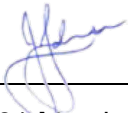




## ANNUAL REVIEW 2021

# MAXWELL UNDERGROUND COAL MINE PROJECT

# Annual Review 2021

<b>Name of operation</b>	Maxwell Underground Coal Mine Project
<b>Name of operator</b>	Maxwell Ventures (Management) Pty Ltd
<b>Development consent / project approvals</b>	SSD 9526, PA 06_0202, DA 106-04-00
<b>Name of holder of development consent / project approval</b>	Maxwell Ventures (Management) Pty Ltd
<b>Mining leases</b>	A173, CL229, CL395, ML1531, ML1820, ML1822
<b>Name of holder of mining leases</b>	Maxwell Ventures (Management) Pty Ltd
<b>Water licences</b>	WAL41559, WAL41491*, WAL41234, WAL43166, WAL39739, WAL43160, WAL39792, 20BL171953, 20BL171954, 20BL171955, 20BL171956, 20BL171957, 20BL174016, 20BL174017, 20BL174018
<b>Name of holder of water licences</b>	Maxwell Ventures (Management) Pty Ltd *WAL 41491 is held by AGL Macquarie Pty Ltd
<b>MOP start date</b>	1 July 2021
<b>MOP end date</b>	30 June 2023
<b>Annual Review start date</b>	1 January 2021
<b>Annual Review end date</b>	31 December 2021
<p><b>I, James Johnson, certify that this audit report is a true and accurate record of the compliance status of Maxwell Infrastructure for the period 1 January 2021 to 31 December 2021 and that I am authorised to make this statement on behalf of Maxwell Ventures (Management) Pty Ltd.</b></p> <p><i>Note.</i></p> <p>a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</p> <p>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</p>	
<b>Name of authorised reporting officer</b>	James Johnson
<b>Title of authorised reporting officer</b>	General Manager Development & Operations
<b>Signature of authorised reporting officer</b>	
<b>Date</b>	31 March 2022

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# 1 STATEMENT OF COMPLIANCE

A statement of compliance is provided in **Table 1** and further details regarding any non-compliance is provided in **Table 2**.

**Table 3** includes the compliance status key as per the Annual Review Guideline published by the Department of Planning and Environment (DPE) in October 2015.

**Table 1. Statement of compliance**

Were all conditions of the relevant approvals complied with?	
SSD 9526	Yes
PA 06_0202	Yes
DA 106-04-00	Yes
CL229	Yes
CL395	Yes
ML1531	Yes
ML1820	Yes
ML1822	Yes
A173	Yes
EPL 1323	No
EPBC 2018/8287	Yes

**Table 2. Non-compliance**

Relevant approval	Condition	Condition description	Compliance status	Relevant section of the Annual Review
EPL 1323	M2.1	Requirement to monitor	Administrative	11

**Table 3. Compliance status key**

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>potential for serious environmental consequences, but is unlikely to occur; or</li> </ul>

Risk level	Colour code	Description
		<ul style="list-style-type: none"> <li>potential for moderate environmental consequences, but is likely to occur</li> </ul>
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>potential for moderate environmental consequences, but is unlikely to occur; or</li> <li>potential for low environmental consequences, but is likely to occur</li> </ul>
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g., submitting a report to government later than required under approval conditions)

## 2 ACRONYMS

Acronym	Definition
A	Authorisation issued under the <i>Mining Act 1973</i>
AC	Alternating current
AQGHGMP	Air Quality and Greenhouse Gas Management Plan
ANZEC	Australia and New Zealand Environment Council
APZ	Asset Protection Zone
As	Arsenic
AS	Australian Standard
AWS	Automatic Weather Station
BAM	Biodiversity Assessment Methodology
bcm	Bank cubic metres
BCT	Biodiversity Conservation Trust
BMP	Biodiversity Management Plan
BOM	Bureau of Meteorology
CaCO <sub>3</sub>	Calcium carbonate
CCC	Community Consultative Committee
Cl	Chloride
CL	Coal Lease issued under the <i>Mining Act 1973</i> .
CMP	Contaminated Materials Protocol
CO <sub>2</sub>	Carbon dioxide
dB(A)	A-weighted decibels
DA	Development Approval
DEM	Digital Elevation Model
D/S	Downstream
DPE	NSW Department of Planning and Environment
EA	Drayton Mine Expansion Environmental Assessment 2007
EC	Electrical conductivity
EIS	Environmental Impact Statement
EL	Exploration Licence
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
FY	Financial year (from 1 July to 30 June each year)
GHG	Greenhouse gas

Acronym	Definition
g/m <sup>2</sup> /month	Grams per square metre per month
GJ	Gigajoules
GW	Groundwater
ha	Hectares
HTE	High Threat Exotic weed
HVEC	Hunter Valley Energy Coal
IEA	Independent Environmental Audit
IPC	Independent Planning Commission
K	Potassium
L <sub>A1</sub> (1 min)	A-weighted sound pressure level that is exceeded for one per cent of the 1-minute measurement period
L <sub>Aeq</sub> (time period)	A-weighted equivalent continuous sound pressure level over the time period
LEM	Landform Evolution Model
Ltd	Limited
m	Metres
m <sup>2</sup>	Square metres
m <sup>3</sup>	Cubic metres
mAHD	Elevation in metres in respect to the Australian Height Datum
Mb	Molybdenum
MB	Monitoring bore
Mg	Magnesium
mg/L	Milligrams per litre
MEA	Mine entry area
MEG	Regional NSW – Mining, Exploration and Geoscience
MI	Maxwell Infrastructure
ML	Megalitres
ML	Mining Lease issued under the <i>Mining Act 1992</i>
MLA	Mining Lease Application
MOD1	Modification 1
MOP	Mining Operations Plan
m/s	Metres per second
mS/cm	Microsiemens per centimetre
MSC	Muswellbrook Shire Council
MWOO	Mixed Waste Organic Outputs
MP	Management Plan



<b>Acronym</b>	<b>Definition</b>
MUG	Maxwell Underground project
NBMP	Noise and Blasting Management Plan
NC	No change
Na	Sodium
NGER	National GHG and Energy Reporting
NM	Noise monitor
NR	Not reported
NSW	New South Wales
NTU	Nephelometric turbidity unit
OEH	NSW Office of Environment and Heritage
OPC	Oil pollution control (dam)
PA	Project Approval
pH	Potential of hydrogen (a measure of acidity/alkalinity)
PM <sub>10</sub>	Particulate matter 10 micrometres or less in diameter
PM <sub>2.5</sub>	Particulate matter 2.5 micrometres or less in diameter
POEO Act	Protection of the Environment Operations Act 1997
Pty	Proprietary
Q	Quarter of a year
REC	Recommendation
RCE	Rehabilitation Cost Estimate
ROM	Run of mine
Sb	Antimony
SCMP	Spontaneous Combustion Management Plan
Se	Selenium
SEARs	Secretary's Environmental Assessment Requirements
SO <sub>4</sub>	Sulphate
sp.	Species
SSD	State Significant Development
STP	Sewage treatment plant
SW	Surface water
t	Tonnes
tCO <sub>2</sub> -e	Tonnes of carbon dioxide equivalent
TDS	Total dissolved solids
TEOM	Tapered Element Oscillating Microbalance
TLTS	Too low to sample

Acronym	Definition
TSP	Total suspended particulates
TSS	Total suspended solids
UG	Underground
µg/L	Micrograms per litre
µg/m <sup>3</sup>	Micrograms per cubic metre
µS/cm	Microsiemens per cm
UHAQMN	Upper Hunter Air Quality Monitoring Network
U/S	Upstream
VWP	Vibrating wire piezometer
WAL	Water Access Licence issued under the <i>Water Management Act 2000</i>
WMP	Water Management Plan

### 3 INTRODUCTION

Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Resources Limited (Malabar) owns and operates the Maxwell Underground Coal Mine Project (Maxwell UG Project). The site is in the Upper Hunter Valley of New South Wales (NSW), east-southeast of Denman and south-southwest of Muswellbrook. The site is approved to extract a maximum of 8 million tonnes of run-of-mine (ROM) coal per year over a period of 26 years with construction expected to commence during the next reporting period.

The site consists of the following areas:

- Underground area comprising the proposed area of underground mining operations and the mine entry area (MEA) to support underground mining and coal handling activities and provide for personnel and materials access;
- Maxwell Infrastructure (formerly Drayton mine) comprising previous open cut mining areas, existing coal handling and preparation plant (CHPP), train load-out facilities and rail loop, Antiene rail spur and other infrastructure and services; and
- Transport and services corridor between the underground area and Maxwell Infrastructure comprising the proposed site access road, covered overland conveyor, power supply and other ancillary infrastructure and services.

The area within and surrounding the site, which has previously been known as Mt Arthur South, Saddlers Creek and Drayton South, has long been identified as having a significant in-situ coal resource. The regional context of the site is shown in **Figure 1**.

Prospecting for coal commenced in the late 1940s, with exploration intensifying during the 1960s and 1970s. Open cut coal extraction and mining activities commenced at Maxwell Infrastructure in 1983 and ceased in October 2016. The previous open cut mining area is currently in the rehabilitation phase of the mine operations.

The site is bordered by Mt Arthur Coal to the west and AGL Macquarie's Bayswater and Liddell Power Stations adjoining the eastern and southern boundaries. The Antiene rural residential area exists to the north of the site. The relevant approval boundaries, lease boundaries and biodiversity offset areas for the site are shown in **Figure 2**.

The development consent for State Significant Development 9526 (SSD 9526) was granted on 22 December 2020 under clause 8A of the *State Environmental Planning Policy (State and Regional Development) 2011* and section 4.5(a) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development consent was modified (MOD1) on 19 November 2021 to allow for the following:

- Repositioning of the underground portal;
- Realignment of a small section of the proposed access road at the Maxwell Infrastructure site to utilise an existing haul road and minimise impacts to established mine rehabilitation;
- Repositioning of an approved clean water diversion for the MEA;
- Repositioning of the water treatment facility from the MEA to the Maxwell Infrastructure site; and
- Other minor works and ancillary infrastructure components within the existing approved surface development areas (e.g., works associated with the reconfiguration of the MEA and pumps/pipelines associated with the water treatment facility).

The site also incorporates the development formerly authorised under the Maxwell Infrastructure Project Approval (PA) 06\_0202. Development Consent DA 106-04-00 for the existing rail loop and Antiene Rail Spur was granted on 2 November 2000 under Section 76(A)9 and 80 of the EP&A Act and is still current



Figure 1. Regional context



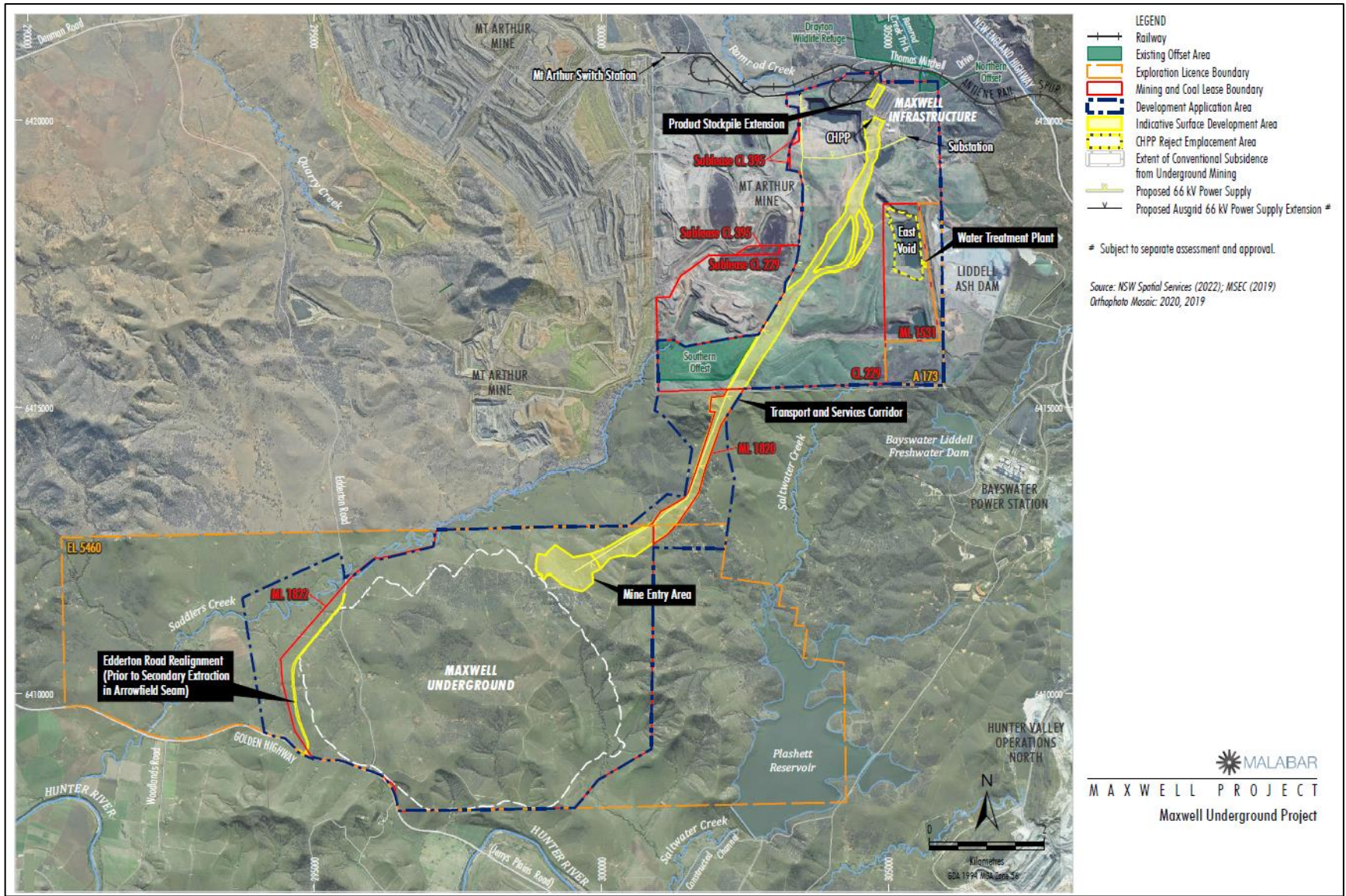


Figure 2. Maxwell UG Project boundaries

This report details the compliance status of the site with respect to development consents and mining leases from 1 January 2021 to 31 December 2021. It has been prepared in accordance with the Annual Review Guideline published by the DPE in October 2015. It also fulfils the Annual Review requirements under the conditions of development consents SSD 9526, PA 06\_0202 and DA 106-04-00 and Annual Environmental Management Report requirements under the conditions of mining leases CL 229, CL 395 and ML 1531. These conditions and where they have been addressed in the report are listed in **Appendix 1**.

Names and contact details of the key personnel who are responsible for environmental management at the site are provided in **Table 4**.

**Table 4. Site contacts**

Name	Role	Contact details
James Johnson	General Manager Development & Operations	(02) 6542 0283 <a href="mailto:jjohnson@malabarresources.com.au">jjohnson@malabarresources.com.au</a>
Donna McLaughlin	Health, Safety, Environment and Community Manager	(02) 6542 0283 <a href="mailto:dmclaughlin@malabarresources.com.au">dmclaughlin@malabarresources.com.au</a>
Alex Newton	Environment and Approvals Coordinator	(02) 6542 0283 <a href="mailto:anewton@malabarresources.com.au">anewton@malabarresources.com.au</a>
Teresa Coleman	Environment and Community Coordinator	(02) 6542 0283 <a href="mailto:tcoleman@malabarresources.com.au">tcoleman@malabarresources.com.au</a>



## 4 APPROVALS

On 22 December 2020, the NSW Independent Planning Commission (IPC) approved the development application for the Maxwell UG Project. The development consent was modified on 19 November 2021 to allow for the repositioning of infrastructure primarily at the MEA and realignment of a section of the site access road.

The site currently operates under SSD 9526, PA 06\_0202 and DA 106-04-00. SSD 9526 requires the surrendering of PA 06\_0202 within 12 months of the commencement of development under SSD 9526. It is anticipated that PA 06\_0202 will be surrendered during the next reporting period.

Environment Protection Licence (EPL) 1323 was varied during the reporting period to update the premises boundary and monitoring locations for the Maxwell UG Project. The variation was approved by the NSW Environment Protection Authority (EPA) on 30 July 2021.

Maxwell held pre-existing mining leases CL229, CL395 and ML1531 at the start of the reporting period. On the 24 December 2020, Maxwell submitted Mining Lease Application (MLA) 597 and MLA 598 to Regional NSW – Mining, Exploration and Geoscience (MEG) for the Maxwell UG Project. Subsequently on 10 November 2021, Maxwell was granted ML1820 for ancillary mining activities and ML1822 was granted on 18 November 2021 for underground coal mining.

The Anglo Sub-Lease is executed between Maxwell and Hunter Valley Energy Coal (HVEC) and registered against a portion of CL229 and CL395. In accordance with the sub-lease, HVEC is responsible for the rehabilitation of the area under the sub-lease, and it is therefore excluded from the scope of this Annual Review.

On 19 August 2020, Maxwell received development consent for SSD 9820 under the State Significant Development provisions of the EP&A Act for the Maxwell Solar Farm. The approved Maxwell Solar Farm activities include the development of a ground-mounted photovoltaic solar plant with an installed capacity of approximately 25 Megawatts (AC). The solar farm would be located on approximately 130 hectares (ha) of rehabilitated open cut mine land within the Maxwell UG Project. Maxwell proposes to apply to excise the land for the Maxwell Solar Farm from CL229 prior to construction of the solar farm.

Current development consents, leases and licences relevant to the site are listed in **Table 5**.

**Table 5. Statutory approvals**

Statutory Approval Reference	Description
SSD 9526	Development Consent issued under Section 4.36 of the <i>Environmental Planning and Assessment Act 1979</i> for the Maxwell UG Project
PA 06_0202	Project Approval issued under Section 75J of the (now repealed) Part 3A of the <i>Environmental Planning and Assessment Act 1979</i> for the Drayton Mine Extension Project.
DA 106-04-00	Development Consent issued under Section 76 (A), 9 and 80 of Part 4 of the <i>Environmental Planning and Assessment Act 1979</i> for use of the existing Drayton Rail Loop and Antiene Rail Spur.
CL229	Coal Lease issued under the <i>Mining Act 1973</i> .
CL395	Coal Lease issued under the <i>Mining Act 1973</i> .

<b>Statutory Approval Reference</b>	<b>Description</b>
ML1531	Mining Lease issued under the <i>Mining Act 1992</i> .
ML1820	Mining Lease issued under the <i>Mining Act 1992</i> for ancillary mining activities.
ML1822	Mining Lease issued under the <i>Mining Act 1992</i> for underground coal mining.
A173	Authorisation issued under the <i>Mining Act 1992</i> .
EPL 1323	Environment Protection Licence (EPL) issued under Section 55 of the <i>Protection of the Environment Operations Act 1997</i> (POEO Act) for mining for coal and coal works.
EPBC 2018/8287	Approval under sections 130(1) and 133(1) of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
WAL41559	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
WAL41491	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
WAL41234	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
WAL43166	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
WAL39739	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
WAL43160	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
WAL39792	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
20BL171953	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL171954	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL171955	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL171956	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL171957	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL174016	Bore licence issued under the <i>Water Act 1912</i> for a monitoring bore.
20BL174017	Bore licence issued under the <i>Water Act 1912</i> for a monitoring bore.
20BL174018	Bore licence issued under the <i>Water Act 1912</i> for a monitoring bore.

## 5 OPERATIONS SUMMARY

### 5.1 Mining Operations

The Maxwell UG Project is an underground mining operation that will produce high-quality coals over a period of approximately 26 years. It involves the extraction of up to 8 million tonnes per annum of ROM coal from four seams within the Wittingham Coal Measures, using the following underground mining methods:

- Underground bord and pillar mining with partial pillar extraction in the Whynot Seam; and
- Underground longwall extraction in the Woodlands Hill Seam, Arrowfield Seam and Bowfield Seam.

Substantial existing infrastructure at the Maxwell Infrastructure site will be utilised for the handling, processing and transportation of coal. This includes the existing CHPP, train load-out facilities and other infrastructure and services including water management infrastructure, administration buildings and workshops.

Construction and or mining operations at the Maxwell UG Project have not commenced under SSD 9526. In accordance with PA 06\_0202, no open cut mining operations can take place at the Maxwell Infrastructure site after 31 December 2017. A production summary is presented in **Table 6** and shows waste rock being moved for construction of the MEA during the next reporting period.

**Table 6. Production summary (extraction)**

Material	Approved limit	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Waste rock / overburden (bcm)	0	0	0	158,029
ROM coal / ore (t)	0	0	0	0
Coarse reject (t)	0	0	0	0
Fine reject (tailings) (t)	0	0	0	0
Saleable product (t)	0	0	0	0

### 5.2 Other Operations

During the reporting period, site activities occurred during daylight hours, typically on a five days per week basis. There were no coal processing or coal transport activities during the reporting period.

The Maxwell rail loop was used on occasion for the temporary stowage of empty rolling stock by Aurizon Operations Ltd. Fixed site infrastructure continued to be preserved under a care and maintenance program. Although open cut mining operations have ceased at the Maxwell Infrastructure site, rehabilitation of the completed mining areas along with ancillary activities, including upkeep of roads and maintenance of equipment continued during the reporting

period. These works were focused on final landform development and rehabilitation. These activities are discussed in more detail in **Section 9**.

### **5.3 Next Reporting Period**

A temporary access road is proposed to be constructed during the next reporting period. The road will be constructed within ML1820 and ML1822 and will join the existing haul road on CL229 to provide access from the Maxwell Infrastructure site to the MEA. The existing haul road within CL229 is proposed to be upgraded during the next reporting period. The road will be upgraded to a surface consistent with the temporary access road and the road will be used to access ML1820.

The MEA will be cleared during the next reporting period to allow for the construction of a pad and temporary MEA facilities. The temporary facilities will consist of the following:

- Light vehicle parking area
- Heavy vehicle parking area
- Temporary toilet and bathhouse facilities
- Mobile crib room
- Temporary site offices
- Equipment laydown areas
- Temporary workshop facilities (igloo) for maintenance
- Shipping containers for storage of equipment and parts
- Generator and potable water tank

Four new dams are proposed to be constructed at the MEA during the next reporting period. The dams include the mine water dam, MEA dam, MEA sedimentation dam and water treatment plant dam. Mine establishment rock removed during construction will preferentially be used at the MEA as construction fill (e.g., for hardstand areas, dam embankments and road construction).

Surface trenching, magnetic surveys, test pits and the drilling of cored and non-cored holes are proposed to be undertaken within ML1822. These exploration activities will assist with further defining the geological model and will provide reservoir (gas testing) characterisation. A geochemistry assessment may also be undertaken if required.

## 6 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

DPE provided a letter in August 2021 stating that they had reviewed the 2020 Annual Review and considered the report to satisfy the reporting requirements of the approvals and the Department's Annual Review Guideline (October 2015). The letter noted that the approved Rehabilitation and Offset Management Plan (2013) for the development included a requirement to report on the topsoil balance and map weed treatment areas annually. This information has been included in this Annual Review.

No response was provided by the Resources Regulator.

Improvement measures from the 2020 Annual Review, actions required by regulatory notices and outstanding actions from the 2018 Independent Environmental Audit (IEA) are listed in **Table 7**.

**Table 7. Actions required from previous review, regulatory notices, improvement actions and IEA actions**

Action required	Requested by	Action taken	Section in Annual Review
The Rehabilitation and Offset Management Plan is from 2013 and should be updated. If the current draft MOP amendment that is with DPE - Planning and Assessment and DPE - Resource Regulator is approved, the Rehabilitation and Offset Management Plan should be updated for consistency (Recommendation (REC) 5).	IEA	Completed: A revised MOP for the Maxwell UG Project was approved by the Resources Regulator on 25 June 2021. A Biodiversity Management Plan for the Maxwell UG Project was approved by DPE on 27 September 2021 and supersedes the Rehabilitation and Offset Management Plan for the Maxwell Infrastructure site.	7.14
Include a map of all areas treated for weeds during the reporting period	DPE Annual Review letter dated 24/8/21	Completed: Map of all areas treated for weeds during the reporting period has been included in this Annual Review.	9.2
Include a topsoil balance which quantifies topsoil available for rehabilitation and identifies any deficit for future rehabilitation requirements	DPE Annual Review letter dated 24/8/21	Completed: Topsoil balance has been included in section 9 of this Annual Review.	9.1

Action required	Requested by	Action taken	Section in Annual Review
Submit a new MOP and any associated rehabilitation documents.	2020 Annual Review	Completed: A revised MOP and RCE for the Maxwell UG Project was submitted to the Resources Regulator on the 14 April 2021. The MOP was approved by the Resources Regulator on 25 June 2021. The Resources Regulator requested additional information for the RCE on 17 August 2021. Maxwell provided this information on 8 September 2021.  Further to this, a revised MOP and RCE was submitted to the Resources Regulator on 13 December 2021 following the granting of ML1820 and ML1822 and approval of MOD1.	9.1
Upgrade the hardware and software for the Maxwell Infrastructure real-time noise monitor.	2020 Annual Review	Completed: The hardware and software for the BarnOwl directional noise monitor was upgraded during the reporting period.	7.2
Upgrade the Maxwell Infrastructure TEOM to include the measurement of particulate matter 2.5 micrometres or less in diameter (PM <sub>2.5</sub> ).	2020 Annual Review	Completed: The Maxwell Infrastructure TEOM was upgraded during the reporting period to include the measurement of PM <sub>2.5</sub> .	7.4
Install a new monitoring bore within the Permian sequence located south of the former open cut mining area.	2020 Annual Review	Completed: A new monitoring bore was installed within the Permian sequence and south of the open cut mining area during the reporting period.	8.5
Undertake two tree planting programs covering approximately 40 hectares of existing mine rehabilitation within the conceptual woodland corridor.	2020 Annual Review	Completed: Autumn and Spring tree plantings were undertaken during the reporting period within the woodland corridor.	9.2



Action required	Requested by	Action taken	Section in Annual Review
A weed control program on mine rehabilitation focussing on Galenia	2020 Annual Review	Completed: A weed management program was ongoing throughout the reporting period targeting Galenia.	9.2
A weed control program on the Wildlife Refuge focussing on Prickly Pear.	2020 Annual Review	Completed: A weed management program was ongoing throughout the reporting period targeting Prickly Pear in the Wildlife Refuge.	9.2
A weed control program on the Southern Offset area focussing on Galenia, Guinea Grass, Rhodes Grass, Castor Oil, Coolatai Grass and Golden Wreath Wattle.	2020 Annual Review	Ongoing: A weed management program was ongoing throughout the reporting period targeting Galenia, Guinea Grass, Castor Oil, Rhodes Grass, Castor Oil, Coolatai Grass and Golden Wreath Wattle.	9.2
Installation of nest boxes in appropriately sized canopy trees within the woodland corridor.	2020 Annual Review	Completed: Nest boxes were installed in appropriately sized canopy trees within the woodland corridor during the reporting period.	7.14
Undertake an IEA under development consents PA 06_0202 and DA 106-04-00.	2020 Annual Review	Ongoing: The next IEA will be undertaken during the next reporting period in accordance with DPE letter of 6 August 2021 providing an extension of time until 5 July 2022 to commission, conduct and submit the IEA.	12

Action required	Requested by	Action taken	Section in Annual Review
<p><b>Direction 1:</b> Engage a suitably qualified expert to undertake an assessment of the long-term erosional stability of the final landforms that have been constructed as part of the rehabilitation of the mine as listed as Pasture and Woodland rehabilitation in Figure 14 – Location of Rehabilitation Activities of the Malabar Annual Environmental Management Report 2020 (Resources Regulator reference: MAAG0010472). The assessment must use an industry accepted Landform Evolution Model (for example CAESAR-Lisflood or SIBERIA) appropriate to the risk and scale of the landform of the site to determine the long-term landscape erosion behaviour. The model used in the assessment must incorporate the following:</p> <p>a. A digital elevation model (DEM) using a resolution appropriate for the level of detail in the existing and/or proposed landform. Ideally, a DEM grid of 1–3 m is to be used.</p> <p>b. Erosion characteristics representative of the materials used in the rehabilitated landform.</p> <p>c. An assessment of the landscape erosion behaviour across a range of time intervals. At a minimum, outputs for 10, 100, and 1000 years are required.</p> <p>d. Consideration of erosion rates for both successful revegetation and failed revegetation.</p>	Resources Regulator	Completed: An assessment of the long-term erosional stability of the final landform was undertaken.	6 (as stated in this Table)

Action required	Requested by	Action taken	Section in Annual Review
<p><b>Direction 2:</b> Engage a suitably qualified expert to undertake an assessment of the surface water management structures located in the rehabilitated landform. The assessment must include the following:</p> <p>a. A hydrological assessment of the surface water management, using appropriate projections to model behaviour for significant rainfall events in accordance with standard industry practice.</p> <p>b. An assessment of the adequacy of the current surface water management installed.</p> <p>c. Review of the adequacy of the current surface water management structure design and construction, including an assessment of long-term competency of rock utilised.</p>	Resources Regulator	Completed: An assessment of the surface water management structures located in the rehabilitated landform was undertaken.	6 (as stated in this Table)

<p><b>Direction 3:</b> Prepare and submit a report providing details of the assessment specified in Direction 1 and 2. As a minimum, this report must include the following:</p> <p>a. Demonstrate how requirements provided in Direction 1 and 2 have been met.</p> <p>b. Plans providing a representation of the final landform contours based on the modelled erosion behaviour at the time frames specified (i.e. 10, 100 and 1000 years) and identification of high-risk erosion areas. Information provided must sufficient scale to show the landform erosion and be consistent with the requirements for Plan 4 – Final Rehabilitation and Post Mining Land Use and Plan 5 – Rehabilitation and Post Mining Land Use Cross Sections described in ESG3: Mining Operations Plan (MOP) Guidelines, September 2013.</p> <p>c. Visual representation of the final landform such as 3D rendering, incorporating the Landform Evolution Model (LEM) outputs required.</p> <p>d. Justification of erosion data used in the model. If generic (non-site specific) erosion data has been used, provide information how this will be verified using field parameters.</p> <p>e. Information on erosion rates resulting from the final landform and an assessment of the potential impact upon the capability of the landform to sustain the approved final land uses as nominated in the development consent.</p> <p>f. Preliminary recommendations of mitigation controls required (if any) to address long term erosion risks.</p>	<p>Resources Regulator</p>	<p>Completed: A report providing details of the assessments specified in Direction 1 and 2 was prepared and submitted to the Resources Regulator on 28 January 2022 (next reporting period).</p>	<p>6 (as stated in this Table)</p>
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Action required	Requested by	Action taken	Section in Annual Review
g. Preliminary recommendations for changes to the surface water management structures (if any).			

## 7 ENVIRONMENTAL PERFORMANCE

The Environmental Management Strategy for the Maxwell UG Project provides an overview of the site's environmental monitoring. Environmental monitoring is a significant indicator of the site's environmental performance. In July 2021, the Environmental Management Strategy for the Maxwell UG Project was approved by DPE. This superseded the Environmental Management Strategy for the Maxwell Infrastructure site. The locations of all environmental monitoring sites are shown in **Appendix 2**.

### 7.1 Meteorological Monitoring

#### Management

Meteorological conditions such as wind speed, wind direction, temperature, rainfall, solar radiation and humidity are monitored at automatic weather stations AWS-1 and AWS-2.

#### Performance

During the reporting period, temperature trends were similar to previous years with a peak in summer and trough in winter. This is shown in **Figure 3** and **Figure 4**. The average temperatures for AWS-1 were similar to the previous five years, being within 1.5 degrees Celsius (°C) of the five-year average for all months. The exception to this was November which was 8.0 °C cooler than the five-year average, reflecting that this month was the wettest November in NSW since records began in 1900 (source: Australian Government Bureau of Meteorology (BoM)).

The average temperatures for AWS-2 were also similar to the previous five years, being within 1.91 °C of the five-year average for all months. The exception to this was also November which was 6.2 °C cooler than the five-year average.

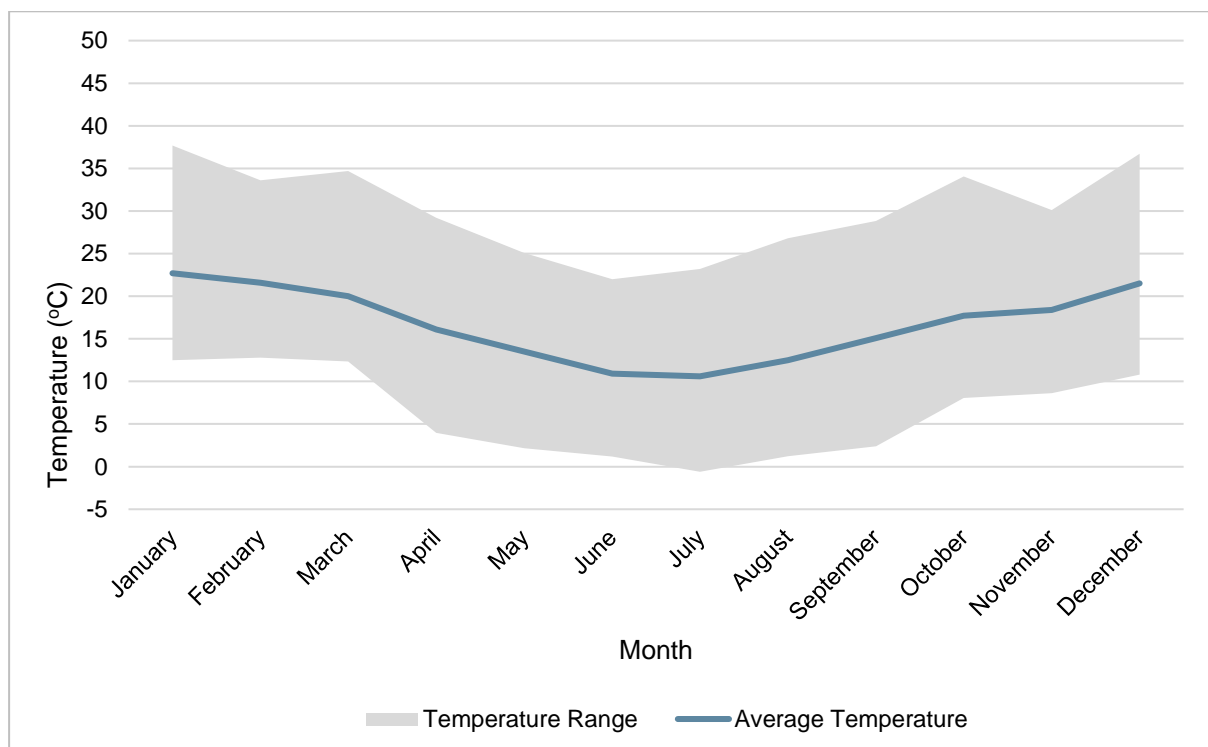
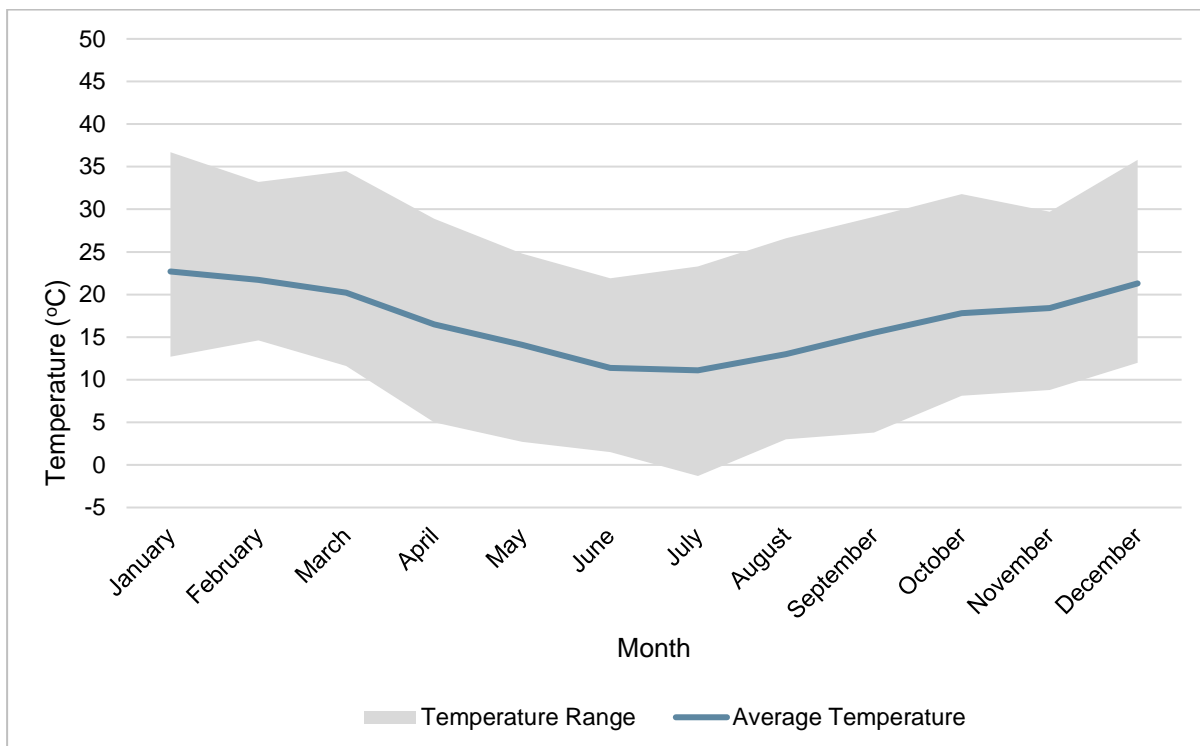


Figure 3. AWS-1 average temperature and temperature range for the reporting period





**Figure 4. AWS-2 average temperature and temperature range for the reporting period**

A summary of wind monitoring over the reporting period is presented in **Figure 5** and **Figure 6**. Consistent with previous years, and consistent with the geography of the Hunter Valley, the predominant winds were from the south-east and north-west to west-north-west. As in previous years, winds from the south-east generally dominated during the warmer months and winds from the north-west generally dominated during the cooler months. In total 87 per cent of wind speeds throughout the reporting period were in the range of 0.5 to 4 metres per second (m/s).

AWS-2 exhibited a higher proportion of higher wind speeds (only 56 per cent were in the range of 0.5 to 4 m/s); this reflects its elevated and exposed location on grazing land.

Rainfall recorded during the reporting period was above average. This can be seen in **Figure 7** which shows monthly rainfall during the reporting period compared to the average monthly rainfall for the previous 10 years. The increase in rainfall was consistent with the [NSW State Seasonal Update for December 2021](#), published by the NSW Department of Primary Industries Climate Unit, which noted that most of NSW is currently in non-drought. November 2021 had an exceptionally high rainfall, and the BoM advised in Special Climate Statement 75 that it was Australia's wettest November on record. The extremely wet conditions were primarily associated with a developing La Niña in the Pacific Ocean that typically increases the chance of higher than median rainfall across NSW. However high rainfall variability or irregularity can still be common due to the influence of localised short-term synoptic weather patterns, such as can be seen for April in **Figure 7** when lower than average rainfall occurred.

### Proposed Improvements

There are no improvements identified for the next reporting period.

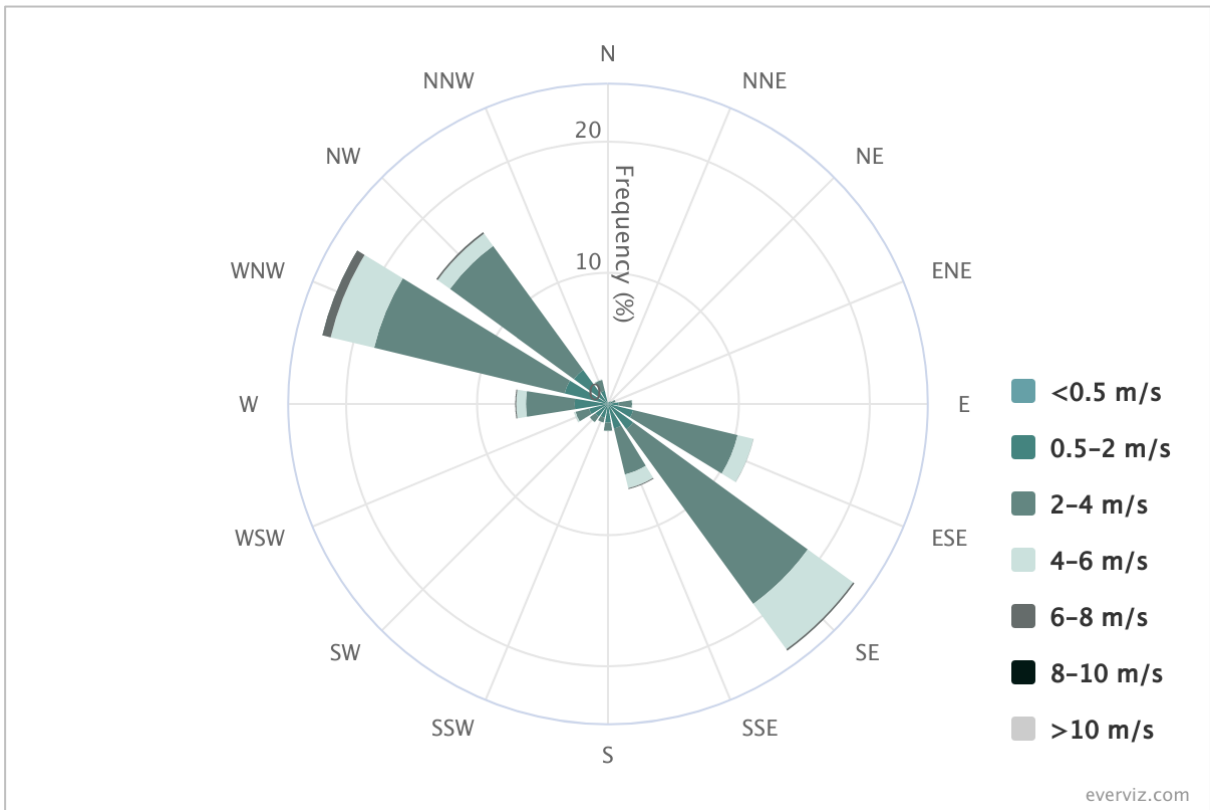


Figure 5. Wind speed and direction for the reporting period at AWS-1

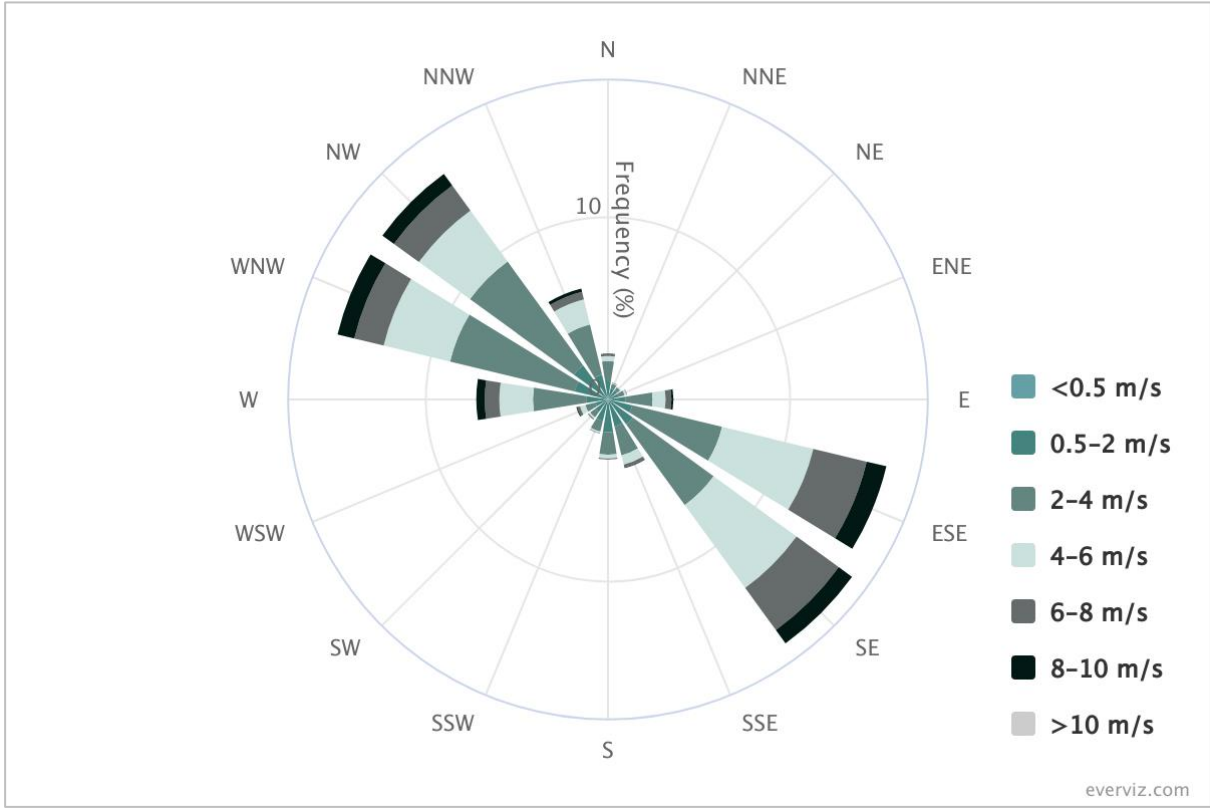
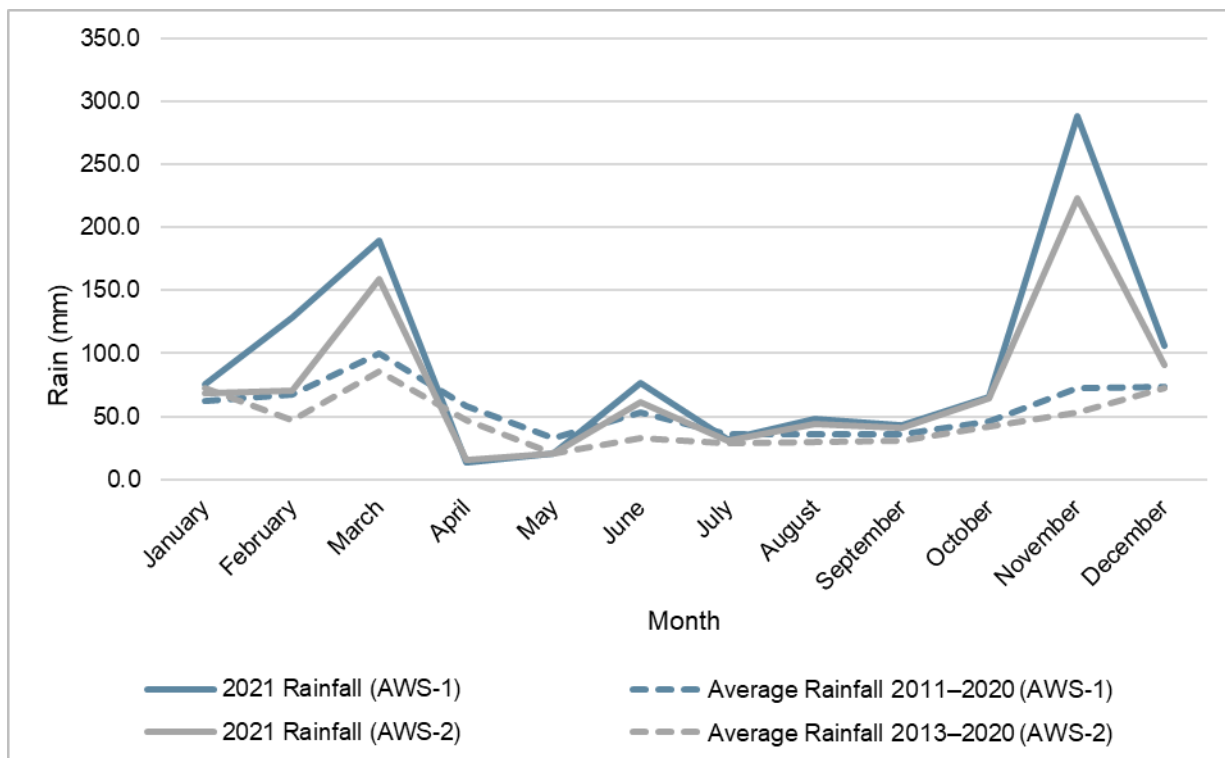


Figure 6. Wind speed and direction for the reporting period at AWS-2



**Figure 7. Rain for the reporting period with historic comparison**

## 7.2 Noise

### Management

Potential noise impacts from the site are managed in accordance with the Noise and Blasting Management Plan (NBMP) for the Maxwell UG Project. This plan was approved by DPE on 27 August 2021 and supersedes the Noise Management Plan for the Maxwell Infrastructure site. The purpose of the NBMP is to detail statutory requirements and outline the controls to be implemented for the management of noise associated with the site.

The noise monitoring program includes a combination of attended and real-time monitoring at locations representative of residential receivers. Attended monitoring is carried out in accordance with the relevant requirements set out in the Noise Policy for Industry (EPA 2017). Measurement of the noise environment for compliance assessment is conducted by an acoustic consultant. The compliance assessment for the remaining residential sites is determined by the acoustic consultant using the noise model to extrapolate from the measured values.

Real-time noise monitoring is undertaken for operational purposes only. Real-time noise monitoring currently involves the use of a BarnOwl directional noise monitoring system. During the reporting period, the hardware and software for the real-time noise monitor was upgraded.

### Performance

Operations at the site were restricted to daylight hours during the reporting period and typically on a five days per week basis. This limited potential noise impacts to the less sensitive times (i.e., daytime only) for potential receptors.

Attended noise monitoring and modelling was conducted during the reporting period to assess noise impacts and determine compliance to approval criteria. Up until 27 August 2021 (date at which the NBMP was approved for the Maxwell UG Project), attended noise

monitoring was conducted on a six-monthly basis and noise impacts were assessed for the following periods:

- Day:
  - 7 am to 6 pm Monday to Saturday
  - 8 am to 6 pm Sundays and public holidays
- Evening:
  - 6 pm to 10 pm
- Night:
  - 10 pm to 7 am Monday to Saturday
  - 10 pm to 8 am Sundays and public holidays

From the 27 August 2021 onwards, attended noise monitoring was conducted every month at three locations (NM1 to NM3) in accordance with the NBMP. An additional location (NM4) was added in September 2021 due to the requirements of the updated Environment Protection Licence. Noise impacts were assessed each month over three consecutive operating days for a minimum of 1.5 hours during the day, 30 minutes during the evening and 1 hour during the night.

Results for the reporting period are summarised in **Table 19 to Table 22** in **Appendix 3**.

Approval criteria was not exceeded for any noise monitoring parameter at any location during the reporting period. Noise generated by the site alone was consistently inaudible and or too low to be measured. This is below the EIS predictions but was expected given the limited operational activity being undertaken. Similarly, cumulative noise impacts were significantly below the approval criteria. Maximum noise levels from the site are compared to maximum noise levels recorded over the previous seven years in **Figure 25** in **Appendix 3**. Results show that there has been a reduction in noise levels since mining operations ceased in late 2016.

The noise model used for the noise assessment in the Maxwell UG Project EIS was validated for the reporting period by an acoustic consultant, as best as possible given the non-operational status of the mine, by comparing actual attended noise monitoring data in the reporting period with the predictions made in the noise model.

### **Proposed Improvements**

In accordance with the NBMP, the real-time noise monitoring data will be calibrated with the attended noise monitoring data during the next reporting period.

## **7.3 Blasting**

### **Management**

Potential blast impacts from the site are managed in accordance with the NBMP for the Maxwell UG Project. This plan was approved by DPE on 27 August 2021 and supersedes the Blast Management Plan for the Maxwell Infrastructure site. The purpose of the NBMP is to detail statutory requirements and outline the controls to be implemented for the management of blasts associated with the site.

Currently no permanent blast monitors are installed, as blasting ceased on site following the completion of open cut mining activities in October 2016. In the event surface construction blasting is conducted for the Maxwell UG Project, temporary blast monitors will be installed to measure and electronically record airblast overpressure and ground vibration. Construction blasts will be monitored in accordance with *AS 2187.2 – 2006 and ANZEC Guidelines*.

### **Performance**

No blasting was undertaken during the reporting period.

## Proposed Improvements

There are no improvements identified for the next reporting period.

## 7.4 Air Quality

### Management

Potential air quality impacts from the site are managed in accordance with the Air Quality and Greenhouse Gas Management Plan (AQGHGMP) for the Maxwell UG Project. This plan was approved by DPE on 25 May 2021 and supersedes the AQGHGMP for the Maxwell Infrastructure site. The purpose of the AQGHGMP is to detail statutory requirements and outline the controls to be implemented for the management of air quality associated with the site.

The air quality management system includes a comprehensive set of both proactive and reactive control measures and monitoring tools to maintain compliance with the air quality criteria for particulate matter less than 10 µm (PM<sub>10</sub>) and particulate matter less than 2.5 µm (PM<sub>2.5</sub>). These measures and tools are designed to minimise the potential for generation of wind-blown dust from disturbed surfaces and mining activities, and to enable effective control of episodic dust events. In accordance with the AQGHGMP, a combination of depositional dust gauges, E-Samplers and tapered element oscillating microbalance (TEOM) monitors were used for the site during the reporting period to:

- monitor air quality surrounding the site;
- assist in air quality management; and
- assess compliance to air quality impact limits specified by approval conditions.

### Performance

A summary of air quality monitoring results during the reporting period are presented below including an assessment of compliance to approval criteria, a comparison to predictions made in the Maxwell UG Project EIS and consideration of long-term trends.

#### Total Suspended Particulates (TSP)

In accordance with the AQGHGMP, TSP levels were calculated during the reporting period based on PM<sub>10</sub> results recorded at the TEOM monitor. As shown in **Table 8**, the annual TSP level was lower than the impact assessment criterion and the highest maximum EIS prediction for year 1 of operations.

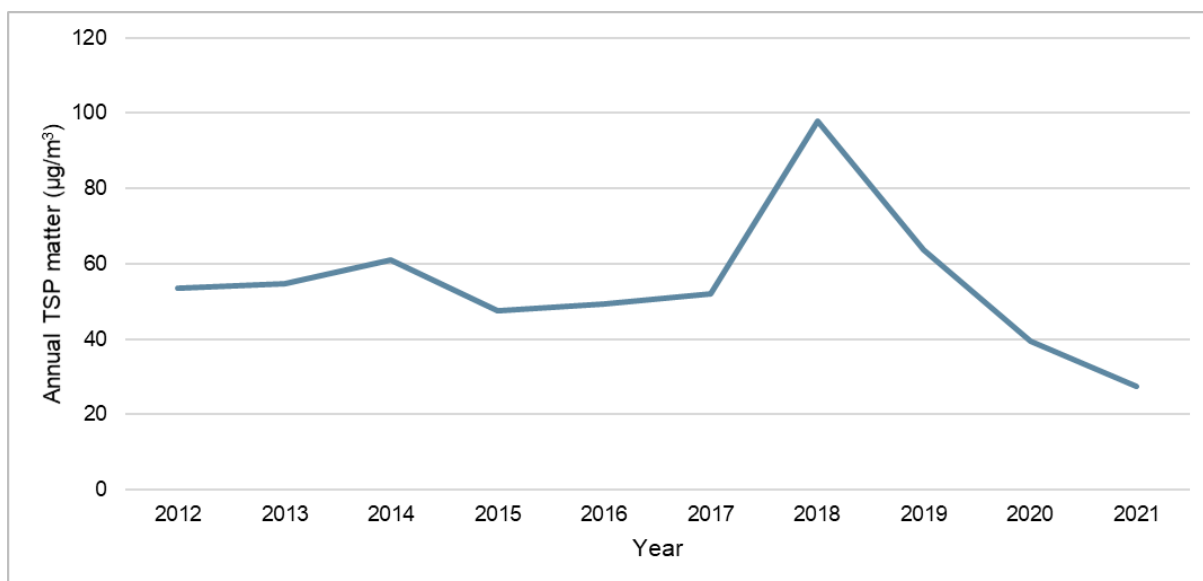
**Table 8. Monitoring summary – TSP (µg/m<sup>3</sup>)**

Monitor	Averaging period	Approval criterion	Highest maximum EIS year 1 prediction	Current reporting period result (2021)
TEOM-1	Annual	90	42.1	27.5
TEOM-2	Annual		36.3	*

Note: \* Monitoring commenced at TEOM-2 on 12 December 2021 hence an annual average is not applicable for 2021.

The long-term trend for the annual TSP level, over a 10-year period, is shown in **Figure 8**. The data shows a significant reduction from 2019 which is likely attributed to the higher-than-average rainfall received during 2020 and 2021 across regional NSW in addition to the cessation of widespread bushfires in 2019–20.

The TSP result recorded in 2018 was particularly high. An investigation at the time into the 2018 result found the elevated levels were being influenced by a lessee feeding cattle in an exposed area immediately adjacent to the monitor and were not attributable to impacts from the site nor indicative of regional conditions.



**Figure 8. Long-term results for TSP calculated from PM<sub>10</sub> results at TEOM-1**

*Notes: Following investigations, it was determined that the elevated 2018 result was not attributable to impacts from the Maxwell Infrastructure site.*

### PM<sub>10</sub>

As shown in **Table 9**, the annual PM<sub>10</sub> level remained below the annual impact assessment criterion and the EIS prediction for year 1 of operations.

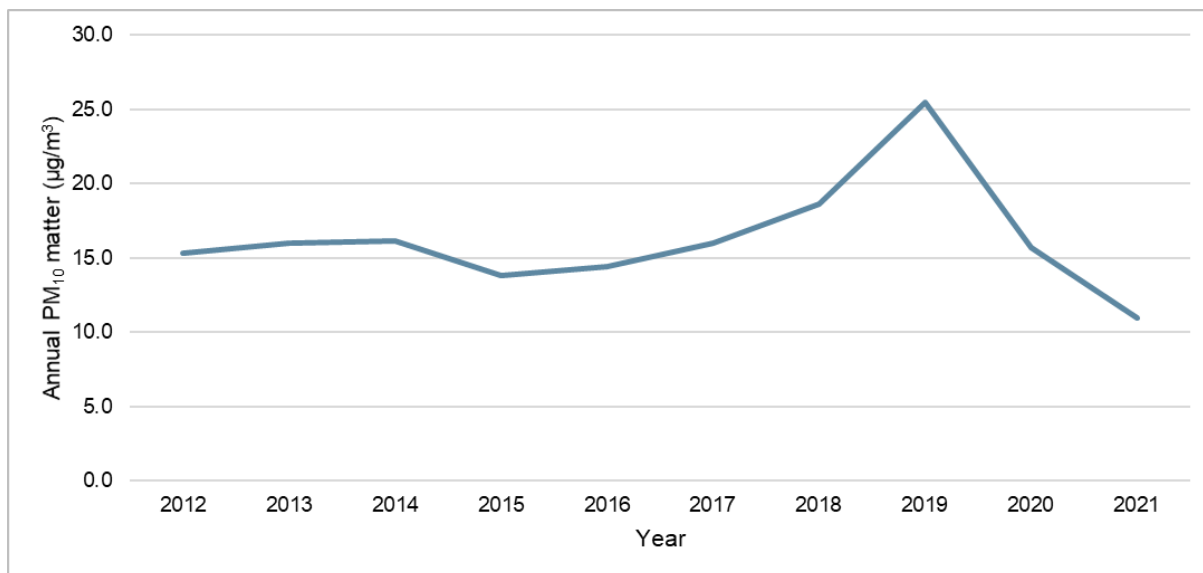
PM<sub>10</sub> levels, as shown in **Figure 9**, are currently trending downwards. This reflects the end of the extended drought in NSW following higher than average rainfall during 2020 and 2021 in combination with the end of the catastrophic bushfires of 2019–20. PM<sub>10</sub> levels monitored by the UHAQMN have shown a similar trend across the region since 2015.

**Table 9. Monitoring summary – PM<sub>10</sub> matter (µg/m<sup>3</sup>)**

Monitor	Averaging period	Approval criterion	Highest maximum EIS year 1 prediction	Current reporting period result (2021)
TEOM-1	Annual	25	17.5	11.0
TEOM-2	Annual		13.0	*

*Notes: \* Monitoring commenced at TEOM-2 on 12 December 2021 hence an annual average is not applicable for 2021.*

All 24-hour PM<sub>10</sub> levels for the reporting period are presented in **Appendix 4**. The 24-hour criterion of 50 micrograms per cubic metre (µg/m<sup>3</sup>) was not exceeded on any day during the reporting period.



**Figure 9. Long-term results for PM<sub>10</sub> at TEOM-1**

### PM<sub>2.5</sub>

As shown in **Table 10**, the annual PM<sub>2.5</sub> level remained below the annual impact assessment criterion and the EIS prediction for year 1 of operations.

Monitoring of PM<sub>2.5</sub> commenced at TEOM-1 on 9 March 2021 and at TEOM-2 on 12 December 2021. Hence there is an insufficient long-term data record to describe trends. However historical concentrations are judged likely to exhibit similar trends to the other airborne particulate fractions and to that recorded by the UHAQMN.

**Table 10. Monitoring summary – PM<sub>2.5</sub> matter (µg/m<sup>3</sup>)**

Monitor	Averaging period	Approval criterion	Highest maximum EIS year 1 prediction	Current reporting period result (2021)
TEOM-1	Annual	8	5.3	4.35 <sup>a</sup>
TEOM-2	Annual		4.9	*

Notes:

<sup>a</sup> Monitoring of PM<sub>2.5</sub> commenced at TEOM-1 on 9 March 2021 and hence the result presented is the long-term average from 9 March to 31 December 2021.

\* Monitoring commenced at TEOM-2 on 12 December 2021 hence calculating an annual average is not statistically valid for 2021.

All 24-hour PM<sub>2.5</sub> levels for the reporting period are presented in **Appendix 4**. The 24-hour criterion of 8 micrograms per cubic metre (µg/m<sup>3</sup>) was not exceeded on any day during the reporting period.

### Deposited Dust

Deposited dust results were significantly less than the impact assessment criteria for both the maximum increase in dust level and maximum total deposited dust. This can be seen in the summary of results presented in **Table 11** and **Table 12**.

However, **Table 12** shows that annual average deposited dust results were higher during the reporting period than the EIS predictions for year 1 of operations. As construction has not commenced these results are unlikely to be influenced by operational activities at the Maxwell UG Project.



The long-term trend in annual average deposited dust levels is shown in **Figure 10**. Like other air quality parameters, deposited dust has been trending down since 2018 consistent with drought conditions and not attributable to impacts from the Maxwell UG Project, as activities have decreased significantly since open cut mining ceased in October 2016.

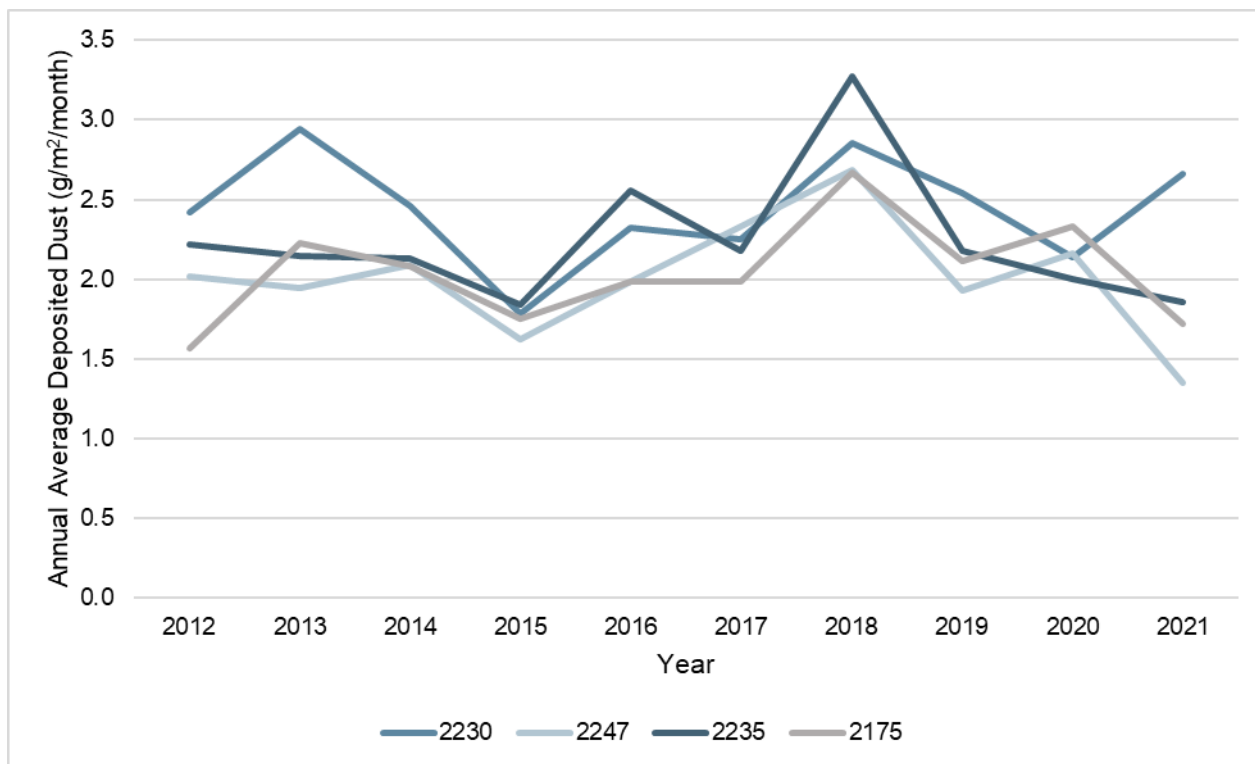
Results for 2019 to 2021 show a reduction in deposited dust levels. The exception is for site 2230 in 2021, for which the annual mean is heavily influenced by one result in July 2021 (11.8 g/m<sup>2</sup>/month). Sampling notes from July 2021 indicate that this was a contaminated sample (contamination can include soil deposited by birds). Without this result, the annual mean would be 1.8 g/m<sup>2</sup>/month.

**Table 11. Monitoring summary – incremental deposited dust (g/m<sup>2</sup>/month)**

Monitor	Averaging period	Approval criterion	Previous reporting period result (2020)	Current reporting period result (2021)
2230	Annual	2	0.0	0.1
2247			-0.1	0.0
2235			0.1	0.0
2175			-0.1	0.0

**Table 12. Monitoring summary - total deposited dust (g/m<sup>2</sup>/month)**

Monitor	Averaging period	Approval criterion	EIS year 1 prediction	Current reporting period result (2021)
2230	Annual	4	1.6	2.7
2247			1.7	2.2
2235			1.7	2.0
2175			1.7	2.3



**Figure 10. Long-term results for deposited dust**

### Proposed Improvements

There are no improvements identified for the next reporting period.

## 7.5 Aboriginal Cultural Heritage

### Management

Aboriginal cultural heritage at the Maxwell UG Project is managed in accordance with the Aboriginal Cultural Heritage Management Plan (ACHMP). This plan was approved by DPE on 1 June 2021, and supersedes the ACHMP for the Maxwell Infrastructure site. The purpose of the ACHMP is to detail the statutory requirements and provide a framework for the management of Aboriginal cultural heritage associated with the site and accompanying offset areas.

### Performance

The Aboriginal Cultural Heritage Assessment for the Maxwell UG Project EIS identified 39 open artefact sites (i.e., isolated artefact or artefact scatters containing Aboriginal objects) that would be wholly or partially impacted within the surface development area.

A surface collection of the 39 open artefact sites was undertaken by archaeologists and registered Aboriginal parties during the reporting period. Recorded locations for all 39 previously identified surface artefact 'loci' were visited during the surface collection. All exposed ground surfaces at and immediately surrounding these locations were inspected for surface artefacts, with existing GPS data, 'loci' photographs and descriptions used as locational guides where necessary. All definite and potential cultural lithic items identified as a result of these inspections were collected.

Approximately 500 lithic items were recovered as part of the surface collection. Artefacts were recovered from 27 of the 39 sites, with artefacts unable to be recovered from 12 sites due to thick vegetation cover obscuring the ground surface. Of those unable to be located, five comprised isolated artefact sites and seven were low density artefact scatters.

Notwithstanding the above, a significantly larger number of lithics were recovered during the surface collection than were recorded during the original site recordings.

Maxwell's site database was updated to reflect the surface collection and Aboriginal Site Impact Recording forms were prepared and submitted to the Aboriginal Heritage Information Management System registrar for all salvaged sites.

### **Proposed Improvements**

Further surface collection will be undertaken within the MOD1 disturbance areas during the next reporting period. The collection will be undertaken in accordance with the ACHMP.

## **7.6 Non-Aboriginal Heritage**

### **Management**

The land that comprises the Maxwell UG Project and surrounds has primarily been used for pastoral activities since the early period of European settlement. The land within the Maxwell Infrastructure site was part of the historic Edinglassie Estate and originally part of Pringle's Station, owned by Robert Pringle and James White in 1839. The majority of the underground area was originally part of the historic Plashett Estate, with a small part to the east forming part of the historic Bowfield Estate. An Historic Heritage Assessment was undertaken for the Maxwell UG Project EIS. The assessment noted that no items listed on local, regional, State or national historic registers are located within the site boundary.

### **Performance**

The Maxwell UG Project will not result in any material adverse impacts on any non-Aboriginal heritage places and as such no specific measures are required to manage or mitigate any impacts.

### **Proposed Improvements**

There are no improvements identified for the next reporting period.

## **7.7 Transport**

### **Management**

Coal transportation activities were not undertaken during the reporting period. First and second workings have not commenced under SSD 9526 and coal transportation activities are not permissible under development consent PA 06\_0202. The rail loop remains under care and maintenance and relevant conditions of approval remain in place. This includes:

- reporting requirements;
- communications with Mt Arthur Coal on the rail loop and Antiene rail spur; and
- the continuation of the Joint Community Consultative Committee (CCC) with Mt Arthur Coal.

### **Performance**

The Maxwell site rail loop was used for the temporary stowage of empty rolling stock by Aurizon Operations Ltd. The number of train movements and the date and time of each train movement is provided in **Appendix 5**.

A number of activities associated with development consent DA 106-04-00 were undertaken during the reporting period including:

- Rock cutting stabilisation works including installation of rock bolts, removal of unstable debris and vegetation.

- Assessment of bare and eroding cutting faces, including soil substrate material assessments, vegetation design, seed mix and application methods. These areas were revegetated.
- Various maintenance activities including clearing of outlets, welded track stability, track grinding, vegetation clearing along track lines and cuttings, replacement of left hand switch and stockrail, testing, condition assessments and inspections.

### **Proposed Improvements**

Preventative maintenance work on sections of the Antiene Rail Spur, including rail grinding, condition assessments, inspections and testing will be undertaken during the next reporting period.

## **7.8 Visual Impact**

### **Management**

Potential visual impacts from the site are managed in accordance with the Visual Impact Management Plan (VIMP) for the Maxwell UG Project. This plan was approved by DPE on 25 May 2021 and details the statutory requirements and controls to be implemented for the management of visual amenity associated with the site. A Landscape and Visual Impact Assessment was undertaken for the Maxwell UG Project EIS and found that the site will have inherently low visual impacts because the mining operation is underground and the MEA is located in a natural valley.

The MEA tree screen (planted in 2019 along ridge lines and contours to the west of the MEA) is monitored on an annual basis for at least the first five years after installation. The inspection requires monitoring to ensure the planted trees are establishing to become self-sustaining. The inspection includes as a minimum, an assessment of the survival rate, tree height, tree width and to identify any impacts from weeds, feral animals or grazing.

Once the tree screen has been established (i.e. five years after planting), annual monitoring will be undertaken to measure the visual impact and determine the effectiveness of the tree screen from representative viewing locations.

### **Performance**

The 2019 tree planting areas were inspected during the reporting period. The inspection found the thinning of areas where plants had perished due to weather conditions, grazing by kangaroos and the height of the surrounding native grasses impacting establishment. The survival rates were varied and ranged from 11 to 72 per cent across the various areas however the overall tree growth was good with several trees being recorded at a height above 2 metres.

Subsequently, infill planting of a further 520 tube stock was undertaken during the reporting period, including incorporation of a growth promoting compound and watering in once planted. Follow up watering was conducted to assist with establishment. A summary of the monitoring results are provided in **Appendix 6**.

Favourable weather conditions during the reporting period have improved vegetation growth and coverage, therefore over time it is expected that this area will improve the visual amenity to complement the natural landscape.

### **Proposed Improvements**

Proposed improvements to the management of visual impacts for the next reporting period include:

- Additional infill planting at the MEA tree planting area with tube stock during the optimal planting periods; and
- A reduction of pest animals within the area prior to planting.

## 7.9 Greenhouse Gas and Energy Efficiency

### Management

Greenhouse gas (GHG) and energy efficiency for the site are managed in accordance with the AQQHGMP for the Maxwell UG Project. This plan was approved by DPE on 25 May 2021 and supersedes the AQQHGMP for the Maxwell Infrastructure site. GHG emissions attributable to the Maxwell UG Project, including emissions from fuel and energy consumption, are regularly quantified. This information is then used to manage GHG emissions and energy consumption to the minimum practicable level.

### Performance

Annual estimations of GHG emissions and energy use at the Maxwell UG Project are calculated over financial years (FY), in line with National GHG and Energy Reporting (NGER) obligations.

GHG emissions and energy consumption were below NGER thresholds for the FY21 period. Approximately 3,076 gigajoules (GJ) of energy was consumed during FY21 and approximately 587 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-e) were emitted from site activities. Of the total, 48 tCO<sub>2</sub>-e were scope one emissions and 540 tCO<sub>2</sub>-e were scope two emissions.

Scope one emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at site. Scope two emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity.

GHG emissions in FY21 were significantly lower than the annual average predicted scope one and two emissions of 410,000 tCO<sub>2</sub>-e per year across all years of operations in the EIS. This is as expected, as this prediction was based on fuel and energy demands of an active mine and included fugitive emissions from coal mining.

As shown in **Figure 11**, GHG emissions and energy use decreased substantially following the cessation of open cut mining during FY17. In FY21, GHG emissions and energy consumption were lower than FY20 reflecting lower diesel usage associated with a lower movement of material to achieve final landforms.

### Proposed Improvements

There are no improvements identified for the next reporting period.

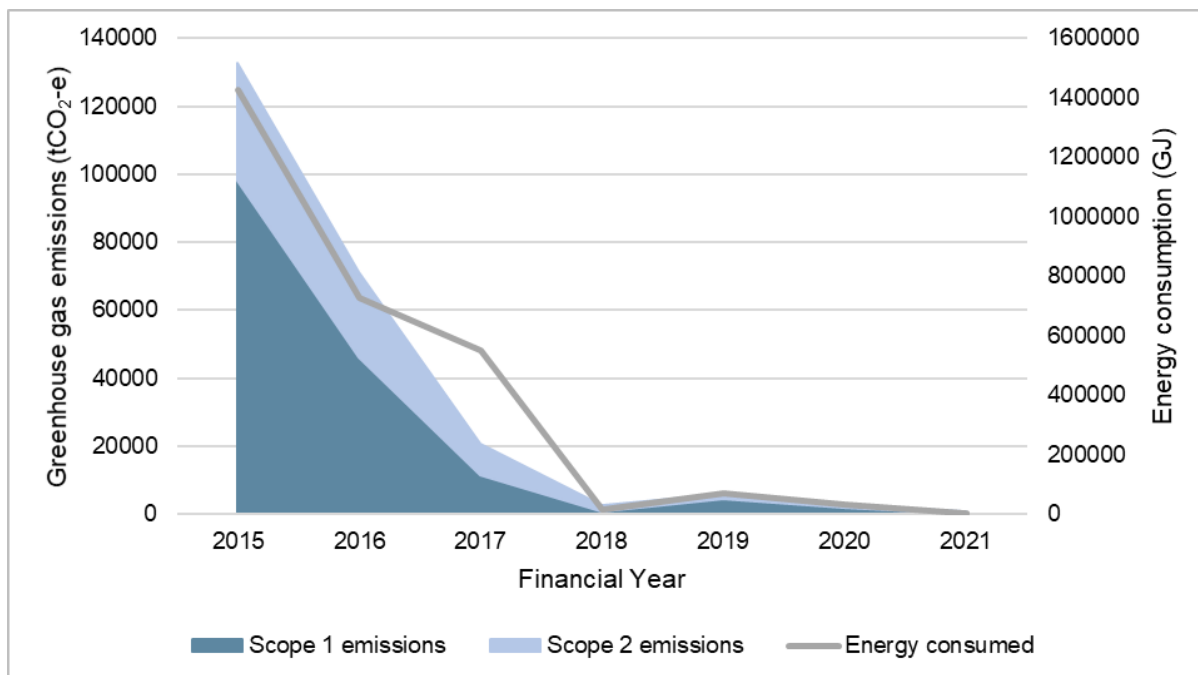


Figure 11. Long-term greenhouse gas emissions and energy consumption

## 7.10 Waste

### Management

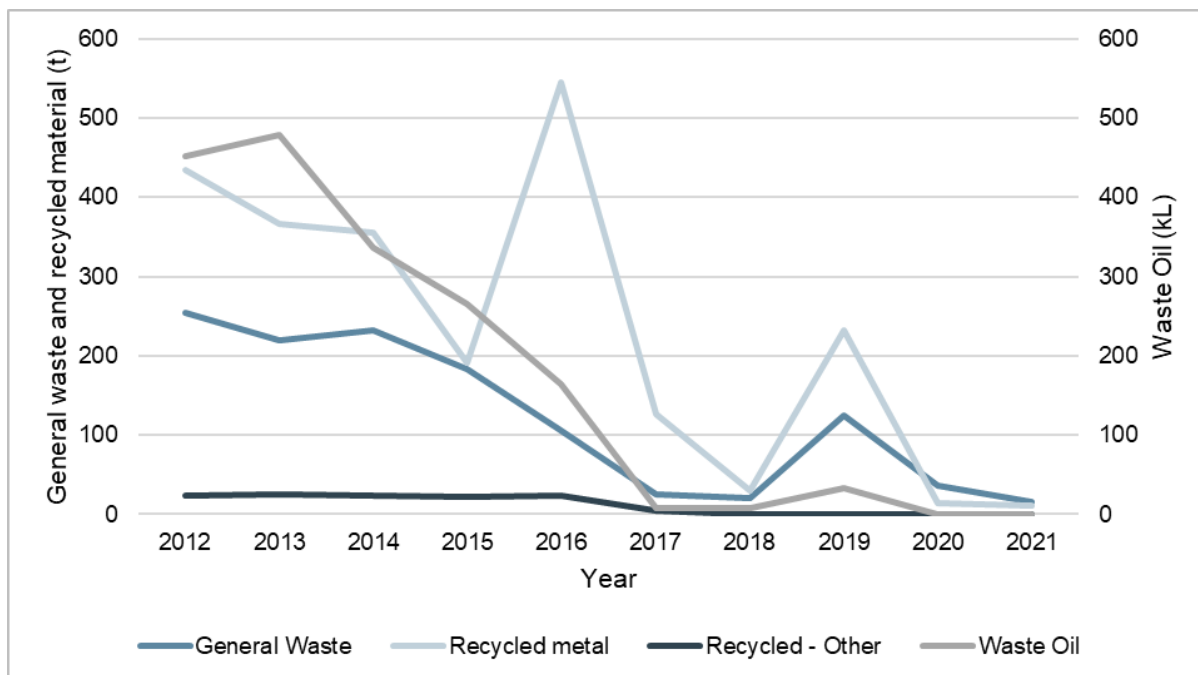
Waste is managed at the Maxwell UG Project in accordance with the Waste Management Plan. Where appropriate, spent resources are reused or recycled in preference to being disposed of as waste. During the reporting period, the focus for waste management was on removing unused resources, particularly around infrastructure areas and recycling materials where possible.

### Performance

Waste and recycling streams are monitored on a monthly basis. Quantities of the major waste and recycling streams over the past 10 years are shown in **Figure 12**. This comparison shows that waste significantly reduced with the cessation of open cut mining in late 2016. This is commensurate with the reduction in resource use associated with the reduced operational activity at the site. During this reporting period, there was a decrease in waste disposed compared to the previous reporting period. This was due to a focus in FY19 on removing unused resources on site. Due to improved waste management practices the proportion of general waste diverted from landfill to recycling increased relative to the previous reporting year. In addition, an initiative to realise the value of cans and bottles via the NSW container deposit scheme Return and Earn resulted in contributions to a local charity.

No predictions were made in the EIS in relation to waste quantities.

The Maxwell UG Project has an existing sewage treatment plant (STP) for effluent generated on-site. This is located at the Maxwell Infrastructure site. From the STP, treated effluent is pumped to settlement ponds. Previously, overflow from the ponds was applied to land. However, due to the low number of people on site and reduced volume of effluent, the treated effluent now evaporates from the first pond.



**Figure 12. Long-term waste stream quantities**

A small amount of Mixed Waste Organic Outputs (MWOO) is stockpiled at the Maxwell Infrastructure site. MWOO was previously used for rehabilitation activities until in October 2018, the NSW Environment Protection Authority (EPA) revoked all general and specific resource recovery orders and exemptions for the application of MWOO to land. An amendment was made by the EPA to the *Protection of the Environment Operations (Waste) Regulation* in October 2020 to allow prescribed premises to dispose of (i.e. bury) MWOO on site subject to conditions of the regulation. Maxwell is proposing to dispose of the stockpiled MWOO during the next reporting period, once construction activities commence for the Maxwell UG Project.

### Proposed Improvements

There are no improvements identified for the next reporting period.

## 7.11 Contaminated Land

### Management

Contaminated land is managed in accordance with the Contaminated Materials Protocol (CMP) for the Maxwell UG Project. This plan was approved by DPE on 30 June 2021. The purpose of the CMP is to describe the procedures to be implemented in the event that potentially contaminated material is identified during construction, and to outline the measures to ensure compliance with the requirements of SafeWork NSW and relevant guidelines.

### Performance

No new areas of contaminated land were identified during the reporting period.

Maxwell Infrastructure also maintains a bioremediation area for the remediation of material contaminated by hydrocarbons. Sediment from the workshop drain and the wash pad sump was added to the bioremediation area in February 2021. In August 2021 all cells within the bioremediation area were turned-over using an excavator and ameliorants were added to the material to assist in the bioremediation process. No material was removed from the bioremediation area during the reporting period.



## Proposed Improvements

There are no improvements identified for the next reporting period.

### 7.12 Bushfire

#### Management

Potential bushfire impacts from the site are managed in accordance with the Bushfire Management Plan for the Maxwell UG Project. This plan was prepared in consultation with the Rural Fire Service. The purpose of the Bushfire Management Plan is to detail statutory requirements and outline the controls to be implemented to manage bushfires on the site.

Where possible a minimum 10 m Asset Protection Zone (APZ) is provided around all key infrastructure and along boundary fences (within approved disturbance areas) to act as a fire break. The vegetation in APZs is limited to grass that is mowed on a regular basis. Non-operational grassed areas are also mowed and/or grazed to reduce fuel loads. Access tracks that can be used as fire trails are monitored annually in August to assess if there are sufficient tracks for fire-fighting access and if tracks require maintenance.

Fire-fighting equipment is available on site and is available for use in the event of a bushfire. The equipment includes a fire trailer, mine site water cart, fire hose reels and pumps, fire extinguishers on a mobile plant and light vehicles.

#### Performance

There were no bushfires recorded at the Maxwell UG Project during the reporting period.

Vegetation was maintained during the reporting period to minimise the risk of bushfire occurring. All equipment was serviced and maintained in accordance with the relevant Australian Standards. Inspection and testing was performed by on-site personnel and appropriate service providers according to the electrical and mechanical maintenance management plans. Hand-held fire extinguishers were inspected by on-site trained personnel and maintained by an external fire service provider.

## Proposed Improvements

Annual inspection of the access tracks will commence during the next reporting period.

### 7.13 Spontaneous Combustion

#### Management

Potential spontaneous combustion at the site is managed in accordance with the Spontaneous Combustion Management Plan (SCMP) for the Maxwell UG Project. This plan was approved by DPE on 17 June 2021 and supersedes the SCMP for the Maxwell Infrastructure site. The purpose of the SCMP is to detail statutory requirements and outline the controls to be implemented for the management of spontaneous combustion associated with the site. The management of spontaneous combustion is focused on the monitoring of previously capped areas along with the capping of any new outbreaks.

Along with regular inspections conducted as part of the general site activities, formal monthly spontaneous combustion inspections are conducted. A thermal imaging camera is utilised to assist the identification of areas where ground surface temperatures are above background levels. The surface area exhibiting smoke or steam emissions is estimated for each detected outbreak. In addition, an annual aerial survey using a fixed wing aircraft fitted with infrared detection is used to identify the presence of hot spots on a site-wide basis. This survey was conducted in July 2021.

Spontaneous combustion monitoring supports the planning of activities to prevent and remediate spontaneous combustion outbreaks. These management activities include reprofiling, track rolling and the application of inert capping.

## Performance

Spontaneous combustion locations are categorised in accordance with the following intensity criteria:

- Minor - visible steam or smoke exists, however, the area affected is 200 m<sup>2</sup> or less.
- Moderate - exhibiting continuous visible smoke or steam and / or has an area of greater than 200 m<sup>2</sup>.
- Major - exhibiting naked flames, regardless of the area affected.

As shown in **Table 13**, all spontaneous combustion outbreaks identified during the reporting period were inactive or of a minor intensity. All locations continue to be monitored. As shown in **Table 13**, approximately 55 square metres (m<sup>2</sup>) was estimated to be affected by spontaneous combustion outbreaks across the site at the end of the reporting period. This is less than previous years and reflects the extensive preventative and remedial works undertaken over the past number of years. The annual aerial infrared survey in July 2021 allowed confirmation of the success of mitigation works to date in addition to informing planning for future activity.

**Table 13. Long-term area affected by spontaneous combustion**

Year	Area Affected (m <sup>2</sup> )
2010	1,170
2011	1,070
2012	1,160
2013	1,180
2014	810
2015	870
2016	810
2017	1,150
2018	1,170
2019	320
2020	50
2021	55

## Proposed Improvements

There are no improvements identified for the next reporting period.



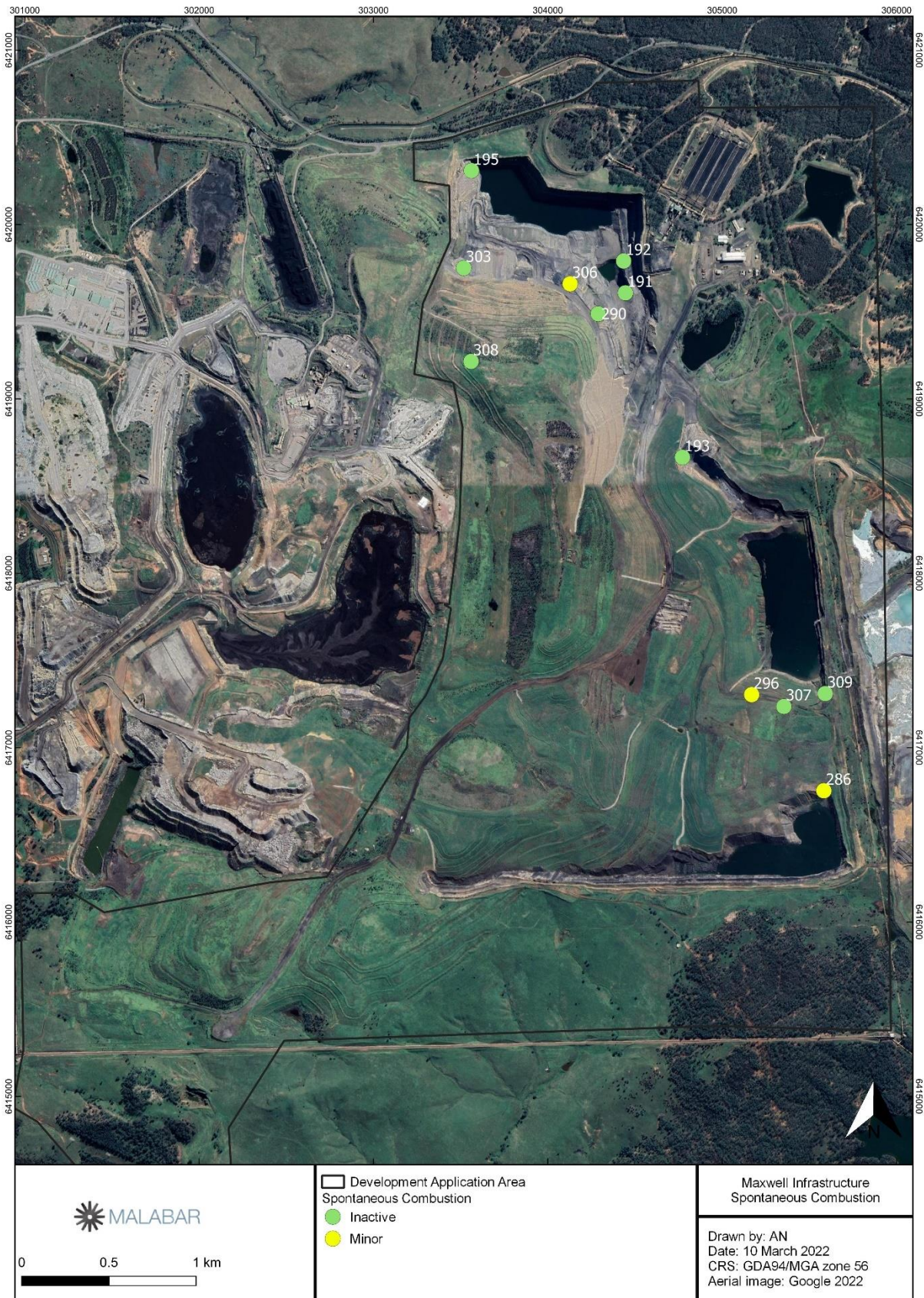


Figure 13. Locations affected by spontaneous combustion at the end of the reporting period



## 7.14 Biodiversity

### Management

Biodiversity at the Maxwell UG Project is managed in accordance with the Biodiversity Management Plan (BMP) and Mining Operations Plan. The BMP was approved by DPE on 20 September 2021 and supersedes the Rehabilitation and Offset Management Plan and Fauna Management Plan for the Maxwell Infrastructure site. The purpose of the BMP is to detail statutory requirements and to outline the short, medium and long-term management measures for vegetation and fauna habitat within:

- the Drayton Wildlife Refuge, Northern Offset Area and Southern Offset Area (jointly referred to as the Maxwell Infrastructure Biodiversity Offset Areas) required under Schedule 2, Conditions B45 and B46 of Development Consent SSD 9526;
- the approved disturbance areas in accordance with Schedule 2, Condition A12 of Development Consent SSD 9526; and
- remnant vegetation and fauna habitat in areas not likely to be impacted by the project.

Routine ecological monitoring is conducted across the Maxwell UG Project including the Maxwell Infrastructure offset areas and rehabilitated lands. The ecological monitoring program was streamlined in 2018 as some sites were replicates located in discrete locations and non-target vegetation types. The streamlined monitoring program maintains the spatial distribution required to provide representative data.

Monitoring sites are located within woodland rehabilitation, pasture rehabilitation and offset areas. Sites located in offset areas are used as a reference site to measure remanent vegetation and fauna habitat in areas not likely to be impacted by mining, these sites are referenced against the woodland rehabilitation, to provide ecological targets for ecosystem integrity and species diversity. Monitoring is undertaken annually, with each site monitored every second year.

### Biodiversity Credits

Maxwell has prepared a draft Biodiversity Stewardship Application for a land based offset property. The proposed offset property provides sufficient credits to satisfy the biodiversity credit requirements in Conditions B47 and B48 of Development Consent SSD 9526. Maxwell held a meeting with the NSW Biodiversity Conservation Trust (BCT) on 27 July 2021. At the meeting, BCT advised that initial review of the draft application would take two weeks and the full assessment of the application would take approximately six months. As such, Maxwell requested a revised timeframe for retiring biodiversity credits to 30 June 2022. This request was approved by DPE on 2 September 2021. A draft Maxwell Biodiversity Stewardship Site Assessment Report and associated documents were submitted to BCT on 1 September 2021. Pre-submission feedback on the application was provided back to Maxwell on 23 November 2021. Maxwell will resubmit the application during the next reporting period.

In accordance with Condition B49 of Development Consent SSD 9526, Maxwell commissioned additional flora surveys and an expert report to demonstrate a reduction in credits. The supplementary surveys did not identify any of the target species within the Maxwell UG Project areas, supporting the survey outcomes described in the Biodiversity Assessment Report (Hunter Eco, 2019). In addition, the expert report also concluded that *Diuris tricolor*, *Prasophyllum petilum* and *Pterostylis chaetophora* are unlikely to be present within the Maxwell UG Project areas. As such, Maxwell requested that the biodiversity credit requirements for *Diuris tricolor*, *Ozothamnus tessellatus*, *Prasophyllum petilum*, *Pterostylis chaetophora* and *Thesium australe* be reduced to zero as these species are not likely to be impacted by the Maxwell UG Project. DPE reviewed and approved the request to reduce biodiversity credit requirements to the following:

- The offset requirements for stage 1 and stage 2 for *Pterostylis chaetophora*, *Ozothamnus tessellatus* and *Thesium australe* are reduced to zero.
- The offset requirements for stage 1 for *Diuris tricolor* are changed from 1,474 credits to 5 credits, and for *Prasophyllum petilum* are changed from 1,114 credits to 6 credits.
- The offset requirements for stage 2 for *Diuris tricolor* and *Prasophyllum petilum* are reduced to zero.

## Performance

During the reporting period the following measures were implemented to improve biodiversity at the Maxwell Infrastructure site:

- regular walkover inspections of rehabilitation;
- tubestock infill planting within woodland vegetation communities;
- culling of kangaroos prior to infill planting to reduce grazing pressure on tubestock;
- continuation of the grazing trial on mine pasture rehabilitation;
- implementation of a targeted weed management program; and
- installation of nest boxes to improve fauna habitat in the woodland vegetation communities.

Ecological monitoring was undertaken during October to December 2021. Monitoring consisted of biometric vegetation sampling, Biodiversity Assessment Methodology (BAM) for remnant woodland reference sites and woodland rehabilitation areas, fauna monitoring, assessment of pest animals, topsoil assessment of monitoring sites, and comparison against the Ecosystem and land use establishment phase performance indicators and completion criteria.

The Mining Operations Plan (MOP) defines rehabilitation into primary and secondary domains, the primary domains are based on land management units with unique operational and functional purposes whereas the secondary domains are defined on land management units with a similar post mining land use objective. The rehabilitation phases within each domain show the progress towards the post mining land use goals. All areas of existing pasture and woodland rehabilitation are currently within the ecosystem and land use establishment phase. The MOP term will focus on enhancing this rehabilitation phase objectives and completion Criteria. The monitoring results in comparison to the ecosystem and land use establishment phase completion criteria are detailed in **Table 24** to **Table 26** in **Appendix 7**.

## Biometric Vegetation Sampling

Biometric vegetation sampling was undertaken on ten reference and woodland rehabilitation sites. Sites were representative of Ironbark-Spotted Gum-Grey Box Woodland, Narrow-leaved Ironbark Woodland and Forest Red Gum Woodland.

Results showed the reference sites were in good condition and naturally self-sustaining with no direct impact from past mining activities or recent site changes. The reference sites show no evidence of die back or disease, with weed management practices during the previous reporting period having a positive impact with generally low weed cover present. General enhancement of these areas will likely continue to occur naturally with the additional application of weed control when required.

The woodland rehabilitation sites showed varying results, as most sites are in early ecosystem establishment phase. These sites recorded lower values in comparison to the reference sites when assessing the number of trees with hollows, total length of fallen logs, regeneration of canopy species and native overstorey, midstory and ground covers. All of these units will increase in time as trees and other native vegetation mature with the application of required management actions such as weed control and enhancement plantings. Native ground cover species on rehabilitation sites is progressing well towards the

target reference sites, with improvements required in the Southern Offset area with weed management of exotic grasses, and replanting of canopy species to provide protection and resilience for successional lower stratum species. Of the 118 plant species that were recorded during surveys, 78 were local native species.

### **Biodiversity Assessment Methodology Sampling**

The BAM vegetation sampling was adopted during the 2021 ecological monitoring program to comply with the Biodiversity Management Plan. The BAM provides a direct comparison of sampling results based on attributes such as foliage cover, stem size, tree regeneration, length of logs and litter cover against a Plant Community Type benchmark database providing an Integrity score. The BAM sampling was undertaken at three woodland reference sites and four woodland rehabilitation sites.

Results indicate that the woodland reference sites scored an integrity score ranging between 54–75 indicating that these sites are achieving the benchmark conditions for the target Plant Community Type. The woodland rehabilitation sites scored lower at <22, these results are expected given the woodland rehabilitation areas are at early phase of ecosystem succession. Improvements to these ecosystems will establish in time, with the addition of weed management programs, an increase in fauna habitats and planting or seeding of native vegetation cover within the canopy, shrub and groundcover layers.

### **Fauna Monitoring**

Fauna monitoring occurred at six sites (four reference sites and two rehabilitation site) to determine the occurrence of terrestrial vertebrate animals, including bird, mammal, reptile and amphibian species.

There were sixty-seven fauna species recorded during the 2021 monitoring program, including forty-seven bird species, twenty mammal species, four reptile species and five amphibian species. A total of seven threatened species were recorded, with the Varied *Sitella* being a new record for the site.

Results indicate that species identified within the rehabilitation sites are within a comparable range of species identified at the reference sites, this shows that appropriate habitats and foraging resources are available within the rehabilitation areas.

### **Pest Animals**

The predominate pest species observed at site were kangaroos, they were noted to be over grazing rehabilitation areas and creating nesting beds under established trees and shrubs. Large numbers of kangaroos have the potential to impact regenerating flora species and establishment of new rehabilitation areas. The reduction in kangaroo numbers will be targeted prior to the Autumn and Spring tree planting campaigns, during the next reporting period.

### **Soil Assessment**

Topsoil samples at twenty-five monitoring sites were analysed in accordance with the MOP rehabilitation monitoring requirements, with results compared to DPI standards for the North Coast of NSW and the Environmental Analysis Laboratory.

The results of topsoil samples from reference sites show that the soils pH, Electrical Conductivity (EC), exchangeable sodium and phosphorus are in line with indicative guidelines, other analytes such as exchangeable calcium, magnesium and potassium are lower than guidelines and the carbon-nitrogen ratio and sulphur were generally higher than the guidelines.

The pasture rehabilitation topsoil analysis indicates that results are generally in line with indicative guidelines. The calcium-magnesium ratio is low and the carbon-nitrogen ratio is high however, these results will not restrict the growth of vegetation. The vegetation at these sites is in good condition.

The woodland rehabilitation sites topsoil analyses were in line with indicative guidelines, with no significant issues to be addressed. The sites are performing well ecologically with a stable ground cover.

**Closure Criteria**

As shown in **Table 24** in **Appendix 7** the regeneration of species from all structural layers was recorded at all biodiversity offset reference sites (including the Southern Offset area) monitored during the reporting period. The total cover of invasive weeds remained below the closure criteria in the Northern Offset, and Wildlife Refuge area, predominately due to weed control implemented during the reporting period. Invasive weeds remain moderate to high in the Southern Offset Area and the Northern rehabilitation areas, including woodland rehabilitation. An intensive weed control program was established focussing on all offset areas and mine rehabilitation during the reporting period. Work will continue in these areas during the next reporting period.

Woodland rehabilitation sites that were monitored during the reporting period are shown in **Table 26** in **Appendix 7**. Monitoring results indicate that the ground cover including foliage coverage and protection from erosion were trending towards the closure criteria. The native tree and shrub species require further management to assist with establishment.

The diversity of canopy and mid-storey species, particularly at the Southern Offset area and Northern rehabilitation area were not meeting the completion criteria targets mainly due to pest animals impacting on planting campaigns and weed infestations. To remediate this issue, further development of a canopy and mid-storey cover through infill planting, and appropriate weed control will occur during the next reporting period.

Pasture rehabilitation sites monitored during the reporting period are shown in **Table 25** in **Appendix 7**. The overall groundcover has established well with a suitable mix of perennial grasses, forbs and legume species. Ecological monitoring demonstrated good cover of perennial grass species in the Eastern rehabilitation area. All pasture rehabilitation sites are trending towards meeting the closure criteria for post mining land use for sustainable grazing.

**Proposed Improvements**

**Table 14** identifies the management measures planned for offset areas during the next reporting period. Measures planned for rehabilitation areas are discussed in **Section 9.3**.

**Table 14. Measures planned for offset areas in the next reporting period**

Location	Management measure
Drayton Wildlife Refuge	Weed control program targeting Prickly Pear.
Southern Offset Area	Weed control program targeted at Galenia and Golden Wreath Wattle.
Southern Offset Area	Infill planting where required.

**8 WATER MANAGEMENT**

**8.1 Water Take**

The Maxwell UG Project is not actively drawing water from any ground or surface water sources. Maxwell holds Water Access Licence (WAL) 41559 and WAL41491 for the passive intake of aquifer water associated with the mine excavation at the Maxwell Infrastructure site.

Although open cut mining has ceased, Maxwell UG Project EIS predicts that ground water will continue to flow into the mine voids until it stabilises. Predicted values in EIS have been



sourced from the Groundwater Impact Assessment within the Drayton Mine Extension Environmental Assessment.

**Table 15** shows the calculated passive water take in accordance with the conditions of WAL41559 and WAL41491. This estimated passive inflow was calculated by consultants specialising in water management and modelling. The inflow of 59 Megalitres (ML) estimated for the reporting period is less than the 985 ML per year (or 2.7 ML/day) that was predicted for year 10 of operations in the previous EA. It is also less than the total entitlement of 1,387 ML held under WAL41559 and WAL41491.

**Table 15. Water take July 2020 to June 2021 (WAL reporting period)**

Water Licence #	Water sharing plan, source and management zone	Entitlement (ML)	Passive take inflows (ML)	Active pumping (ML)	TOTAL (ML)
<b>WAL 41559</b>	Sharing Plan: North Coast Fractured and Porous Rock Groundwater Sources	985			
<b>WAL 41491</b>	Water Source: New England Fold Belt Coast Groundwater Source	402	424	0	424
<b>WAL 41234</b>	Sharing Plan: North Coast Fractured and Porous Rock Groundwater Sources 2016 Water Source: Sydney Basin-North Coast Groundwater Source	806	0	0	0
<b>WAL 43166</b>	Sharing Plan: North Coast Fractured and Porous Rock Groundwater Sources 2016 Water Source: Sydney Basin-North Coast Groundwater Source	28	0	0	0
<b>WAL 39739</b>	Sharing Plan: North Coast Fractured and Porous Rock Groundwater Sources 2016 Water Source: Sydney Basin-North Coast Groundwater Source	23	0	0	0
<b>WAL 43160</b>	Sharing Plan: Hunter Unregulated and	50	0	0	0

Water Licence #	Water sharing plan, source and management zone	Entitlement (ML)	Passive take inflows (ML)	Active pumping (ML)	TOTAL (ML)
	Alluvial Water Sources 2009 Water Source: Jerrys Water Source.				
<b>WAL 39792</b>	Sharing Plan: North Coast Fractured and Porous Rock Groundwater Sources 2016 Water Source: Sydney Basin-North Coast Groundwater Source	55	0	0	0

## 8.2 Water Consumption

During the reporting period, the site consumed approximately 1.1 ML of raw water from dams on site. This water was primarily used for vehicle and equipment wash-down. A total of 1.7 ML of potable water was also used in administration facilities for toilets, washing and consumption. A small quantity was also used to assist seedlings post-planting. In addition, 0.04 ML of water was delivered during the reporting period to tanks supplying cattle troughs.

As **Figure 14** shows, water consumption has reduced over the long-term, particularly since open cut mining ceased in 2016. The reduction in operational activity has decreased raw water demand and the reduction in the number of people on site has decreased demand for potable water.

Water stored on site increased from approximately 14,362 ML to 16,727 ML during the reporting period, indicating that water consumption was well within the limits required to maintain the site's closed raw water system, with no active intake or output of water. This is also demonstrated by the input-output statement of the water accounting framework in **Appendix 8**.

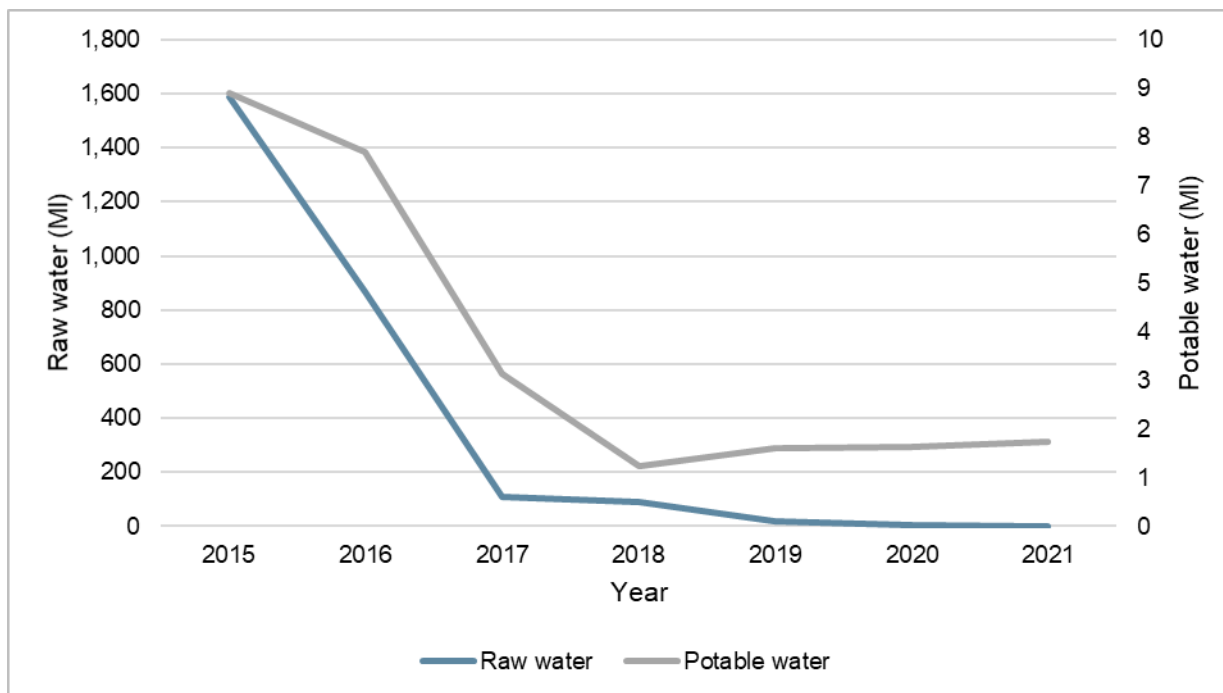


Figure 14. Long-term water consumption

### 8.3 Surface Water

#### Management

Surface water at the site is managed in accordance with the Water Management Plan (WMP) for the Maxwell UG Project. This plan was approved by DPE on 29 November 2021 and supersedes the WMP for the Maxwell Infrastructure site. The purpose of the WMP is to detail statutory requirements and outline the water management controls to be implemented for the site. This WMP includes the following sub-plans:

- Site Water Balance and Salt Balance
- Erosion and Sediment Control Plan
- Surface Water Management Plan.

The WMP includes quarterly water quality monitoring.

#### Performance

In accordance with the current WMP, the quality of surface water at Maxwell Underground is analysed quarterly and following rainfall events >25mm in a 24-hour period midnight to midnight. Average surface water quality results for the reporting period are provided in **Appendix 9. Surface Water Quality Results** along with a comparison to the average results recorded for the previous ten years.

Generally, results from mine water storage monitoring locations for all variables in the reporting period were lower than those recorded for 2020. This is likely due to the high rainfall during 2021 further diluting water storages and monitored variables. The exceptions to this were a small increase in the pH at the OPC dam, and of calcium and bicarbonate in the ES void. However the differences are small relative to and are within long term averages.

Some downstream surface water monitoring results exceeded the trigger values, which have been set using preliminary guideline values. Specifically:

- for field measurements of EC at sites W3, Saddlers D/S and SW1 in Q3 2021, of turbidity at MEA D/S in Q3 2021 and of EC at SW1 in Q4 2021; and
- for laboratory measurements of TSS at Saddlers U/S and TDS at W3 and SW1 in Q3 2021, of TSS at Saddlers D/S and SW1 and of TDS at SW1 in Q4 2021.

In accordance with the Surface Water Quality Trigger Action Response Plan monitoring will continue to enable the development of site-specific trigger values.

### **Proposed Improvements**

The access to some monitoring sites pose a safety risk after heavy rain; hence the locations of those sites will be reviewed during the next reporting period.

## **8.4 Stream Health**

### **Management**

Stream health impacts at the site are managed in accordance with the current WMP. This includes quarterly stream health monitoring at each of the three locations along Saddlers Creek.

The extent of riparian vegetation, the extent of erosion and sedimentation deposits and Swamp Oak health is used as an indicator of stream health and to provide supplementary information on potential geomorphic impacts to drainage lines. Monitoring is undertaken by taking photographs and recording observations at each site.

### **Performance**

The results of the stream health monitoring are shown in **Appendix 10**.

Changes since the commencement of monitoring in Q3 2020 reflect changes that can be expected following the end of the extended drought in 2020. The significantly higher rainfall has resulted in an increase in water levels, a general improvement in vegetation size and health including of weeds along the broader banks. Apart from an increase in pool depths, no changes have been observed in relation to the physical characteristics at all three monitoring locations.

## **8.5 Groundwater**

### **Management**

Groundwater at the site is managed in accordance with the WMP for the Maxwell UG Project. This plan was approved by DPE on 29 November 2021 and supersedes the WMP for the Maxwell Infrastructure site. The purpose of the WMP is to detail statutory requirements and outline the water management controls to be implemented for the site. This WMP includes the Groundwater Management Plan.

Maxwell committed to installing an additional groundwater monitoring bore within the Permian sequence south of the former pit batters and in the vicinity of Saltwater Creek. To meet this commitment Bore GW04 was installed in August 2021. Maxwell also committed to installing an additional shallow groundwater monitoring bore in a tributary of the vicinity of Saltwater Creek on EL5460. To meet this commitment bore MB03 was also installed in August 2021.

### **Performance**

#### **Groundwater Levels**

Groundwater levels, measured monthly (or twice daily where loggers are installed), have remained stable over the reporting period. The long-term groundwater levels at monitoring locations over the past 10 years is displayed in **Figure 15** to **Figure 18**. Groundwater levels in the Maxwell Infrastructure bores have remained relatively stable over the reporting period. There is some evidence that they are reacting to a slow recharge of groundwater following the end of the extended drought that occurred to 2020. Groundwater levels in the Maxwell Underground alluvial bores show that they are more reactive to rainfall than the deeper bores

and increases in water levels over the reporting period generally reflect the significantly higher than average rainfall in 2021.

The elevation of groundwater levels has also remained above the elevation of the water surface in the voids, indicating that there is likely to be an inflow of aquifer water into the voids as predicted in the EA and supported by the site water balance model discussed in **Section 8.1**.



Figure 15. Long-term groundwater levels – Maxwell Infrastructure

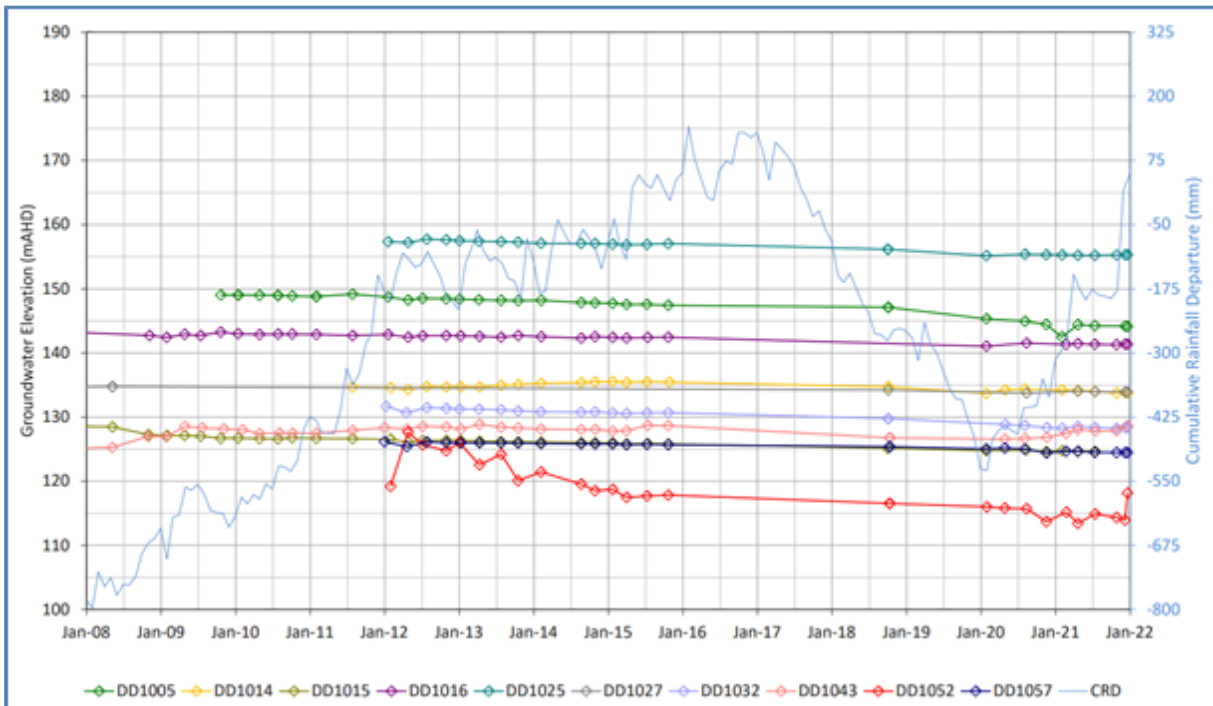


Figure 16. Long-term groundwater levels – Maxwell Underground – non-alluvial (generally deeper) bores



Figure 17. Long-term groundwater levels – Maxwell Underground – Hunter River Catchment bores

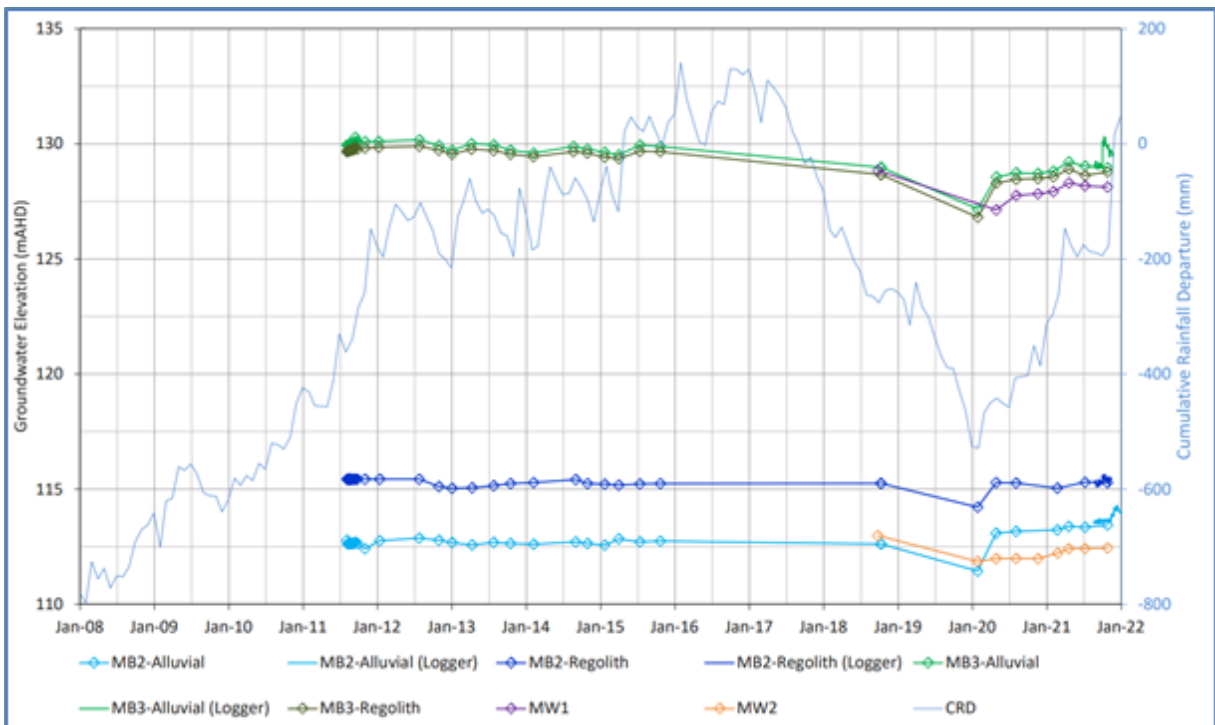


Figure 18. Long-term groundwater levels – Maxwell Underground – Saddlers Creek bores

### Groundwater Quality

The quality of groundwater at the site is analysed regularly in accordance with the current Groundwater Management Plan. Average groundwater quality results for the reporting period along with a comparison to average results recorded for the previous five years, where available, are provided in **Appendix 11**. Groundwater Results in the reporting period were generally consistent with those recorded previously.

**Proposed Improvements**

In accordance with the approved Groundwater Management Plan four new monitoring bores will be installed prior to second workings.



### 9.1 Management

Rehabilitation at the Maxwell UG Project is managed in accordance with the BMP and MOP. The BMP was approved by DPE on 20 September 2021 and supersedes the Rehabilitation and Offset Management Plan and Fauna Management Plan for the Maxwell Infrastructure site. The MOP was approved by the Resources on the 25 June 2021.

The post mining land use goal is to deliver a safe, stable, non-polluting and sustainable post-mining landform that is consistent with the surrounding natural topography. As an underground mine, the project would result in minimal changes to existing landforms. Consistent with previous approvals for the Maxwell Infrastructure site, the vision is to create a landscape with areas capable of productive land use, alongside woodland corridors to support biodiversity will be maintained.

In accordance with the Maxwell UG Project EIS the design and post-mining land use objectives for the site are as follows:

- Provide a landscape that is safe, stable and non-polluting.
- Minimise potential environmental impacts and liability arising from mine closure.
- Remove any waste or potentially hazardous materials from site.
- Minimise the potential impacts of decommissioning.
- Develop landforms that return land affected by mining to a condition that is suitable for a range of sustainable land uses.
- Create a stable post-mining landform that is compatible with the surrounding landscape, and that is capable of productive land use that achieves the nominated land capability.
- Establish vegetation that is self-sustaining, is perpetual and provides a sustainable habitat for local fauna and successive flora species.
- Create a post-mining landform that enhances the local and regional habitat corridors as presented in the *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales* (DMR, 1999).
- Develop land uses that benefit the future use of the site for the local community.
- Develop a landscape that reduces the requirement for long-term monitoring and management.

#### Mining Operations Plan

In September 2020, the Resources Regulator granted a further extension to extend the MOP term until 30 June 2021. This was done to allow a determination to be made on the Maxwell UG Project which would provide clarity on the remaining rehabilitation schedule and final landform. A revised MOP was submitted to the Resources Regulator on 14 April 2021 following the approval of the development application for the Maxwell UG Project. The MOP was approved by the Resources Regulator on 25 June 2021.

A revised MOP was submitted to the Resources Regulator on 13 December following the grant of ML 1820 and ML 1822 and approval of MOD1. Approval is expected during the next reporting period.

#### Rehabilitation Cost Estimate

A revised Rehabilitation Cost Estimate (RCE) was submitted to the Resources Regulator on 15 June 2020. The RCE took into consideration the MOP that had been submitted in April 2020 and the rehabilitation activities undertaken by Maxwell during 2018 and 2019. On 27 October 2020, the Resources Regulator “stopped the clock” on the processing of the application and requested further information and required that a revised RCE be submitted to the Resources Regulator by 12 November 2020. Maxwell requested the date be extended

until 8 January 2021 and this was approved by the Resources Regulator and a revised RCE was submitted on 8 January 2021.

Prior to the review of this RCE being finalised, another RCE was submitted to the Resources Regulator on 14 April 2021. This RCE was submitted following the approval of the development application for the Maxwell UG Project. The Resources Regulator requested additional information for the RCE on 17 August 2021. Maxwell provided the additional information on 8 September 2021.

On 13 December 2021 another RCE was submitted to the Resources Regulator following the grant of ML1820 and ML1822 and approval of MOD1. Approval is expected during the next reporting period.

### **Targeted Assessment Program- Landform Establishment and Section 240 Notice**

On 2 March 2021, the Resources Regulator performed a planned inspection of landform establishment activities at Maxwell Infrastructure site. This targeted assessment was undertaken to identify risks and assess performance of associated controls associated with landform establishment activities, as well as assess compliance with statutory obligations. Based on the observations during the inspection, the Resources Regulator formed the view that there is a potential risk of adverse impact to the environment due to the uncertainty of the long-term erosional stability of the final landform. The potential environmental risks identified by the Resources Regulator were as follows:

- i. The uncertainty of the long-term erosional stability of the final landform, which may lead to landform stability issues (e.g. gullyng). This may subsequently lead to the release of sediments to the surrounding environment at level significantly higher quantities than natural landscapes post closure.
- ii. The potential instability issues that may result in the final landform not being able to support the nominated final land use(s).
- iii. In circumstances where geochemically problematic materials are contained in emplacements (such as material subject to spontaneous combustion/heating), erosion can deplete the cap over these emplacements, exposing this material and reinstating combustion/heating issues impacting the final land use(s).

Subsequently, on the 28 June 2021, Maxwell was issued with a notice under Section 240 of the *Mining Act 1992* (Section 240 Notice) to undertake an assessment of the long-term erosional stability of the final landforms that have been constructed as part of the rehabilitation of the mine and listed as Pasture and Woodland rehabilitation in Figure 14 of the Annual Environmental Management Report 2020. The notice also required Maxwell to undertake an assessment of the surface water management structures located in the rehabilitated landform. The assessments will be submitted during the next reporting period.

### **Soil Amelioration**

Due to historic site practices, good quality topsoil for use during rehabilitation is minimal. Previously on site, soil ameliorants have been used to increase soil organic matter, improve soil nutrient levels and promote vegetation growth.

Biosolids, which are a by-product of the wastewater treatment process, have been used on site as a soil ameliorant in pasture areas. Compost made up of garden organics and biosolids has also been used as a soil ameliorant in some woodland areas. Where required gypsum is also applied at a rate of 5 tonnes per hectare.

Topsoil stripped during the construction of the Maxwell UG Project (i.e., from the transport corridor and mine entry area) will be recovered using dozers, excavators or scrapers. It will then be placed into dedicated stockpiles. Where possible, stockpiles will be no greater than 3 metres in height and will be located away from drainage lines, operational areas and proposed disturbance areas. Surface drainage in the vicinity of stockpiles will be diverted to

minimise run-on and managed to minimise sediment laden run-off. All stockpiles will be ripped and sown with a cover crop/pasture mix once their construction is completed.

A combination of topsoil, subsoil and ameliorants will be used for future rehabilitation. A soil balance is provided in **Table 16**. These numbers do not include topsoil and subsoil currently in-situ. Maxwell considers that there is sufficient material for the rehabilitation of the Maxwell UG Project.

**Table 16. Soil balance (stockpiled)**

Type	Estimated Amount (m <sup>3</sup> )
Topsoil	106,677
Subsoil	1,0252,276

## 9.2 Performance

Approximately 850 hectares of previously open cut mined land associated with the Maxwell Infrastructure site has been rehabilitated. In accordance with the MOP, no new areas of rehabilitation were completed during the reporting period. No buildings or infrastructure were decommissioned or demolished during the reporting period. Rehabilitation activities focussed on enhancing existing areas of rehabilitation. These activities included:

- infill planting in the woodland rehabilitation corridor to increase species diversity;
- installation of nest boxes in appropriately sized canopy trees to assist with fauna husbandry;
- targeted weed management across the site for High Threat Exotic weed species;
- management of pest animal species in consultation with the Local Land Services and near neighbours; and
- continued cattle grazing on pastured rehabilitated paddocks.

The location of rehabilitation activities is shown in **Figure 19**.

All areas of rehabilitation are within the ecosystem and land use establishment phase. This phase incorporates revegetated lands and habitat augmentation, focusing on species selection, presence and growth, together with weed and pest animal management. Whilst the rehabilitation is progressing, no areas of rehabilitation have been formally signed off as meeting the land use objectives and completion criteria.

A summary of the rehabilitation status is provided in **Table 17**.

**Table 17. Rehabilitation status**

<b>Mine Area Type</b>	<b>Previous reporting period (actual) Year 2019 (ha)</b>	<b>This reporting period (actual) Year 2021 (ha)</b>	<b>Next reporting period (forecast) Year 2022 (ha)</b>
<b>A. Total mine footprint<sup>1</sup></b>	1,238	1,238	1316
<b>B. Total active disturbance<sup>2</sup></b>	419	385	463
<b>C. Land being prepared for rehabilitation<sup>3</sup></b>	30	0	0
<b>D. Land under active rehabilitation<sup>4</sup></b>	819	853	853
<b>E. Completed rehabilitation<sup>5</sup></b>	0	0	0

<sup>1</sup> Total mine footprint includes all areas within the mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities.

<sup>2</sup> Total active disturbance includes all areas ultimately requiring rehabilitation.

<sup>3</sup> Land being prepared for rehabilitation includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development.

<sup>4</sup> Land under active rehabilitation includes areas under rehabilitation and being managed to achieve relinquishment.

<sup>5</sup> Completed rehabilitation requires formal sign-off by the Resource Regulator that the area has successfully met the rehabilitation land use objectives and completion criteria.



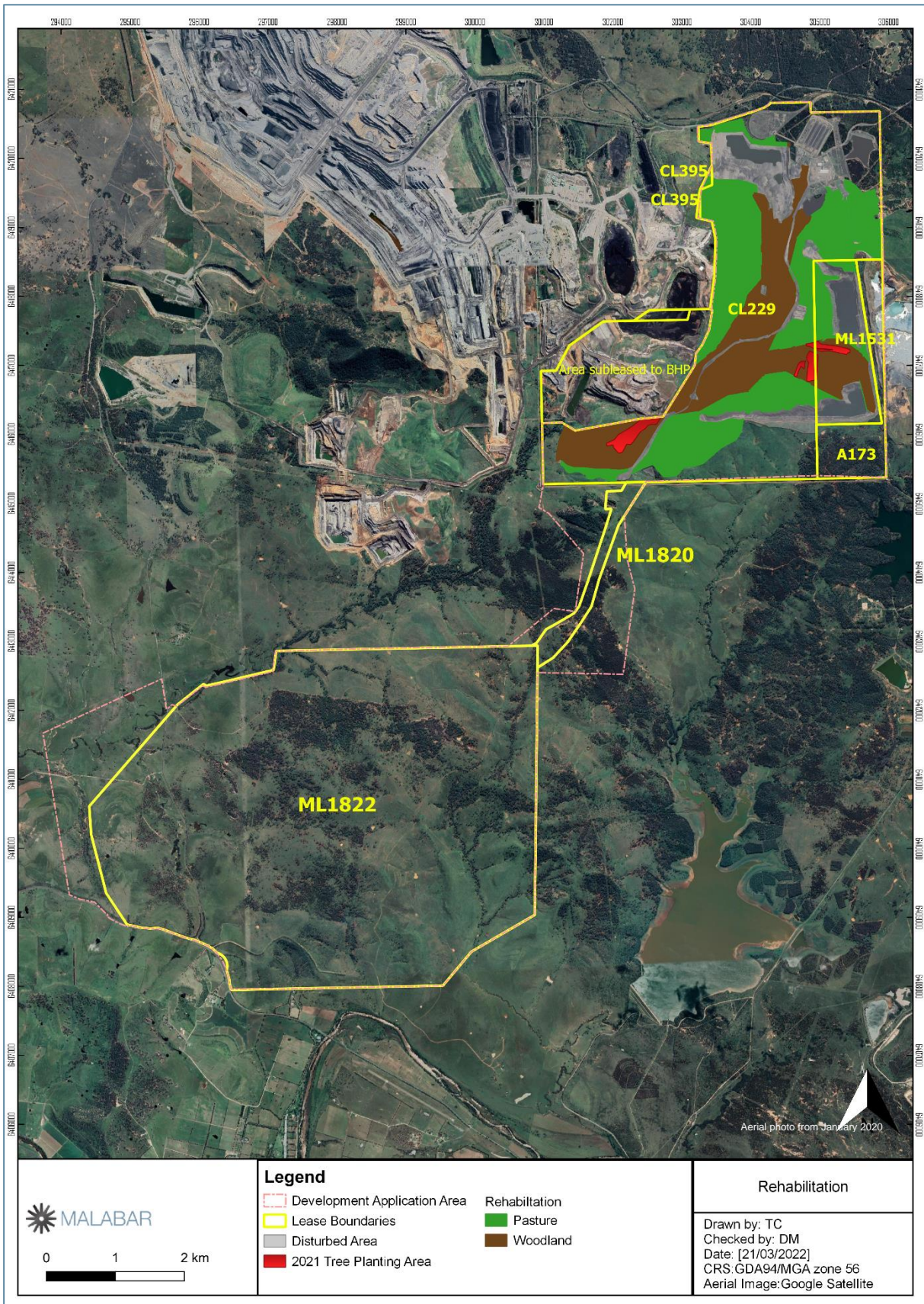


Figure 19. Location of rehabilitation activities

## Other Rehabilitation Activities

### Tree Planting

Two tree planting programs were undertaken during the reporting period. The programs targeted a total of 25 hectares of existing mine rehabilitation within the conceptual woodland corridor. This was based on an original 40 hectares but refined to take into account ground conditions following site inspection. Ground preparation works for optimal tree propagation were undertaken and included:

- slashing of grass to safely define the work area as well as improve the success of spraying activities to prevent competition to tree growth;
- single deep rip lines (minimum 500 mm deep) to break up the surface to allow tube stock to be planted and establish. The rip lines also help capture water, reduce erosion and improve soil moisture levels; and
- spraying of rip lines with glyphosate to reduce competition for growth from grass species.

Tree and shrub species consistent with the Spotted Gum Ironbark Woodland, Red Gum Woodland and Yellow Box Woodland vegetation communities were planted. A total of 22,556 plants were installed using a growth promoting compound and immediately watered in with a minimum of one litre per plant. Follow-up watering was minimal after installation due to wet conditions in Autumn; the Spring planting campaign required less follow up water due to intermittent rainfall throughout the warmer months.

### Kangaroo Cull

The culling of kangaroos was undertaken during the reporting period to reduce grazing pressure and minimise the impact to native groundcover species from the digging of day beds under trees and shrubs in rehabilitation areas. Programs were targeted prior to planting activities on rehabilitated land.

### Weed Management

Weed management activities were undertaken during the reporting period in summer, autumn, winter and spring as shown in **Figure 20**. Weed type, density, distribution and access were taken into account when planning weed management activities. Primary areas of focus were:

- offsets and conservation areas;
- areas adjacent to private land;
- areas of rehabilitation
- tree planting areas;
- areas of high infestations of weeds of national significance; and
- areas identified for weed control in the Ecological Monitoring Report for 2020.

### Nest Boxes

Twenty nest boxes were installed in woodland rehabilitation during the reporting period. The nest boxes were installed within the Southern Offset area. Monitoring of nest boxes occurred as part of the ecological monitoring program in Spring 2021. The monitoring results indicate that there has been no usage of the nest boxes, likely due to the boxes being installed less than 12 months earlier. The nest boxes were observed to be installed correctly and located in an appropriate habitat.

During the next reporting period nest boxes will be installed in remnant vegetation to determine a comparison of occupation in rehabilitation to remnant vegetation and existing habitat such as the Northern Offset area, or Wildlife Refuge. This will determine any design issue with the nest boxes, should they be unoccupied within remnant vegetation. The monitoring of nest boxes will occur during the 2022 Spring ecological monitoring program.



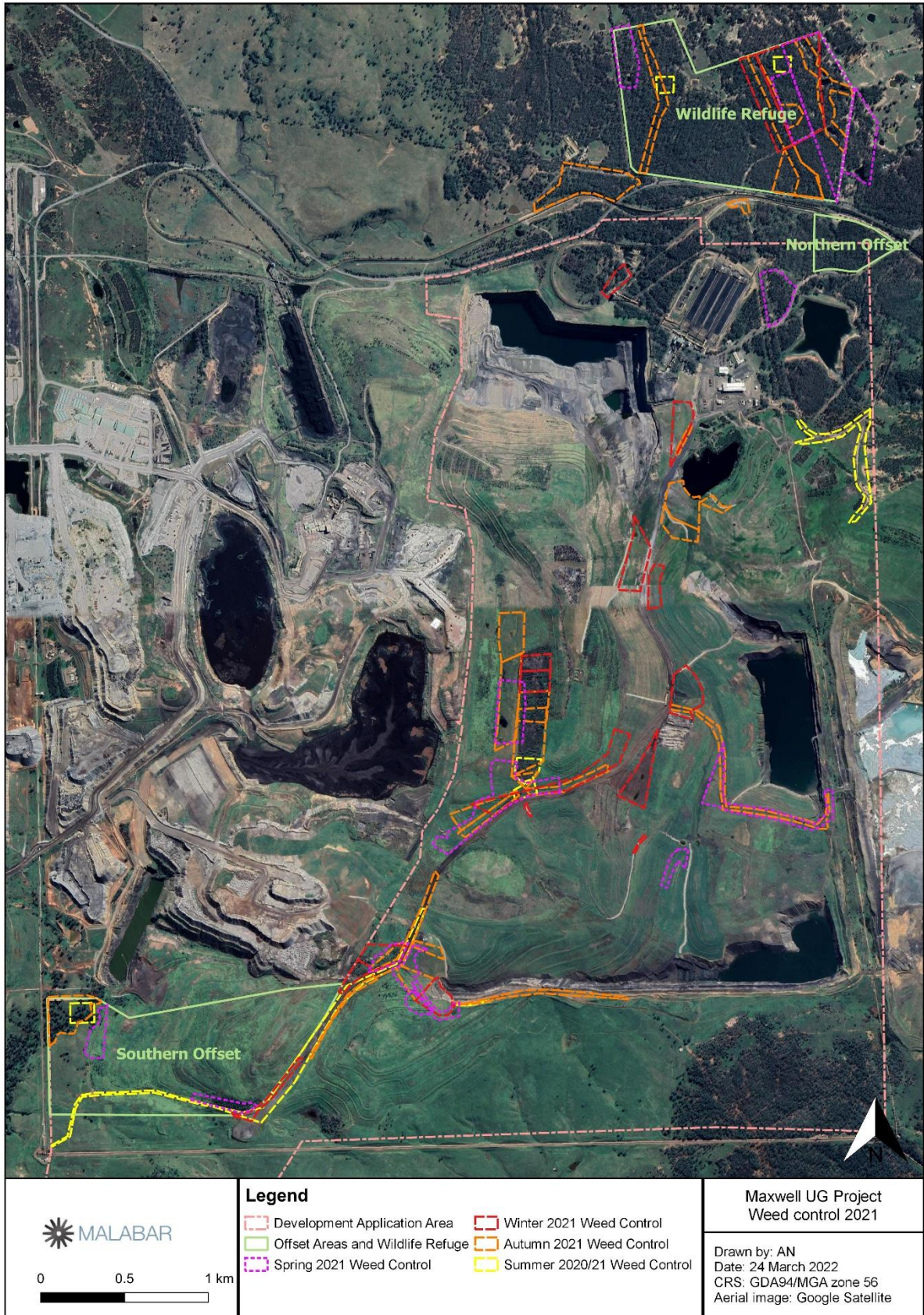


Figure 20. Weed control 2021

## **Trials**

### **Cattle Grazing Trial**

A grazing trial commenced on rehabilitation at the Southern Tip in 2018. The trial continued throughout the reporting period. Cattle were strategically rotated between three paddocks of which two were located on mine rehabilitation. The cattle will be sold to market during the next reporting period and the paddocks will be rested and monitored for new vegetation growth and diversity. Results so far are demonstrating that Maxwell can create a post mining landscape that is compatible with the surrounding landscape and capable of sustaining productive land use.

### **Native Grass Trial**

A native grassland establishment trial was undertaken at Maxwell Infrastructure during 2013. The trial involved seeding a small area in the north with locally collected grassland species from Dartbrook. The seed mix was dominated by Red Grass (*Bothriochloa macra*) and Queensland Blue Grass (*Dichanthium sericeum*). The trial was monitored in 2013 and determined to be unsuccessful due to poor germination. A follow-up inspection during 2018 showed the area to be dominated by native grasses, particularly Lobed Bluegrass (*Bothriochloa biloba*) and Queensland Bluegrass. Queensland Blue Grass was then included into the pasture mix as a trial on a 24 hectare parcel of land that was rehabilitated during 2018. Due to the dry conditions at the time, only a small number of Queensland Blue Grass was identified in the area. Further inspections of the area will be undertaken during the next reporting period.

## **9.3 Actions for the Next Reporting Period**

The following activities will occur during the next reporting period:

- two tree planting programs with approximately 20,000 tube stock planted on existing mine rehabilitation within the conceptual woodland corridor;
- a weed control program focussing on High Threat Exotic weed species;
- installation of nest boxes in appropriately sized canopy trees within remnant vegetation to compare occupation within rehabilitation areas; and
- submission of a new MOP and revised RCE to the Resources Regulator.



### 10.1 Complaints

The Maxwell UG Project maintains a 24-hour community hotline (1800 653 960) for any issues or enquiries. The community hotline number is advertised in the local newspapers and on the Malabar Resources website (<https://malabarresources.com.au>). In addition to the community hotline, the Maxwell site can also be contacted by email ([info@malabarresources.com.au](mailto:info@malabarresources.com.au)). Complaints received are recorded on the Community Complaints register found on the Malabar Resources website, the register is updated on a monthly basis.

During the reporting period, there were no complaints received. The number of complaints received has continued to decrease since 2015 (as shown in **Figure 21**) in line with a decrease in activities since open cut mining ceased in October 2016.

### 10.2 Engagement

Community Consultative Committees (CCCs) provide a forum for discussion between Maxwell and representatives of the local community, key stakeholder groups and the local council on issues relating directly to the Maxwell UG Project. Although the CCC is not a decision-making or regulatory body, it performs an important advisory and consultative role.

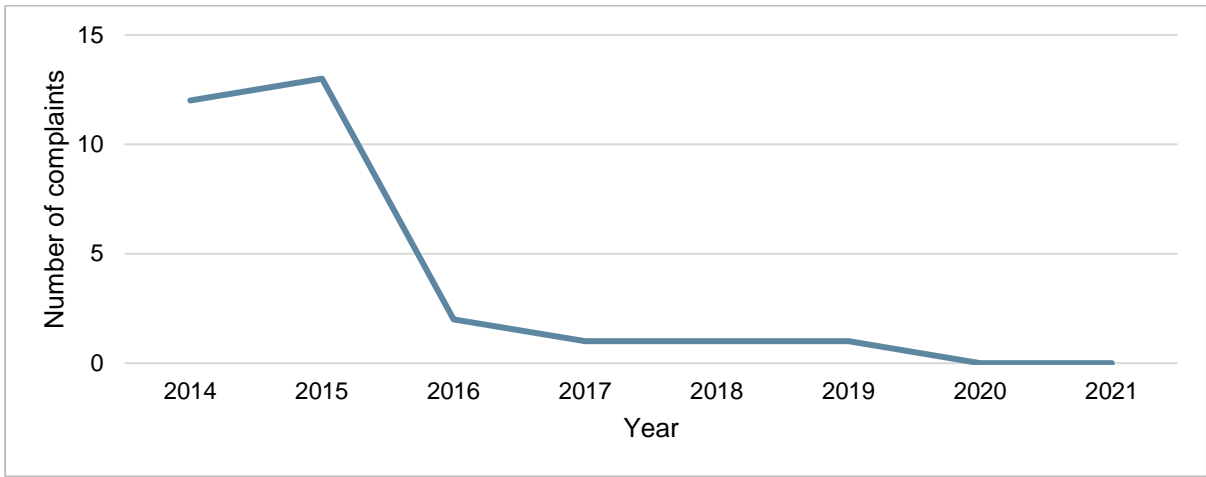
An Extraordinary CCC meeting was held on 9 June 2021 with the Maxwell Infrastructure and Spur Hill (Exploration Licence 7429) CCC members to discuss the merging of these CCC's to form the Maxwell CCC. The merging of the CCC provides for a streamlined and consistent approach to providing information to our members and the local community. Malabar sought approval from DPE to combine the Maxwell Infrastructure and Spur Hill CCC's to form the Maxwell CCC as required under Development Consent SSD 9526.

On 2 August 2021, The DPE approved for the Maxwell Infrastructure CCC to be combined with the Maxwell CCC and had no objections to amalgamate the Spur Hill CCC into the Maxwell CCC. An approved Independent Chairperson has been appointed to Chair the Maxwell CCC.

The Maxwell Infrastructure CCC met on two occasions during the reporting period including the 10 March 2021 and 9 June 2021. The Maxwell CCC held meetings on 22 September 2021 and 8 December 2021. During the meetings the CCC reviewed the site's environmental performance and discussed community issues.

Two meetings were also held for the Antiene Rail Spur, Joint CCC during the reporting period. The meetings were held on the 9 June 2021 and 8 December 2021. These meetings were attended by CCC representatives from Maxwell and Mt Arthur Coal. During the meetings the CCC reviewed the environmental performance of the Antiene Rail Spur which is a shared asset between the two sites.

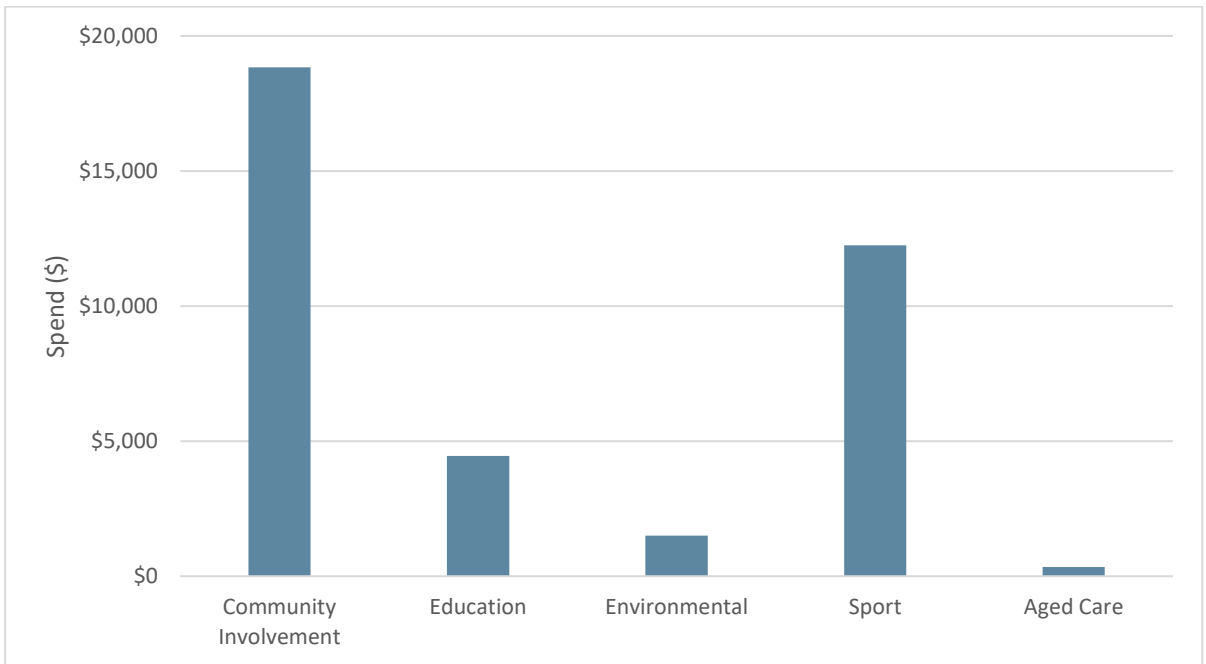
Information on environmental management and performance, as well as relevant approvals, can be accessed by the community through the [Malabar Resources website](#).



**Figure 21. Long-term number of complaints**

### 10.3 Contributions

Malabar donated to local community groups, charities, aged care, schools, scholarships and sporting teams within Muswellbrook, Denman, Scone, Singleton and the surrounding areas. During the reporting period, over \$37,000 was donated to the local community. Categories of the contributions are detailed below in **Figure 22**.



**Figure 22. Community contributions in the reporting period**

## 11 INCIDENTS AND NON-COMPLIANCES

### 11.1 Incidents

As identified in **Table 2**, Maxwell received an advisory letter from the EPA in July 2021 following submission of the 2020 Annual Return that showed EPA Identification Point No.11 (ES-04) had a data capture rate of 84 per cent. This occurred due to monitoring equipment failure from 30 June to 27 August 2020 which required the unit to be sent to the equipment manufacturer in the US for repairs. At the time, Maxwell was unable to source a replacement monitor. The monitor has since been repaired and is operational.

### 11.2 Exceedances

No monitoring results exceeded approval criteria during the reporting period.

## 12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The measures listed in **Table 18** will be implemented during the next reporting period to continue to improve the environmental and community performance at the Maxwell Infrastructure site.

**Table 18. Improvement measures planned for next reporting period**

Reference Number	Measure	Planned Timing
1	Undertake an IEA under development consents SSD 9526, PA 06_0202 and DA 106-04-00.	By 5 July 2022
2	Real-time noise monitoring data will be calibrated with the attended noise monitoring data.	Monthly following commencement of construction
3	Further surface collection of Aboriginal artefacts will be undertaken within the MOD1 disturbance areas during the next reporting period.	April 2022
4	Preventative maintenance work on sections of the Antiene Rail Spur, including rail grinding, condition assessments, inspections and testing will be undertaken during the next reporting period.	Throughout 2022
5	Additional infill planting at the MEA tree planting area with tube stock during the optimal planting periods.	End of 2022
6	A reduction of pest animals prior to tree planting.	End of 2022
7	Annual inspection of the access tracks will commence during the next reporting period in accordance with the Bushfire Management Plan.	August 2022

Reference Number	Measure	Planned Timing
8	Management measures planned for offset areas during the next reporting period are: <ul style="list-style-type: none"> <li>• Drayton Wildlife Refuge - Weed control program targeting Prickly Pear</li> <li>• Southern Offset Area - Weed control program targeted at Galenia and Golden Wreath Wattle</li> <li>• Southern Offset Area - Infill planting where required.</li> </ul>	May 2022
9	The access to some surface water monitoring sites pose a safety risk after heavy rain; hence the locations of those sites will be reviewed during the next reporting period.	End of 2022
11	Two tree planting programs with approximately 20,000 tube stock planted on existing mine rehabilitation within the conceptual woodland corridor.	May and October 2022
12	A weed control program focussing on High Threat Exotic weed species.	Throughout 2022
13	Installation of nest boxes in appropriately sized canopy trees within remnant vegetation to compare occupation within rehabilitation areas.	End of 2022
14	Submission of a new MOP and revised RCE to the Resources Regulator.	July 2022



## APPENDIX 1. APPROVAL CONDITIONS RELEVANT TO THE ANNUAL REVIEW

Condition	Description	Report Section
<b>SSD 9526</b>		
<b>Schedule 2 Condition B28</b>	The applicant must report on water captured, intercepted or extracted from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.	<b>8.1 and Appendix 8</b>
<b>Schedule 2 Condition B64 (e)</b>	The applicant must: (e) monitor and report on the effectiveness of the waste minimisation and management measures in the Annual Review referred to in condition E11.	<b>7.10</b>
<b>Schedule 2 Condition B83</b>	The Applicant must: keep accurate records of the: Amount of coal transported from the site (on a daily basis); and Date and time of each train movement generated by the development; and publish these results in the Annual Review.	<b>7.7 and Appendix 5</b>
<b>Schedule 2 Condition E7</b>	Within three months of: (b) the submission of an Annual Review under condition E11; The suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant	<b>To be conducted within three months of the submission of this Annual Review</b>

Condition	Description	Report Section
<p><b>Schedule 2</b> <b>Condition E11</b></p>	<p>By the end of March in each year after the commencement of the development, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must:</p> <p>(a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;</p> <p>(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the:</p> <p>(i) relevant statutory requirements, limits or performance measures/criteria;</p> <p>(ii) requirements of any plan or program required under this consent;</p> <p>(iii) monitoring results of previous years; and</p> <p>(iv) relevant predictions in the document/s listed in condition A2(c).</p> <p>(c) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;</p> <p>(d) evaluate and report on:</p> <p>(i) the effectiveness of the noise and air quality management systems; and</p> <p>(ii) compliance with the performance measures, criteria and operating conditions of this consent;</p> <p>(e) identify any trends in the monitoring data over the life of the development;</p> <p>(f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p> <p>(g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.</p>	<p><b>2021 Annual Review to be submitted by 31 March 2022</b></p> <p>5, 9</p> <p>7, 8, 10 <b>Appendix 3</b> <b>Appendix 4</b> <b>Appendix 5</b> <b>Appendix 6</b> <b>Appendix 7</b> <b>Appendix 9</b> <b>Appendix 10</b> <b>Appendix 11</b></p> <p>11</p> <p>7</p> <p>1, 7, 8, 9</p> <p>7, 8, 9</p> <p>7, 8, 9</p> <p>7, 8, 9, 12</p>

Condition	Description	Report Section
<b>E12</b>	Copies of the Annual Review must be submitted to Council and made available to the CCC and any interested person upon request.	<b>Copies of the Annual Review will be submitted to Council and made available to the CCC and any interested persons upon request.</b>
<b>E17(a)(xi)</b>	Before commencement of construction until the completion of all rehabilitation required under this consent, the Applicant must: Make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website: (xi) the Annual Reviews of the development.	<b>The Annual Review will be made publicly available on the Malabar Resources website.</b>
<b>PA 06_0202</b>		
<b>Schedule 3 Condition 7</b>	The Proponent shall: (a) implement all reasonable and feasible noise mitigation measures; (b) investigate ways to reduce the noise generated by the project, including maximum noise levels which may result in sleep disturbance; and (c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review.	<b>7.2</b>
<b>Schedule 3 Condition 44</b>	The Proponent shall: (a) keep records of the: amount of coal transported from the site each year; and number of coal haulage train movements generated by the project (on a daily basis); date and time of each train movement generated by the project; and (b) include these records in the Annual Review.	<b>7.7 and Appendix 5</b>
<b>Schedule 3 Condition 47</b>	The Proponent shall: ... (e) report on waste management and minimisation in the Annual Review,	<b>7.10</b>
<b>Schedule 5 Condition 5</b>	Within 12 months of this approval, and annually thereafter, the Proponent shall submit an Annual Review to the Director-General and relevant agencies. This report must:	

Condition	Description	Report Section
	<p>(a) identify the standards and performance measures that apply to the project;</p> <p>(b) describe the works carried out in the last 12 months;</p> <p>(c) describe the works that will be carried out in the next 12 months;</p> <p>(d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;</p> <p>(e) include a summary of the monitoring results for the project during the past year;</p> <p>(f) include an analysis of these monitoring results against the relevant:</p> <ul style="list-style-type: none"> <li>· limits/criteria in this approval;</li> <li>· monitoring results from previous years; and</li> <li>· predictions in the EA;</li> </ul> <p>(g) identify any trends in the monitoring results over the life of the project;</p> <p>(h) identify and discuss any non-compliance during the previous year; and</p> <p>(i) describe what actions were, or are being, taken to ensure compliance.</p>	<p><b>7, 8 and 9</b></p> <p><b>5.1 and 5.2</b></p> <p><b>5.3</b></p> <p><b>10.1</b></p> <p><b>7, 8 and 9</b></p> <p><b>7, 8 and 9</b></p> <p><b>7, 8 and 9</b></p> <p><b>1 and 11</b></p> <p><b>11 and 12</b></p>
<p><b>Appendix 3 Statement of Commitments Ref 21</b></p>	<p>[Maxwell Infrastructure] will prepare and submit to relevant regulatory departments an Annual Review which will discuss monitoring results and include a discussion on predictions and commitments made within this EA.</p>	<p><b>7, 8 and 9</b></p>
<p><b>DA 106-04-00</b></p>		
<p><b>Schedule 2 Condition 5.1b</b></p>	<p>The Applicant shall: ...</p> <p>(iii) provide all results and analysis of air quality monitoring in the Annual Review including a determination of the annual dust deposition rate in gm/m<sup>2</sup>/month, which shall be plotted in the Annual Review.</p>	<p><b>7.4 and Appendix 4</b></p>
<p><b>Schedule 2 Condition 5.3.2c</b></p>	<p>The Applicant shall also: ...</p> <p>(ii) include a summary of noise monitoring results in the Annual Review.</p>	<p><b>7.2 and Appendix 3</b></p>

Condition	Description	Report Section
<p><b>Schedule 2 Condition 8.1a</b></p>	<p>The Applicant shall, throughout the life of the rail loading facility and rail loop and for a period of at least three years after the completion of operations in the DA area, prepare and submit an Annual Environmental Management Report, which may be incorporated into the existing Drayton Annual Review to the satisfaction of the Director- General. The Annual Review shall include a review of the performance of coal transportation against the Environmental Management Strategy, the conditions of this consent, and other licences and approvals relating to the coal transport operations. To enable ready comparison with the predictions of the EIS, diagrams and tables, the report shall include, but not be limited to, the following matters:</p> <p>(i) an annual compliance review of the performance of the project against conditions of this consent and statutory approvals;</p> <p>(ii) a review of the effectiveness of the environmental management of the coal transport operations in terms of EPA, DMR, and MSC requirements;</p> <p>(iii) results of all environmental monitoring required under this consent or other approvals, including interpretations and discussion by a suitably qualified person;</p> <p>(iv) identify trends in monitoring results over the life of coal transport operations;</p> <p>(v) a listing of any variations obtained to approvals applicable to the subject area during the previous year; and</p> <p>(vi) environmental management targets and strategies for the next year, taking into account identified trends in monitoring results.</p>	<p>1 and 11</p> <p>7.7</p> <p>7, 8 and 9</p> <p>7, 8 and 9</p> <p>4</p> <p>12</p>
<p><b>Schedule 2 Condition 8.1b</b></p>	<p>In preparing the Annual Review, the Applicant shall:</p> <p>(i) respond to any request made by the Director-General for any additional requirements; and</p> <p>(ii) comply with any requirements of the Director-General or other relevant government agencies.</p>	<p>6</p> <p>6</p>
<p><b>Schedule 2 Condition 9.2a</b></p>	<p>The environmental coordinator employed by [Maxwell Infrastructure] (refer condition 2.1) shall be responsible: ...</p> <p>(ii) for providing a report of complaints received with respect to the Drayton coal transportation operations every six months throughout the life of the project to the Director-General, MSC, EPA, DMR, and CCC, or as otherwise agreed by the Director-General. A summary of this report shall be included in the Annual Review (condition 8.1(a)).</p>	<p>10.1</p>
<p><b>CL 229, CL 395 and ML 1531</b></p>		

Condition	Description	Report Section
<b>Condition 3</b>	<p>(1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management report with the Director-General.</p> <p>(2) The Annual Review must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:</p> <p>the accepted Mining Operations Plan;</p> <p>development consent requirements and conditions;</p> <p>Environment Protection Authority and Department of Land and Water Conservation (or Department of Environment and Conservation and Department of Planning) licences and approvals;</p> <p>Any other statutory environmental requirements;</p> <p>Details of any variations to environmental approvals applicable to the lease area; and</p> <p>Where relevant, progress towards final rehabilitation objectives.</p>	<p><b>All</b></p> <p><b>9</b></p> <p><b>7, 8 and 9</b></p> <p><b>7, 8 and 9</b></p> <p><b>7, 8 and 9</b></p> <p><b>4</b></p> <p><b>9</b></p>

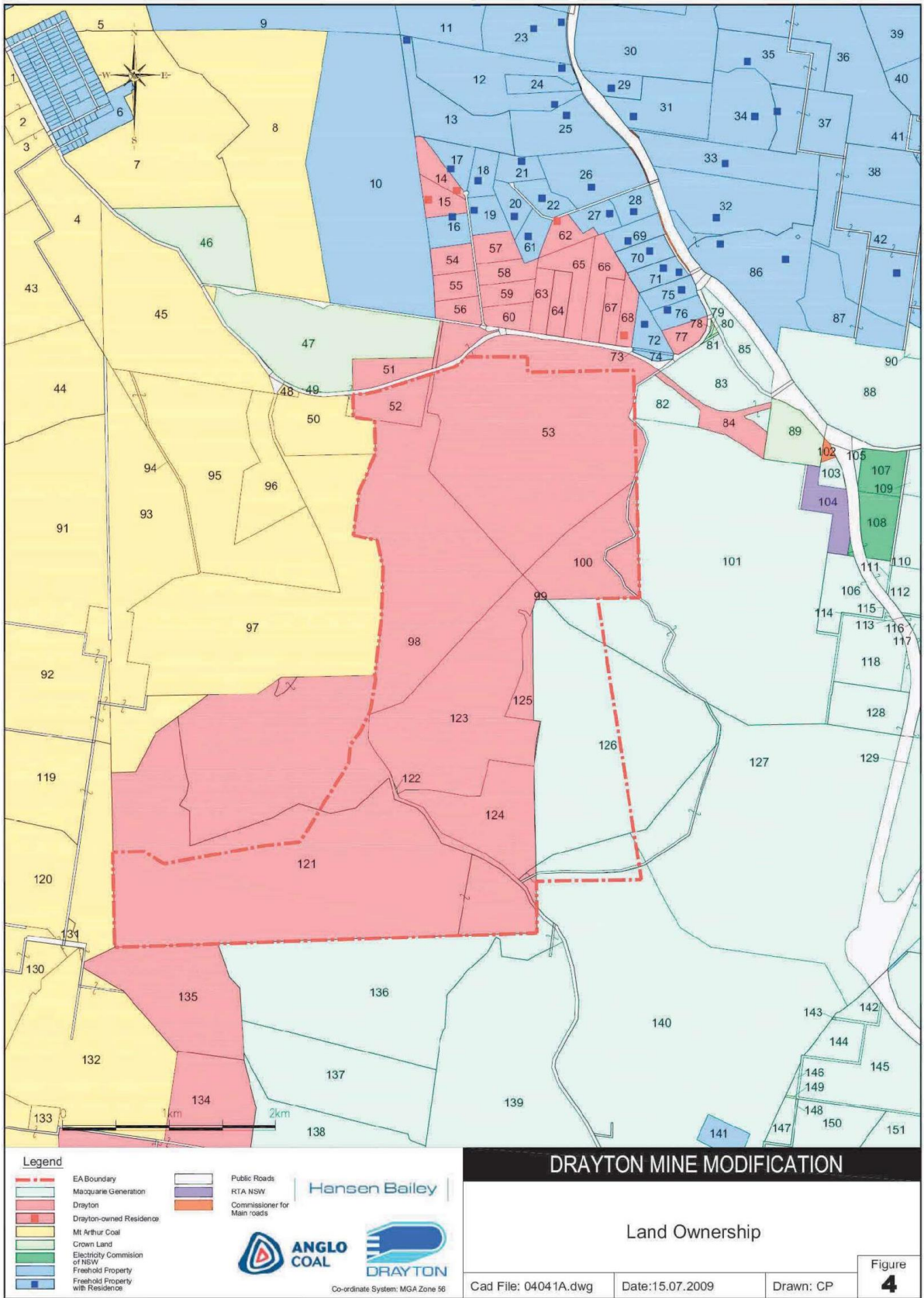


## APPENDIX 2. ENVIRONMENTAL MONITORING LOCATIONS



**Figure 23. Environmental monitoring locations**





**Figure 24. Noise modelling locations (land ownership) under the Maxwell Infrastructure Noise Management Plan and prior to implementation of the Noise and Blasting Management Plan for the Maxwell Underground Project**

## APPENDIX 3. NOISE MONITORING RESULTS

Table 19. Modelled noise generated by the project alone (results under the Maxwell Infrastructure Noise Management Plan)

Location	Approval criterion (dB(A))				EA year 10 prediction (dB(A))			2021 maximum result (dB(A))				
	Day	Evening	Night		Day	Evening	Night	Day	Evening	Night		
	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>A1</sub> (1 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (1 min)
34	35	35	39	45	<30	<30	34	<20	<20	<20	<20	
29	35	35	36	47	32	33	34	<20	<20	<20	<20	
31	35	35	37	47	32	34	35	<20	<20	<20	<20	
33	35	35	38	45	<30	32	36	<20	<20	<20	<20	
86	35	35	38	45	30	31	38	<20	<20	<20	<20	
32	35	35	40	47	30	33	39	<20	<20	<20	<20	
71	35	35	41	47	32	35	40	<20	<20	<20	<20	
75*	35	35	41	47	32	34	40	<20	<20	<20	<20	
70	35	36	41	47	33	36	40	<20	<20	<20	<20	
76*	35	36	42	47	33	35	42	<20	<20	<20	<20	
28	35	37	40	47	33	36	39	<20	<20	<20	<20	
69	35	37	41	47	34	36	40	<20	<20	<20	<20	
13	36	36	35	45	35	34	33	<20	<20	<20	<20	
12	36	36	36	47	34	35	35	<20	<20	<20	<20	
25*	36	37	37	47	34	35	35	<20	<20	<20	<20	
26	36	37	38	47	34	36	37	<20	<20	<20	<20	
27	36	37	39	47	34	36	38	<20	<20	<20	<20	
72*	36	37	42	47	34	36	42	<20	<20	<20	<20	
17	37	38	36	47	36	37	36	<20	<20	<20	<20	
21	38	38	38	45	36	37	37	<20	<20	<20	<20	
22	38	38	38	45	36	37	37	<20	<20	<20	<20	
18	38	39	38	47	37	38	37	<20	<20	<20	<20	
20	39	40	39	45	38	39	39	<20	<20	<20	<20	
61*	39	40	39	45	37	39	39	<20	<20	<20	<20	
14	40	39	39	47	38	39	38	<20	<20	<20	<20	
19	40	40	39	47	39	40	39	<20	<20	<20	<20	
16*	41	41	39	47	40	41	39	<20	<20	<20	<20	
23	35	35	35	47	32	33	33	<20	<20	<20	<20	
35*	35	35	35	47	<30	30	34	<20	<20	<20	<20	
42*	35	35	35	47	<30	<30	31	<20	<20	<20	<20	
37	35	35	35	45	<30	<30	33	<20	<20	<20	<20	

\* Measured: Doherty (16), Skinner (61), Robertson (72), Shaman (75) and Holder (76)

**Table 20. Monitoring summary - cumulative noise (results under the Maxwell Infrastructure Noise Management Plan)**

Location	Approval criterion (dB(A))			EA year 10 prediction (dB(A))	2021 maximum result (dB(A))		
	Day (L <sub>Aeg</sub> (11 hr))	Evening (L <sub>Aeg</sub> (4 hr))	Night (L <sub>Aeg</sub> (9 hr))		Day (L <sub>Aeg</sub> (11 hr))	Evening (L <sub>Aeg</sub> (4 hr))	Night (L <sub>Aeg</sub> (9 hr))
Doherty (16)	50	45	40	None	<20	<20	<20
Skinner (61)					<20	<20	<20
Robertson (72)					<20	<20	<20
Sharman (75)					<20	<20	<20
Horder (76)					<20	<20	<20

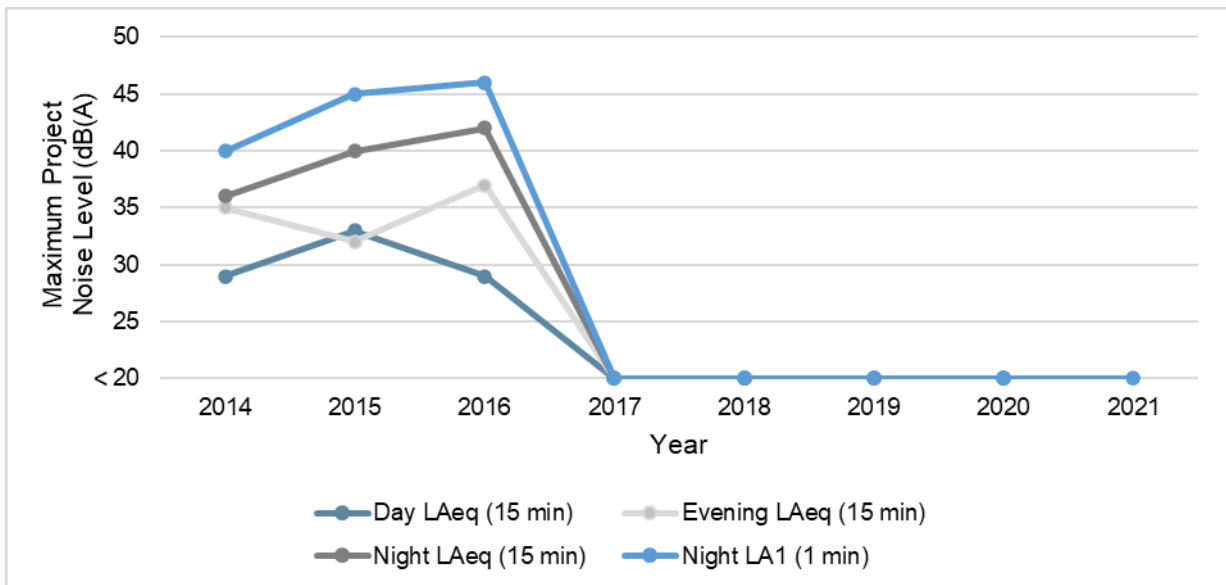
**Table 21. Monitored noise generated by the project alone (results under the Maxwell Underground Project Noise and Blasting Management Plan)**

Location	Maxwell Underground Project Operational noise criteria (dB(A))				Rail loop and Antiene Rail Spur development consent operational noise criteria (db(A))			2021 maximum result (dB(A))		
	Day (L <sub>Aeq</sub> (15 min) Years 1 to 3)	Evening (L <sub>Aeq</sub> (15 min))	Night (L <sub>Aeq</sub> (15 min))	Night (L <sub>max</sub> )	Day L <sub>Aeq</sub> (15 min)	Evening L <sub>Aeq</sub> (15 min)	Night L <sub>Aeq</sub> (15 min)	Day (L <sub>Aeq</sub> (11 hr))	Evening (L <sub>Aeq</sub> (4 hr))	Night (L <sub>Aeq</sub> (9 hr))
390, 398, 402	44	39	39	52	38	38	38	<20	<20	<20
425, 427	40	37	37	52				<20	<20	<20
399	42	37	37	52				<20	<20	<20
400	41	36	36	52				<20	<20	<20
403	44	40	40	52				<20	<20	<20
411	45	41	41	52				<20	<20	<20
418	44	39	39	52				<20	<20	<20
419, 420, 539	42	38	38	52				<20	<20	<20
421, 424	41	38	38	52				<20	<20	<20
423	42	39	39	52				<20	<20	<20
538	42	38	38	52				<20	<20	<20

<b>All other privately-owned properties</b>	40	35	35	52					<20	<20	<20
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**Table 22. Monitoring summary - cumulative noise (results under the Maxwell Underground Project Noise and Blasting Management Plan)**

Location	Rail loop and Antiene Rail Spur development consent cumulative noise criteria (db(A))			2021 maximum result (dB(A))		
	Day (L <sub>Aeg</sub> (11 hour))	Evening (L <sub>Aeg</sub> (4 hour))	Night (L <sub>Aeg</sub> (9 hour))	Day (L <sub>Aeg</sub> (11 hour))	Evening (L <sub>Aeg</sub> (4 hour))	Night (L <sub>Aeg</sub> (9 hour))
<b>NM1</b>	40	40	40	25	31	31
<b>NM2</b>				<20	27	29
<b>NM3</b>				<20	<20	<20
<b>NM4</b>				<20	20	<20



**Figure 25. Long-term maximum project noise levels**

## APPENDIX 4. AIR QUALITY MONITORING RESULTS

Table 23. PM<sub>10</sub> and PM<sub>2.5</sub> 24-hour average concentrations in µg/m<sup>3</sup> for the reporting period. See Notes below table.



Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
1/01/2021	5.77			
2/01/2021	6.60			
3/01/2021	11.38			
4/01/2021	6.54			
5/01/2021	6.65			
6/01/2021	12.68			
7/01/2021	10.27			
8/01/2021	12.02			
9/01/2021	5.63			
10/01/2021	6.89			
11/01/2021	10.25			
12/01/2021	15.50			
13/01/2021	16.92			
14/01/2021	15.11			
15/01/2021	21.70			
16/01/2021	24.82			
17/01/2021	21.62			
18/01/2021	17.35			
19/01/2021	24.31			
20/01/2021	13.58			
21/01/2021	24.21			
22/01/2021	16.23			
23/01/2021	17.68			
24/01/2021	15.81			
25/01/2021	20.89			
26/01/2021	15.09			
27/01/2021	26.51			

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
28/01/2021	4.47			
29/01/2021	4.21			
30/01/2021	10.72			
31/01/2021	23.18			
1/02/2021	15.54			
2/02/2021	7.10			
3/02/2021	17.80			
4/02/2021	16.62			
5/02/2021	20.27			
6/02/2021	13.23			
7/02/2021	9.23			
8/02/2021	16.29			
9/02/2021	12.39			
10/02/2021	12.65			
11/02/2021	13.28			
12/02/2021	-			
13/02/2021	9.73			
14/02/2021	14.75			
15/02/2021	15.54			
16/02/2021	-			
17/02/2021	-			
18/02/2021	-			
19/02/2021	-			
20/02/2021	-			
21/02/2021	-			
22/02/2021	-			
23/02/2021	-			

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
24/02/2021	9.90			
25/02/2021	15.78			
26/02/2021	10.77			
27/02/2021	14.90			
28/02/2021	17.33			
1/03/2021	25.27			
2/03/2021	28.98			
3/03/2021	17.41			
4/03/2021	15.70			
5/03/2021	19.00			
6/03/2021	17.02			
7/03/2021	19.94			
8/03/2021	16.46			
9/03/2021	9.79	2.05		
10/03/2021	16.52	3.78		
11/03/2021	14.80	5.74		
12/03/2021	7.65	2.16		
13/03/2021	8.26	3.85		
14/03/2021	3.91	0.35		
15/03/2021	10.84	2.53		
16/03/2021	9.64	3.19		
17/03/2021	6.75	2.44		
18/03/2021	2.59	-1.04		
19/03/2021	4.83	0.26		
20/03/2021	6.20	2.91		
21/03/2021	4.51	0.9		
22/03/2021	3.10	-0.44		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
23/03/2021	3.58	1.62		
24/03/2021	-	-		
25/03/2021	-	-		
26/03/2021	-	-		
27/03/2021	11.41	3.75		
28/03/2021	9.37	3.74		
29/03/2021	11.72	4.32		
30/03/2021	14.67	6.8		
31/03/2021	10.68	2.49		
1/04/2021	10.37	4.45		
2/04/2021	9.46	4.46		
3/04/2021	10.71	5.71		
4/04/2021	9.55	4.23		
5/04/2021	13.43	6.46		
6/04/2021	8.15	2.85		
7/04/2021	3.94	-0.7		
8/04/2021	8.55	4.37		
9/04/2021	12.06	6.1		
10/04/2021	14.87	5.19		
11/04/2021	10.63	3.17		
12/04/2021	11.35	3.69		
13/04/2021	11.11	3.43		
14/04/2021	10.62	2.47		
15/04/2021	17.31	4.86		
16/04/2021	-	-		
17/04/2021	-	-		
18/04/2021	11.06	6.88		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
19/04/2021	11.03	7.11		
20/04/2021	10.32	6.82		
21/04/2021	11.70	4.71		
22/04/2021	11.97	4.5		
23/04/2021	12.52	5.13		
24/04/2021	14.51	7.43		
25/04/2021	15.44	8.37		
26/04/2021	18.21	9.77		
27/04/2021	14.19	7.45		
28/04/2021	14.63	8.05		
29/04/2021	12.31	6.78		
30/04/2021	10.04	4.66		
1/05/2021	8.81	3.63		
2/05/2021	14.56	5.86		
3/05/2021	9.56	4.54		
4/05/2021	8.95	4.59		
5/05/2021	8.57	4.51		
6/05/2021	5.78	2.67		
7/05/2021	4.14	-0.12		
8/05/2021	8.04	4.63		
9/05/2021	10.02	4.59		
10/05/2021	9.91	4.88		
11/05/2021	6.78	1.55		
12/05/2021	10.77	3.96		
13/05/2021	14.45	8.42		
14/05/2021	11.27	4.65		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
15/05/2021	8.53	1.32		
16/05/2021	9.40	3.59		
17/05/2021	7.74	2		
18/05/2021	-	-		
19/05/2021	8.52	3.9		
20/05/2021	11.46	5.35		
21/05/2021	13.98	7.27		
22/05/2021	10.62	3.99		
23/05/2021	10.36	6.1		
24/05/2021	9.31	4.92		
25/05/2021	-	-		
26/05/2021	9.40	3.03		
27/05/2021	8.92	3.28		
28/05/2021	7.25	2.35		
29/05/2021	11.14	4.12		
30/05/2021	13.52	4.23		
31/05/2021	10.89	3.58		
1/06/2021	13.27	5.65		
2/06/2021	-	-		
3/06/2021	11.49	6.73		
4/06/2021	5.89	2.77		
5/06/2021	5.85	3.76		
6/06/2021	7.79	4.59		
7/06/2021	8.29	5.21		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
8/06/2021	7.60	3.23		
9/06/2021	1.48	0.25		
10/06/2021	2.27	1.39		
11/06/2021	4.88	3.86		
12/06/2021	4.91	3.11		
13/06/2021	3.87	2.6		
14/06/2021	5.04	2.89		
15/06/2021	6.96	3.98		
16/06/2021	12.14	6.59		
17/06/2021	3.33	0.00		
18/06/2021	4.36	1.74		
19/06/2021	4.38	2.31		
20/06/2021	3.82	0.93		
21/06/2021	8.60	2.93		
22/06/2021	9.62	4.77		
23/06/2021	12.29	6.91		
24/06/2021	7.05	2.99		
25/06/2021	3.76	1.37		
26/06/2021	2.96	0.54		
27/06/2021	4.62	2.48		
28/06/2021	5.31	2.83		
29/06/2021	10.82	6.14		
30/06/2021	9.02	5.21		
1/07/2021	12.55	6.92		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2/07/2021	8.16	5.49		
3/07/2021	7.37	5.21		
4/07/2021	4.95	2.07		
5/07/2021	6.04	2.73		
6/07/2021	5.15	1.78		
7/07/2021	9.26	4.64		
8/07/2021	14.25	8.33		
9/07/2021	11.57	8.53		
10/07/2021	4.34	2.00		
11/07/2021	9.31	3.84		
12/07/2021	8.91	4.84		
13/07/2021	8.05	4.82		
14/07/2021	6.80	3.82		
15/07/2021	6.63	3.85		
16/07/2021	7.04	0.04		
17/07/2021	11.44	1.76		
18/07/2021	7.94	3.07		
19/07/2021	5.80	3.37		
20/07/2021	4.22	1.45		
21/07/2021	6.14	3.00		
22/07/2021	3.92	-0.01		
23/07/2021	8.63	4.39		
24/07/2021	5.50	2.46		
25/07/2021	6.69	1.77		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
26/07/2021	6.84	2.60		
27/07/2021	7.14	2.88		
28/07/2021	13.87	4.61		
29/07/2021	7.21	2.53		
30/07/2021	6.24	2.39		
31/07/2021	14.34	7.26		
1/08/2021	12.15	6.48		
2/08/2021	14.46	4.38		
3/08/2021	11.48	4.45		
4/08/2021	-	-		
5/08/2021	3.03	0.61		
6/08/2021	3.77	1.74		
7/08/2021	5.90	2.39		
8/08/2021	7.27	3.47		
9/08/2021	14.28	5.07		
10/08/2021	10.36	5.41		
11/08/2021	9.43	5.17		
12/08/2021	14.12	6.18		
13/08/2021	11.34	4.52		
14/08/2021	19.62	11.22		
15/08/2021	23.92	12.42		
16/08/2021	14.85	5.43		
17/08/2021	10.64	3.21		
18/08/2021	18.05	6.69		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
19/08/2021	18.13	9.79		
20/08/2021	12.69	6.52		
21/08/2021	10.62	5.83		
22/08/2021	7.91	3.84		
23/08/2021	10.69	4.65		
24/08/2021	2.05	0.42		
25/08/2021	5.11	2.34		
26/08/2021	5.27	2.97		
27/08/2021	-	-		
28/08/2021	2.61	-0.17		
29/08/2021	4.68	-0.74		
30/08/2021	3.77	-0.41		
31/08/2021	3.58	-0.74		
1/09/2021	-	-		
2/09/2021	-	-		
3/09/2021	9.02	3.67		
4/09/2021	6.86	2.51		
5/09/2021	3.51	1.40		
6/09/2021	4.41	0.88		
7/09/2021	8.84	1.67		
8/09/2021	9.90	3.42		
9/09/2021	8.20	2.08		
10/09/2021	-	-		
11/09/2021	13.28	4.27		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
12/09/2021	13.90	3.94		
13/09/2021	16.94	4.62		
14/09/2021	4.88	1.94		
15/09/2021	6.78	3.05		
16/09/2021	9.28	2.60		
17/09/2021	8.59	3.54		
18/09/2021	13.72	5.79		
19/09/2021	8.86	3.10		
20/09/2021	9.68	3.58		
21/09/2021	8.66	1.88		
22/09/2021	11.62	3.98		
23/09/2021	9.38	4.86		
24/09/2021	8.57	2.69		
25/09/2021	14.35	4.02		
26/09/2021	8.77	2.16		
27/09/2021	10.92	0.88		
28/09/2021	17.16	7.05		
29/09/2021	18.27	6.38		
30/09/2021	6.10	3.02		
1/10/2021	6.12	2.62		
2/10/2021	6.57	2.78		
3/10/2021	6.95	3.38		
4/10/2021	11.97	3.20		
5/10/2021	12.70	2.67		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
6/10/2021	15.35	5.48		
7/10/2021	14.17	5.30		
8/10/2021	31.78	8.49		
9/10/2021	20.12	6.33		
10/10/2021	18.53	8.40		
11/10/2021	4.34	1.48		
12/10/2021	5.83	1.72		
13/10/2021	4.27	0.86		
14/10/2021	7.88	2.43		
15/10/2021	14.34	3.12		
16/10/2021	6.90	2.44		
17/10/2021	6.16	1.32		
18/10/2021	13.10	4.31		
19/10/2021	11.05	3.19		
20/10/2021	12.88	3.21		
21/10/2021	14.60	4.38		
22/10/2021	15.77	5.63		
23/10/2021	-	-		
24/10/2021	-	-		
25/10/2021	-	-		
26/10/2021	17.27	4.49		
27/10/2021	12.90	3.64		
28/10/2021	16.06	4.52		
29/10/2021	22.87	5.79		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
30/10/2021	20.84	3.64		
31/10/2021	11.82	2.73		
1/11/2021	24.30	5.55		
2/11/2021	15.53	2.11		
3/11/2021	18.00	4.77		
4/11/2021	18.11	5.34		
5/11/2021	9.88	2.95		
6/11/2021	11.19	4.32		
7/11/2021	17.96	7.56		
8/11/2021	10.55	4.85		
9/11/2021	16.62	6.84		
10/11/2021	11.82	3.43		
11/11/2021	8.93	3.09		
12/11/2021	21.03	3.45		
13/11/2021	8.37	2.50		
14/11/2021	5.18	0.01		
15/11/2021	10.31	0.65		
16/11/2021	7.78	1.47		
17/11/2021	15.04	3.95		
18/11/2021	11.92	2.56		
19/11/2021	14.84	4.85		
20/11/2021	14.40	5.77		
21/11/2021	7.60	3.25		
22/11/2021	9.39	2.51		

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
23/11/2021	9.11	2.46		
24/11/2021	13.26	3.90		
25/11/2021	-	-		
26/11/2021	4.48	2.27		
27/11/2021	4.44	0.49		
28/11/2021	10.94	1.22		
29/11/2021	17.01	5.15		
30/11/2021	10.30	3.46		
1/12/2021	5.45	0.86		
2/12/2021	6.65	1.00		
3/12/2021	-	-		
4/12/2021	-	-		
5/12/2021	-	-		
6/12/2021	-	-		
7/12/2021	-	-		
8/12/2021	7.00	2.19		
9/12/2021	6.51	2.54		
10/12/2021	9.82	1.89		
11/12/2021	7.19	1.39		
12/12/2021	13.14	4.18	9.85	2.44
13/12/2021	20.35	4.86	18.35	4.43
14/12/2021	20.75	6.88	20.23	6.81
15/12/2021	18.84	6.78	26.36	6.83
16/12/2021	-	-	17.48	8.16

Date	TEOM-1		TEOM-2	
	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
17/12/2021	17.87	3.86	19.21	5.23
18/12/2021	16.93	3.80	17.53	6.04
19/12/2021	-	-	16.65	6.81
20/12/2021	-	-	13.11	5.05
21/12/2021	-	-	23.55	10.35
22/12/2021	-	-	-	-
23/12/2021	-	-	-	-
24/12/2021	-	-	10.06	3.34
25/12/2021	13.34	7.72	8.70	3.54
26/12/2021	10.16	4.22	8.76	3.01
27/12/2021	7.78	1.52	2.09	-1.69
28/12/2021	7.28	1.99	9.33	5.81
29/12/2021	9.29	2.73	-0.49	-3.05
30/12/2021	11.86	4.06	2.59	-0.55
31/12/2021	11.82	2.60	4.15	-0.2

Notes:

*The monitoring of PM<sub>2.5</sub> commenced at TEOM-1 on 9 March 2021.*

*The monitoring of PM<sub>10</sub> at TEOM-2 commenced on 10 December 2021.*

*Invalid 24-hour PM<sub>10</sub> results were recorded by TEOM-1 on 12 February, 24–26 March, 16–17 April, 25 May, 2 June, 10 September, 23–25 October, 3–7, 16 and 19–24 December 2021. This was due to power outages. Extensive electrical investigations and works were completed during 2021, inclusive of a new distribution board on 23 December which has resolved the power issues experienced.*

*Invalid 24-hour PM<sub>10</sub> results were recorded by TEOM-1 from 16 to 23 February 2021, due to the scheduled relocation of the dual channel TEOM from the Spur Hill monitoring site to the TEOM-1 site. This was to enable the recording of both PM<sub>10</sub> and PM<sub>2.5</sub> concentrations at the TEOM-1 site to enable assessment of compliance with the air quality criteria of SSD 9526.*

*Invalid 24-hour PM<sub>10</sub> results were recorded by TEOM-1 on 18 May, 4&27 August, 1–2 September and 25 November 2021 due to scheduled equipment calibration and repairs occurring on these days.*

*Invalid 24-hour PM<sub>10</sub> results were recorded by TEOM-2 on 22–23 December 2021 due to the replacement of a failed ambient sensor which resulted in insufficient data being recorded to calculate a valid 24-hour average.*

*Some minor negative 24-hour PM<sub>2.5</sub> results were recorded at both TEOMs during 2021, however this is considered a normal function of the TEOM equipment and should not be discounted.*



## APPENDIX 5. TRAIN MOVEMENTS

Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
01-Jan-21	0	-	0
02-Jan-21	0	-	0
03-Jan-21	0	-	0
04-Jan-21	0	-	0
05-Jan-21	0	-	0
06-Jan-21	0	-	0
07-Jan-21	0	-	0
08-Jan-21	0	-	0
09-Jan-21	0	-	0
10-Jan-21	0	-	0
11-Jan-21	0	-	0
12-Jan-21	0	-	0
13-Jan-21	0	-	0
14-Jan-21	0	-	0
15-Jan-21	0	-	0
16-Jan-21	0	-	0
17-Jan-21	0	-	0
18-Jan-21	0	-	0
19-Jan-21	0	-	0
20-Jan-21	0	-	0
21-Jan-21	0	-	0
22-Jan-21	0	-	0
23-Jan-21	0	-	0
24-Jan-21	0	-	0
25-Jan-21	0	-	0
26-Jan-21	0	-	0
27-Jan-21	0	-	0
28-Jan-21	0	-	0
29-Jan-21	0	-	0
30-Jan-21	0	-	0
31-Jan-21	0	-	0
01-Feb-21	0	-	0
02-Feb-21	0	-	0
03-Feb-21	0	-	0
04-Feb-21	0	-	0
05-Feb-21	0	-	0
06-Feb-21	0	-	0
07-Feb-21	0	-	0
08-Feb-21	0	-	0
09-Feb-21	0	-	0
10-Feb-21	0	-	0
11-Feb-21	0	-	0
12-Feb-21	0	-	0

Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
13-Feb-21	0	-	0
14-Feb-21	0	-	0
15-Feb-21	0	-	0
16-Feb-21	0	-	0
17-Feb-21	0	-	0
18-Feb-21	0	-	0
19-Feb-21	0	-	0
20-Feb-21	0	-	0
21-Feb-21	0	-	0
22-Feb-21	0	-	0
23-Feb-21	0	-	0
24-Feb-21	0	-	0
25-Feb-21	0	-	0
26-Feb-21	0	-	0
27-Feb-21	0	-	0
28-Feb-21	0	-	0
01-Mar-21	0	-	0
02-Mar-21	0	-	0
03-Mar-21	0	-	0
04-Mar-21	0	-	0
05-Mar-21	0	-	0
06-Mar-21	0	-	0
07-Mar-21	0	-	0
08-Mar-21	0	-	0
09-Mar-21	0	-	0
10-Mar-21	0	-	0
11-Mar-21	0	-	0
12-Mar-21	0	-	0
13-Mar-21	0	-	0
14-Mar-21	0	-	0
15-Mar-21	0	-	0
16-Mar-21	0	-	0
17-Mar-21	0	-	0
18-Mar-21	0	-	0
19-Mar-21	0	-	0
20-Mar-21	0	-	0
21-Mar-21	0	-	0
22-Mar-21	0	-	0
23-Mar-21	0	-	0
24-Mar-21	0	-	0
25-Mar-21	0	-	0
26-Mar-21	0	-	0
27-Mar-21	0	-	0
28-Mar-21	0	-	0
29-Mar-21	0	-	0

Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
30-Mar-21	1	15:00	0
31-Mar-21	0	-	0
01-Apr-21	0	-	0
02-Apr-21	0	-	0
03-Apr-21	0	-	0
04-Apr-21	0	-	0
05-Apr-21	0	-	0
06-Apr-21	0	-	0
07-Apr-21	0	-	0
08-Apr-21	0	-	0
09-Apr-21	0	-	0
10-Apr-21	0	-	0
11-Apr-21	0	-	0
12-Apr-21	1	8:41	0
13-Apr-21	0	-	0
14-Apr-21	0	-	0
15-Apr-21	0	-	0
16-Apr-21	0	-	0
17-Apr-21	0	-	0
18-Apr-21	0	-	0
19-Apr-21	1	12:00	0
20-Apr-21	0	-	0
21-Apr-21	0	-	0
22-Apr-21	0	-	0
23-Apr-21	0	-	0
24-Apr-21	0	-	0
25-Apr-21	0	-	0
26-Apr-21	0	-	0
27-Apr-21	0	-	0
28-Apr-21	0	-	0
29-Apr-21	0	-	0
30-Apr-21	0	-	0
01-May-21	0	-	0
02-May-21	0	-	0
03-May-21	0	-	0
04-May-21	0	-	0
05-May-21	0	-	0
06-May-21	0	-	0
07-May-21	0	-	0
08-May-21	0	-	0
09-May-21	0	-	0
10-May-21	0	-	0
11-May-21	0	-	0
12-May-21	0	-	0
13-May-21	0	-	0

Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
14-May-21	0	-	0
15-May-21	0	-	0
16-May-21	0	-	0
17-May-21	0	-	0
18-May-21	0	-	0
19-May-21	0	-	0
20-May-21	0	-	0
21-May-21	0	-	0
22-May-21	0	-	0
23-May-21	1	7:41	0
24-May-21	0	-	0
25-May-21	0	-	0
26-May-21	0	-	0
27-May-21	0	-	0
28-May-21	1	11:00	0
29-May-21	0	-	0
30-May-21	0	-	0
31-May-21	1	18:00	0
01-Jun-21	0	-	0
02-Jun-21	0	-	0
03-Jun-21	0	-	0
04-Jun-21	0	-	0
05-Jun-21	0	-	0
06-Jun-21	0	-	0
07-Jun-21	0	-	0
08-Jun-21	0	-	0
09-Jun-21	0	-	0
10-Jun-21	0	-	0
11-Jun-21	0	-	0
12-Jun-21	0	-	0
13-Jun-21	0	-	0
14-Jun-21	0	-	0
15-Jun-21	0	-	0
16-Jun-21	0	-	0
17-Jun-21	0	-	0
18-Jun-21	0	-	0
19-Jun-21	0	-	0
20-Jun-21	0	-	0
21-Jun-21	0	-	0
22-Jun-21	0	-	0
23-Jun-21	0	-	0
24-Jun-21	0	-	0
25-Jun-21	0	-	0
26-Jun-21	0	-	0
27-Jun-21	0	-	0

Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
28-Jun-21	0	-	0
29-Jun-21	0	-	0
30-Jun-21	0	-	0
01-Jul-21	0	-	0
02-Jul-21	0	-	0
03-Jul-21	0	-	0
04-Jul-21	0	-	0
05-Jul-21	0	-	0
06-Jul-21	0	-	0
07-Jul-21	0	-	0
08-Jul-21	0	-	0
09-Jul-21	0	-	0
10-Jul-21	0	-	0
11-Jul-21	0	-	0
12-Jul-21	0	-	0
13-Jul-21	0	-	0
14-Jul-21	0	-	0
15-Jul-21	0	-	0
16-Jul-21	0	-	0
17-Jul-21	0	-	0
18-Jul-21	0	-	0
19-Jul-21	0	-	0
20-Jul-21	1	12:12	0
21-Jul-21	0	-	0
22-Jul-21	0	-	0
23-Jul-21	0	-	0
24-Jul-21	0	-	0
25-Jul-21	0	-	0
26-Jul-21	0	-	0
27-Jul-21	0	-	0
28-Jul-21	0	-	0
29-Jul-21	0	-	0
30-Jul-21	0	-	0
31-Jul-21	0	-	0
01-Aug-21	0	-	0
02-Aug-21	1	NR	0
03-Aug-21	0	-	0
04-Aug-21	0	-	0
05-Aug-21	0	-	0
06-Aug-21	0	-	0
07-Aug-21	0	-	0
08-Aug-21	0	-	0
09-Aug-21	0	-	0
10-Aug-21	0	-	0
11-Aug-21	0	-	0

Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
12-Aug-21	0	-	0
13-Aug-21	0	-	0
14-Aug-21	0	-	0
15-Aug-21	0	-	0
16-Aug-21	0	-	0
17-Aug-21	0	-	0
18-Aug-21	0	-	0
19-Aug-21	0	-	0
20-Aug-21	1	21:00	0
21-Aug-21	0	-	0
22-Aug-21	0	-	0
23-Aug-21	0	-	0
24-Aug-21	1	8:30	0
25-Aug-21	0	-	0
26-Aug-21	0	-	0
27-Aug-21	0	-	0
28-Aug-21	1	9:00	0
29-Aug-21	0	-	0
30-Aug-21	0	-	0
31-Aug-21	0	-	0
01-Sep-21	1	18:00	0
02-Sep-21	0	-	0
03-Sep-21	0	-	0
04-Sep-21	0	-	0
05-Sep-21	0	-	0
06-Sep-21	0	-	0
07-Sep-21	0	-	0
08-Sep-21	0	-	0
09-Sep-21	0	-	0
10-Sep-21	0	-	0
11-Sep-21	0	-	0
12-Sep-21	0	-	0
13-Sep-21	0	-	0
14-Sep-21	0	-	0
15-Sep-21	0	-	0
16-Sep-21	0	-	0
17-Sep-21	0	-	0
18-Sep-21	0	-	0
19-Sep-21	0	-	0
20-Sep-21	0	-	0
21-Sep-21	0	-	0
22-Sep-21	0	-	0
23-Sep-21	1	21:00	0
24-Sep-21	0	-	0
25-Sep-21	0	-	0



Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
26-Sep-21	0	-	0
27-Sep-21	0	-	0
28-Sep-21	0	-	0
29-Sep-21	0	-	0
30-Sep-21	0	-	0
01-Oct-21	0	-	0
02-Oct-21	0	-	0
03-Oct-21	0	-	0
04-Oct-21	0	-	0
05-Oct-21	0	-	0
06-Oct-21	0	-	0
07-Oct-21	0	-	0
08-Oct-21	0	-	0
09-Oct-21	0	-	0
10-Oct-21	0	-	0
11-Oct-21	0	-	0
12-Oct-21	0	-	0
13-Oct-21	0	-	0
14-Oct-21	0	-	0
15-Oct-21	0	-	0
16-Oct-21	0	-	0
17-Oct-21	0	-	0
18-Oct-21	0	-	0
19-Oct-21	0	-	0
20-Oct-21	0	-	0
21-Oct-21	0	-	0
22-Oct-21	0	-	0
23-Oct-21	0	-	0
24-Oct-21	0	-	0
25-Oct-21	0	-	0
26-Oct-21	0	-	0
27-Oct-21	0	-	0
28-Oct-21	0	-	0
29-Oct-21	0	-	0
30-Oct-21	0	-	0
31-Oct-21	0	-	0
01-Nov-21	0	-	0
02-Nov-21	0	-	0
03-Nov-21	0	-	0
04-Nov-21	0	-	0
05-Nov-21	0	-	0
06-Nov-21	0	-	0
07-Nov-21	0	-	0
08-Nov-21	0	-	0
09-Nov-21	0	-	0

Date	Total train movements per day	Time of train movements (24 hour)	Total tonnage per day
10-Nov-21	0	-	0
11-Nov-21	0	-	0
12-Nov-21	0	-	0
13-Nov-21	0	-	0
14-Nov-21	0	-	0
15-Nov-21	0	-	0
16-Nov-21	0	-	0
17-Nov-21	0	-	0
18-Nov-21	0	-	0
19-Nov-21	0	-	0
20-Nov-21	0	-	0
21-Nov-21	0	-	0
22-Nov-21	0	-	0
23-Nov-21	0	-	0
24-Nov-21	0	-	0
25-Nov-21	0	-	0
26-Nov-21	0	-	0
27-Nov-21	0	-	0
28-Nov-21	0	-	0
29-Nov-21	0	-	0
30-Nov-21	0	-	0
01-Dec-21	0	-	0
02-Dec-21	0	-	0
03-Dec-21	0	-	0
04-Dec-21	0	-	0
05-Dec-21	0	-	0
06-Dec-21	0	-	0
07-Dec-21	0	-	0
08-Dec-21	0	-	0
09-Dec-21	0	-	0
10-Dec-21	0	-	0
11-Dec-21	0	-	0
12-Dec-21	0	-	0
13-Dec-21	0	-	0
14-Dec-21	0	-	0
15-Dec-21	0	-	0
16-Dec-21	0	-	0
17-Dec-21	0	-	0
18-Dec-21	0	-	0
19-Dec-21	0	-	0
20-Dec-21	0	-	0
21-Dec-21	0	-	0
22-Dec-21	0	-	0
23-Dec-21	0	-	0
24-Dec-21	0	-	0

<b>Date</b>	<b>Total train movements per day</b>	<b>Time of train movements (24 hour)</b>	<b>Total tonnage per day</b>
25-Dec-21	0	-	0
26-Dec-21	1	11:00	0
27-Dec-21	0	-	0
28-Dec-21	0	-	0
29-Dec-21	0	-	0
30-Dec-21	0	-	0
31-Dec-21	0	-	0

*NR Not Reported*

## APPENDIX 6. VISUAL IMPACT RESULTS

Plant ID No.	Year Planted	Plant Height (m)	Plant Width (m)
1	2019	2.0	0.8
2	2019	1.8	1.0
3	2019	2.1	1.7
4	2019	1.4	1.1
5	2019	1.5	0.9
6	2019	2.4	1.3
7	2019	0.8	0.5
8	2019	1.5	1.3
9	2019	1.6	0.9
10	2019	0.9	0.4
11	2019	2.2	1.5
12	2019	2.4	1.8
13	2019	1.6	1.1
14	2019	1.2	0.9
15	2019	1.6	1.0
16	2019	0.9	0.6
17	2019	1.5	0.8
18	2019	1.5	1.1
19	2021	0.4	0.1
20	2019	1.3	1.3
21	2019	1.8	1.2
22	2019	1.6	0.9
23	2019	1.6	1.3
24	2019	1.9	1.0
25	2019	2.3	1.4
26	2019	1.6	1.0
27	2019	1.0	0.5
28	2021	0.5	0.1
29	2019	1.3	0.4
30	2019	1.5	0.7
31	2019	0.8	0.3

## APPENDIX 7. BIODIVERSITY MONITORING RESULTS

Table 24. Performance of Biodiversity Offset sites 2021

Performance indicator	Completion Criteria	Reference Site			Rehabilitation Site	
		1b	3b	3c	7b	8b
Species composition for active vegetation regeneration	Tree, shrub and ground cover species selected from published species composition lists for targeted vegetation communities.	N/A	N/A	N/A	Y	Y
	Hunter Lowland Redgum Forest is part of the vegetation community within the Wildlife Refuge.	Y	Y	N/A	N/A	N/A
	Spotted Gum - Grey Box woodland is part of the vegetation community within the Northern Offset area.	N/A	N/A	Y	N/A	N/A
	Native woodland communities established within the Southern Offset area included: • Narrow-leaved Ironbark Woodland; • Spotted Gum - Grey Box Woodland; and • Red Gum Forest	N/A	N/A	N/A	Y	Y
Canopy and understorey (tree and shrub) establishment	Seed and or planting establishment results in > 200 stems/ha of understorey and > 400 stems/ha of canopy species at the end of 12 months.	N/A	N/A	N/A	N	N
Unauthorised access	Unauthorised access (firewood collection, shooting) prevented through adequate fencing, signage and inspections.	Y	Y	Y	Y	Y
Weeds management	Weeds species < 20% of species diversity and < 20% groundcover	Y	Y	Y	N	N
Spontaneous combustion	No visible spontaneous combustion or vegetation impacts.	Y	Y	Y	Y	Y
Feral animal management	Regular feral animal management implemented to protect rehabilitation.	Y	Y	Y	Y	Y

**Table 25. Performance of pasture rehabilitation sites 2021**

Performance indicator	Completion Criteria	2021		
		Rehabilitation Site		
		11d	11i	12c
Groundcover establishment	Groundcover vegetation established consisting of suitable mix of perennial grasses, forbs and legume species.	Y	Y	Y
	Pasture vegetation is > 70% cover after 12 months.	Y	Y	Y
Species diversity	No single species represents more than 40% of cover.	Y	N	Y
	At least 3 perennial pasture species present (> 3 months after grazing or slashing).	Y	Y	Y
Weed management	Weeds of concern represent < 20% of species diversity and < 20% groundcover.	Y	Y	Y
Spontaneous combustion	No visible spontaneous combustion or vegetation impacts.	Y	Y	Y
Feral animal management	Rehabilitation establishment is not being impeded by feral animals.	Y	Y	Y

**Table 26. Performance of woodland sites 2021**

Performance indicator	Completion Criteria	2021	
		Rehabilitation Site	
		10d	12b
Vegetation cover establishment	Combined groundcover and foliar cover > 50% after 12 months.	Y	Y
Groundcover as erosion protection	No bare patches in groundcover vegetation > 100 square metres or active erosion rills > 30cm depth.	Y	Y
Native tree and shrub establishment	Tree and shrub species consistent with key species of: • Narrow Leaved Ironbark Woodland • Spotted Gum – Grey Box Woodland; and • Red Gum Woodland.	N	Y
	Seed and or planting establishment results in > 200 stems/ha of understorey and > 400 stems/ha of canopy species at the end of 12 months.	N/A	Y
Weed management	Weeds of concern represent < 20% of species diversity and < 20% groundcover.	N	Y
Spontaneous combustion	No visible spontaneous combustion or vegetation impacts.	Y	Y
Feral animal management	Rehabilitation establishment is not being impeded by feral animals.	Y	Y
Unauthorised access	Unauthorised access (firewood collection, shooting) prevented through adequate fencing, signage and inspections.	Y	Y



Performance indicator	Completion Criteria	2021	
		Rehabilitation Site	
		10d	12b
Bushfire management	Firebreaks and access trails maintained.	Y	Y

**Key**

	Met performance criteria		Did not meet performance criteria
--	--------------------------	--	-----------------------------------

## APPENDIX 8. WATER ACCOUNTING FRAMEWORK INPUT – OUTPUT STATEMENT

Reporting Period	Date	Storage (ML)
Start	01/01/2021	14,362
Finish	31/12/2021	16,727

### INPUTS-OUTPUTS

Input-Output	Element (Source / Destination)	Sub-element (Inputs/Outputs)	Water Quality			Sub-element Total (ML)	Measured, Estimated, Simulated	Accuracy
			Category 1 (ML)	Category 2 (ML)	Category 3 (ML)			
Inputs	Surface Water	<i>Precipitation and Runoff</i>		2,459.0		2,459.0	Simulated	Medium
		<i>Rivers and Creeks</i>						
		<i>External Surface Water Storage</i>						
	Groundwater	<i>Aquifer Interception</i>			424.3	424.3	Estimated	Medium
		<i>Bore Fields</i>						
		<i>Entrainment</i>						
	Seawater	<i>Estuary</i>						
		<i>Sea/Ocean</i>						
	Third Party Water	<i>Contract</i>						
		<i>Wastewater</i>						
<i>Other</i>		1.7				Measured	High	
<b>TOTAL INPUTS</b>			<b>1.7</b>	<b>2,459.0</b>	<b>424.3</b>	<b>2,885.0</b>		
Outputs	Surface Water	<i>Discharge</i>						
		<i>Environmental Flows</i>						
	Groundwater	<i>Seepage</i>						
		<i>Reinjection</i>						
	Seawater	<i>Discharge to Estuary</i>						
		<i>Discharge to Sea/Ocean</i>						
	Supply to Third Party							
	Other	<i>Evaporation</i>	519.4			519.4	Simulated	Medium
<i>Entrainment</i>								
<i>Other (potable, misc)</i>								
<b>TOTAL OUTPUTS</b>			<b>519.4</b>			<b>519.4</b>		

# APPENDIX 9. SURFACE WATER QUALITY RESULTS

## Mine water storage monitoring locations

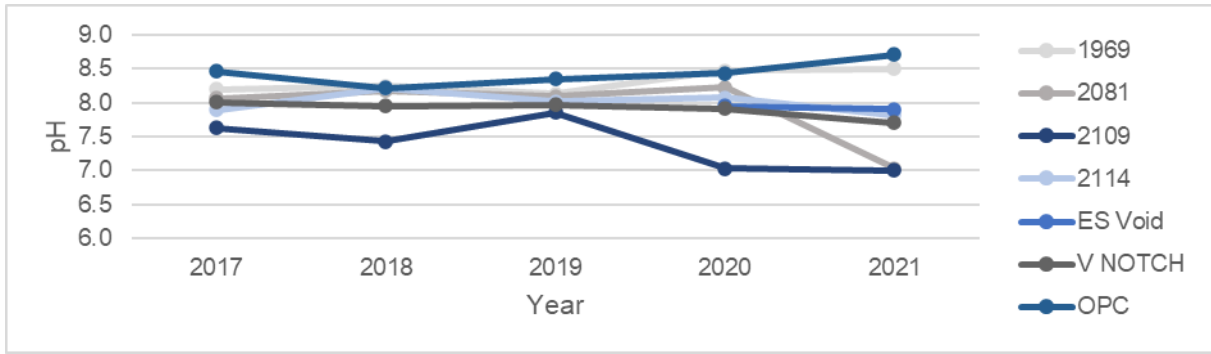


Figure 26. Long-term surface water pH

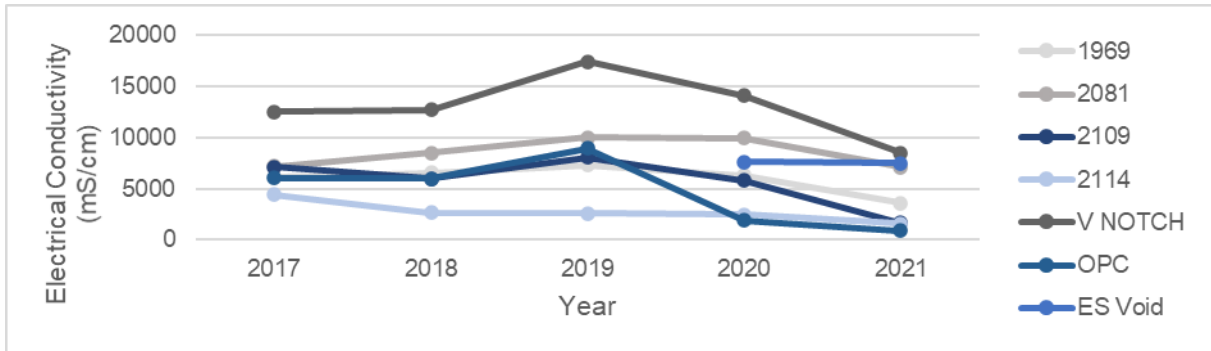


Figure 27. Long-term surface water electrical conductivity

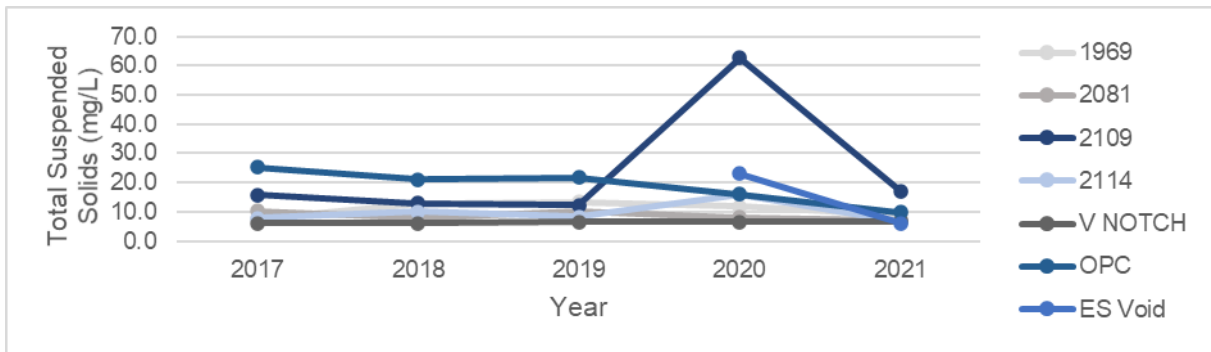


Figure 28. Long-term surface water total suspended solids

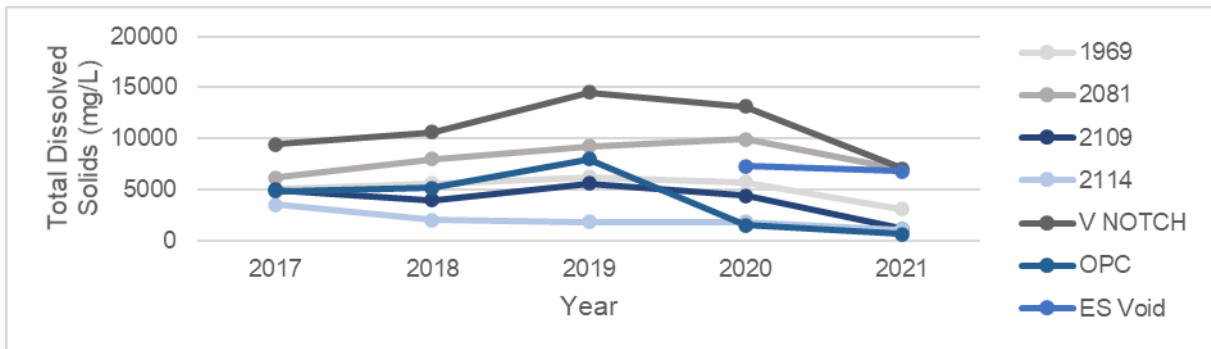


Figure 29. Long-term surface water total dissolved solids

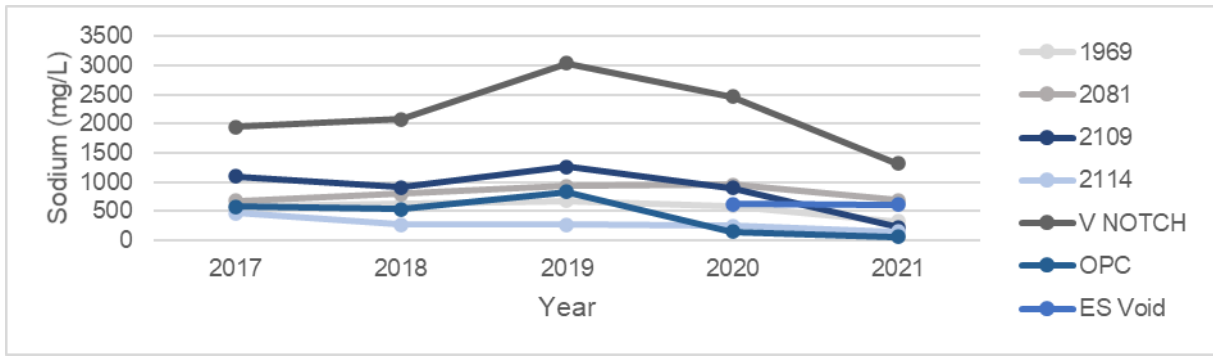


Figure 30. Long-term surface water sodium

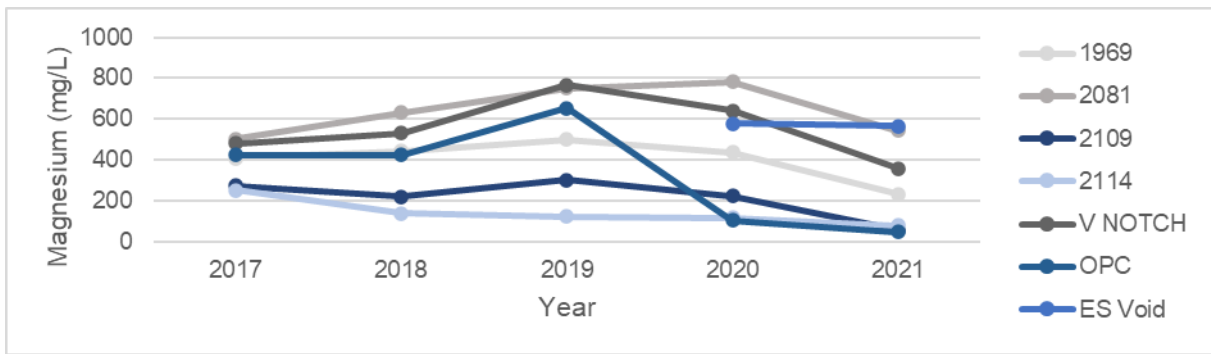


Figure 31. Long-term surface water magnesium

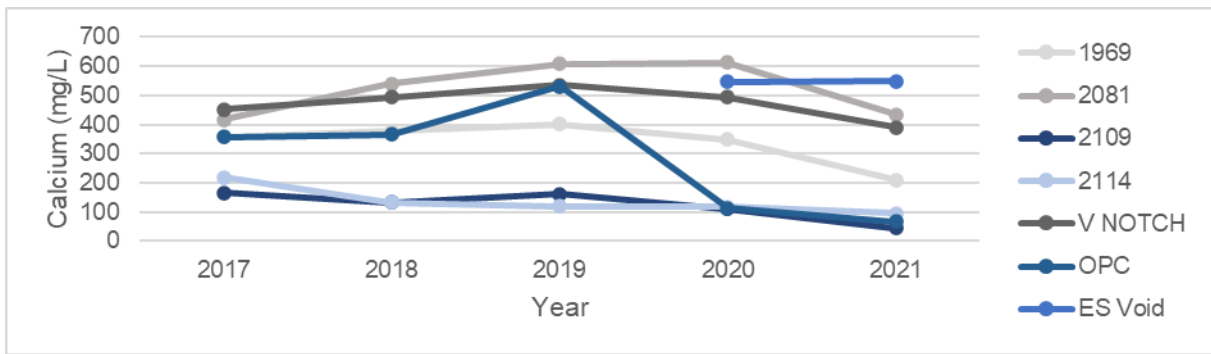


Figure 32. Long-term surface water calcium

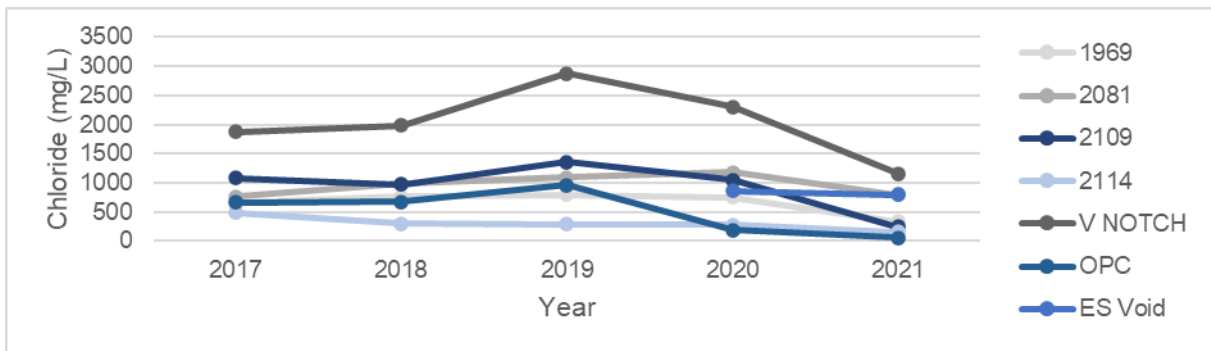


Figure 33. Long-term surface water chloride

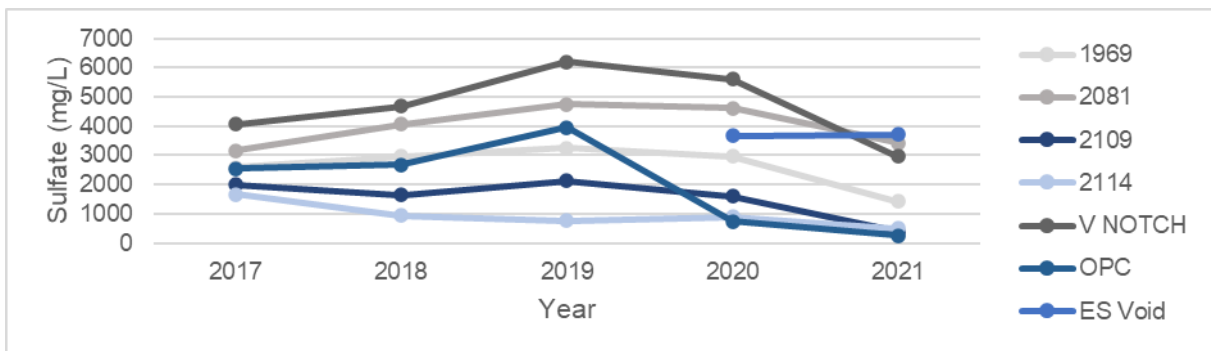


Figure 34. Long-term surface water sulfate

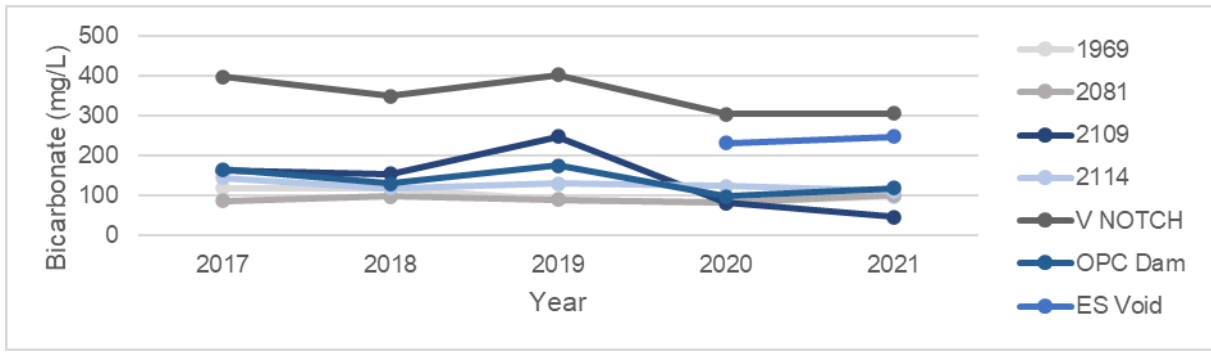


Figure 35. Long-term surface water bicarbonates

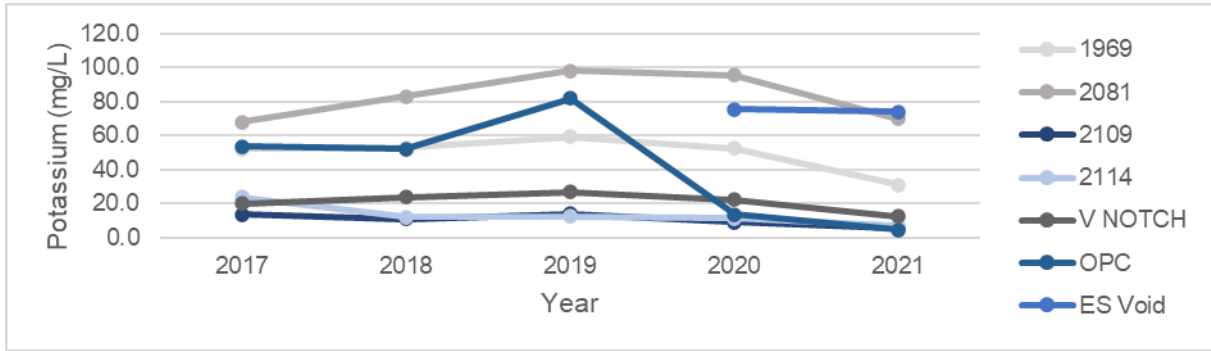


Figure 36. Long-term surface water potassium

Table 27. Average BTEX, PAH and TPHs Measured Concentrations at the OPC Dam.

Location	Year	Parameter		
		BTEX	PAHs	TPHs
OPC Dam	2021	<LOR	<LOR	<LOR

Note: Regular monitoring for these variables commenced in 2020. LOR: Limit of reporting

### Downstream Surface Water Monitoring Locations

#### Notes

Laboratory results only included. Field measurements are not included as these are deemed for use for investigatory purposes only and there are no trigger levels set. Results include all sampling events including post-rainfall.



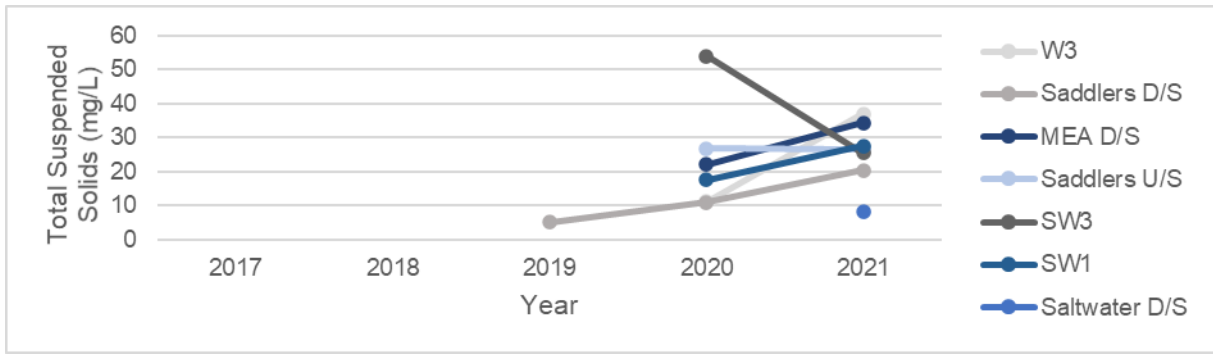


Figure 37. Total suspended solids

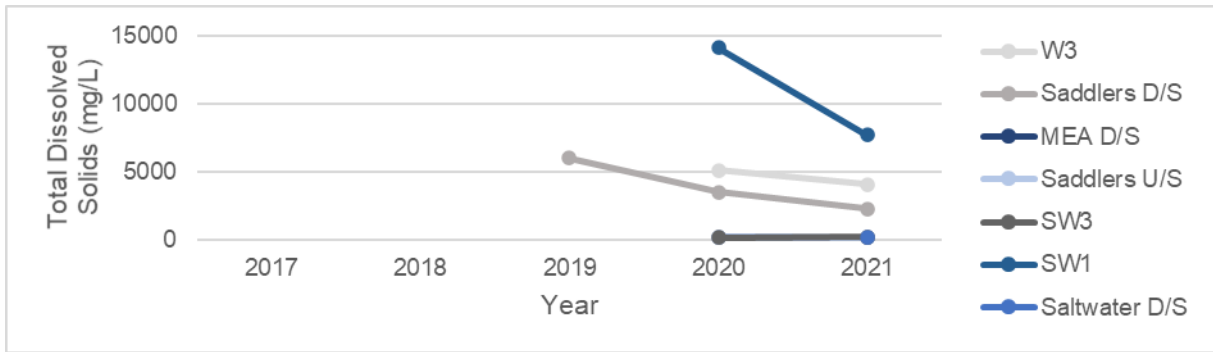


Figure 38. Total dissolved solids

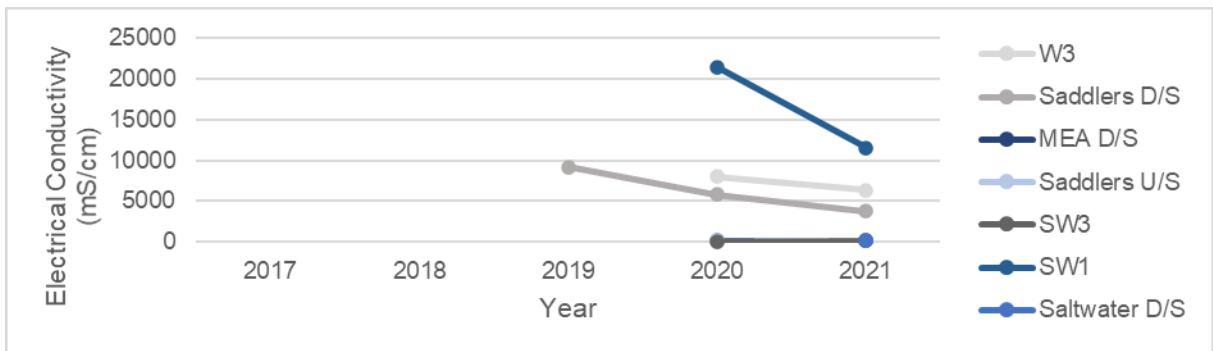


Figure 39. Electrical conductivity

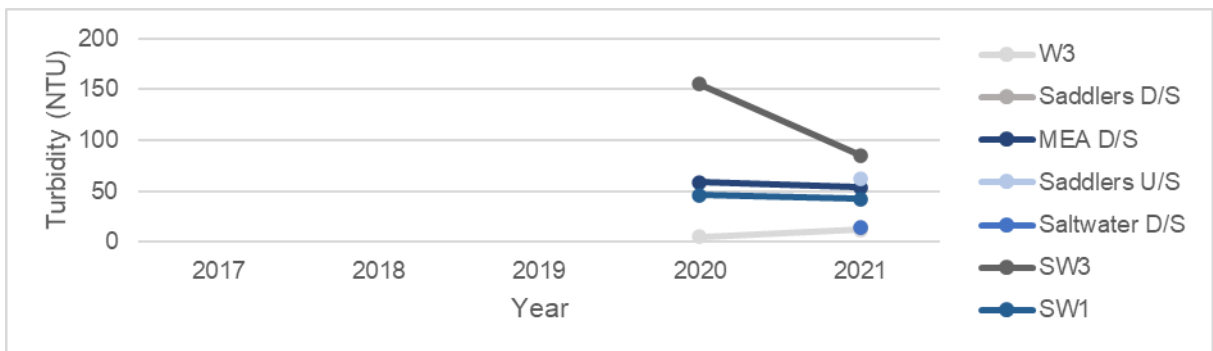


Figure 40. Turbidity

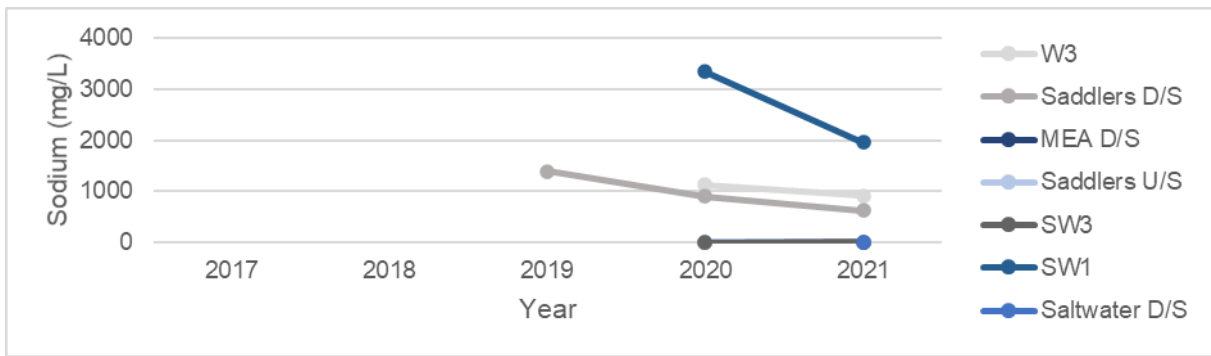


Figure 41. Sodium

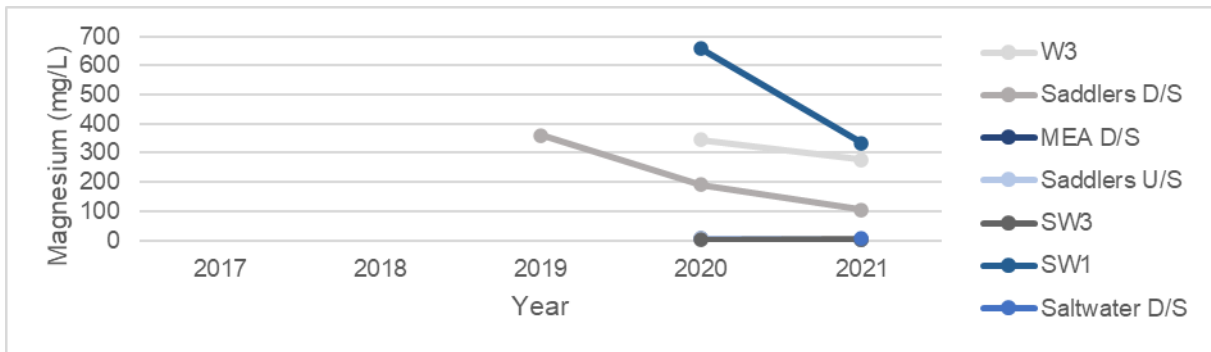


Figure 42. Magnesium

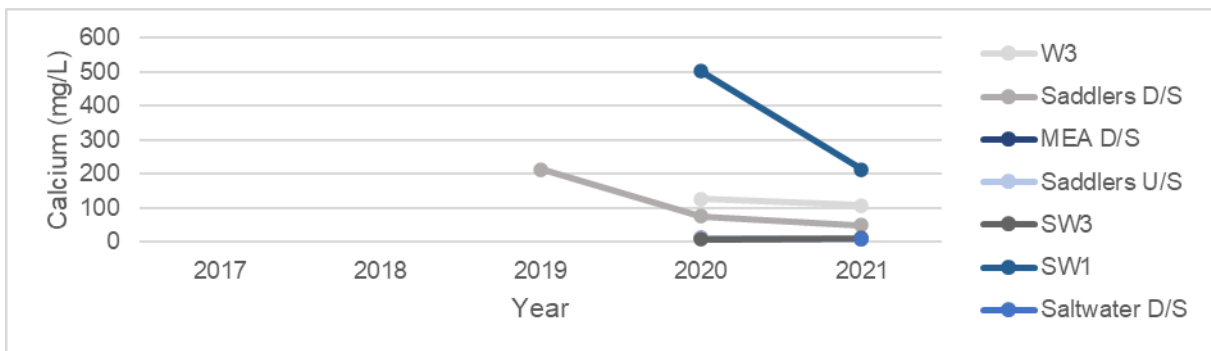


Figure 43. Calcium

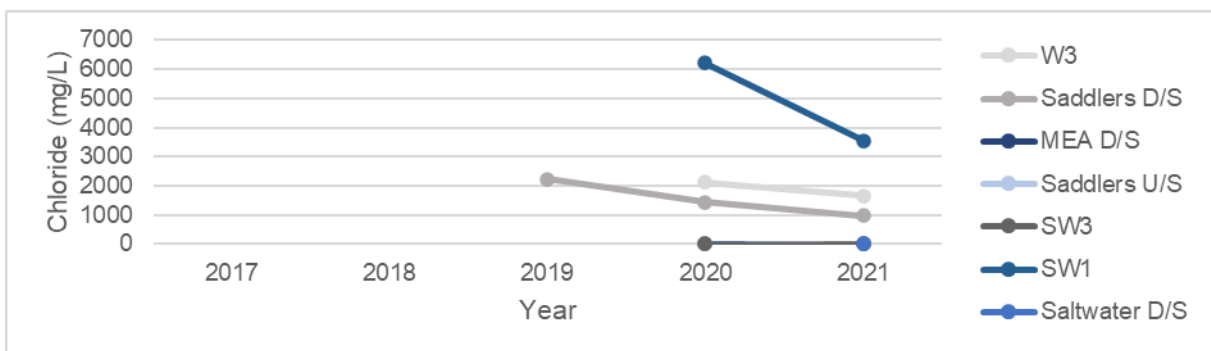


Figure 44. Chloride

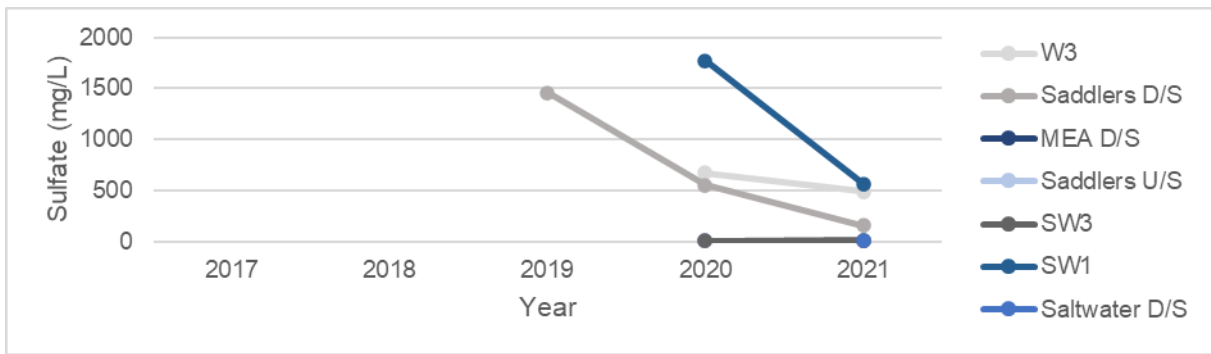


Figure 45. Sulfate

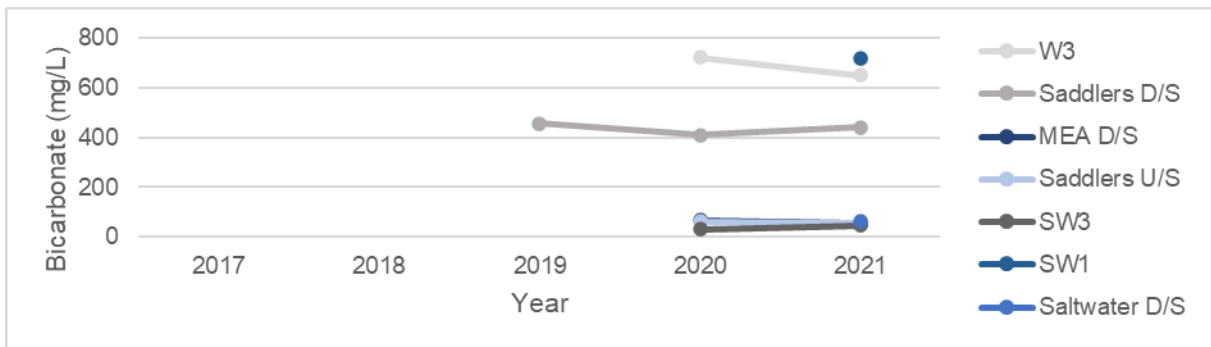


Figure 46. Bicarbonates

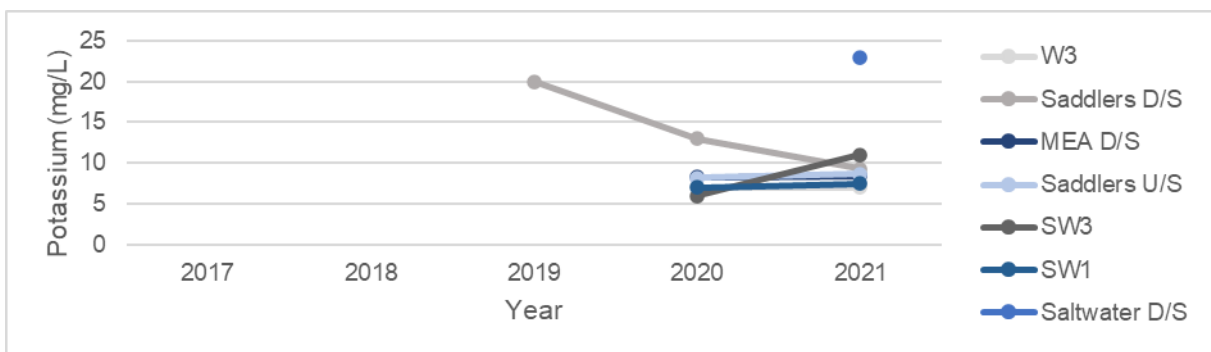


Figure 47. Potassium

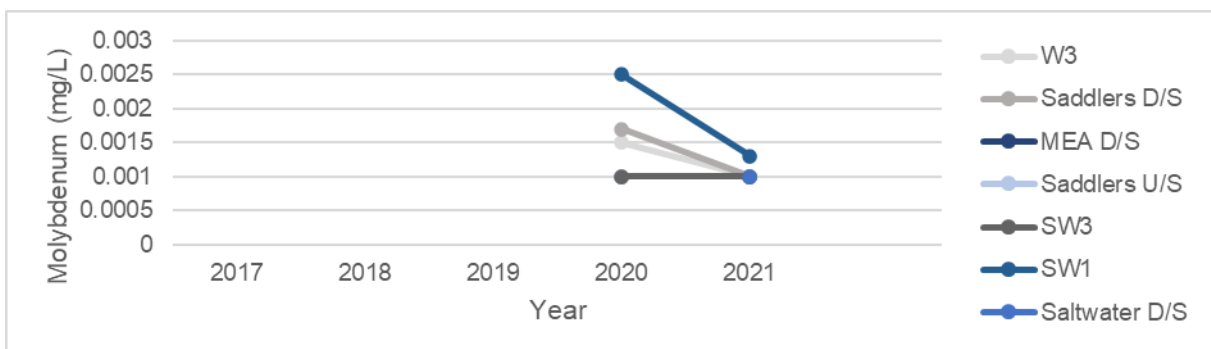


Figure 48. Molybdenum

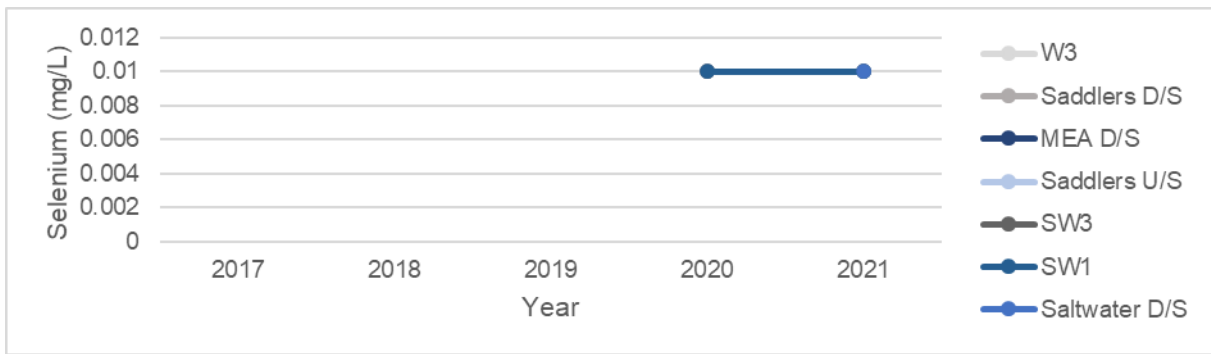


Figure 49. Selenium

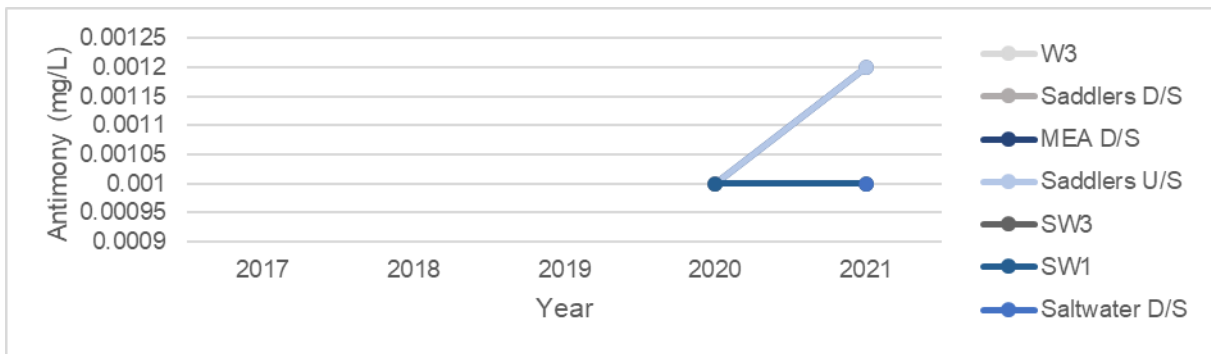


Figure 50. Antimony

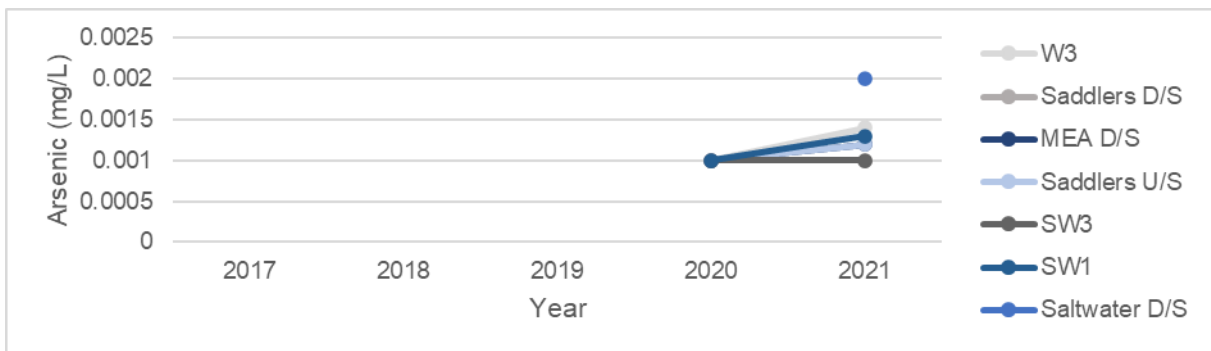


Figure 51. Arsenic

**Table 28. Surface water field measurements at sites along Saddlers Creek during Q3 and comparison against trigger levels. If an exceedance of the trigger level occurs for three consecutive readings, this is highlighted in red.**

Site		Field result			
		pH	EC	Turbidity	
		Units	µS/cm	NTU	
		Trigger	6.5–8.5	7600	64
		Sample date			
W3	8/7/21	7.7	11236	9.0	
Saddlers D/S (W4 – Bowfield)	8/7/21	8.0	10655	1.7	
MEA D/S	8/7/21	6.4	163	67	
Saddlers U/S	8/7/21	6.9	4218	2.8	
Saltwater D/S	8/7/21	Dry			
SW1/ Saddlers	8/7/21	7.2	18,836	44	
SW2	Location to be established – see notes				
SW3	8/7/21	Dry			

Notes. Surface water sampling first occurred under the Maxwell UG Project Surface Water MP on 8/7/21 (prior to its approval on 25/11/21). Results and comparison against trigger levels are from the scheduled sampling only; ie results from any rainfall events are not included.

Turbidity results presented are laboratory results; from Q1 2022, a field meter will be used to determine turbidity; this will enable direct comparison against the field trigger values for turbidity. Trigger for turbidity calculated by WRM Water based on the 80<sup>th</sup> percentile of the entire laboratory NTU dataset to end of 2021.

**Table 29. Surface water field measurements at sites along Saddlers Creek during Q4 and comparison against trigger levels. If an exceedance of the trigger level occurs for three consecutive readings, this is highlighted in red.**

Site		Field result		
		pH	EC	Turbidity
		Units	µS/cm	NTU
		Trigger	7600	64
Sample date				
W3	26/10/21	TLTS	TLTS	TLTS
Saddlers D/S (W4 – Bowfield)	26/10/21	7.89	3630	35
MEA D/S	26/10/21	8.43	279	26
Saddlers U/S	26/10/21	7.73	2817*	5.7
Saltwater D/S	26/10/21	Dry		
SW1/ Saddlers	26/10/21	7.75	17,840*	3.4
SW2	Location to be established – see notes			
SW3	26/10/21	Dry		

TLTS = Too low to sample. \* = sampling notes were 'Very low level'.



**Table 30. Surface water laboratory results at sites along Saddlers Creek during Q3 and comparison against trigger levels. If an exceedance of the trigger level occurs for three consecutive readings, this is highlighted in red.**

Site	Sample date	Laboratory result													
		Sb	As (V)	As (III)	CaCO3	Ca	Cl	Mg	Mb	K	Se	Na	SO4	TSS	TDS
Units		mg/L	mg/L mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Trigger		9 <sup>(c)</sup>	13 <sup>(c)</sup>	24 <sup>(b) (c)</sup>	(a)	(a)	(a)	(a)	34 <sup>(c)</sup>	(a)	11 <sup>(c)</sup>	(a)	(a)	50	4900
W3	8/7/21	0.0010	0.0010	0.0010	838	145	2130	368	0.0010	4.0	0.010	1190	573	33	5300
Saddlers D/S (W4 – Bowfield)	8/7/21	0.0010	0.0010	0.0010	785	93	2150	220	0.0010	10.0	0.010	1310	313	5.0	4640
MEA D/S	8/7/21	0.0010	0.0010	0.0010	53	9.0	11	4.0	0.0010	7.0	0.010	9.0	1.0	58	112
Saddlers U/S	8/7/21	0.0010	0.0010	0.0010	395	258	455	184	0.0010	19.0	0.010	216	723	5.0	2370
Saltwater D/S	8/7/21	Dry													
SW1/ Saddlers	8/7/21	0.0010	0.0010	0.0010	955	253	4080	366	0.0010	5.0	0.010	2330	601	17	8770
SW2	8/7/21	Location to be established – see notes													
SW3	8/7/21	Dry													

**Table 31. Surface water laboratory results at sites along Saddlers Creek during Q4 and comparison against trigger levels. If an exceedance of the trigger level occurs for three consecutive readings, this is highlighted in red.**

Site	Sample date	Laboratory result													
		Sb	As (V)	As (III)	CaCO <sub>3</sub>	Ca	Cl	Mg	Mb	K	Se	Na	SO <sub>4</sub>	TSS	TDS
Units		mg/L	mg/L mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Trigger		9 <sup>(c)</sup>	13 <sup>(c)</sup>	24 <sup>(b) (c)</sup>	(a)	(a)	(a)	(a)	34 <sup>(c)</sup>	(a)	11 <sup>(c)</sup>	(a)	(a)	50	4900
W3	26/10/21	TLTS													
Saddlers D/S (W4 – Bowfield)	26/10/21	0.0010	0.0010	0.0010	311	34	849	80	0.0010	9.0	0.01	476	109	58.0	1800
MEA D/S	26/10/21	0.0010	0.0010	0.0010	51	11	18	5	0.0010	9.0	0.01	11	1	8.0	149
Saddlers U/S	26/10/21	0.0010	0.0020	0.0020	388	147	373	116	0.0010	18.0	0.01	175	418	14.0	1580
Saltwater D/S	26/10/21	Dry													
SW1/ Saddlers	26/10/21	927	268	5280	432	0.0010	6.0	0.01	2590	622	5.0	9910	927	268	5280
SW2	26/10/21	Location to be established – see notes													
SW3	26/10/21	Dry													

- (a) No trigger; for interpretation purposes only
- (b) Result is a combination of As (V) and As (III)
- (c) Trigger set as a preliminary guideline value

## APPENDIX 10. STREAM HEALTH MONITORING RESULTS

Table 32. Stream Health Monitoring Records – Site: W3

Measured variable	Site W3. Baseline condition (Q3 2020). Date: 21/07/2020	Q4 2020 Date: 15/12/2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
<b>Flow conditions</b>	No flow.	NC	NC	NC	-	NC
<b>Channel setting</b>	Flow (when present) will be heavily constrained by weeds; singular channel, contained within shallow valley.	NC	NC	NC	-	NC
<b>Valley shape</b>	Steep unconsolidated walls, no cliffs.	NC	NC	NC	-	NC
<b>Channel shape variability</b>	Regular	NC	NC	NC	-	NC
<b>Bed material</b>	Mud (silt and clay)	NC	NC	NC	-	NC
<b>Large wood and log jams</b>	None	NC	NC	NC	-	NC
<b>Pool dimensions</b>	No pools visible	NC	NC	NC	-	NC
<b>Pool hydraulic control</b>	No pools visible	NC	NC	NC	-	NC
<b>Exposed bedrock feature</b>	None	NC	NC	NC	-	NC
<b>Channel dimensions</b>	~12m	NC	NC	NC	-	NC
<b>Knickpoint type and dimensions</b>	None	NC	NC	NC	-	NC
<b>In-channel vegetation</b>	Heavily and continuously infested with <i>Juncus acutus</i> (90%)	Increase in weed variety: bamboo and thistle (~10% combined)	NC	Increased in height and thickness	-	NC
<b>Width of riparian vegetation</b>	~30m	~30m	NC	NC	-	NC
<b>Composition and cover of riparian vegetation</b>	Grass exotics on lower banks; upper banks have <i>Acacia saligna</i> or similar.	Thistles have appeared (~10% cover)	NC	Thicker growth	-	NC
<b>Swamp Oak health</b>	Baseline assessment commenced Q2 2021.	-	-	None present in locality	-	NC
<b>Other observations</b>	Some slippage of mid-bank due to cattle and of upper bank due to steepness.	Stake with blue marker added	NC	Small trees on bank have increased in height	-	NC

**Table 33. Stream Health Monitoring Records – Site: Saddlers Downstream**

Measured variable	Site: Saddlers Downstream. Baseline condition (Q3 2020). Date: 21/07/2020	Q4 2020 Date: 15/12/2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
Flow conditions	No flow.	NC	NC	NC	-	NC
Channel setting	One confined channel consisting of large stagnant pools.	NC	NC	NC	-	NC
Valley shape	Moderate to steep/rocky banks: gorge on one side, low slope on other	NC	NC	NC	-	NC
Channel shape variability	Irregular: V and U shape; meandering	NC	NC	NC	-	NC
Bed material	Sandy gravel to silt and clay, exposed bedrock	NC	NC	NC	-	NC
Large wood & log jams	None	NC	NC	NC	-	NC
Pool dimensions	Not measured	6.37m width w x ongoing x 0.5m deep	Rain pool ~ 70cm deep	60mm rain within past week; water level increased by 20+cm	-	Deeper water. Risen by ~20cm.
Pool hydraulic control	Rock bar to one side	NC	NC	NC	-	NC
Exposed bedrock feature	Bedrock visible on one bank	NC	NC	NC	-	NC
Channel dimensions	~5m	6.73m	NC	NC	-	NC
Knickpoint type and dimensions	None	NC	NC	NC	-	NC
In-channel vegetation	Juncus, exotic grasses, thistle, sheoak.	Thistle increase (annual species)	NC	Thicker and taller	-	Thicker and taller
Width of riparian vegetation	~30m	~30m	NC	35+m	-	NC
Composition and cover of riparian vegetation	Sheoak: range of heights to >10m, exotic grasses	Bamboo and thistle newly present	More shrubs / grasses grown	More growth in shrubs & grasses	-	NC
Swamp Oak health	Baseline assessment commenced Q2 2021.	-	-	Sheoaks have grown, no damage, looking healthy	-	NC

<b>Other observations</b>		Site relocated (due to high water). Blue markers added.	NC	Increased water level	-	Increased water level from recent rains
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**Table 34. Stream Health Monitoring Records – Site: Saddlers Upstream**







<b>Measured variable</b>	<b>Site: Saddlers Upstream. Baseline condition (Q3 2020). Date: 21/07/2020</b>	<b>Q4 2020 Date: 15/12/2020</b>	<b>Q1 2021</b>	<b>Q2 2021</b>	<b>Q3 2021</b>	<b>Q4 2021</b>
<b>Flow conditions</b>	No flow – dry.	NC	NC	NC	-	NC
<b>Channel setting</b>	Part of a wider braided (3) creek network; channels confined, moderate depth.	NC	NC	NC	-	NC
<b>Valley shape</b>	Moderate to steep v-shape banks.	NC	NC	NC	-	NC
<b>Channel shape variability</b>	Meandering, no cliffs, varying depths	NC	NC	NC	-	NC
<b>Bed material</b>	Mud (silt and clay)	NC	NC	NC	-	NC
<b>Large wood and log jams</b>	Some small logs/branches	NC	NC	NC	-	NC
<b>Pool dimensions</b>	3.5 x 1.8 x 0.5m depth (dry)	NC	NC	Pools have 30cm water due to recent rains	-	More water in pools
<b>Pool hydraulic control</b>	Cohesive material	NC	NC	NC	-	NC
<b>Exposed bedrock feature</b>	None	NC	NC	NC	-	NC
<b>Channel dimensions</b>	2.5 + wide x 3.5m depth	NC	NC	NC	-	NC
<b>Knickpoint type and dimensions</b>	None.	NC	NC	NC	-	NC
<b>In-channel vegetation</b>	Mainly exotic grasses, some small sheoak, some weeds (Juncus, thistle).	NC	NC	Grass has died off in channel	-	Grasses thicker, trees taller
<b>Width of riparian vegetation</b>	~80m.	NC	NC	NC	-	NC
<b>Composition and cover of riparian vegetation</b>	Exotic grasses, sheoak of varying heights: <3 to >3m.	Thistle newly present	NC	NC	-	NC
<b>Swamp Oak health</b>	Baseline condition commenced Q2 2021: Good general health likely	-	-	See baseline	-	Sheoak health good, taller, no

	due to high rainfall in Q1 2021, no apparent stress. Multiple smaller specimens are seen around the bank line, ranging in height from 20cm to approximately 1m. No evidence of disease or livestock damage.					damage, smaller sapplings starting to grow
<b>Other observations</b>		Stake with blue marker required	Stake with blue marker added	General area looks healthy and good native grasses.	-	NC





**Photos of Stream Health Monitoring at commencement of monitoring in Q3 2020, and at the commencement and end of the reporting period (Q1 2021 and Q4 2021).**

**Site: W3**

Quarter	Upstream photo	Downstream photo
Q3 2020		
Q1 2021		
Q4 2021		

**Site: Saddlers Downstream**



Quarter	Upstream photo	Downstream photo
Q3 2020		
Q1 2021		
Q4 2021		



**Site: Saddlers Upstream**

Quarter	Upstream photo	Downstream photo
Q3 2020		
Q1 2021		
Q4 2021		

## APPENDIX 11. GROUNDWATER RESULTS

Table 35. 2021 Average Nutrient Concentrations in Groundwater

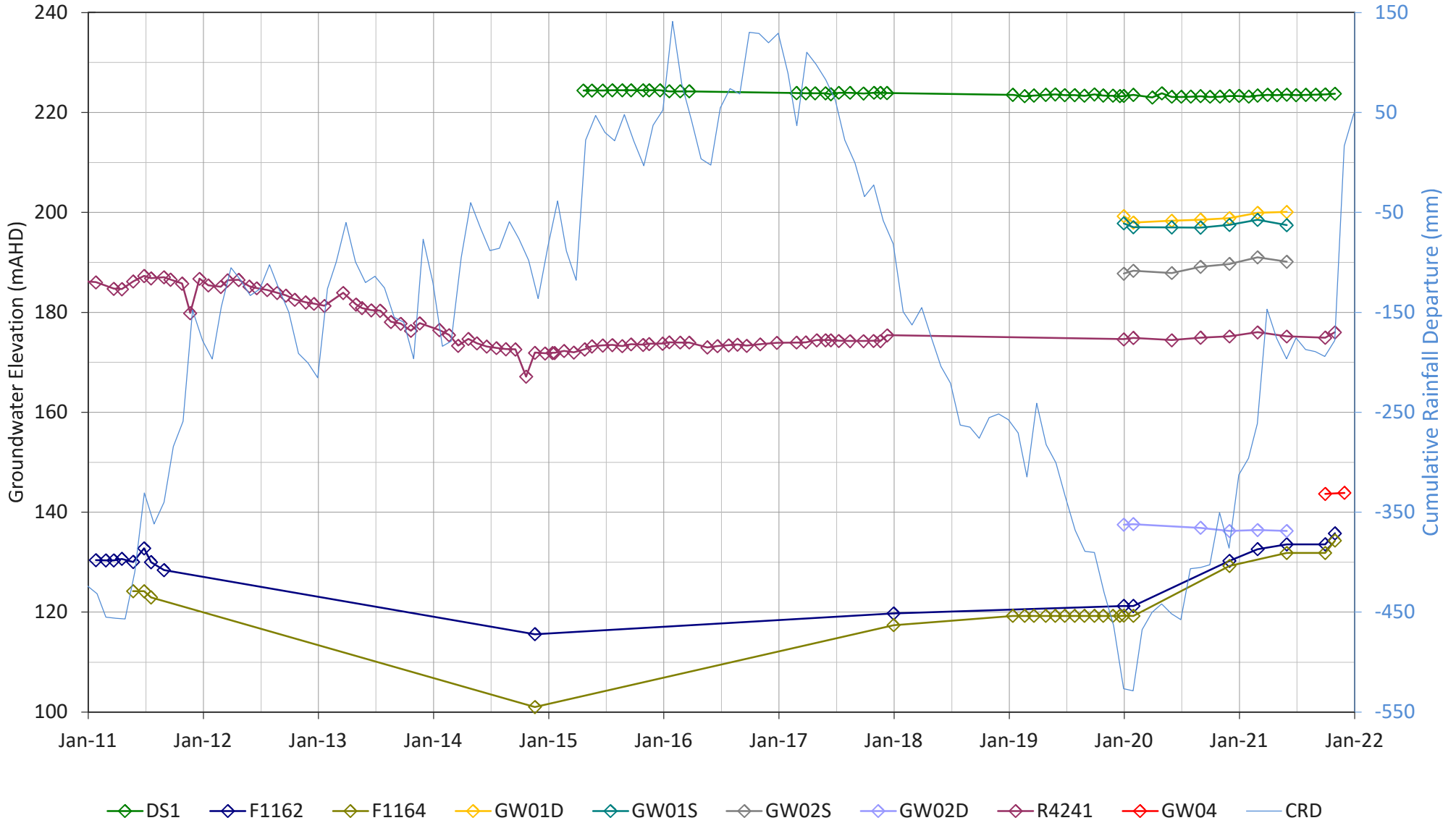
Metal	Monitoring Site				
	DS1	R4241	GW01D	GW02D	GW02S
Ammonia as N	0.07	0.98	0.61	4.02	0.22
Nitrate as N	0.023	0.27	0.54	0.0578	0.013
Nitrite as N	0.010	0.023	0.010	0.027	0.010
Reactive Phosphorus as P	0.010	0.010	0.010	0.010	0.010
Total Kjeldahl Nitrogen as N	0.10	1.13	0.63	8.6	0.73
Total Nitrogen as N	0.10	1.2	1.17	8.7	0.73
Total Phosphorus as P	0.037	0.087	0.047	2.9	0.21

Note: Upon implementation of the MUG Project Surface Water Management Plan these variables are no longer required and hence no longer analysed for. The 2021 average is therefore the year-to-date average to June 2021 inclusive.

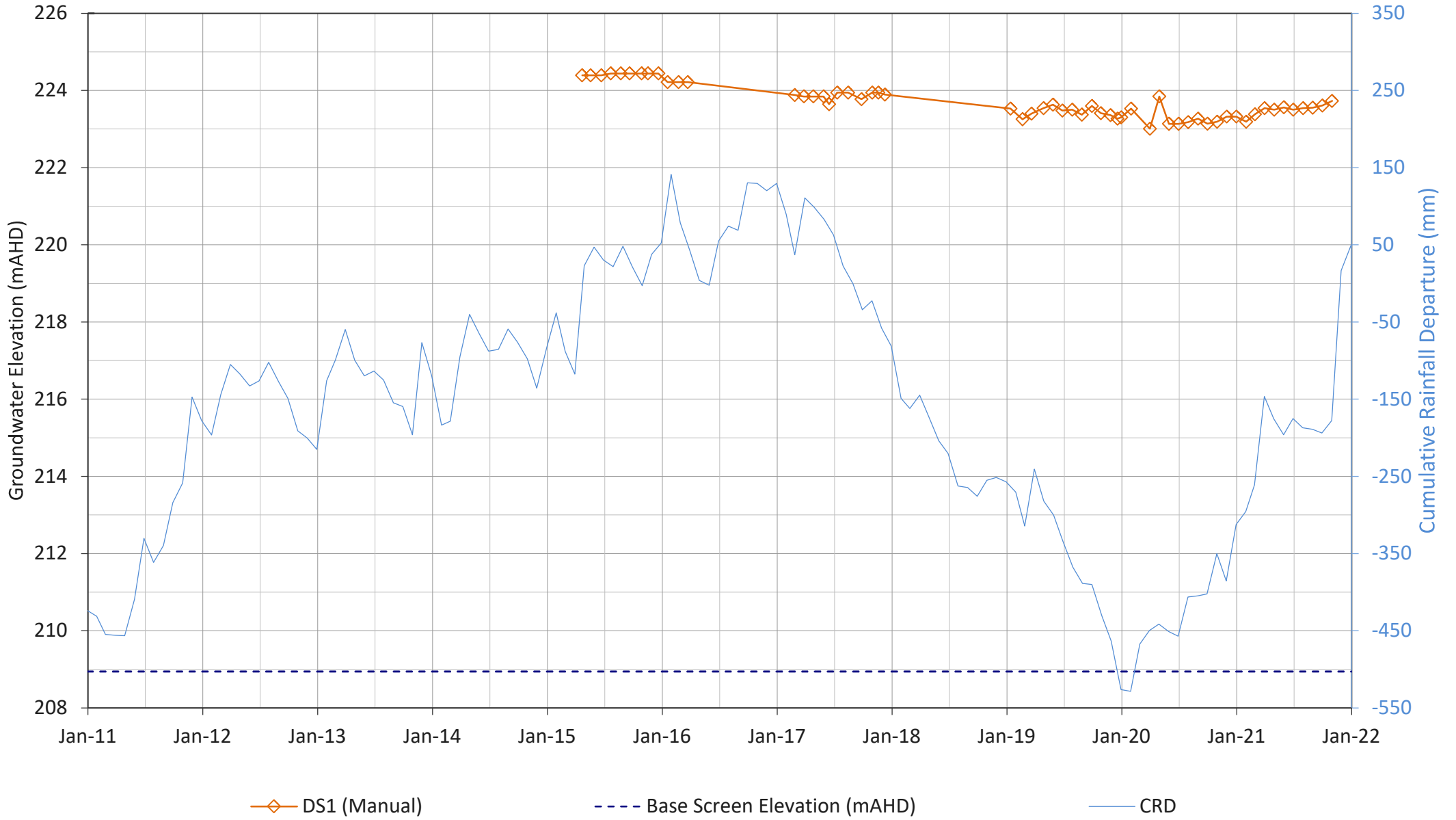
The remainder of Appendix 11 is structured as follows:

- Hydrographs from Maxwell Infrastructure bores (9 bores)
- Hydrographs from Maxwell Underground (MUG) bores (23 bores)
- Hydrographs from MUG vibrating wire piezometers (VWPs) (5 bores)
- Hydrographs from MUG VWP RD-series (2 bores)
- Water quality graphs for MI bores (9 bores)
- Water quality graphs for MUG bores (23 bores).

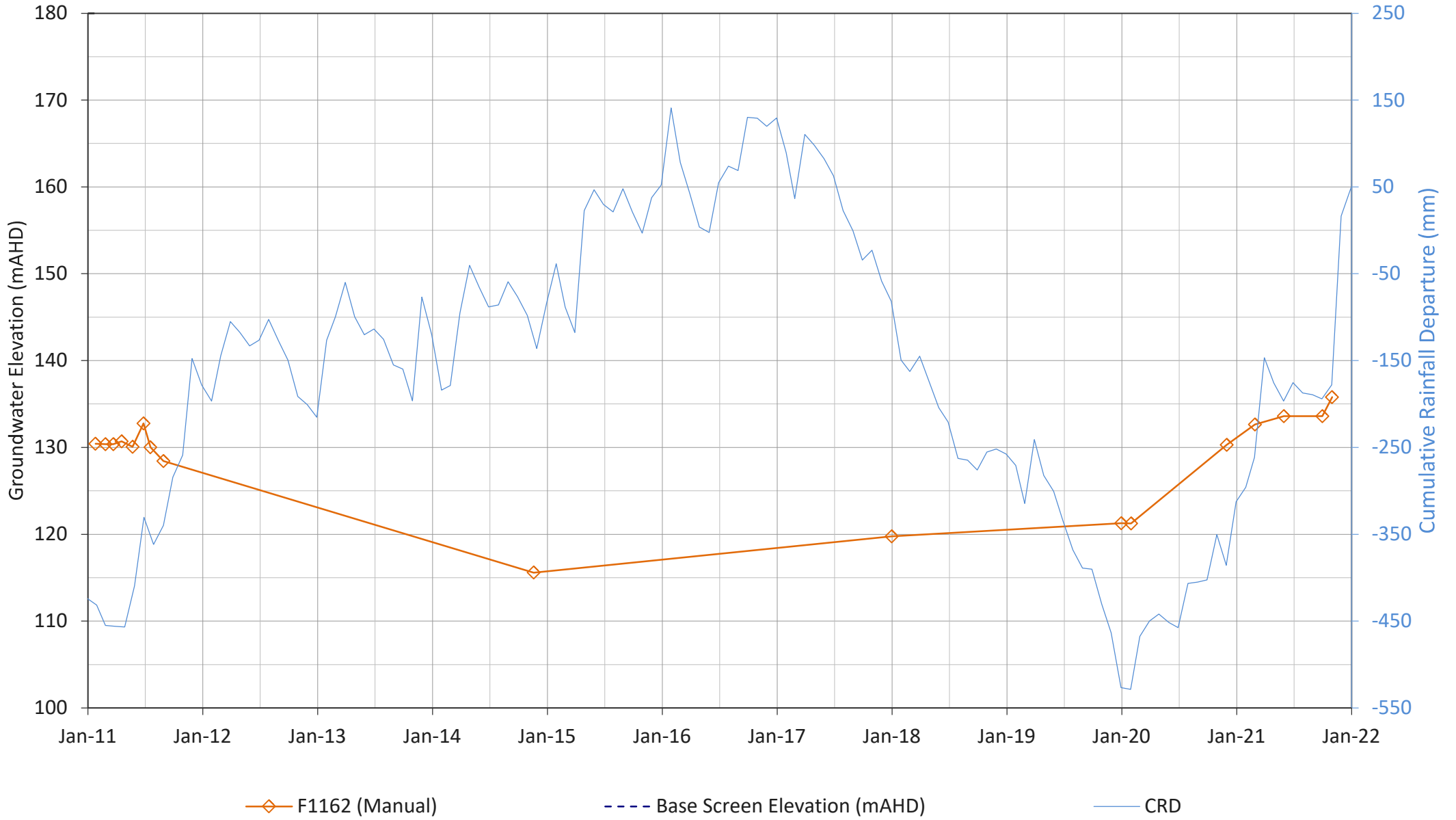
# Maxwell Infrastructure Groundwater Monitoring Bores



# DS1

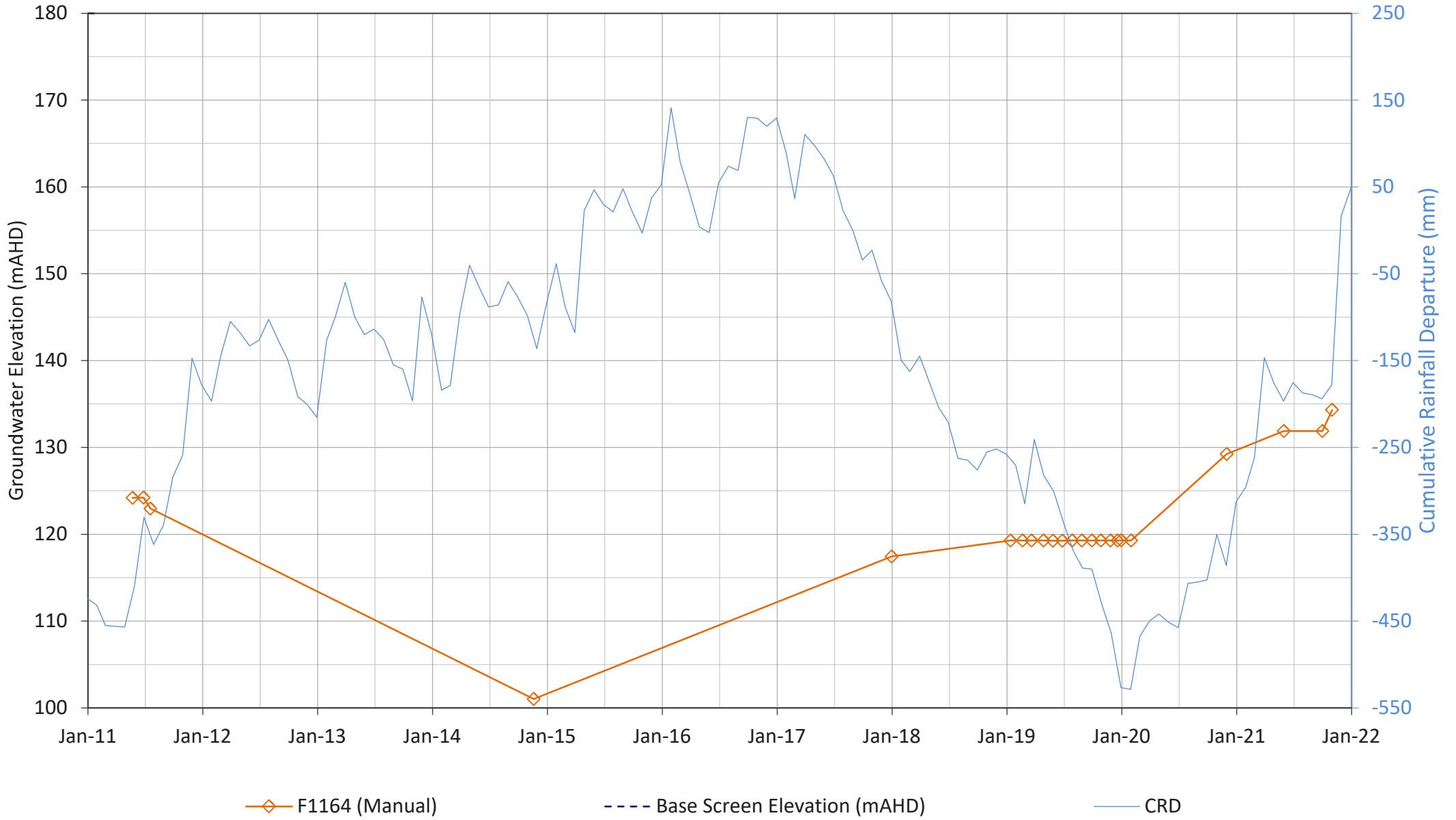


# F1162

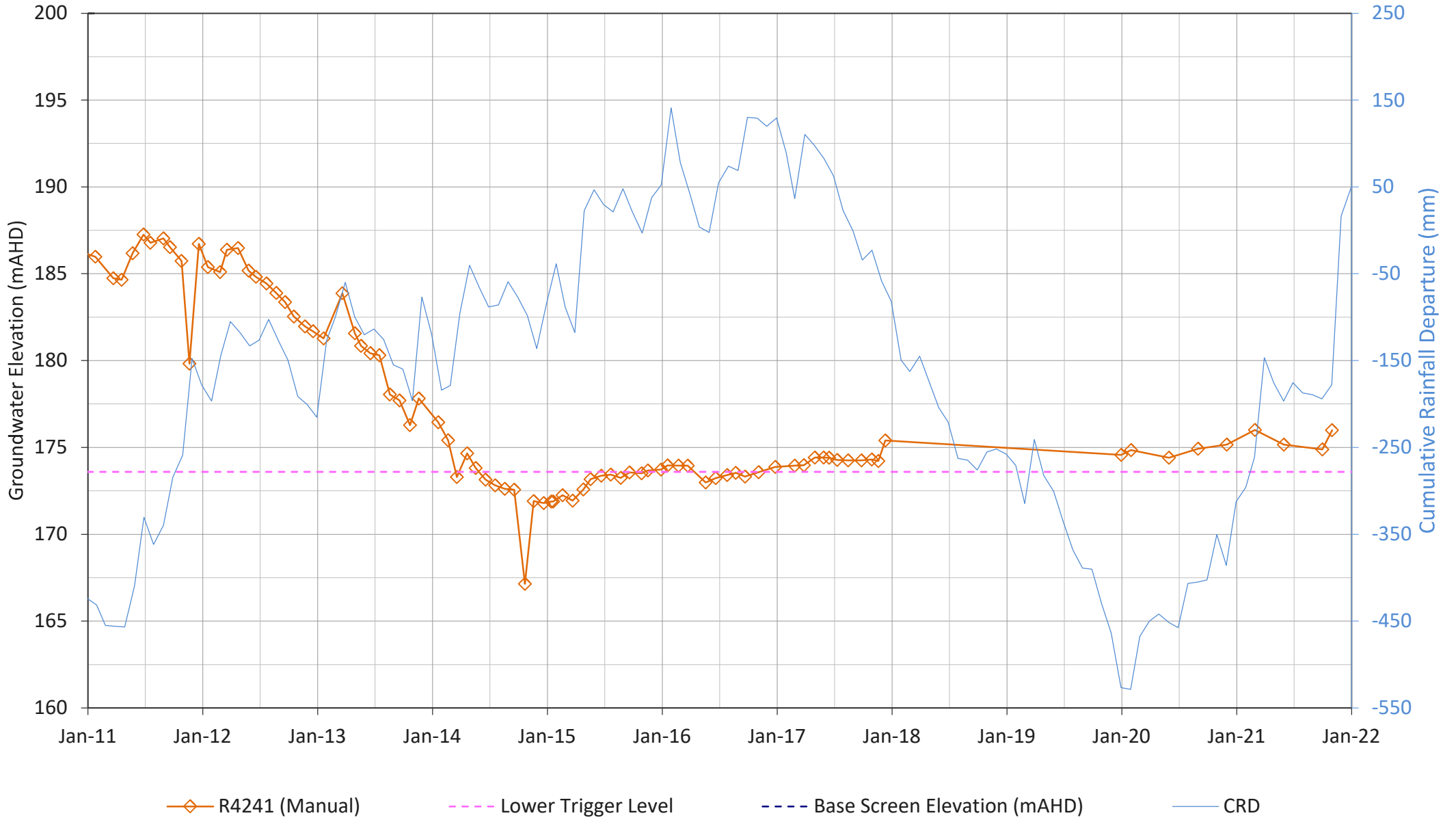




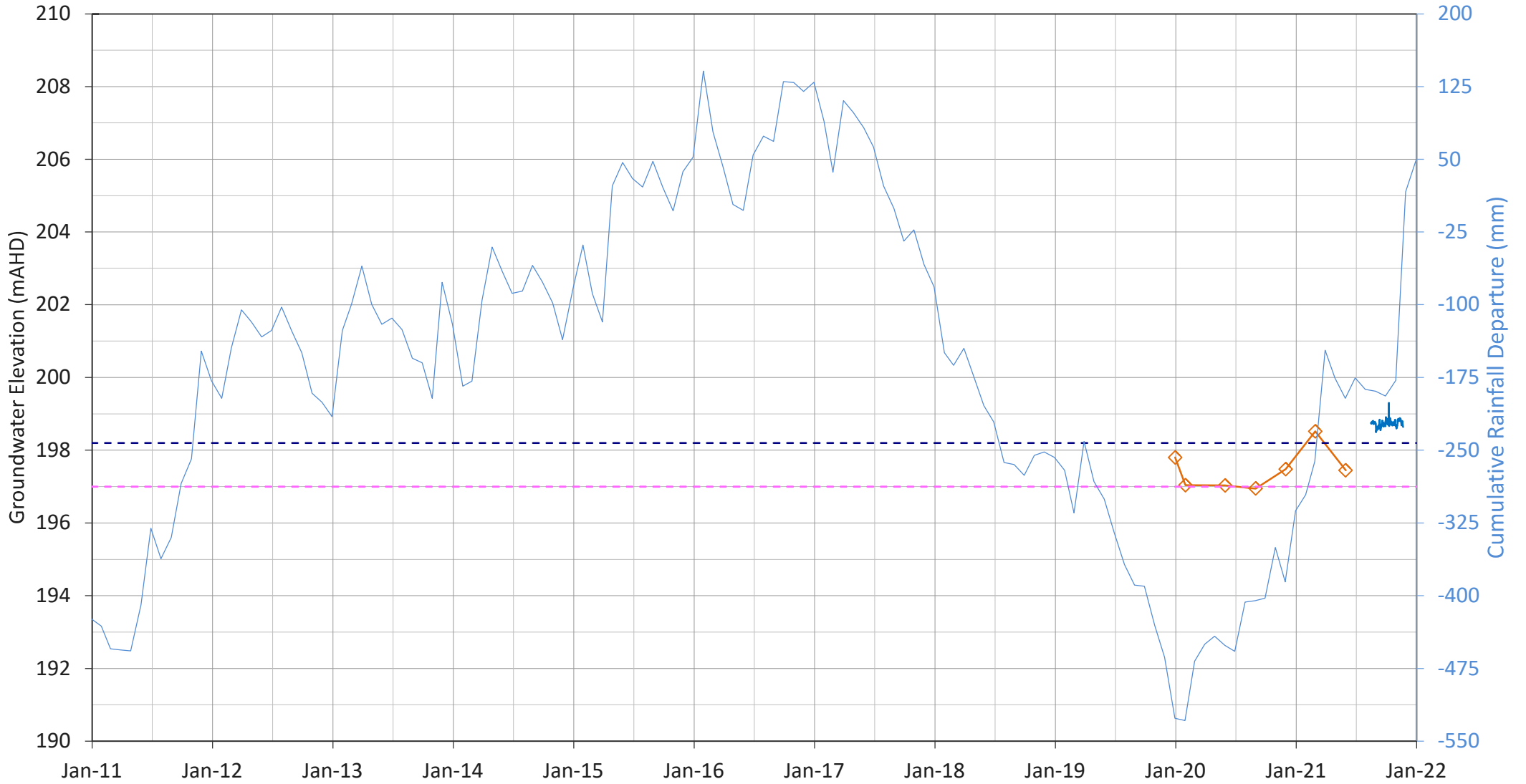
# F1164



# R4241

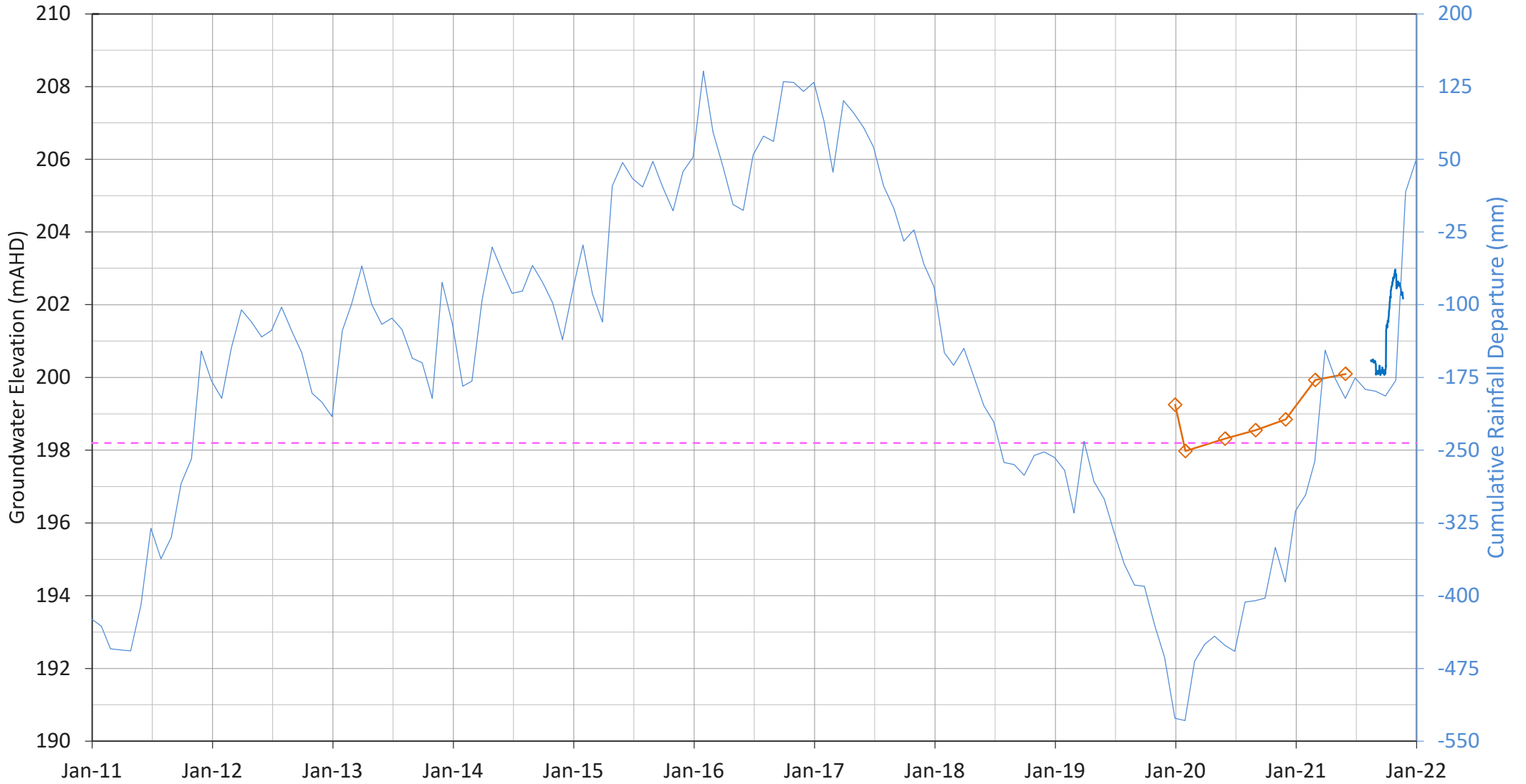


# GW01S



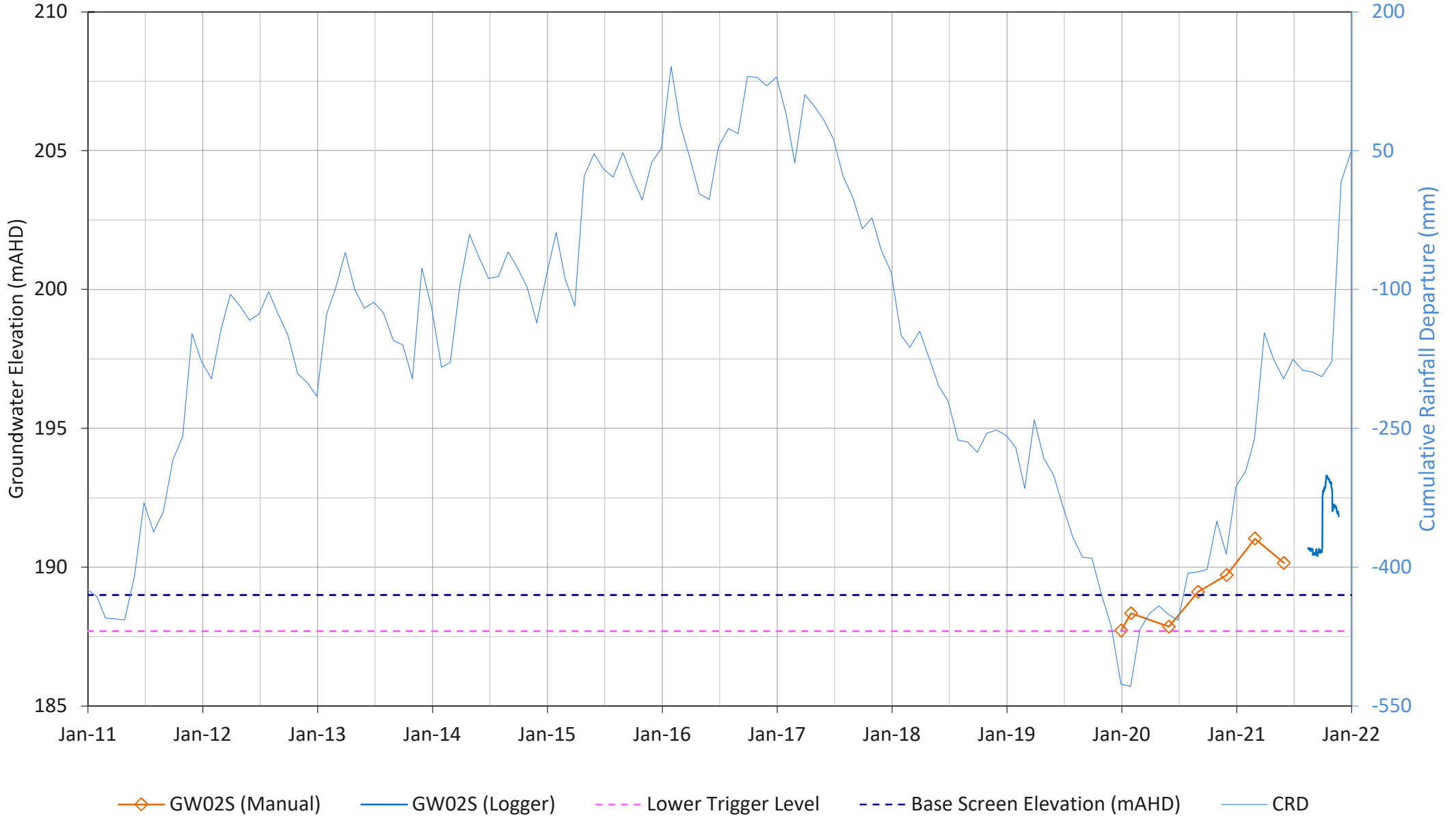
GW01S (Manual)    GW01S (Logger)    Lower Trigger Level    Base Screen Elevation (mAHD)    CRD

# GW01D

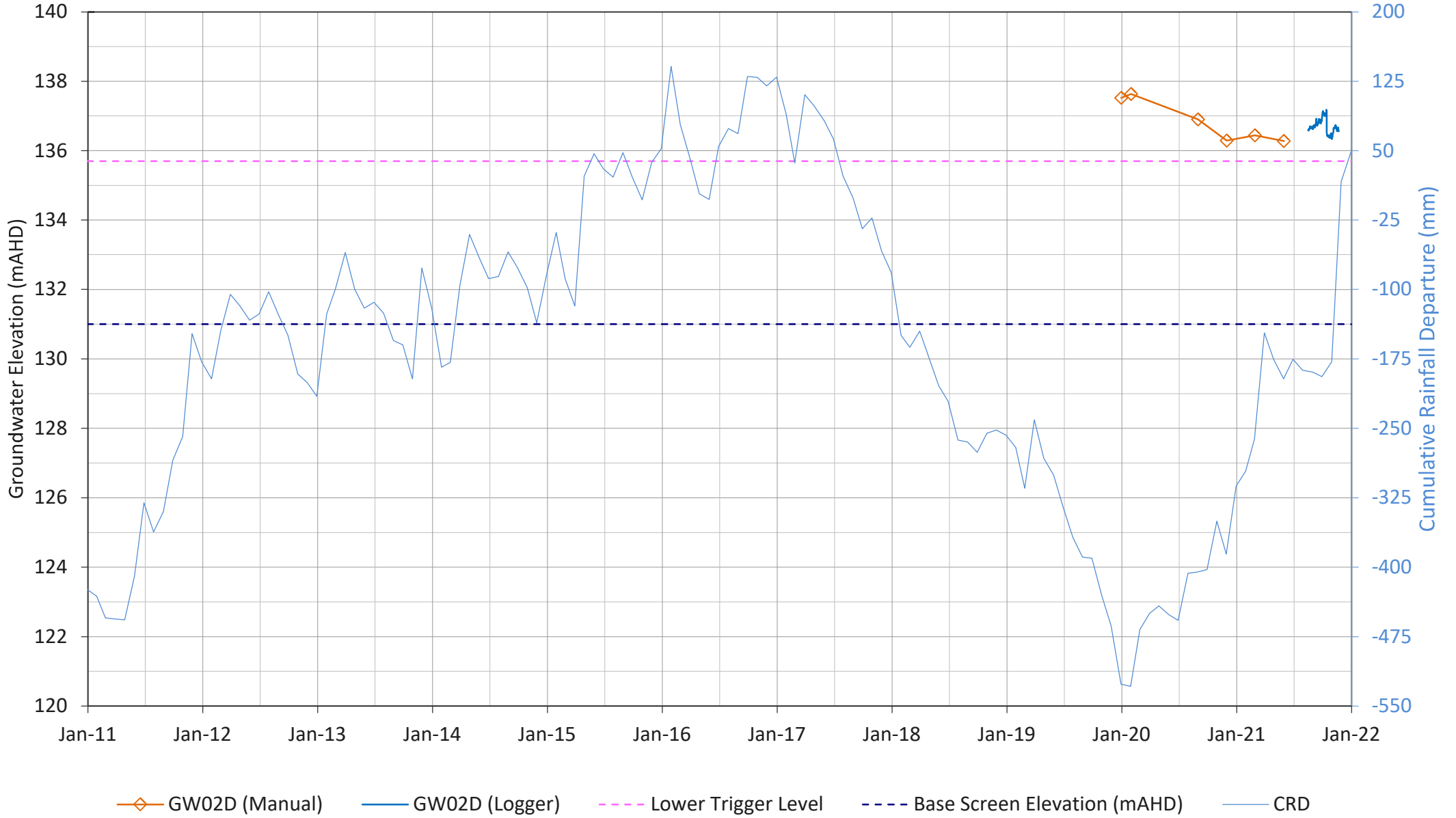


GW01D (Manual)    GW01D (Logger)    Lower Trigger Level    Base Screen Elevation (mAHD)    CRD

# GW02S

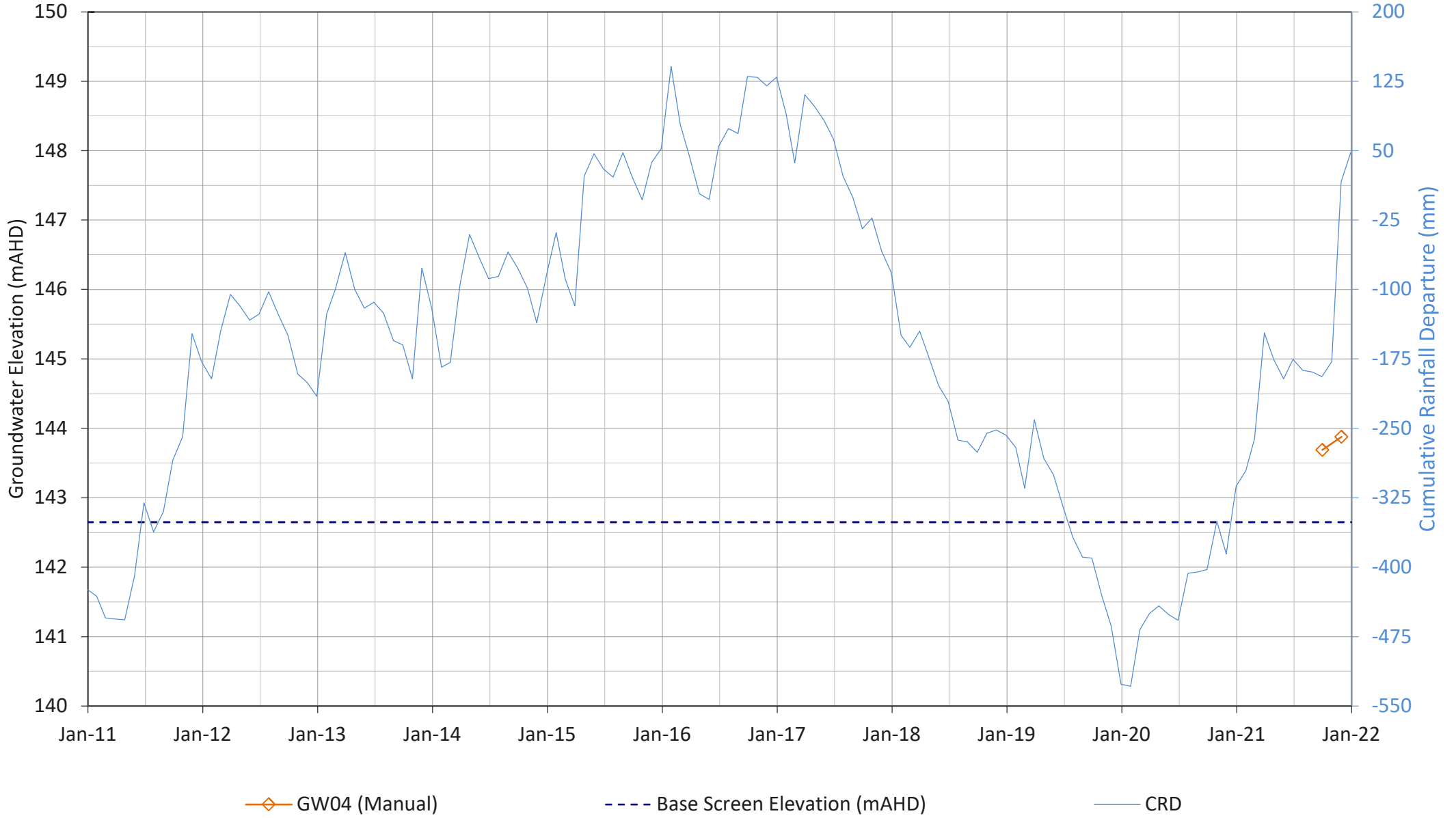


# GW02D

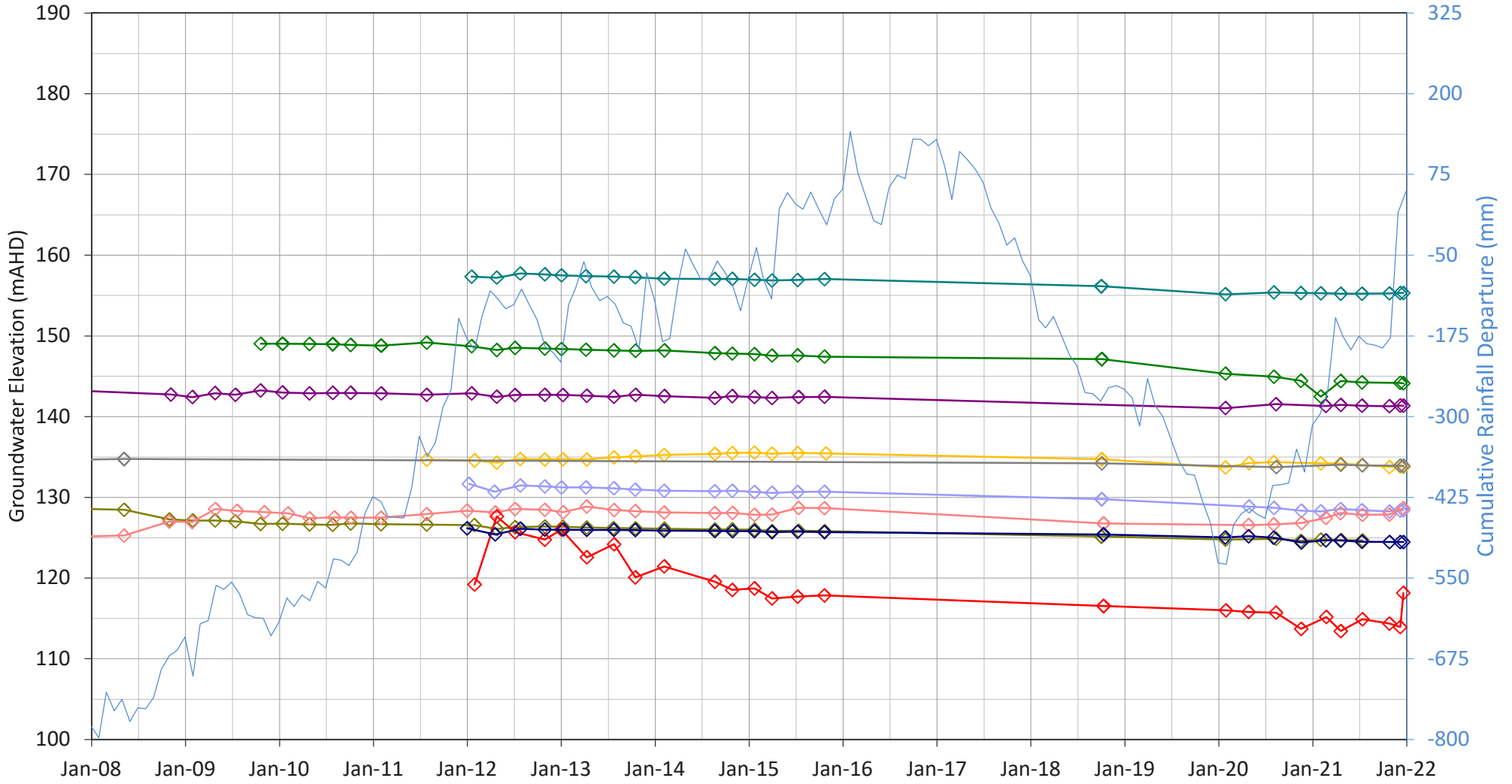




# GW04

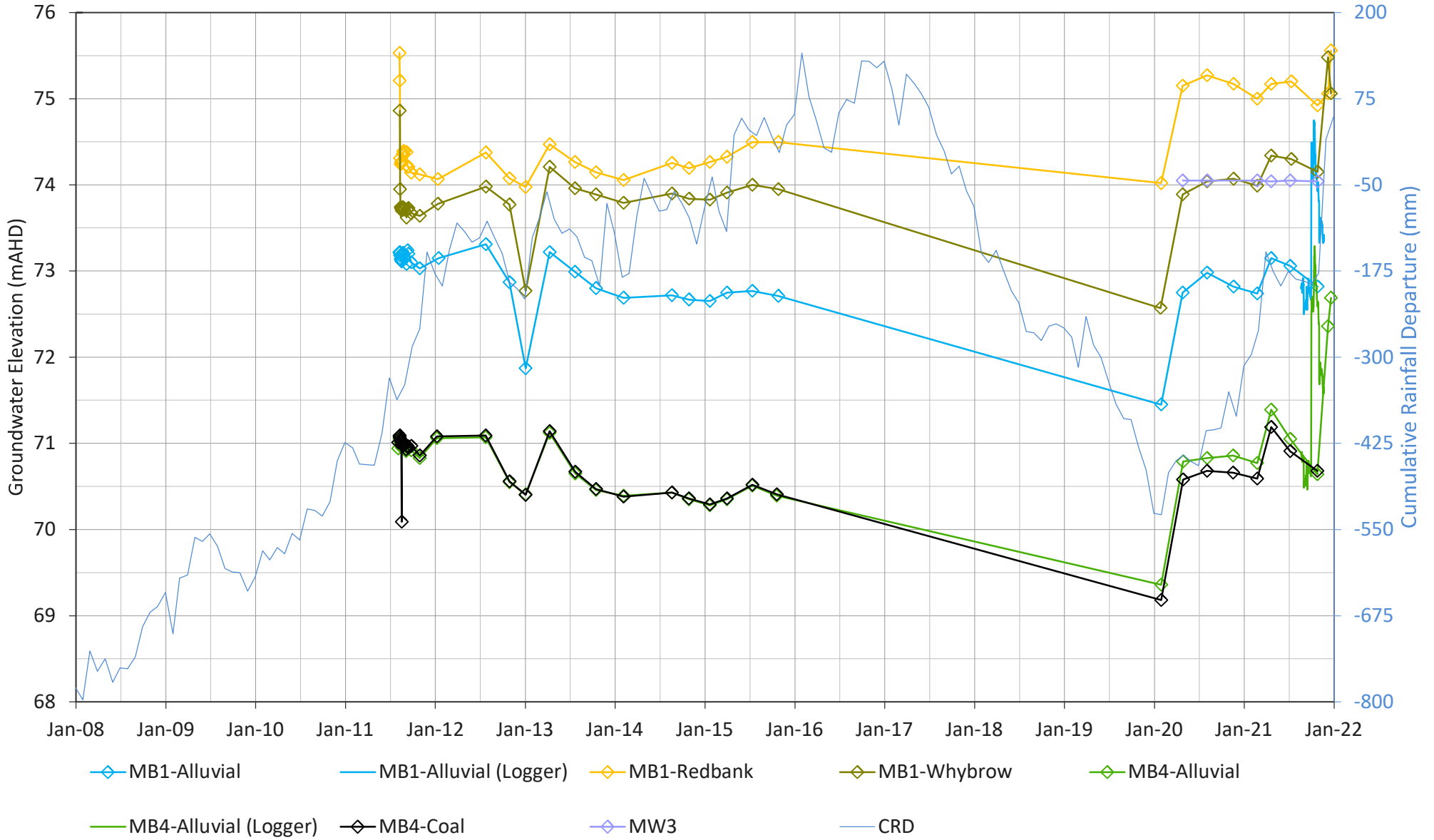


# Maxwell Underground Groundwater Monitoring Bores

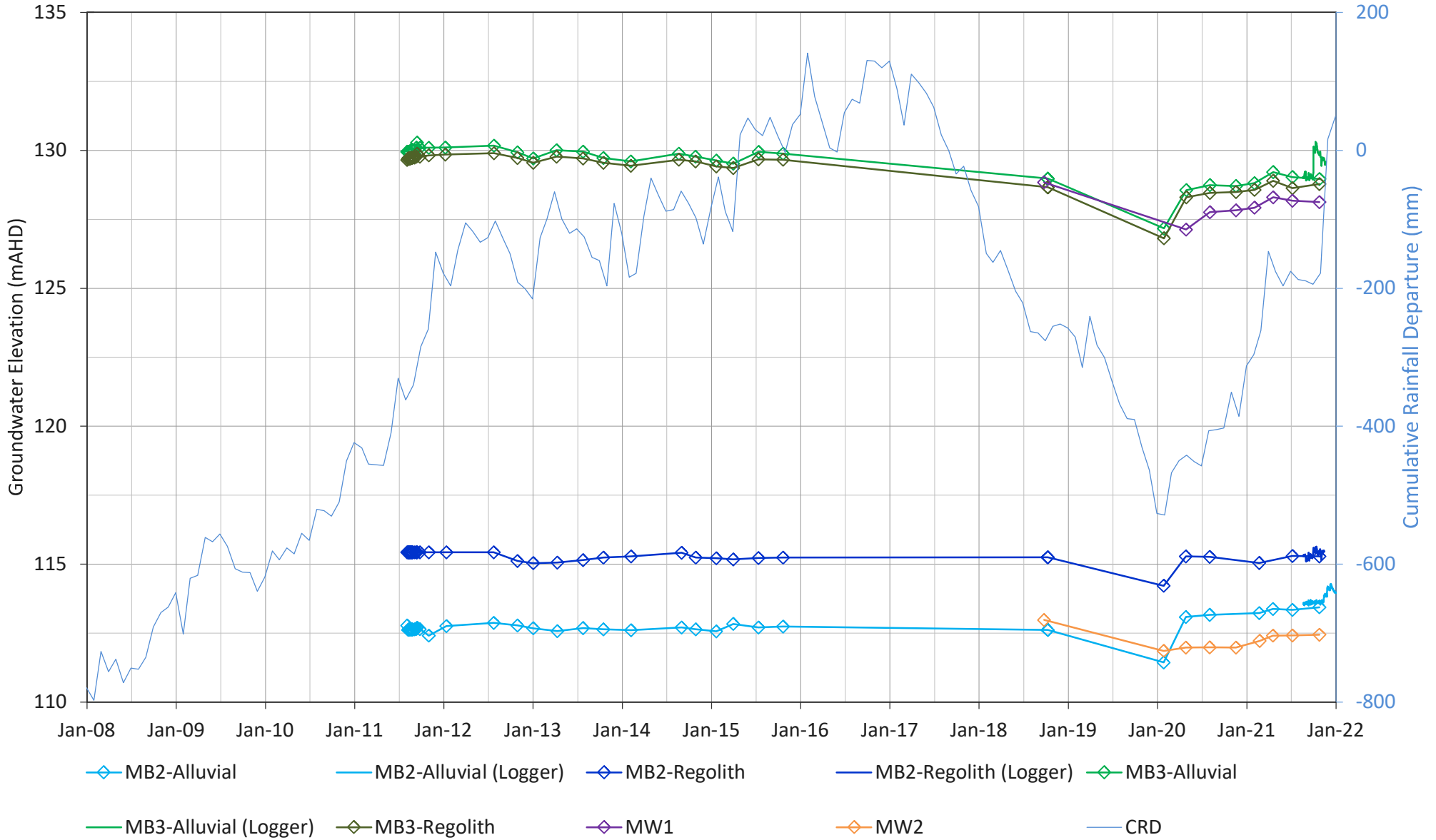


◆ DD1005  
 ◆ DD1014  
 ◆ DD1015  
 ◆ DD1016  
 ◆ DD1025  
 ◆ DD1027  
 ◆ DD1032  
 ◆ DD1043  
 ◆ DD1052  
 ◆ DD1057  
 — CRD

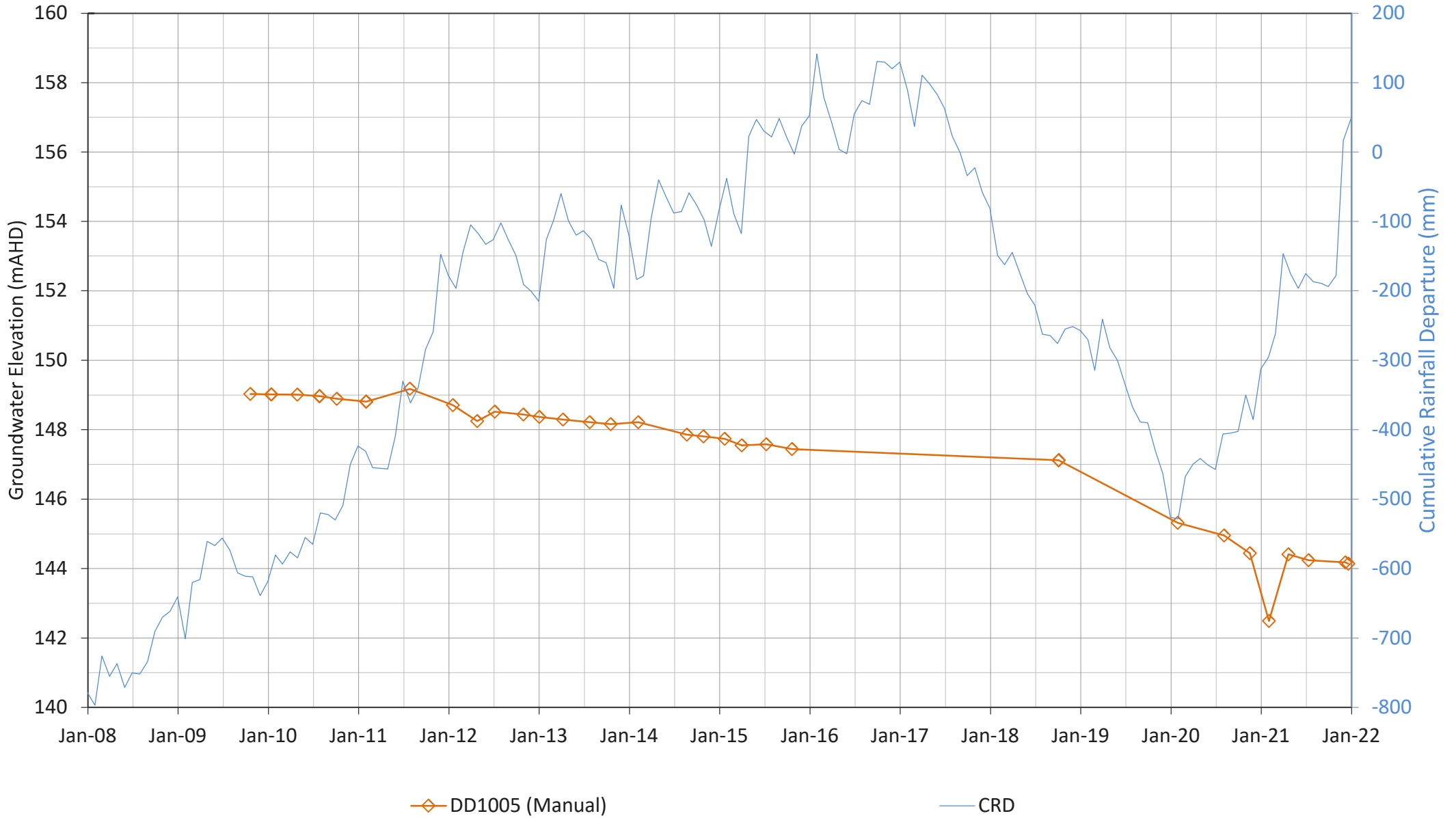
Maxwell Underground Groundwater Monitoring Bores (Hunter River Catchment)



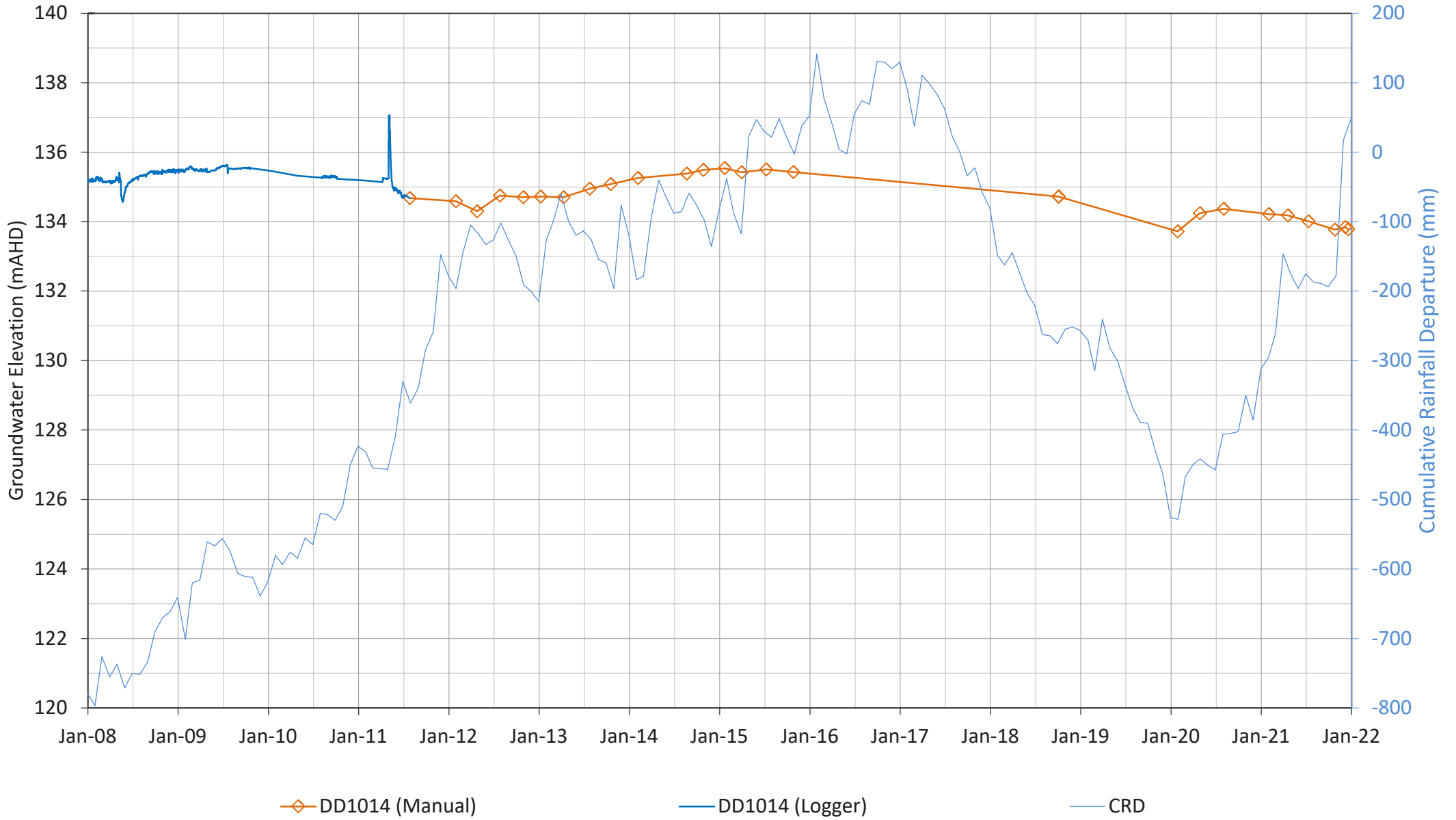
Maxwell Underground Groundwater Monitoring Bores (Saddlers Creek Catchment)



# DD1005

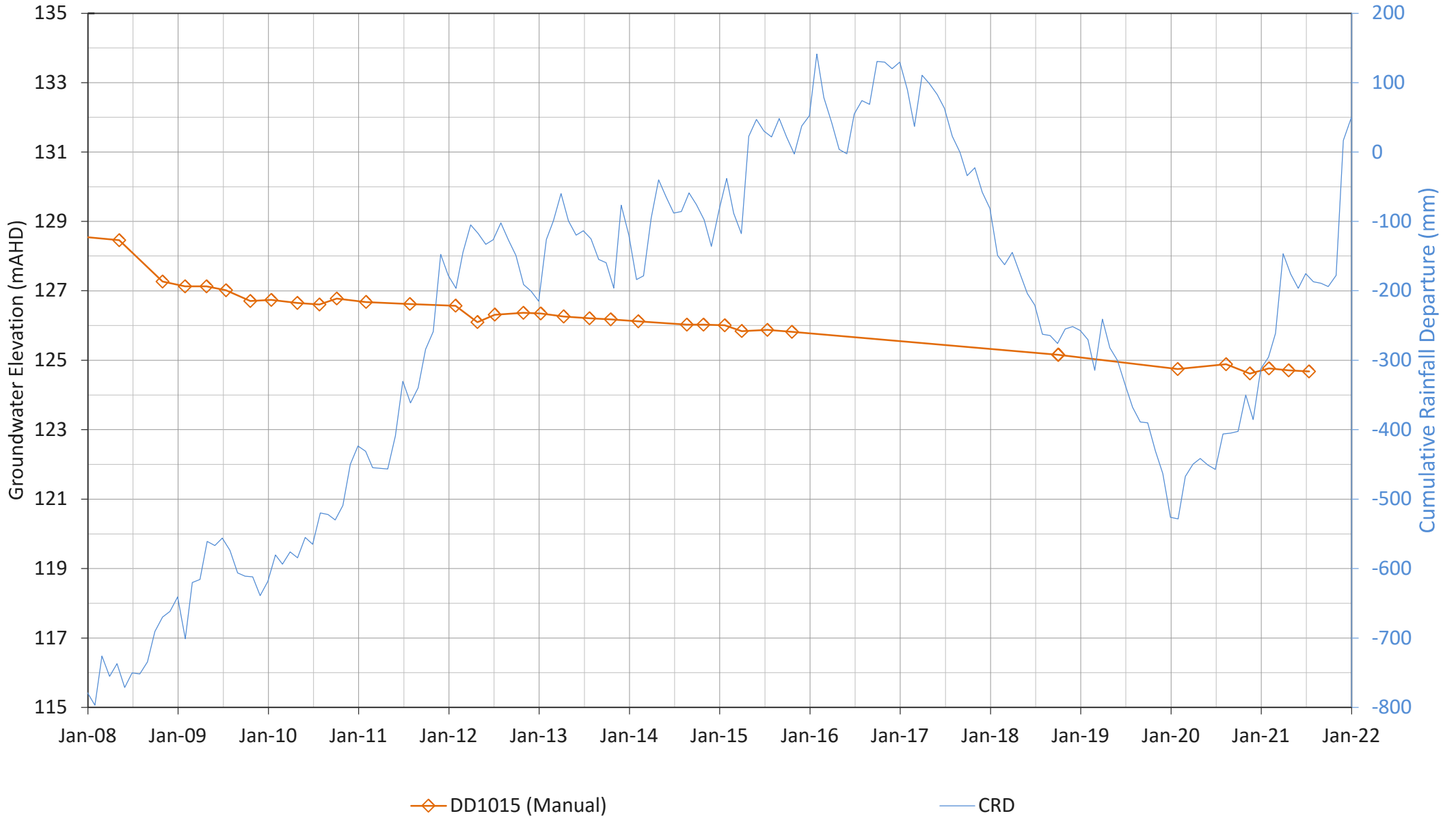


# DD1014

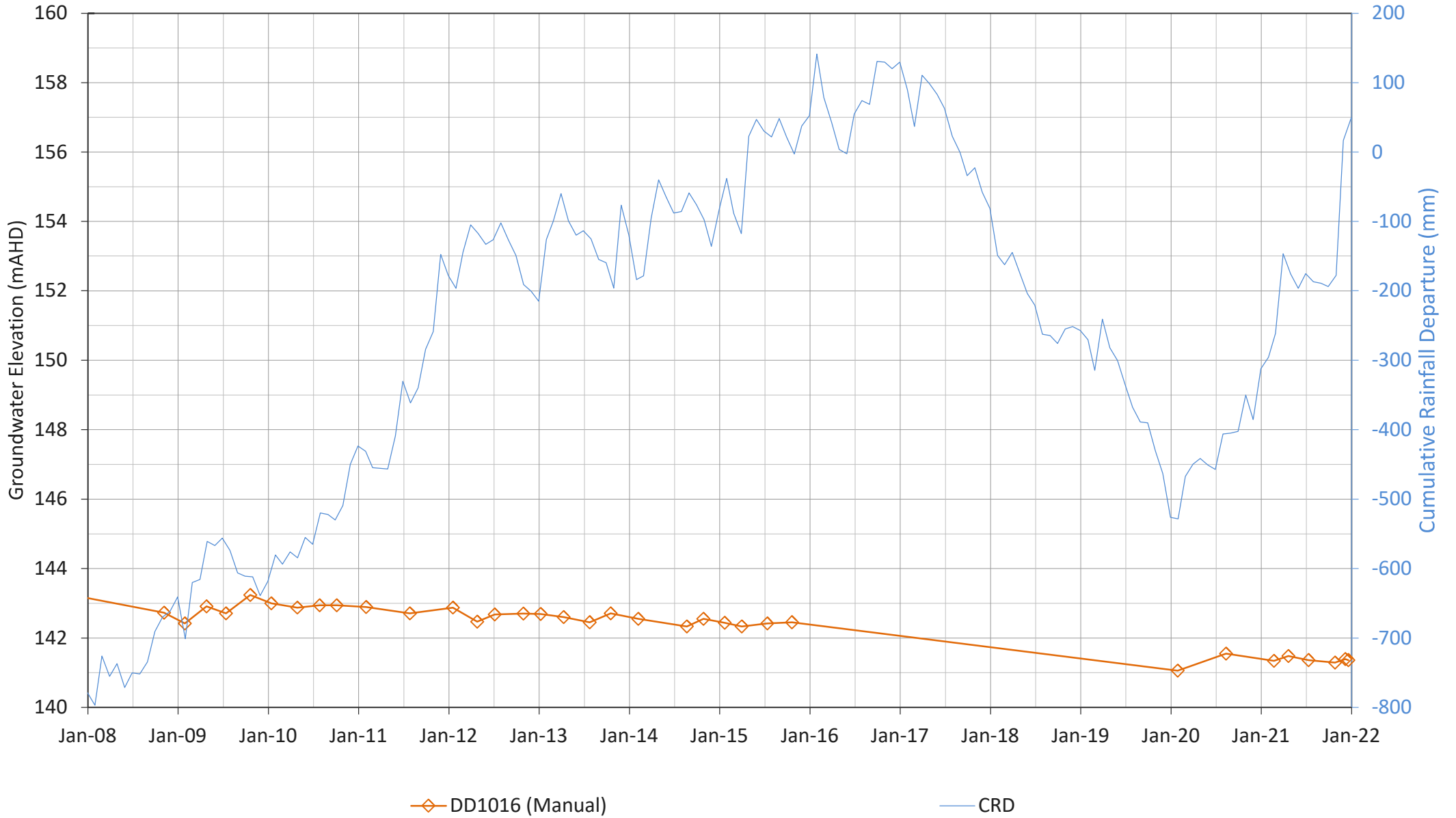




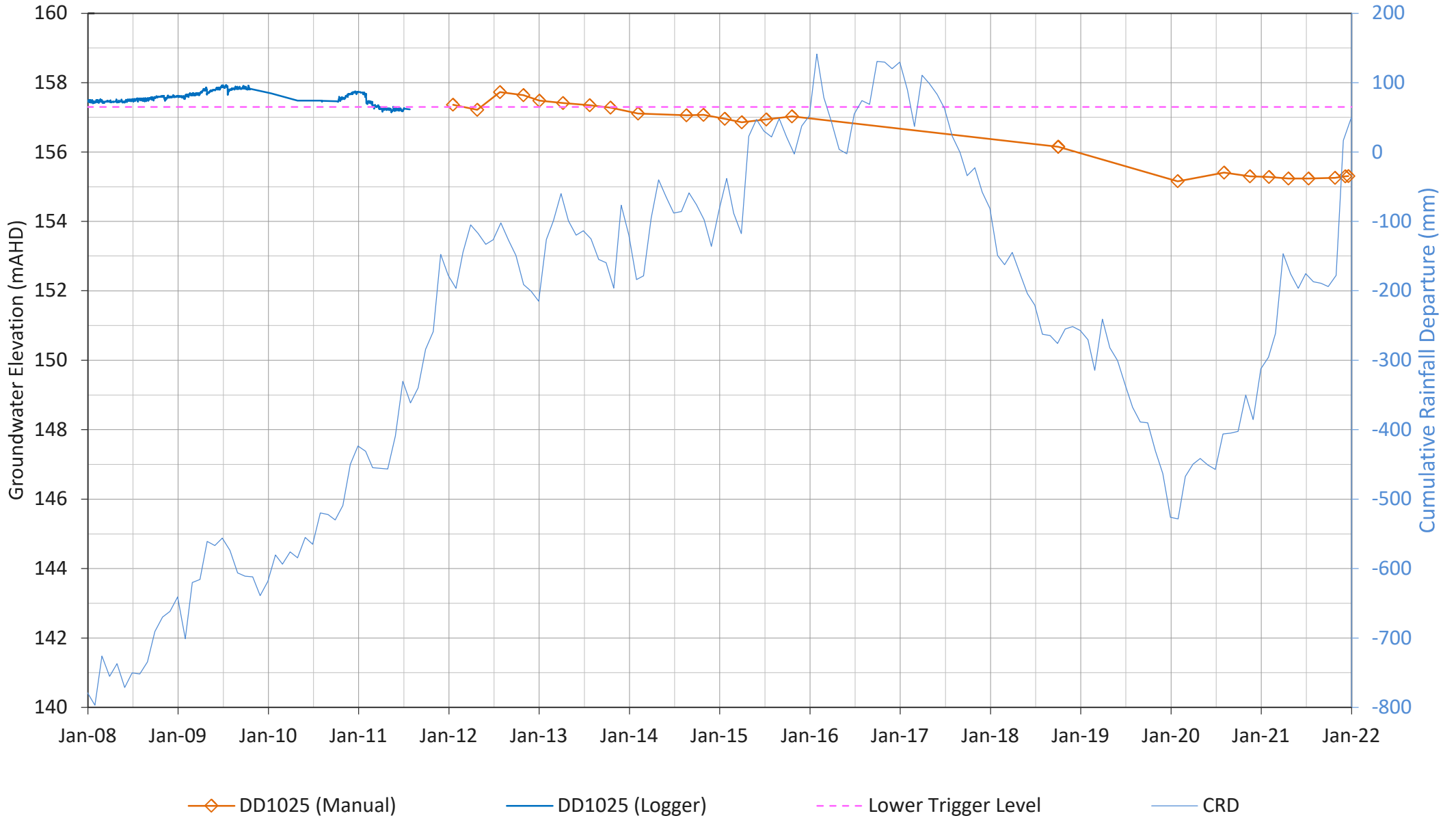
# DD1015



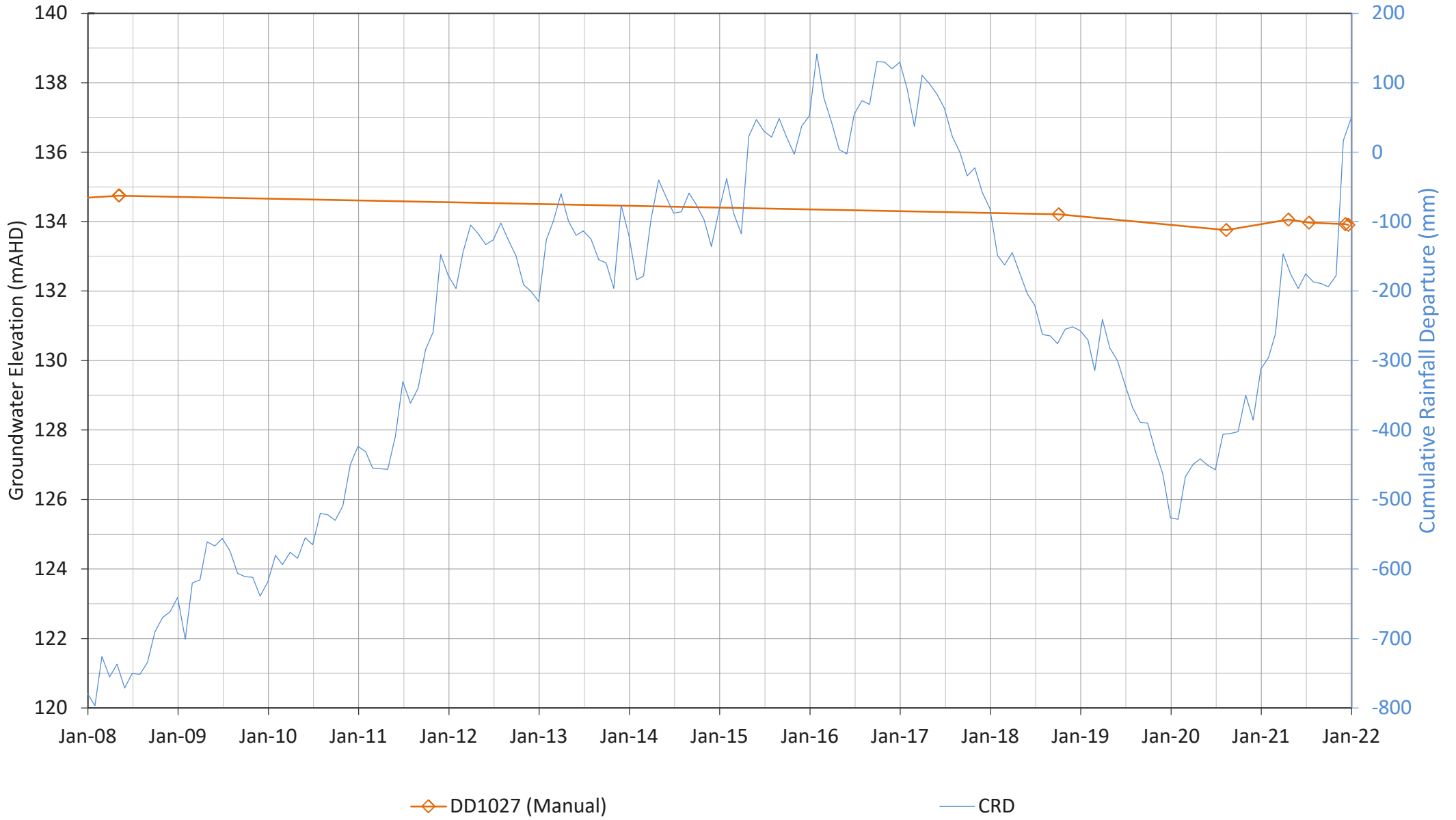
# DD1016



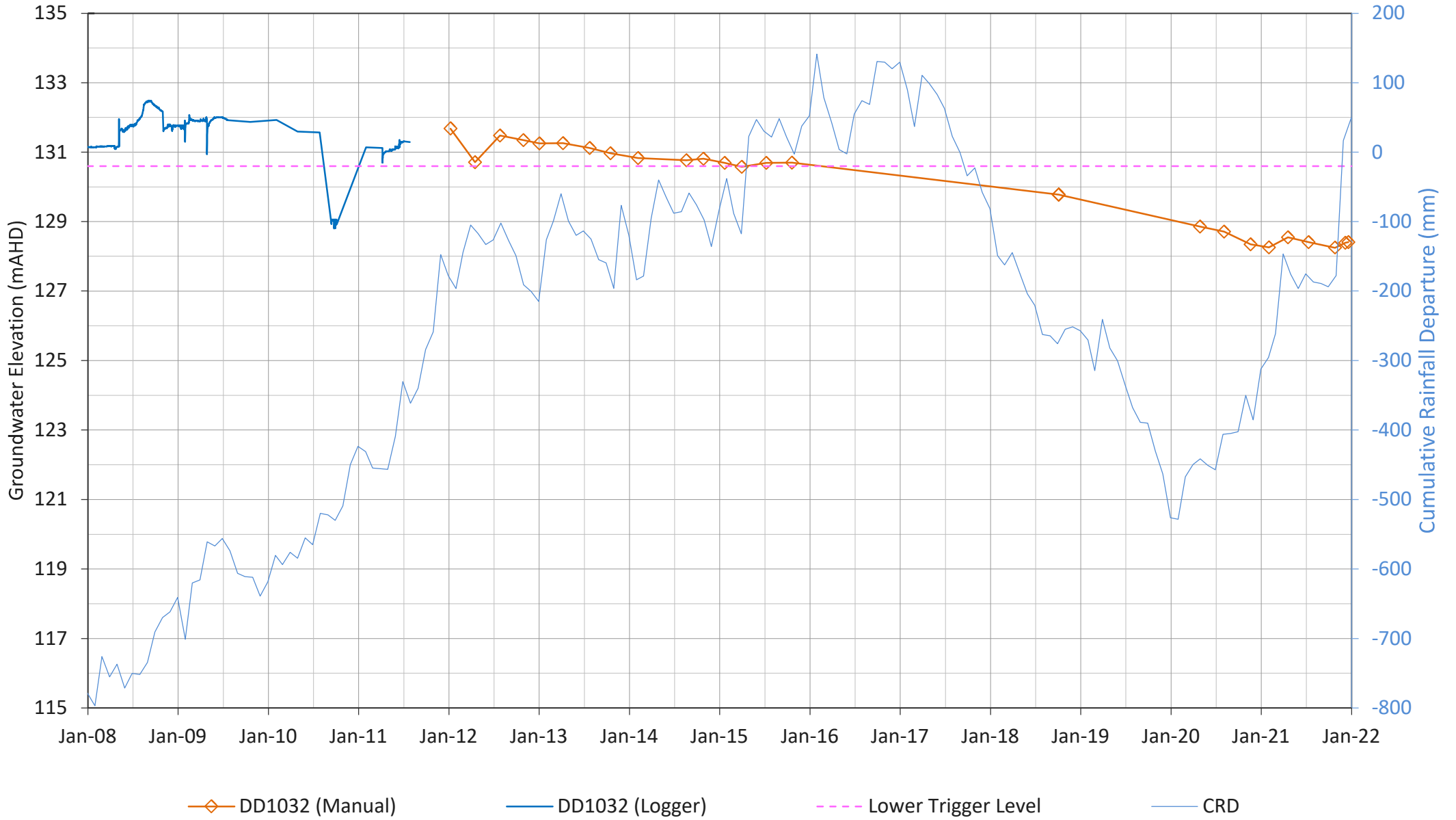
# DD1025



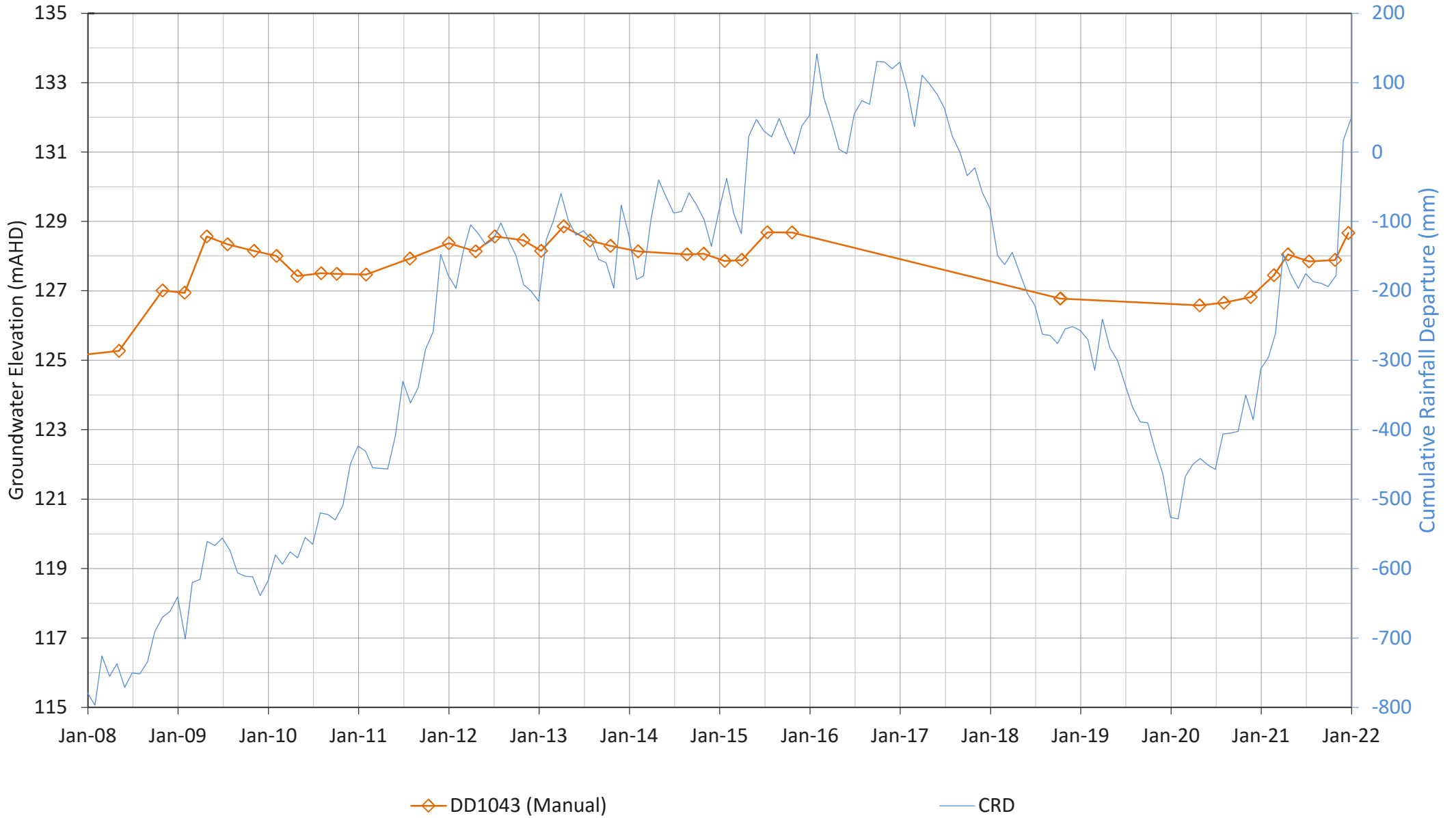
# DD1027



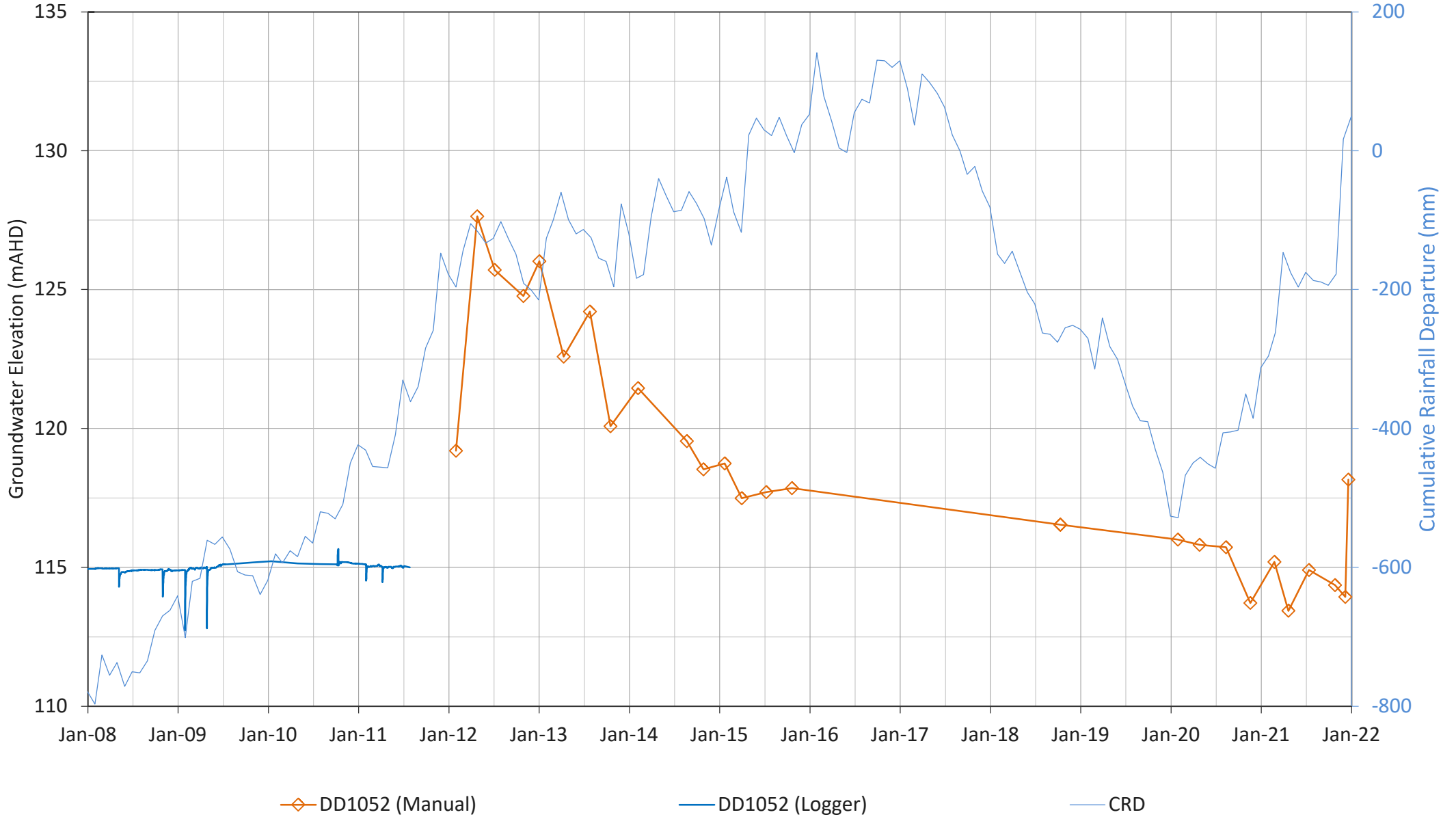
# DD1032



# DD1043

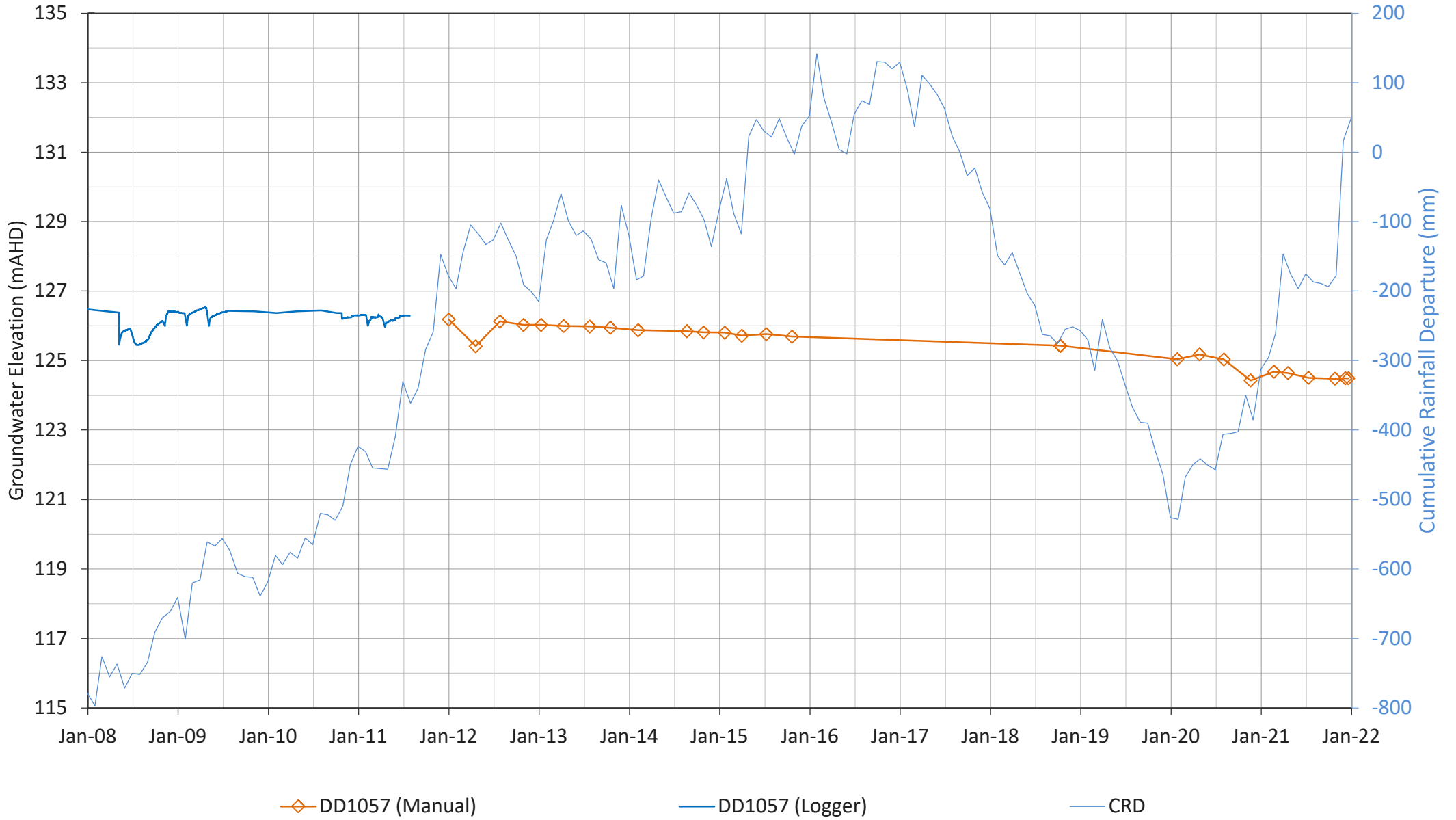


# DD1052

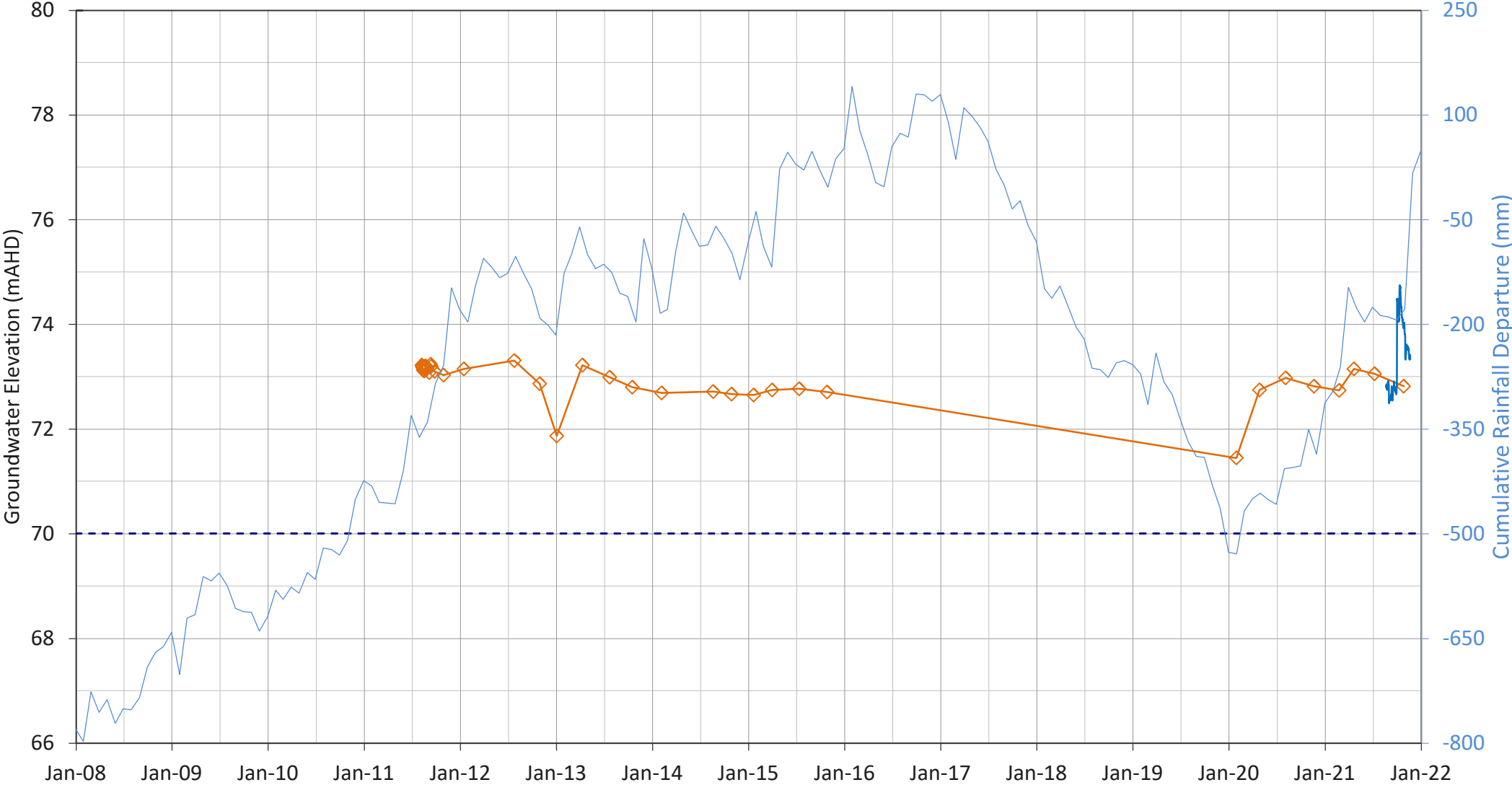




# DD1057



# MB1-Alluvial



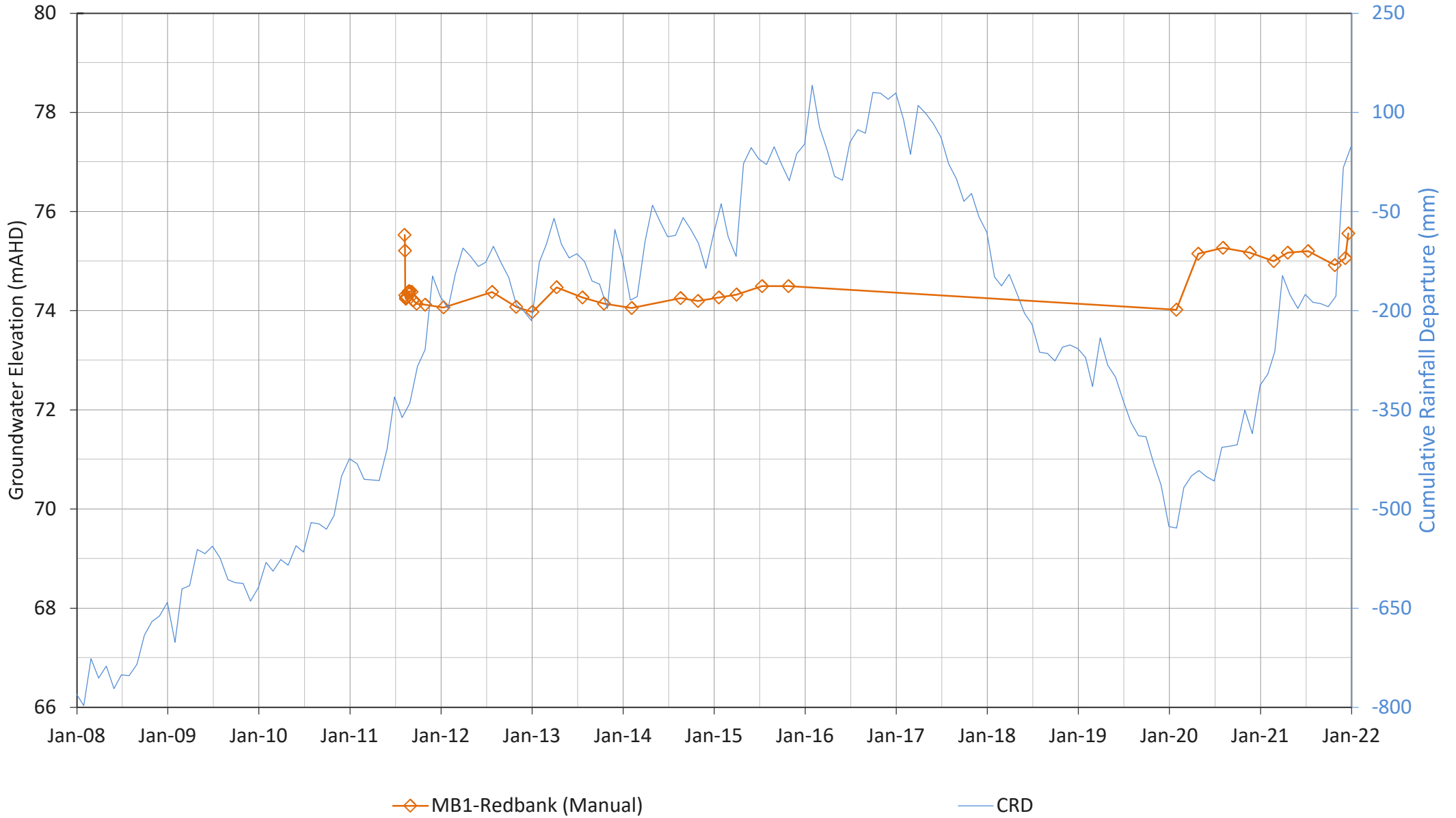
—◇— MB1-Alluvial (Manual)

— MB1-Alluvial (Logger)

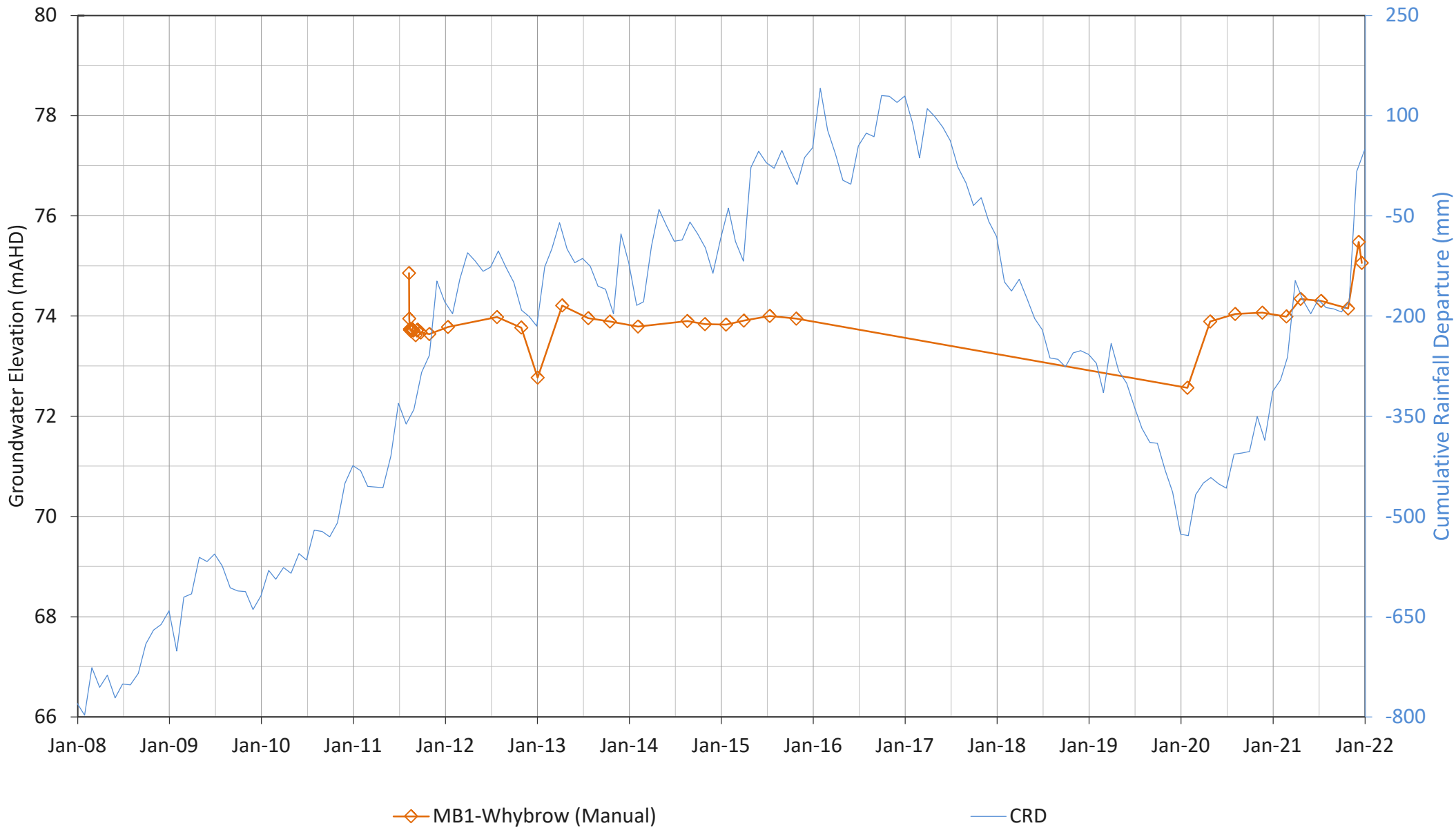
- - - Base Screen Elevation (mAHD)

— CRD

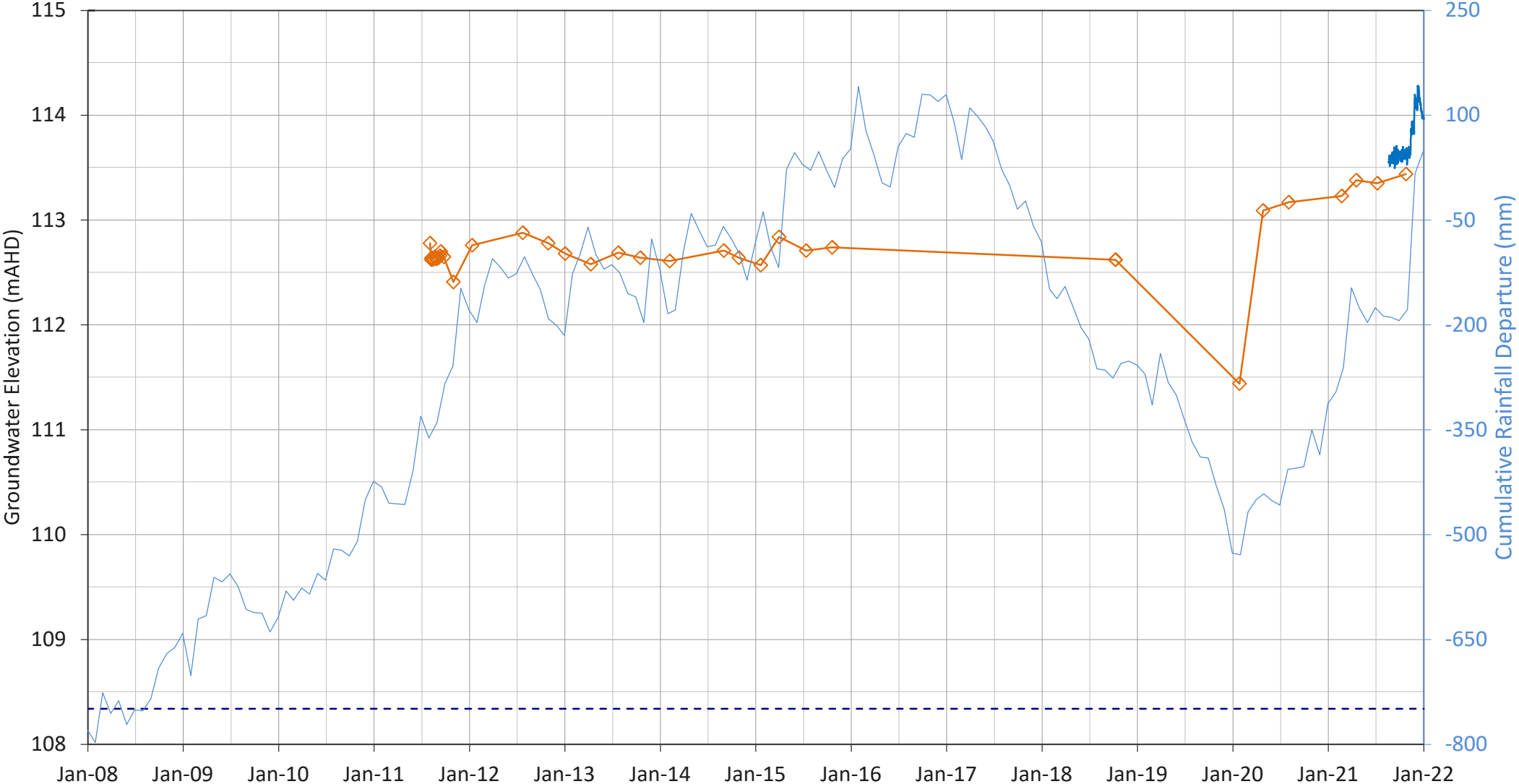
# MB1-Redbank



# MB1-Whybrow



# MB2-Alluvial



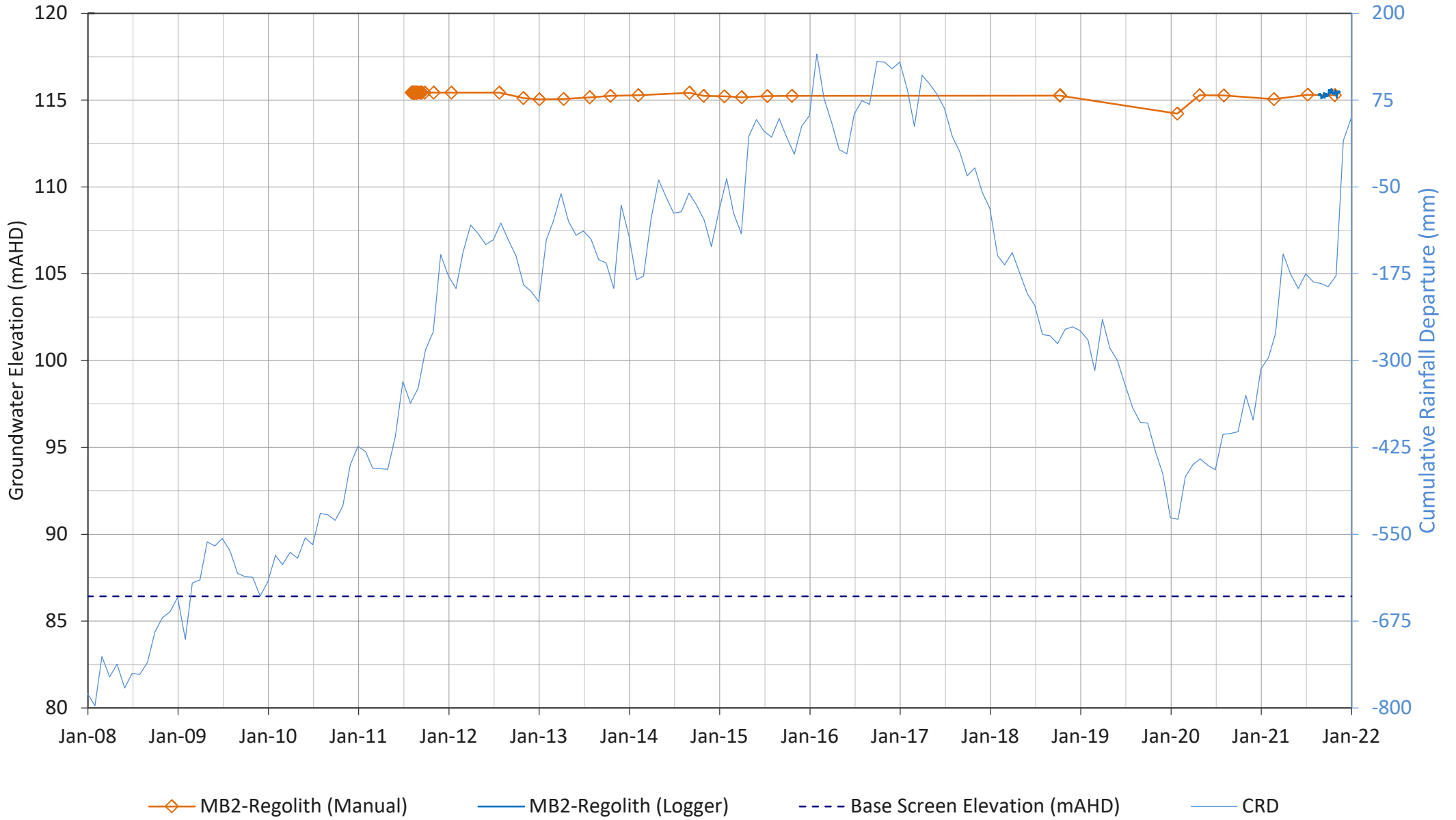
—◇— MB2-Alluvial (Manual)

— MB2-Alluvial (Logger)

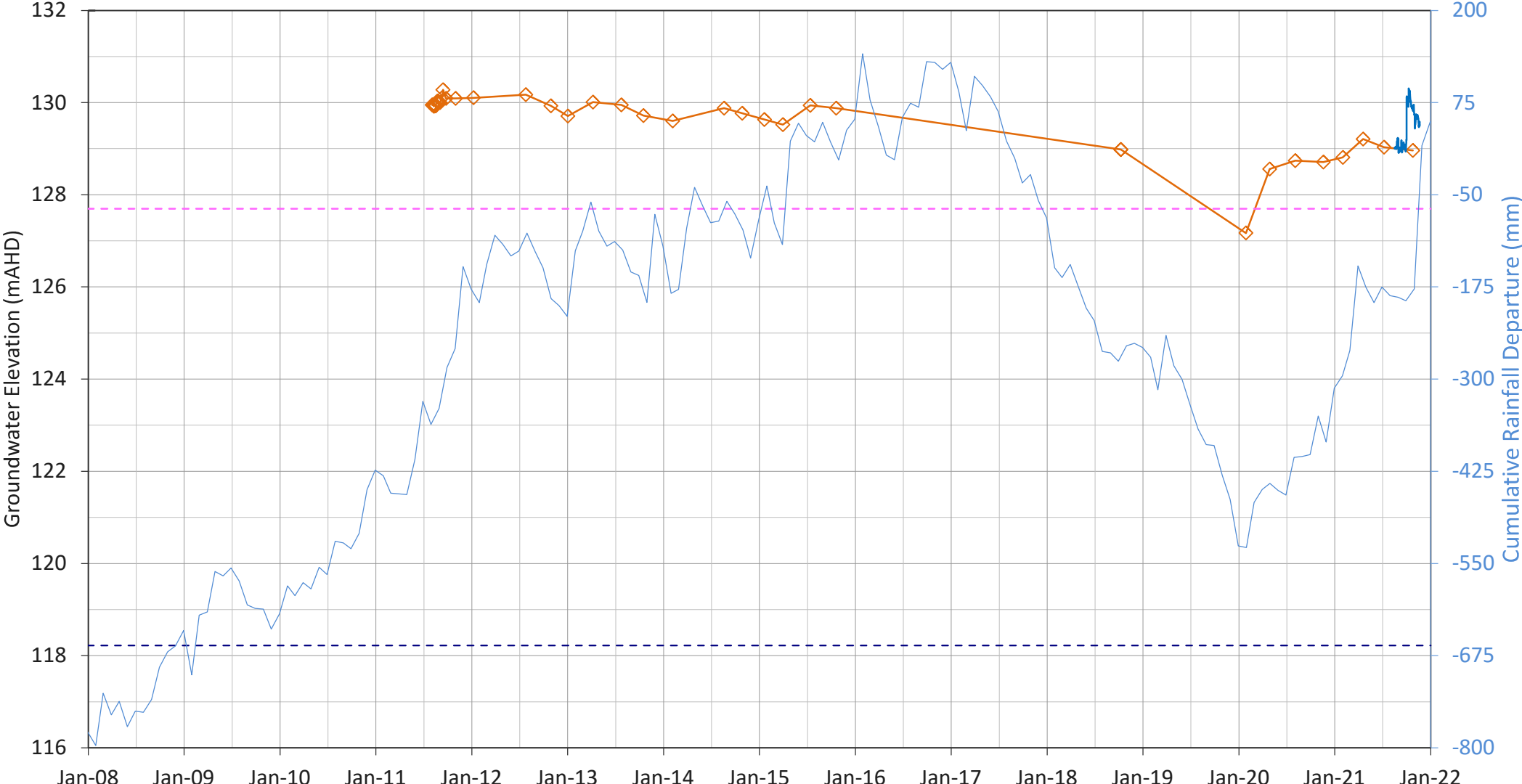
- - - Base Screen Elevation (mAHD)

— CRD

# MB2-Regolith



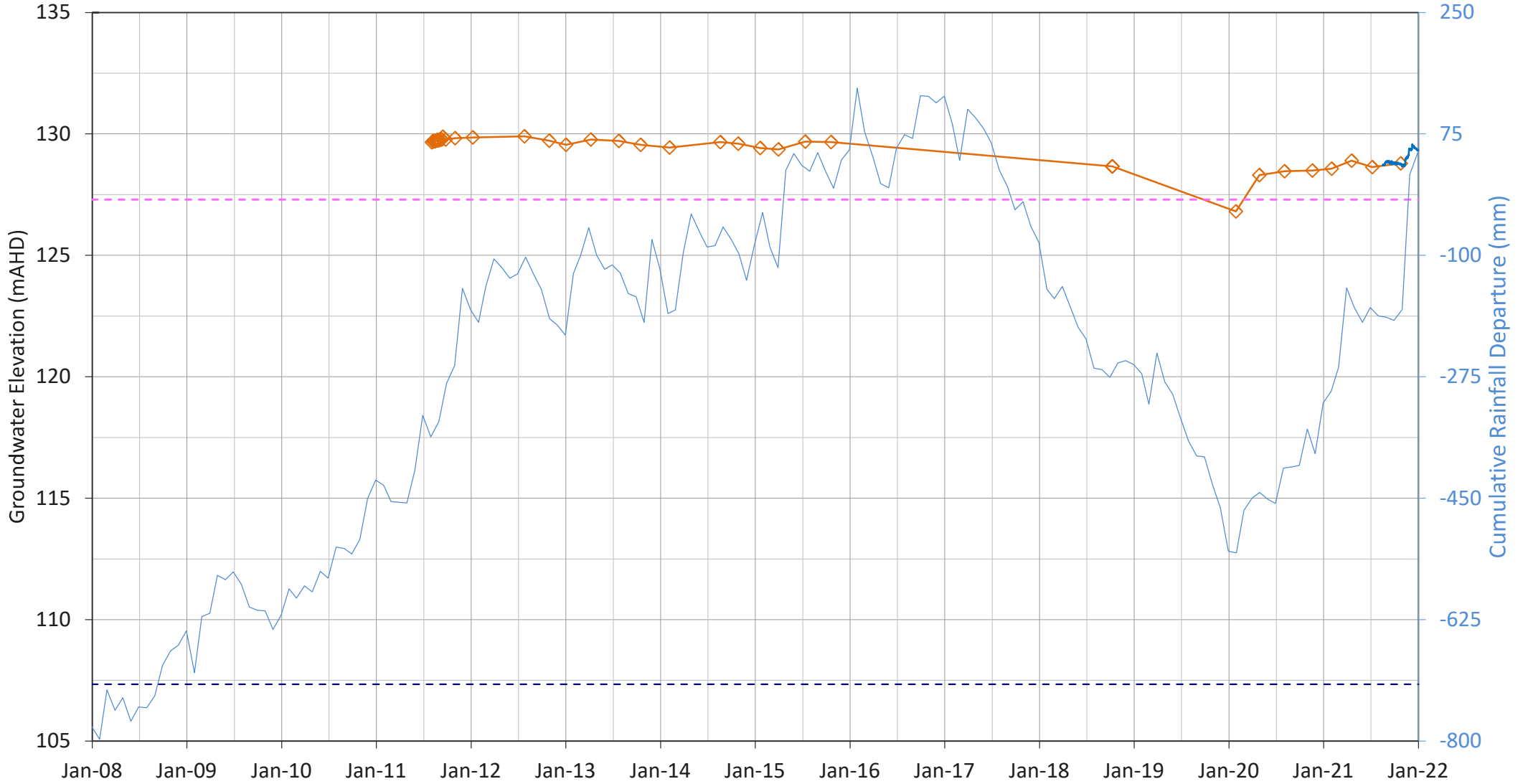
# MB3-Alluvial



—◇— MB3-Alluvial (Manual)    — MB3-Alluvial (Logger)    - - - Lower Trigger Level    - - - Base Screen Elevation (mAHD)    — CRD

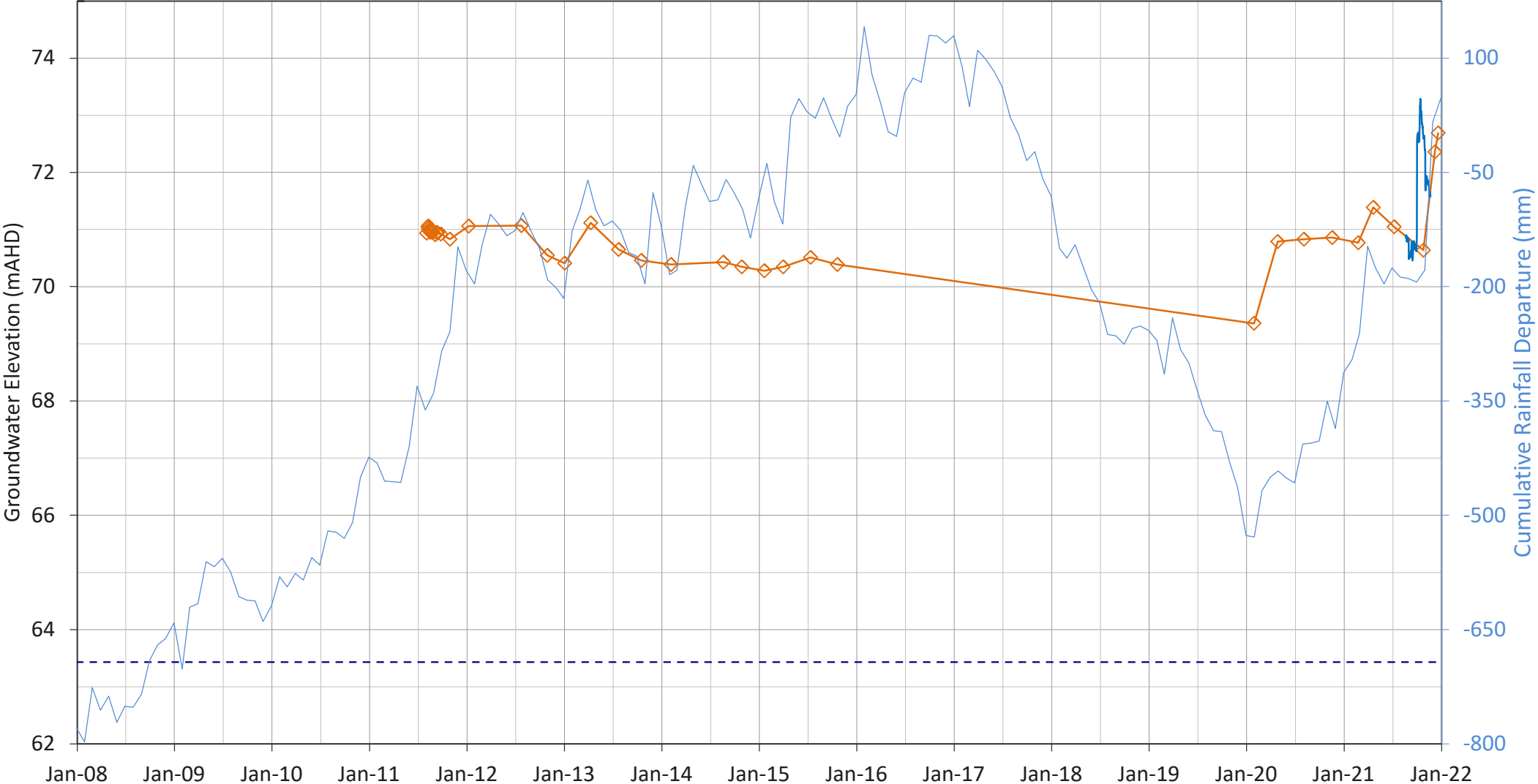


# MB3-Regolith



—◇— MB3-Regolith (Manual) — MB3-Regolith (Logger) - - - Lower Trigger Level - - - Base Screen Elevation (mAHD) — CRD

# MB4-Alluvial



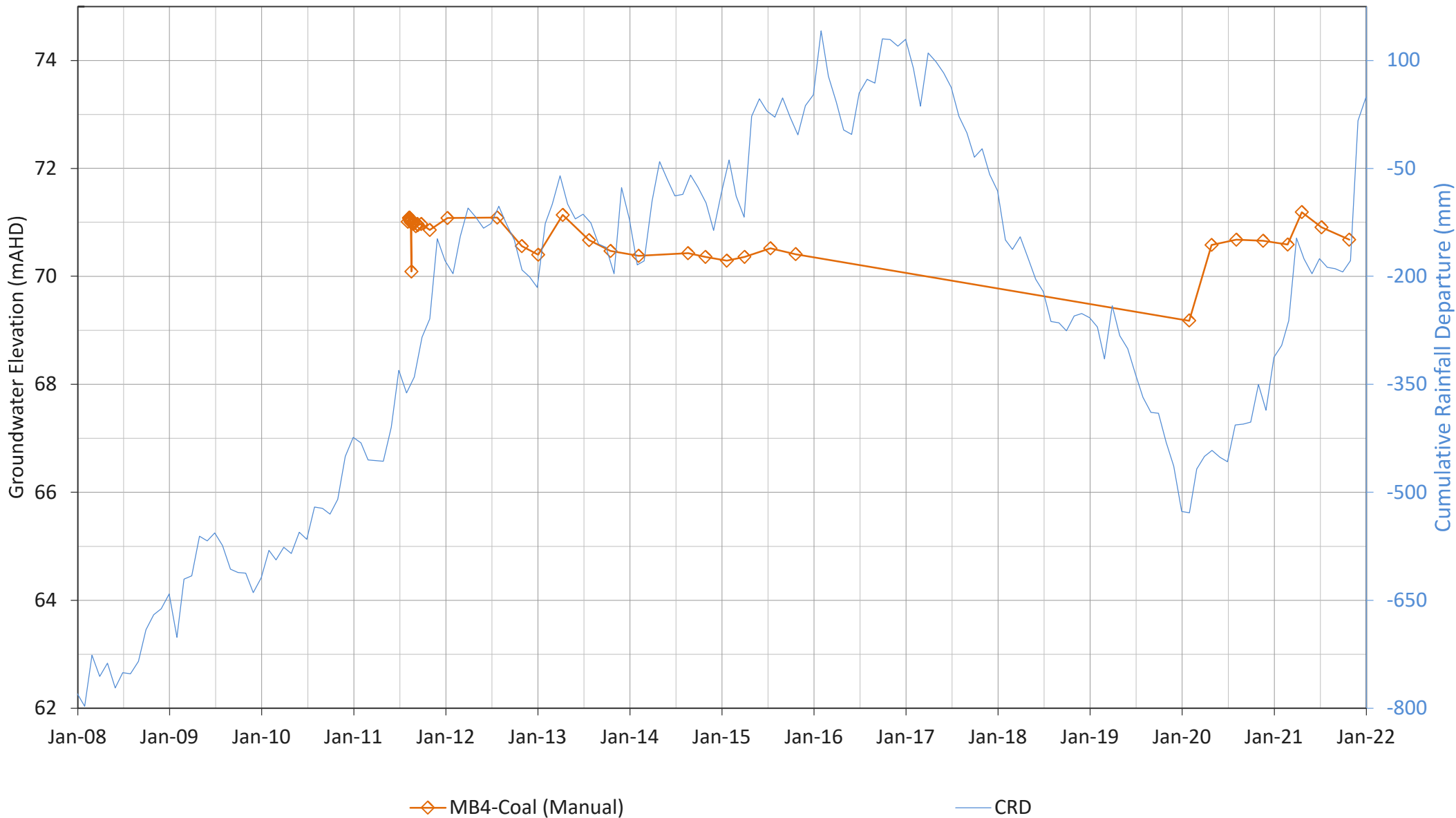
—◇— MB4-Alluvial (Manual)

— MB4-Alluvial (Logger)

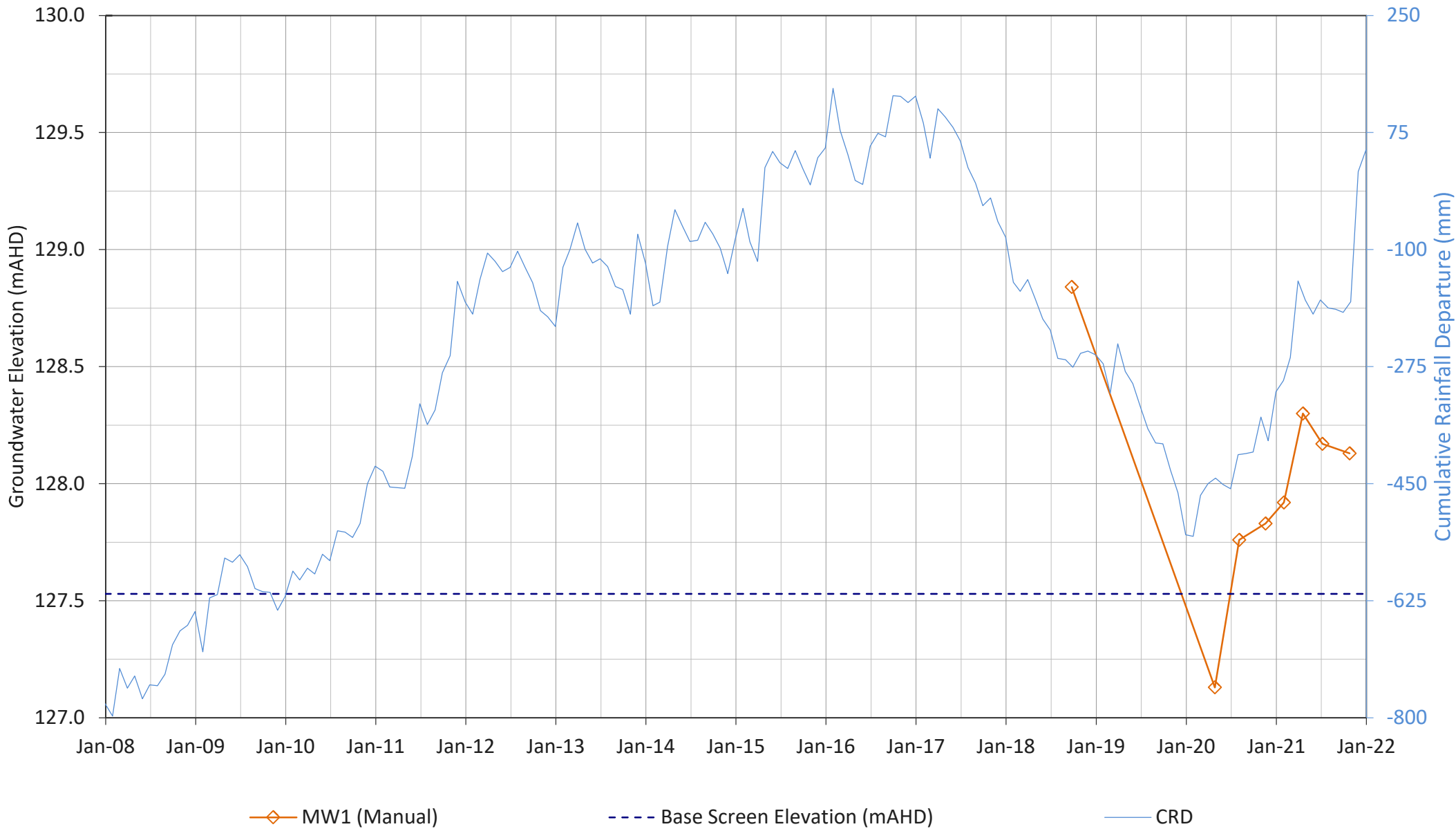
- - - Base Screen Elevation (mAHD)

— CRD

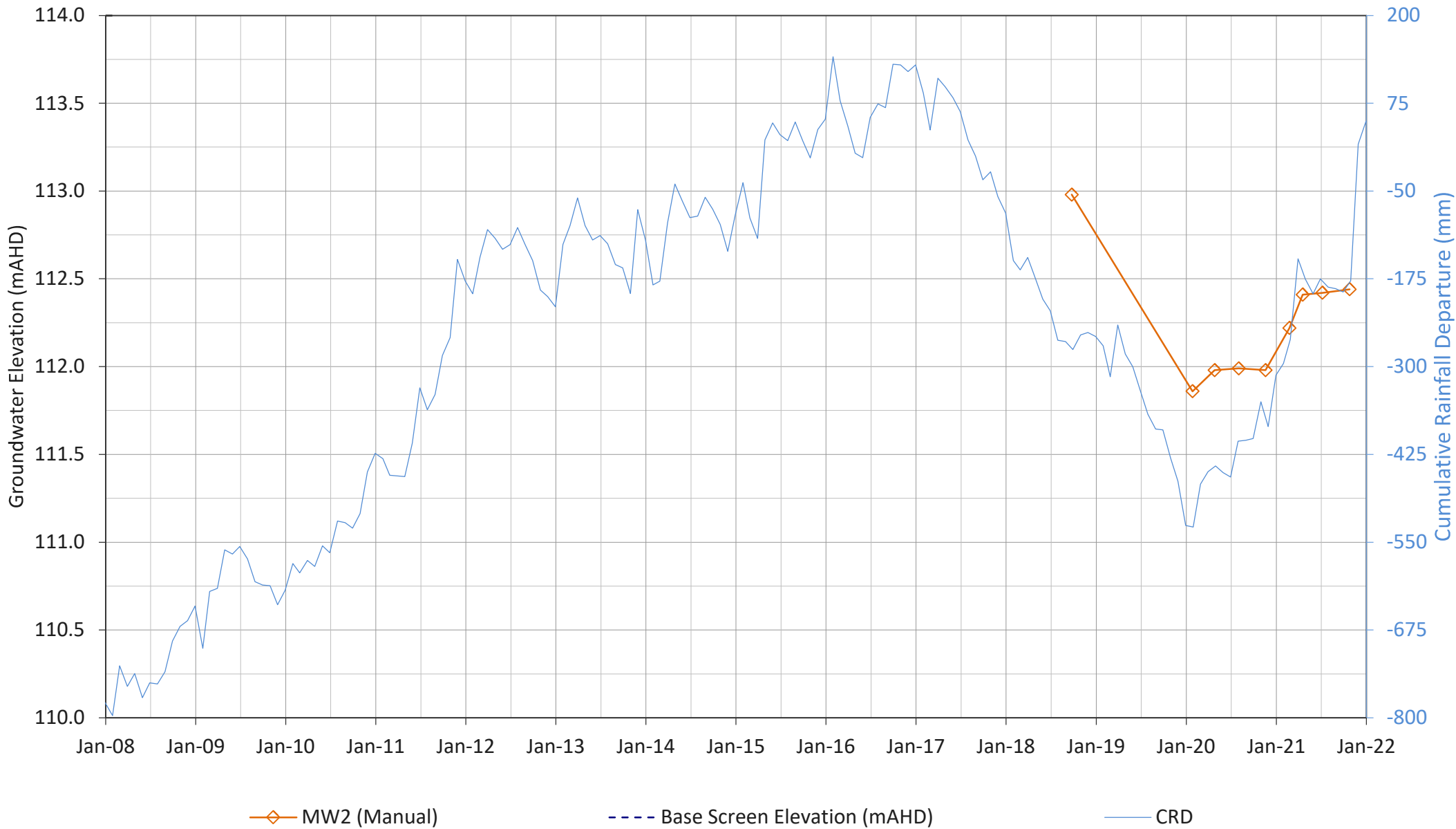
# MB4-Coal



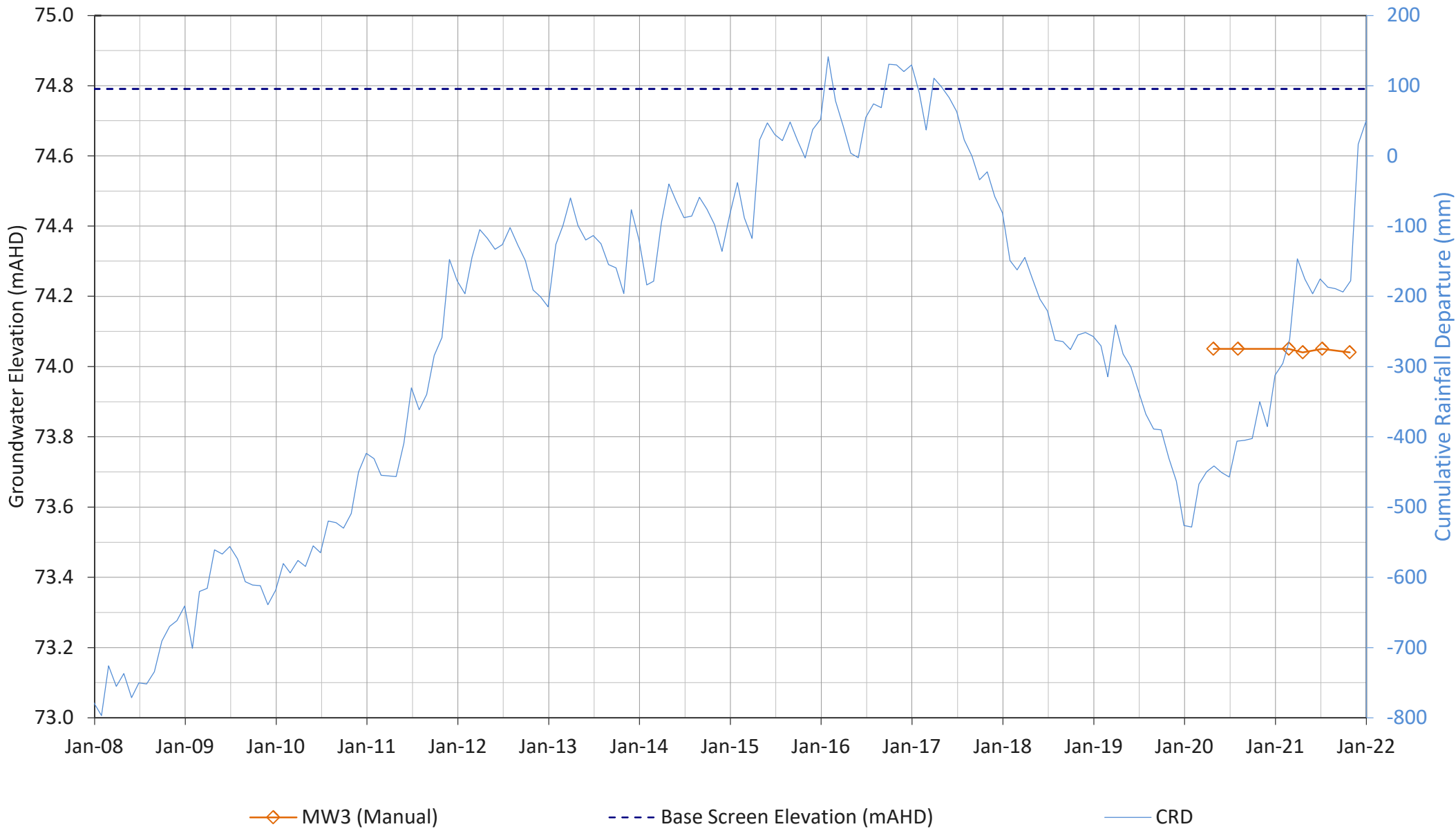
# MW1



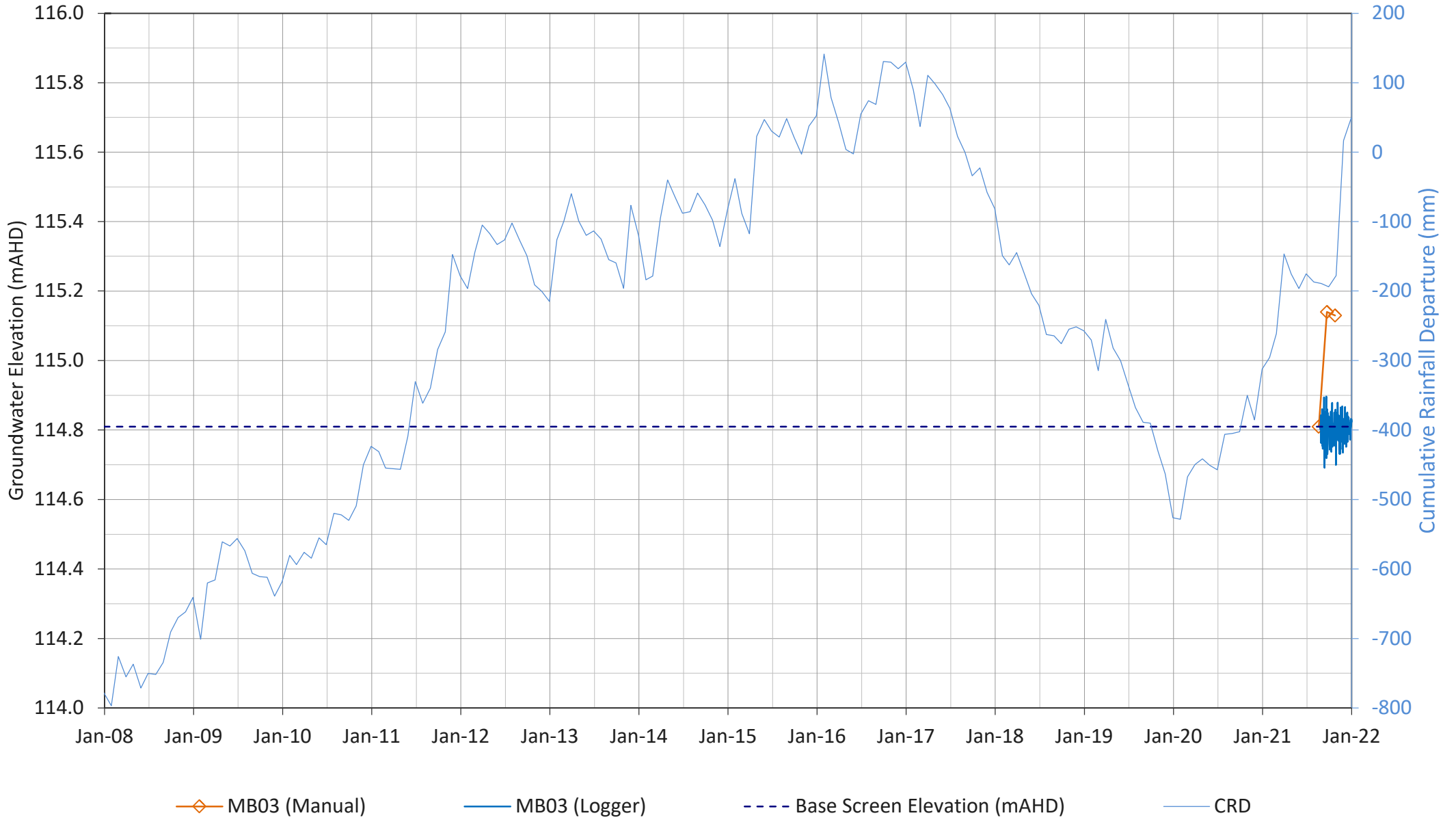
# MW2



# MW3

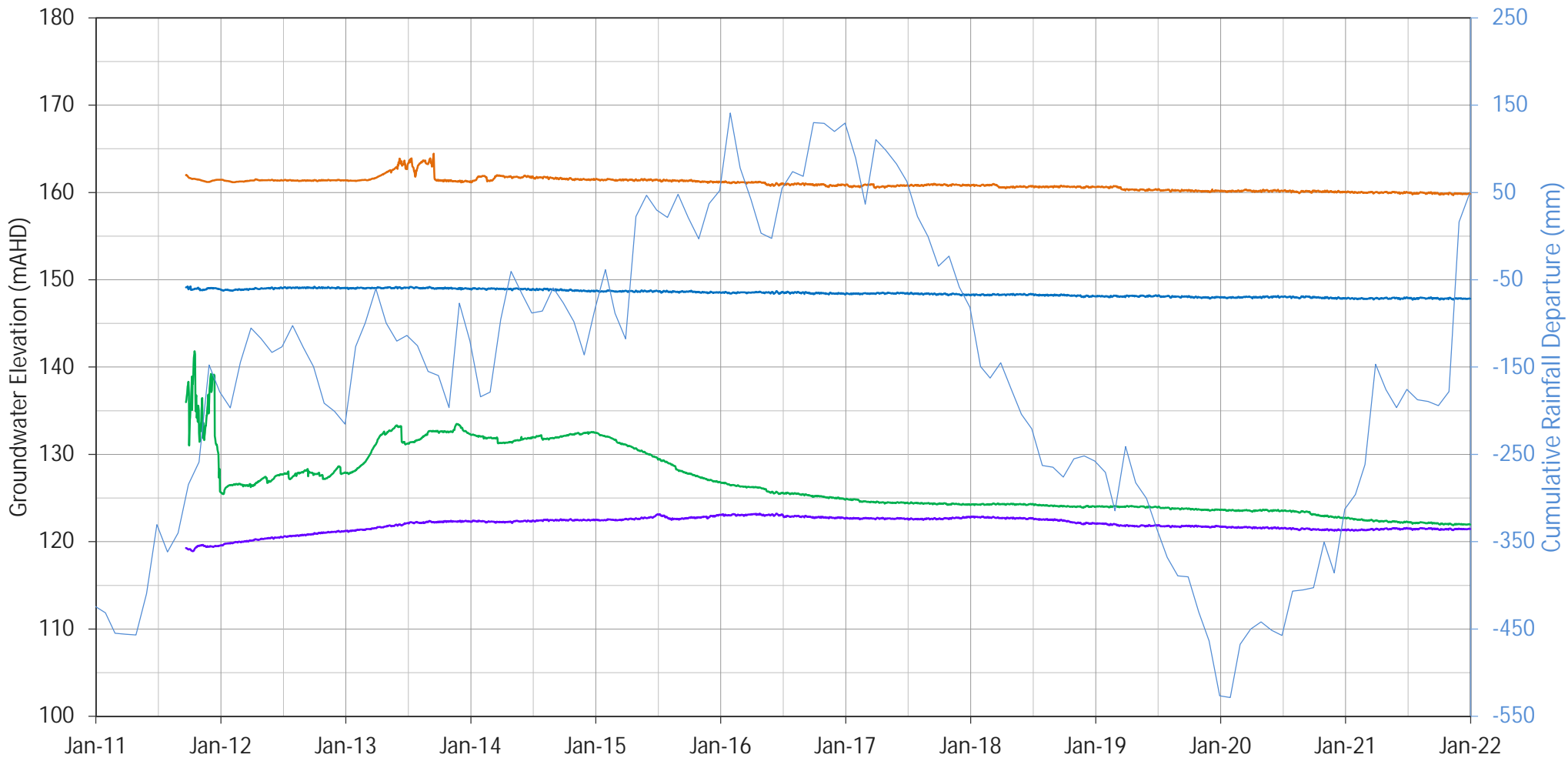


# MB03



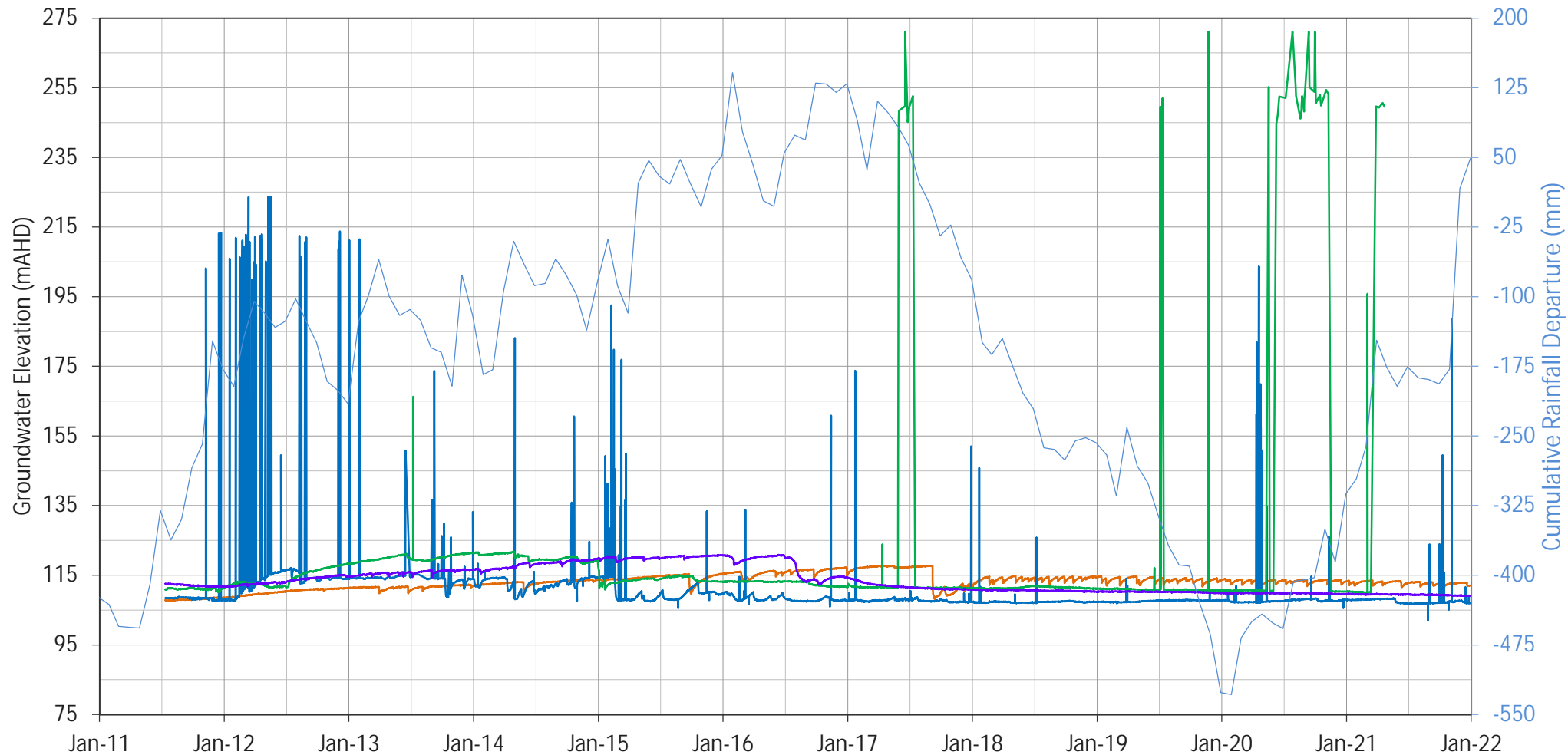


# BKL6R12



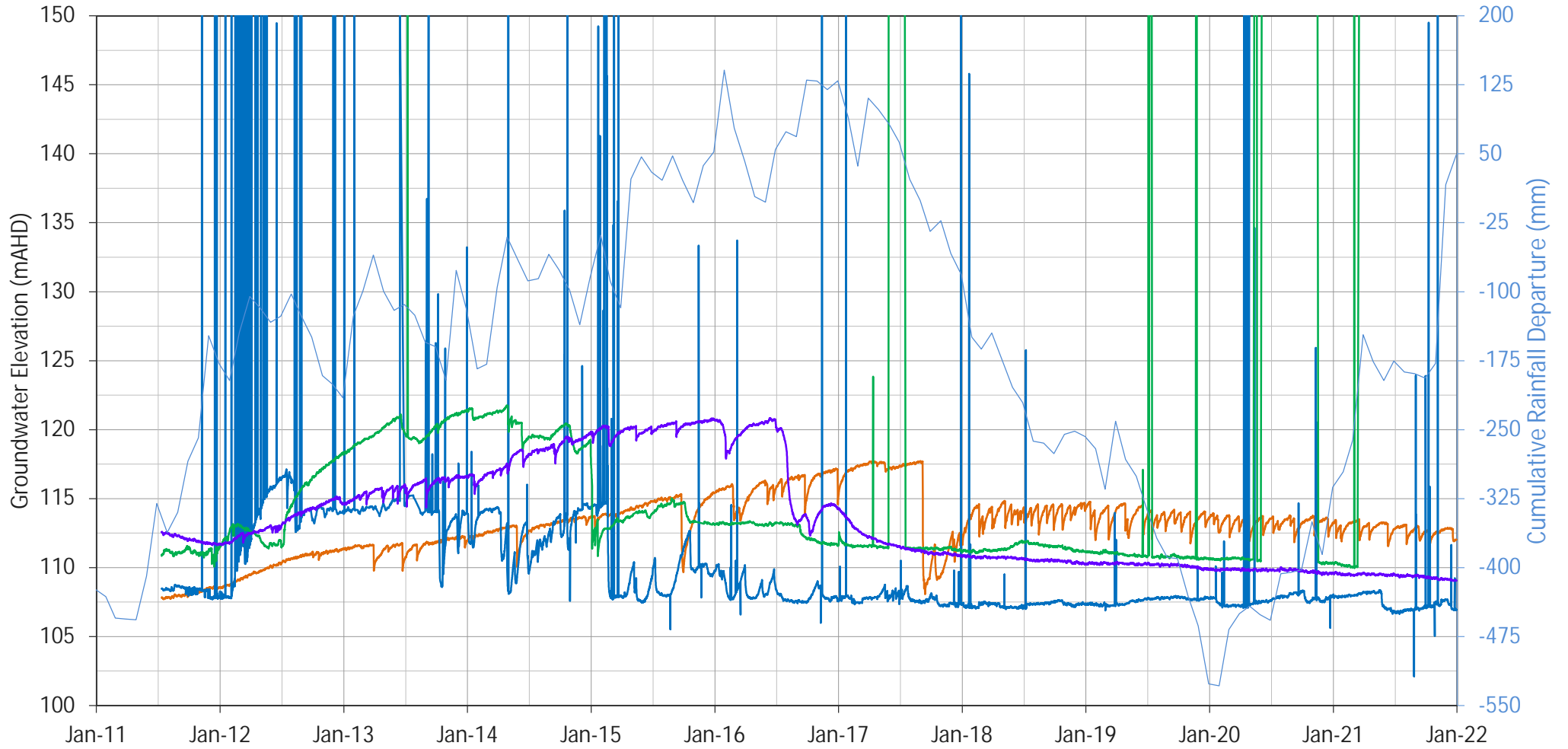
— BKL6R12-VWP1 (WB2-25m) — BKL6R12-VWP2 (RB-40.5m) — BKL6R12-VWP3 (WN2-86.5m) — BKL6R12-VWP4 (BK1-113.7m) — CRD

# WND16



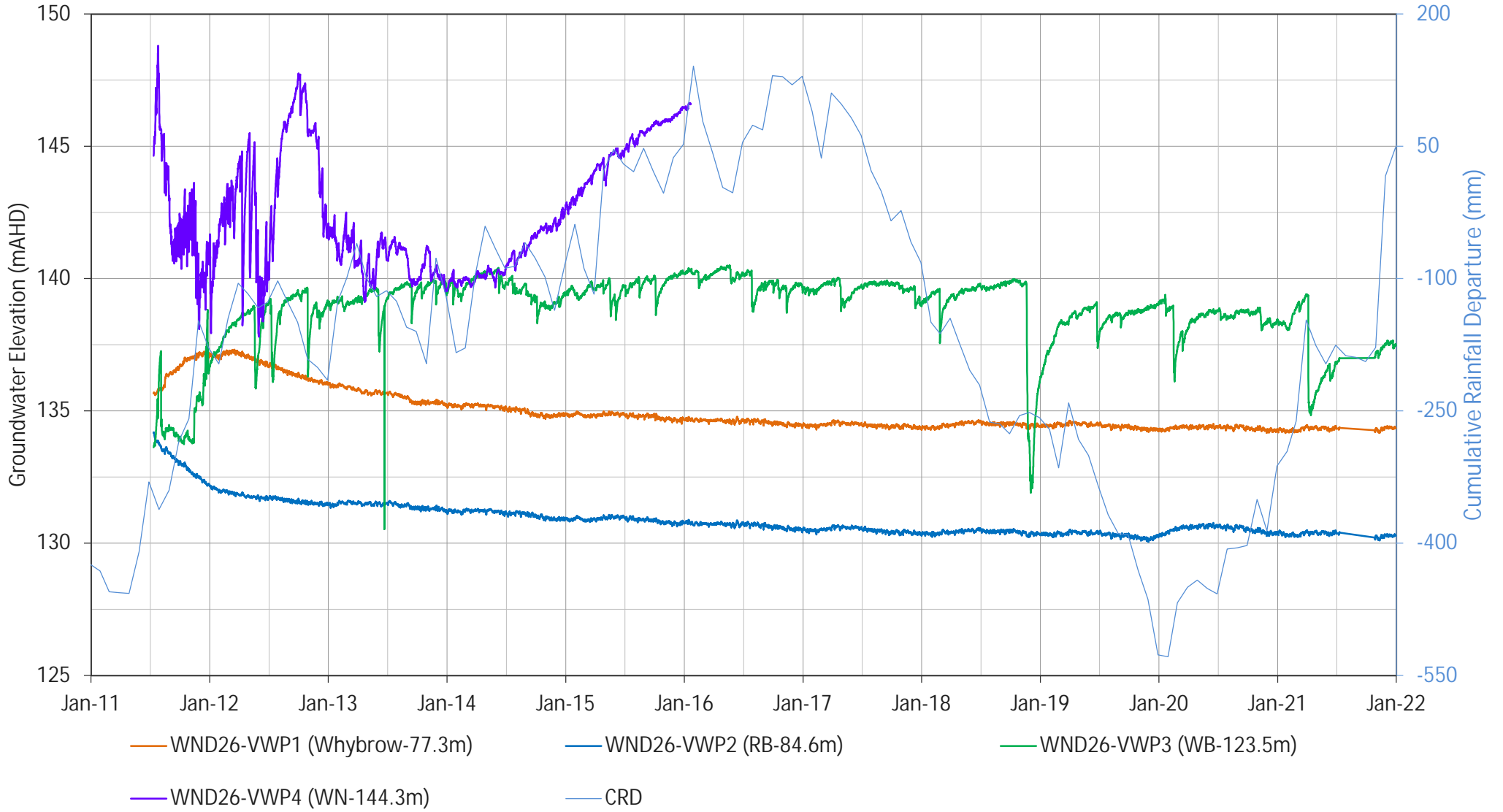
— WND16-VWP1 (WB-33.8m) — WND16-VWP2 (WN-59.3m) — WND16-VWP3 (BK-90.2m) — WND16-VWP4 (BK-110.5m) — CRD

# WND16

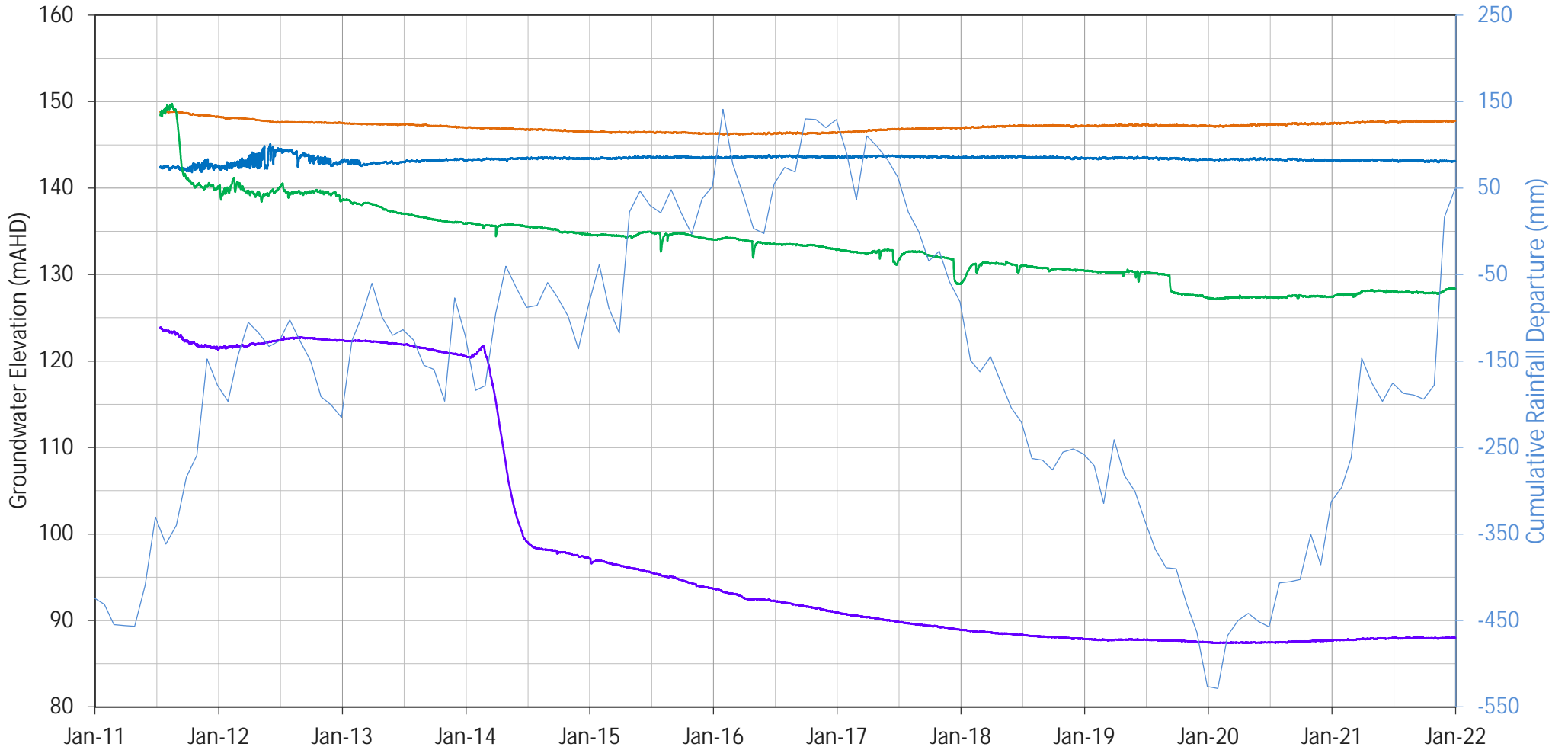


— WND16-VWP1 (WB-33.8m) — WND16-VWP2 (WN-59.3m) — WND16-VWP3 (BK-90.2m) — WND16-VWP4 (BK-110.5m) — CRD

# WND26

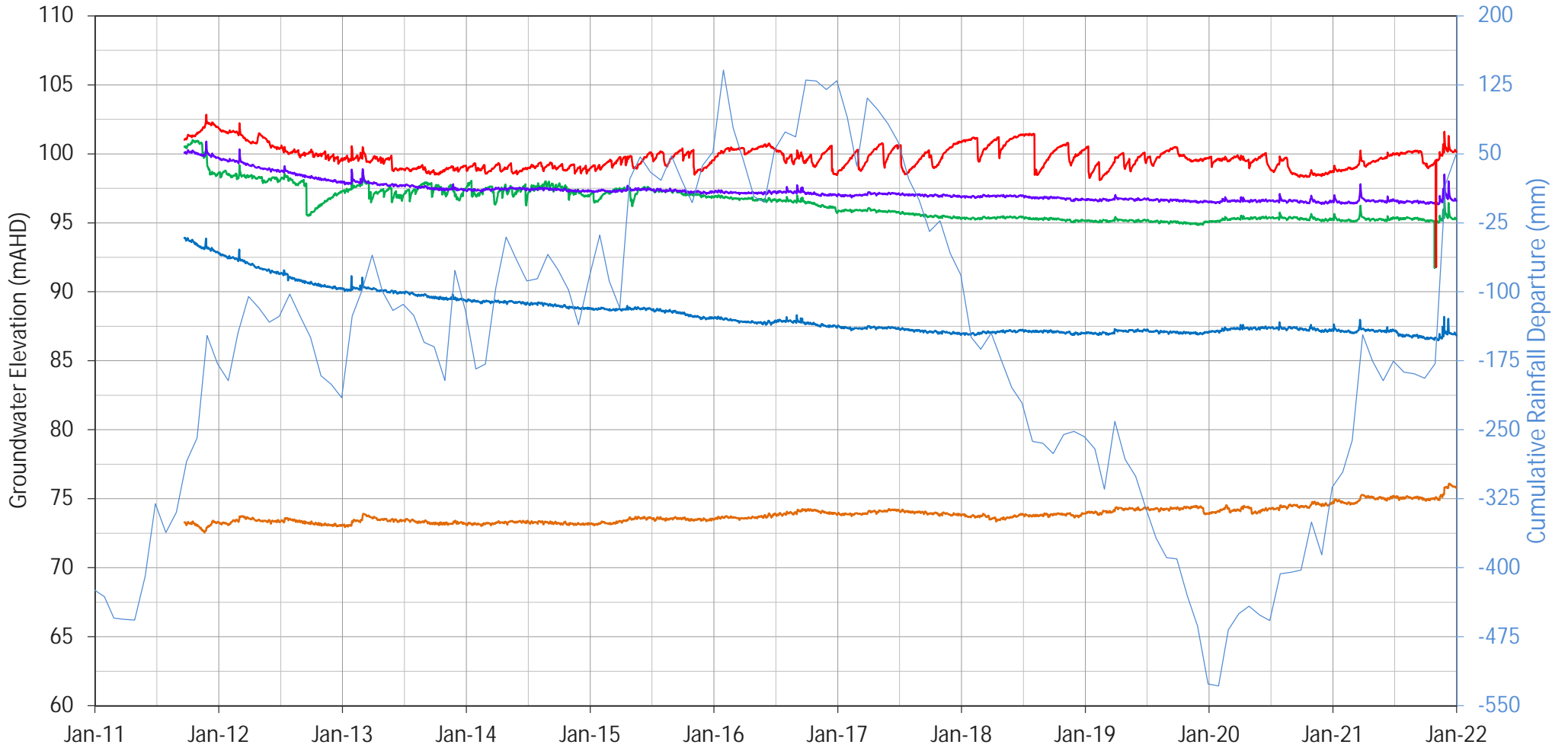


# RBD\_1



— RBD\_1-VWP1 (Whybrow-24.7m) — RBD\_1-VWP2 (RB-33.6m) — RBD\_1-VWP3 (WN-79.5m) — RBD\_1-VWP4 (BK-103.3m) — CRD

# VWP1



— VWP1-interburden (VWP1-21m)

— VWP1-interburden (VWP2-40m)

— VWP1-interburden (VWP3-73m)

— VWP1-Whybrow (VWP4-87m)

— VWP1-WN (VWP5-109.2m)

— CRD

