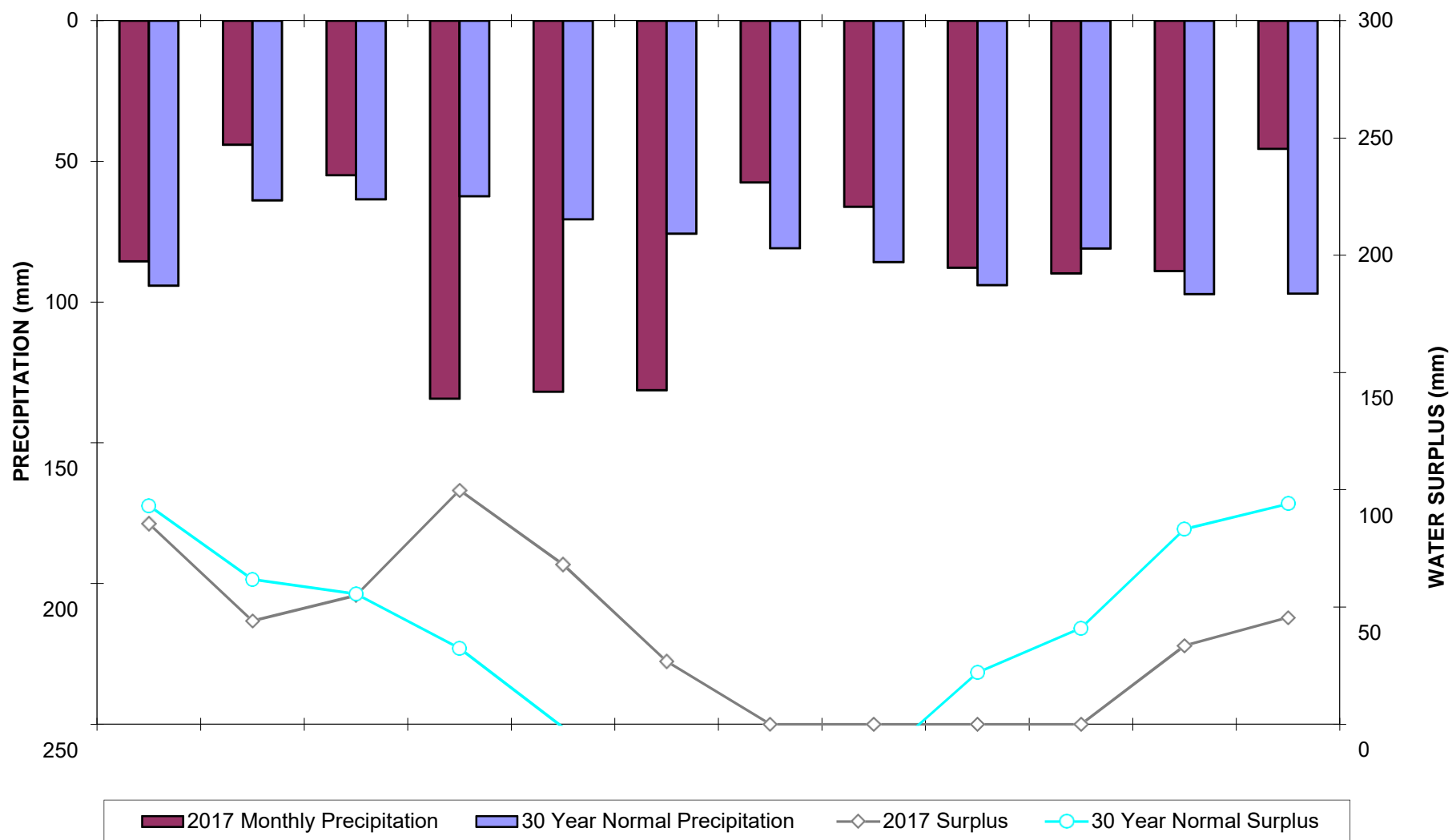


TABLE A-7
2018 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-8	0	0	0.82	0	79	150	79	0	79	0
FEBRUARY	-4	0	0	0.82	0	97	150	97	0	97	0
MARCH	-2	0	0	1.03	0	47	150	47	0	47	0
APRIL	2	0	0	1.12	0	133	150	133	0	133	0
MAY	16	6	76	1.27	96	68	122	0	28	0	0
JUNE	18	7	88	1.28	113	44	53	0	69	0	53
JULY	22	9	109	1.30	142	64	0	0	78	0	25
AUGUST	22	9	108	1.20	130	107	0	0	23	0	23
SEPTEMBER	18	7	85	1.04	89	21	0	0	68	0	68
OCTOBER	8	2	35	0.95	33	130	97	97	0	0	0
NOVEMBER	0	0	0	0.81	0	103	150	103	0	50	0
DECEMBER	-2	0	0	0.78	0	98	150	98	0	98	0
TOTAL	7	40			602	991		653	265	503	168
(POTENTIAL) NET WATER SURPLUS=										388 mm	
ACTUAL SURPLUS=										503 mm	

NOTES: WHC - Water Holding Capacity

Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-6: SHANTY BAY CLIMATOLOGICAL STATION

2018 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)

MONTHLY PRECIPITATION AND WATER SURPLUS

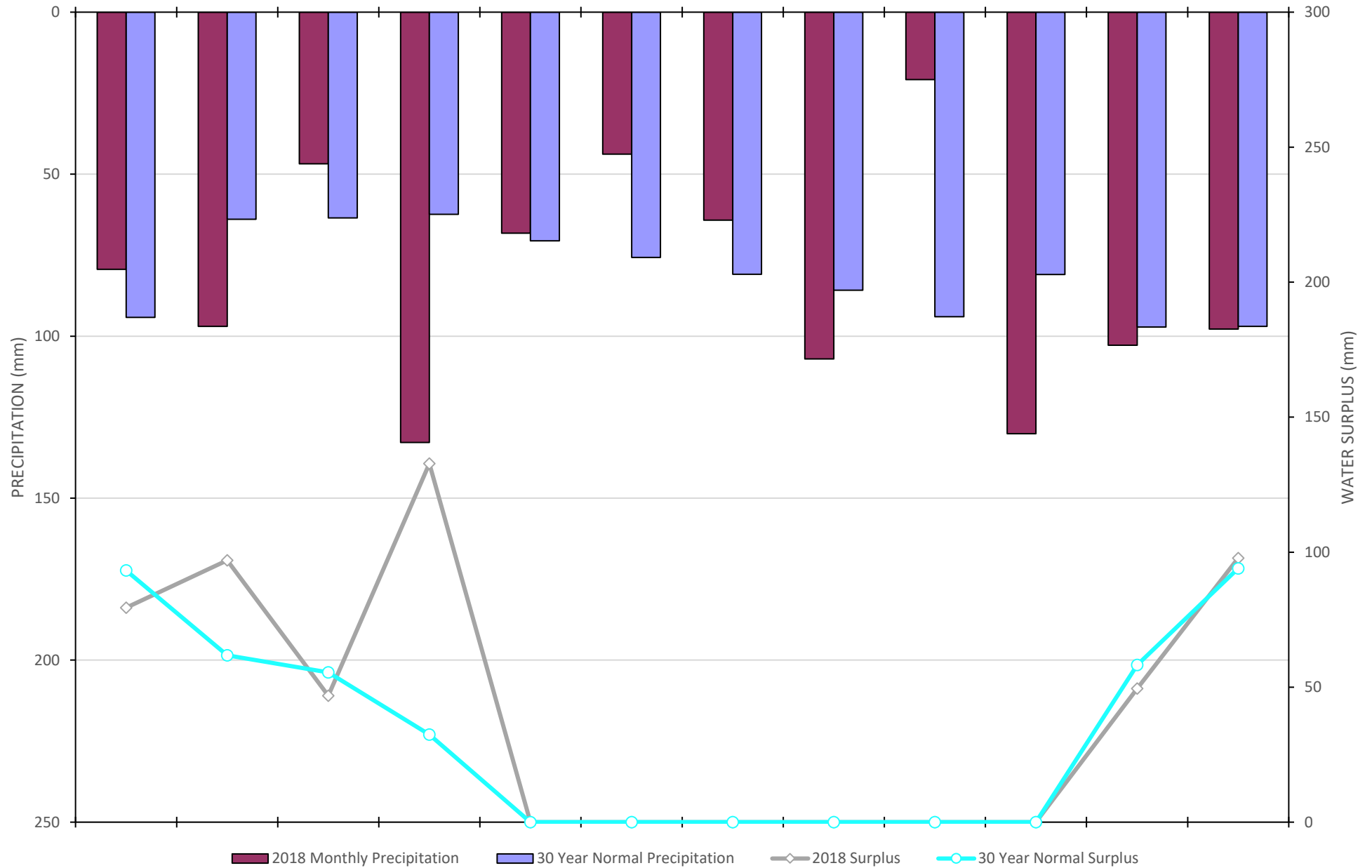


TABLE A-8
2018 WATER BUDGET
WALKER CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-8	0	0	0.82	0	60	150	60	0	60	0
FEBRUARY	-5	0	0	0.82	0	63	150	63	0	63	0
MARCH	-4	0	0	1.03	0	23	150	23	0	23	0
APRIL	-1	0	0	1.12	0	104	150	104	0	104	0
MAY	15	5	74	1.27	94	76	132	0	18	0	0
JUNE	17	6	83	1.28	107	44	69	0	63	0	0
JULY	20	8	102	1.30	133	45	0	0	88	0	19
AUGUST	20	8	100	1.20	120	84	0	0	36	0	36
SEPTEMBER	16	6	77	1.04	80	22	0	0	58	0	58
OCTOBER	6	1	28	0.95	27	105	78	78	0	0	0
NOVEMBER	-2	0	0	0.81	0	66	144	66	0	0	0
DECEMBER	-4	0	0	0.78	0	65	150	65	0	60	0
TOTAL	6	35			560	756		458	263	308	113
(POTENTIAL) NET WATER SURPLUS=										196 mm	
ACTUAL SURPLUS=										308 mm	

NOTES: WHC - Water Holding Capacity

Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-7: WAI CLIMATOLOGICAL STATION
 2018 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

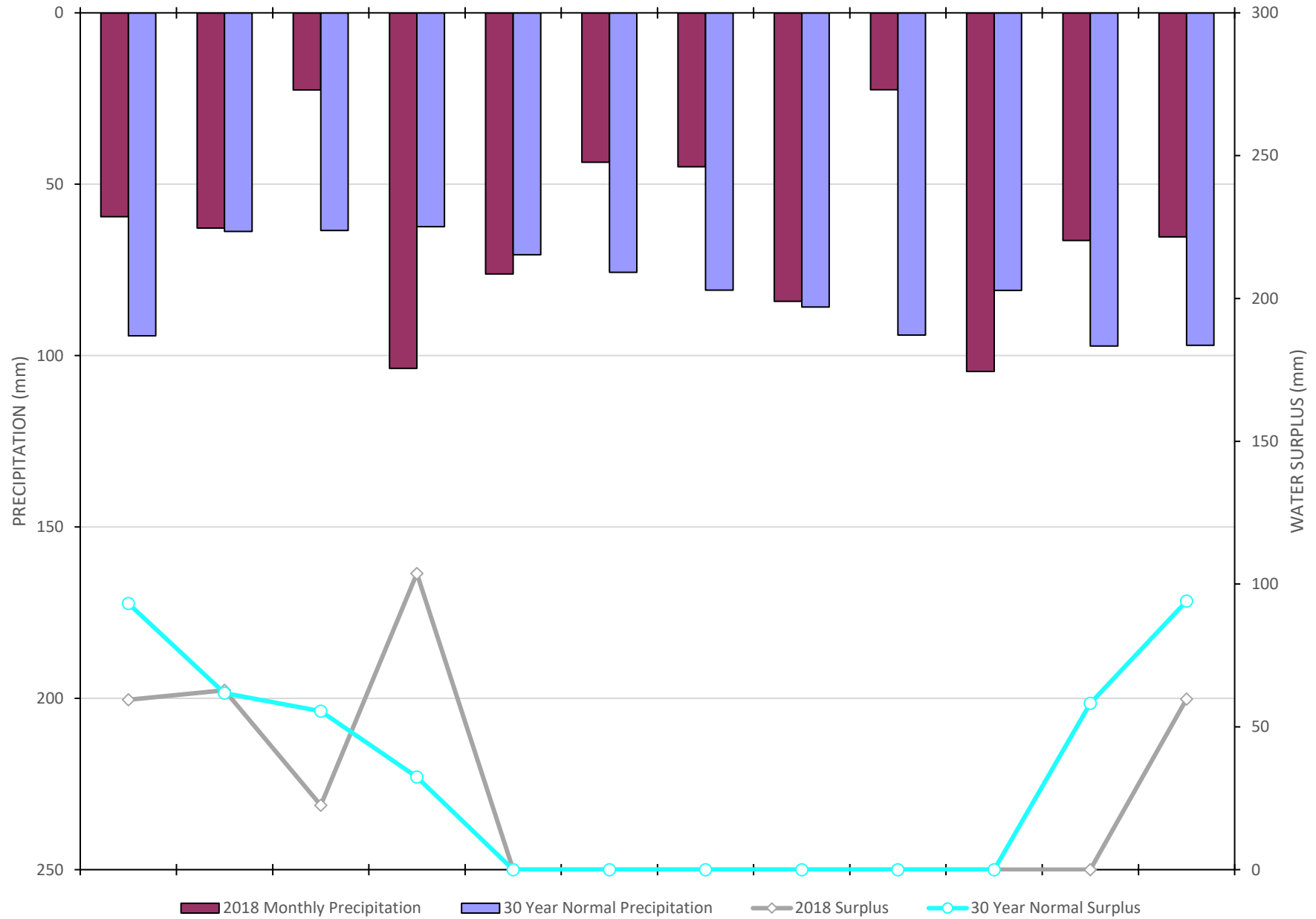


TABLE A-9
2019 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-9.0	0	0	0.82	0	66	150	66	0	66	0
FEBRUARY	-6.1	0	0	0.82	0	88	150	88	0	88	0
MARCH	-3.0	0	0	1.03	0	63	150	63	0	63	0
APRIL	4.8	1	22	1.12	25	100	150	75	0	75	0
MAY	10.9	3	52	1.27	67	87	150	20	0	20	0
JUNE	16.5	6	82	1.28	104	75	121	0	29	0	0
JULY	22.0	9	111	1.30	144	50	26	0	95	0	26
AUGUST	19.3	8	96	1.20	116	54	0	0	62	0	36
SEPTEMBER	16.0	6	79	1.04	82	75	0	0	7	0	7
OCTOBER	9.6	3	46	0.95	44	137	93	93	0	0	0
NOVEMBER	-0.5	0	0	0.81	0	46	139	46	0	0	0
DECEMBER	-2.8	0	0	0.78	0	108	150	108	0	97	0
TOTAL	6.5	36			581	949		560	192	410	68
(POTENTIAL) NET WATER SURPLUS=										368 mm	
ACTUAL SURPLUS=										410 mm	

NOTES: WHC - Water Holding Capacity
Data from the Shanty Bay Climatological Station. Located at 44°24'N 79°38'W, 250 mASL

FIGURE A-8: SHANTY BAY CLIMATOLOGICAL STATION

2019 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)

MONTHLY PRECIPITATION AND WATER SURPLUS

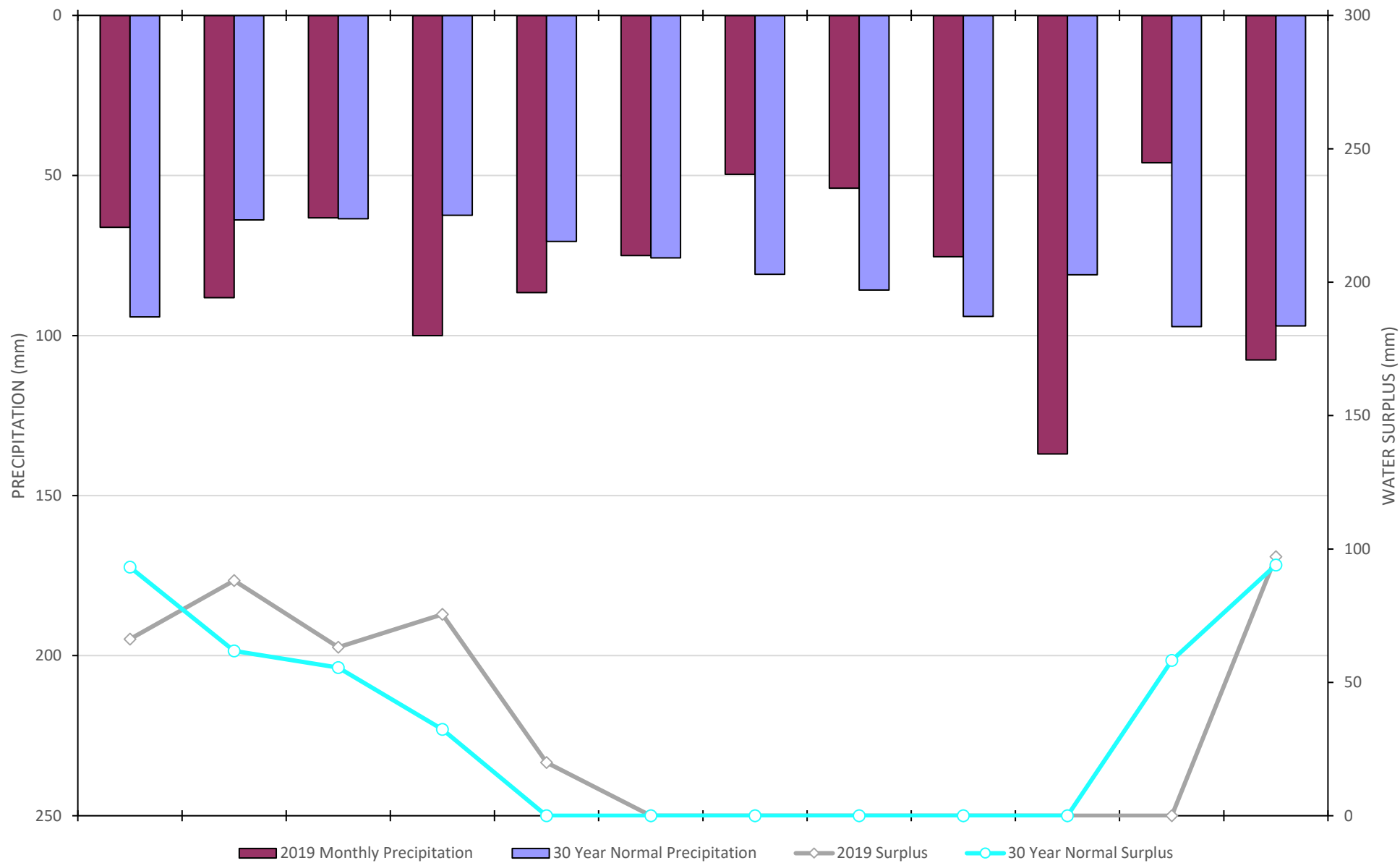


TABLE A-10
2019 WATER BUDGET
WALKER CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-10.4	0	0	0.82	0	38.4	150	38	0	38	0
FEBRUARY	-8.3	0	0	0.82	0	16.0	150	16	0	16	0
MARCH	-5.6	0	0	1.03	0	33.0	150	33	0	33	0
APRIL	2.7	0	14	1.12	16	127.9	150	112	0	112	0
MAY	9.4	3	48	1.27	62	96.1	150	35	0	35	0
JUNE	15.5	6	79	1.28	102	53.9	102	0	48	0	0
JULY	20.4	8	104	1.30	135	24.0	0	0	111	0	9
AUGUST	17.8	7	91	1.20	109	17.2	0	0	92	0	92
SEPTEMBER	14.6	5	75	1.04	78	73.7	0	0	4	0	4
OCTOBER	7.8	2	40	0.95	38	89.1	51	51	0	0	0
NOVEMBER	-2.4	0	0	0.81	0	62.8	114	63	0	0	0
DECEMBER	-3.9	0	0	0.78	0	28.1	142	28	0	0	0
TOTAL	4.8	31			540	660.2		376	255	234	105
(POTENTIAL) NET WATER SURPLUS=										120 mm	
ACTUAL SURPLUS=										234 mm	

NOTES: WHC - Water Holding Capacity
Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-9: WAI CLIMATOLOGICAL STATION
 2019 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

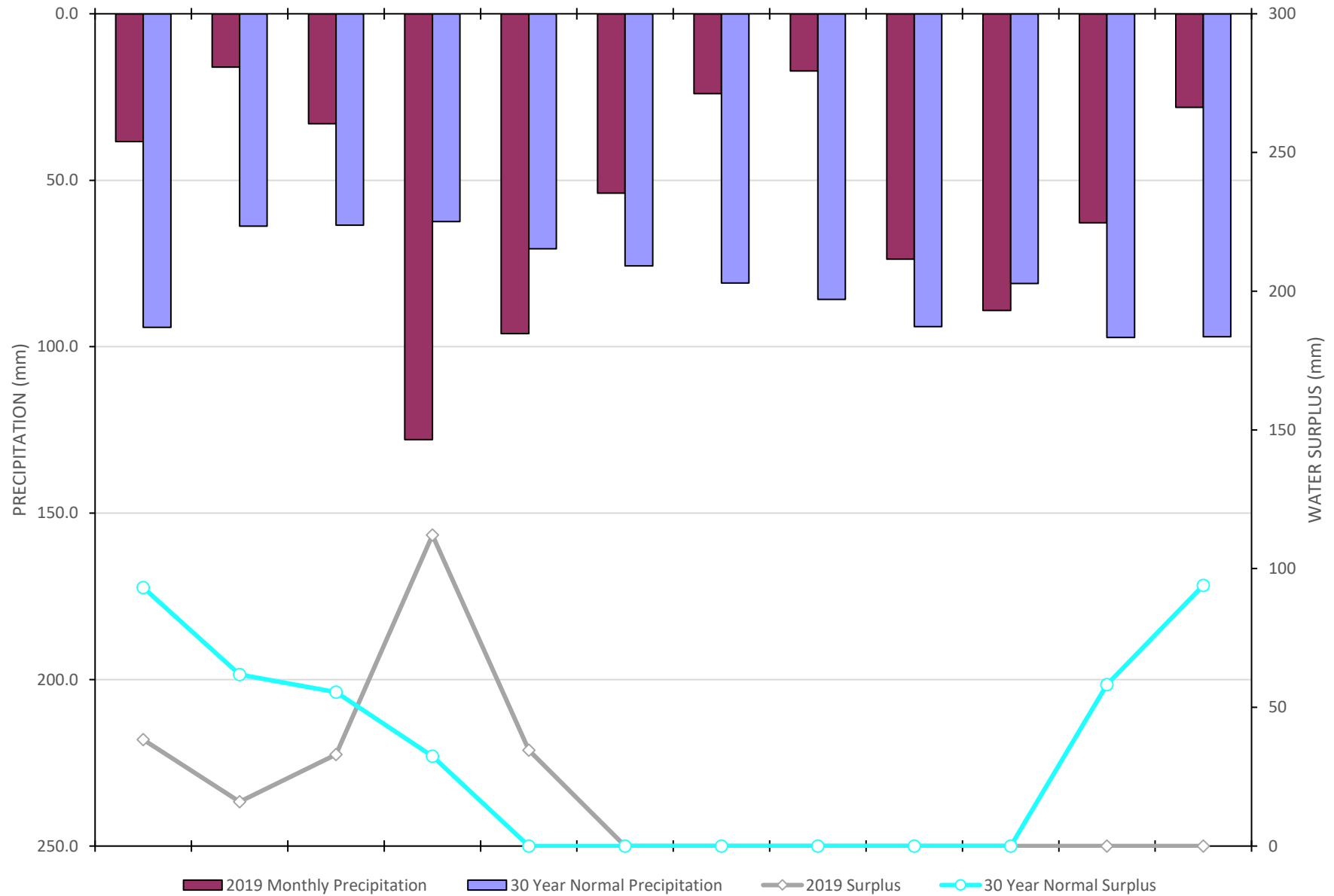


TABLE A-11
2020 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-3.8	0	0	0.82	0	108	150	108	0	108	0
FEBRUARY	-5.1	0	0	0.82	0	80	150	80	0	80	0
MARCH	1.5	0	0	1.03	0	48	150	48	0	48	0
APRIL	4.7	1	20	1.12	22	49	150	27	0	27	0
MAY	11.4	3	53	1.27	67	109	150	42	0	42	0
JUNE	18.5	7	91	1.28	116	56	90	0	60	0	0
JULY	23.0	10	116	1.30	150	51	0	0	99	0	9
AUGUST	20.4	8	101	1.20	121	220	98	98	0	0	0
SEPTEMBER	15.4	5	74	1.04	77	66	88	0	10	0	0
OCTOBER	8.3	2	37	0.95	35	62	114	26	0	0	0
NOVEMBER	5.9	1	0	0.81	0	69	150	69	0	33	0
DECEMBER	-2.0	0	0	0.78	0	107	150	107	0	107	0
TOTAL	8.2	39			589	1025		606	170	446	9
(POTENTIAL) NET WATER SURPLUS=										436 mm	
ACTUAL SURPLUS=										446 mm	

NOTES: WHC - Water Holding Capacity
Data from the Shanty Bay Climatological Station. Located at 44°24'N 79°38'W, 250 mASL

FIGURE A-10: SHANTY BAY CLIMATOLOGICAL STATION

2020 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)

MONTHLY PRECIPITATION AND WATER SURPLUS

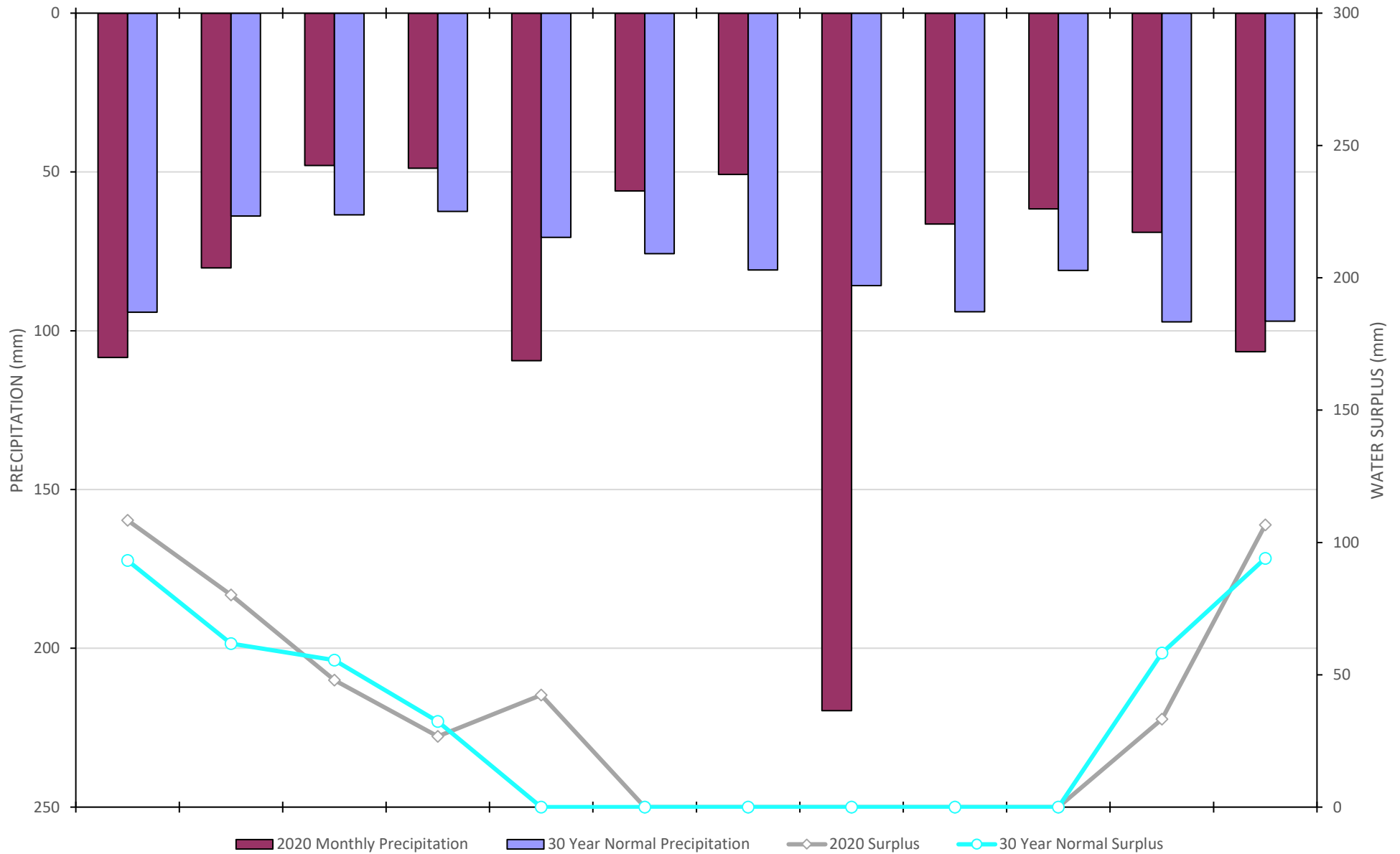


TABLE A-12
2020 WATER BUDGET
WALKER CLIMATOLOGICAL STATION
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-4.8	0	0	0.82	0	50.7	150	51	0	51	0
FEBRUARY	-6.6	0	0	0.82	0	34.1	150	34	0	34	0
MARCH	-0.4	0	0	1.03	0	82.2	150	82	0	82	0
APRIL	2.6	0	15	1.12	17	36.1	150	19	0	19	0
MAY	9.7	3	53	1.27	67	78.5	150	12	0	12	0
JUNE	17.7	7	92	1.28	118	84.9	117	0	33	0	0
JULY	21.1	9	109	1.30	141	99.9	75	0	42	0	0
AUGUST	18.7	7	97	1.20	117	47.7	6	0	69	0	6
SEPTEMBER		0	0	1.04	0		6	0	0	0	0
OCTOBER	5.4	1	30	0.95	29	61.3	39	32	0	0	0
NOVEMBER	1.3	0	0	0.81	0	7.2	46	7	0	0	0
DECEMBER	-3.5	0	0	0.78	0	6.7	52	7	0	0	0
TOTAL	5.6	27			489	589.3		244	144	198	6
(POTENTIAL) NET WATER SURPLUS=										100 mm	
ACTUAL SURPLUS=										198 mm	

NOTES: WHC - Water Holding Capacity
Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.
No data available from Aug 21 to Oct 8th
No data available from Nov 4 to Dec 17

FIGURE A-11: WAI CLIMATOLOGICAL STATION
 2020 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
 MONTHLY PRECIPITATION AND WATER SURPLUS

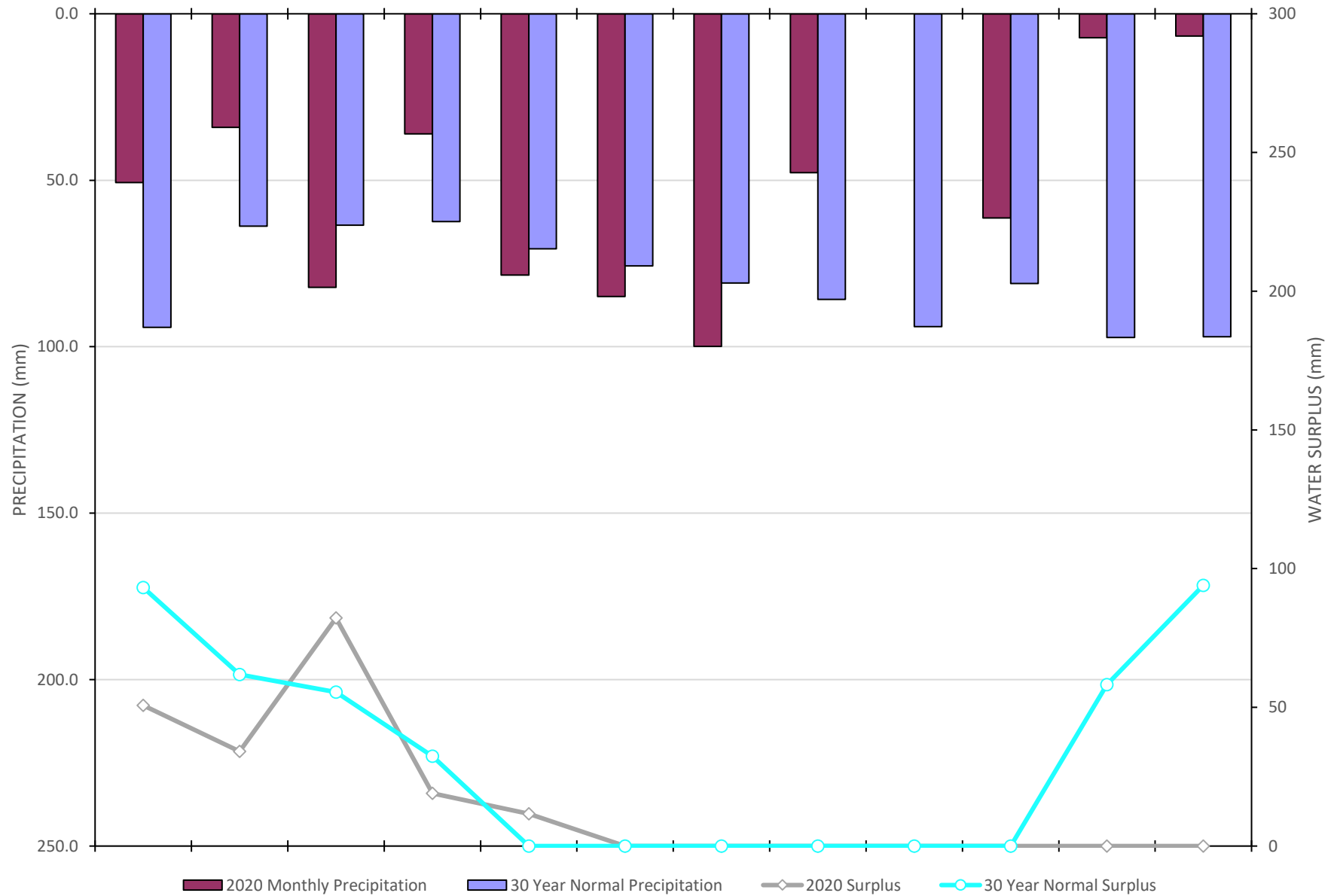


FIGURE A-12: MEAN MONTHLY TEMPERATURE
2020 (SHANTY BAY and WAI STATIONS) vs. 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100

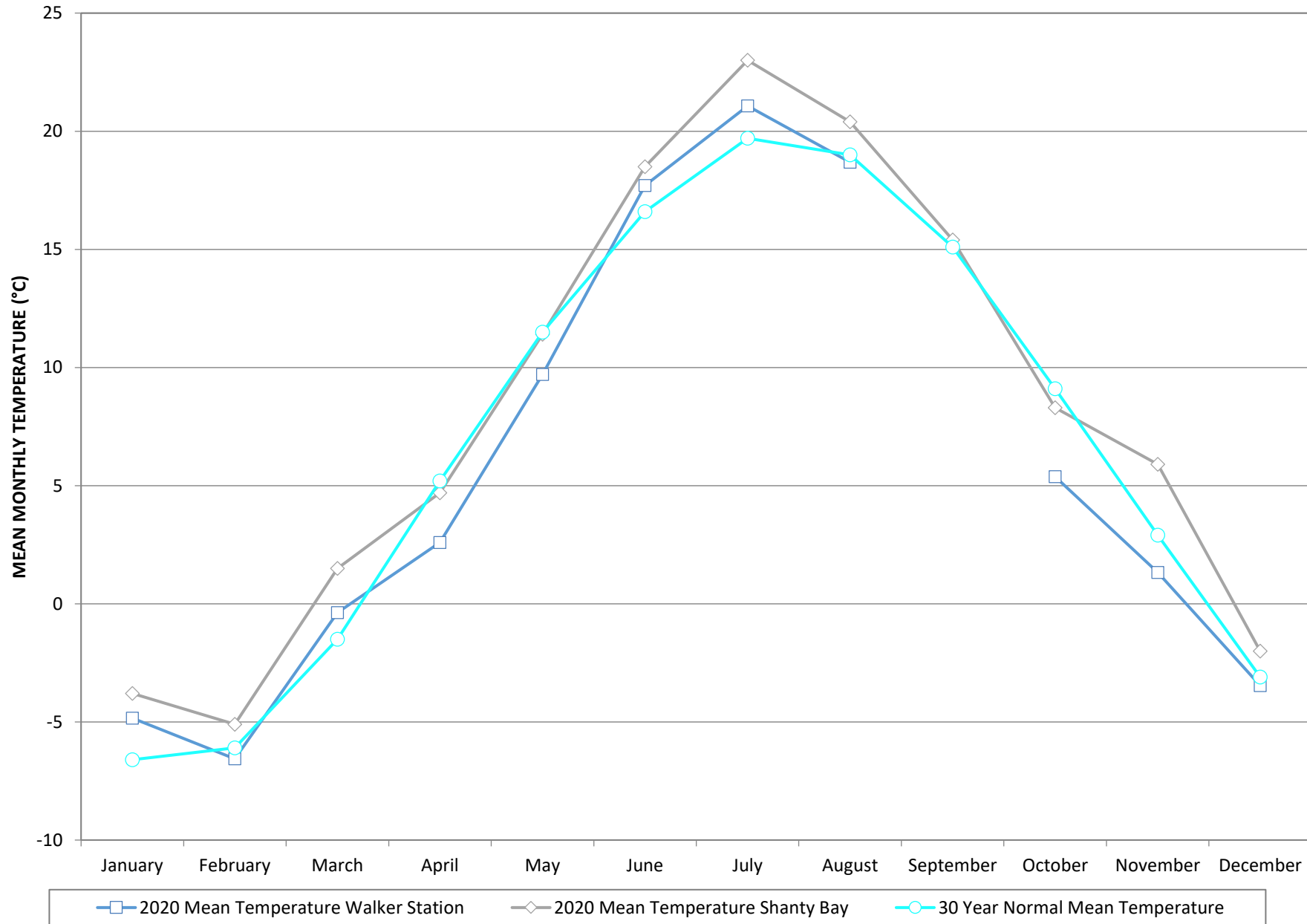
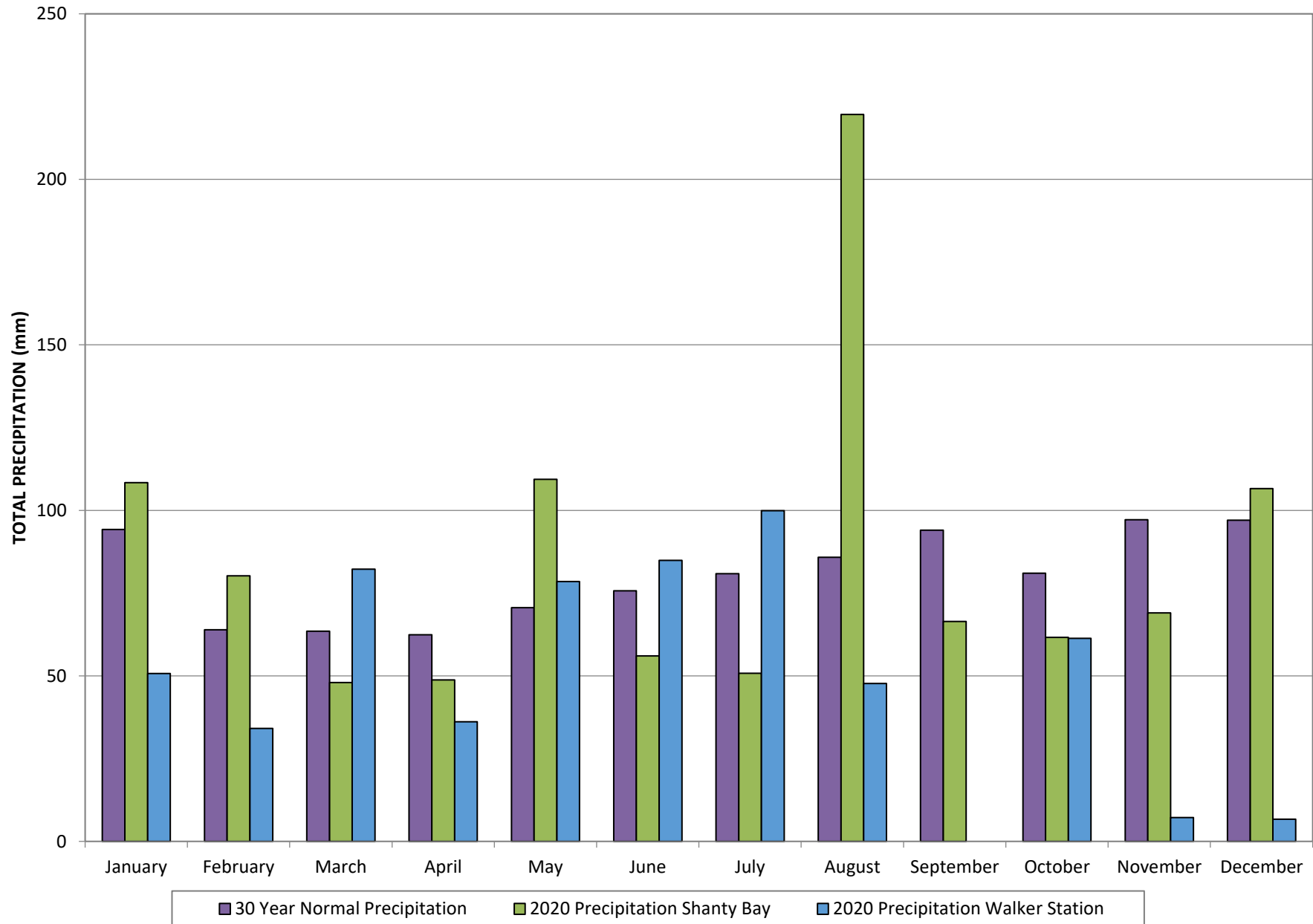


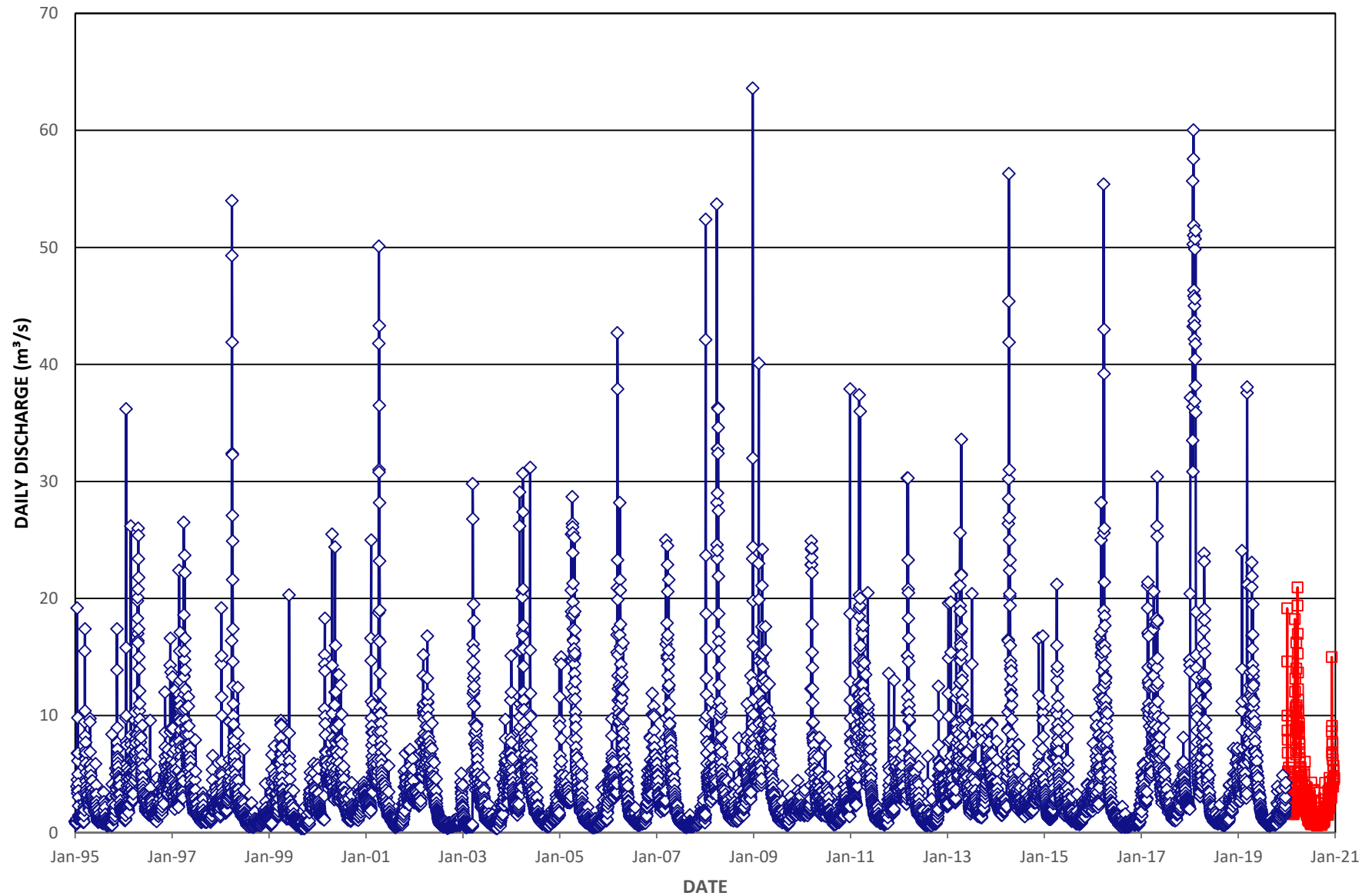
FIGURE A-13: TOTAL PRECIPITATION

2020 (SHANTY BAY and WAI STATIONS) vs. 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
DUNTROON QUARRY - 2020 AMP SUMMARY REPORT
111-53312-03 100



SURFACE WATER HYDROGRAPH
Mad River at Avening
Environment Canada Station 02ED015

FIGURE A-14



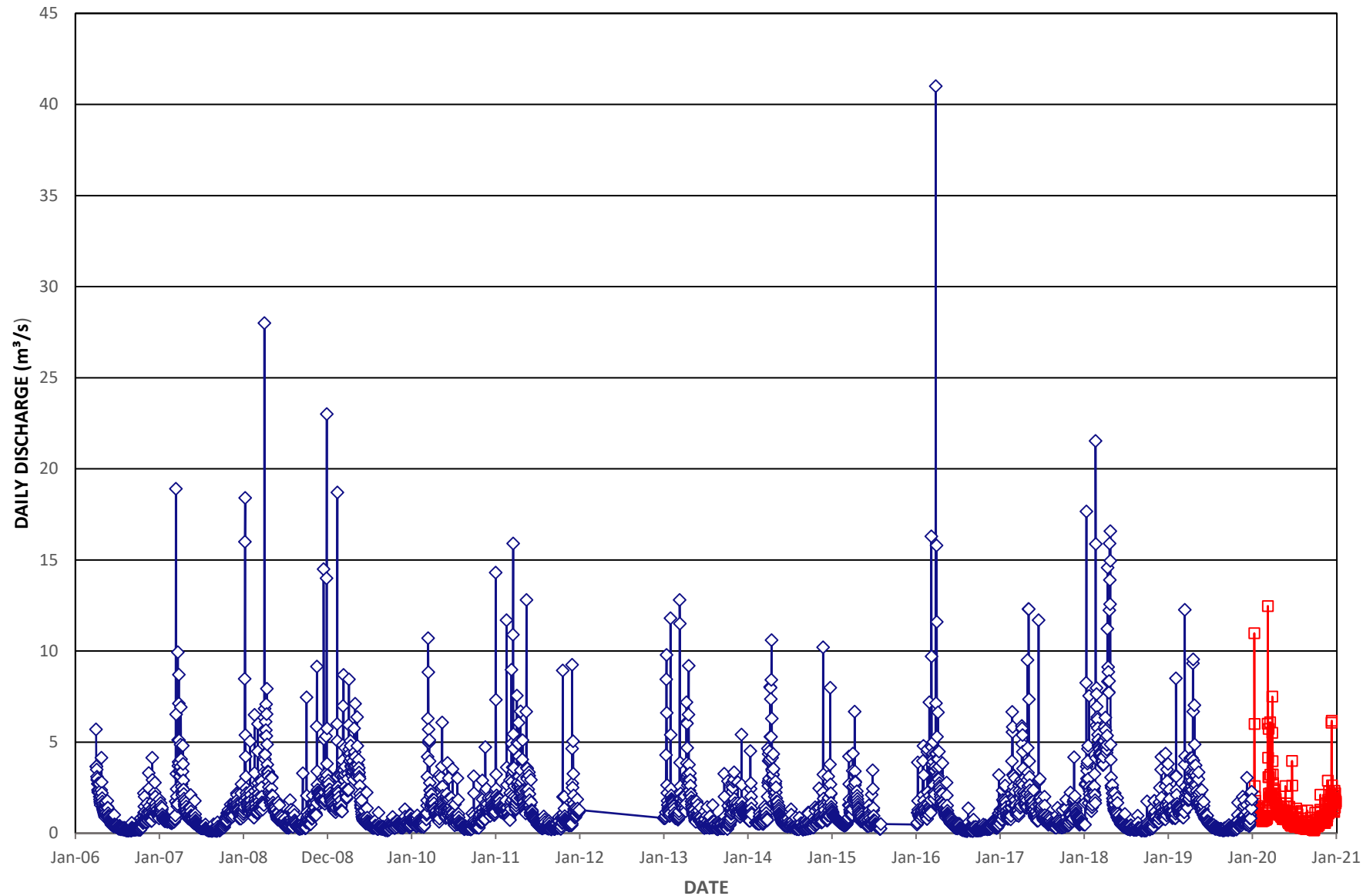
NOTE: Data for this graph obtained from Government of Canada Hydrometric Data Station 02ED015. (<https://wateroffice.ec.gc.ca>)



SURFACE WATER HYDROGRAPH

FIGURE A-15

Pretty River at Collingwood
Environment Canada Station 02ED031



NOTE: Data for this graph obtained from Government of Canada Hydrometric Data Station 02ED031. (<https://wateroffice.ec.gc.ca>)

—□— 2020 —◇— 2006-2019



APPENDIX B & C

HISTORIC SURFACE WATER AND GROUNDWATER DATA

For the purposes of paper conservation both Appendix B and C can be found on Walker Industries company website. From the corporate website under the **DIVISION** tab, select **AGGREGATES**. From here, select **DUNTROON QUARRY** from the options listed. In addition, a link to the historic data is provided below:

<http://www.walkerind.com/walker-aggregates/Duntroon-Quarry/>