Basement Impact Assessment

Soils LIMITED

Geotechnical & Environmental Consultants

Basement Impact Assessment

For

47 South Hill Park, London NW3 2SS

On behalf of

Kewdale Property Investment

REPORT 12998/BIA

Soils Limited
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Basement Impact Assessment

Job Title: 47 South Hill Park, London NW3 2SS

Client: Kewdale Property Investment

CONTROL DOCUMENT

SOILS LIMITED DOCUMENT REFERENCE NUMBER:
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Note: This is not a valid document for use in the design of the project unless it is titled **Final** in the Document Status box.

	Name	Signature
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Checked by:	R B Higginson	
	Rob Ainsworth	

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

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Basement Impact Assessment

On

47 South Hill Park, London NW3 2SS

For

Kewdale Property Investment

Section 1
Introduction

1.1 Commission
Soils Limited was commissioned by CSE Consulting, on behalf of Kewdale Property Investment to carry out a Basement Impact Assessment of this site at 47 South Hill Park, London NW3 2SS, in accordance with guidelines from London Borough of Camden ("the Council") in support of a planning application.

1.2 Objective of the Basement Impact Assessment
This report comprises a Basement Impact Assessment which is in accordance with the *London Borough of Camden Development Policy DP27 – Basements and Lightwells* and the *LB Camden guidance document "Camden geological, hydrogeological and hydrological study – Guidance for subterranean development"* produced by Arup describe a risk-based impact assessment with regard to hydrology, hydrogeology and land stability. This has been used as relevant background technical guidance to the development of the Basement Impact Assessment.

The aim of the work is to assess if the proposed partial basement will have a detrimental impact on the surroundings with respect to groundwater and land stability and in particular to assess whether the development will affect the stability of neighbouring properties, local and regional hydrogeology and whether any identified impacts can be appropriately mitigated by the design of the development.

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It is recognised that any Basement Impact Assessment is a live document and that further detailed assessments will be ongoing, if appropriate, as the design and construction progresses.

1.3 Site Location

The site address is 47 South Hill Park, London NW3 2SS approximately centred at OS Land Ranger Grid Reference TQ 274 859 and at an approximate elevation of 81m Above Ordnance Datum (AOD).

A site location plan is presented as Figure 1 below.

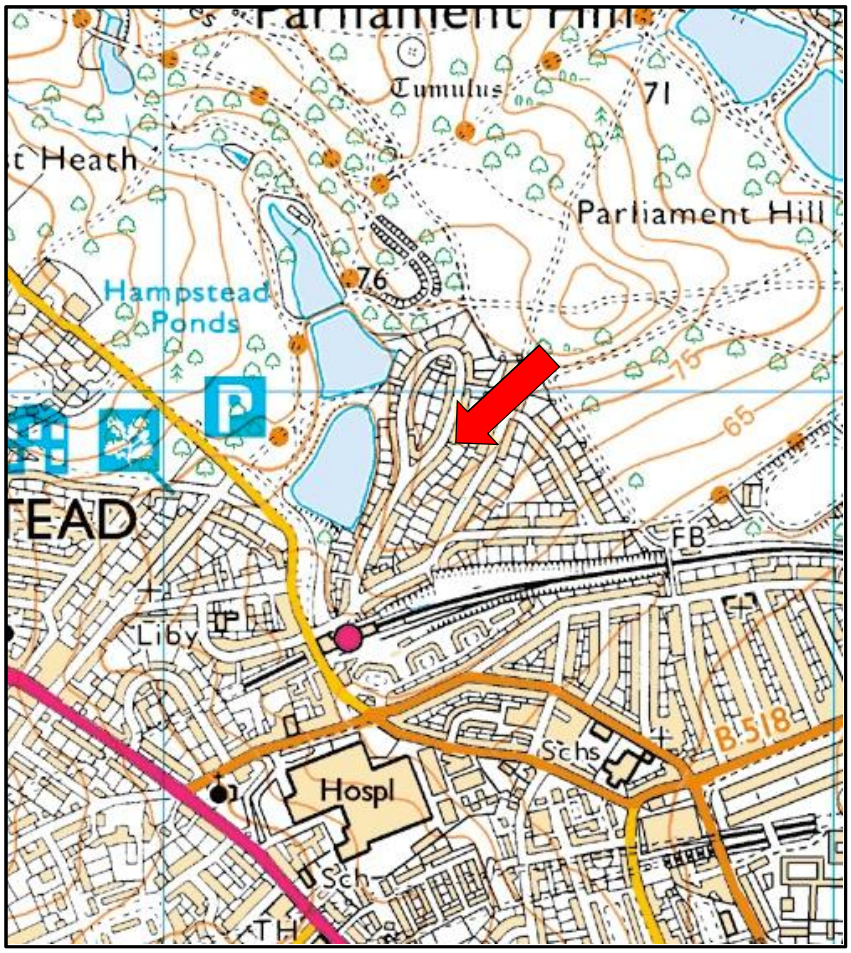

Figure 1: Site Location Plan

1.4 Proposed Redevelopment

Figures 2 and 3 (over page) show the existing and proposed long sections through the property.

The existing semi-basement occupies a little under half of the footprint of the property. The proposal is to extend both the existing ground floor and semi-basement into the rear garden of the property.

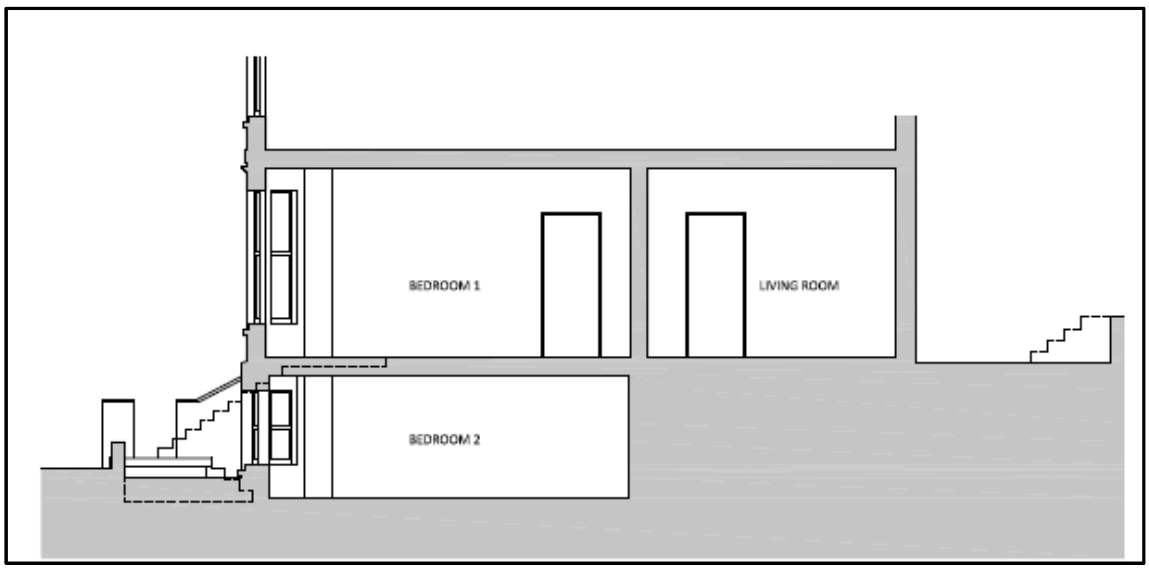

Figure 2: Long Section – Existing

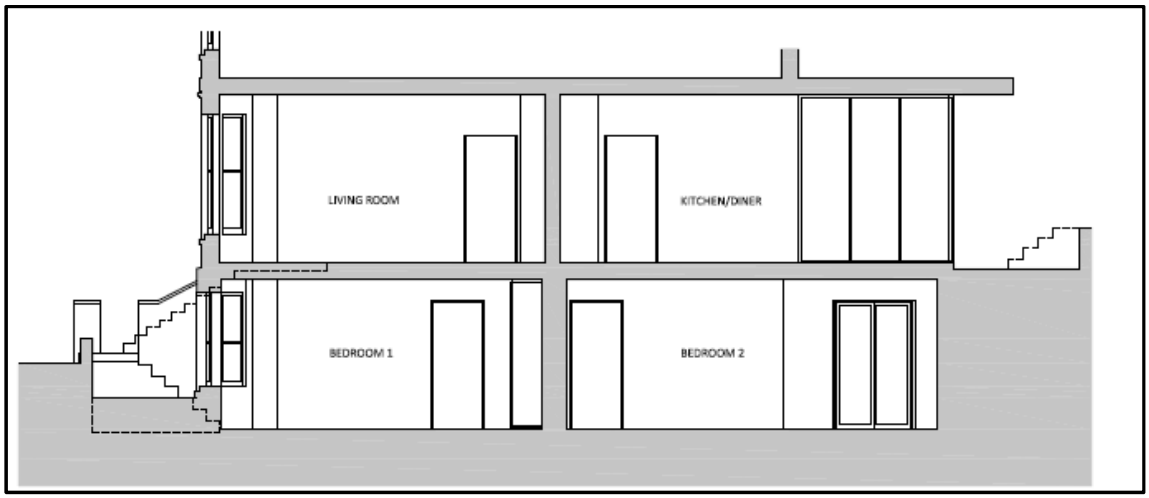

Figure 3: Long Section – Proposed

1.5 Limitations and Disclaimers

This Basement Impact Assessment relates to 47 South Hill Park, London NW3 2SS and was prepared for the sole benefit of Kewdale Property Investment (The "Client") and was prepared solely for the scheme described in Section 1.4.

Soils Limited disclaims any responsibility to the client and others in respect of any matters outside the scope of the above.

This report has been prepared by Soils Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the Client.

This report is personal and confidential to the client and Soils Limited accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report wholly its own risk.

The Client may not assign the benefit of the report or any part to any third party without the consent of Soils Limited.

The ground and groundwater may exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief. As such these do not necessarily address all aspects of ground behaviour at the site.

An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Section 2
Site Conditions

2.1 Published Geological Data

Records obtained from the British Geological Survey (Sheet 256 of the Geological Survey of Britain, Solid and Drift Edition) indicate the site to be underlain by:

- London Clay Formation;
- Lambeth Group (formerly referred to as the Upper Mottled Clay, Laminated Beds, Lower Mottled Beds; and Upnor Formations);
- Thanet Sands;
- Grey Chalk Sub-group (formerly the Upper Chalk)

The London Clay Formation comprises stiff grey fissured clay, weathering to brown near surface. Concretions of argillaceous limestone in nodular form (Claystones) occur throughout the formation. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay Formation, and precautions against sulphate attack to concrete are sometimes required. In the north London area the upper part of the London Clay Formation has been disturbed by periglacial action and as a result may contain pockets of sand and gravel.

The strata beneath the London Clay Formation (as listed above) would not be encountered during the construction of the basement as the London Clay Formation is shown by geological records to be more than 150 metres thick in the area of the site.

2.3 Hydrology

The nearest Surface Water Feature was a large pond located 90m to the west of the site, this being the Hampstead No.1 Pond. The East Heath has two long established pond chains that were originally formed from tributaries of the River Fleet. They were dammed over 300 years ago and now form the ponds. Hampstead No.2 pond is situated immediately to the north of No.1 pond.

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Figure 4: Site in relation to Hampstead No.1 and No.2 Ponds

The Flood and Water Management Act 2010 regulations, which will come into effect in 2012, will mean that the ponds will have to be assessed against flooding on a 1:10,000 year return period. It is likely that the earth embankment dams will need strengthening and that some of the ponds will need new spillways.

The water level of the lower pond is 14m lower than the ground elevation at the property and there was no risk to the site from flooding if the crest of the embankments were overtopped.

2.4 Hydrogeology

The site was underlain by separate 'shallow' and 'deep' groundwater bodies. Shallow groundwater would be locally perched within any superficial Made Ground or pockets of locally sandy clay. These aquifers were separated by impermeable clay of the London Clay Formation and Lambeth Group from the Chalk at depth.

Any water infiltrating the London Clay Formation will generally tend to flow vertically downwards at a very slow rate towards the chalk aquifer. Due to the predominantly cohesive nature of the soils, the groundwater flow rate is anticipated to be very slow. Published data for the permeability of the London Clay Formation indicates the horizontal permeability to generally range between 10^{-10} m/s and 10^{-8} m/s, with an even lower vertical permeability.

The shallow aquifer was considered to be relevant to the proposed development and basement impact assessment. The deeper aquifer would not be affected in any way by the proposed works so was not considered further.

2.5 Shallow Groundwater

It was reasonable to assume that the direction of shallow groundwater flow corresponds to the slope of the ground surface, which was to the southwest (i.e. towards the River Thames). The hydraulic gradient was shallow and flow rates would be very low and imperceptible as far as the development was concerned.

A seasonal variation in level within the shallow groundwater could be expected.

2.6 Contamination

No contaminative uses have been identified for the site and surrounding land.

The British Geological Survey of urban soil chemistry results for a sampling location to the northwest of the site is tabulated below.

BGS Measured Urban Soil Chemistry		
Metal	**Amount (mg/kg)**	**Exceeds Residential Land-use guidelines**
Arsenic	21	No
Cadmium	0.3	No
Chromium	115	No
Lead	367	No
Nickel	19	No

It was concluded that the site was not contaminated land in accordance with *'Annex 2: development on Land Affected by Contamination'* of Planning Policy Statement 23.

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Section 3
Screening

3.1 Screening Assessment

The London Borough of Camden guidance requires that any development proposal that includes a subterranean basement should be screened to determine whether or not a full BIA is required.

A number of screening tools are included in the Arup document and for the purposes of this report reference has been made to Appendix E which includes a series of questions within a screening flowchart for three categories; groundwater flow; land stability; and surface water flow. Responses to the questions are tabulated below.

3.2 Subterranean (Groundwater) Screening Assessment

Question	Response
1a. Is the site located directly above an aquifer?	No – discounting the Chalk Formation at depth
1b. Will the proposed basement extend beneath the water table surface?	It may though this will need to be confirmed by ground investigation as locally perched pockets of groundwater could be present. If a piled retaining wall is adopted it may extend below the basement level.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	Yes. The nearest Surface Water Feature was a large pond located 42m to the west of the site, the Hampstead No. 1 Pond created by damming a tributary of the River Fleet.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	Lies very close or on watershed.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No. Drainage will be taken to combined sewers in public highway. Permeable area to the rear of the house will not be changed.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No. House at approx. 82m.AOD and surface level of pond is 68m.AOD.

The above assessment has identified the following potential issues:

Q2. The site is within 100m of Hampstead No.1 Pond
Q3. Site lies very close or on watershed of Hampstead No.1 Pond

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3.3 Stability Screening Assessment

Question	Response
1. Does the existing site include slopes, natural or manmade, greater than 7°?	No.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No.
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	No.
5. Is the London Clay the shallowest strata at the site?	Yes
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	No
7.Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	No – on site. In the wider setting the combination of mature trees and high shrinkability London Clay Formation makes it probable that subsidence has occurred in the wider area.
8. Is the site within 100 m of a watercourse or potential spring line?	No.
9. Is the site within an area of previously worked ground?	No
10. Is the site within an aquifer?	No.
11. Is the site within 50 m of Hampstead Heath ponds?	No
12. Is the site within 5 m of a highway or pedestrian right of way?	Yes, the site is adjacent to South Hill Park Road.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Yes
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No

The above assessment has identified the following potential issues:

Q7. Shrink-swell subsidence may have affected properties in the wider area
Q8. The site is within 5 m of a public highway
Q13. Differential depth of foundations relative to adjoining properties

3.4 Surface Flow and Flooding Screening Assessment

Question	Response
1. Is the site within the catchment of the pond chains on Hampstead Heath?	Possibly - Lies very close or on watershed.
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No
5. Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?	No
6. Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk	No

The above assessment has identified the following potential issues:

Q1. Confirmation whether site lies in catchment of Hampstead Ponds

Section 4
Potential Impacts and Hazard Mitigation

4.1 Introduction

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential hazards are assessed for each of the identified potential impact factors.

The investigation of the potential impacts is carried out through a planned site investigation. The scope of the investigation must comply with the guidance issued by the London Borough of Camden Council and be a suitable basis on which to assess the potential impacts.

4.2 Potential Impacts and Hazard Mitigation

The following potential impacts were identified.

Potential Impact	Hazard Assessment	Mitigation
1/ The site is within 100 m of Hampstead No. 1 Pond and lies very close or on watershed of Hampstead No. 1 Pond. These ponds were created by impounding the River Fleet.	ARUP identify the risks are that a reduction in flow into the Hampstead Ponds could lead to increased contamination concentration in the ponds, whilst increased flows could raise water levels reducing available capacity to accommodate storm flows. Changes from basement works could affect groundwater and surface run off flows.	Site investigation to establish soil and groundwater conditions
2/ Shrink-swell subsidence may have affected properties in the wider area	Changes to vegetation on site could adversely affect foundations of adjoining structures	Site investigation to establish soil conditions and details of existing foundations. Effects mitigated at design stage.
3/ Site within 5m of a highway or pedestrian right of way	Excavation of a basement could result in structural damage to the road or footway; however work for the proposed basement at this site will take place at a distance of greater than 5 metres from adjacent public highways.	Site investigation to establish soil conditions and details of existing retaining walls. Effects mitigated at design stage.
4/ Differential depth of foundations relative to adjoining properties	Basement construction can result in undermining of foundations of neighbouring properties and cause excessive ground movements resulting in structural instability.	Site investigation to establish soil conditions and details of existing retaining walls. Effects mitigated at design stage.

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4.3 Effect on River Fleet

The property is 90 metres to the east of Hampstead No.1 Pond, one a series of ponds created some 300 years ago by damming headwaters of the River Fleet. Above the Hampstead and Highgate ponds the River Fleet has two headwaters. Downstream, the outlets from the ponds are carried in underground pipes to Camden where they are combined and are then carried underground into the River Thames 6.5km to the south. Changes to the Hampstead Ponds can affect the volume and quality of water entering the River Fleet closed culvert down-slope.

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Section 5
Ground Investigation

5.1 Ground Investigation

The ground investigation was planned to address Potential Impacts 1-4 established from the scoping study.

Site works were commenced on September 2012 and comprised the following:

- Logging of 4No internal trial pits dug to expose existing foundations;
- Drilling of 3No boreholes to a depth of 5m.bgl with sampling and in situ testing.
- Installing 3No monitoring wells in the boreholes;
- Installing groundwater level dataloggers in the wells.

Soils Limited attended the site on the 22nd October 2012 to carry out the following:

- Recovery of groundwater dataloggers.

Trial Hole Locations are shown on Figure 5 below.

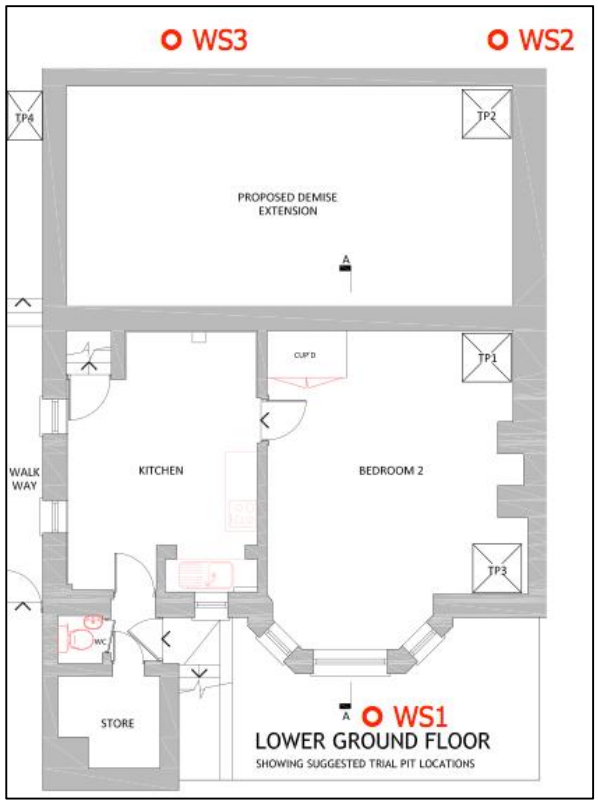

Figure 5: Trial Hole Locations

5.2 Ground Conditions

Ground conditions comprised a limited thickness of Made Ground associated with the original construction of the property. overlying natural soils of the London Clay Formation.

5.2.1 Made Ground

In all the trial pits and boreholes, with the exception of TP3, a limited thickness (maximum 1.10m in TP2) of Made Ground was encountered which comprised brown silty clay with occasional brick fragments.

TP3 was terminated in concrete at a depth of 0.9m.bgl.

5.2.2 London Clay Formation

Excepting TP3 (see above) in each of the trial holes soils of the London Clay Formation were present. These comprised firm, becoming stiff with depth, brown locally blue grey gleyed silty clay.

The depth to the base of the London Clay Formation was not proved, though from geological records is likely to be in excess of 150 metres thick

5.2.3 Roots

Roots and rootlets were present in each of the boreholes and to the full depth of WS2 at 5.0m.bgl.

5.3 Foundation Configuration

Foundation exposure excavations undertaken by others were logged by Soils Limited, the locations are shown on Figure 5.

5.3.1 Trial Pit 1

This was located inside the existing lower ground floor in the centre of the house against the party wall with the adjoining property. The trial pit had been taken to a depth of 0.9m below basement floor level and exposed concrete with occasional brick inclusions against the party wall. The base of the foundation had not been established.

5.3.2 Trial Pit 2

This was located inside the existing lower ground floor at the rear of the house against the party wall with the adjoining property. The foundation comprised stepped brickwork to 0.52m below floor level over a concrete strip foundation extending to 1.1m below floor level that projected out by 0.38m from the face of the wall.

5.3.3 Trial Pit 3

This was located inside the existing lower ground floor to the front of the house against the party wall with the adjoining property. The foundation

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was taken to 0.33m below floor level and comprised a brick footing that did not project out from the face of the wall.

5.3.4 Trial Pit 4

This was located from ground level 0.53m.bgl overlying London Clay Formation to the base of the trial pit at 1.0m.bgl. The depth and configuration of the foundation was not established. Excavation had been hampered by services.

The information from the trial pits shows that the foundation construction was typical for properties of the age and type in London. Foundations were either essentially non-existent e.g. Trial Pit 3, or a combination of stepped brickwork and a low quality concrete footing, e.g Trial Pit 2.

5.4 Groundwater

Groundwater monitoring wells were installed in the boreholes to a depth of 5m.bgl. Each well comprised a 38,mm diameter standpipe with a gravel filter surround. Slotted casing was used from 5.0-1.0m.bgl and plain casing with a bentonite seal to prevent entry of surface water from 1.0m.bgl to surface. A lockable 'top-hat' cover completed the installation.

Groundwater level dataloggers (DIVER™) were installed in each well along with an atmospheric and temperature datalogger (BARODIVER™).

Details of well installations and groundwater depths are tabulated below.

Well	Depth (m.bgl)	Highest water level (m.bgl)	Monitoring period	Comment
WS1 (DIVER 1)	5.0	n/r	20-09-12 to 22-10-12	Internal data error
WS2 (DIVER 2)	5.0	3.45	20-09-12 to 22-10-12	Varied from 3.45 to 3.55m.bgl over monitoring period though no trend.
WS3 (DIVER 4)	5.0	n/r	20-09-12 to 22-10-12	Internal data error

Records for the DIVER™ dataloggers and the BARODIVER™ are given in Appendix B.

Section 6
Potential Impacts and Mitigation

6.1 Mitigation of Adverse Effects

This section of the report addresses the potential impacts and hazards identified by the scoping study and listed in Section 4.2.

Potential Impact	Hazard	Site Investigation	Mitigation
1/ The site is within 100 m of Hampstead No. 1 Pond and lies very close or on watershed of Hampstead No. 1 Pond. These ponds were created by impounding the River Fleet.	Changes from basement works could affect groundwater and surface run off flows.	Groundwater to 3.45m.bgl (Sept-October 2012) and below both existing and proposed basement levels. Construction will not result in a reduction in soft-landscaped area so percolation into the ground will not be affected. Foundations to the basement extension will be no deeper than those to either the existing basement, or the basement to the adjoining property so there will be no difference to percolation movement in the unsaturated zone.	NONE REQUIRED There basement construction would not affect either the Hampstead Ponds or the River Fleet. Proposed works will result in no change to status quo.
2/ Shrink-swell subsidence may have affected properties in the wider area	Changes to vegetation on site could adversely affect foundations of adjoining structures	Property is located on highly shrinkable clays of the London Clay Formation. Roots present externally to >5.0m.bgl., though none internally. Existing vegetation will not be affected by the proposed construction.	Foundations and underpinning will take account presence of shrinkable soils in accordance with established Building Research Establishment best practice guidance.

Continued Overleaf

Continued from previous page.

Potential Impact	Hazard	Site Investigation	Mitigation
3/ Site within 5m of a highway or pedestrian right of way	Excavation of a basement could result in structural damage to the road or footway;	Construction of proposed basement at will take place at a distance of greater than 5 metres from adjacent public highways.	NONE REQUIRED
4/ Differential depth of foundations relative to adjoining properties	Basement construction can result in undermining of foundations of neighbouring properties and cause excessive ground movements resulting in structural instability.	Site investigation has shown that the basement party wall with the adjoining property can be constructed using traditional underpinning techniques. These are tried and tested for the ground conditions present at the site.	Structural design and method statements will draw on established successful practices. Pre-start and completion surveys will be made of the adjoining property.

6.2 Effect of Basement Construction on Shallow Groundwater

A rearward extension of the existing semi-basement is proposed. The property is to extend to the rear and the semi-basement extension will be wholly below the extended structure.

Groundwater was at 3.45m.bgl during September to October 2012 and will be below the level of construction for both the existing and proposed basements.

The hydraulic gradient was shallow and flow rates would be very low and imperceptible as far as the development was concerned. Published data for the permeability of the London Clay Formation indicates the horizontal permeability to generally range between 10^{-10} m/s and 10^{-8} m/s, or a maximum of horizontal groundwater flow of 5mm a year.

The shallow groundwater level will remain below the proposed semi-basement with a maximum credible seasonal variation of around 1.5 metres.

The ARUP report raises the hazard of groundwater flow being impeded and creating a damming effect upslope. This will not happen as construction is wholly above the groundwater level.

Foundations to the basement extension will be no deeper than those to either the existing basement, or the basement to the adjoining property so there will be no difference to percolation movement in the unsaturated zone.

Sustainable development should ensure that the hydrological cycle is mimicked. The proposed works will not result in a reduction in soft-landscaped area so percolation into the ground and water movement in the unsaturated zone will not be adversely affected.

The proposed basement extension will neither have a detrimental effect on groundwater flow and levels, nor be a hindrance against the possibility of future basement construction to adjoining properties.

6.3 Surrounding Buildings

This section considers the potential effects of basement construction on nearby properties.

Detrimental effects would be manifested as cracking and more serious structural damage. Many old buildings in London do exhibit signs of historic movement and repair. In practice, it is often difficult to attribute cracks visible in a structure to specific site construction activities unless a detailed survey of the affected structure and its founding strata had been undertaken before the construction works.

Any observed changes in the state of the building can then be causally linked to the works with more confidence and less debate than if no pre-works condition survey had been undertaken. Surveys require the cooperation of the property owners, as entry by surveyors into the property will be necessary. This would normally be undertaken in collaboration with the neighbour's party wall surveyors.

Close supervision will be made during the construction phase. Movement monitoring of neighbouring and nearby structures will be commence before construction starts and continued through the construction phase and for an appropriate period thereafter.

The data from the site investigation has established soil, groundwater and existing foundation conditions and shown that construction using conventional underpinning methods against the party wall could be used. The client's engineer can prepare working drawings and construction method statements that will mitigate adverse effects of neighbouring and nearby properties.

6.4 Residual Impacts

On completion of the scheme there will be no residual effect on the environment or on nearby properties.

The proposed basement extension will not be a hindrance against the possibility of future basement construction to adjoining properties.

The following area appended to this report:

Appendix A Site Investigation Logs
Appendix B Records for the DIVER™ dataloggers and the BARODIVER™

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Geotechnical Advisor

Appendix A Site Investigation Logs

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Appendix B Records for the DIVER™ dataloggers and the BARODIVER™

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WS: WS 1

Site:	47 South Hill Park Road, London	Start Date: 20/09/2012	Ground Level: -
Client:	Kewdale Property Investment	End Date: 20/09/2012	Easting: -
Project No:	12998	Logged By: SN	Northing: -
Site National Grid Reference:		Excavation Method:	
Site Level (mOD):	0.000	Plant: Premier Rig	
		Shoring/Support: None	
		Trial Pit Length: -	Trial Pit Width: -

Samples & Tests

Depth	Type	Result	Hand Pen.
0.20 - 0.20	D		
0.70 - 0.70	D		
1.00 - 1.00	D		350.0
1.50 - 1.50	D		120.0
2.00 - 2.00	D		175.0
2.50 - 2.50	D		275.0
3.00 - 3.00	D		225.0
3.50 - 3.50	D		450.0
4.00 - 4.00	D		250.0
4.50 - 4.50	D		280.0
5.00 - 5.00	D		400.0

Strata Details

Elev.	Legend	Depth	Thick	Description
		0.18	0.18	MADE GROUND Paving slab over concrete
		0.37	0.19	MADE GROUND Brown silty clay with occasional brick fragments and fine roots
		4.63		Brown slightly blue grey veining mottled CLAY with occasional fine roots, decomposed roots only from 2.00m bgl and no roots visible from 3.70m bgl
		5.00		End of Borehole at 5.00 m

General Notes:

1. All linear dimensions are in metres unless otherwise stated
2. All relative density/shear strength descriptioins are based only on field observations and available in-situ test data.
3. Trial pit logged from the ground surface below 1.2 m depth.

Groundwater Observations:

Dry

Stability:

Stable

General Remarks:

Roots observed to 3.70m bgl. Driver 1 installed at 4.85m bgl. Well installed at 5.05m bgl

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WS: WS 2

Site:	47 South Hill Park Road, London	Start Date: 20/09/2012	Ground Level: -
Client:	Kewdale Property Investment	End Date: 20/09/2012	Easting: -
Project No:	12998	Logged By: SN	Northing: -
Site National Grid Reference:		Excavation Method:	
Site Level (mOD):	0.000	Plant: Premier Rig	
		Shoring/Support: None	
		Trial Pit Length: -	Trial Pit Width: -

Samples & Tests

Strata Details

Depth	Type	Result	Hand Pen.	Elev.	Legend	Depth	Thick	Description
0.30 - 0.30	D					0.16	0.16	CONCRETE
0.60 - 0.60	D		25.0			0.40	0.24	MADE GROUND Brown silty clay with occasional fine roots and brick
1.00 - 1.00	D		175.0					Brown mottled silty CLAY with very occasional fine roots, slightly blue grey mottled from 1.70m and occasional roots traces from 2.50m bgl
1.50 - 1.50	D		175.0					
2.00 - 2.00	D		200.0					
2.50 - 2.50	D		200.0			4.60		
3.00 - 3.00	D		200.0					
3.50 - 3.50	D		275.0					
4.00 - 4.00	D		300.0					
4.50 - 4.50	D		250.0					
5.00 - 5.00	D		400.0			5.00		End of Borehole at 5.00 m

General Notes:

1. All linear dimensions are in metres unless otherwise stated
2. All relative density/shear strength descriptioins are based only on field observations and available in-situ test data.
3. Trial pit logged from the ground surface below 1.2 m depth.

Groundwater Observations:

Dry

Stability:

Stable

General Remarks:

Roots observed to 5.00m bgl. Driver 4 installed at 4.80m bgl. Well installed at 5.00m bgl

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WS: WS 2 REAR

Site:	47 South Hill Park Road, London	Start Date: 20/09/2012	Ground Level: -
Client:	Kewdale Property Investment	End Date: 20/09/2012	Easting: -
Project No:	12998	Logged By: SN	Northing: -
Site National Grid Reference:		Excavation Method:	
Site Level (mOD):	0.000	Plant: Premier Rig	
		Shoring/Support: None	
		Trial Pit Length: -	Trial Pit Width: -

Samples & Tests

Depth	Type	Result	Hand Pen.
0.50 - 0.50	D		
1.00 - 1.00	D		140.0
1.50 - 1.50	D		220.0
2.00 - 2.00	D		250.0
2.50 - 2.50	D		150.0
3.00 - 3.00	D		275.0
3.50 - 3.50	D		275.0
4.00 - 4.00	D		250.0
4.50 - 4.50	D		200.0
5.00 - 5.00	D		275.0

Strata Details

Elev.	Legend	Depth	Thick	Description
		0.12	0.12	CONCRETE
		0.48		MADE GROUND Brown silty clay with occasional brick rubble and fine roots
		0.60		Brown mottled silty CLAY between 1.10-1.25m bgl weak claystone, becoming slightly blue grey mottled from 1.50m and root traces from 2.50m bgl
		4.40		
		5.00		End of Borehole at 5.00 m

General Notes:

1. All linear dimensions are in metres unless otherwise stated
2. All relative density/shear strength descriptioins are based only on field observations and available in-situ test data.
3. Trial pit logged from the ground surface below 1.2 m depth.

Groundwater Observations:

Dry

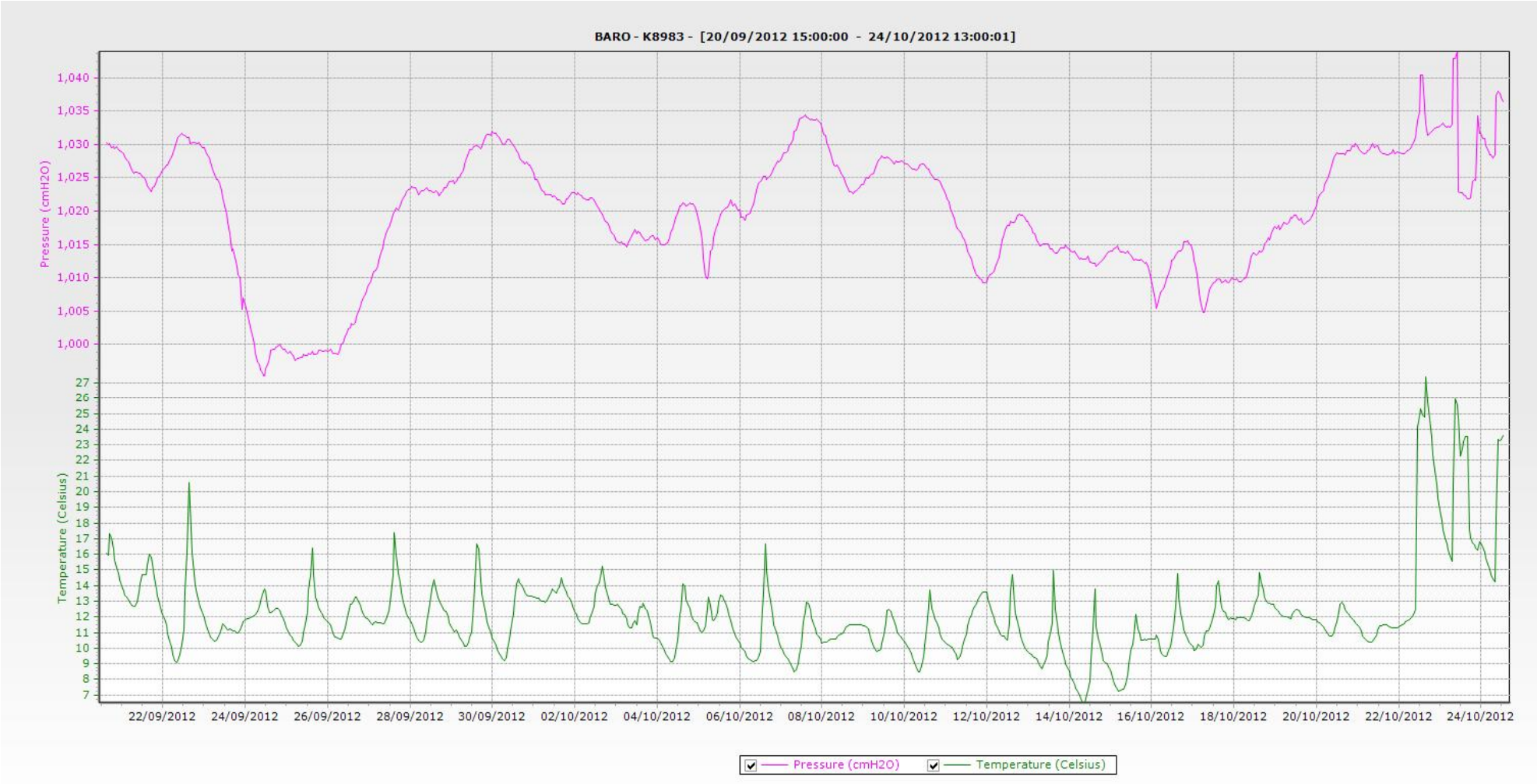
Stability:

Stable

General Remarks:

Roots observed to 0.60m bgl. Driver 2 installed at 4.80m bgl. Well installed at 5.00m bgl

BAROMETER


BARO - K8983 - [20/09/2012 15:00:00 - 24/10/2012 13:00:01]
Pressure (cmH2O)
1,040
1,035
1,030
1,025
1,020
1,015
1,010
1,005
1,000
Temperature (Celsius)
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
22/09/2012
24/09/2012
26/09/2012
28/09/2012
30/09/2012
02/10/2012
04/10/2012
06/10/2012
08/10/2012
10/10/2012
12/10/2012
14/10/2012
16/10/2012
18/10/2012
20/10/2012
22/10/2012
24/10/2012
Pressure (cmH2O)
Temperature (Celsius)

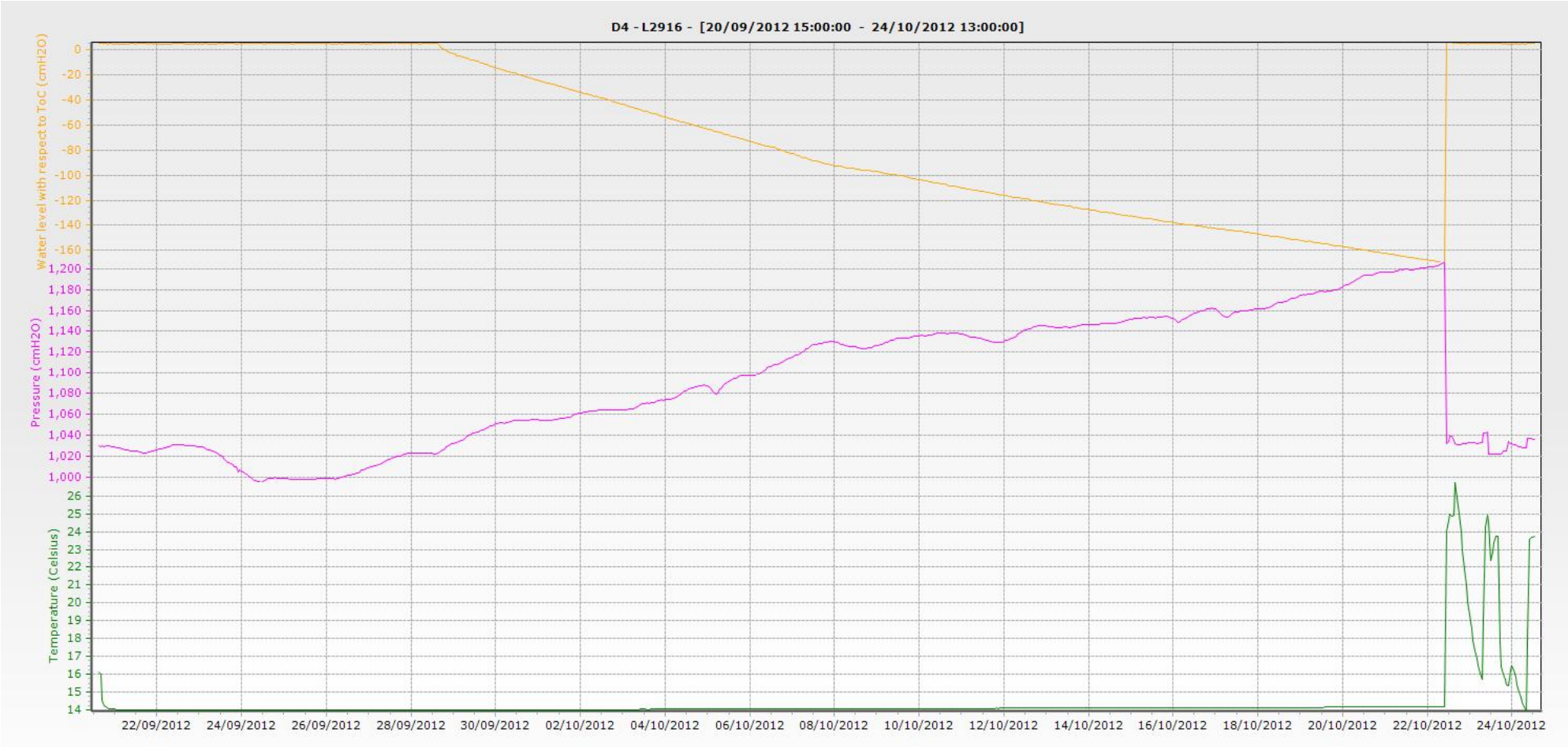
DIVER 1


D1 - L2809 - [20/09/2012 15:00:00 - 24/10/2012 13:00:01]
Water level with respect to ToC (cmH2O)
Pressure (cmH2O)
Temperature (Celsius)
22/09/2012
24/09/2012
26/09/2012
28/09/2012
30/09/2012
02/10/2012
04/10/2012
06/10/2012
08/10/2012
10/10/2012
12/10/2012
14/10/2012
16/10/2012
18/10/2012
20/10/2012
22/10/2012
24/10/2012

DIVER 2


D2 - L2786 - [20/09/2012 15:00:00 - 24/10/2012 13:00:01]
Water level with respect to ToC (cmH2O)
Pressure (cmH2O)
Temperature (Celsius)
0
-50
-100
-150
-200
-250
-300
-350
1,350
1,300
1,250
1,200
1,150
1,100
1,050
26
25
24
23
22
21
20
19
18
17
16
15
14
22/09/2012
24/09/2012
26/09/2012
28/09/2012
30/09/2012
02/10/2012
04/10/2012
06/10/2012
08/10/2012
10/10/2012
12/10/2012
14/10/2012
16/10/2012
18/10/2012
20/10/2012
22/10/2012
24/10/2012

DIVER 4


D4 - L2916 - [20/09/2012 15:00:00 - 24/10/2012 13:00:00]
Water level with respect to ToC (cmH2O)
Pressure (cmH2O)
Temperature (Celsius)
22/09/2012
24/09/2012
26/09/2012
28/09/2012
30/09/2012
02/10/2012
04/10/2012
06/10/2012
08/10/2012
10/10/2012
12/10/2012
14/10/2012
16/10/2012
18/10/2012
20/10/2012
22/10/2012
24/10/2012