Appendix 5

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30th January 2023 Ref: A11909/230123/L2

Prepared for:

Steven Bainbridge
Chapman Lily Planning Limited
Unit 5 Designer House
Sandford Lane
Wareham
BH20 4DY

By Email: steven.bainbridge@clplanning.co.uk

Dear Steven,

RE: Site 1 Central Site – Hybrid Application, Marnhull - Infiltration Testing

Omnia were commissioned by Chapman Lily Planning Limited, to undertake infiltration testing in general accordance with *BRE Digest 365 – Soakaway Design* at the above referenced site. Three (3no.) infiltration tests within locations SA101-SA103 were unable to be completed on 31st October to 1st of November 2022. Please find set out below a summary of on-site observations from site works undertaken on Tuesday 17th January, including presentation of infiltration rates within SA101-SA103.

Yours sincerely,

[redacted]

Abbie Dodds
Graduate Geo-Environmental Consultant

[redacted]

Hannah Spurling
Geo-Environmental Consultant

Appendix I – Limitations
Appendix II – Drawings
Appendix III – Exploratory Hole Logs
Appendix IV – In-situ Soakaway Certificates

Quality Assurance

Project Number: A11909 January 2023						
Geotechnical	**Infiltration Testing Letter Report**					
	Prepared by:	A. Dodds	**Date:**	23.01.23	**Signature:**	[redacted]
	Reviewed by:	H. Spurling	**Date:**	25/01/23	**Signature:**	
	Authorised by:	O. Maxwell	**Date:**	27/01/23	**Signature:**	

North Office
Millennium City Park,
Millennium Road,
Preston,
PR2 5BL

01772 963 024

Midlands Office
12 High Pavement,
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Portsmouth,
PO6 4TP

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Site Address	(Northern parcel of land) - Land off Church Hill, Marnhull, DT10 1PU
National Grid Reference	(Northern parcel of land) - 378050, 118960
Site Area	(Northern parcel of land) – Approximately 6.1 ha

1.0 Background

The site comprises two (2no.) separate fields off Church Hill Lane within the village of Marnhull, Dorset. Reference to the 'northern parcel' of land references the field accessed from Church Hill, while reference to the 'southern parcel' of land references the field accessed from Butts Lane.

The northern parcel of land was situated off Church Hill, Marnhull, DT10 1PU. The area of investigation comprised an irregularly shaped agricultural field that had recently been cultivated. The ground was noted to be very wet and boggy on foot, and the topography sloped in a slight downward gradient from the south to the north. Access was via Church Hill to the south.

The southern parcel of land was situated off Chippel Lane, Marnhull, DT10 1NL. The area of investigation comprised an irregularly shaped agricultural field, which had also been recently cultivated. The topography sloped in a slight downward gradient from the north towards the south. Access was via a metal gate off Butts Lane to the northwest.

It is understood that Chapman Lily Planning Limited's client propose to develop both parcels of land under the same planning application. The proposed development will comprise a mixture of residential (retirement living) and commercial buildings, with associated soft landscaping and roadways.

Proposed development plans are detailed as Figures 2.1 and 2.2 within Appendix II. In order to progress with the application stage and assist with the drainage design, winter groundwater monitoring and soakaway testing are required.

Site works were completed from 31/10/22 to 01/11/22 to fulfil the scope of infiltration testing however on the northern parcel of land soakage testing was unable to be completed due to wet ground conditions on site restricting access.

Soakaway testing within the southern parcel of land is summarised within the previous letter referenced A11909/221112/L1. The scope to complete three (3no.) infiltration tests within SA101- SA103 was fulfilled within one (1no.) day on Tuesday the 17th of January 2023, with the excavation of three (3no.) trial pit locations across the northern parcel. The soakaway test locations are presented as Figure 3.0 in Appendix II and were specified by the drainage engineers for the scheme; however due to the wet ground conditions on the 17/01/2023 test locations were repositioned to be as close as possible to the specified locations however access and ground conditions dictated the final position.

Please note, this report covers the infiltration testing within the northern parcel of land (Church Hill) only. A separate factual report regarding winter groundwater monitoring will be issued upon completion of this aspect.

2.0 Geology & Hydrogeology

The British Geological Survey (BGS) map for the site, Shaftesbury (Sheet 313 1:50,000 Solid and Drift, 1994) indicates that the site is underlain by the following geological sequence:

Table 2.1 Geological sequence on site (northern parcel of land)

Geological Unit	Classification	Description
Superficial Deposits (northern extent only)	Head Deposits	Clay, Silt, Sand and Gravel
Bedrock (bands listed from northwest to southeast)	Hazelbury Bryan Formation	Mudstone
	Woodrow Clay Member	Mudstone
	Cucklington Oolite Member	Limestone
	Sturminster Pisolite Member	Limestone
	Newton Clay Member	Mudstone (sandy)

3.0 Ground Conditions Encountered

As disused in Section 1.0, only soakaway locations within the northern parcel are being summarised within this report. The locations generally confirmed the published geology, encountering soils attributed to the above listed bedrock geology within Table 2.1.

Exploratory hole logs are included within Appendix III of this report.

3.1 Topsoil

Topsoil was encountered within all three (3no.) exploratory hole locations, to depths of between 0.30m bgl (SA102) and 0.55mbgl (SA103). The soils predominantly comprised firm brown slightly sandy CLAY. Sand is fine.

3.2 Bedrock

3.2.1 Hazelbury Bryan Formation/Woodrow Clay Member/Newton Clay Member (Undifferentiated).

Soils attributed to the Hazelbury Bryan Formation/Woodrow Clay Member/Newton Clay Member were encountered within all three (3no.) locations directly beneath the Topsoil. Due to the similar properties of the above listed bedrock and narrow bands depicted on the published BGS maps, the three (3no.) mudstone-based bedrock strata have been grouped together for the purpose of this investigation as differentiating between them was not possible.

This bedrock was encountered directly below the Topsoil to a maximum observed depth of 1.60m bgl (SA101) although the base of the strata was not proven in any location. Typically, this bedrock comprised firm orangish brown slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine subangular to subrounded flint (SA102-SA103) OR soft to firm greyish blue mottled orangish brown sandy CLAY. Sand is fine to medium (SA101).

3.3 Groundwater Conditions

Groundwater was not encountered within SA101 or SA103. Groundwater seepage was identified at 1.30m bgl at SA102, where the pit was terminated.

4.0 BRE DG365 Soakaway Testing

Soakaway testing was undertaken in general accordance with BRE DG365 on Tuesday 17th January 2023 within SA101-SA103.

The soakaway test certificates, including full time and depth data, are included within Appendix IV with the test results summarised in Table 4.1 below.

Table 4.1 Summary of infiltration rates

Location	Test Number	Pit Dimensions (L x W x D)	Depth to fill (m bgl)	Strata Type	Duration of Test (hrs:mins)	Infiltration Rate (m/s)
SA101	1	2.40 x 0.40 x 1.60	1.60	CLAY	02:21	N/A
SA102	1	2.20 x 0.40 x 1.30	1.30	CLAY	03:24	N/A
SA103	1	2.60 x 0.40 x 1.50	1.50	CLAY	04:08	N/A

Both the 75% and 25% effective storage depths were not reached within Test 1 for SA101 and Test 1 for SA102. Therefore, the tests are not considered to have been successful.
Although the 75% effective storage depth within SA103 was reached, the 25% effective storage depth was not reached during the test, such that an infiltration rate could not be calculated.

5.0 Discussion & Conclusions

During the duration of the soakaway tests, the 75% and 25% effective storage depths were not reached within two (2no.) soakaway test locations (SA101 & SA102) and 25% effective storage depth was not reached within one (1no.) soakaway test location (SA103). As a result, soil infiltration rates were not calculated. This is attributed to the cohesive nature of the fine-grained material that was typically encountered within the intrusive locations.

Although the 75% intercept was reached within SA103, the 25% intercept was not reached. The data obtained suggests that the test may have been successful if given more time, however given that works were limited to one day the test had to be terminated.

Although SA103 indicates testing may have been successful, given the geology was consistent across the site it is considered that the site may not be suitable for conventional soakaway design, and it is recommended that a qualified drainage engineer is provided with the results of this testing for further discussion.

The application of soakaway drainage will ultimately be dependent on the specific requirements of the development. All soakaways should be designed in accordance with BRE Special Digest 365-Soakaway Design.

END OF REPORT

APPENDIX I

Limitations

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between OE Ltd and the Client as indicated in Section 1.2.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination, which are enforced, by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

9. OE cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by OE is owned by them and no such plans or documents may be reproduced, published, or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by OE in this connection without their explicit written agreement there to by OE.

10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II

Figures

Key

Site Boundary

0 100 200 300 400 m

Scale	Paper Size
1:10,000	A4

Omnia Consulting, 3-6 The Quarterdeck, Port Solent,
Portsmouth, Hampshire, PO6 4TP
T: (01489) 808 088
E: info@omnia-consulting.co.uk
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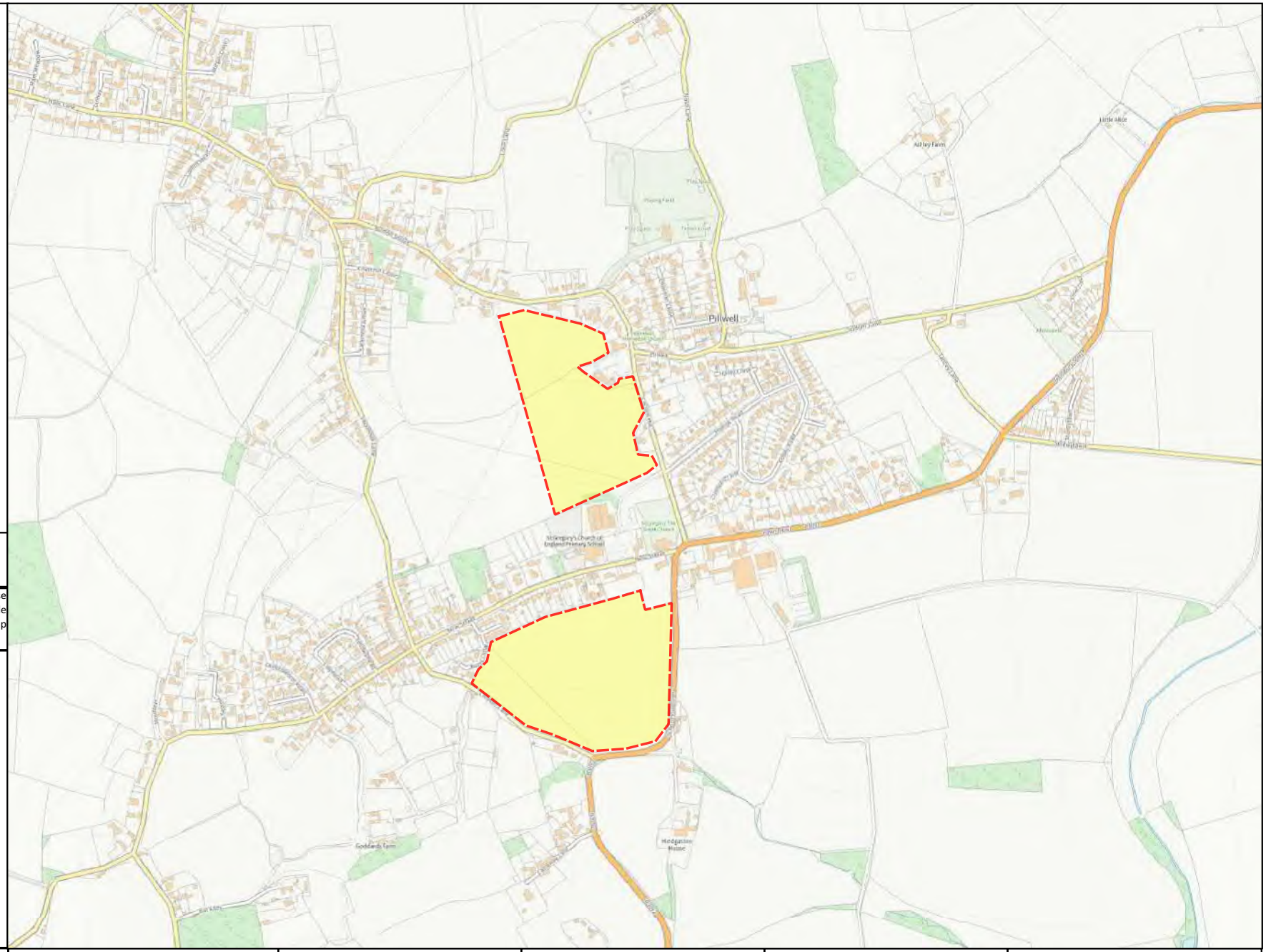

OMNIA	Job Title: Site 1 Central Site - Hybrid Application	Client: Champan Lily Planning Limited	Project Number: A11909	Date: 12/11/2022
			Drawn By: L. Burnett	Authorised By: O. Maxwell

Drawing Title: Figure 1.0 Site Location Map

0 25 50 75 100 m

Scale	Paper Size
1:2,200	A4

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OMNIA

Job Title:	Client:	Project Number:	Date:	Drawing Title:
Site 1 Central Site - Hybrid Application	Champan Lily Planning Limited	A11909	12/11/2022	Figure 2.1 (Phillips Rd) Proposed Development Plan
		Drawn By: L. Burnett	Authorised By: O. Maxwell	

Key

return SA positions

A11909 Site Boundary

0 50 100 m

Scale	Paper Size
1:3,000	A4

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T: (01489) 808 088
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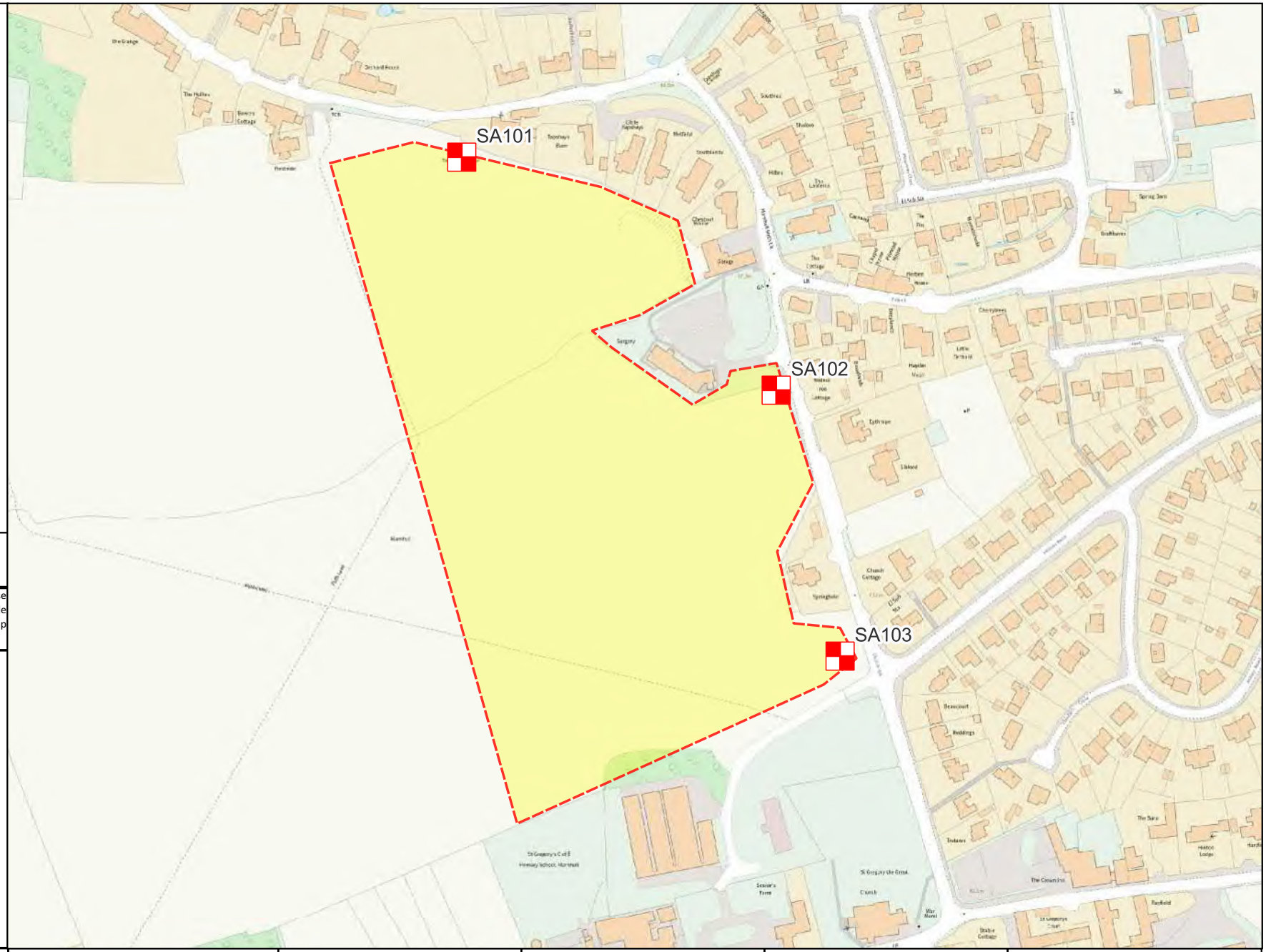


OMNIA	Job Title: Site 1 Central Site- Hybrid Application	Client: Champan Lily Planning Limited	Project Number: A11909	Date: 30/01/2023
			Drawn By: H. Spurling	Authorised By: O. Maxwell

Drawing Title: Figure 3.0 Intrusive Location Plan (SA101-SA103)

APPENDIX III

Trial Pit Logs

Trial Pit Log

OMNIA			Trialpit No **SA101** Sheet 1 of 1
Project Name: Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 377917.00 - 119138.00 Level:	Date 17/01/2023
Location: Land off Church Hill, Marnhull, DT10 1PU		Dimensions (m): 2.4 × 0.4, Depth 1.60	Scale 1:20
Client: Chapman Lily Planning Limited			Logged HS

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Firm brown slightly sandy CLAY. Sand is fine. [TOPSOIL]
				0.40			Firm orangish brown slightly sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
				1.00			Soft to firm greyish blue mottled orangish brown sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				1.60			End of pit at 1.60 m

Remarks: 1. Position scanned by CAT and Genny prior to excavation. Groundwater was not encountered.

Stability: Stable

AGS

Trial Pit Log

Trialpit No **SA102**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378097.00 - 119008.00 Level:
Location:	Land off Church Hill, Marnhull, DT10 1PU	Dimensions (m): Depth 1.30	2.2 × 0.4
Client:	Chapman Lily Planning Limited		

Date 17/01/2023

Scale 1:20

Logged HS

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Firm brown slightly gravelly slightly sandy CLAY. Sand is fine. [TOPSOIL]
				0.30			Firm orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine subangular flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
							From 0.70m bgl: Becomes light grey mottled orangish brown.
							From 1.00m bgl: No gravel.
				1.30			End of pit at 1.30 m

1 2 3 4

Remarks: 1. Position scanned by CAT and Genny prior to excavation. Groundwater seepage found at 1.30m bgl.

Stability: Stable

Trial Pit Log

Trialpit No **SA103**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378129.00 - 119961.00 Level:
Location:	Land off Church Hill, Marnhull, DT10 1PU	Dimensions (m): Depth 1.50	1.6 × 0.4
Client:	Chapman Lily Planning Limited		

Date 17/01/2023

Scale 1:20

Logged HS

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Firm dark brown sandy CLAY. Sand is fine. [TOPSOIL]
				0.55			Firm orangish brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium subangular to subrounded flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
				1.10			Firm greyish yellowish light brown sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]. *From 1.30m bgl: Slightly gravelly. Gravel is fine to medium, angular to subangular flint.*
				1.50			End of pit at 1.50 m

1 2 3 4

Remarks: 1. Position scanned by CAT and Genny prior to excavation. Groundwater not encountered.

Stability: Stable

APPENDIX IV

Soakaway Test Certificates

Site Name:	Site 1 - Central Site - Hybrid Application
Site Reference:	A11909
Test Date:	17/01/2023

Trial Pit Identification:	SA101
Trial Pit Length (m):	2.40
Trial Pit Width (m):	0.40
Trial Pit Depth (m):	1.60
Groundwater Level (m bgl):	Dry

SOIL INFILTRATION RATE TEST

See BRE DG365, Soakaway Design (2016).

Geology Description:

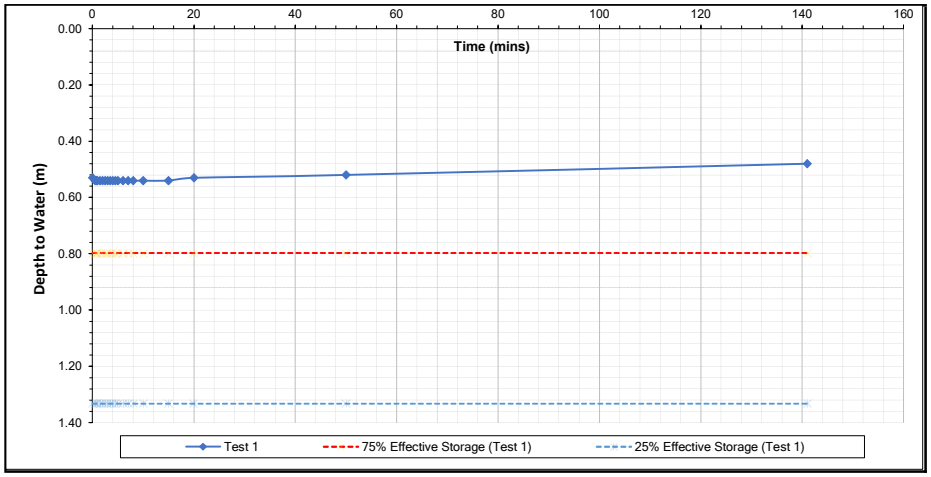
0.00 - 0.40m bgl: Firm brown slightly sandy CLAY. Sand is fine. [TOPSOIL]
0.40-1.00m bgl: Firm orangish brown slightly sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
1.00-1.60m bgl: Soft to firm greyish blue mottled orangish brown sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]

Test Parameters	TEST 1	
	Time (min)	Depth (m)
Effective Storage Depth (m):	0.00	0.53
1.07	0.50	0.54
75% Effective Storage Depth (m):	0.75	0.54
0.80	1.00	0.54
	1.50	0.54
(i.e. Depth Below Ground Level) (m):	2.00	0.54
0.80	2.50	0.54
	3.00	0.54
25% Effective Storage Depth (m):	3.50	0.54
0.27	4.00	0.54
	4.50	0.54
(i.e. Depth Below Ground Level) (m):	5.00	0.54
1.33	6.00	0.54
	7.00	0.54
Effective Storage Depth Across 75% - 25% (m):	8.00	0.54
0.54	10.00	0.54
	15.00	0.54
Time to Fall to 75% Effective Depth (min):	20.00	0.53
N/A	50.00	0.52
	141.00	0.48
Time to Fall to 25% Effective Depth (min):		
N/A		
Vp75%-25% (m3):		
0.51		
As50% (m2):		
3.96		
Tp75%-25% (mins):		
N/A		

DESIGN SOIL INFILTRATION RATE, f (m/s):	**N/A**

Comments:

NOTE: During the duration of the test the required inercept failed to be reached. Therefore the test is considered not to have been successful. There was some pit collapse towards the end of the test.



Site Engineer:	Date:
HS	17/01/2023

Checked and Approved By:	Date:
HS	23/01/2023

Location
SA101

uired

Site Name:	Site 1 - Central Site - Hybrid Application
Site Reference:	A11909
Test Date:	17/01/2023

Trial Pit Identification:	SA102
Trial Pit Length (m):	2.20
Trial Pit Width (m):	0.40
Trial Pit Depth (m):	1.30
Groundwater Level (m bgl):	Dry

SOIL INFILTRATION RATE TEST

See BRE DG365, Soakaway Design (2016).

Geology Description:

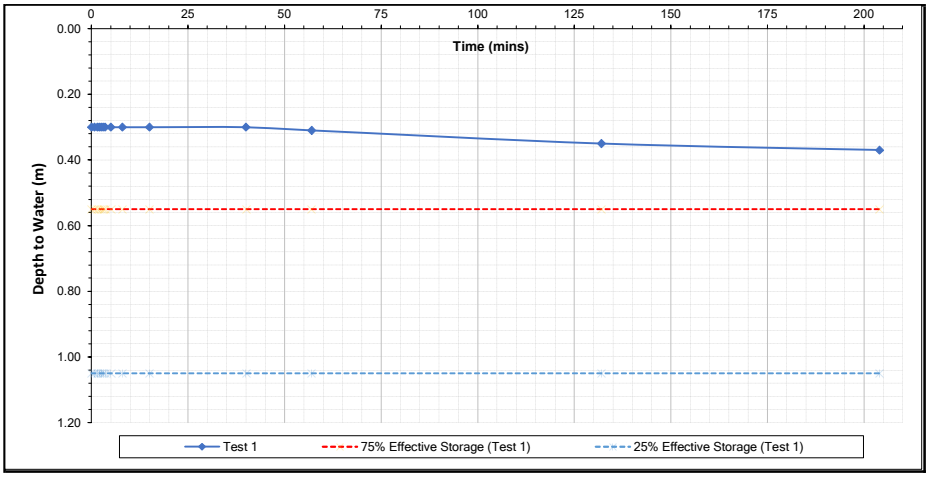
0.00 - 0.30m bgl: Firm brown slightly sandy CLAY. Sand is fine. [TOPSOIL]
0.30-1.30m bgl: Firm orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine subangular flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]

Test Parameters	TEST 1	
	Time (min)	Depth (m)
Effective Storage Depth (m):	0.00	0.30
1.00	0.75	0.30
75% Effective Storage Depth (m):	1.50	0.30
0.75	2.00	0.30
	2.50	0.30
(i.e. Depth Below Ground Level) (m):	3.00	0.30
0.55	3.50	0.30
	5.00	0.30
25% Effective Storage Depth (m):	8.00	0.30
0.25	15.00	0.30
	40.00	0.30
(i.e. Depth Below Ground Level) (m):	57.00	0.31
1.05	132.00	0.35
	204.00	0.37
Effective Storage Depth Across 75% - 25% (m):		
0.50		
Time to Fall to 75% Effective Depth (min):		
N/A		
Time to Fall to 25% Effective Depth (min):		
N/A		
Vp75%-25% (m3):		
0.44		
As50% (m2):		
3.48		
Tp75%-25% (mins):		
N/A		

DESIGN SOIL INFILTRATION RATE, f (m/s):	**N/A**

Comments:

NOTE: During the duration of the test the required inercept failed to be reached. Therefore the test is considered not to have been successful.



Site Engineer:	Date:
HS	17/01/2023

Checked and Approved By:	Date:
HS	23/01/2023

Location
SA102

uired

Site Name:	Site 1 - Central Site - Hybrid Application
Site Reference:	A11909
Test Date:	17/01/2023

Trial Pit Identification:	SA103
Trial Pit Length (m):	1.60
Trial Pit Width (m):	0.40
Trial Pit Depth (m):	1.50
Groundwater Level (m bgl):	Dry

SOIL INFILTRATION RATE TEST

See BRE DG365, Soakaway Design (2016).

Geology Description:

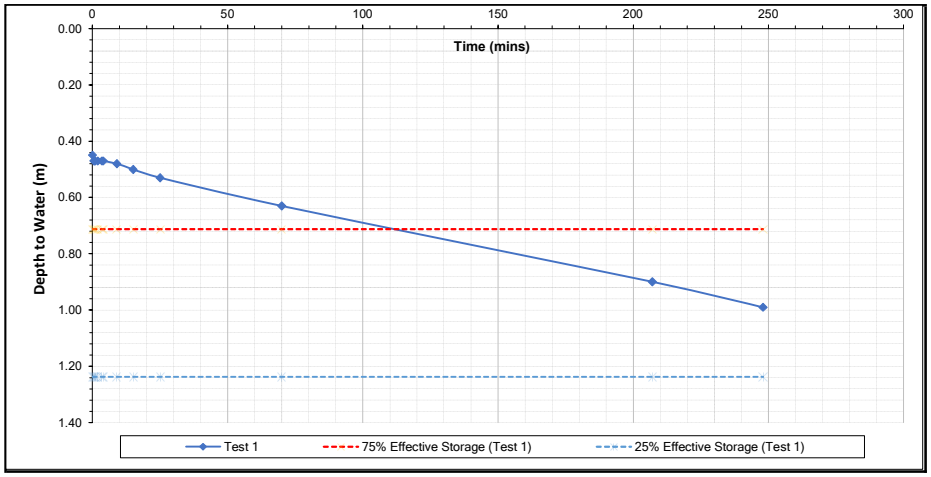
0.00 - 0.55m bgl: Firm dark brown sandy CLAY. Sand is fine. [TOPSOIL]
0.55-1.10m bgl: Firm orangish brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium subangular to subrounded flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
1.10-1.55m bgl: Firm greyish yellowish light brown sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
From 1.30m bgl: Slightly gravelly. Gravel is fine to medium, angular to subangular flint.

Test Parameters	**TEST 1**	
	Time (min)	**Depth (m)**
Effective Storage Depth (m):	0.00	0.45
1.05	0.50	0.47
75% Effective Storage Depth (m):	0.75	0.47
0.79	1.00	0.47
	2.00	0.47
(i.e. Depth Below Ground Level) (m):	3.50	0.47
0.71	4.00	0.47
	9.00	0.48
25% Effective Storage Depth (m):	15.00	0.50
0.26	25.00	0.53
	70.00	0.63
(i.e. Depth Below Ground Level) (m):	207.00	0.90
1.24	248.00	0.99
Effective Storage Depth Across 75% - 25% (m):		
0.53		
Time to Fall to 75% Effective Depth (min):		
110		
Time to Fall to 25% Effective Depth (min):		
207		
Vp75%-25% (m3):		
0.34		
As50% (m2):		
2.74		
Tp75%-25% (mins):		
97		

DESIGN SOIL INFILTRATION RATE, f (m/s):	**N/A**

Comments:

NOTE: During the duration of the test the required inercept failed to be reached. Therefore the test is considered not to have been successful.



Site Engineer:	**Date:**
HS	17/01/2023

Checked and Approved By:	**Date:**
HS	23/01/2023

Location
SA103

uired

Appendix 6

NOTES

1. Drawing based on 22039 P201 Proposed Site Plan, produced by Bright Space Architects (Dated: 06.04.23)

2. Surface water flood risk zones based on the extract from Environmental Agency website (RoFSW–ST71, Dated September 2022)

3. The Contractor shall verify the invert levels of any existing inspection chamber/manhole or pipe, where drainage connections are to be made, prior to commencement of drainage works. Any discrepancies with levels and gradients shown on the construction issue drawings must be reported to PFA Consulting and the Contractor shall seek clarification regarding any construction issue prior to continuing the drainage works.

4. The works shown on this drawing could affect Statutory Undertaker's apparatus and the Contractor is required to verify the location and depth of all such apparatus prior to commencement of the works and to take any precautions necessary when working in the vicinity of any such apparatus.

5. Contains Public sector information licensed under the Open Government Licence v3.0

6. This drawing should be read in combination with PFA Consulting's Flood Risk Assessment (Document Ref: C798–DOC14)

Arlington House
Cider Cottage
Braeburn House
Blenheim House
Newton House
BUTTS CLOSE
CHIPPEL LANE
SCHOOLHOUSE LANE
Existing Hedge
public footpath
82.7m
SuDS Feature 3
SuDS Feature 4
SuDS Feature 2
SUDS Feature 1
GS1
GS2
GS3
Flow Control Chamber
70.5m
Chippel Lodge
Hillside

0m 50m 100m
Scale 1:1250

N

PFA consulting

Stratton Park House, Wanborough Road
Swindon, SN3 4HG

Telephone
01793 828000

Website
www.pfaplc.com

For Planning
This drawing is produced for the purposes of supporting a planning application and should not be relied upon for tender, pricing, or construction purposes.

KEY

- Site Boundary
- Overland Flow Routes

Flood Constraints

- Low risk of Surface Water Flooding (Between 1 in 100 (1%) and 1 in 1000 (0.1%))
- Onsite Surface Water Drainage Network
- Conveyance SuDS Feature (Subject to Detailed Design)
- Outfall from site
- 3 metre Watercourse Buffer
- Drainage Ditch
- Regrading/Landscaping to Existing Ground (TBC)
- Underground Storage (Geocellular or similar approved)

Rev	Date	Description	Drawn	Check
#	26/05/23	First Issue.	IS	MWS

Status
FOR PLANNING

Client
P & D Crocker

Project
Butts Close, Marnhull

Drawing Title
Indicative Surface Water Drainage Strategy

Drawing No.
C798/26

Date: April 2023 | Scale: 1:1000 @ A3

E-Mail: istevenson@pfaplc.com

Appendix 7

Omnia
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Email: info@omnia-consulting.co.uk
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30th May 2023

ref: A11909/230518/L1

Steven Bainbridge
Chapman Lily Planning Limited
Unit 5 Designer House
Sandford Lane
Wareham
BH20 4DY

By Email: steven.bainbridge@clplanning.co.uk

Dear Steve,

RE: Central Site – Hybrid Application – Winter Groundwater Monitoring

Omnia were commissioned by Chapman Lily Planning Limited to undertake winter groundwater monitoring within eight (8no.) installed wells across the site in order to provide detailed information on groundwater levels over the winter period.

If you have any questions, please do not hesitate to contact us.

Yours Sincerely,
Omnia Consulting

[redacted]

Abbie Dodds
Graduate Geo Environmental Consultant

[redacted]

Olivia Maxwell
Principal Geo Environmental Consultant

Attachments:

Attachment 1: Limitations

Attachment 2: Drawings

Attachment 3: Exploratory Hole Logs

Attachment 4: Photographs

Attachment 5: Groundwater Monitoring Graphs

Quality Assurance

Remarks	Draft
Date	May 2023
Prepared by	A. Dodds
Signature	[redacted]
Checked by	H. Spurling
	[redacted]
Authorised by	O. Maxwell
Signature	[redacted]
Project number	A11909
Comments	

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0115 7043 492

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Port Solent,
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PO6 4TP

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Site Details	
Site Name	(Northern parcel of land) - Land off Church Hill, Marnhull, DT10 1PU (Southern parcel of land) - Land off Butts Close, Marnhull, DT10 1NL
National Grid Reference	(Northern parcel of land) - 378050, 118960 (Southern parcel of land) – 377997, 118486

1 Background

It is understood that Chapman Lily Planning Limited's client is proposing to develop both parcels of land under the same planning application. The proposed development will comprise a mixture of residential (retirement living) and commercial buildings, with associated soft landscaping and roadways. In order to progress with the application stage and assist with the drainage design, winter groundwater monitoring and soakaway testing are required.

In November 2022, an Infiltration Testing Letter report (Omnia ref: A11909/221112/L1) was completed within the site which undertook infiltration testing in general accordance with *BRE Digest 365 – Soakaway Design* within three (3no.) trial pits within the southern parcel of land. The trial pits excavated had a maximum depth of 2.90m bgl.

A period of winter groundwater monitoring was also required to provide detailed information on groundwater levels over the winter period, to assist with drainage design. During the November 2022 works eight (8no.) windowless samples were excavated within the northern and southern parcels of land consisting for four (4no.) locations in each field. Eight (8no.) groundwater monitoring installations were placed in total to a maximum depth of 4.91m bgl, in order to carry out the winter groundwater monitoring.

Additional infiltration testing was conducted In January 2023, an Infiltration Testing Letter report (Omnia ref: A11909/230123/L2) was completed within the site which undertook infiltration testing in general accordance with *BRE Digest 365 – Soakaway Design* within three (3no.) trial pits within the northern parcel of land. The trial pits excavated had a maximum depth of 1.60m bgl.

1.1 Site Description

At the time of the ground investigation the site comprised (2no.) parcels of land within the village of Marnhull, Dorset.

The northern parcel of land was situated off Church Hill, Marnhull, DT10 1PU. The area of investigation comprised an irregularly shaped agricultural field that had recently been cultivated. At the time of the site works (November 2022) the ground was noted to be very wet and boggy underfoot. Access was via Church Hill to the south. The boundaries were mostly made up of hedgerows and there was a 10m wide patch of trees in the center of the field, running east/west. A public footpath ran along the eastern edge of the field.

The southern parcel of land was situated off Butts Close, Marnhull, DT10 1NL. The area of investigation comprised an irregularly shaped agricultural field, which had also been recently cultivated. Access was via a metal gate off Butts Close to the northwest. The boundaries of the field mostly consisted of hedgerows with fencing to some back gardens on the northern boundary of the field. Near the eastern edge of the field was a 5m circular patch of trees with a derelict building over an unused well.

The site covered an area of approximately 6.1ha in the northern parcel of land and approximately 7.7ha in the southern parcel of land.

1.2 Scope of works

During the ground investigation on site, eight (8no.) window sample boreholes were installed (WS101, WS102, WS103, WS104, WS105, WS106, WS107 and WS108) to be used to facilitate the specified number of winter groundwater monitoring points. The maximum depth across the boreholes was 4.91m bgl (WS105).

Dataloggers were placed within all eight (8no.) monitoring wells across the site, allowing the collection of a continuous dataset with groundwater measurements taken at hourly intervals. Continuous monitoring data was downloaded at monthly intervals at which point each well was manually dipped with an electronic dip-tape to confirm that the dataloggers were operating within the expected parameters.

Winter groundwater monitoring was undertaken between 8th November 2022 and 10th May 2023.

1.3 Changes to scope of works

During visit 5 on the 06/04/2023 the Farm machinery was positioned over the window sample installation at WS103, which obstructed access to the hole and therefore data was not able to be collected from WS103. Additionally, during the final visit on the 10/05/2023 the hole was able to be accessed and the Level Logger and data were collected, however, due to the damage from the machinery to the installed well the manual dip readings were unable to be carried out.

1.4 Site Topography

A review of topographic maps, EA LiDAR and on-site observations indicates that the northern parcel of land's topography sloped in a downward gradient from the south to the north and the topography of the southern parcel sloped in a downward gradient from the north towards the south.

2 Geology & Hydrogeology

The British Geological Survey (BGS) map for the site (Shaftesbury, Sheet 313 1:50,000 Solid and Drift, 1994) indicates that the site is underlain by the geological sequence summarised in Table 2.1:

Table 2.1 - Geological Succession

Geological Unit	Classification	Description	Aquifer Classification
Superficial (Northern extent only)	Head Deposits	Clay, silt, sand and Gravel	Secondary (Undifferentiated)
Bedrock (bands listed from northwest to southeast)	Hazelbury Bryan Formation	Mudstone	Unproductive Strata
	Woodrow Clay Member	Mudstone	Secondary A
	Cucklington Oolite Mmeber	Limestone	Secondary A
	Sturminsted Pisolite Member	Limestone	Secondary A
	Newton Clay Member	Mudstone (sandy)	Secondary A

The intrusive site investigation undertaken by Omnia in November 2022 and January 2023 found the geology present on site to generally correspond with that highlighted within BGS mapping. The findings are outlined below.

Topsoil was encountered within all locations (WS101-108 and SA101-106) with thicknesses ranging from 0.28-0.80m and was typically recovered as firm brown slightly sandy slightly gravelly (slightly silty) CLAY. Sand was fine. Gravel was angular to subrounded fine to medium flint with occasional rootlets and roots (WS101, WS102, WS103, WS104, WS105, WS106 and WS108) and occasional cobbles of subangular limestone. The base of the topsoil was proven within all locations.

Head Deposits were encountered within two (2no.) locations (WS101 and WS102) to a maximum depth of 3.20m bgl (WS102). The deposits typically comprised firm orangish brown mottled light grey reddish sandy CLAY with occasional rootlets. Sand is fine to medium.

The Hazelbury Bryan Formation, Woodrow Clay Member and Newton Clay Member were undifferentiated and were encountered within thirteen (13no.) locations, to a maximum depth of 5.00m bgl (WS105 and WS108). The formations were typically described as the following:

- Soft brownish orange slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint.
- Soft OR firm OR stiff grey OR brown slightly sandy CLAY. Sand is fine.
- Stiff reddish-brown CLAY.
- Soft to firm greyish blue mottled orangish brown sandy CLAY. Sand is fine to medium.
- Weathered limestone bedrock recovered as grey angular fine to coarse GRAVEL of limestone.
- Yellowish to light brown sandy very clayey subangular to subrounded, fine to coarse GRAVEL of limestone. Sand is fine to coarse and coarse grains are observed to be spherical.
- Grey mottled light grey slightly sandy subangular, fine to coarse GRAVEL of weak mudstone. Sand is fine to medium.
- Orangish brown mottled light brown clayey fine to coarse SAND.
- Dark brown mottled orangish brown slightly gravelly very clayey fine to coarse SAND. Gravel is subrounded, fine to medium flint and occasional fine, white, subangular to subrounded, sandstone/claystone rock.

The base of the undifferentiated Hazelbury Bryan Formation, Woodrow Clay Member and Newton Clay Member was not proven at any intrusive locations advanced as part of this ground investigation.

2.1 Groundwater Conditions

Within two (2no.) locations groundwater strikes were encountered and two (2no.) groundwater seepages were encountered within a further two (2no.) locations were encountered during the intrusive investigation. The summary of these is below:

Table 2-2. Summary of Groundwater Conditions from the ground investigation

Location	Depth (m bgl)	Strata	Type of Water Strike
SA102	1.30	Hazelbury Bryan Formation/Woodrow Clay Member/Newton Clay Member (Undifferentiated)	Groundwater Seepage
WS101	1.20		Groundwater Strike
WS103	1.00		Groundwater Strike
WS105	4.00		Groundwater Seepage

3 Groundwater Monitoring Results

3.1 Spot Monitoring

Results of the groundwater spot monitoring undertaken between 8/11/2022 to 10/05/2023 for all available monitoring wells has been summarised and included in Table 3.1 below.

Table 3.1 – Groundwater monitoring results

Location	Date	Depth to Groundwater (m bgl)	Depth to base (m bgl)
WS101	08/11/2022	0.31	2.09
	02/12/2022	0.61	2.06
	03/01/2023	0.18	2.04
	02/02/2023	0.60	2.08
	02/03/2023	1.00	2.05
	06/04/2023	0.34	2.03
	10/05/2023	0.10	2.03
WS102	08/11/2022	Dry	1.14
	02/12/2022	Dry	1.11
	03/01/2023	Dry	1.14
	02/02/2023	Dry	1.14
	02/03/2023	Dry	1.15
	06/04/2023	Dry	1.15
	10/05/2023	Dry	1.15
WS103	08/11/2022	Dry	1.13
	02/12/2022	Dry	1.08
	03/01/2023	0.27	1.27
	02/02/2023	Dry	1.20
	02/03/2023	Dry	1.20
	06/04/2023	Due to damage to installation measurements were not table to be collected	
	10/05/2023		
WS104	08/11/2022	0.36	1.22
	02/12/2022	0.94	1.12
	03/01/2023	0.45	1.11
	02/02/2023	Dry	1.14
	02/03/2023	Dry	1.12
	06/04/2023	0.84	1.12
	10/05/2023	0.75	1.13
WS105	08/11/2022	4.55	4.91
	02/12/2022	3.31	4.88
	03/01/2023	1.95	4.85
	02/02/2023	2.57	4.80
	02/03/2023	3.01	4.85
	06/04/2023	1.93	4.85
	10/05/2023	1.62	4.85
WS106	08/11/2022	1.40	1.71
	02/12/2022	0.82	1.72
	03/01/2023	0.74	1.73
	02/02/2023	1.05	1.70
	02/03/2023	1.26	1.72
	06/04/2023	0.90	1.72
	10/05/2023	0.69	1.73
WS107	08/11/2022	0.49	0.78
	02/12/2022	0.83	0.82

Location	Date	Depth to Groundwater (m bgl)	Depth to base (m bgl)
	03/01/2023	0.16	0.82
	02/02/2023	Dry	0.82
	02/03/2023	Dry	0.82
	06/04/2023	Dry	0.82
	10/05/2023	Dry	0.78
WS108	08/11/2022	Dry	1.82
	02/12/2022	0.18	1.82
	03/01/2023	0.00	1.83
	02/02/2023	0.46	1.84
	02/03/2023	1.24	1.80
	06/04/2023	0.26	1.80
	10/05/2023	0.26	1.84

3.2 Continuous Monitoring

Continuous groundwater monitoring was undertaken for a period of six (6no.) months utilising LevelScout Level Loggers which were deployed at locations WS101, WS102, WS103, WS104, WS105, WS106, WS107 and WS108 across the site. The pressure transducers within the Level Loggers measure total pressure (water column pressure & atmospheric pressure), and in order to measure changes in water level only, fluctuations in atmospheric pressure need to be compensated for with a Baroscout barometric pressure logger that was placed securely on site to facilitate this.

Monitoring was undertaken from 8th November 2022 with monitoring set at hour intervals for both the groundwater and for atmospheric pressure.

The depths at which the leveloggers were installed are summarised in Table 3.1 below:

Table 3.1 - Datalogger Deployment Depths

Location	Levelogger Depth (m bgl)
WS101*	1.74
WS102	1.11
WS103*	1.21
WS104*	0.98
WS105*	4.75
WS106	1.58
WS107*	0.70
WS108*	1.52

*Level Logger depth were adjusted on the 02/12/2022, depths shown above are post-adjustment

Locations of the groundwater monitoring installations have been denoted on Figure 3.0 appended to this report.

The minimum and maximum groundwater levels recorded have been summarised in

Table 3.2 below:

Table 3.2 – Summary of Minimum and Maximum Winter Groundwater Levels

Location	Shallowest Groundwater Level (m bgl)	Deepest Groundwater Level (m bgl)	Date of Shallowest Groundwater Level	Date of Deepest Groundwater Level
WS101	0.00	1.00	20/12/2022	02/03/2023
WS102	1.04	Dry	24/03/2023	11/22-05/23
WS103	0.20	Dry	15/11/2022	11/22-12/22 02/23-05/23
WS104	0.28	Dry	18/11/2022, 23/12/2022, 16/01/2023	02/23-03/23
WS105	1.49	4.59	16/01/2023	08/11/2022
WS106	0.43	1.34	13/11/2022, 20/12/2022	08/11/2022
WS107	0.11	0.87	09/11/2022, 16/01/2023	12/11/2022
WS108	0.00	1.76	20/12/2022-17/01/2023, 19/01/2023, 31/03/2023, 01/04/2023, 14/04/2023, 10/05/2023	08/11/2022

A review of groundwater levels across the eight (8no.) locations shows groundwater has been recorded between 4.59m bgl at its deepest (WS105) and ground level (WS101 and WS108) at the shallowest. Review of the data indicates that the groundwater across the site did not fluctuate uniformly over time but has been shown to be at its shallowest in different areas at different times throughout the period of November 2022 to May 2023.

Fluctuations within the groundwater recorded at within all eight (8no.) boreholes are observed, which correlates with rainfall data (ref: https://environment.data.gov.uk/flood-monitoring/archive [Accessed on 18.05.2023 - Station: 43202] for the site's location.

4 Discussion

From a review of the data presented above, it can be seen that the shallowest groundwater levels at all locations varied between ground level (WS101 and WS108) and 4.59m bgl (WS105) during the 2022/2023 winter groundwater monitoring period. The data for all eight (8no.) boreholes positively correlates with rainfall records within the location of the site. Therefore, consideration should be given to the presence of groundwater across the site during the design of foundations and drainage solutions for the site.

Attachment 1

Limitations

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between OEC and the Client as indicated in Section 1.0.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination, which are enforced, by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

9. OEC cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by OEC is owned by them and no such plans or documents may be reproduced, published, or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by OEC in this connection without their explicit written agreement there to by OEC.

10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

Attachment 2

Drawings

Key

Site Boundary

0 100 200 300 400 m

Scale	Paper Size
1:10,000	A4

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Portsmouth, Hampshire, PO6 4TP
T: (01489) 808 088
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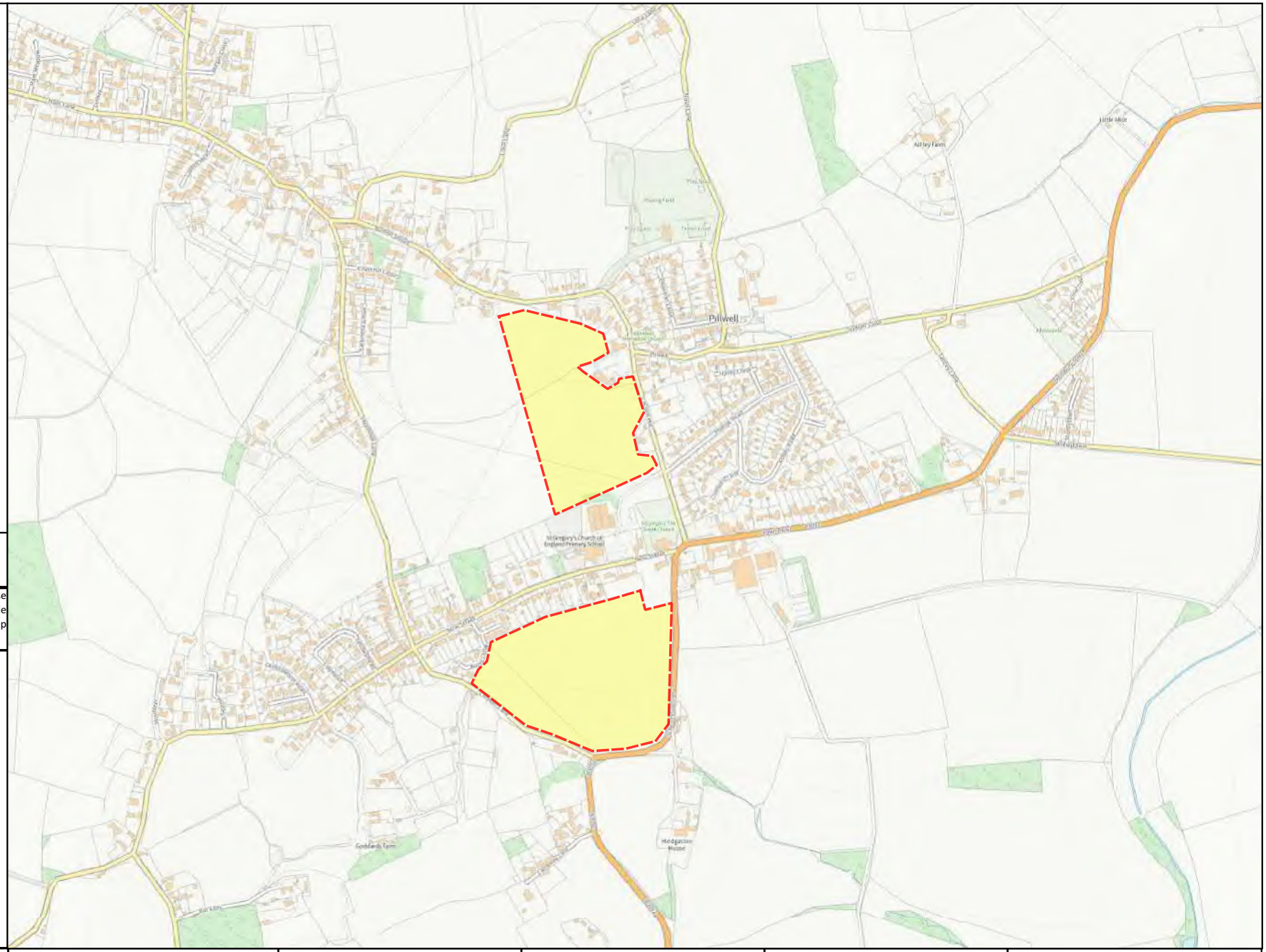

OMNIA	Job Title: Site 1 Central Site - Hybrid Application	Client: Champan Lily Planning Limited	Project Number: A11909	Date: 12/11/2022
			Drawn By: L. Burnett	Authorised By: O. Maxwell

Drawing Title: Figure 1.0 Site Location Map

0 25 50 75 100 m

Scale	Paper Size
1:2,200	A4

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OMNIA

Job Title:	Client:	Project Number:	Date:	Drawing Title:
Site 1 Central Site - Hybrid Application	Champan Lily Planning Limited	A11909	12/11/2022	Figure 2.1 (Phillips Rd) Proposed Development Plan
		Drawn By: L. Burnett	Authorised By: O. Maxwell	

0 25 50 75 100 m

Scale	Paper Size
1:2,200	A4

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OMNIA

Job Title:	Client:	Project Number:	Date:	Drawing Title:
Site 1 Central Site - Hybrid Application	Champan Lily Planning Limited	A11909	12/11/2022	Figure 2.2 (Butts Close) Proposed Development Plan
		Drawn By: L. Burnett	Authorised By: O. Maxwell	

Key

- Groundwater Monitoring installations
- A11909 Site Boundary

0 50 100 150 200 m

Scale	Paper Size
1:4,500	A4

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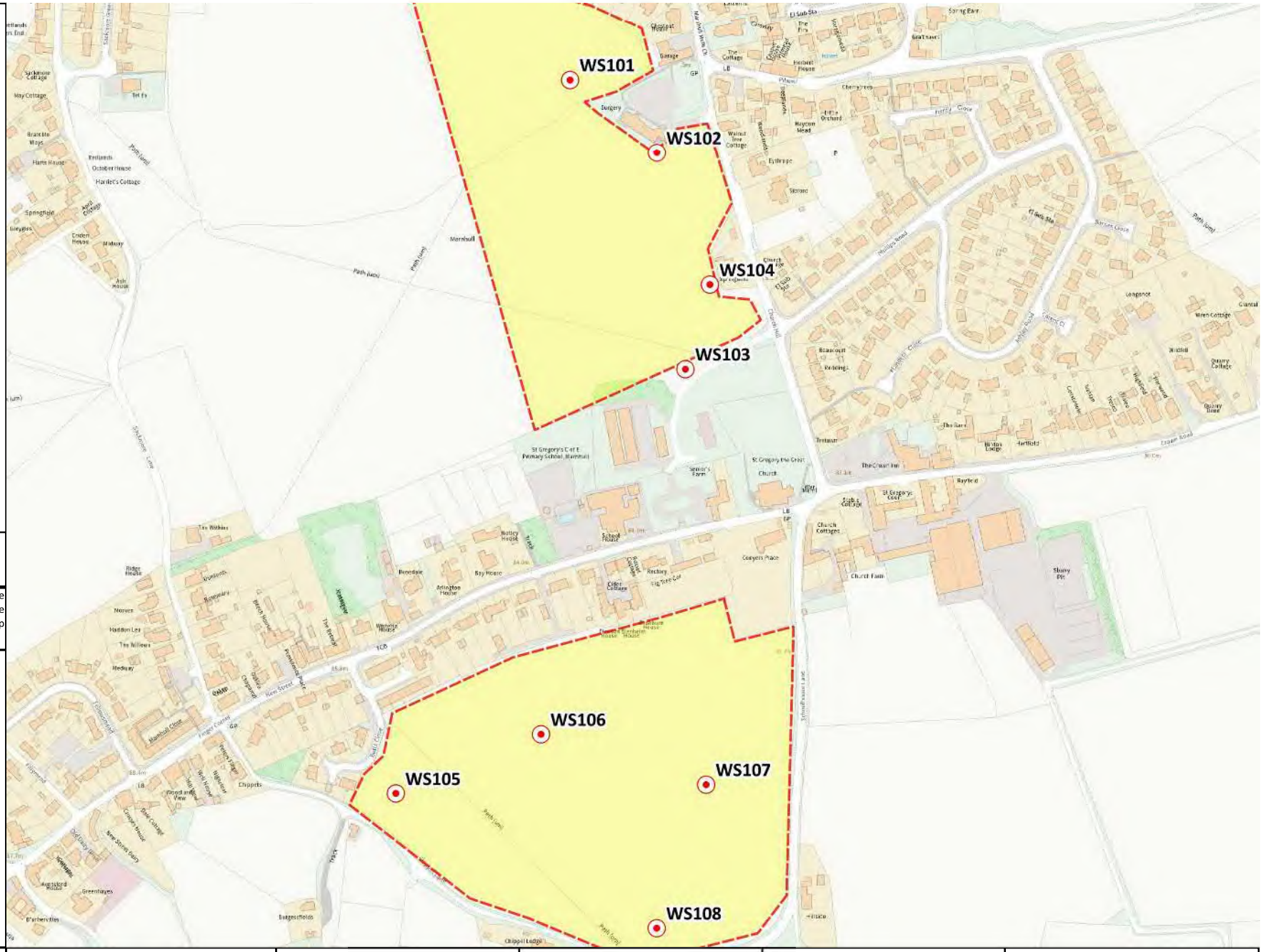

OMNIA

Job Title:	Client:	Project Number:	Date:	Drawing Title:
Site 1 Central Site - Hybrid Application	Champan Lily Planning Limited	A11909	30.05.2023	Figure 3.0 Winter Groundwater Monitoring Locations
		Drawn By: A. Dodds	Authorised By: O. Maxwell	

Attachment 3

Exploratory Hole Logs

Trial Pit Log

OMNIA			Trialpit No **SA101** Sheet 1 of 1
Project Name: Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 377917.00 - 119138.00 Level:	Date 17/01/2023
Location: Land off Church Hill, Marnhull, DT10 1PU		Dimensions (m): 2.4 × 0.4, Depth 1.60	Scale 1:20
Client: Chapman Lily Planning Limited			Logged HS

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Firm brown slightly sandy CLAY. Sand is fine. [TOPSOIL]
				0.40			Firm orangish brown slightly sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
				1.00			Soft to firm greyish blue mottled orangish brown sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				1.60			End of pit at 1.60 m

Remarks: 1. Position scanned by CAT and Genny prior to excavation. Groundwater was not encountered.

Stability: Stable

AGS

Trial Pit Log

Trialpit No **SA102**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378097.00 - 119008.00 Level:
Location:	Land off Church Hill, Marnhull, DT10 1PU	Dimensions (m): Depth 1.30	2.2 × 0.4
Client:	Chapman Lily Planning Limited		

Date 17/01/2023

Scale 1:20

Logged HS

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Firm brown slightly gravelly slightly sandy CLAY. Sand is fine. [TOPSOIL]
				0.30			Firm orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine subangular flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
							From 0.70m bgl: Becomes light grey mottled orangish brown.
							From 1.00m bgl: No gravel.
				1.30			End of pit at 1.30 m

1 2 3 4

Remarks: 1. Position scanned by CAT and Genny prior to excavation. Groundwater seepage found at 1.30m bgl.

Stability: Stable

Trial Pit Log

Trialpit No **SA103**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378129.00 - 119961.00 Level:
Location:	Land off Church Hill, Marnhull, DT10 1PU	Dimensions (m): Depth 1.50	1.6 × 0.4
Client:	Chapman Lily Planning Limited		

Date 17/01/2023

Scale 1:20

Logged HS

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Firm dark brown sandy CLAY. Sand is fine. [TOPSOIL]
				0.55			Firm orangish brown slightly gravelly sandy CLAY. Sand is fine. Gravel is fine to medium subangular to subrounded flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
				1.10			Firm greyish yellowish light brown sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]. *From 1.30m bgl: Slightly gravelly. Gravel is fine to medium, angular to subangular flint.*
				1.50			End of pit at 1.50 m

1 2 3 4

Remarks: 1. Position scanned by CAT and Genny prior to excavation. Groundwater not encountered.

Stability: Stable

Trial Pit Log

Trialpit No **SA104**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 377948.03 - 118536.32 Level:
Location:	Land off Church Hill, Marnhull, DT10 1PU	Dimensions (m): Depth 2.80	2.6 × 0.6
Client:	Chapman Lily Planning Limited		

Date 31/10/2022

Scale 1:20

Logged JR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Brown slightly sandy slightly gravelly slightly silty CLAY. Sand if fine to medium. Gravel is angular to subrounded fine to medium flint. [TOPSOIL]
				0.30			Soft brownish orange slightly gravelly sandy CLAY with rare cobbles. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Cobbles are angular flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				1.80			Firm grey slightly sandy CLAY. Sand is fine. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				2.80			End of pit at 2.80 m

1 2 3 4

Remarks: Position scanned with CAT and 'Genny' prior to excavation. Location terminated at 2.80m bgl due to hard bedrock.

Stability: Stable

Trial Pit Log

OMNIA

Trialpit No **SA105**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378117.36 - 118475.30 Level:
Location:	Land off Church Hill, Marnhull, DT10 1PU	Dimensions (m): Depth 1.80	2.5 × 0.6
Client:	Chapman Lily Planning Limited		

Date 31/10/2022

Scale 1:20

Logged JR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to medium. Gravel is angular to subangular fine to medium flint. [TOPSOIL]
				0.28			Soft orangish brown sandy CLAY. Sand is fine to coarse. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				1.10			Stiff reddish brown CLAY. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				1.25			Weathered limestone bedrock recovered as grey angular fine to coarse GRAVEL of limestone. [CUCKLINGTON OOLITE MEMBER/ STURMINSTER PISOLITE MEMBER/ TODBER FREESTONE MEMBER (UNDIFFERENTIATED)].
				1.80			End of pit at 1.80 m

1 2 3 4

Remarks: Position scanned with CAT and 'Genny' prior to excavation. Location terminated at 1.80m bgl due to hard bedrock.

Stability: Stable

AGS

Trial Pit Log

Trialpit No **SA106**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378092.70 - 118360.93 Level:
Location:	Land off Church Hill, Marnhull, DT10 1PU	Dimensions (m):	2.45 × 0.6 Depth 2.90
Client:	Chapman Lily Planning Limited		

Date 31/10/2022

Scale 1:20

Logged JR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to medium. Gravel is angular to subrounded, fine to medium flint. [TOPSOIL]
				0.30			Soft orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium flint. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
							From 1.20mbgl: Becomes sandy
				1.40			Firm dry and friable reddish brown CLAY. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/ NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				1.65			Soft to firm orangish brown mottled brown sandy CLAY. Sand is fine to coarse. [HAZELBURY BRYAN FORMATION/WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)].
				2.90			End of pit at 2.90 m

1 2 3 4

Remarks: Position scanned with CAT and 'Genny' prior to excavation.

Stability: Stable

AGS

Borehole Log

Borehole No. **WS101**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 377976.00 - 119060.00	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 01/11/2023 - 01/11/2023	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over dark brown slightly sandy CLAY. Sand is fine to medium with frequent rootlets. [TOPSOIL]
					0.40			Firm orangish brown mottled light grey reddish sandy CLAY with occasional rootlets. Sand is fine to medium. [HEAD DEPOSITS]
								From 1.40mbgl: Sand is fine to medium.
								From 1.80mbgl: Sand is fine to medium and colour becomes grey.
					2.00			End of borehole at 2.00 m

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Remarks

1. Position scanned with calibrated CAT & 'Genny' prior to excavation. Borehole terminated early due to SPT refusal. No groundwater was encountered during excavation.

OMNIA

Borehole Log

Borehole No.
WS102
Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378054.00 - 119003.00	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 01/11/2023 - 01/11/2023	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is subangular to subrounded, fine to medium flint. Sand is fine to coarse. [TOPSOIL]
					0.40			Firm to soft orangish brown mottled greyish slightly sandy very gravelly CLAY. Sand is fine to medium. Gravel is coarse, subangular hard, grey with pink colour, all approximately 0.05m in length. [HEAD DEPOSITS]
					1.20			Stiff to firm orangish brown mottled light grey sandy CLAY with occasional black speckling and red staining with occasional soft clay pockets. Sand is fine to medium. [HEAD DEPOSITS]
								At 1.80mbgl: Some organic root material found.
								From 2.10mbgl: Firm
								From 2.20mbgl: Some greyish sub angular gravel
								From 2.60mbgl: Soft.
					3.20			Orangish brown mottled light brown clayey fine to coarse SAND. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								At 3.30mbgl: Some black subangular medium gravel.
					4.00			Soft orangish brown mottled brown sandy CLAY. Sand is fine to coarse. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					4.50			End of borehole at 4.50 m

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Remarks
1. Position scanned with calibrated CAT & 'Genny' prior to excavation. Borehole temrinated early due to SPT refusal. No groundwater was encountered during excavation.

AGS

Borehole Log

Borehole No. **WS103**

Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378081.00 - 118823.00	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 01/11/2023 - 01/11/2023	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40			Grass over dark brown slightly gravelly sandy CLAY with rootlets and roots. Gravel is subangular to subrounded, fine to medium flint. [TOPSOIL]
	▼				1.00			Soft light brown mottled light grey sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					1.20			Grey mottled light grey slightly sandy subangular, fine to coarse GRAVEL of weak mudstone. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					1.50			Firm to soft grey mottled light brown slightly sandy CLAY. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								End of borehole at 1.50 m

1 2 3 4 5

Remarks

1. Position scanned with calibrated CAT & 'Genny. Borehole terminated early due to SPT refusal.' prior to excavation. Groundwater strike was encountered at 1.00m bgl during excavation.

OMNIA

Borehole Log

Borehole No.
WS104
Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378099.00 - 118891.00	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 01/11/2023 - 01/11/2023	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over dark brown slightly gravelly sandy CLAY with frequents rootlets, occasional large roots approximately 2-3cm in width and occasional cobbles of subangular limestone. Gravel is subangular to subrounded, fine to coarse flint and limestone. [TOPSOIL]
					0.50			Yellowish to light brown sandy very clayey subangular to subrounded, fine to coarse GRAVEL of limestone. Sand is fine to coarse and coarse grains are observed to be spherical. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								From 1.20mbgl: Sand is medium to coarse and slightly clayey
					1.45			End of borehole at 1.45 m

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Remarks
1. Position scanned with calibrated CAT & 'Genny' prior to excavation. Borehole terminated early due to SPT refusal. No groundwater was encountered during excavation.

AGS

OMNIA

Borehole Log

Borehole No.
WS105
Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 377837.40 - 118467.40	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 31/10/2022 - 31/10/2022	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass/ploughed land over dark brown slightly gravelly sandy CLAY with frequent rootlets and some straw. [TOPSOIL]
					0.80			Firm to soft orangish brown mottled bluish grey slightly sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								At 1.15m bgl: Became firm.
					1.20			Stiff orangish brown mottled light grey sandy CLAY. Sand is fine to coarse. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								Between 1.60-1.80m bgl: Some black mottling.
								At 1.80m bgl: Firm to soft and became darker orange
					2.00			Stiff to firm light brown mottled oranges, light grey and occasional black speckling slightly sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					2.80			Orange fine to medium slightly clayey SAND. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								At 2.90m bgl: Subangular flint cobble.
								At 3.00m bgl: Light orange mottled creams and oranges.
					4.50			Light grey mottled orangish clayey fine to coarse SAND. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					5.00			End of borehole at 5.00 m

Remarks
1. Position scanned with calibrated CAT & 'Genny' prior to excavation. Groundwater seepage found at 4.00m bgl.

AGS

OMNIA

Borehole Log

Borehole No.
WS106
Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 377956.30 - 118515.70	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 31/10/2022 - 31/10/2022	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			Grass/ploughed land of dark brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine to medium with frequent rootlets. [TOPSOIL]
					0.50			Dark brown mottled orangish brown slightly gravelly very clayey fine to coarse SAND. Gravel is subrounded, fine to medium flint and occasional fine, white, subangular to subrounded, sandstone/claystone rock. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					1.20			Firm orangish mottled yellowish slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded, fine to coarse, white, very soft siltstone/chalk. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					1.80			Light grey mottled orangish and white slightly gravelly very clayey SAND. Gravel is subangular to subrounded, fine to coarse white, occasionally spherical rock. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					2.00			Orange mottled light grey fine to coarse SAND. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								End of borehole at 2.00 m

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2
3
4
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Remarks
1. Position scanned with calibrated CAT & 'Genny' prior to excavation. No groundwater was encountered during excavation.

AGS

OMNIA

Borehole Log

Borehole No.
WS107
Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378094.90 - 118474.60	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 31/10/2022 - 31/10/2022	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over ploughed land of dark brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded, fine to coarse flint. [TOPSOIL]
					0.30			Dark brown mottled orange sandy very clayey GRAVEL of subangular to subrounded, fine to coarse limestone of grey/orangish brown rock with frequent fossils and occasional orangish white rocks and occasional flint. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								At 0.80m bgl: Cobbles of orange, white and grey, subangular, hard limestone with frequent fossils
					1.20			Orangish mottled white slightly sandy slightly clayey subangular to subrounded, fine to coarse GRAVEL of limestone and occasional flint. Sand is fine to coarse. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					1.40			End of borehole at 1.40 m

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Remarks
1. Position scanned with calibrated CAT & 'Genny' prior to excavation. No groundwater was encountered.

AGS

OMNIA

Borehole Log

Borehole No.
WS108
Sheet 1 of 1

Project Name:	Site 1 Central Site - Hybrid Application	Project No. A11909	Co-ords: 378053.30 - 118355.20	Hole Type WS
Location:	Land off Church Hill, Marnhull, DT10 1PU		Level:	Scale 1:25
Client:	Chapman Lily Planning Limited		Dates: 31/10/2022 - 31/10/2022	Logged By AD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass/ploughed land over dark brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subanuglar to subrounded, fine to coarse flint with frequent rootlets and some straw. [TOPSOIL]
					0.40			Soft to firm oragnish brown mottled light grey slightly sandy CLAY. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					1.00			Light grey mottled orange and grey with occasional black speckling clayey fine to medium SAND and occasional white fibres and flint fragments. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					1.50			Stiff to firm brown mottled orange and blueish grey and cream sandy CLAY with occasional black speckling. Sand is fine to medium. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
								At 2.60m bgl: Colour change to brown mottled orange with occasional red staining.
								At 2.80m bgl: Very sandy.
								At 3.30m bgl: Slightly gravelly. GRAVEL of subangular weak dark grey mudstone/siltstone.
								At 3.80m bgl: Gravelly.
					4.00			Cream mottled oranges and light grey slightly clayey fine to medium SAND. [HAZELBURY BRYAN FORMATION/ WOODROW CLAY MEMBER/NEWTON CLAY MEMBER (UNDIFFERENTIATED)]
					5.00			End of borehole at 5.00 m

1 2 3 4 5

Remarks
1. Position scanned with calibrated CAT & 'Genny' prior to excavation. No groundwater was encountered during excavation.

AGS

Attachment 4

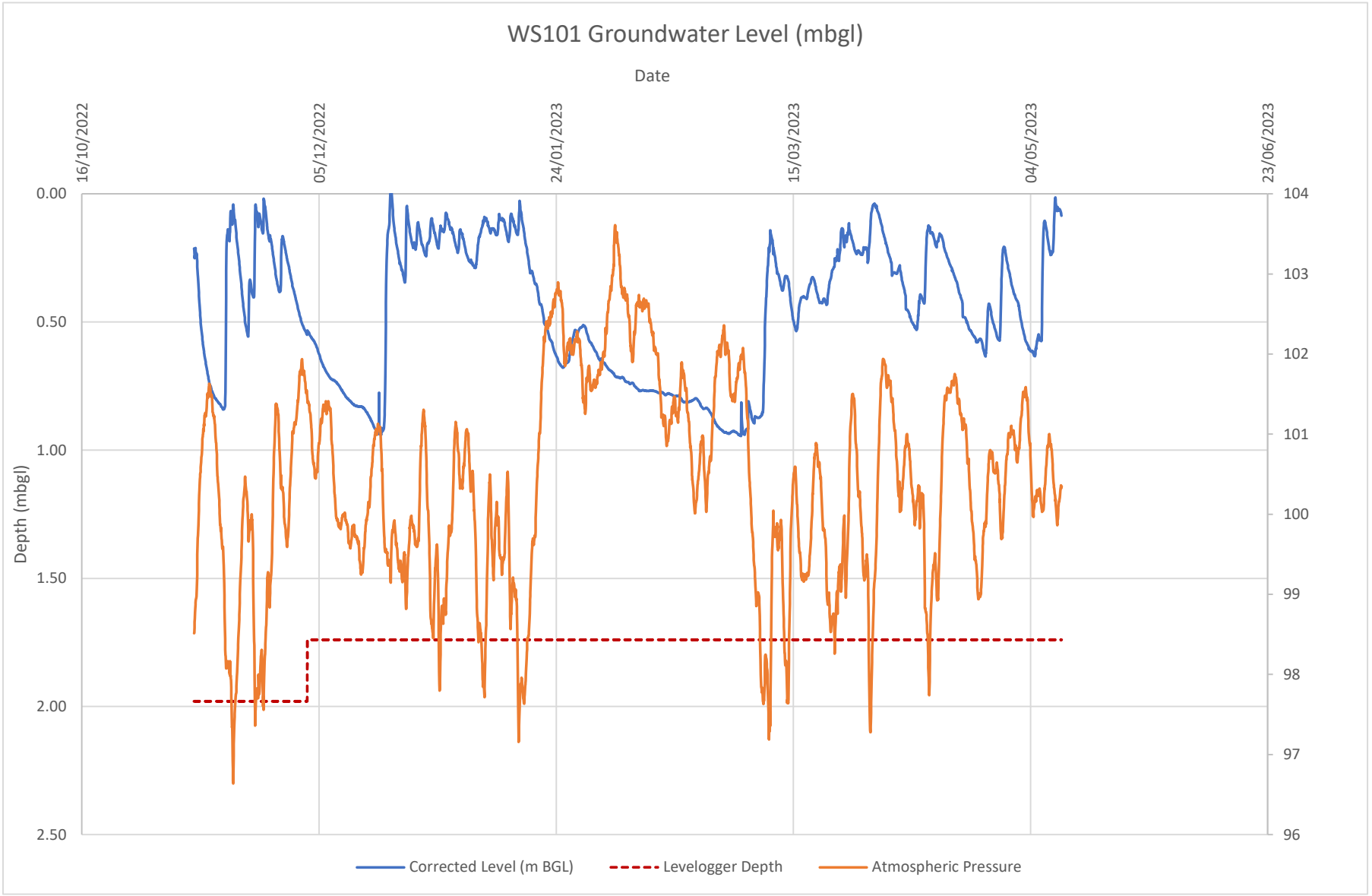
Photographs

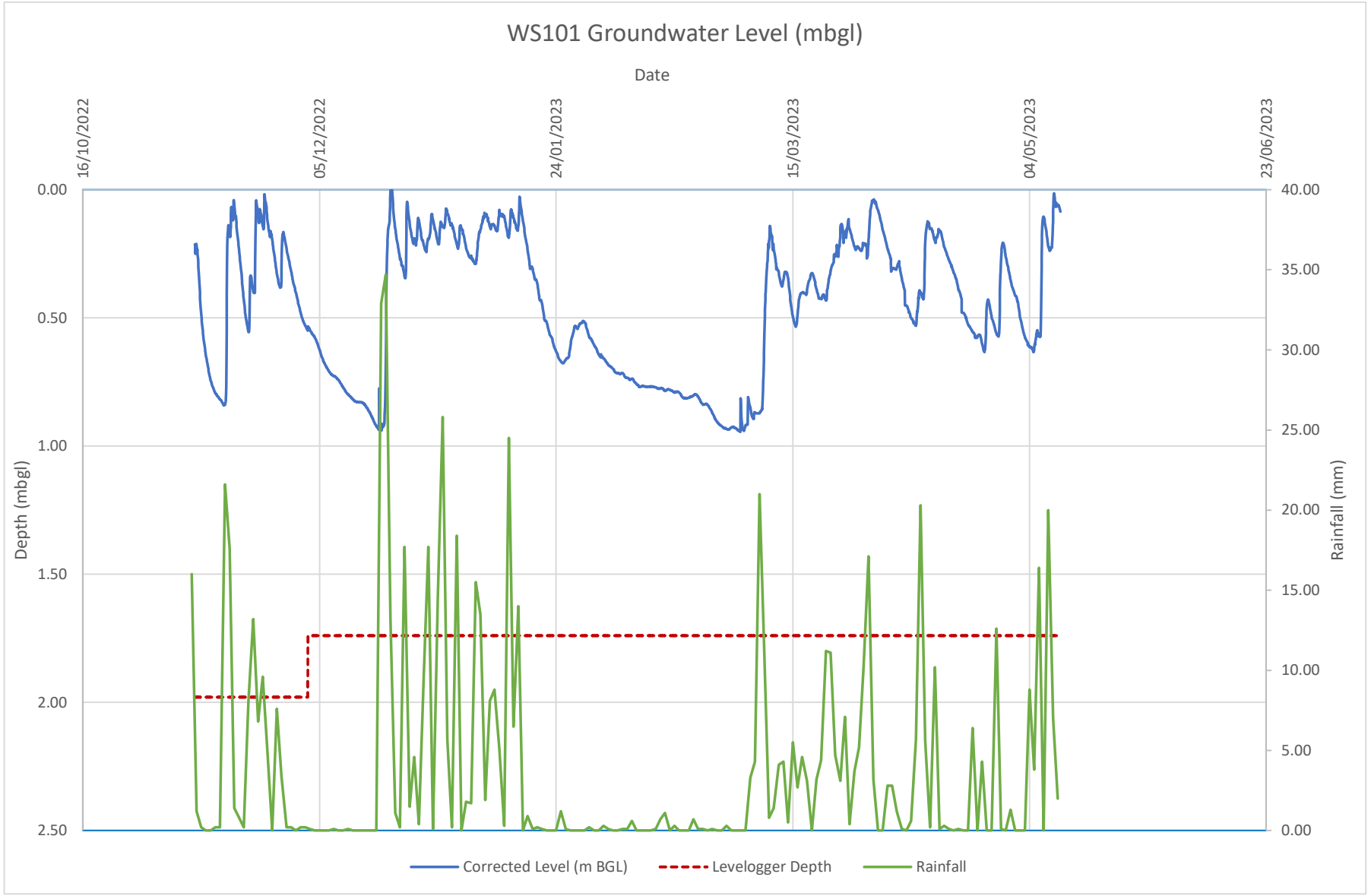
Photograph 1 – Partial view of the southern parcel on the western boundary

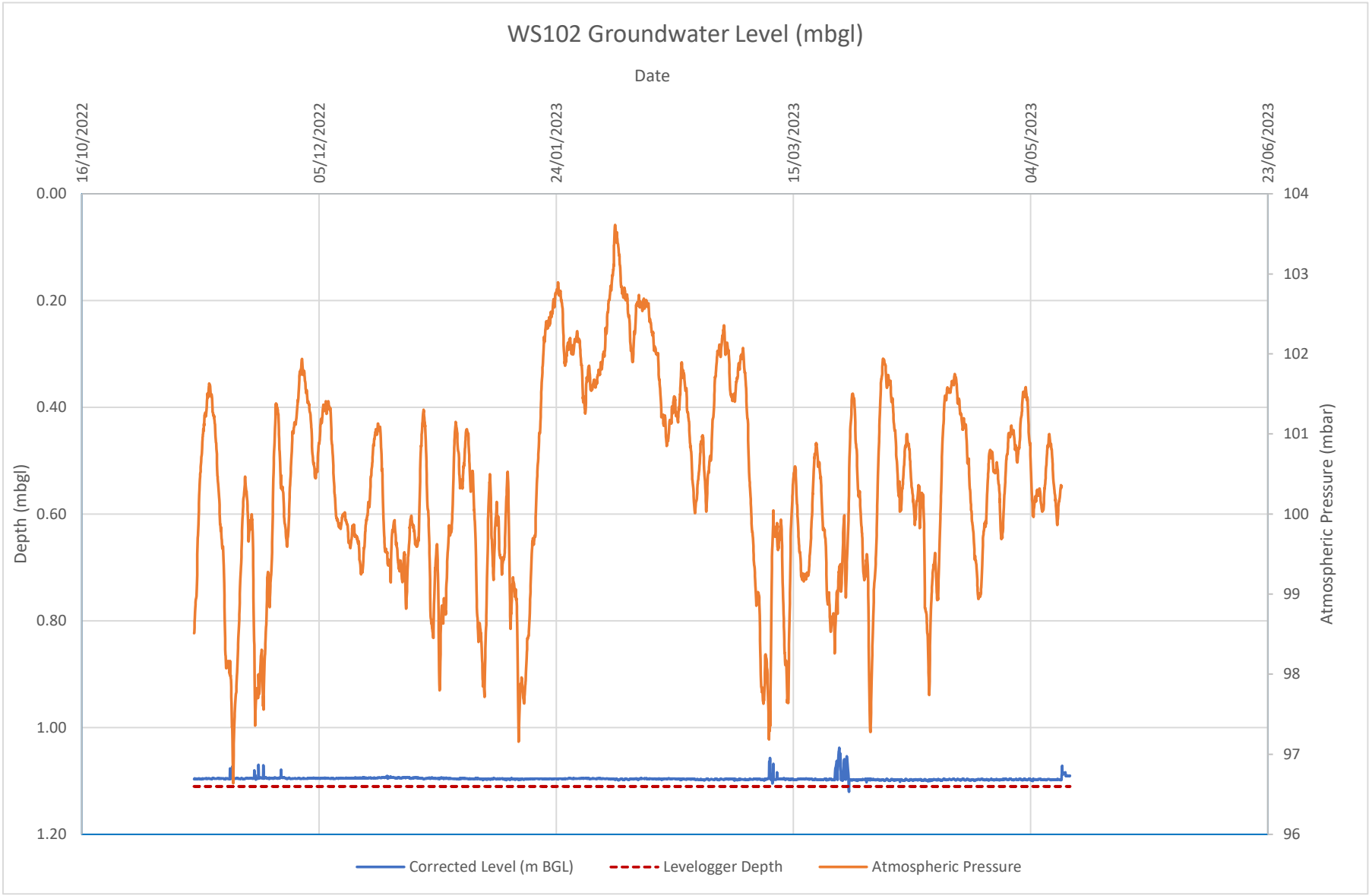
Photograph 2 – View of the northern parcel, facing northwest from the southern boudary of the field

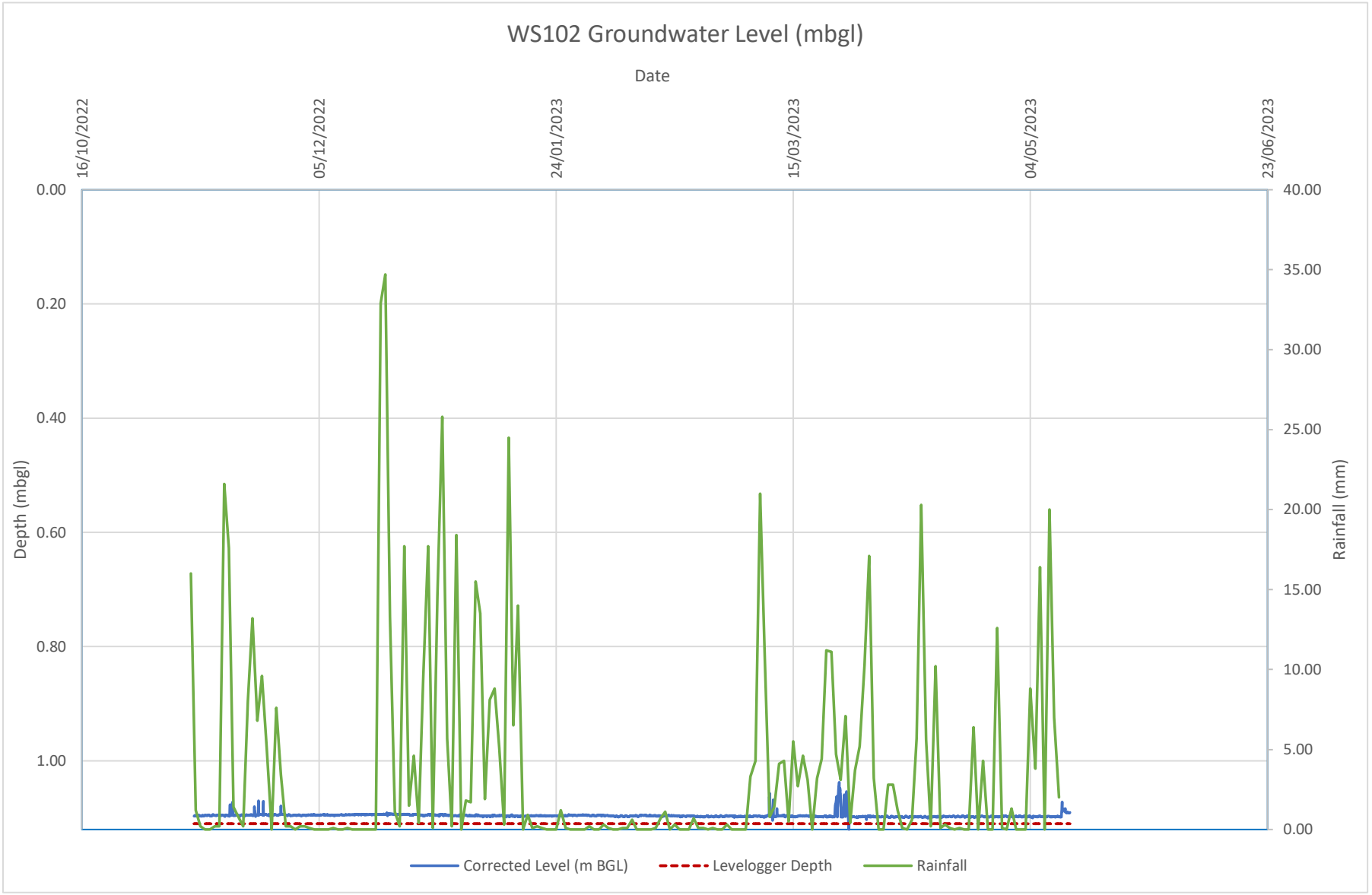
Attachment 5

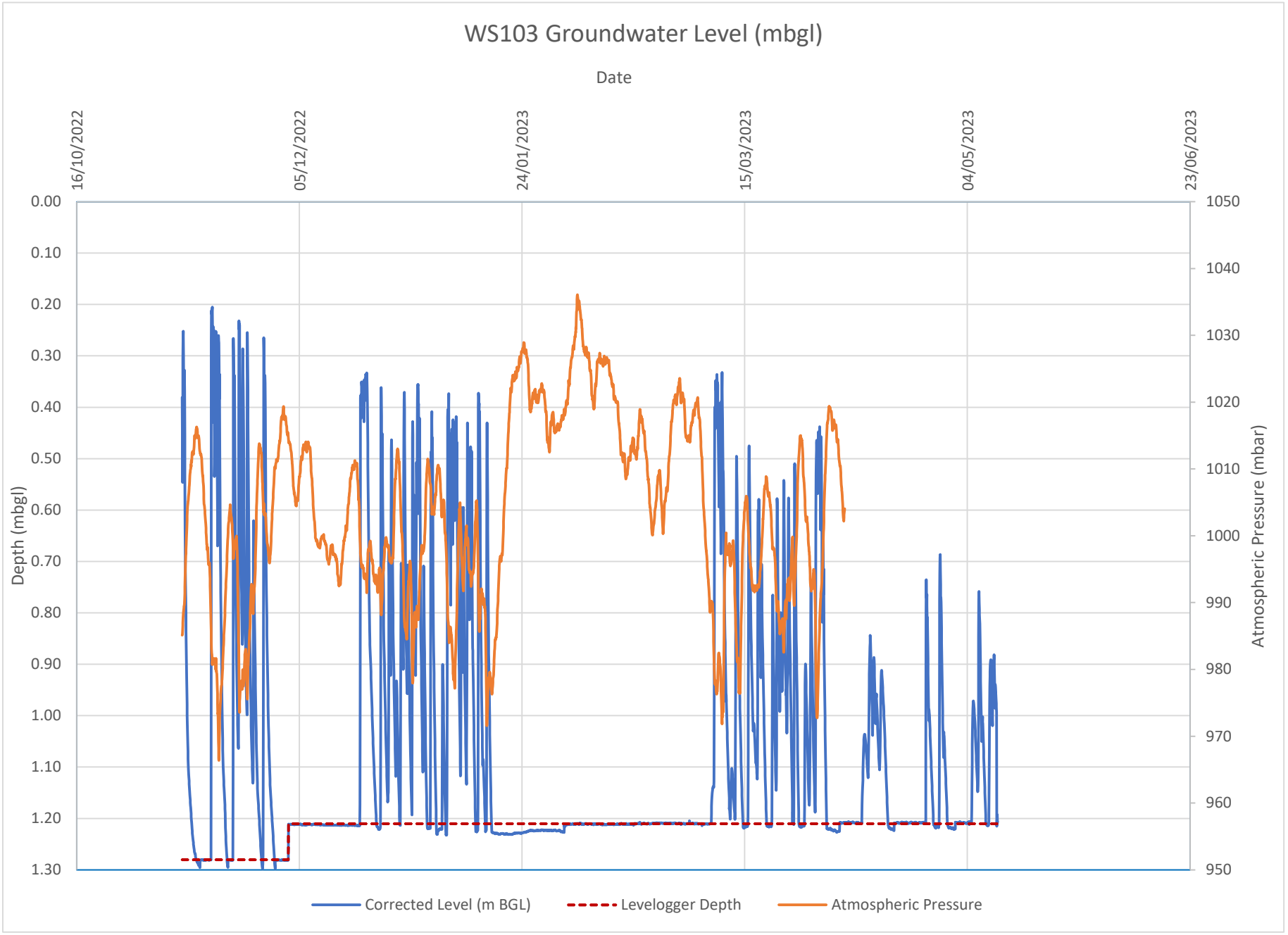
Groundwater Monitoring Graphs

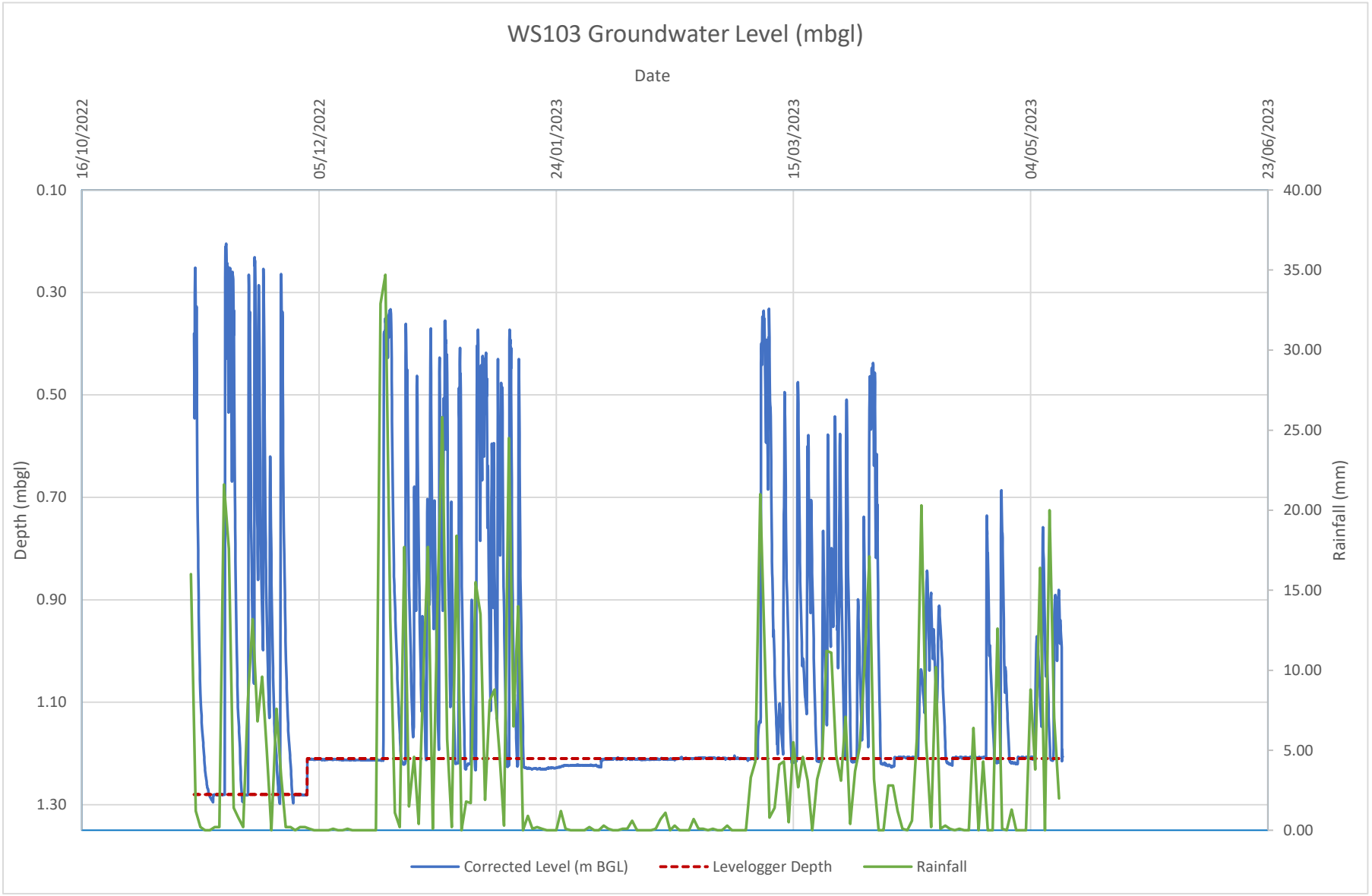

WS101 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.50
1.00
1.50
2.00
2.50
104
103
102
101
100
99
98
97
96
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure


WS101 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.50
1.00
1.50
2.00
2.50
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall


WS102 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
Atmospheric Pressure (mbar)
104
103
102
101
100
99
98
97
96
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure


WS102 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall


WS103 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
Atmospheric Pressure (mbar)
1050
1040
1030
1020
1010
1000
990
980
970
960
950
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure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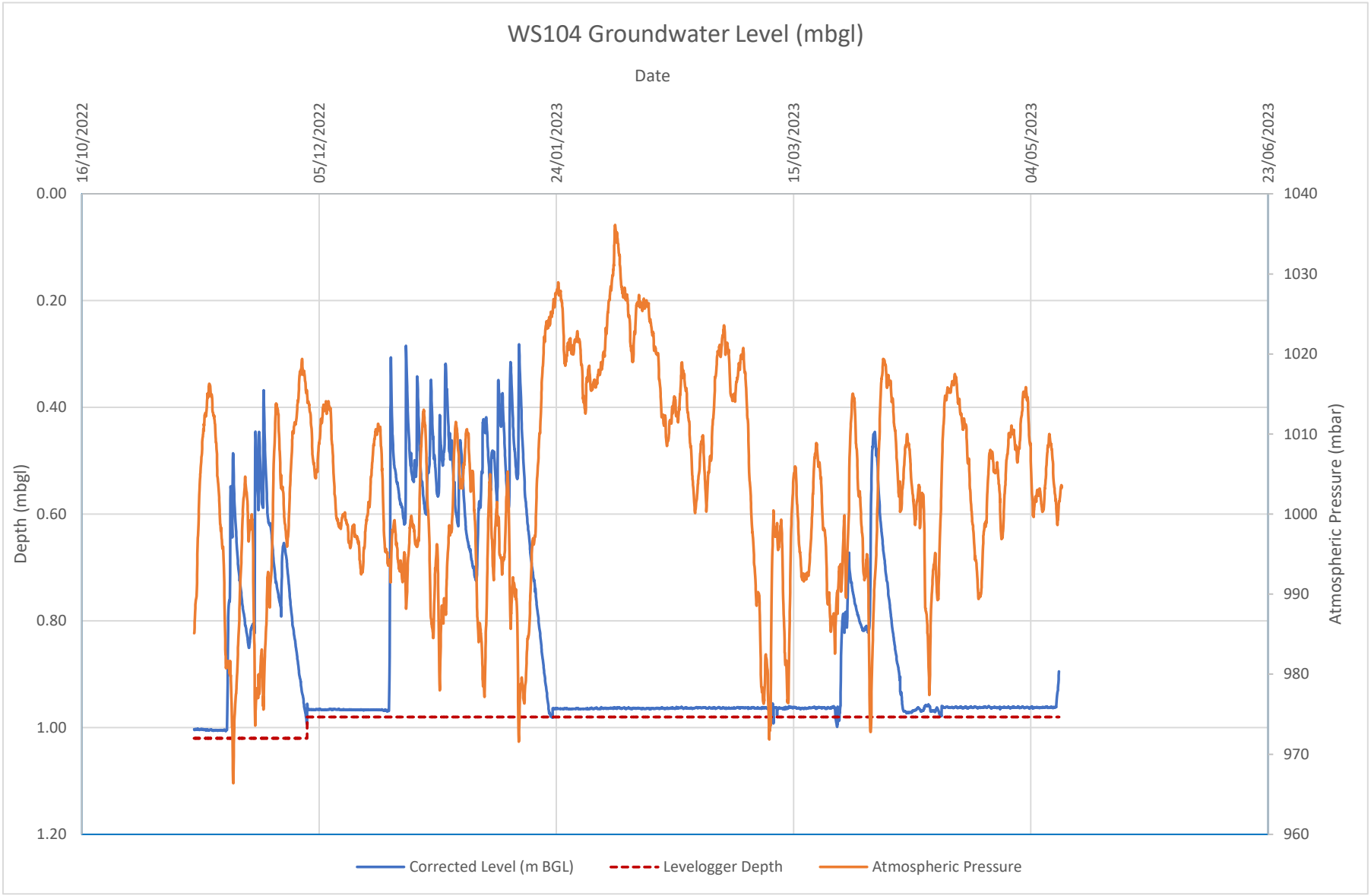
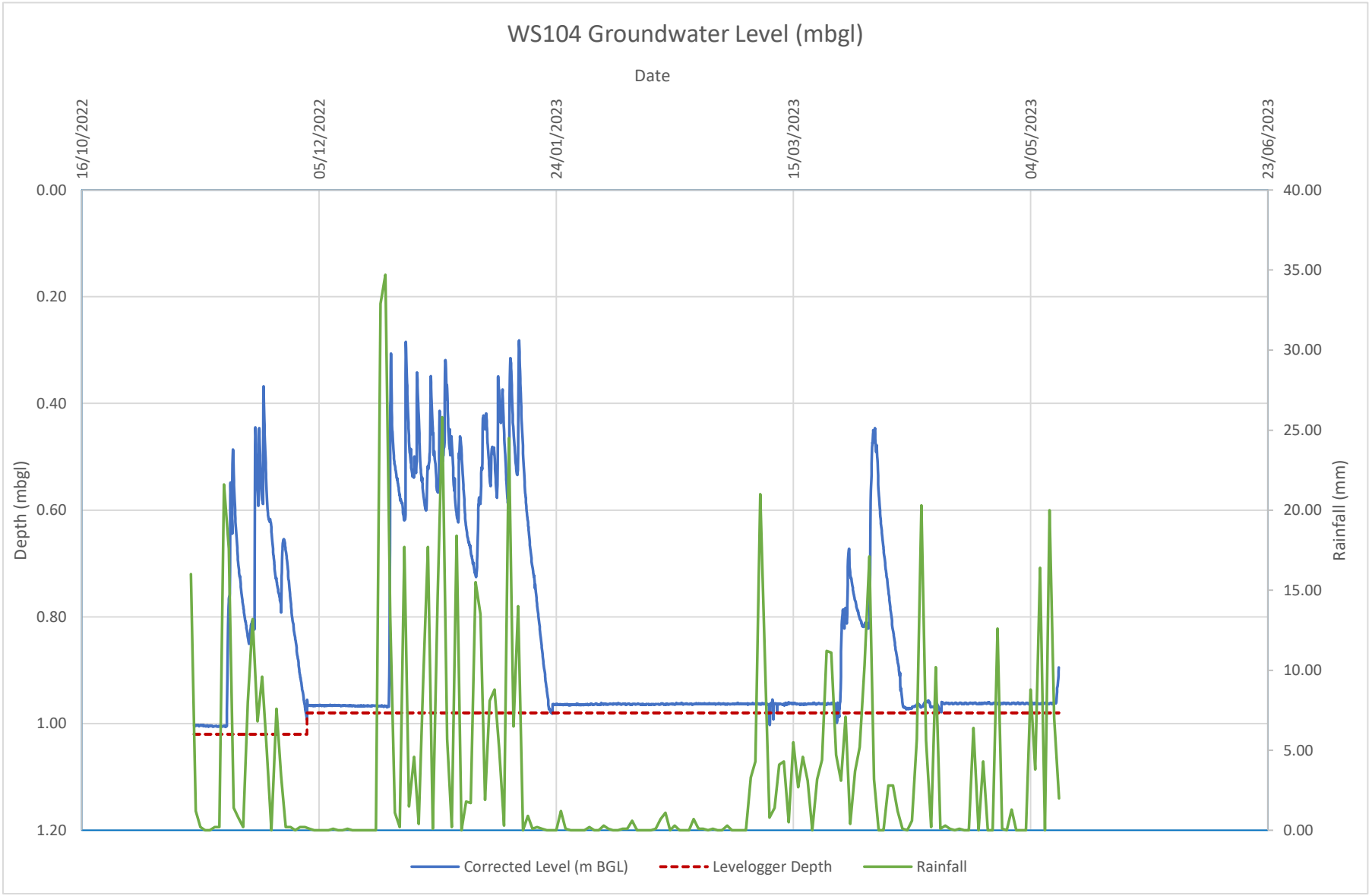
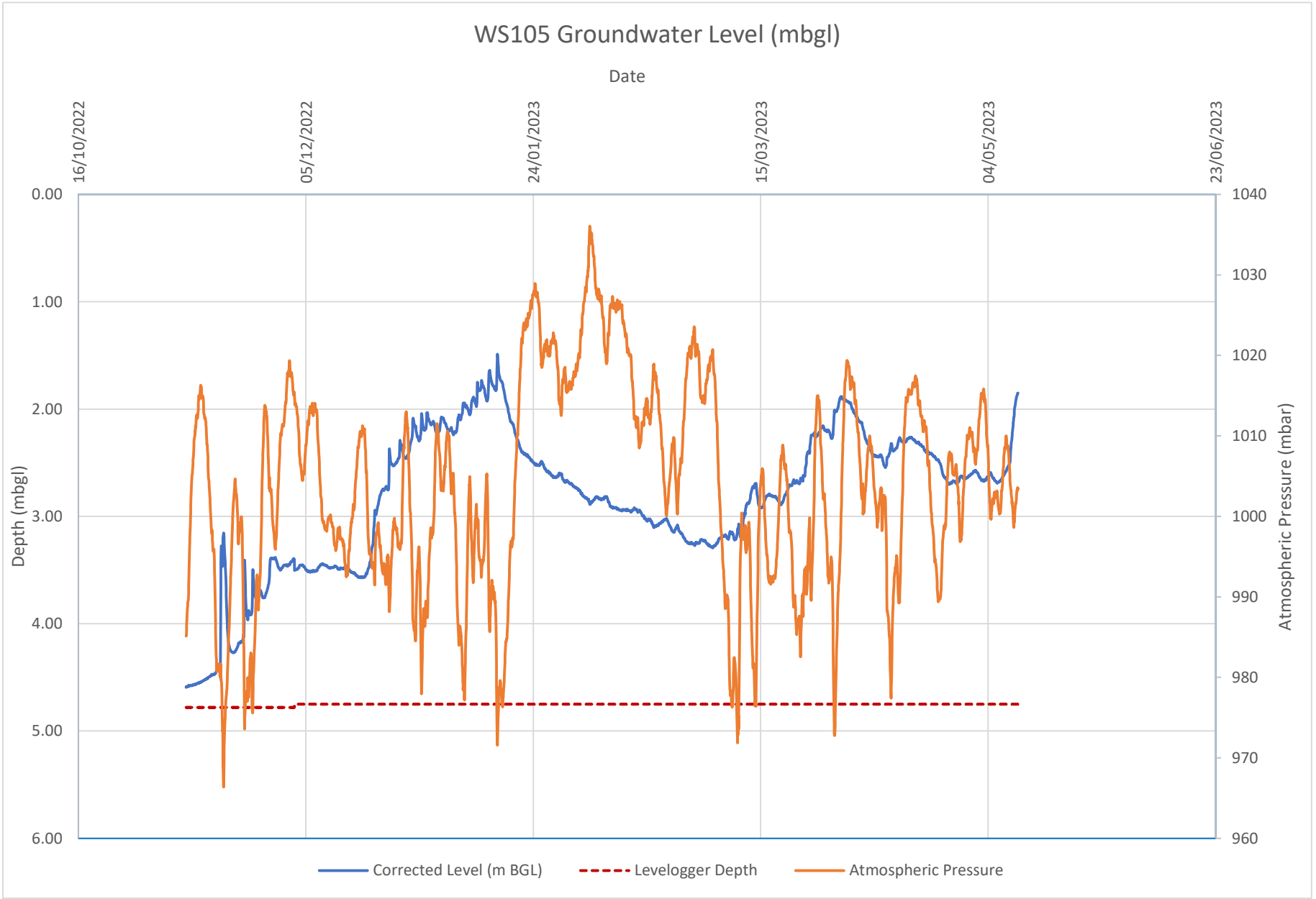
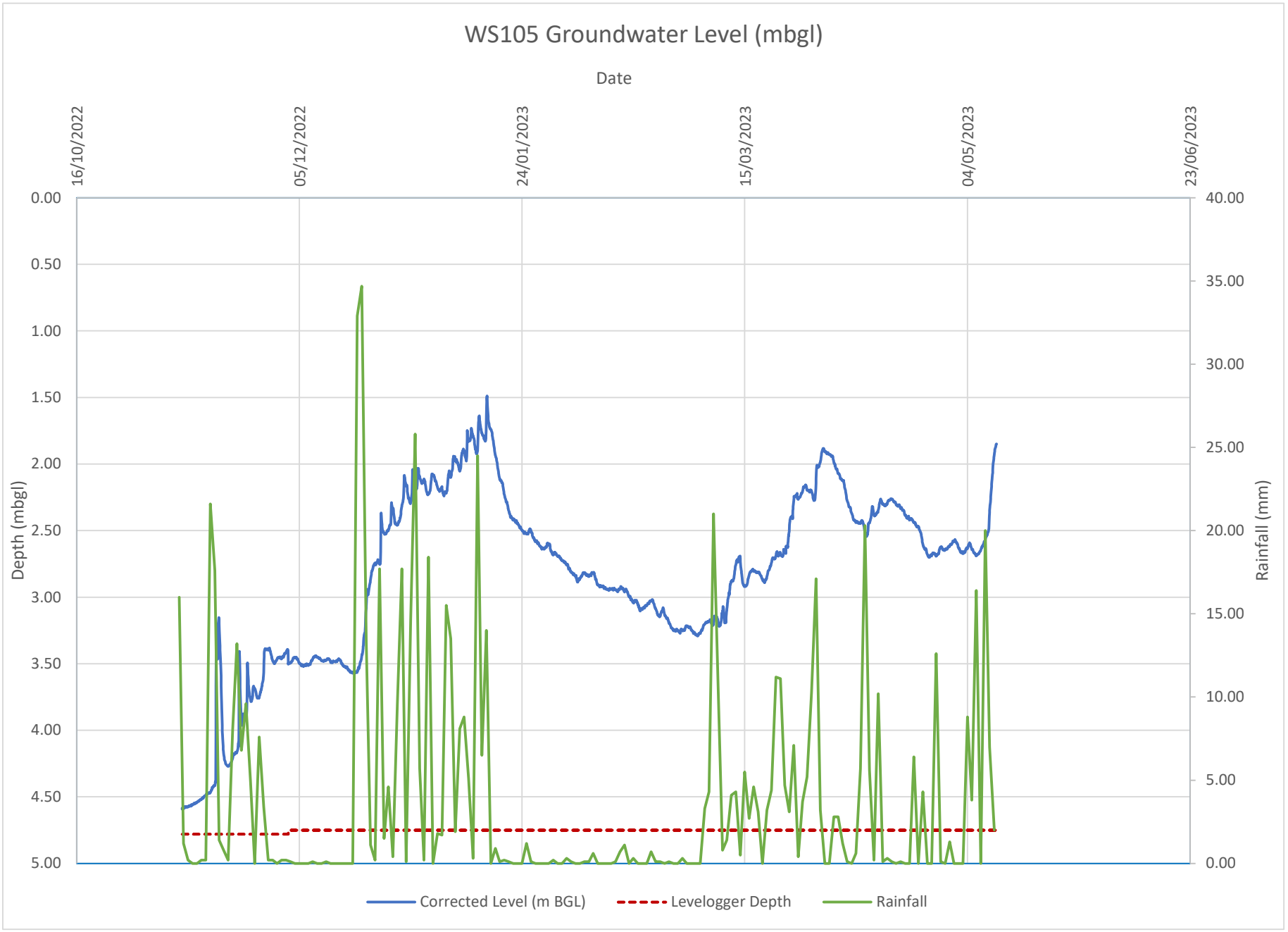
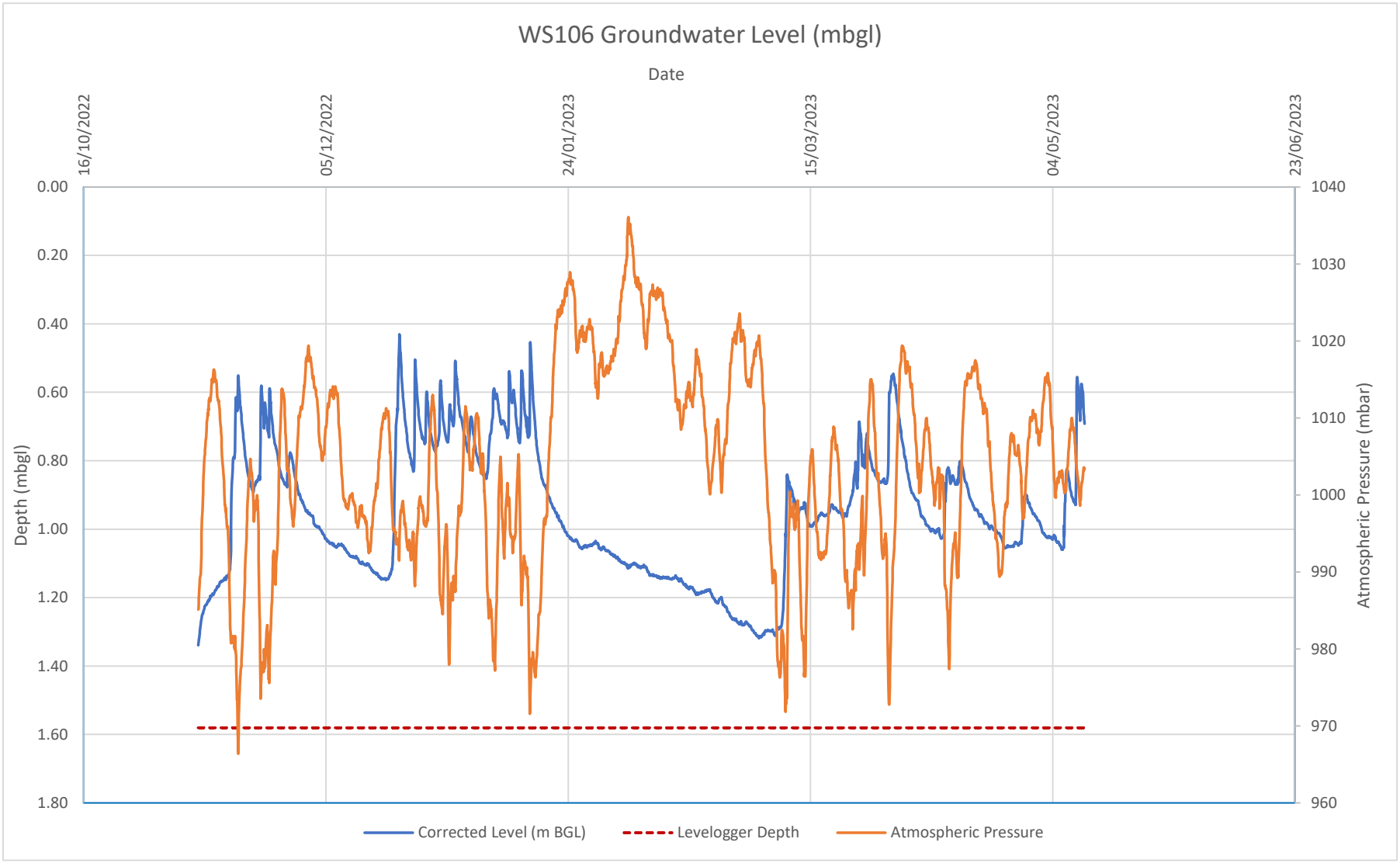
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.10
0.30
0.50
0.70
0.90
1.10
1.30
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall

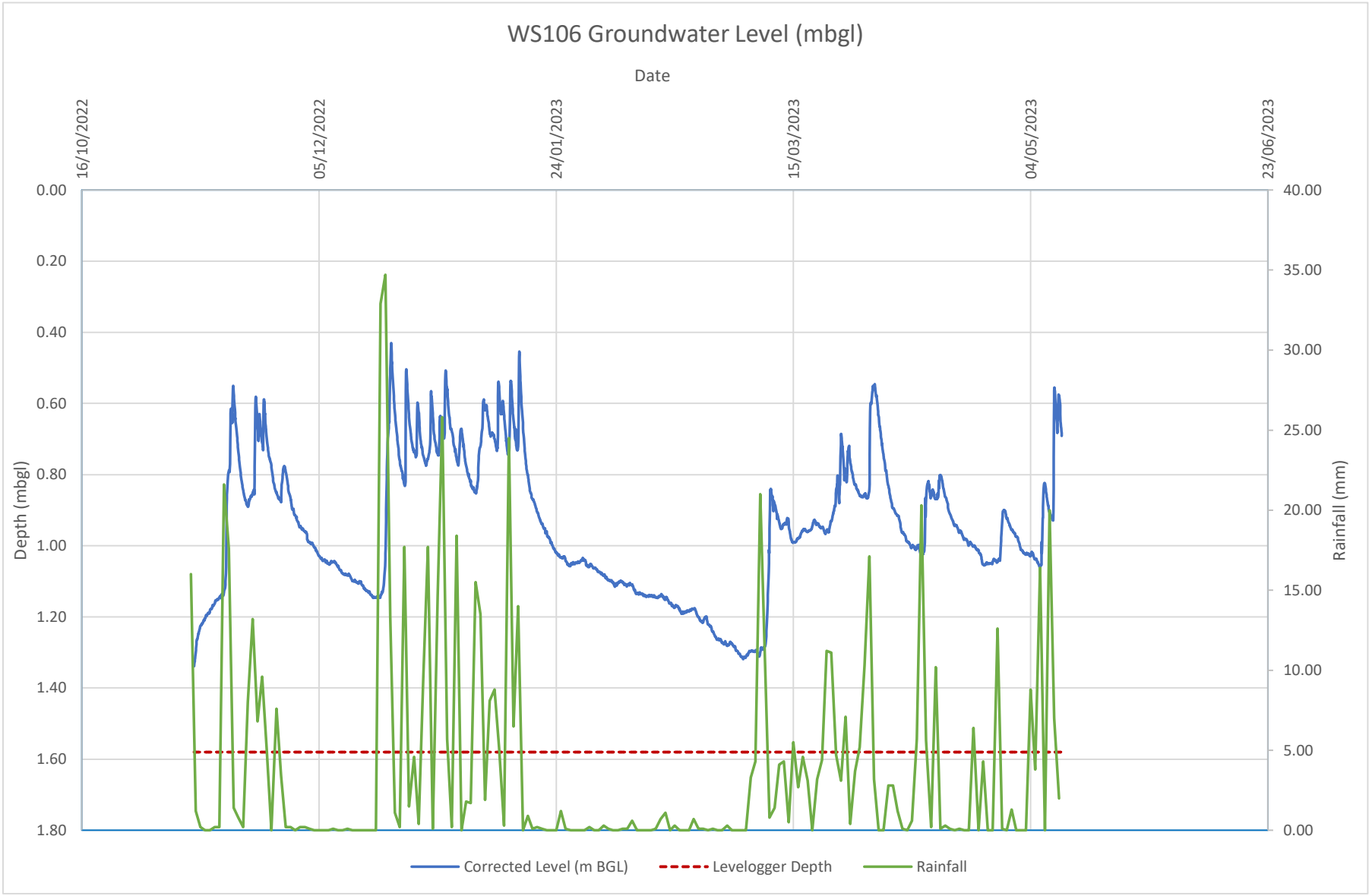

WS104 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
Atmospheric Pressure (mbar)
1040
1030
1020
1010
1000
990
980
970
960
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure

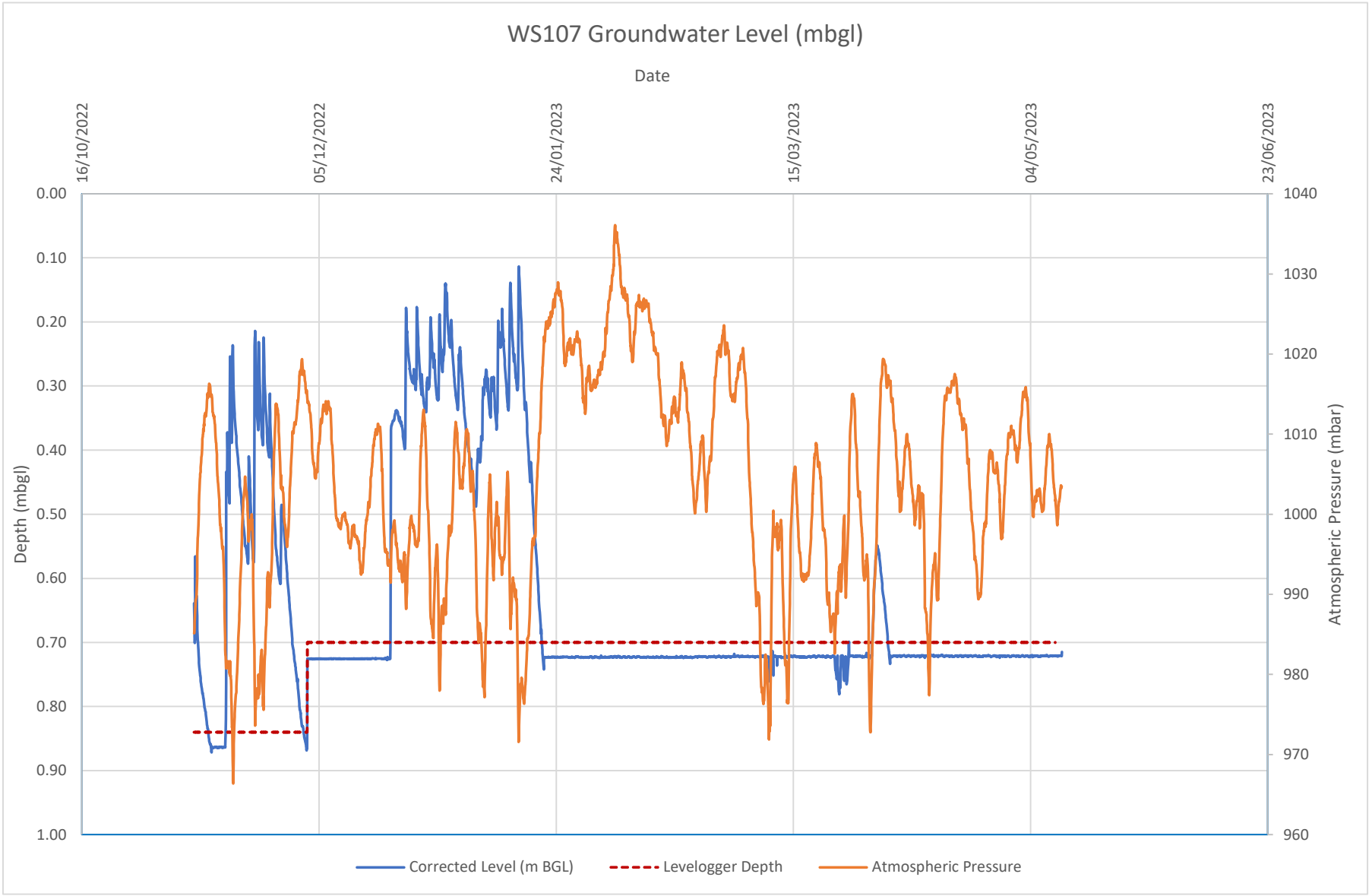

WS104 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall

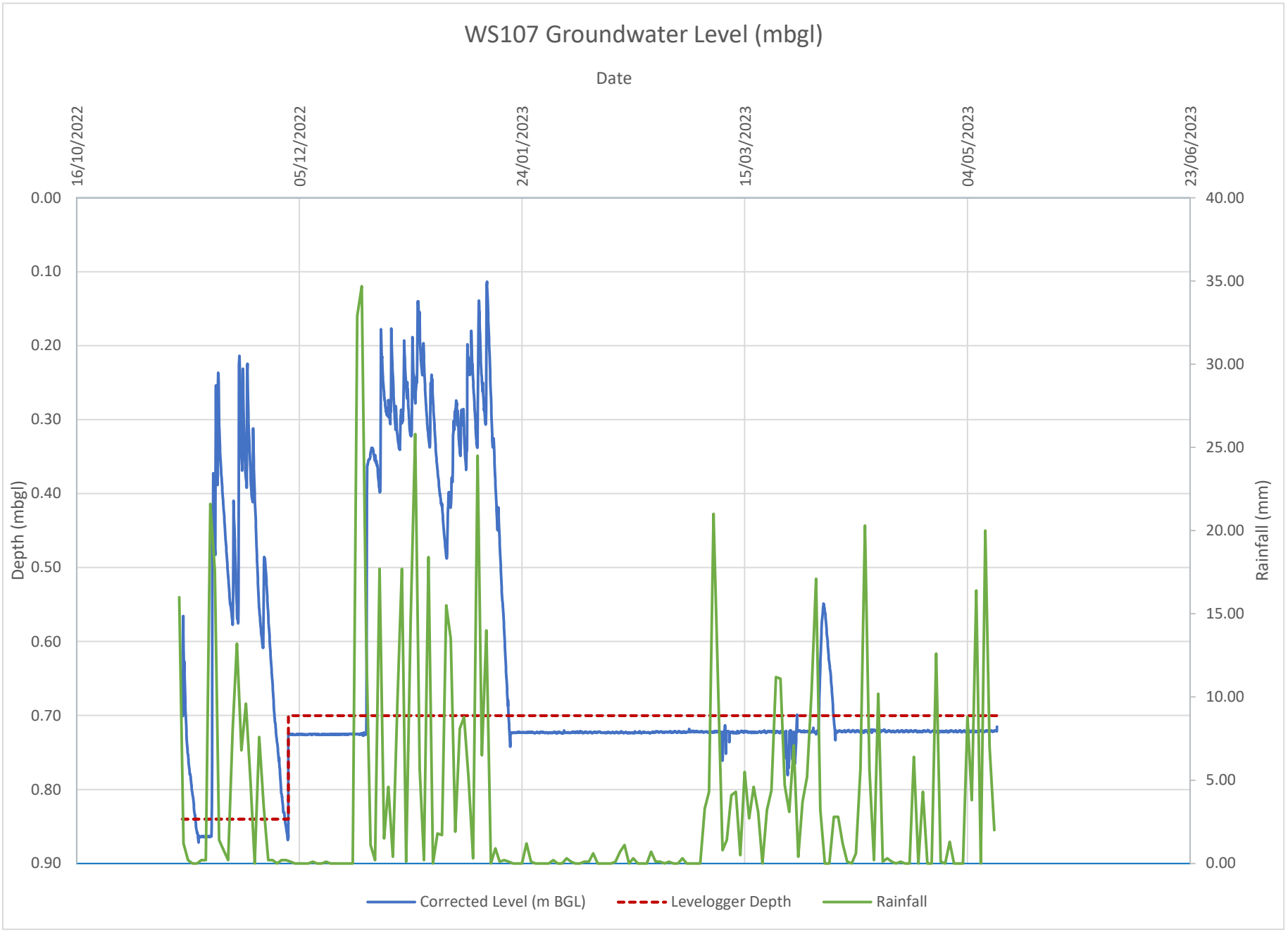

WS105 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
0.00
1.00
2.00
3.00
4.00
5.00
6.00
Depth (mbgl)
1040
1030
1020
1010
1000
990
980
970
960
Atmospheric Pressure (mbar)
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure

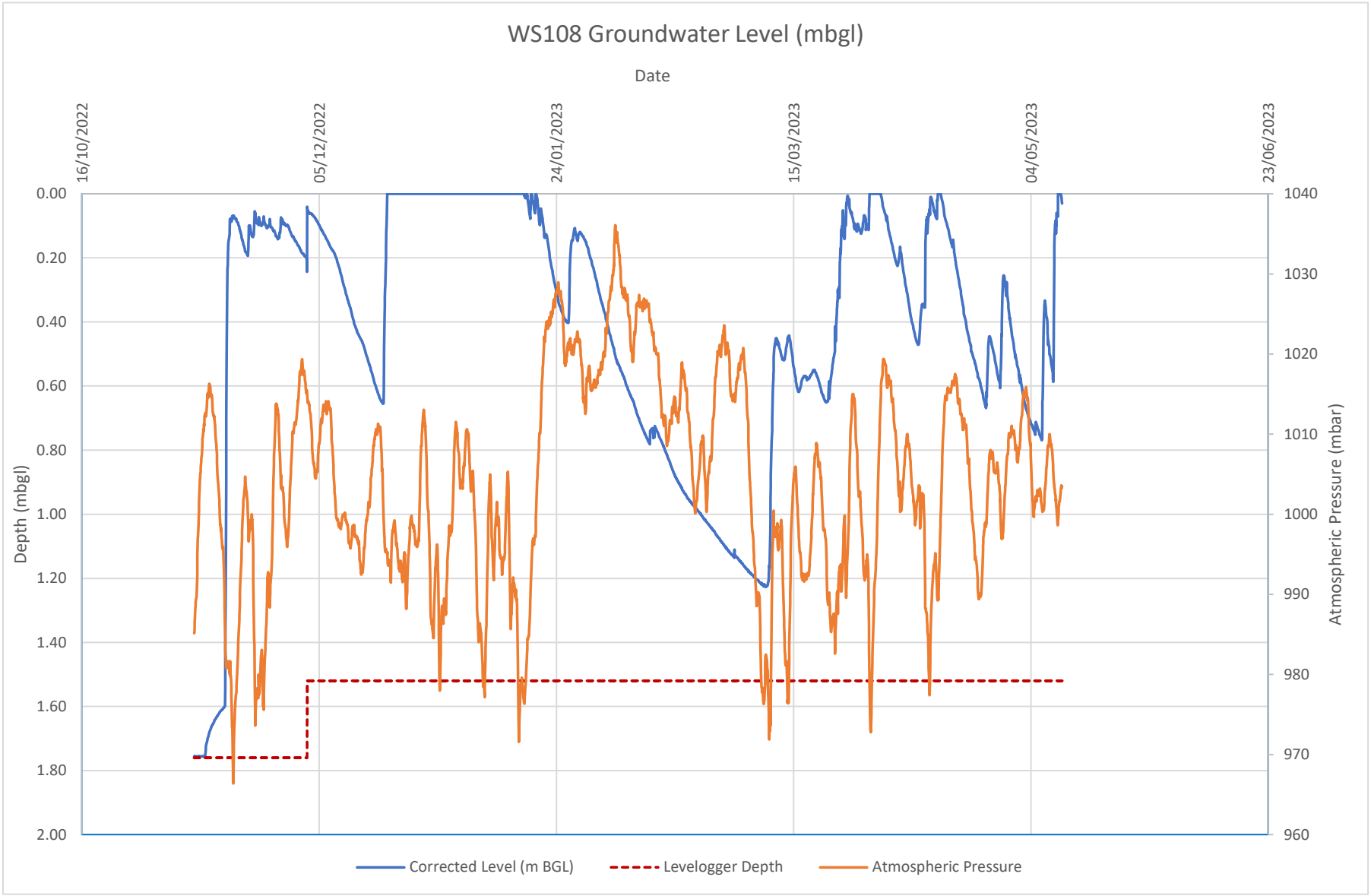

WS105 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall

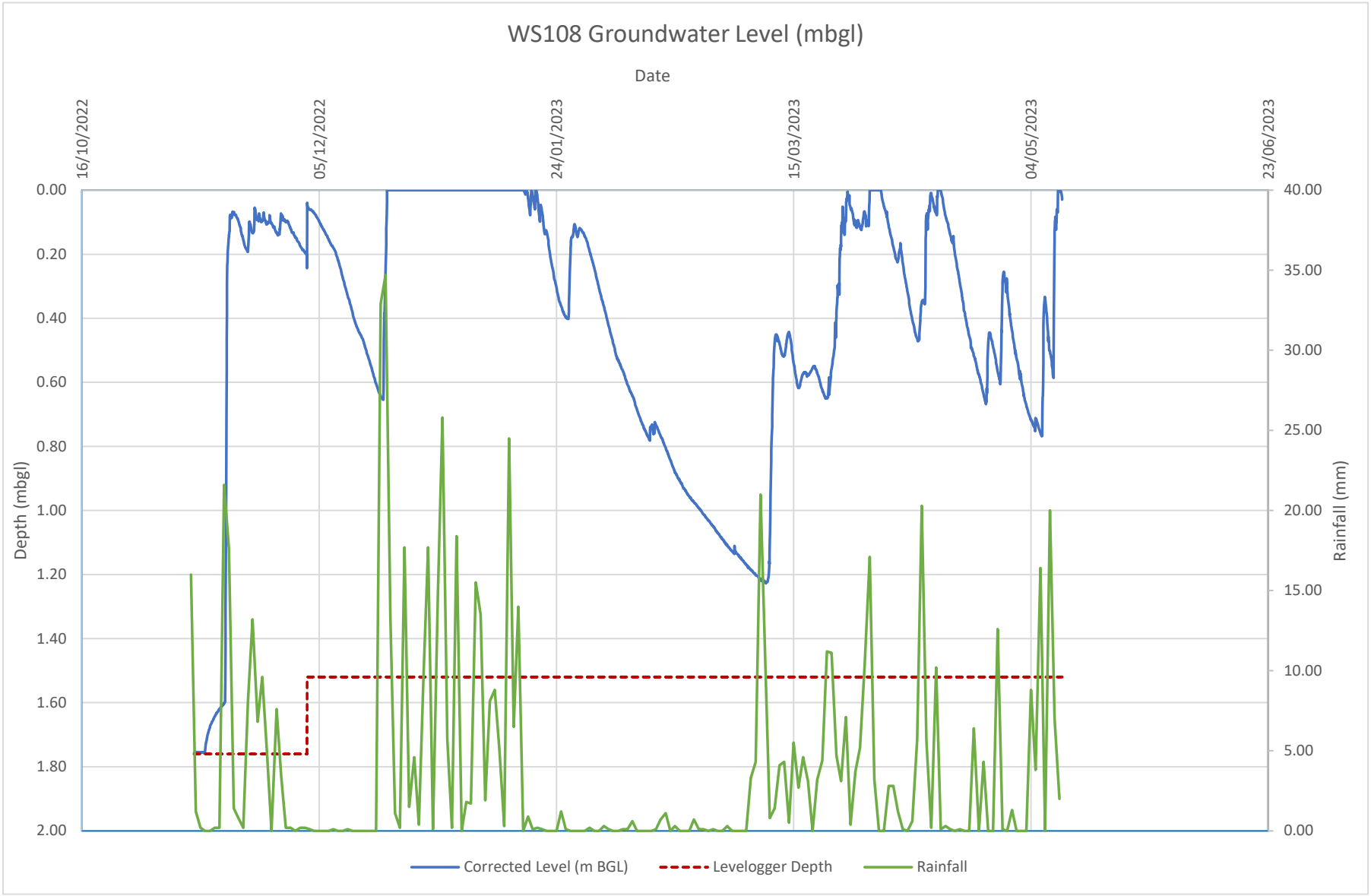

WS106 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
Atmospheric Pressure (mbar)
1040
1030
1020
1010
1000
990
980
970
960
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure


WS106 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall


WS107 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
Atmospheric Pressure (mbar)
1040
1030
1020
1010
1000
990
980
970
960
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure


WS107 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall


WS108 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
2.00
Atmospheric Pressure (mbar)
1040
1030
1020
1010
1000
990
980
970
960
Corrected Level (m BGL)
Levelogger Depth
Atmospheric Pressure


WS108 Groundwater Level (mbgl)
Date
16/10/2022
05/12/2022
24/01/2023
15/03/2023
04/05/2023
23/06/2023
Depth (mbgl)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
2.00
Rainfall (mm)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Corrected Level (m BGL)
Levelogger Depth
Rainfall

Appendix 8

ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 SAAR (mm) 782 Urban 0.000
Area (ha) 4.635 Soil 0.450 Region Number Region 7

Results l/s

QBAR Rural 23.2
QBAR Urban 23.2

Q1 year 19.7

Q1 year 19.7
Q30 years 52.5
Q100 years 73.9