



Hills Quarry Products Limited

## Airfield Quarry

Gally Leaze, Gloucestershire

Proposed sand and gravel extraction and restoration

# Hydrogeological Risk Assessment

Final Report

April 2022

## Appendix 1 Guidance & Information Sources

## Regulatory & Industry Standard Guidance & Methodologies & Literature References

- "Hydrogeological Impact Appraisal for Dewatering Abstractions Environment Agency - Science Report (SC040020/SR1)". Water Resource Consultants for the Environment Agency, April 2007.
- "National Planning Policy Framework" (NPPF: Department for Communities and Local Government [DCLG], February 2019).
- "Planning Practice Guidance to the National Planning Policy Framework - [www.gov.uk/government/collections/planning-practice-guidance](http://www.gov.uk/government/collections/planning-practice-guidance)" (PPG: DCLG), Launched March 2014).
- "Flood Risk and Coastal Change", Planning Practice Guidance (PPG), DCLG / Department for the Environment Food and Rural Affairs (DEFRA), above website - launched March 2014.
- "Planning Policy Statement 25 (PPS 25): Development and Flood Risk" (PPS25: DCLG, 2006)
- "Development and Flood Risk: A Practice Guide Companion to PPS25", DCLG, February 2009 (referred to herein as PPS25pg).
- "Flood Estimation Handbook CD-ROM, Version 3.0 (FEH CD-ROM No.3)", Centre for Ecology and Hydrology (CEH; formerly the Institute of Hydrology), 2009 and successor web-service.
- "The Calculation of Actual Evaporation and Soil Moisture Deficit over Specified Catchment Areas", Grindley J, November 1969, Hydrological Memorandum 38, Meteorological Office, Bracknell, UK.
- "Estimation of Open Water Evaporation, Guidance for Environment Agency Practitioners", R&D Handbook W6-043/HB, Finch JW and Hall RL, October 2001.
- "Technical Management of Water in the Coal Mining Industry", National Coal Board (NCB), 1982.
- "Some Physical Properties of Sand and Gravels", Hazen A., 1893, Massachusetts State Board of Heath, 24th Annual Report.
- "Control of groundwater for temporary works", SH Somerville, 1986, Construction Industry Research and Information Association (CIRIA) report no. 113.
- "Groundwater Protection: Principles and Practice (GP3)" Version 1.1, EA, August 2013 and the superseding "Groundwater Protection - collection", DEFRA Website, January 2020.
- "Groundwater Hydrology", D K Todd, 1980.
- LandSim Release 2 Manual / Version 2.5 Addendum / Version 2.5.17 Addendum, Golder Associates / EA, EA R&D Publication 120.
- "Flood Estimation Handbook CD-ROM, Version 3.0 (FEH CD-ROM No.3)", Centre for Ecology and Hydrology (CEH; formerly the Institute of Hydrology), 2009 and successor web-service.
- Landfill Developments: Groundwater Risk Assessment for Leachate (<https://www.gov.uk/guidance/landfill-developments-groundwater-risk-assessment-for-leachate>);
- "Additional guidance for hydrogeological risk assessments for landfills and the derivation of groundwater control levels and compliance limits", EA Horizontal Guidance Note H1 – Annex J3, Version 2.1, December 2011;
- "Hydrogeological Risk Assessments for Landfills and the Derivation of Groundwater Control and Trigger Levels" (LFTGN01), EA, March 2003 ;
- "Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water" (LFTGN02), EA, February 2003, and;
- "Techniques for the Interpretation of Landfill Monitoring Data" (Guidance Notes), EA Final technical report P1-471, 2002.
- "Manual for the production of Groundwater Source Protection Zones", EA March, 2019.

## Published Data Sources

- Ordnance Survey (OS): Topographic maps at scales of 1:50,000 and 1:25,000.
- OS open-source digital data (Meridian 2, Panorama & Terra50 data-sets).
- British Geological Survey (BGS): Published 1:50,000 scale solid and drift geological mapping, sheet-no's. 252 (Swindon).
- BGS Geoindex, well details and borehole logs, 2017.
- Environment Agency (EA) , October 2017:
- Source Protection Zone (SPZ) spatial mapping data;
- Licensed abstractions;
- Flooding spatial mapping data;
- Register of Waste Disposal Sites;
- Local rainfall data, and;
- Water Framework Directive Catchment Mapping, Cycle 2.
- Natural England (NE): Spatial mapping & citation information for Designated Sites of ecological interest (Sites of Special Scientific Interest [SSSI's] & Special Areas of Conservancy [SAC's]);
- Geoindex, well details and borehole logs and On-line Lexicon of Named Rock Units, BGS;
- Spatial mapping & citation information for Designated Sites of ecological interest (Sites of Special Scientific Interest [SSSI's] & Special Areas of Conservancy [SAC's]), Natural England (NE);
- "The Physical Properties of Major Aquifers in England and Wales", EA & BGS, Allen D.J, Brewerton L.J, Coleby L.M, Gibbs B.R, Lewis M.A, McDonald A.M, Wagstaff S.J, Williams A.T, 1997;
- "Climate & Drainage", Technical Bulletin No. 34, Ministry of Agriculture Fisheries & Food (MAFF), September 1976.
- "Cotswolds Catchment Abstraction Licensing Strategy", EA, December 2012.
- "Gloucestershire Minerals Local Plan 1997-2032 - [www.glocestershire.gov.uk/planning-and-environment/planning-policy/minerals-local-plan-for-gloucestershire](http://www.glocestershire.gov.uk/planning-and-environment/planning-policy/minerals-local-plan-for-gloucestershire)" (MLP), March 2020.
- "Gloucestershire County Council, Strategic Flood Risk Assessment for Minerals and Waste Development Framework", September 2008.
- "Geoenvironmental and geotechnical Desk Study Report and Phase 1 Ground Condition Assessment." Peter Brett Associates. May 2009.
- "Groundwater Risk Assessment for Broxborough Landfill – Addendum report for Extension Area. Report Ref. 15738RR014i2." Entec. Nov 1998.
- "Some properties of heavily overconsolidated Oxford Clay at a site near Bedford." Geotechnique 22 No. 3, pp485-507. R.H.G Parry. 1972.
- "Contaminant Transport in heterogeneous porous media: a case study." Journal of Hydrology. 175 pp 383 – 406. R Mackay and T.A Cooper. 1996.
- "Whetstone Bridge Farm. Environmental Impact Assessment", SLR Associates for Moreton Cullimore Limited, June 2011.
- "Eysey Manor Farm, Cricklade, Wiltshire. An assessment of the potential impacts upon the water environment of the proposed extraction of sand and gravel and restoration to agriculture, lakes and nature conservation after-uses.", Hydrogeology Unit, Tarmac Quarry Products Limited, May 2001.

## Site Specific Data Sources

- "Airfield Quarry, Gally Leaze, Gloucestershire. Proposed sand and gravel extraction and restoration. Hydrological & Hydrogeological Impact Assessment". BCL. November 2020. Ref. /B/LMM/AQ\_HHIA/20.
- "Down Ampney Estate. Mineral Assessment Report", D K Symes Associates for Down Ampney Estate, December 2005"
- "Down Ampney Quarry. Winning and working of sand and gravel. Environmental Statement", Scott Wilson for Hanson Quarry Products Europe Limited, August 2009"
- Airfield Quarry topographic survey, Brunel Surveys. 2018.
- Base of deposit survey, Brunel Surveys. 2018.
- Groundwater elevation and water quality data collected by Hanson and Hills Quarry Products Limited.
- Drill logs for site piezometers – installed September 2018, BCL.
- Results of water features survey undertaken by BCL – *appendix 4*.
- Piezometer testing and sampling, BCL, 2020.



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Appendix 2 Gloucestershire County Council Regulation 25  
Letter

**The Mineral Planning Authority (MPA) formally requests further information and clarification on the following matters in response to consultations responses from statutory consultees and representations from consultees and public in accordance with EIA Regulations 2017 for planning application 21/0032/CWMAJM ‘*The extraction of minerals, provision of associated infrastructure including access and processing facilities, associated ancillary buildings, structures and operations, with site restoration using imported materials to agriculture and enhanced ecological interest and bio-diversity*’ at *Former RAF Down Ampney Airfield & Surrounding Areas The New Road Down Ampney Gloucestershire GL7 5PL.***

## **Highways**

### **Location of Access Road**

- Information on how Policy 19 (Chippenham Central Areas of Opportunity) of the Wiltshire Core Strategy (2015) that requires any development proposals effecting the area including possible impacts of HGV traffic on the local road network has been considered and addressed in connection with the routing of HGV vehicles from the proposed site and any proposed movements through Cricklade.
- Information on how the proposed quarry considers the possible/potential impacts of the construction of the proposed access on Plantation W16 and whether further protection measures are required taking into account the recent changes made to the Cotswold Water Park SSSI destinations.
- Clarification on whether the existing access in to the site from the C124 via Oak Road – see pictures below was considered as a possible entrance for the proposed site as the road is wider, relatively straight, with good visibility and no watercourse to cross. It is also within Gloucestershire County Boundary which would make them the sole authority for the application.

[https://ww3.goucestershire.gov.uk/PROW/PROWWS.ashx/GetFileGCCContents?Filename=images%2f21\\_0032\\_CWMAJM\\_KEMPSFORD\\_PC\\_29JUL21.PDF](https://ww3.goucestershire.gov.uk/PROW/PROWWS.ashx/GetFileGCCContents?Filename=images%2f21_0032_CWMAJM_KEMPSFORD_PC_29JUL21.PDF)



## Proposed Routing

- Clarification on whether a routing scheme is proposed that would require no HGV traffic to and from the site would be permitted to travel through Cricklade.

## **Noise and Vibration**

- Information on proposed mitigation to protect Marston Meysey from the possible impacts from noise generated from the operation/extraction of Phase 1 especially during the winter months when many of the trees which form a summer barrier along the banks of Marston Meysey Brook have no leaves.

## **Climate Change**

- Additional information relating to the use of renewable energy options to power the various elements of plant site and offices in the short and long term.
- Plans on reducing the carbon output and impact of HGvs importing and exporting material from the site during the construction and operation of the proposed quarry.

## **Ecology**

### Skylarks

- Information concerning the possible impacts from the operation of phase 1 and any temporary structures of the proposed development on nesting skylarks (Priority Species) located to the east of phase 1.

### Bats

- Further information is required to justify why further bat surveys are not required due to the submitted surveys being 3-4 years old in order for them to be still valid.

To achieve this the MPA suggests that a qualified Ecologist walks the site to check that conditions for bats have not changed since the bat surveys were completed and provide the results to MPA.

- That the Landscape and Ecology Management Plan (LEMP) chapter 2.1 pre-works is edited to include pre-works checks for potential new bat roosts in trees prior to the commencement of each phase (such surveys are mentioned in the ES Ecology Chapter at (6.8.1 & 7.4.1).

### Cotswold Water Park Sites of Special Scientific Interest (SSSI)

- Chapter 8-Ecology of the Submitted ES needs to be revised to reflect the location of the new current SSIS boundaries and assess any impacts upon them from the proposed development.

## **Cumulative impact**

### Highway

- Clarification on whether the potential extra road capacity generated by the proposed RAF Fairford developments and Blackbur Farm has been assessed in relation to the proposal and existing developments and if not further information is

required to take account of the cumulative traffic impacts of these existing and proposed developments.

## Hydrology

- Clarification is required relating to the labelling of plans 'Working phases plan – Phase 3A as it is repeated. Presumably the phase between 1 and 2B should be labelled 2A?
- Clarification on the status of the roadside waterbody adjacent to the site as it has been described as a drain and Meysey Brook' tributary.
- Clarification on whether the proposed development of RAF Fairford ie more built up areas reducing natural flow through grassed areas has been considered

## Flood Risk Assessment (FRA)

A revised FRA together with detailed hydraulic flood modelling is required to be submitted.

The revised FRA should include the following information:

- a sufficiently robust assessment of the effects of the development final landform and phasing on flood storage, conveyance, connectivity and flood risk elsewhere by hydraulic flood modelling;
- Present a detailed topographic survey of the existing ground levels at the site;
- Surveys showing the existing site levels and detailed drawings showing the levels of the proposed development phases. Site levels need to be stated in relation to the Ordnance Datum (the height above average sea level).
- detail the proposed ground levels for the development in sufficient detail, in particular the proposed site access road;
- acknowledge the area of the site within Flood Zone 3b;
- demonstrate that there is no loss of floodplain storage volume, conveyance, connectivity or adverse effects on flood risk elsewhere as a result of the development phasing and restored condition;
- consider the requirement for flood emergency planning including flood warning and evacuation of people for a range of flooding events up to and including the extreme event; and
- consider the effects of climate change on fluvial flood risk.

## Hydrological and Hydrogeological Impact Assessment - Further Details Required

- The Environment Agency records show several features in the boreholes, wells and springs database located around the site that have not been picked up in the local abstraction features and water features survey in the impact assessment report. The water features survey should therefore be reviewed and resubmitted.
- Clarification on the details provided in Table 19 of Hydrogeological Impact Assessment as the EA are of the opinion that it does not provide a satisfactory assessment of the potential quality or quantity impacts to water features in the vicinity (or indeed appear to relate to features picked up in Appendix 4 (Water features survey)).

- A water features risk screening and ranking would be useful as well as an indication of the water features monitoring plan for pre, during and post works.
- Information outlining the reasoning/rationale of the design of the baseline monitoring that has occurred of the water chemistry data obtained and their sensitivities in terms of water quality, from the proposal.
- Information on field data (including temperature, DO, EC, pH) for the local groundwater and surface waters, including the identified local water features (where possible to access). This data is essential for context and for a detailed long-term baseline assessment, and should be included in regular monitoring and evaluation.
- The groundwater contour maps (Figs 13 & 14) are not valid because they have been made from mixed datasets (showing (a) max. and (b) min. groundwater elevation recorded at each location) and are presented independent of the observation time.

To address this the MPA requires these maps are reproduced to show contemporaneous groundwater elevation data plotted separately by aquifer units (where these units are not in hydraulic continuity) to identify the most vulnerable down gradient receptors.

### **Archaeology and Heritage**

- Clarification on whether the proposed Silt Management Area has been excavated in the past.
- Archaeological information regarding the proposed mitigation for the Silt Management Area and the enabling works - drainage diversion channels, haul roads and Plant Area is required to be submitted as the proposed archaeological mitigation only refers to the extraction phases (1-9).

### **Landscape/restoration**

- Information relating to the consideration of the proposed landscape restoration of the site against the adopted Mineral Local Plan Allocation 6. Policy DM 09 (Landscape).
- Further information to demonstrate that the proposed restoration of the sites design is;
  - o sustainable,
  - o achievable,
  - o Possible sources of infill material to be used and its availability to be imported to the site when required.

### **Further information**

The submission of any further information the applicant wishes to submit to the MPA to address any additional matters raised by consultees and contributor comments and or any further information the applicant feels appropriate to submit.



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## Appendix 3 Site piezometer and BGS borehole records

<b>RECORD OF WELL</b>	
At <u>DOWNS, AMPNEY, SW. O.B.H.</u>	
Town or Village <u>DOWNS, AMPNEY</u>	
County <u>WILTS</u>	
Six-inch National Grid sheet and reference <u>50.1038.9583.SU19.NW</u>	
For <u>TWA</u>	
State whether owner, tenant, builder, contractor, consultant, etc.: <u>OWNER</u>	
Address (if different from above) .....	
Level of ground surface above sea level (O.D.) ..... ft (.....m)	
*DELETE AS NECESSARY	
If well top is not at ground level state how far <u>above*</u> : ..... ft (.....m) SHAFT ..... ft (.....m); diameter ..... ft (.....m);	
HEADINGS (please attach details—dimensions and directions)	
BORE ..... ft (.....m); diameter: at top ..... 5 ..... in (.....mm); at bottom ..... 4 ..... in (.....mm)	
Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.): ..... Øm. T.P. 56m. DIA. 175. mm. PLASTIC. PLAIN ..... ..... 56. → 103. !!. 193. MM. !!. SLOTTED ..... .....	
Water struck at depths of ..... ft (.....m) below well top	
Rest level of water ..... ft (.....m) <u>above*</u> well top. Suction at ..... ft (.....m)	
Yield on ..... hours* test pumping at ..... gallons per ..... (..... l/s) with depression to ..... ft (.....m) below well top. Recovery to rest level in ..... mins* hours	
Capacity of pump ..... g.p.h. (.....l/s)	
Date of measurements ..... 6.1.82	
<b>DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:</b>	
Make and/or type ..... Motive power .....	
Capacity ..... gallons (.....m³) per hour. Suction at ..... ft (.....m) below well top. Amount pumped ..... gallons (.....m³) per day. Estimated consumption ..... gallons (.....m³) per week	
Well made by ..... D.R.LING & GEOFACILITIES Date of sinking .....	
ADDITIONAL NOTES ANALYSIS (please attach copy if available)	
AQUIFER: <u>G.T. OOLITE</u> CLASSIFIED BY <u>TWA</u>	

INSTITUTE OF GEOLOGICAL SCIENCES  
HYDROGEOLOGY UNIT  
EXHIBITION ROAD  
LONDON SW7 2DE  
British Geological Survey

IGS 2494 10 000 7/79

For Institute use only Licence No.  
NN.....  
SU 19/70  
British Geological Survey  
252/229  
SU 19/70  
252/229

Received from MONKHOUSE  
.....  
Date 24.3.82  
Observation well .....  
Recorder .....  
ER log .....  
Site marked on  
1" map ..... O  
6" map—Grid Sheet ..... O  
(use symbol)  
Copy to C & S MIDS  
.....  
Date .....

BOREHOLE DATA SHEET				
MARSTON MEYSEY		B.G.S. No. <u>SU 19/69A</u> T.W.A. No. <u>SU 19/69A</u>		
N.G.R. <u>SU 1297 9756</u>		S.L. <u>83.6</u> m.O.D.	T.D. <u>168</u> m	Date <u>1982</u>
Logs available:				
Core <input type="checkbox"/>	Gamma <input checked="" type="checkbox"/>	S.P. <input checked="" type="checkbox"/>	16" N.R. <input checked="" type="checkbox"/>	64" N.R. <input checked="" type="checkbox"/>
Point Res. <input checked="" type="checkbox"/>	Caliper <input type="checkbox"/>	Other:		
Casing details:				
Type	Diam. mm	From m B.G.L.	To m B.G.L.	
Plain steel	150	0	144	
Plastic slotted	100	144	168	
Formation details				
	Depth to basem	Thickness m	Notes	
Drift	2.0	2.0	2nd terrace deposit	
OxC	41.3	39.3	Moat 10m, Lox to 41.3	
KIS	50.7	9.4	Depths from gamma-log.	
KIC	54.0	3.3		
Cb	58.8	4.8		
FMb clay	71.2	12.4		
FMbL	82.6	11.4		
WhL/AO	101.7	19.1		
HMB	104.3	2.6		
Ty	115.0	10.7		
TSF	NP			
LFE	134.6	19.6		
CG	142.5	7.9		
UTG	146.4	3.9		
LInO	159.1	12.7		
ULi	168.0	4.9		
NP Not present				

**RECORD OF WELL**

For Institute use only Licence No.

SU 19/58B N .....

At ... Mayeshampton ... OS H .....

Town or Village ... Mayeshampton .....

County ... Gloucestershire .....

EXACT SITE

British Geological Survey

British Geological Survey

British Geological Survey

Six-inch National Grid sheet and reference ... SU 1179 9903 .....

For ... Thomas Water Anthony .....

State whether owner, tenant, builder, contractor, consultant, etc.: ... OWNER .....

Address (if different from above) .....

Level of ground surface above sea level (O.D.) ..... ft (. .... c. 86. .... m)

If well top is not at ground level state how far above\* below: ..... ft (. .... m)

SHAFT ..... ft (. .... m); diameter ..... ft (. .... m);

NECESSARY

HEADINGS (please attach details—dimensions and directions)

BORE ..... ft (. .... 126.5 .... m); diameter: at top ..... in (. .... 200 .... mm);

at bottom ..... in (. .... 150 .... mm) British Geological Survey

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

91.0 m. x. 200 mm. plain from surface.

Water struck at depths of ..... ft (. .... m) below well top

Rest level of water ..... ft (. .... 9.5 .... m) above\* well top. Suction at ..... ft (. .... m)

Yield on ..... hours\* days' test pumping at ..... gallons per ..... (..... l/s) with depression to ..... ft (. .... m) below well top. Recovery to rest level in ..... mins\* hours

TEST CONDITIONS

Capacity of pump ..... g.p.h. (..... l/s)

Date of measurements .....

NORMAL CONDITIONS

**DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:**

Make and/or type ..... Motive power .....

Capacity ..... gallons (..... m<sup>3</sup>) per hour. Suction at ..... ft (. .... m)below well top. Amount pumped ..... gallons (..... m<sup>3</sup>) per day. Estimatedconsumption ..... gallons (..... m<sup>3</sup>) per week

Well made by ..... Stow Date of sinking .....

LOG OF STRATA

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Observation borehole in the Inferior Oolite.

Received from ... TWA .....

Date ... 13. 9. 74. .... British Geological Survey

Observation well .....

Recorder .....

ER log .....

Site marked on .....

1" map .....

6" map—Grid Sheet .....

(use symbol) .....

Copy to ... British Geological Survey .....

Date .....

For Institute use only

British Geological Survey

GEOLOGICAL CLASSIFICATION

If measurements start below ground surface, state how far.

British Geological Survey

NATURE OF STRATA

British Geological Survey

THICKNESS

British Geological Survey

DEPTH

British Geological Survey

Feet Inches Metres Feet Inches Metres

<i>Holloways Clay (Oxfordian)</i>	7.3	7.3	7.3	7.3	7.3	7.3
<i>Great Oolite Series</i>	70.5	77.8	77.8	77.8	77.8	77.8
<i>Fulmer's Earth Clay</i>	12.2	90.0	90.0	90.0	90.0	90.0
<i>Inferior Oolite</i>	33.3	123.3	123.3	123.3	123.3	123.3
<i>Upper Liias</i>	3.2	126.5	126.5	126.5	126.5	126.5

Institute of Geological Sciences  
RECORD OF SHAFT OR BOREHOLE

British Geological Survey

L76153030446422986211/11/1971

Name and Number of Shaft or Borehole:

2020 AYNG 2 (DA2)

For whom made BGS Flans Press Unit

British Geological Survey British Geological Survey

Town or Village County

Exact site (reference to a fixed point on 1-in or 1:50 000 Map)

6-in or 1:10 000 map

British Geological Survey  
SU 19 NW 1/6

National Grid Reference

1/1802 96403

British Geological Survey

1-in or 1:50 000  
New Series Map No

Enter 'C' if  
Confidential

252

Purpose for which made Drilling sequence

British Geological Survey British Geological Survey

Ground level at shaft bore relative to OD m. If not ground level give OD of beginning of shaft bore m.

Made by Drillfire

Date of sinking Feb. 1988

Information from Core

Examined by K. V. Robinson and  
A. H. Hallan

base

Specimen Numbers and Additional Notes

British Geological Survey

MOxC  
28.23

LOxC  
67.60

KIS  
est. c. 77.7

KIC  
81.25

Cb  
86.89m

Fmb  
34.4

Aquitaine base c. 415. 18.7m below top LOxC  
280/263 above base LOxC

89.87

c. 10.1

c. 3.55

5.44

British Geological Survey

British Geological Survey

British Geological Survey

Geological Classification

Description of Strata

Thickness  
metres

Depth  
metres

Middle Oxford Clay

30cm run of core above 7.66m  
Exact position not known  
Mudstone, pale grey, silty, hard and indurated,  
a few lenses, scattered shell frags,  
scattered pyritic nests; ammonite  
at 8cm: a few pyritic nests; a few  
lens surfaces;

0.30

CORE FROM 7.66 m

Mudstone, pale grey, silty, hard and indurated,  
a few lenses, scattered shell frags,  
scattered pyritic nests; ammonite  
7.67m

run to

0.04

7.70

SAMPLES PF/46(1) 3

British Geological Survey

0.40

8.10

BR/46(1)

0.10

8.20

MP/46(1)

0.10

8.30

Mudstone, pale grey, silty, with smooth  
surfacing, small pyritic nests common,

BOREHOLE DATA SHEET

CRICKLADE STW	B.G.S. No. SU 19 SW/17	T.W.A. No. SU 19/74
---------------	------------------------	---------------------

N.G.R. SU 1055 9394	S.L. c. 97 m O.D.	T.D. 140.3 m	Date 1984
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Logs available:

Core	<input type="checkbox"/>	Gamma	<input checked="" type="checkbox"/>	S.P.	<input type="checkbox"/>	16° N.R.	<input type="checkbox"/>	64° N.R.	<input checked="" type="checkbox"/>
------	--------------------------	-------	-------------------------------------	------	--------------------------	----------	--------------------------	----------	-------------------------------------

Point Res.	<input type="checkbox"/>	Caliper	<input type="checkbox"/>	Other: Guard Persuitit > Chipping, (VKA)
------------	--------------------------	---------	--------------------------	------------------------------------------

Casing details:

Type	Diam. mm	From m B.G.L.	To m B.G.L.
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Formations

	Depth to base m	Thickness m	Notes
Drift	5.5	5.5	Silt loam Alluvium
OxC	47.2	41.7	OxC to c. 14.6; LOxC to 47.2
KIS	59.0	11.8	
KIC	63.0	4.0	
Cb	68.8	5.8	
FMB clay	74.6	5.8	
FMBL	88.6	14.0	
WhL/AO	113.4	24.8	WSL to 96.0; WSL to 104.0; WSL to 113.4
HMB	120.4	7.0	HMB lithified into argillite upper part
Ty	125.7	5.3	1 Ty concretionaries in Mayingham.
TSF	NP		
LFE	140.3	14.6	
CG			
UTG			Depth from gamma - log
LInO			
ULI			

NP Not present

VKR: Clipping examined by VK Robinson of Thames W.A.

British Geological Survey

British Geological Survey

British Geological Survey

CASTLE HILL FM AIRFIELD		SU 19/41C	
British Geological Survey Owner CO-OP		British Geological Survey Licence No.	
Occupier		IGS Ref. No.	
Ground Level c 78 m OD ft. OD		Nat. Grid Ref. SU 19 NW 9711	
Level of Well Top m OD ft. OD		Status Aquifer SU 19 NW 93	
Rest Water Level m bwt ft. bwt		Summary of Geological Section Thickness Depth	
(Date ) m OD ft. OD		OXFORD CLAY	81.5 81.5
Construction		CORABRASH	10.0 91.5
Depth bwt Dia.		Linings (below well top)	
		From	To
		Dia.	Type
Abstraction Rates Type of Pump			
gph Chem./Bact. Anal. YES NO			
gpd Well Driller RUSUGROVE			
Client space has been allowed, continue in 'Notes' overleaf.			

## Detail of Strata in No. 4 Borehole, Down Ampney

British Geological Survey Presumed Geological Classification	British Geological Survey Nature of Strata	British Geological Survey Thickness Metres ft	British Geological Survey Thickness Metres ft
Oxfordian Clay	Top Soil	0.91 3'	0-0.91 0-3'
Ok Clay & On clay	Sand and Gravel	2.14 7'	0.91-3.05 3'-10'
Kellaway Beds	Silty clay with sand & Gravel	3.05 10'	3.05-6.10 10'-20'
Gornabrush and Forest Marble	Dark Grey/Brown Clay	12.19 40'	6.10-18.27 20'-60'
	Ditto, large pebble of dark grey limestone with veins of calcite	1.52 5'	18.29-19.81 60'-65'
	Darker grey brown clay (Sandy)	1.53 5'	19.81-21.34 65'-70'
	Dark grey clay (hard)	1.57 15'	21.34-26.21 70'-85'
	Ditto	2.23 27'	25.21-33.14 85'-112'
C6	Dark grey silty clay with thin bands of limestone	34.14-34.75 112'	114'
	Ditto with lump of soft dirty white limestone	2.74 9'	34.75-37.49 114'-123'
	Dark brown silty clay with broken shells	0.61 2'	37.49-38.10 123'-125'
	Dirty white soft limestone and clays	1.52 5'	38.10-39.62 125'-130'
Fm6	Grey green marly clay with thin beds of limestone	15.24 50'	39.62-54.86 130'-180'
	Hard Grey Rock	1.53 5'	54.86-56.39 180'-185'
	Grey silty clay	1.52 5'	56.39-67.91 185'-190'
	Very dark fine silty clay with pieces of dark grey limestone with veins of calcite	2.44 8'	57.91-60.83 190'-198'
Hm8	Dark grey soft limestone and silts	4.27 14'	60.85-64.62 198'-212'
	Dirty grey soft limestone	5.18 17'	64.62-67.80 212'-229'
HLL	Hard dirty white limestone	0.30 1'	67.80-70.10 229'-230'
	Dirty white silty limestone	1.53 5'	70.10-71.43 230'-235'
	Very dark earthy clay	3.05 10'	71.43-74.63 235'-245'

British Geological Survey 5/9 British Geological Survey

British Geological Survey

Lenticular clay from examination of previous samples:

Oxford Clay (+? Kellaway Beds) to 112ft. 34.14m

British Geological Survey

to 242ft. 64.62m

British Geological Survey

Great Oolite ls. (+? Kellaway Beds) to 245ft. 74.68m

3/6 Agreed B.G.S.  
1/6

WELL LOG DATA SHEET			
POULTON HILL FARM		B.G.S. No. SU 09/131 T.W.A. No. SU 09/131	
N.G.R. SU 0940 9453		S.L. c 88 m.O.D.	T.D. 64 m Date 1977
Logs available:			
Core	<input type="checkbox"/> British Geological Survey	Gamma	<input type="checkbox"/> S.P. of Survey
Point Res.	<input checked="" type="checkbox"/>	Caliper	<input type="checkbox"/> Other: Drillers log
Casing details:			
Type	Diam. mm	From m B.G.L.	To m B.G.L.
Plain	250	0	23.6
Plain	204	23.6	50.9
Slotted	204	50.9	57.0
Formations			
British Geological Survey	Depth to base m	Thickness m	Notes British Geological Survey
Drift	2.1	2.1	Alluvium - depth from drillers log
OxC	23.2	21.1	depth from drillers log
KIS	32.6	9.4	Perforations from geophysical
KIC	37.5	4.9	log
Cb	41.9	4.4	
FMB clay	? 49.0	7.1	
FMBL	64.0	15.0	T.D. recording 58.2m
WhL/AO	-	-	drillers log; geophysics
HMB	-	-	end of c 52.0m; 64m recording
Ty	-	-	to TWA summary log.
TSF	-	-	
LFE	-	-	
CG	-	-	
UTG	-	-	
LInO	-	-	
ULI	-	-	

British Geological Survey

NP Not present British Geological Survey

M G Souter 1986 British Geological Survey

16/06/84 14:27 FAX 0734 596755 NAGCIR0.RBH6.CC 002-002

GRANGE FRM		SU 19/77	
Owner	Licence No.		
Occupier	IGS Ref. No. British Geological Survey		
Ground Level	m OD	ft OD	
Level of Well Top	m OD	ft OD	
Rest Water Level	0.46 m bwt	ft. bwt	
(Date )	m OD	ft. OD	
Construction	78/00/WE/NL		
Depth bwt	Dia.	Linings (below well top)	
104 M		From	To
		0	102 M
		150mm	fl + slot
Abstraction Rates Type of Pump British Geological Survey			
gph	Chem./Bact. Anal.		YES NO
gpd	Well Driller		
If insufficient space has been allowed, continue in 'Notes' overleaf.			

British Geological Survey

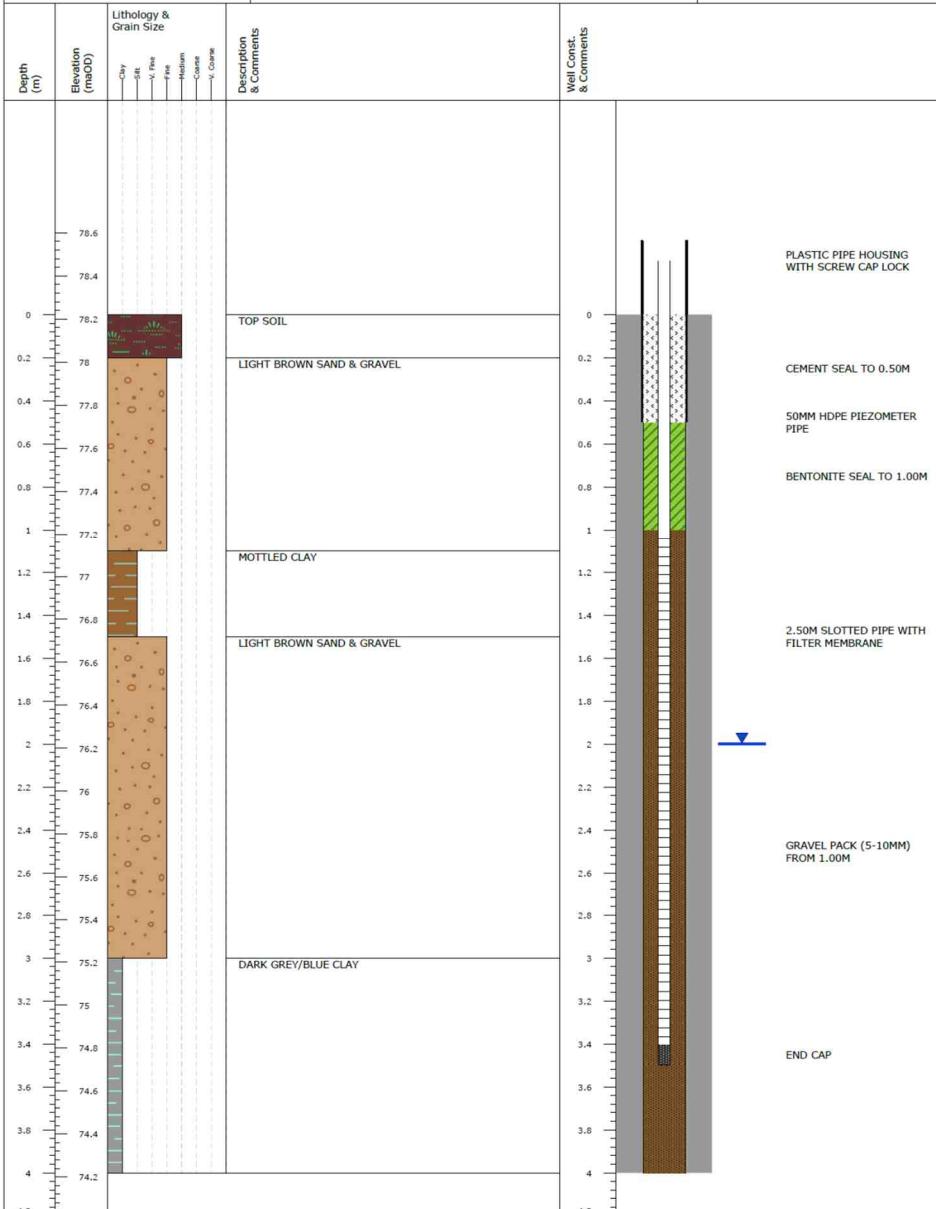


**BCL Consultant  
Hydrogeologists  
Limited**

**Contractor:** Hughes Drilling  
**Driller:** M. O'Sullivan

**Project:** Welcome Trust  
**Site:** Airfield Quarry  
**Job No:** BCL/PI/0219/001  
**Logged By:** Gavinder Meetcia  
**Drill Rig:** B40  
**Drilling Started:** 24 September 2018  
**Drilling Finished:** 25 September 2018

**Hole No:** P1\_18  
**Sheet:** 1 of 1  
**Eastings:** 412393  
**Northings:** 196626  
**Inc/Ori:** 90 / 0  
**Depth (m):** 4  
**Security Cover Elevation (maOD):** 78.56

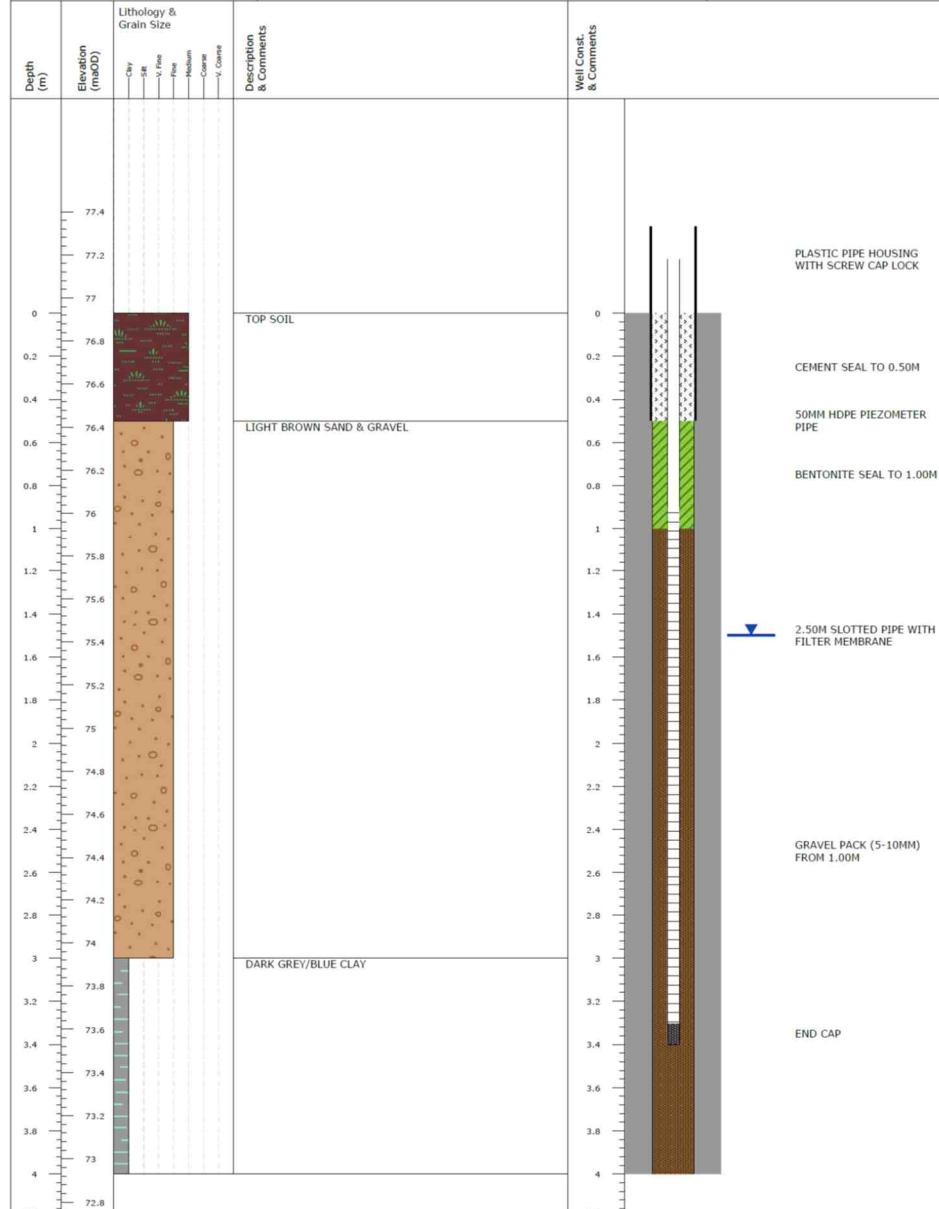


**BCL Consultant  
Hydrogeologists  
Limited**

**Contractor:** Hughes Drilling  
**Driller:** M. O'Sullivan

**Project:** Welcome Trust  
**Site:** Airfield Quarry  
**Job No:** BCL/PI/0219/001  
**Logged By:** Gavinder Meetcia  
**Drill Rig:** B40  
**Drilling Started:** 24 September 2018  
**Drilling Finished:** 25 September 2018

**Hole No:** P2\_18  
**Sheet:** 1 of 1  
**Eastings:** 412540  
**Northings:** 196301  
**Inc/Ori:** 90 / 0  
**Depth (m):** 4  
**Security Cover Elevation (maOD):** 77.33



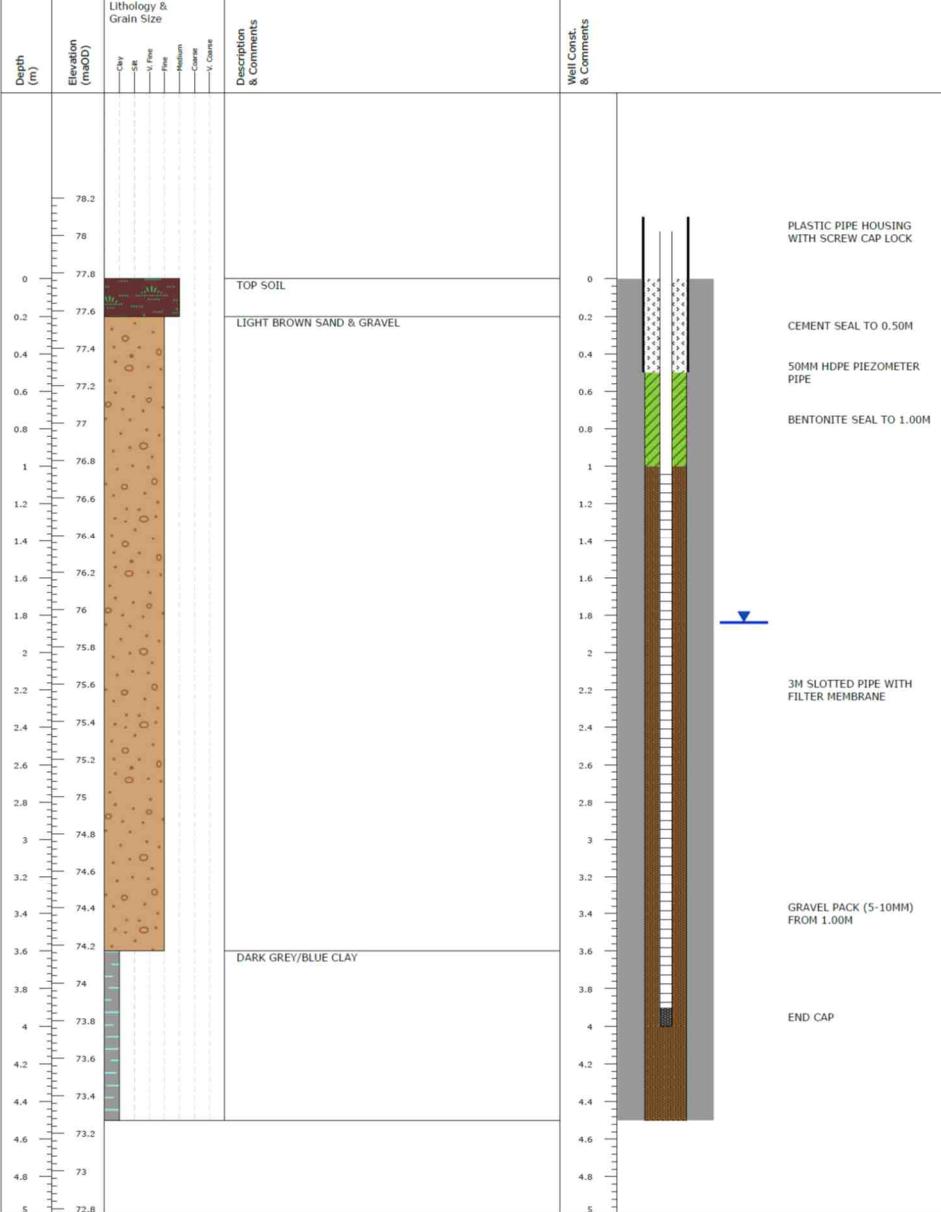


**BCL Consultant  
Hydrogeologists  
Limited**

Project:  
Site:  
Job No:  
Logged By:  
Drill Rig:  
Drilling Started:  
Drilling Finished:

**Welcome Trust  
Airfield Quarry**  
**BCL/PI/0219/001**  
**Gavinder Meetc**  
**B40**  
**24 September 2018**  
**25 September 2018**  
Hole No: P3\_18  
Sheet: 1 of 1  
Easting: 411812  
Northing: 195944  
Inc/Ori: 90 / 0  
Depth (m): 4.5  
Security Cover Elevation (maOD): 78.1

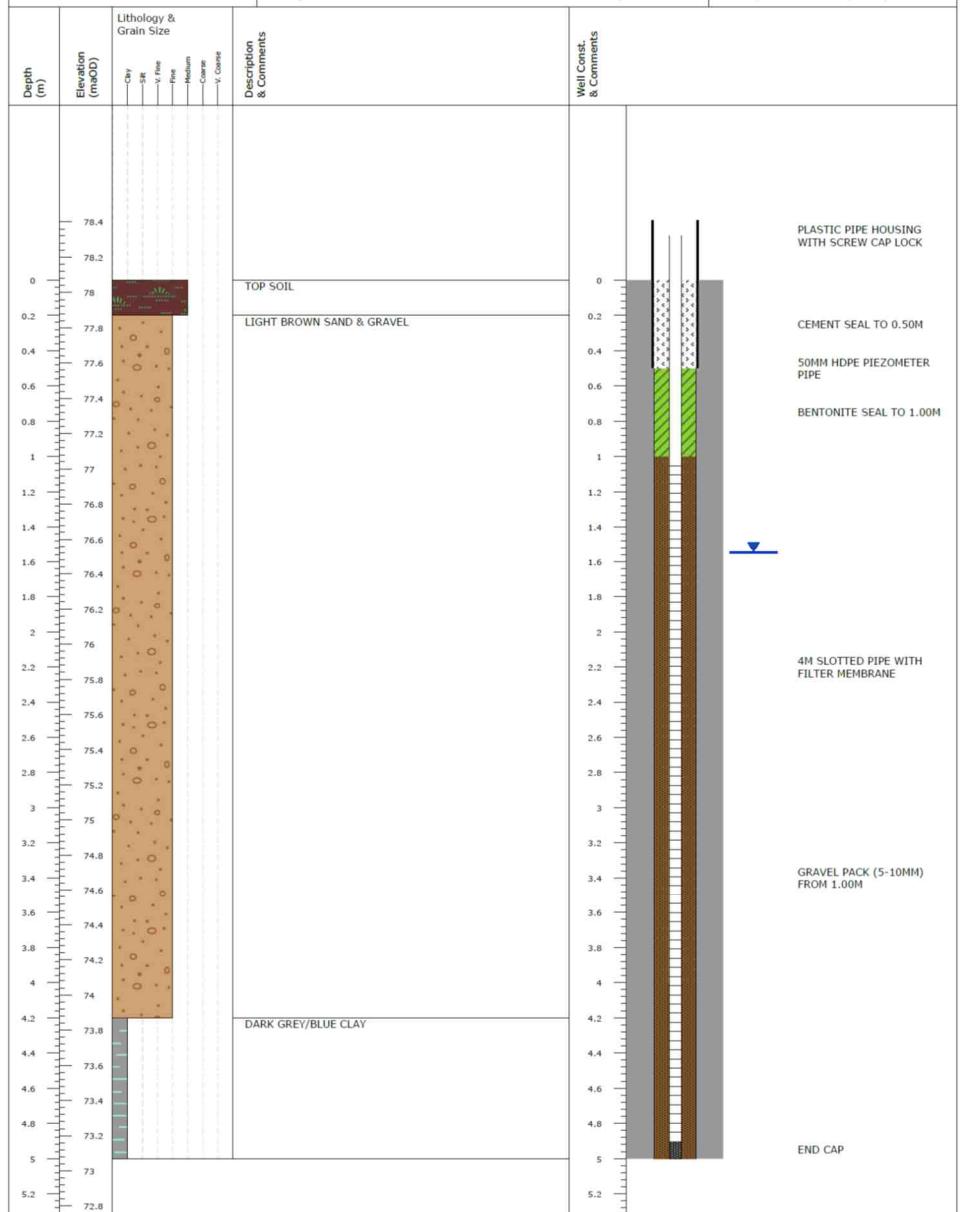
Contractor: **Hughes Drilling**  
Driller: **M. O'Sullivan**

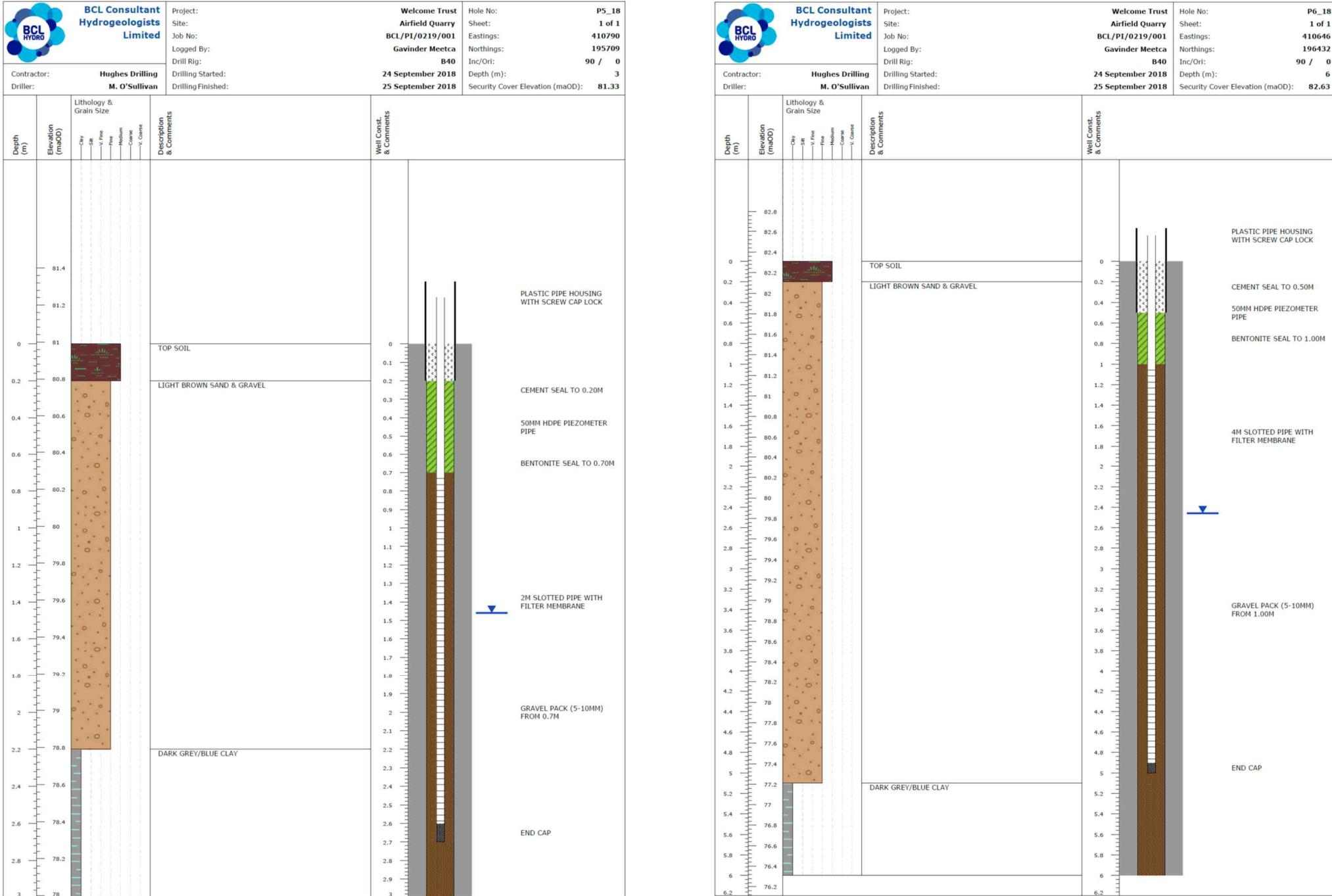


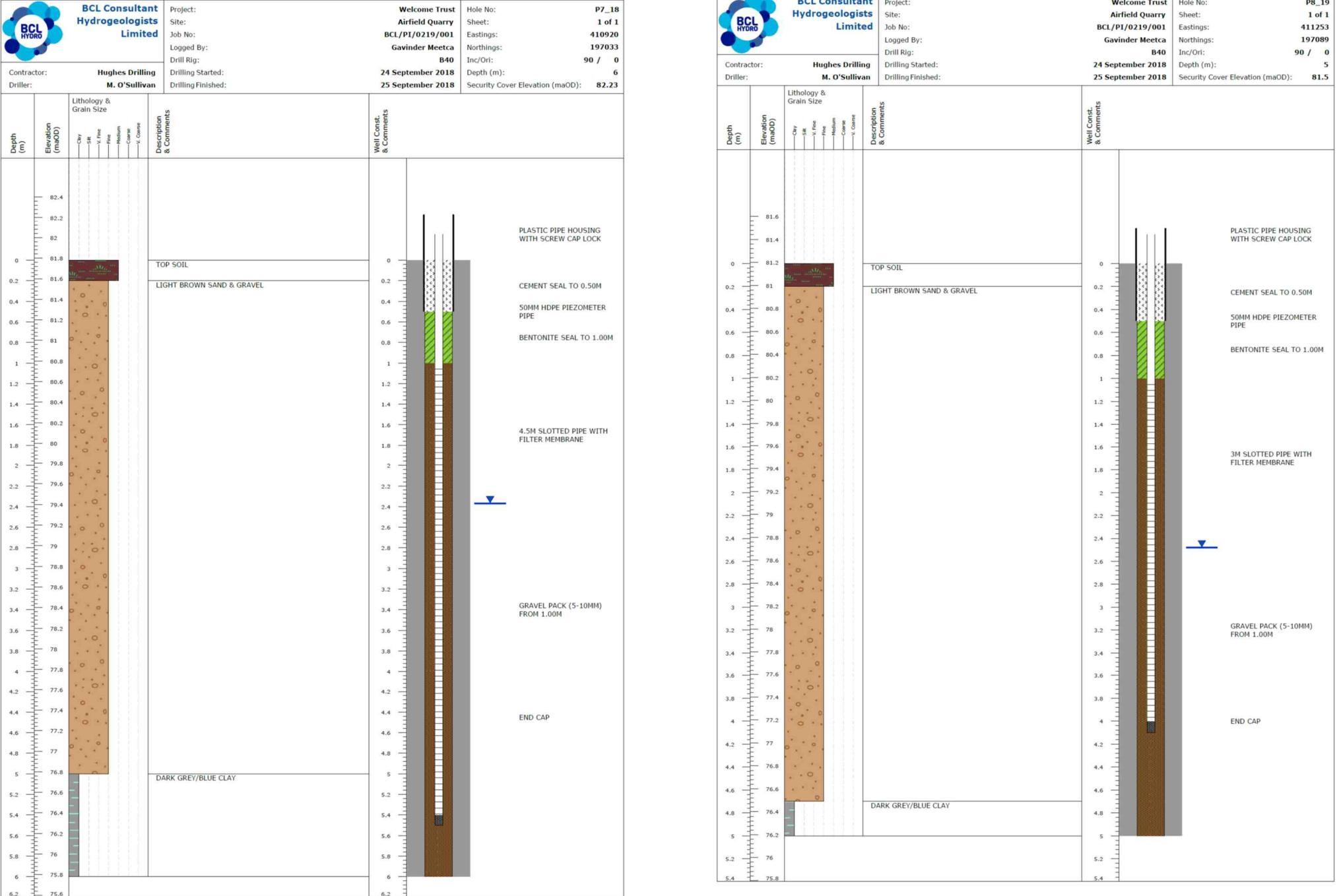
**BCL Consultant  
Hydrogeologists  
Limited**

Project:  
Site:  
Job No:  
Logged By:  
Drill Rig:  
Drilling Started:  
Driller:

**Welcome Trust  
Airfield Quarry**  
**BCL/PI/0219/001**  
**Gavinder Meetc**  
**B40**  
**24 September 2018**  
**25 September 2018**  
Hole No: P4\_18  
Sheet: 1 of 1  
Easting: 411424  
Northing: 195646  
Inc/Ori: 90 / 0  
Depth (m): 5  
Security Cover Elevation (maOD): 78.4





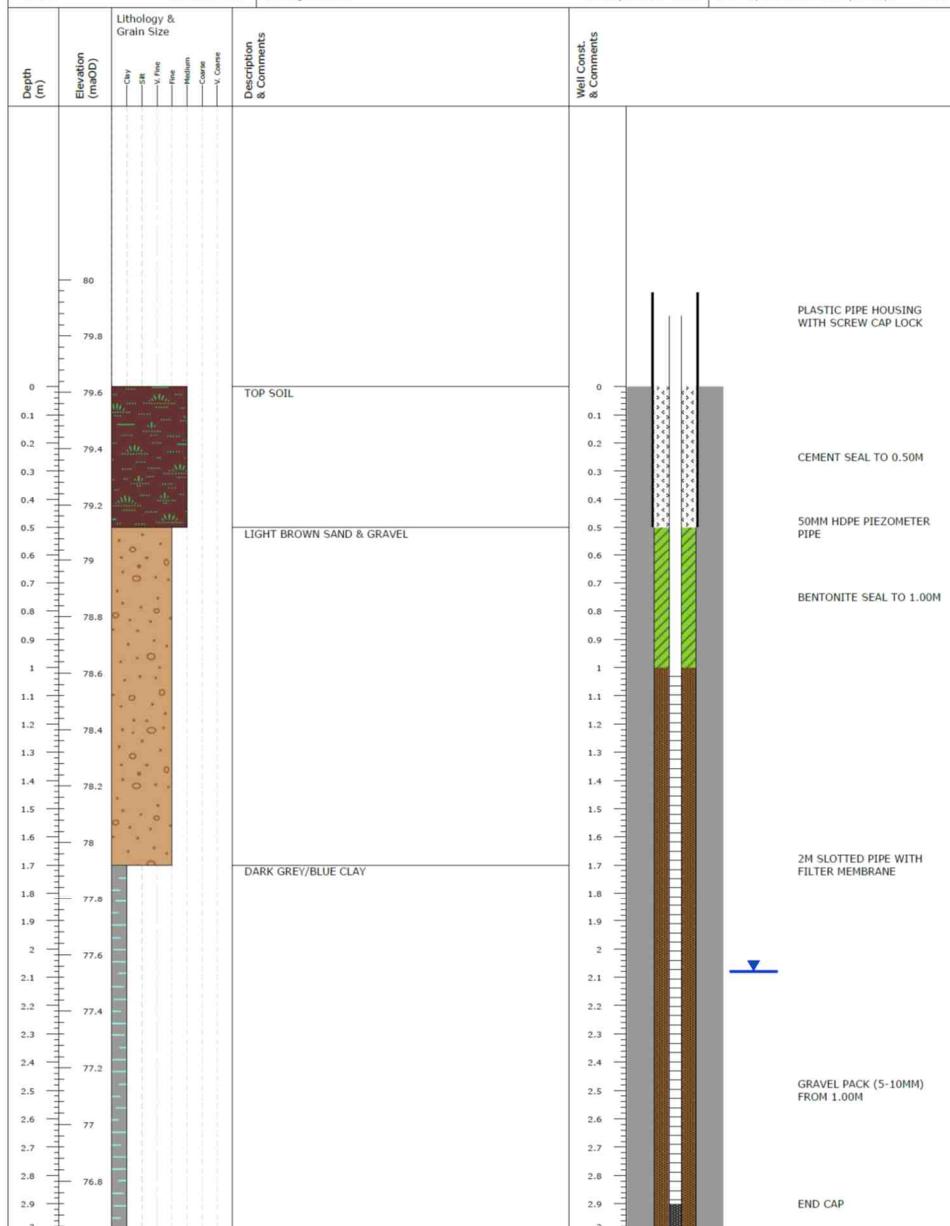




**BCL Consultant  
Hydrogeologists  
Limited**

**Contractor:** Hughes Drilling  
**Driller:** M. O'Sullivan

Project: Welcome Trust Hole No: P9\_18  
Site: 1 of 1  
Job No: 411741  
Logged By: Gavinder Meetc  
Drill Rig: B40  
Drilling Started: 24 September 2018  
Drilling Finished: 25 September 2018  
Elevations: Eastings: 411741  
Northing: 196990  
Inc/Orl: 90 / 0  
Depth (m): 3  
Security Cover Elevation (maOD): 79.95





Hills Quarry Products Limited

## Airfield Quarry

Gally Leaze, Gloucestershire

Proposed sand and gravel extraction and restoration

# Hydrogeological Risk Assessment

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## Appendix 4 Hydraulic testing of monitoring points

## AIRFIELD QUARRY - WATER FEATURES SURVEY

Conducted by P Burfitt and G Meetca. 24th/25th September 2018.

X	Y	Point	Description
410939	195306	1:D	Ditch: 2 m wide and 1 m deep on northern side of road (main drainage channel under road). Dry.
411203	195531	2:P	Pond: Ampney Pits LWS. Main pond 30 m x 70 m at eastern end of site, surrounded by woodland. Water is very cloudy green and stagnant. All ponds SE are dry (no standing water).
410266	195692	3:S	Ampney Brook (main channel): 4 m wide, water is around 10 cm deep, 1 m/sec surface flow velocity.
409656	196044	4:S	Footpath at Church Farm. Stream is 3 m wide, mostly dry - some small puddles but no flow.
409803	196158	5:S	Ampney Brook (main channel): 6 m wide, water is 0.3 m deep in standing section, 0.15 m deep in flowing section. Flow of up to 1 m/sec.
412033	196799	6:S	Drainage: no flow of water, some small puddles, 1.5 m deep.
412148	196473	7:D	Ditch: no flow of water, some small puddles, 1.5 m deep.
408982	195319	8:S	Former Canal route: 2 m wide, water up to 20 cm deep, GB reading = 0.16 m. Flow estimated at 5 l/s.
408926	195183	9:S	Stream: 1 m wide, water up to 15 cm deep. Flow estimated at 0.5 l/s flowing south.
408780	195371	10:S	Stream: 1 m wide, water up to 15 cm deep, <0.1 l/s flow at bridge crossing
408674	194927	11:S	River Churn (note - flow split between former canal [8:S] and this channel): 5 m wide, water up to 40 cm deep. Flowing east at approx 10 l/s
409735	194779	12:P	Pooled water: Under bridge, 10 m wide, water around 0.5m deep, unable to view full extent.
409448	197305	13:S	Stream: 2 m wide, water up to 20 cm deep, 0.5 l/s.
409307	197308	14:S	Stream: 3 m wide, water is 25 cm deep, little to no flow.
409639	197584	15:S	Ampney Brook: 4-5 m wide, water is 40-50 cm deep, Approx 5 l/s flow towards the south.
409469	198098	16:D	Ditch: 1.5 m deep, 0.5-1 m wide. Water is 5-10 cm deep and covered with vegetation along course. Very low flow (<0.1 l/s). Ditch becomes dry 50m north on eastern side of bridleway.
409367	198435	17:S	Channel: 1.5 m wide, 1.5 - 2 m deep. Completely dry and bed is not boggy
410244	197077	18:S	Channel: 3-5 m wide, 2 m deep compared to GL. Mostly dry with some small (<50cm) puddles with <5 cm of water in them. Some vegetation has begun growing in the bed.
410952	197650	19:D	Ditch: 0.5 m deep, 0.5 m wide. Dry on southern side of Duke's Field and also dry on eastern side of road next to culvert.
413221	197037	20:S	Stream: 0.5 -1 m wide, 2 m below GL, 5-15 cm of water, 0.2l/s flow. Drainage ditch alongside bridleway is dry (50 cm wide, 1 m deep).
413768	197006	21:P	Pond: 50 m x 50 m. Dry - ground is very boggy with no standing water.
412716	196691	22:D	Ditch: 1 m deep, 1 m wide. Dry on both sides of bridleway.
412212	196001	23:S	Stream: 2 m wide. Water is 10-15 cm deep, low flow of around 4 l/s
411330	198950	24:S	Stream: 1.5 m - 2 m wide. Water is around 10-15 cm deep. Very low flow (<0.1 l/s)
411718	198686	25:D	Ditch: 1 m wide, 50 cm deep. Dry. Ditch alongside field boundary also dry
411712	198406	26:D	Ditch: 1 m wide, 50 cm deep. Dry.
411594	198382	27:S	Stream: Joining main channel from west. 1.5 m wide, 0.4 m deep. Dry. Bed is not boggy and is filled with dead leaves.
410716	194813	28:P	Lagoon: Manmade and lined water circulation lagoons - Eysey Manor Quarry.
410085	194342	29:S	River Churn: 5 m wide, water around 0.5m deep. Flowing southeast at approx 10 l/s.
411059	194469	30:S	Ampney Brook: Approx. 5m wide, water is 0.5m deep, Approx 10l/s flow towards the south.
411210	194055	31:S	River Thames: Approx. 8m wide, water around 1m depth(around 1m below adjacent bank level). V slow movement to the east.
411478	194526	32:S	Former canal: Dry in base of feature and in drainage running adjacent to north and south (approx 1.5mbgl).
412227	195350	33:S	Former canal: standing water present in base of canal at bridge. No visible flow and around 0.25m deep.
412358	195872	34:S	Channel: Maintained drainage channel some 2m deep and 3m wide. Water level around 0.25m in base. No visible flow.
413087	195515	35:S	River Thames: Approx. 8m wide, water around 1m depth(around 2m below adjacent bank level). No visible movement. Pond shown adjacent to river on OS - dry.
412386	196214	36:S	Drainage: Approx. 2m wide running past Whetstone Quarry - standing water in base of feature.
412087	196065	37:S	Channel: Approx 4m wide and 1.5m deep. Water level around 0.25m and flow around 4l/s. Main channel conveying water south from eastern section of Airfield site.
411414	195637	38:S	Drainage: Approx. 1m and 1m deep, wide running southeast from main road. Dry.
412748	197885	39:S	Marston Meysey Brook: Approx 3m wide and 1.5m deep. Water level around 0.15m and flow around 8l/s. Eastern channel of upstream Marston Meysey Brook.
412479	197103	40:S	Marston Meysey Brook: Approx 3m wide and 1m deep. Water level around 0.15m and flow around 12.5l/s.
410499	197488	41:P	Pond: Shown on OS but no longer visible/in existence on ground.
410473	197608	42:P	Pond: Approx 10x20m. Water level around 1mbgl.
410645	197771	43:S	Spring: Shown on OS. No visible flow at time of survey. Dry.
411786	197486	44:P	Pond: Concrete lined reservoir. Looks to be lined but no access.
412697	196927	45:P	Pond: Approx. 5mx30m. Water level around 1m below ground level, formed on flat area adjacent to Marston Meysey Brook.
412879	196405	46:P	Pond: Series of ponds restored within Roundhouse Quarry. No access but water level around 2m below adjacent ground level.
412796	196464	47:W	Well: shown on OS. No access at time of survey but also not visible at point marked on map. Property located immediately adjacent to Roundhouse and expected to have been affected by that if still in existence.
411070	195178	48:P	Pond: Waterbody formed within part restored area at Eysey Manor Quarry. Water level around 2m below adjacent ground level, 1m above base of deposit.
410754	197158	49:D	Drainage: Manmade deep channel (around 2m), draining towards Down Ampney village. 0.15m water in base and no visible flow.
409278	195577	50:P	Pond: Waterbodies in Latton village. Houses built around flanks. Waterlevel estimated as 1.5m below adjacent ground level.

X	Y	Point	Description
413000	196250	Roundhouse Farm	Roundhouse Farm Quarry – former quarry restored to a series of groundwater fed ponds. Water level around 1.5m below surrounding ground level.
412500	196000	Whetstone Quarry	Whetstone Quarry – Current quarry operations. Most northwestern area has been worked and is currently left as an unlined flooded void. Water level around 1.5m below surrounding ground level.
411000	195000	Eysey Manor Quarry	Eysey Manor Quarry – Current quarry operations. Northeastern area closest to Airfield Quarry has been worked and currently left as openwaterbody. Water level around 1.5mbgl. Some clay lining along the northern flank of waterbody. Area to west of causeway road is being infilled (back to agriculture), using inert infill.

Spot flow gauge exercise (Ampney and Marston Meysey Brooks): 8th May 2019. P Burfitt and G Meetca.

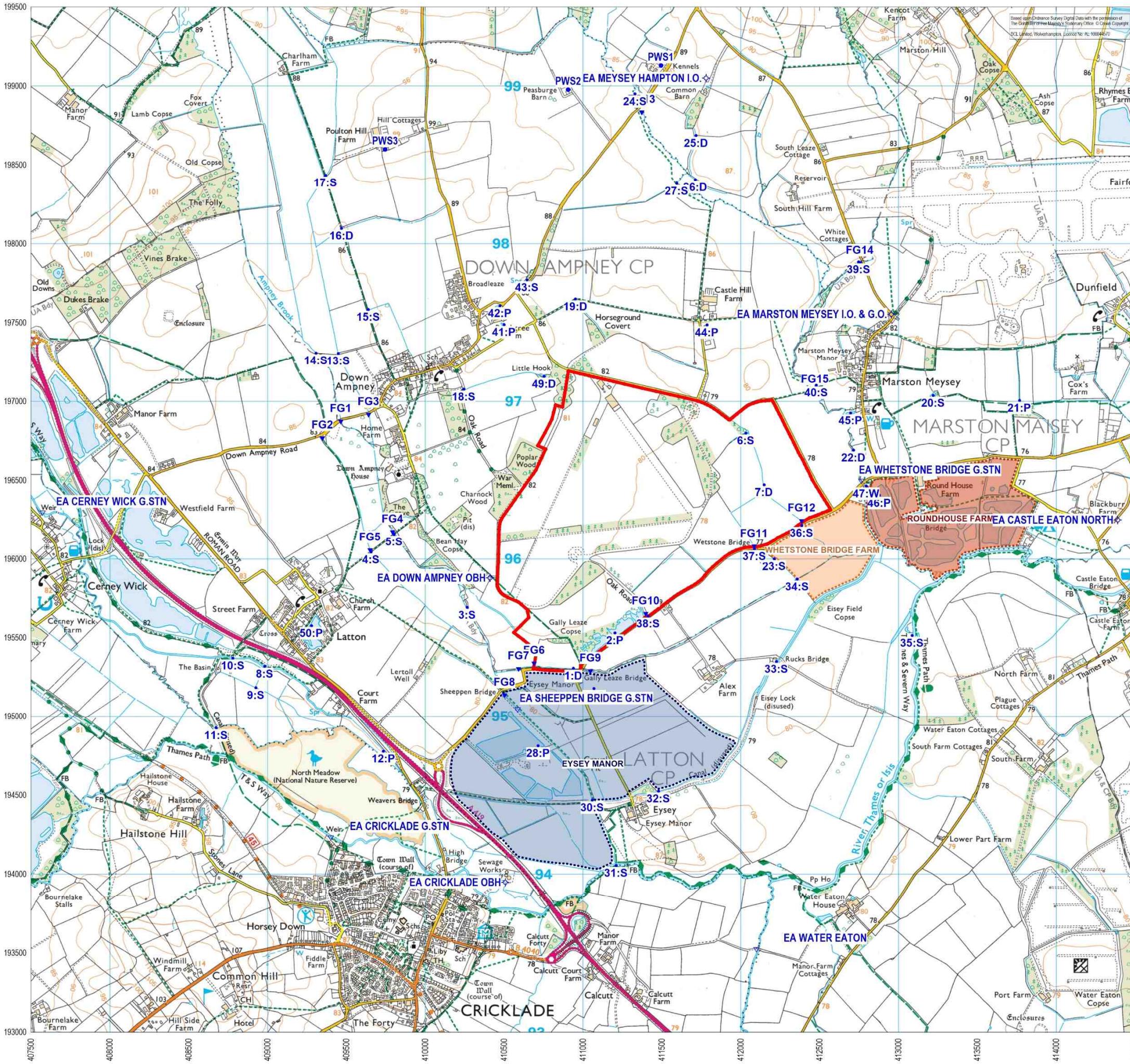
X	Y	Point	Calculated flow (litres/second)
409465	196868	FG1	239.2
409348	196764	FG2	0.5
409641	196912	FG3	15.7
409793	196169	FG4	478.2 - Not ideal gauge location (likely oversestimate).
409650	196053	FG5	2
410691	195334	FG6	Dry
410592	195299	FG7	Dry
410503	195131	FG8	324
411047	195285	FG9	Dry
411398	195647	FG10	Damp
412086	196077	FG11	15
412387	196239	FG12	Dry
411372	198829	FG13	6
412755	197872	FG14	8
412471	197054	FG15	12.5

#### Other flow observations

Date	Location	Flow observation (litres/sec)	Date	Location	Flow observation (litres/sec)
15/08/2019	6:S	Dry	07/04/2021	6:S	4
	36:S	Dry		36:S	Damp - no flow
	37:S	7		37:S	17
	38:S	Dry		37a:S	6
	Gain	7		38:S	Damp - no flow
02/09/2019	6:S	No vis flow	10/05/2021	Gain	13
	36:S	Dry		6:S	6
	37:S	5		36:S	4
	38:S	Dry		37:S	40
	Gain	5		37a:S	24
05/11/2019	6:S	15	09/06/2021	38:S	Dry
	36:S	Floodwater backing up to watercourse		Gain	34
	37:S	Floodwater backing up to watercourse		6:S	1
	38:S	Floodwater backing up to watercourse		36:S	Damp - no flow
	Gain	Floodwater backing up to watercourse		37:S	11
03/12/2019	6:S	10	12/07/2021	37a:S	7
	36:S	Floodwater backing up to watercourse		38:S	Dry
	37:S	Floodwater backing up to watercourse		Gain	10
	38:S	3		6:S	1
	Gain	Floodwater backing up to watercourse		36:S	Damp - no flow
06/01/2020	6:S	11	13/07/2021	37:S	11
	36:S	0.5		37a:S	5
	37:S	200		38:S	Dry
	38:S	0.5m deep - no vis flow		Gain	11

Date	Location	Flow observation (litres/sec)	Date	Location	Flow observation (litres/sec)	
	Gain	189	11/08/2021	6:S	0.25	
04/02/2020	6:S	12.5		36:S	Dry	
	36:S	1		37:S	7	
	37:S	375		37a:S	5	
	38:S	0.5m deep - no vis flow		38:S	Dry	
	Gain	363		Gain	7	
05/03/2020	6:S	25	06/09/2021	6:S	Damp - no flow	
	36:S	5		36:S	Dry	
	37:S	Floodwater backing up to watercourse		37:S	4	
	38:S	Floodwater backing up to watercourse		37a:S	3	
	Gain	Floodwater backing up to watercourse		38:S	Dry	
22/06/2020	6:S	5		Gain	4	
	36:S	0.25	07/10/2021	6:S	1	
	37:S	15		36:S	Damp - no flow	
	38:S	Dry		37:S	11	
	Gain	10		37a:S	7	
06/07/2020	6:S	0.25		38:S	Dry	
	36:S	Dry		Gain	10	
	37:S	11	04/11/2021	6:S	6	
	37a:S	9		36:S	2	
	38:S	Dry		37:S	30	
	Gain	11		37a:S	18	
04/08/2020	6:S	Damp - no flow		38:S	Dry	
	36:S	Dry		Gain	24	
	37:S	4	03/12/2021	6:S	1	
	37a:S	1		36:S	Damp - no flow	
	38:S	Dry		37:S	17	
	Gain	4		37a:S	6	
07/09/2020	6:S	3		38:S	Dry	
	36:S	Damp - no flow		Gain	16	
	37:S	18	06/01/2022	6:S	26	
	37a:S	12		36:S	5	
	38:S	Dry		37:S	75	
	Gain	15		37a:S	36	
08/10/2020	6:S	22		38:S	Dry	
	36:S	16		Gain	49	
	37:S	63	08/02/2022	6:S	8	
	37a:S	13		36:S	No flow	
	38:S	Dry		37:S	38	
	Gain	41		37a:S	18	
05/11/2020	6:S	47		38:S	Damp - no flow	
	36:S	19		Gain	30	
	37:S	113	09/03/2022	6:S	9	
	37a:S	19		36:S	0.25	
	38:S	Dry		37:S	38	
	Gain	66		37a:S	30	
01/12/2020	6:S	11		38:S	Damp - no flow	
	36:S	2		Gain	29	
	37:S	90	06/04/2022	6:S	4	

Date	Location	Flow observation (litres/sec)	Date	Location	Flow observation (litres/sec)	
	37a:S	36		36:S	No flow	
	38:S	Dry		37:S	34	
	Gain	79		37a:S	18	
06/01/2021	6:S	38		38:S	Dry	
	36:S	6		Gain	30	
	37:S	Floodwater backing up to watercourse				
	37a:S	54				
	38:S	Floodwater backing up to watercourse				
	Gain	Floodwater backing up to watercourse				
08/02/2021	6:S	28				
	36:S	4				
	37:S	Floodwater backing up to watercourse				
	37a:S	48				
	38:S	Floodwater backing up to watercourse				
	Gain	Floodwater backing up to watercourse				
09/03/2021	6:S	6				
	36:S	2				
	37:S	30				
	37a:S	18				
	38:S	Damp - no flow				
	Gain	24				



Key



Airfield Quarry site boundary

B/HOP/AQ\_HRA22



Hills Quarry Products Limited

Airfield Quarry, Gally Leaze, Gloucestershire

Hydrogeological Risk Assessment

Final Report

Figure 1: Water features survey – location plan

Drawn By: PB

Scale: 1:20,000

Date: Apr 22

Format: A3L



Hills Quarry Products Limited

## Airfield Quarry

Gally Leaze, Gloucestershire

Proposed sand and gravel extraction and restoration

# Hydrogeological Risk Assessment

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Appendix 5 Airfield Quarry – Water quality data























Hills Quarry Products Limited

## Airfield Quarry

Gally Leaze, Gloucestershire

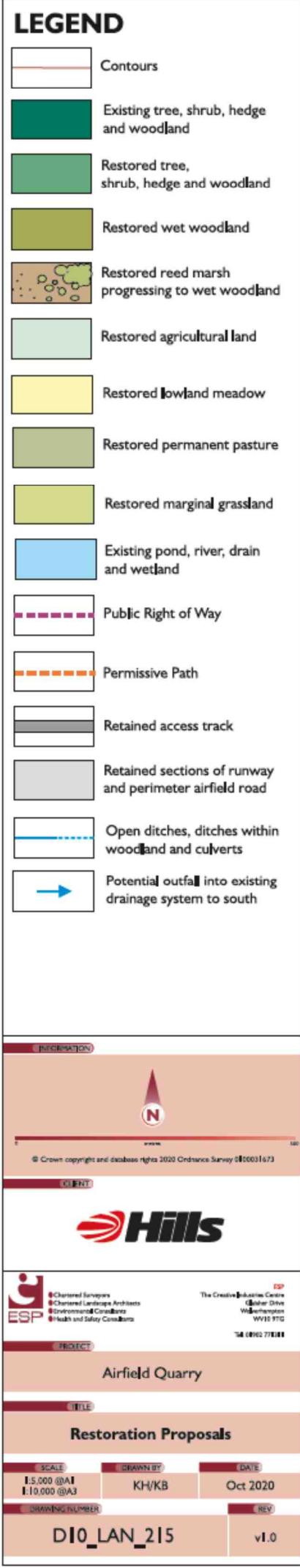
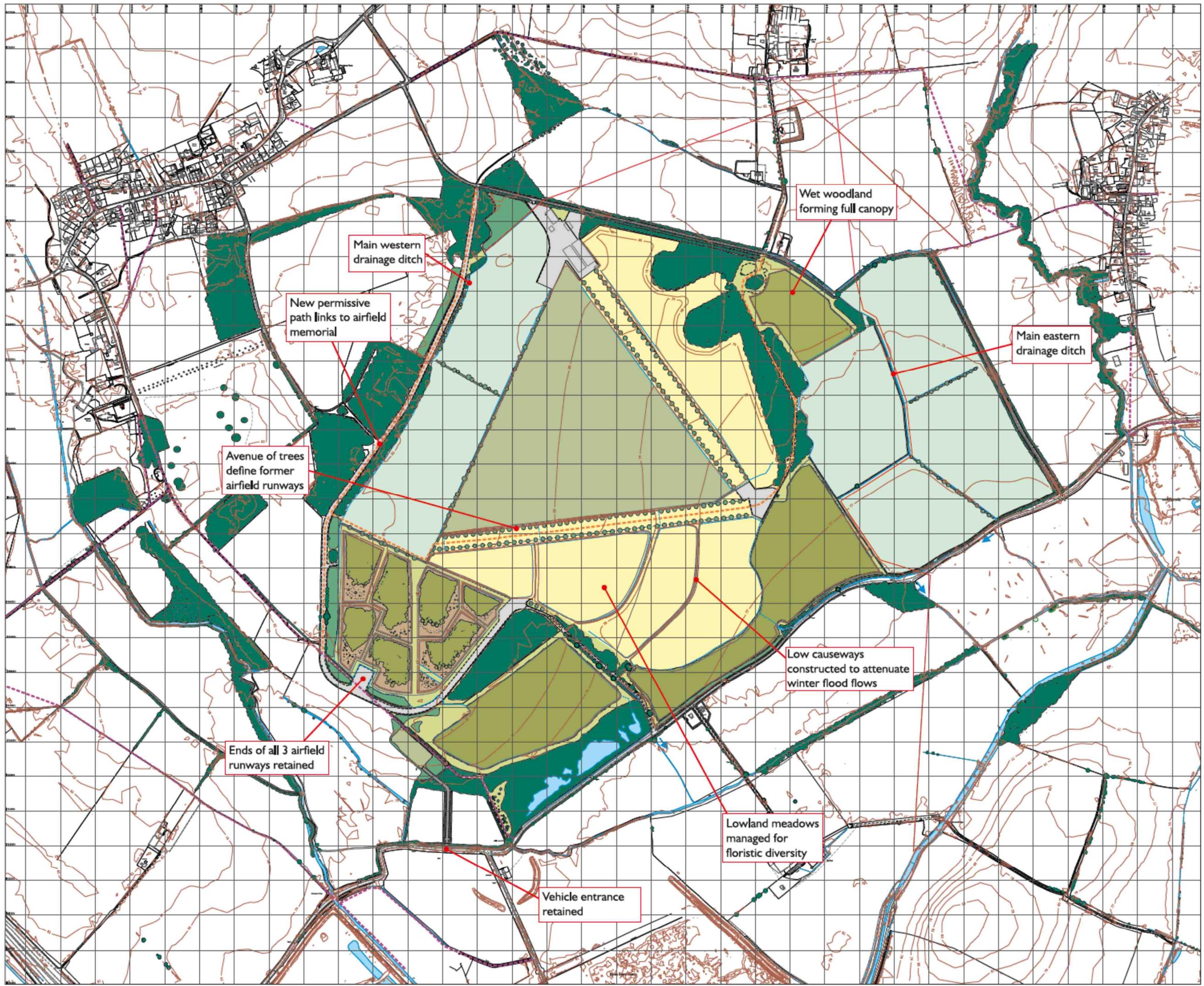
Proposed sand and gravel extraction and restoration

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Appendix 6 Restoration drawing (ESP Drawing no.  
D10\_LAN\_215)





Hills Quarry Products Limited

## Airfield Quarry

Gally Leaze, Gloucestershire

Proposed sand and gravel extraction and restoration

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Appendix 7 Water Acceptance Certificates – Shorncote Quarry





**Certificate No.** 21-02516-Issue 1-Page: 2  
**Site Address<sup>^</sup>** Rec Yard

ACSE Sample Number 55062  
 Sample ID 573529 - 21-71122  
 Client's Sample Ref.<sup>^</sup> Soil Sample  
 Material Source<sup>^</sup> Soil/Clay  
 Location / Sample Depth (m)<sup>^</sup> Shorncote Rec Yard  
 Time Sampled<sup>^</sup> 1310  
 Date Sampled<sup>^</sup> 17/03/2021  
 Sample Deviating Codes ef  
 Client's Sample Description<sup>^</sup>  
 ACS Testing Material Description<sup>^</sup> Soil  
 Principal Matrix (as received) Loam



<b>LANDFILL WASTE ACCEPTANCE CRITERIA (WAC)</b>					
<b>TEST VALUES</b>					
Mass of Undried Test Portion (Mw)	90.8	g	Volume of Leachant Used (L10)	0.899	litres
Mass of Dried Test Portion (Mp)	90.0	g			
Moisture Content Ratio (MC)	0.9	%	Volume of Eluate (VE10)	0.866	litres
Dry Matter Content (DR)	99.1	%			

<b>SOLIDS ANALYSIS</b>					<b>LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION</b>
Analyte	Method	AS	Sample Condition for Analysis	Results	
Total Organic Carbon (%)	MT/ACSE/102	*	As received	1.53	
Loss on ignition (%)	MT/ACSE/302	*ef	Air dried at 30 °C	3.4	
BTEX (mg/kg)	MT/ACSE/101	*ef	As received	< 0.60	
PCBs (7 congeners) (mg/kg)	MT/ACSE/104	*	Air dried at 30 °C	< 1.00	
Mineral oil (C10 - C40) (mg/kg)	MT/ACSE/105		As received	< 50	
PAHs (mg/kg)	MT/ACSE/108	*#ef	As received	4.20	
pH (units)	MT/ACSE/301	*ef	Air dried at 30 °C	8.9	

<b>ELUATE ANALYSIS</b>					<b>LANDFILL WASTE ACCEPTANCE CRITERIA SPECIFICATION</b>
Analyte	Method	AS	Concentration in Eluate (mg/l)	Amount Leached (mg/kg)	
Eluate Preparation	LP/ACSE/811				BS EN 12457-2-2002 LIMIT VALUES (mg/kg) at L/S 10
Liquid : Solid Ratio (L/S)	LP/ACSE/101	*	L/S 10	L/S 10	Inert Waste
pH (units)	MT/ACSE/301	*	8.2		Stable non-reactive hazardous waste in non-hazardous landfill
Temperature (°C)	MT/ACSE/301		20		Hazardous waste
Conductivity (mS/m)	MT/ACSE/303	*	25.20		
Arsenic	MT/ACSE/205	*	< 0.007	< 0.070	
Barium	MT/ACSE/205	*	0.0651	0.651	
Cadmium	MT/ACSE/205	*	< 0.0008	< 0.008	
Chromium (total)	MT/ACSE/205	*	< 0.001	< 0.010	
Copper	MT/ACSE/205	*	< 0.008	< 0.080	
Mercury	MT/ACSE/202	*	< 0.0001	< 0.0010	
Molybdenum	MT/ACSE/205	*	0.0028	0.028	
Nickel	MT/ACSE/205	*	< 0.0008	< 0.0080	
Lead	MT/ACSE/205	*	< 0.004	< 0.040	
Antimony	MT/ACSE/205	*	< 0.003	< 0.030	
Selenium	MT/ACSE/205	*	< 0.006	< 0.060	
Zinc	MT/ACSE/205	*	< 0.002	< 0.020	
Chloride	MT/ACSE/204	*	5.14	51.39	
Fluoride	MT/ACSE/204	*	0.24	2.420	
Sulphate	MT/ACSE/204	*	71.89	718.9	
Total dissolved solids	MT/ACSE/304	*	245	2450	
Phenol index	MT/ACSE/107	*	< 0.05	< 0.50	
Dissolved organic carbon	MT/ACSE/103	*	9.04	90.37	

**Comments:** (comments are beyond the scope of UKAS accreditation)

Key (at clients request):

Individual test result exceeds the landfill waste acceptance criteria limit for inert waste.

The landfill waste acceptance criteria limits are provided for guidance only.  
 Eluates prepared in accordance with BS EN 12457-3:2002\*