Determinand	No. of Exceedances / No. Analysed	Units	DWS	EQS	Concentration		> DWS	> EQS
					Minimum	Maximum		
PAH								
Naphthalene	1 / 18	µg/L	6	2	<0.01	110	Yes	Yes
Phenanthrene	1 / 18	µg/L	4	-	<0.01	6.7	Yes	-
Anthracene	1 / 18	µg/L	90	0.1	<0.01	1.4	No	Yes
Fluoranthene	1 / 18	µg/L	4	0.0063	<0.01	0.56	No	Yes
Metals								
Arsenic	1 / 20	µg/L	10	50	<1.1	60	Yes	Yes
Copper	19 / 20	µg/L	2,000	1	<0.7	99	No	Yes
Iron	9 / 20	µg/L	200	1,000	9	3,200	Yes	Yes
Lead	10 / 20	µg/L	10	1.2	<1	30	Yes	Yes
Nickel	1 / 20	µg/L	20	4	<0.3	13	No	Yes
Zinc	3 / 20	µg/L	6,000	10.9	<0.4	27	No	Yes
Chromium (hexavalent)	1 / 20	µg/L	50	3.4	<5	16	No	Yes
Inorganics								
Ammoniacal Nitrogen (as N)	2 / 20	mg/L	-	0.3	<0.015	1.5	-	Yes

Table 6.18.6: Summary of Exceedances in Soil Leachate in Natural Ground

Determinand	No. of Exceedances / No. Analysed	Units	DWS	EQS	Concentration		>DWS	> EQS
					Minimum	Maximum		
pH		-	-	-	6.5	8	-	-
Dissolved Organic Carbon		mg/L	-	-	<0.1	12.9	-	-
Organophosphorus Pesticides								
Malathion	2 / 3	µg/L	0.1	0.01	<0.03	0.04	No	Yes
Metals								
Arsenic	1 / 19	µg/L	10	50	<1.1	180	Yes	Yes
Cadmium	1 / 19	µg/L	5	0.08	<0.08	0.1	No	Yes
Copper	16 / 19	µg/L	2,000	1	<0.7	22	No	Yes
Iron	9 / 19	µg/L	200	1,000	10	2,100	Yes	Yes
Lead	12 / 19	µg/L	10	1.2	<1	5.3	No	Yes
Zinc	4 / 19	µg/L	6,000	10.9	<0.4	15	No	Yes

6.18.26 Table 6.18.4 to Table 6.18.6 highlights which determinands exceed the DWS and which exceed the EQS. It should be noted that the DWS was not exceeded in soil leachate from Made Ground for the following determinands: Anthracene (DWS 90 µg/l); Fluoranthene (DWS 4 µg/l); Copper (DWS 2,000 µg/l); Zinc (DWS 6,000 µg/l), Nickel (DWS 20 µg/l) and Chromium (hexavalent) (DWS 50 µg/l).

6.18.27 DWS was not exceeded in soil leachate from natural ground for Malathion (DWS 0.1 µg/l); Cadmium (DWS 5 µg/l); Lead (DWS 10 µg/l); Copper and Zinc. The respective DWS criteria were also not exceeded in soil leachate from Topsoil samples for Nickel (DWS 20 µg/l), Copper, Lead and Zinc.

6.18.28 2No. samples out of 20No. in Made Ground recorded marginal exceedances above EQS for Ammoniacal Nitrogen. However, it is considered that the risk to controlled waters from Ammoniacal Nitrogen is low.

6.18.29 The results of the Tier 2 assessment indicate a potential risk to controlled waters from localised concentrations of the determinands in soil leachate. However, the marginal exceedances above EQS and conservative nature of the Tier 2 assessment suggest that any risk to controlled waters would be negligible.

Groundwater Test Results (Tier 2 Screening)

6.18.30 The results of the Tier 2 screening assessment for the groundwater samples obtained during the 2019 Ground Investigation are presented in Appendix C and the certificates of chemical analysis are presented in the Ground Investigation Report (HE514465-BAM-EGT-ZZ-RP-WM-0001).

6.18.31 The groundwater tests carried out included:

- Groundwater Suite tests including the following determinands: Arsenic, Boron, Cadmium, Chromium (hexavalent), Chromium (total), Copper, Iron, Lead, Mercury, Nickel, Selenium, Zinc, Ammoniacal Nitrogen, Cyanide (total), Cyanide (free), pH, Phenols (HPLC), and Dissolved Organic Carbon;
- total petroleum hydrocarbons (speciated) – CWG Aliphatic/Aromatic Split and banding
- polycyclic aromatic hydrocarbons (PAH, speciated);
- volatile organic compounds (VOCs);
- semi-volatile organic compounds (SVOCs); and
- Phenols.

6.18.32 2No. monitoring wells out of 19No. were screened in Made Ground deposits and the remaining 17No. monitoring wells were screened in natural ground. Table 6.17.2 presents a summary of the groundwater levels recorded in these monitoring wells.

6.18.33 Three rounds of groundwater monitoring have been undertaken. On one occasion (during round 2) no access was available for BH11 and BH12, therefore no monitoring was undertaken at these locations. Table 6.18.7 provides a summary of the determinands identified in groundwater from Made Ground across the Scheme that exhibited exceedances above the Tier 2 Generic Assessment Criteria.

Table 6.18.7: Summary of Exceedances above the GAC in groundwater samples (rounds 1, 2 and 3) taken from monitoring wells screened in Made Ground across the Scheme

Determinand	No. of Exceedances / No. Analysed	Units	GAC (DWS)	GAC (EQS)	Concentration		> DWS	> EQS
					Minimum	Maximum		
pH	-	-	-	-	6.9	9.4	-	-
Dissolved Organic Carbon	-	mg/L	-	-	149	444	-	-
TPH								
>C16-C21 Aliphatics	2 / 5*	µg/L	300	-	<10	1,160	Yes	-
>C21-C35 Aliphatics	2 / 5*	µg/L	300	-	<10	4,270	Yes	-
>EC16-EC21 Aromatics	2 / 5*	µg/L	90	-	11	424	Yes	-
>EC21-EC35 Aromatics	3 / 5*	µg/L	90	-	21	1,090	Yes	-
>C8-C10 Aliphatics	1 / 5*	µg/L	300	-	149	412	Yes	-
BTEX								
Ethylbenzene	3 / 5*	µg/L	300	20	<5	45	No	Yes
Xylene Total	3 / 5*	µg/L	500	30	<11	91	No	Yes
Inorganics								
Ammoniacal Nitrogen as N (Filtered)	2 / 5*	mg/L	-	0.3	0.0417	5.46	-	Yes
Metals								
Arsenic (filtered)	5 / 6	µg/L	10	50	8.47	33.9	Yes	No
Chromium (hexavalent) (Filtered)	4 / 6	µg/L	50	3.4	<3	27.8	No	Yes
Chromium (III+VI)	4 / 6	µg/L	50	-	39	415	Yes	-
Copper (filtered)	2 / 6	µg/L	2000	1	0.495	5.32	No	Yes
Iron	6 / 6	µg/L	200	1,000	16,200	469,000	Yes	Yes
Iron (filtered)	1 / 6	µg/L	200	1,000	21.7	36,100	Yes	Yes
Nickel (filtered)	6 / 6	µg/L	20	4	4.17	7.95	No	Yes
PAH								
Naphthalene	2 / 5*	µg/L	6	2	0.172	9.3	Yes	Yes
Phenanthrene	1 / 5*	µg/L	4	-	1.1	8.38	Yes	-
Anthracene	5 / 5*	µg/L	90	0.1	0.123	2.2	No	Yes
Fluoranthene	5 / 5*	µg/L	4	0.0063	0.705	11	Yes	Yes
Pyrene	1 / 5*	µg/L	9	-	0.62	9.62	Yes	-
Benz(a)anthracene	1 / 5*	µg/L	3.5	-	0.054	6.54	Yes	-
Benzo(a)pyrene	5 / 5*	µg/L	0.01	0.00017	0.934	15.9	Yes	Yes
Indeno(1,2,3-c,d)pyrene	5 / 5*	µg/L	0.1	-	0.563	12.8	Yes	-
Dibenz(a,h)anthracene	5 / 5*	µg/L	0.07	-	0.151	1.88	Yes	-
Benzo(g,h,i)perylene	5 / 5*	µg/L	0.1	0.0082	0.742	4.04	Yes	Yes
Benzo(b)fluoranthene	5 / 5*	µg/L	0.1	0.017	1.52	24.5	Yes	Yes
Benzo(k)fluoranthene	5 / 5*	µg/L	0.1	0.017	0.584	7.74	Yes	Yes
Phenols								
Phenol	3 / 6	µg/L	5,800	7.7	<9	13.6	No	Yes

Determinand	No. of Exceedances / No. Analysed	Units	GAC (DWS)	GAC (EQS)	Concentration		> DWS	> EQS
					Minimum	Maximum		
Phenol (filtered)	2 / 4*	µg/L	5,800	7.7	<2	16.8	No	Yes
SVOC								
Bis(2-ethylhexyl)phthalate	2 / 5*	µg/L	8	1.3	<8	127	Yes	Yes

**During the third round of monitoring at BH26 there was insufficient water in the well to allow for analysis of all determinands.*

6.18.34 2No. out of the 19No. monitoring wells were screened in Made Ground materials. The 2No. monitoring wells were BH03 at Featherstone Overbridge area and BH26 at the northern extent of the Scheme.

6.18.35 Table 6.18.8 provides a summary of the determinands identified in groundwater from the 17No. monitoring wells screened in natural deposits at the Scheme that exhibited exceedances above the Tier 2 Generic Assessment Criteria.

Table 6.18.8: Summary of Exceedances in groundwater (rounds 1, 2 and 3) taken from monitoring wells screened in the Natural Deposits at the Site

Determinand	No. of Exceedances / No. Analysed	Units	GAC (DWS)	GAC (EQS)	Concentration		> DWS	> EQS
					Minimum	Maximum		
pH	-	-	-	-	6.7	11	-	-
Dissolved Organic Carbon	-	mg/L	-	-	<3	659	-	-
TPH								
>C12-C16 Aliphatics	9 / 49*	µg/L	300	-	<10	5,110	Yes	-
>C16-C21 Aliphatics	1 / 49*	µg/L	300	-	<10	420	Yes	-
>C21-C35 Aliphatics	11/ 49*	µg/L	300	-	<10	4,070	Yes	-
>EC21-EC35 Aromatics	12 / 49*	µg/L	90	-	<10	1,210	Yes	-
>C8-C10 Aliphatics	2 / 49*	µg/L	300	-	<10	390	Yes	-
BTEX								
Xylene Total	4 / 49*	µg/L	500	30	<11	60	No	Yes
Inorganics								
Ammoniacal Nitrogen as N (Filtered)	8 / 49*	mg/L	-	0.3	0.013	0.998	-	Yes
Metals								
Arsenic (filtered)	8 / 49*	µg/L	10	50	<0.5	15.5	Yes	No
Cadmium (filtered)	10 / 49*		5	0.08	<0.08	4.61	No	Yes
Chromium (hexavalent) (Filtered)	7 / 49*	µg/L	50	3.4	<3	20.2	No	Yes
Chromium (III+VI)	14 / 49*	µg/L	50	-	<3	242	Yes	-
Copper (filtered)	15 / 49*	µg/L	2,000	1	<0.3	12.4	No	Yes
Iron	43 / 49*	µg/L	200	1,000	34.3	213,000	Yes	Yes
Iron (filtered)	13 / 49*	µg/L	200	1,000	<19	10,700	Yes	Yes
Nickel (filtered)	16 / 49*	µg/L	20	4	<0.4	23.2	Yes	Yes
Zinc (filtered)	6 / 49*	µg/L	6,000	10.9	<1	40.1	No	Yes
PAH								
Fluoranthene	41 / 49*	µg/L	4	0.0063	<0.025	1.94	No	Yes

Determinand	No. of Exceedances / No. Analysed	Units	GAC (DWS)	GAC (EQS)	Concentration		> DWS	> EQS
					Minimum	Maximum		
Benzo(a)pyrene	46 / 49*	µg/L	0.01	0.00017	<0.002	1.91	Yes	Yes
Indeno(1,2,3-c,d)pyrene	10 / 49*	µg/L	0.1	-	<0.005	1.9	Yes	-
Dibenz(a,h)anthracene	7 / 49*	µg/L	0.07	-	<0.005	0.357	Yes	-
Benzo(g,h,i)perylene	29 / 49*	µg/L	0.1	0.0082	<0.005	2.46	Yes	Yes
Benzo(b)fluoranthene	27 / 49*	µg/L	0.1	0.017	<0.005	3.19	Yes	Yes
Benzo(k)fluoranthene	25 / 49*	µg/L	0.1	0.017	<0.005	1.22	Yes	Yes
Phenols								
Phenol	2 / 49*	µg/L	5800	7.7	<0.5	9.07	No	Yes
Phenol (filtered)	6 / 49*	µg/L	5800	7.7	<0.5	87.4	No	Yes

*BH11 and BH12 were unavailable for groundwater monitoring on one occasion.

Detailed Quantitative Risk Assessment (DQRA)

6.18.36 Following the Tier 2 risk assessment detailed in the Generic Quantitative Assessment for groundwater detailed in Section 6.17, elevated concentrations of TPHs, PAHs, some metals, VOCs, SVOCs, Phenols and Ammoniacal Nitrogen were detected in groundwater samples at the Site which warranted further detailed assessment. The detailed quantitative risk assessment (DQRA) has been undertaken in accordance with current guidance to assess the potential risk posed to the receptors by the elevated contaminant concentrations. Results obtained from BH22A were discounted due to an incorrect monitoring well installation allowing infiltration of rainwater.

6.18.37 The risk assessment is based on the guidance contained within the Environment Agency (2006) Remedial Target Methodology - Hydrogeological Risk Assessment for Land Contamination' (RTM) and the associated Remedial Targets Worksheet (Release 3.2). The RTM document provides guidance on the method to derive remedial targets from soil, leachate and groundwater data.

6.18.38 The assessments have been based on groundwater data only as the determinands recorded at concentration exceeding their respective generic assessment criteria (DWS and/or EQS) are considered the principal contaminants of concern.

6.18.39 A Level 3 groundwater assessment was undertaken for the site. The Level 3 groundwater assessment simulates the migration of contaminants that have already reached the underlying groundwater, considering the potential attenuation as the contaminated groundwater moves to the receptor(s):

- Potable Groundwater Abstraction
- Latherford Brook

6.18.40 The assessment does not take into consideration dilution at the receptor.

Remedial Target Methodology

6.18.41 The site-specific remedial target concentrations with respect to the elevated contaminants in groundwater were computed in accordance with the Environment Agency's Risk Assessment Methodology (RTM). The Remedial Target Worksheet (Release 3.2) for the hydrogeological risk assessment for land contamination was utilised. The input parameters were derived from data from the ground investigation at the site and the various databases for related soil types and geochemical inputs.

Risk Assessment Simulation Overview

6.18.42 The risk assessment simulations assume a continuous groundwater body present beneath the Scheme. This assumption is based on the groundwater monitoring data obtained and data from the Ground Investigation Report (HE514465-BAM-EGT-ZZ-RP-WM-0001). Aerobic biodegradation rates for the organic contaminants have been used as dissolved oxygen concentration data was available for the groundwater at the Scheme. This is a conservative approach.

6.18.43 As there was 1No. groundwater and 1No. surface water receptor considered in the DQRA, Table 6.18.9 and Table 6.18.10 have separated the contaminants of concern based on the receptor they pose a risk to and their corresponding Acceptance Criteria (groundwater (DWS) and/or surface water (EQS)). The groundwater abstraction (AW9) considered is a private water supply and no information about its use was able to be obtained. Therefore, to make the assessment more conservative it was assumed to be a potable water supply.

6.18.44 The specific input parameters for each simulation in RTM worksheet and the physical properties of the various contaminants are included in Appendix D to this GIR.

Results of the Detailed Quantitative Risk Assessment (DQRA)

Drinking Water Standard (DWS) Exceedances

6.18.45 Table 6.18.9 details the results of the DQRA, full results are included in Appendix D, the simulated remedial target values and the predicted maximum concentrations of the various contaminants at the compliance point (Groundwater abstraction – AW9).

6.18.46 The results summarise the predicted concentrations of the contaminant after the contaminant reaches the receptor. A Remedial Target Value (RTV) is given in Red or Green. Red corresponds to an RTV value less than the maximum concentration recorded in groundwater which indicates that mitigation measures may be required, and Green corresponds to an RTV value more than the maximum concentration recorded in groundwater which indicates that mitigation measures are not required.

Table 6.18.9: Results of DQRA Assessment for the Groundwater Abstraction Receptor (AW9)

Determinand	Target Concentration (DWS) (mg/L)	Maximum Concentration Recorded in Groundwater (mg/L)	Predicted Concentration at Receptor (mg/L)	Remedial Target Value (RTV) (mg/L)
>C12-C16 Aliphatics	0.3	5.11	0	No Impact
>EC16-EC21 Aliphatics	0.3	0.15	0	No Impact
>EC21-EC35 Aliphatics	0.3	0.367	0	No Impact
>EC16-EC21 Aromatics	0.3	1.09	0	No Impact
>EC21-EC35 Aromatics	0.09	1.09	0	No Impact
>C8-C10 Aliphatics	0.3	0.412	0	No Impact
Ethylbenzene	0.3	0.034	3.58E-194	2.85E+191
Xylene Total	0.5	0.091	3.61E-195	1.26E+193
Naphthalene	0.006	0.0093	1.17E-165	4.76E+160
Phenanthrene	0.004	0.00838	8.51E-305	3.94E+299
Fluoranthene	0.004	0.011	0	No Impact
Pyrene	0.009	0.00962	4.95E-302	1.75E+297
Benz(a)anthracene	0.0035	0.00654	0	No Impact
Benzo(a)pyrene	0.00001	0.0159	0	No Impact
Indeno(1,2,3-c,d)pyrene	0.0001	0.0128	0	No Impact
Dibenz(a,h)anthracene	0.00007	0.00188	0	No Impact
Benzo(g,h,i)perylene	0.0001	0.00404	0	No Impact
Benzo(b)fluoranthene	0.00001	0.0245	0	No Impact
Benzo(k)fluoranthene	0.00001	0.00774	0	No Impact
Bis(2-ethylhexyl) phthalate	0.008	0.12700	0	No Impact
Nickel	0.02	0.0232	6.56E-03	7.08E-02
Arsenic	0.01	0.0339	8.47E-03	4.00E-02
Chromium III	0.05	0.415	2.14E-284	9.71E+281
Chromium VI	0.05	0.415	0	No Impact

xx RTV less than maximum concentration recorded in groundwater
xx RTV greater than maximum concentration recorded in groundwater

6.18.47 The results of the DQRA for groundwater sampled suggest that there will be no risks from the organic or metal determinands detected in groundwater to the identified critical receptor (Groundwater Abstraction AW9).

Environmental Quality Standard Exceedances

6.18.48 Table 6.18.10 details the results of the DQRA, full results are included in Appendix D, the simulated remedial target values and the predicted maximum concentrations of the various contaminants at the compliance point (Latherford Brook).

6.18.49 The results summarise the predicted concentrations of the contaminant after the contaminant reaches the receptor. A Remedial Target Value (RTV) is given in Red or Green. Red corresponds to an RTV value less than the maximum concentration recorded in groundwater which indicates that mitigation measures may be required, and Green corresponds to an RTV value more than the maximum concentration recorded in groundwater which indicates that mitigation measures are not required.

Table 6.18.10: Results of DQRA for Surface Water Receptor (Latherford Brook)

Determinand	Target Concentration (EQS) (mg/L)	Maximum Concentration Recorded in Groundwater (mg/L)	Predicted Concentration at Receptor (mg/L)	Remedial Target Value (RTV) (mg/L)
Ethylbenzene	0.02	0.045	1.03E-194	8.74E+190
Xylene Total	0.03	0.091	7.72E-196	3.54E+192
Ammoniacal Nitrogen	0.3	5.46	5.95E-04	2.75E+03
Naphthalene	0.002	0.00749	3.09E-166	4.85E+160
Anthracene	0.0001	0.0022	2.86E-283	7.70E+275
Fluoranthene	0.0000063	0.011	0	No Impact
Benzo(a)pyrene	0.00000017	0.0159	0	No Impact
Benzo(g,h,i)perylene	0.0000082	0.004	0	No Impact
Benzo(b)fluoranthene	0.000017	0.0245	0	No Impact
Benzo(k)fluoranthene	0.000017	0.00774	0	No Impact
Phenol	0.0077	0.087	3.82E-100	1.76E+96
Bis(2-ethylhexyl) phthalate	0.0013	0.127	0	No Impact
Cadmium	0.00008	0.00461	4.20E-03	8.78E-05
Chromium (hexavalent)	0.0034	0.0278	2.34E-02	4.04E-03
Copper	0.001	0.0124	1.24E-02	1.00E-03
Nickel	0.004	0.0232	2.16E-02	4.30E-03
Zinc	0.0109	0.0401	4.00E-02	1.09E-02

xx RTV less than maximum concentration recorded in groundwater
xx RTV greater than maximum concentration recorded in groundwater

6.18.50 The results indicate that there will be no impact on Latherford Brook by any of the organic determinands recorded during the groundwater monitoring. However, the maximum concentrations of Cadmium, Chromium (hexavalent), Copper, Nickel and Zinc recorded in groundwater are slightly greater than their corresponding Remedial Target Values. 5No. out the 6No. determinands recorded maximum concentrations monitoring wells screened in natural ground whilst the maximum chromium (VI) was recorded in monitoring well screened in Made Ground. Trace element concentrations in associated aquifers such as the underlying bedrock aquifer can naturally approach and exceed the measured maximum concentration and the related EQS.

Summary of Controlled Waters Risk Assessment

6.18.51 The Tier 2 screening results revealed elevated concentrations of ammoniacal nitrogen, some metals and organic compounds in groundwater within the Made Ground and natural ground.

6.18.52 A Detailed Quantitative Risk Assessment was carried out using the EAs Remedial Targets Worksheet for the contaminants identified in groundwater within the Made Ground and natural ground at the Site. The results of the DQRA indicates that there is negligible risk to identified receptors from organic contaminants.

6.18.53 The theoretical risk from dissolved metals is likely to be influenced by naturally occurring low-level concentrations derived from the strata mineralogy. Therefore, it is considered that there is a very low risk to the identified receptors from the presence of Cadmium, Chromium (hexavalent), Copper, Nickel and Zinc, in a proportionally small number of groundwater samples, to surface water receptors.

6.18.54 No remedial works are considered necessary regarding the concentrations of potential contaminants encountered within groundwater within the Scheme boundary.

6.18.55 Where dewatering of excavations is required during the construction works water should be collected, stored, tested and then shall either be:

- Discharged to foul sewer under a trade effluent consent agreed with the local sewerage undertaker and/or;
- Discharged to surface water under a water discharge activity environmental permit ("WDA-EP") from the Environment Agency.

Ground Gas Risk Assessment

General

6.18.56 The generation or migration of ground gases from natural sources can pose a major hazard to structures if the gases are able to accumulate within them. In terms of the proposed development, the main risks are that ground gases may accumulate within any enclosed structures or beneath any pavements.

6.18.57 For this study, the borehole gas concentration and flow rate results for carbon dioxide (CO_2) and methane (CH_4) have been compared against guidance values given in the following documents:

- BSI Standards Publication BS 8485:2015+A1:2019 "Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings"; and
- CIRIA Report C665 (2007) "Assessing Risks Posed by Hazardous Ground Gases to Buildings"

6.18.58 For commercial/industrial end-use the Wilson and Card (1997) classification method is used to give a semi-quantitative estimate of risk for the Scheme.

Ground Gas Monitoring Results

6.18.59 A total of 19No. boreholes were monitored for ground gas on 11No. occasions between 11th July 2019 and the 25th November 2019. Gas measurements were made for carbon dioxide (CO_2), methane (CH_4), oxygen (O_2), carbon monoxide (CO), hydrogen sulphide (H_2S) and flow rate (l/s). 1No. borehole was screened in the Made Ground, 9No. were screened in the superficial deposits, 7No. in the weathered bedrock and 2No. in the bedrock. BH22A did not provide monitoring data as access was restricted by artesian water.

6.18.60 Based on the monitoring data from all 11No. rounds the following assessment has been undertaken for the site. The range of gas concentrations, flow rates and atmospheric pressures recorded during the monitoring rounds are presented in Appendix E. Table 6.18.11 presents a summary of the results in each of the borehole locations. The calculated gas screening values are shown in Table 6.18.13 and Table 6.18.14. These values are based on the maximum concentration and the maximum flow rate recorded at each borehole during the monitoring period. Drawing HE514465-ACM-EGT-M54_ZZ_ZZ_Z-DR-GS-0002: Ground Gas and Groundwater Monitoring Location Plan is attached in Appendix A of this report showing the locations of the monitoring wells from which gas recordings were taken.

Table 6.18.11: Summary of Recorded Maximum Gas Concentrations and Flow Rates

Strata	Borehole Number	Peak Gas Readings					
		Max CH_4 (% v/v)	Max CO_2 (% v/v)	Min O_2 (% v/v)	Max CO (ppm)	Max H_2S (ppm)	Max Flow Rate (l/hr)
Made Ground	BH03	86.2	17.7	0	2000	6	11.7
Superficial Deposits	BH06	0	3.4	12.1	99	2	6.2
	BH07	0.9	0.2	12.4	78	0	0.4
	BH10	0.1	2.8	17.3	18	1	0.6
	BH12	0.2	0.2	19.9	41	1	0.2
	BH16	0.1	0.1	20.4	262	0	0.5
	BH21	3.3	1.3	15.9	366	1	20.4
	BH24	0.1	8.1	3.9	114	0	3.8
	BH25	5	0.9	13.8	197	12	0.3
	BH26	0.9	0.2	8	295	1	0.3
Weathered Bedrock	BH04	0.1	8.9	9.6	4	0	0.2
	BH05	0.1	1.8	19.7	4	0	5.1
	BH09	7.1	2.1	10.3	446	5	14.4
	BH11	0.3	1.4	19.6	12	0	0.3
	BH18	0.6	1.6	14.2	278	0	3.3
	BH20	0.1	3.1	18	1	0	3.3
	BH27	0.3	3.4	16.9	140	0	0.3
Bedrock	BH08a	0.3	2.1	18.9	240	25	3.5
	BH22a	Not accessible	Not accessible	Not accessible	Not accessible	Not accessible	Not accessible

6.18.61 The gas monitoring results indicate that the methane results range between 0% v/v and 86.2% v/v. Most results are beneath 1.0% v/v apart from results in BH03, BH09, BH21 and BH25 with methane readings of 86.2% v/v, 7.1% v/v, 3.3% v/v and 5% v/v respectively.

6.18.62 One carbon dioxide reading was encountered above 10% v/v (17.7% v/v) at monitoring location (BH03) screened in Made Ground. This location recorded two readings above 10% v/v during the sixth and seventh monitoring round. The most recent monitoring results recorded reduced readings of 0.1% v/v.

6.18.63 The carbon monoxide concentrations were recorded within all wells and ranged between 1ppm and 2000ppm showing a large variation between monitoring locations. The highest carbon monoxide values were recorded in the earlier rounds of monitoring. Within the last three rounds of monitoring most of the carbon monoxide levels were recorded under 10ppm. The higher carbon monoxide concentrations were generally associated with boreholes which were generally screened in deposits containing clay, which may have hindered gas migration.

6.18.64 The hydrogen sulphide concentrations were recorded between 0 ppm and 6 ppm for all borehole locations except for BH25 (12 ppm) and BH08A (25 ppm). The maximum gas flow rate ranged between 0.2 l/hr and 20.4l/hr.

6.18.65 Maximum concentrations of methane, carbon dioxide, and carbon monoxide and minimum concentration of oxygen were recorded in BH03 which was screened within Made Ground, which was noted during the site walkover to be in an area containing fly tipped waste. Whilst maximum concentration of hydrogen sulphide was recorded in BH08A which was screened within bedrock and maximum gas flow rate was recorded in BH21 which was screened in superficial deposits.

Classification of Gas Regime

6.18.66 In accordance with guidelines within CIRIA C665 (2007), Gas Screening Values (GSVs) have been calculated to assess the significance of gas generation at the site. This is achieved by multiplying the percentage gas concentration (as a decimal) by the flow rates. A GSV has been calculated for each monitoring well location in the development plots based on the maximum gas concentration and maximum flow rate recorded in each monitoring well.

6.18.67 GSV can be calculated from the gas concentration and the flow rate:

$$GSV\ (l/hr) = \frac{Gas\ concentrataion\ (\%\ v/v)}{100}\ x\ flow\ rate\ (l/hr)$$

6.18.68 The corresponding Characteristic Situation (CS) for the site is based on comparison of the generated GSVs to the values given in Table 6.18.12 taken from CIRIA C665.

Table 6.18.12: Classification Scheme for Site Gas Risk Assessment (Modified Wilson and Card Classification)

Characteristic Situation	Risk Classification	Gas Screening Value (CH_4/CO_2) l/hr	Additional Factors	Typical Source of Generation
1	Very Low	<0.07	Typically, CH4 <1% and CO2 <5%. Otherwise consider increase to CS2.	Natural Soil with low organic content. "Typical" Made Ground.
2	Low	<0.7	Borehole air flow rate not to exceed 70l/hr. Otherwise consider increase to CS3.	Natural Soil with high peat/organic content. "Typical" Made Ground.
3	Moderate	<3.5	-	Old landfill Inert waste Mineworking (flooded).
4	Moderate to High	<15	Quantitative Risk Assessment required to evaluate scope of protective measures.	Mineworking susceptible to flooding Completed Landfill (WMP 26b criteria).
5	High	<70	-	Mineworking unflooded inactive with shallow workings near the surface.
6	Very High	>70	-	Recent Landfill site.

Source: Table reproduced from CIRIA Report C665

6.18.69 The initial approach in the assessment is to use the worst-case scenario by determining the GSV based on the maximum methane/carbon dioxide concentration and maximum flow rate recorded across the site over the monitoring period. Table 6.18.13 presents the most conservative GSV and characteristic situation for the site.

Table 6.18.13: Summary of Gas Regime based on Overall Peak Readings at the Site

Location	Peak Gas Readings			Gas Screening Values		Characteristic Situation
	Max CH_4 (% v/v)	Max CO_2 (% v/v)	Flow Rate (l/hr)	Max CH_4 (% v/v)	Max CO_2 (% v/v)	
Whole *Scheme*	86.2	17.7	20.4	17.58	3.61	5

6.18.70 Based on the maximum gas concentration (Made Ground) and maximum flow rate (Superficial Deposits) recorded at the site over the monitoring period, the site would be classified as Characteristic Situation 5 (CS5). However, this approach is overly conservative and does not accurately represent the Scheme as a whole.

6.18.71 The gas condition within each underlying stratum is more representative of the potential risk to the future end users. Therefore, the assessment has been undertaken based on the different ground materials screened across the Scheme.

6.18.72 The summary maximum GSV calculated for both methane and carbon dioxide classification in each stratum is presented in Table 6.18.14.

Table 6.18.14: Summary of Gas Regime for each Stratum

Strata	Peak Gas Readings			Gas Screening Values		Characteristic Situation
	Max CH_4 (% v/v)	Max CO_2 (% v/v)	Flow Rate (l/hr)	Max CH_4 (% v/v)	Max CO_2 (% v/v)	
Made Ground	86.2	17.7	11.7	10.08	2.07	4
Superficial Deposits	3.3	8.1	20.4	0.67	0.307	2
Weathered Bedrock	7.1	8.9	14.4	1.02	1.28	3
Bedrock	0.3	2.1	3.5	0.01	0.073	2

6.18.73 All strata monitored recorded concentrations of methane and carbon dioxide and the characteristic situation of the strata ranged from CS2 to CS4.

6.18.74 The assessment of the gas risk indicates that 9No. of the 18No. locations monitored are classed as CS1 (very low risk). 5No. locations (2No. in the superficial deposit strata, 2No. in the weathered bedrock and 1No. in the bedrock) are classed as CS2 (low risk), 3No. readings (1No. in the superficial deposits and 2No. in the weathered bedrock) are classed as CS3 (moderate risk) and 1No. reading taken in the Made Ground is classed as CS4 (moderate to high risk).

Gas Risk Assessment

Oxygen

6.18.75 The monitoring results show that minimum oxygen concentrations ranged from 0% v/v to 20.4% v/v across the Scheme. Depleted oxygen concentration (i.e. less than 18% v/v) was detected at twelve (12) of the eighteen (18) monitoring locations with the response zone located in the Made Ground, natural superficial deposits and weathered bedrock.

6.18.76 Table 6.18.15 summarises the physiological effects of an oxygen deficient atmosphere.

Table 6.18.15: Effect of Reduced Oxygen Concentrations (CIRIA Report 149)

Oxygen (%vol/vol)	Physiological Effects
19 – 21	Normal range of concentration in the atmosphere
17	Faster, deeper breathing, slight impairment of judgement.
10-16	Initial signs of anoxia leading to emotional upsets; abnormal fatigue upon exertion.
6-10	Nausea, vomiting, unconsciousness; collapse may occur.
<6	Convulsions, gasping respiration, death.

6.18.77 Based on the oxygen data recorded across the Scheme, it is concluded that there would be a risk to construction workers entering excavations within the Scheme.

Methane

Explosion Risk

6.18.78 The greatest hazards posed by methane are those of fire and explosion. The limits of flammability, i.e. the Lower Explosion Limit (LEL) and Upper Explosion Limit (UEL) are 5% v/v and 15% v/v, respectively. Where methane concentrations are encountered between these two ranges there is the possibility of ignition/explosion. However, concentrations above this should not necessarily be considered safe, because on dilution with air the composition may fall within this flammable range.

Asphyxiation Risk

6.18.79 The level of toxicity from asphyxiation is currently set at 30% (v/v) (8-hour long term Occupational Exposure Limit OEL). Ventilation in confined spaces is required at concentrations greater than 0.25% (v/v). Where entry into excavations is unavoidable the activity should comply with confined space legislation.

Assessment

6.18.80 Most methane concentrations recorded across the site were below 1% v/v apart from results in BH03, BH09, BH21 and BH25 with methane readings of 86.2% v/v, 7.1% v/v, 3.3% v/v and 5% v/v respectively.

6.18.81 10No. of the 18No. monitoring locations recorded methane concentrations above the ventilation requirement limit of 0.25% v/v.

6.18.82 There is a risk of explosion at monitoring locations of BH03, BH09 and BH25. There is a risk of asphyxiation due to methane for construction workers working in confined spaces and excavations in BH03 and a requirement for ventilation at monitoring locations BH06, BH08A, BH09, BH10, BH11, BH18, BH21, BH24, BH25 and BH27.

Carbon Dioxide

6.18.83 For carbon dioxide there is no risk of flammability. However, there is a risk of asphyxiation and as such there are toxicity limits of 0.5% (v/v) for an 8-hour long term Occupational Exposure Limit (OEL) and 1.5% (v/v) for a 10-minute Occupational Exposure Limit (OEL).

6.18.84 Concentrations of carbon dioxide were reported in the range of 0.1% v/v to 17.7% v/v during monitoring across the site with the response zones located within the Made Ground, superficial deposits and weathered bedrock. There were 14No. exceedances of the 10-minute OEL and 11No. exceedances of the 8-hour long term OEL.

6.18.85 It is concluded that there may be a risk to construction workers entering excavations from carbon dioxide. Where entry into excavations is unavoidable, the activity should comply with confined space legislation, and assessed prior to site workers entering.

Carbon Monoxide

6.18.86 A long term (8 hour) workplace exposure limit of 30ppm and a short term (15 minute) workplace exposure limit of 200ppm is given for carbon monoxide.

6.18.87 Carbon monoxide was detected above the short term (15 minute) workplace exposure limit at 7No. out of the 18No. borehole locations. There were 13No. recorded exceedances of the long term (8 hour) workplace exposure limit. The maximum exceedance recorded was 2,000ppm in BH03 during the fourth round of monitoring. Therefore, there is a moderate risk from carbon monoxide at the Scheme.

Hydrogen Sulphide

6.18.88 A long term (8 hour) workplace exposure limit of 5ppm and a short term (15 minute) workplace exposure limit of 10ppm is given for hydrogen sulphide.

6.18.89 Hydrogen sulphide was present at concentrations between 0ppm and 5ppm at all locations apart from BH03, BH08A, BH09 and BH25 where concentrations of 6ppm, 25ppm, 5ppm and 12ppm were recorded, respectively. These exceed the long term (8 hour) workplace exposure limit, whilst concentrations recorded in BH08A and BH25 also exceed the workplace exposure limit.

Ground Gas Mitigation Measures

6.18.90 The risks from accumulations of ground gas are considered to be an issue during the construction phase and maintenance phases. There is considered not to be a significant risk from ground gas during the operation phase as ground gas accumulation is only considered a risk in confined/enclosed spaces.

6.18.91 During the construction phase, restricted access to confined spaces and excavations should be implemented. Where work in confined spaces is unavoidable, a site-specific and task-specific risk assessment should be undertaken prior to the commencement of the works. Monitoring of confined spaces for potential ground gas accumulations should be undertaken and the works should be undertaken by suitably trained personnel with the use of specialist Personal Protective Equipment (PPE) where necessary.

6.18.92 Maintenance workers that are required to undertake excavations during the operational life of the Scheme should be provided with information on the nature of each sub area at the site, upon which to base site and task specific risk assessments. Such work will also include measures as detailed for the construction phase to minimise the effects of the work to human health.

Updated Conceptual Site Model and Risk Assessment

General

6.18.93 Current best practice recommends that the determination of health hazards due to contaminated land is based on the principle of risk assessment, as outlined in Part 2A of the Environmental Protection Act 1990.

6.18.94 The risk assessment process for the environmental contaminants is based on a source-pathway-receptor analysis. These terms can be defined as follows:

- Source: Hazardous substance that has the potential to cause adverse impacts;

- Pathway: Route whereby a hazardous substance may encounter the receptor: examples include ingestion of contaminated soil and leaching of contaminants from soil into watercourses;
- Receptor: Target that may be affected by contamination: examples include human occupants/users of site, water resources (surface waters or groundwater), or structures.

6.18.95 For a risk to be present there must be a viable pollutant linkage i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway. A conceptual site model has been developed for the Scheme with the view to assessing the potential risks during construction and upon completion of the proposed new development. The conceptual model considers the human health, controlled waters and ground gas risk assessments presented in Section 6.17 of this report. The potential sources of contamination, potential receptors and potential contaminant pathways are identified, and are presented in Table 6.18.16 to Table 6.18.19, for the Scheme. The associated contaminant linkages between these sources, pathways and receptors are presented in Table 6.18.19. Drawing HE514465-ACM-EGN-M54_ZZ_ZZ_Z-DR-GS-0004, in Appendix A of this report, presents the Updated Schematic Conceptual Site Model.

Potential Sources of Contamination

6.18.96 A summary of the key areas of potentially contaminated land within the geology study area are summarised in Table 6.18.16. These key areas are split into those within the Scheme boundary, and those within 250m of the Scheme boundary.

Table 6.18.16: Summary of Potential Sources of Contamination

Source location	Potential Source	Description
Within the *Scheme* boundary and extending offsite	Made Ground	Made Ground has been recorded across the whole of the *Scheme* to a maximum depth of 6m bgl. One landfill is located within the *Scheme* boundary Adjacent to A460 near the M6 Junction 11, which was unable to be identified during the ground investigation. Tier 2 Screening assessment of soil samples indicate minimal exceedances of Benzo(a)pyrene, Dibenz(a,h)anthracene and Benzo(b)fluoranthene. However, the UCL95 values of the contaminants were below the GAC for commercial/industrial end use. Chrysotile containing Asbestos was identified as loose fibres at one location within the *Scheme* (TP04).
	Historical Mining (Coal)	Potential for polluting discharges from mines affecting watercourses.
	Agricultural use	Agricultural land used for both arable/livestock farming.
	Soil leachate	Tier 2 screening indicate exceedances of TPH, VOCs, PAH, Pesticides, Metals and Inorganics compared to GAC.
	Groundwater	Groundwater levels were present across the *Scheme* from between 0.62m bgl to 27.59m bgl. The controlled waters risk assessment indicates that there are some EQS exceedances of some metals, ammoniacal nitrogen and PAHs within the Made Ground and superficial deposits.
	Ground Gas	Gas monitoring within the *Scheme* boundary has recorded the presence of carbon dioxide at elevated concentration up to a maximum of 17.7% v/v; and methane at elevated concentration up to a maximum of 86.2 % v/v, and depleted oxygen concentrations, within the proposed *Scheme* areas. Flow rates were recorded up to 20.4 l/hr and There were exceedances of the short term and long-term workplace exposure limits for carbon monoxide and a moderate risk from carbon monoxide was identified at identified locations within the *Scheme* boundary.
Sources outside the *Scheme* boundary	Industrial and commercial uses, leaks, spills and emissions from fuel stations	Potential spills from service pumps and leaks from the underground tanks at Shareshill Service Station (M6 Diesel). Present day Hilton Main Industrial Park built on former Hilton Colliery located within 100m to the south of M54 Junction 1. A large Tarmac plant/quarry also exists on this site at present.
	Other historical activities	Historical landfills, the closest located some 500 m east of the *Scheme* boundary relating to Church Road, Shareshill. Former Collieries immediately south of M54 Junction 1.

Receptors

6.18.97 A summary of the potential land contamination receptors for the Scheme is presented in Table 6.18.17.

Table 6.18.17: Description of Potential Land Contamination Receptors

Potential Receptors	Description
Future Site Users	Includes users of the newly developed road. Residents who live within the vicinity, employees and customers at facilities located in the *Scheme* vicinity.
Controlled Waters	The surface waters and hydrological features as identified in Section 9.6.40 of Chapter 9 of the Environmental Statement [TR010054/APP/6.1]. The underlying Principal, Secondary 'A' and Undifferentiated aquifers as identified in Section 9.6.33 of Chapter 9 of the Environmental Statement [TR010054/APP/6.1].
Development Infrastructure	Includes the newly developed road and any infrastructure built as part of the *Scheme*.
Construction Workers	Exposures experienced by construction workers are of shorter duration than for future site users due to the limited period of exposure. However, the nature of the exposure may be more severe than for future site users as construction workers may be required to expose, treat, excavate and transport or otherwise engage in close contact with the exposed materials as a necessity. Construction workers and Maintenance workers involved in below ground works could be affected by the ground gases present within the *Scheme* boundary.
Flora and fauna	The *Scheme* would pass through areas designated 'Priority Habitat: Deciduous Woodland' and a priority area for Countryside Stewardship measures addressing Lapwing habitat issues.
Agricultural Soils	Grade 2, Grade 3 and Grades 3a and 3b agricultural land is present within the alignment of the *Scheme*.
Off-site Receptors	Includes human Receptors, Surface waters (ponds etc) and groundwater, Flora and fauna and agricultural soils situated outside the *Scheme* extents.

Pathways

6.18.98 Table 6.18.18 provides a summary of the potential pathways by which contamination sources may encounter receptors considered most appropriate for the Scheme.

Table 6.18.18: Description of Potential Pathways

Potential Pathways		Description
Soil Pathway Including the following sources • Made Ground • Soil Derived Leachate	Dermal Contact	Direct contact with contaminated ground soils, soil derived dust, soil leachate and perched water in the Made Ground.
	Ingestion	Direct or indirect ingestion of Made Ground soil and soil derived dust.
	Inhalation	Inhalation of Made Ground soil derived dust, organic vapours or ground generated gas.
Groundwater Pathways Including the following sources: • Soil Leachate • Groundwater	Rainfall Infiltration & Vertical / Lateral migration via permeable strata	Rainfall infiltration can generate and mobilise Made Ground soil-derived leachate impacting on surface waters and groundwater. Majority of the *Scheme* would include areas of hard standing which would limit the amount of infiltration at the site.
	Lateral Migration through Aquifer	Aquifers allow transportation of contaminants through the permeable strata.
Gas Pathways Including the following sources: • Ground Gas	Vertical / Lateral Migration via permeable strata	Permeable strata may allow transportation of ground gases, and build up within basement structures, foundations or confined spaces. Possible explosion risk.

Potential Contaminant Linkages

6.18.99 The potential contaminant linkages and associated risks identifies for the Scheme in its proposed use are summarised in Table 6.18.19.

Table 6.18.19: Potential Contaminant Linkages

Source		Potential Pathway		Receptors
Diffuse and specific areas of metal, inorganic and organic contamination within the Made Ground	➧	Ingestion of contaminated soil Inhalation/ingestion of soil derived dust Inhalation of organic vapours Direct contact with soils/dusts	➧	Future Site Users Construction Workers Off-Site Receptors (outside *Scheme* boundary) Controlled waters Agricultural Soils Development Infrastructure
Generated leachate from Made Ground	➧	Leaching into groundwater and migration to surface watercourses	➧	Future Site Users Construction workers Controlled Waters Development Infrastructure
Contaminants in groundwater	➧	Migration and diffusion	➧	Future Site Users Construction workers Controlled Waters Development Infrastructure
Agricultural use	➧	Inhalation/ingestion/dermal contact. Leaching of contaminants to groundwater in underlying aquifers.	➧	Future site users Controlled waters
Ground Gases	➧	Migration and diffusion via permeable strata	➧	Future Site Users Construction Workers Off-site receptors (outside *Scheme* boundary) Development Infrastructure

Environmental Risk Assessment

6.18.100 Conceptual site models are included in the Preliminary Sources Study Reports (2002 and 2008). The various components of the model are discussed in the following sections and consider the Scheme in its current condition and the proposed future use, based on the risk assessment undertaken following the 2019 Ground Investigation.

Risk Assessment Principles

6.18.101 Current best practice recommends that the determination of hazards due to contaminated land is based on the principle of risk assessment, as outlined in Part 2A of the Environmental Protection Act 1990.

6.18.102 For a risk to be present there must be a viable pollutant linkage; (i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway). The potential contaminant linkages that have been identified for this Scheme are presented in Table 6.18.19.

6.18.103 Assessments of risks associated with each of these contaminant linkages, following review of available information for the Scheme is discussed in the following sections.

6.18.104 Using criteria broadly based on those presented in Section 6.3 of the CIRIA Report "Contaminated Land Risk Assessment: A Guide to Good Practice" (CIRIA Report C552) the magnitude of the risk associated with potential contamination at the site has been assessed.

6.18.105 To do this an estimate is made of:

- the potential severity of the risk; and
- the likelihood of the risk occurring.

6.18.106 The severity of the risk is classified according to the criteria in Table 6.18.20.

Table 6.18.20: Severity of Risk

Severity	Description
Severe	Acute risks to human health likely to result in "significant harm" (e.g. very high concentrations of contaminants / ground gases). Catastrophic damage to buildings/property (e.g. by explosion, sites with high gassing potential, extensive VOC contamination). Major pollution of controlled waters (e.g. surface watercourses or Principal aquifers/source protection zones). Short term risk to a particular ecosystem.
Medium	Chronic (long-term) risk to human health likely to result in "significant harm" (e.g. elevated concentration of contaminants/ground gases). Pollution of sensitive controlled waters (e.g. surface watercourses or Principal / Secondary aquifers). Significant effects on sensitive ecosystems or species.
Mild	Pollution of non-sensitive waters (e.g. smaller surface watercourses or Unproductive Strata). Significant damage to crops, buildings, structures or services (e.g. by explosion, sites with medium gassing potential, elevated concentrations of contaminants).
Minor	Non-permanent human health effects (requirement for protective equipment during site works to mitigate health effects). Damage to non-sensitive ecosystems or species. Minor (easily repairable) damage to buildings, structures or services (e.g. by explosion, sites with low gassing potential).

6.18.107 The probability of the risk occurring is classified according to criterial given in Table 6.18.21.

Table 6.18.21: Probability of Risk Occurring

Probability	Description
High likelihood	Pollutant linkage may be present that appears very likely in the short-term and risk is almost certain to occur in the long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low likelihood	Pollutant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.

6.18.108 An overall evaluation of the level of risk is gained from a comparison of the severity and probability, as shown in Table 6.18.22.

Table 6.18.22: Comparison of Severity and Probability

		SEVERITY			
PROBABILITY		Severe	Medium	Mild	Minor
	High Likelihood	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/Low	Low
	Low Likelihood	Moderate	Moderate/Low	Low	Very Low
	Unlikely	Moderate/Low	Low	Very Low	Very Low

Evaluation of Risk

6.18.109 An evaluation of the potential risks associated with the identified sources at the site to the various receptors are discussed and presented in the following section. The level of risk is determined based on the current condition of the Scheme and considers the proposed development.

6.18.110 The evaluation includes an assessment of the significance of the potential contaminant linkages. Where it is considered that a particular pollutant linkage is not plausible in the context of the site and the proposed development, the overall risk is determined as very low.

6.18.111 The potential contaminant linkages identified at the Scheme has been compared with the risk matrix shown in Table 6.18.22, and the resultant risk evaluation is presented in Table 6.18.23.

Table 6.18.23: Risk Evaluation of Potential Contaminant Linkages

Source	Pathway	Receptor	Potential Contaminant Linkage	Risk evaluation		
				Severity	Probability	Risk
Contaminants in Made Ground	Direct contact / ingestion / inhalation	Future Site Users	Y	Minor	Low	Very Low
	Direct contact / ingestion / inhalation	Construction Workers	Y	Minor	Likely	Low
	Infiltration / Migration	Controlled Waters	Y	Minor	Low	Very Low
	Inhalation of vapours / dusts	Off-Site Receptors	Y	Minor	Low	Very Low
	Direct contact / uptake	Flora & Fauna	Y	Minor	Unlikely	Very Low
	Migration / uptake	Agricultural Soils	Y	Mild	Low	Low
	Direct contact	Development Infrastructure	Y	Minor	Likely	Low
Contaminants in Natural Strata	Direct contact / ingestion / inhalation	Future Site Users	Y	Minor	Unlikely	Very Low
	Direct contact / ingestion / inhalation	Construction Workers	Y	Minor	Likely	Low
	Infiltration / Migration	Controlled Waters	Y	Minor	Low	Very Low
	Inhalation of vapours / dusts	Off-Site Receptors	Y	Minor	Unlikely	Very Low
	Direct contact / uptake	Flora & Fauna	Y	Minor	Unlikely	Very Low
	Migration / uptake	Agricultural Soils	Y	Minor	Low	Very Low
	Direct contact	Development Infrastructure	Y	Minor	Likely	Low
Contaminants in Leachate / Groundwater	Direct contact / ingestion / inhalation	Construction Workers	Y	Minor	Likely	Low
	Infiltration / Migration	Controlled Waters	Y	Medium	Low	Moderate / Low
	Inhalation of vapours / dusts	Off-Site Receptors	Y	Minor	Low	Very Low
	Direct contact / uptake	Flora & Fauna	Y	Mild	Low	Low
	Migration / uptake	Agricultural Soils	Y	Mild	Low	Low
	Direct contact / ingestion / inhalation	Future Site Users	Y	Minor	Low	Very Low
	Direct contact	Development Infrastructure	Y	Mild	Low	Low
Ground Gases	Migration & Inhalation / Explosion	Future Site Users	Y	Mild	Likely	Moderate / Low

Source	Pathway	Receptor	Potential Contaminant Linkage	Risk evaluation		
				Severity	Probability	Risk
	Migration & Inhalation / Explosion	Construction Workers	Y	Medium	Low	Moderate / Low
	Migration & Inhalation / Explosion	Off-Site Receptors	Y	Mild	Low	Low
	Migration and Explosion	Development Infrastructure	Y	Minor	Likely	Low
	Direct contact/ uptake	Flora & Fauna	Y	Minor	Low	Very Low

Evaluation of Risk to Future Site Users

Evaluation of Risks from Underlying Soils (Made Ground)

6.18.112 The human health risk assessments (detailed in Section 6.17) undertaken on the results have indicated that the risks to human health from contaminants in soils for a highway scheme, based on commercial/industrial) end-use are not significant. The vast majority of determinands were recorded at concentrations below the relevant GACs with three exceedances of PAH detected in a sample taken from Made Ground. Asbestos containing materials were identified in one out of thirty-nine samples from the Scheme.

6.18.113 The likelihood of future users of the proposed developments encountering the Made Ground is considered to be 'Low'. The developed site will be covered with a variety of finishes including hard-standing, (e.g. roads, and pavements) which will further reduce the likelihood of future site users coming into direct contact with Made Ground.

6.18.114 The severity of the risk to the future users is considered 'Minor'. Therefore, the potential risk to the future users from contaminants in the underlying ground Made Ground is assessed as 'Very Low'.

Evaluation of Risks from Underlying Soils (Natural Ground)

6.18.115 The human health risk assessments (detailed in Section 6.17) undertaken on the results have indicated that the risks to human health from contaminants in soils for a commercial/industrial end-use are not significant. None of the soil samples tested from natural ground exceeded the relevant GAC.

6.18.116 The likelihood of future users of the proposed developments encountering the underlying soils is considered to be 'Unlikely'. Once the Scheme is developed it is considered that the exposure of the future site-users and maintenance workers to direct contact with soil and groundwater/leachate will be limited as the developed site will be covered with a variety of finishes including hard-standing, (e.g. roads, and pavements). This will reduce the likelihood of future site users coming into direct contact with the underlying soil.

6.18.117 The severity of the risk to the future users is considered 'Minor'. Therefore, the potential risk to the future users from contaminants in the underlying ground is assessed as 'Very Low.

Evaluation of Risks from Controlled Waters

6.18.118 The risk to future site users from direct contact with contaminated leachate or groundwater is considered to be 'Very Low'. Although some contaminants have been detected within the groundwater beneath the Scheme, the future users of the proposed developments are unlikely to encounter the underlying groundwater at the Scheme.

6.18.119 The Tier 2 screening results revealed elevated concentrations of ammoniacal nitrogen, some metals and organic compounds in groundwater within the Made Ground and natural ground. The results of the DQRA did not indicate a risk from contaminant exceedances found in the groundwater.

Evaluation of Risks from Ground Gases

6.18.12010 No. of the 18No. methane gas concentrations were recorded at concentrations above 0.25% v/v requiring ventilation in confined spaces. Carbon dioxide was recorded at concentrations up to 17.7% v/v in BH03. The highest flow rate recorded was 20.4l/hr. The site strata Made Ground, superficial deposits, weathered bedrock and bedrock have been classified as Gas Characteristic Situation CS4, CS2, CS3 and CS2 respectively according to Table 8.5 of the CIRIA C665.

6.18.121 Carbon monoxide was detected above the short term (15 minute) workplace exposure limit of 200ppm in boreholes BH03, BH08A, BH09, BH16, BH18, BH21 and BH26. The maximum exceedance recorded was 2,000ppm in BH03 during the fourth round of monitoring. Therefore, there is a Moderate/Low risk from carbon monoxide at the site before the implementation of gas mitigation measures in Section 6.17. It is considered that the proposed measures are sufficient to mitigate the risks from ground gas to the future users of the Scheme.

6.18.122 The ground gas recorded within the remainder of the Scheme presents a low risk.

Evaluation of Risk to Construction Workers

6.18.123 The assessment has identified a 'Low' to 'Moderate/Low' risk to construction workers at the Scheme regarding risks from underlying soils, groundwater and ground gas. This takes into consideration that whilst construction/Site workers might be expected to encounter soils and leachate/groundwater, the use of personal protective equipment will be a prerequisite to them being on site.

6.18.124 Regarding the one location (TP04) where asbestos containing material was identified, the risk to construction workers is slightly increased. Before commencing work at this location, a Site-specific health and safety risk assessment should be carried out in accordance with current health and safety regulations. This assessment should cover potential risks to both construction staff and the local population. Based on the findings of this risk assessment, appropriate mitigation measures should be implemented during the earthworks.

6.18.125 It is concluded that there may be a 'Moderate' risk to construction workers entering excavations from carbon monoxide, methane, carbon dioxide and depleted oxygen concentrations. Where entry into excavations is unavoidable, the activity should comply with confined space legislation, and assessed prior to site workers entering.

6.18.126 The risk to construction workers from ground gas is generally low. However, in the area of Made Ground/ superficial deposits at BH03, BH08A, BH09, BH16, BH18, BH21 and BH26 the risk to construction workers from ground gas is considered to be 'Moderate'. This risk will be mitigated through wearing appropriate PPE and monitoring the atmospheric conditions. Entry into underground structures should comply with confined space legislation and assessed prior to entry.

Evaluation of Risk to Controlled Waters

6.18.127 According to the information contained within the Envirocheck report, there are no SPZ within the site boundary. There are six licenced groundwater abstractions within 1km of the site which could be potential receptors. Elevated concentrations of ammoniacal nitrogen, some metals and organic compounds were identified in the soil leachate.

6.18.128 Samples obtained from the groundwater monitoring points also shows elevated concentrations of some metals, ammoniacal nitrogen and some PAHs. The highest concentrations of PAH were recorded in in BH03 which was screened within the Made Ground. The Made Ground was described as follows:

- Soft becoming firm reddish brown gravelly slightly sandy clay with medium cobble content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of quartz, sandstone, siltstone, brick, coal, tarmac and slag. Cobbles are angular of bricks and quartz. (hydrocarbon odour).

6.18.129 The results of the DQRA indicates that five metal determinands are present at concentrations which are greater than their corresponding EQS concentration. However, the concentrations are only slightly elevated and have been recorded in a relatively small number of groundwater samples. Trace element concentrations in associated aquifers such as the underlying bedrock aquifer can naturally approach and exceed the measured maximum concentration and the related EQS.

6.18.130 Based on the findings of the controlled water risk assessment and the DQRA, the risk to controlled waters from contaminants at the site is considered to be 'Low' overall.

Evaluation of Risk to Development Infrastructure

6.18.131 The risks to development infrastructure have been identified as 'Very Low' to 'Low'. The risks identified can be mitigated through appropriate design measures.

Evaluation of Risk to Flora and Fauna

6.18.132 The risks to flora and fauna on the site have been classified as Low/ Very Low. The site passes through areas identified by Defra's MAGIC map (accessed 13/11/19) as a 'priority habitat (Deciduous Woodland)'. These are described as those being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The site area also lies in a priority area for Countryside Stewardship measures addressing Lapwing habitat issues. The Environmental Statement Chapter 8: Biodiversity [TR010054/APP/6.1], addresses the loss of the woodland and habitat area and states the intention to replant the woodland off site. Existing vegetation on the site does not appear to exhibit signs of distress due to contaminants in the soil.

Evaluation of Risk to Off-Site Receptors

6.18.133 Any risks to local off-site receptors would be associated with off-site migration of contamination, for instance, in the form of wind-blown dust, and / or organic vapours. The greatest potential for dust generation will be during the construction phase.

6.18.134 It is considered that dust generation will be kept to a minimum, in accordance with general best practice, as outlined in, for example, "Environmental Good Practice on Site", 3rd Edition, CIRIA Publication C692. Also, the risk assessment indicates that there is very low risk from contamination in the soils to human receptors. Therefore, the impact of dust generated during construction on offsite receptors is considered to be 'Very Low'.

Evaluation of Risk to Agricultural Soils

6.18.135 Much of the area to the north of Hilton Lane, is classified as Grade 2 (very good) agricultural land by the Natural England ALC Grades - Post 1988 Survey map. There are small areas north of Hilton Lane classified as Grade 3a (good) and 3b (moderate) agricultural land. However, the area located to the north-east of the A462 is classified as Grade 3a (good) agricultural land.

6.18.136 Agricultural land to the south of Hilton Lane, and from Junction 1 to Junction 2 of the M54, has been classified by the Natural England Provisional ALC 1:250,000 map as Grade 3 (good to moderate) but has not been subdivided into Grades 3a and 3b.

6.18.137 The potential impact of potential contaminated soil, leachate and/or groundwater is considered to be 'Very Low' to 'Low' as the existing vegetation on the site does not appear to exhibit signs of distress due to contaminants in the soil.

Geo-Environmental Conclusions

6.18.138 Following the completion of the 2019 Ground Investigation, the test results and monitoring data have been assessed. The following conclusions have been made based on the assessment undertaken with respect to geo-environmental issues:

6.18.139 The Tier 2 screening and statistical assessments of the soil test results indicate that the risks to human health from organic and inorganic contamination in the soil are not significant in the context of the proposed end-uses of the site.

6.18.140 Asbestos (Chrysotile) was identified as loose fibres in one sample at depth in TP04. No other samples tested recorded the presence of asbestos.

6.18.141 The Tier 2 screening results revealed elevated concentrations of ammoniacal nitrogen, some metals and organic compounds in groundwater within the Made Ground and natural ground. The Tier 2 screening assessment and level 3 groundwater DQRA undertaken did not indicate significant risk to surface water course or potable water supply receptors from the recorded concentrations of determinands in the groundwater.

6.18.142 The ground gas risk assessment undertaken has classified the Made Ground strata as CS4 based on the high methane and gas flow rate concentration recorded in BH03. The superficial deposits are classed as CS2, the weathered bedrock as CS3 and the bedrock as CS2. As a result, appropriate gas protection measures would be required where there may be enclosed structures within the Scheme.

6.18.143 The ground gas risk assessment undertaken has identified potential risks construction workers in confined spaces and / or excavations from at least one ground gas or from oxygen depletion at each of the junctions. Therefore, it is recommended that site-specific and task-specific risk assessment should be undertaken prior to the commencement of any works in excavations and confined spaces.

6.18.144 Generally, earthworks materials arising from the excavations may be re-used within the within the works. However, this will be subject to re-use acceptability criteria to be derived for the development. Elevated leachate concentrations recorded within Made Ground and natural ground may pose risks to controlled waters and therefore assessment will be required to determine where such materials may be reused within the works

Outline Mitigation Measures

- A Construction Environmental Management Plan (CEMP) would be prepared and implemented by the selected construction contractor. This CEMP will include a range of measures associated with mitigating potential impacts as associated with land contamination as detailed below. Such measures accord with legal compliance and best practice guidance when working with or around contaminated materials.
- Potential impacts specific to construction workers during construction would be mitigated by adherence to the working practices in accordance with CIRIA (2015) C741 Environmental Good Practice on Site. 4th Edition, including:
  - measures to minimise dust generation;
  - provision of PPE, such as gloves, barrier cream, overalls etc. to minimise direct contact with soils;
  - provision of adequate hygiene facilities and clean welfare facilities for all construction site workers;
  - monitoring of confined spaces for potential ground gas accumulations, restricting access to confined spaces i.e. by suitably trained personnel, and use of specialist PPE, where necessary; and
  - preparation and adoption of a site and task specific health and safety plan.
- The mitigation measures would aim to ensure that the surface water run-off from the construction site (site preparation, earthworks and construction activities) do not have a detrimental effect on any receiving watercourses (e.g. Latherford Brook). Mitigation measures would also aim to ensure that surface water run-off does not have a detrimental effect on the underlying Principal or Secondary 'A' Aquifers. Surface water run-off would be controlled using appropriate drainage measures and infiltration into the ground would be minimised. This would minimise the potential for contaminants to migrate to controlled waters.
- Materials used to construct the proposed Scheme would be designed and specified taking due account of the potential for aggressive ground conditions. The assessment methodology set out in Building Research Establishment Special Digest 1 (2005) would be adopted to determine the appropriate

concrete classification in relation to the protection of buried concrete against sulphate attack.

- The potential impacts on off-site receptors would be addressed through the adoption of the following measures:
  - damping of ground with water to minimise dust;
  - sheeting of lorries transporting spoil off site and the use of dust suppression equipment on plant;
  - groundwater level controls (as required);
  - adequate fuel / chemical storage facilities e.g. bunded tanks, hard standing and associated emergency response/ spillage control procedures;
  - well maintained plant and associated emergency response/ spillage control procedures; and
  - any temporary onsite storage of contaminated material would be stored on sheeting and covered to minimise the potential for leachate and run off from the stockpile being generated.
- The Made Ground in the vicinity of BH03 has recorded elevated concentrations of ground gases, segregation of materials with high organic matter, or other form of treatment, during the earthworks may be necessary to reduce the gassing potential of the Made Ground material within the Scheme boundary.

7. Geotechnical Risk Register

7.1 General

7.1.1 The geotechnical risk register is provided in Table 7.1.1. The risk register lists geotechnical risks to the project which have been identified during preliminary assessment and updated to reflect findings of the 2019 Ground Investigation and subsequent laboratory testing. Possible consequences of the risks are outlined in the register, together with proposed risk mitigation measures to be taken as the project develops.

7.1.2 The Risk Rating is defined by the following relationship:

Risk Classification (R) = Likelihood (L) x Severity (S)

Table 7.1.1: Risk Assessment Criteria and Rating

Likelihood (L)		Severity (S)				
		1	2	3	4	5
		Minor	Moderate	Serious	Major	Catastrophic
1	Extremely unlikely	1	2	3	4	5
2	Unlikely	2	4	6	8	10
3	Likely	3	6	9	12	15
4	Extreme likely	4	8	12	16	20
5	Almost certain	5	10	15	20	25

Risk Classification (R)	
Low (1-8)	Ensure assumed control measures are maintained and reviewed as necessary.
Medium (9-19)	Additional control measures needed to reduce risk rating to a level that is acceptable.
High (20-25)	Activity not permitted. Hazard to be avoided or risk to be reduced to tolerable level.

Potential severity of harm occurring		
1	**Minor**	Minor damage or loss - (No human injury)
2	**Moderate**	Moderate damage or loss - (Slight injury or illness)
3	**Serious**	Substantial damage or loss - (Serious injury or illness)
4	**Major**	Major damage or loss - (Fatal injury)
5	**Catastrophic**	Catastrophic loss or damage - (Multiple fatalities)

Table 7.1.2: Geotechnical Risk Register

Risk Ref	Hazard/Risk Classification Description	Potential Consequence	Affected Party	Risk Classification Before Mitigation			Mitigation/Control Measures / Opportunity	Risk Classification After Mitigation		
				L	S	R		L	S	R
Insufficient / unclear ground investigation										
R01	Excessive settlement and poor foundation materials due to unforeseen ground conditions in the proximity of Latherford Brook, due to the lack of GI close to the water course.	Potential insufficient skin friction and negative skin friction issues for piles that may require larger diameter and/or longer piles. Insufficient bearing capacity and stability issues for embankments that may require excavation and replacement and/or basal reinforcement. May require further design. Additional cost and programme delays.	Contractor, road users, Highways England	3	3	9	Mitigation completed: Preliminary design allowed for 2m of soft soil. Future Mitigation: Confirmatory GI to be undertaken once the vegetation has been cleared to delimit extent of soft deposits. Detailed design to allow for cautious ground model, to be updated once the conditions are confirmed by GI. Excavation and replacement of soft ground, basal reinforcement or ground improvement.	2	2	4
R02	Failure/settlement of Reinforced Earth walls/abutments due to poor ground conditions.	Potential issues with bearing capacity and global stability requirements for the RE Wall design in certain areas with poor shallow materials (Made Ground or alluvium), this may require excavation and replacement of the poor materials. In a worst-case scenario, ground treatment may be needed.	Contractor, road users, Highways England	3	4	12	Preliminary design of structures on RE Walls to be updated. This design will include the need for excavation and replacement or advice for further ground treatment to be design during detailed design stage.	3	2	6
R03	Unforeseen poor ground conditions in areas of embankments and structures not accessible during GI	In areas not accessible during GI, due to lack of permission, presence of protected species or heavily vegetated areas, there is a possibility of finding unforeseen poor ground conditions, which may cause additional cost and programme delays. Design changes required.	Contractor	3	4	12	Undertake additional/confirmatory GI and laboratory testing to confirm design assumptions where insufficient information exists. Excavation and replacement of poor ground, ground improvement or redesign structure/earthworks.	2	2	4
R04	Unforeseen presence of contaminated material requiring treatment or offsite disposal	Contamination might be found in areas not covered by the GI. Additional cost for contaminated ground analysis, assessment, treatment, disposal and replacement. This possibility may also imply programme delays. Health and safety issues for workers, the general public and the environment.	Contractor, site workers, general public, the environment	3	3	9	Undertake additional GI and laboratory testing if contamination is found, or suspected, before or during the works, including chemical testing of possible contaminated land. Compliance with material re-use acceptability criteria in Earthworks Specification and remediation strategy. Undertake hazardous waste assessment. Contractor to organise WAC testing on unsuitable material requiring offsite disposal following detail design.	2	2	4
R05	Unforeseen extent and depth of the Made Ground fill on Featherstone Overbridge area.	Additional cost of potential remediation works and to excavate and dispose of the materials to a landfill. Additional cost of importing material to replace excavated material.	Contractor	4	4	16	Undertake additional ground investigation to determine the limits of the potentially contaminated and unsuitable fill materials. Prepare Remediation Strategy if significant contamination identified. Compliance with Earthworks Specification and Remediation Strategy for re-use of earthwork materials. Where necessary offsite disposal of excavated material; replacement with suitable fill material; appropriate foundation design.	2	3	6

Risk Ref	Hazard/Risk Classification Description	Potential Consequence	Affected Party	Risk Classification Before Mitigation			Mitigation/Control Measures / Opportunity	Risk Classification After Mitigation		
				L	S	R		L	S	R
R06	Lower Pool unforeseen poor ground conditions in new area of retaining wall/false cutting	Insufficient bearing capacity and stability issues for embankments, deep or very shallow competent layer that may prevent installation of sheet piles to design depth. Additional cost and programme delays. Area may require further design.	Contractor	3	3	9	Undertake additional ground investigation in new area of the lower pool (close to the bridge) to confirm strata depths and quality for selected structure/earthwork. Adopt cautious assumptions for the detailed design.	2	2	4
R07	Unexploded Ordnance (UXO) high risk area in pile wall west of M54 Junction 11	Safety risk if UXO is encountered in GI or works (fatal injury). Severe damage to plant, building and services. Possible disruption to local community as could lead to road closure if UXO is found during survey works. Impact in the media if UXO is found.	Contractor, Highways England, site workers, general public, road network, equipment and plant	3	5	15	Contractor to undertake additional UXO surveys in area classified as high risk prior to any intrusive works.	2	4	8
R08	Unknown geotechnical properties of existing noise bunds adjacent to the M54 motorway, west of M54 J1.	Without confirmation of the bund composition the retaining wall design may be inadequate, resulting in potential stability issues, project delays and additional costs.	Contractor, road users, Highways England	4	3	12	Additional GI may be needed to obtain samples in the noise bunds (by hand augers) and undertake laboratory testing. Cautious back-analysis of the current slopes can be undertaken to determine conservative parameters of the fill materials which can then be applied to the retaining wall design.	2	3	6
Variation in thickness / distribution of soil and rock units										
R09	Differential settlement of structures due to lateral change in extent / thickness of soil as the alignment runs along the border between the shallow sandstone and the deep glacial channels.	Foundation design to differ from one abutment to the other. Differential settlements between abutments due to higher embankment settlements in the glacial deposits side. Additional cost and programme delays. Areas may require further design.	Contractor, road users, Highways England	4	4	16	Undertake additional GI in areas where the ground lateral changes are more acute. Preliminary design of structures and abutments to be updated. This design will include the advice for further ground treatment to be design during detailed design stage.	3	3	9
R10	Embankment over deep glacial cohesive compressible deposits may lead to excessive settlement timing	Possible large post-constructive settlements. Programme delays. Maintenance issues.	Contractor, road users, maintenance workers, Highways England	4	3	12	Designer to assess the settlement time in order to determine whether pre-loading or other consolidation speed up measures are needed. Contractor to allow enough earthworks construction to avoid excessive post-constructive settlements and future maintenance issues.	3	2	6
R11	Differential or excessive settlement of structures and embankments / slope instability on the glacial channels due to presence of potentially poor quality GSG	The detected glacial channels may give rise to construction difficulties where piling or embankments are required. Excessive settlement of embankments, insufficient skin friction and base resistance that may require longer piles and / or larger diameter piles. Additional cost and programme delays. Areas may require further design.	Contractor, Highways England, road users	3	4	12	Undertake additional ground investigation to confirm whether the GSG poor condition are due to poor drilling. Design of earthworks, slopes and piling assuming worst case ground conditions. Recommend for pile test to be carried out.	2	2	4

Risk Ref	Hazard/Risk Classification Description	Potential Consequence	Affected Party	Risk Classification Before Mitigation			Mitigation/Control Measures / Opportunity	Risk Classification After Mitigation		
				L	S	R		L	S	R
R12	Misinterpretation of rock head / hard strata encountered at shallow depth than anticipated due to poor recovery.	Interception of hard strata during excavation/piled foundation construction. Excavation/construction progress reduced. Not possible to install piles to design depth. Inappropriate plant on site to carry out excavation.	Contractor	3	4	12	Rock head/hard strata investigated during 2019 GI. Confirmatory GI proposed to confirm strata depths for selected structures. Design of piled foundations to be undertaken using a cautious ground model. Early piling Contractor involvement, to be consulted and ensure that adequate information is available to enable correct piling method is to be chosen.	2	3	6
R13	Damage to gas pipeline due to induced displacements from nearby proposed earthworks	Repairs to utilities. Design changes required; additional cost of minimising impact of services; additional land required; compliance with undertaker's requirements; additional time for negotiations with undertakers. Health and safety of workers.	Contractor, utility owners, site workers, land owners, general public, Highways England	4	4	16	Designer to allow for early consultation with oil and gas transmission pipelines utilities companies. Contractor to allow for compliance with specific statutory undertakers' requirements; design to assess potential displacements on the assets and incorporate mitigation measures.	2	3	6
Variation in material properties of soil and rock units										
R14	Soft/unsuitable material at pavement/road formation level in areas with Made Ground (FOB) or near ponds.	Short-term trafficability problems. Increased capping layer thickness required.	Contractor, road users, maintenance workers, Highways England	4	3	12	CBR tests have been undertaken during 2019 GI. Remaining risk to be mitigated during detailed pavement design through use of cautious design CBR values. Specification of on-site formation inspections and DCP/additional CBR testing may be required during construction. Excavation and replacement according to IAN 73/06 Revision 1 (2009) may be required.	2	2	4
R15	Significant variation in glacial clay properties leading to foundation failures / settlement	Foundation design change during construction; alternative foundation construction required. Programme delays and additional cost.	Contractor	3	3	9	Designer to allow for additional investigation and laboratory testing to confirm material properties; appropriate foundation design; on site review of material by geotechnical engineer. Contractor to utilise methodology to minimise disturbance of in-situ material.	2	2	4
R16	Possible significant variation in sandstone properties	Due to poor recovery in M54 J1 and M6 J11 there are some gaps in the sandstone quality, which could lead to an inaccurate pile design. Additional costs due to wrong piling technique and programme delays.	Contractor	3	4	12	Undertake confirmatory GI in affected structures. Pile design to be based on reasonable cautious parameters with information from existing GI. Recommend for pile testing to be carried out. Early piling Contractor involvement, to be consulted and ensure that adequate information is available to enable correct piling method is to be chosen.	2	3	6

Risk Ref	Hazard/Risk Classification Description	Potential Consequence	Affected Party	Risk Classification Before Mitigation			Mitigation/Control Measures / Opportunity	Risk Classification After Mitigation		
				L	S	R		L	S	R
R17	Unforeseen fault in Brookfield Farm cutting	According to the geological drawings there could be a fault in the Brookfield Farm cutting area. This could lead to a broken ground/disturbed material in the cutting. Additional costs for de-watering measures during construction. Stability issues. Potential flooding of excavations. Need for specific drainage design. May need stabilisation measures. Programme delays.	Contractor, site workers, maintenance workers, Highways England	3	3	9	Designer to allow for sensitivity analysis of slope stability to different groundwater levels. Design of toe drains and support measures for the fault zone. Contractor to design of appropriate temporary works measures and to schedule works in drier periods.	1	3	3
R18	Faults in areas of retaining walls, west of M54 Junction 1	According to the geological drawing there could be a series of faults intersecting the area of the noise bunds, mostly perpendicular to the retaining walls. Potential insufficient skin friction and negative skin friction issues for piles that may require larger diameter and/or longer piles. May require further design. Additional cost and programme delays.	Contractor	3	3	9	Designer to allow for cautious ground model for the piled wall design and adequate sensitivity analysis during detailed design.	2	2	4
R19	Variation between Glacial Till (GT) and Glacial Sands and Gravels (GSG)	Due to the high variation between GT and GSG, which appear interbedded showing high mixing and lateral variations, may be an issue for cuttings and foundations. Foundation design change during construction; alternative foundation construction required. Programme delays and additional cost.	Contractor	4	3	12	Detailed design to allow for cautious ground model for the cuttings, foundations and piles design. Additional GI may be required in areas of high uncertainty. Recommend for pile testing to be carried out.	3	2	6
R20	Potential issues during piling due to the presence of conglomerate beds	Localised conglomerate hard spots leading to increase on piling cost and decrease in productivity. Change of piling techniques. Programme delays and additional cost.	Contractor	3	3	9	Early piling Contractor involvement, to be consulted and ensure that adequate information is available to enable correct piling method is to be chosen.	2	2	4
Groundwater										
R21	Flooding on the Latherford Brook area causing instability to foundations and embankments due to materials wash away	Scour of foundations, wash away of embankment toe and/or softening of materials. Slope and structures instability. Additional construction cost and programme delays. Further design changes. Remediation measures.	Contractor, road users, Highways England, maintenance workers	4	4	16	Designer to adequately assess flood risk and scour potential; appropriate design of foundations including piles and scour protection measures if required; use of suitable fill at toe of slopes, to a height based on historical flooding data, to mitigate wash away potential.	2	3	6

Risk Ref	Hazard/Risk Classification Description	Potential Consequence	Affected Party	Risk Classification Before Mitigation			Mitigation/Control Measures / Opportunity	Risk Classification After Mitigation		
				L	S	R		L	S	R
R22	Ground water levels in, Featherstone Bridge area, Lower pool and Dark Lane to Accommodation Bridge cuttings may need dewatering.	Additional costs for de-watering measures during construction. Stability issues. Potential flooding of excavations. Need for specific drainage design. May need stabilisation measures. Programme delays.	Contractor, site workers	4	4	16	Monitoring of piezometers, designer to allow for sensitivity analysis of slope stability to different groundwater levels; Contractor to design of appropriate temporary works measures; design of slope, crest and toe drains. Contractor to schedule works in drier periods.	3	2	6
R23	Groundwater problems caused by the presence of artesian water in the Latherford Brook and Brookfield Farm ponds.	Difficulty in controlling water during construction. Deformation/uplift of structures or wash out of embankment toe. Damage to integrity of drilled/bored piles.	Contractor, road users, Highways England	3	3	9	Artesian water encountered during 2019 GI near the Latherford Brook Structure and Brookfield Farm ponds. Use of driven piling in structures to avoid diffusing artesian water pressures where these have been encountered during ground investigation. Designer to allow for use of suitable fill at toe of slopes, to mitigate wash away potential.	2	2	4
Variability in amount, condition and control of excavated materials, excavatability										
R24	Earthworks materials imbalance. Surplus of general fill encountered during construction	Additional disposal costs.	Contractor	4	3	12	Designer to allow for use of acceptable non-structural surplus fill in landscaping. Early earthworks contractor involvement to assess and plan earthworks operations.	3	3	9
R25	Earthworks materials imbalance. Deficit of general fill encountered and / or additional unacceptable material encountered during construction	Additional cost in disposal of unacceptable material, programme delays. Need for borrow pit or imported material.	Contractor, land owners	3	4	12	Early earthworks contractor involvement to assess and plan earthworks operations. Additional GI if deemed necessary; Contractor to arrange careful sorting and stockpiling of acceptable material; use of appropriate unacceptable material in landscaping / non-structural fill	3	3	9
R26	Earthworks materials imbalance. Site won material unacceptable without pre-treatment	Cost / time implications.	Contractor	3	3	9	Contractor to use methodology to minimise production of unacceptable material and allow for uncertainty in condition of material that will be excavated.	2	2	4
R27	Earthworks materials imbalance. Excessive wet weather during construction	Degradation of haul roads, additional wetting of materials, additional cost of pre-treating / placing materials.	Contractor	4	4	16	Contractor to ensure contingency for import / use of site won granular material / geotextiles to protect haul roads; protection of stockpiles from adverse weather conditions; Contractor to consider scheduling earthworks in summer to reduce risk of weather impact.	2	3	6
R28	Earthworks materials imbalance. Excessive hot / dry weather	Problems with dust, problems with material suitability.	Contractor, site workers, general public	3	2	6	Contractor to ensure contingency for moisture conditioning of site won material; spraying to minimise dust pollution.	2	1	2

Risk Ref	Hazard/Risk Classification Description	Potential Consequence	Affected Party	Risk Classification Before Mitigation			Mitigation/Control Measures / Opportunity	Risk Classification After Mitigation		
				L	S	R		L	S	R
R29	Borrow pit material not valid, shallow water level, high variability of materials that makes available volume insufficient to cover balance needs.	Classification and separation of materials could be difficult due to variability. Additional cost if imported fill is required. Additional cost and time if additional borrow pit needs to be investigated. Programme delays until the issues are solved.	Contractor, land owners	4	3	12	Undertake sufficient additional GI (Trial pits) and lab tests in any chosen borrow pit area for an adequate characterisation. This will confirm the quality, variability and extent of the soil to be used as fill.	3	3	9
R30	Base of cuttings in cohesive glacial till may potentially experience long-term heave movements.	The overconsolidated cohesive glacial till may heave in the long-term once ground above has been excavated. Depending on how much heave occurs during a specific time period, it may affect the road in use. Could result in potential programme delay and maintenance issues.	Contractor, road users	3	3	9	Relevant cuttings on GT to be modelled with 2D FEM PLAXIS software during detailed design to check the impact and timings of the heave. Construction hold periods may be required to mitigate the issue before surfacing.	2	3	6
Geo-environmental Risks										
R31	Potential contaminants present in groundwater.	Works may cause migration of potential contamination towards sensitive water receptors.	Contractor, general public, environment	3	3	9	Contamination assessment (undertaken already). Geotechnical design to account for conditions encountered. Piling Risk Assessment undertaken to identify acceptable (to Environment Agency) piling method(s). Remediation of groundwater potentially may be required (e.g. in-situ treatment) in isolated locations. Where dewatering of excavations required, storage of incidental water and chemical testing of incidental water before disposal to foul sewer or surface water subject to appropriate discharge consent or Environmental Permit.	2	2	4
R32	Risk from ground gases for construction workers entering excavations.	Certain areas where there is a 'Moderate' risk to construction workers entering excavations from carbon monoxide, methane, carbon dioxide and depleted oxygen concentrations. This is related to areas of made ground and superficial deposits.	Contractor, site workers	3	4	12	Wearing appropriate PPE and monitoring the atmospheric conditions. Enter into underground structures should comply with confined space legislation and assessed prior to entry. Preparation and adoption of a site and task specific health and safety plan.	2	3	6
R33	Asbestos identified in an area during GI.	Asbestos containing material has been identified in one sample within TP04. Asbestos fibres can pose a risk to health to construction workers if airborne.	Contractor, site workers, general public	3	4	12	Before commencing work in areas of suspected asbestos, a site-specific health and safety risk assessment should be carried out in accordance with current health and safety regulations. This assessment should cover potential risks to both construction staff and the local population. Based on the findings of this risk assessment, appropriate mitigation measures should be implemented during the earthworks.	2	3	6

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Appendix A. Drawings

Geology Plan

HE514465-ACM-SGT-M54_SW_PR_Z-DR-GE-1013

Geotech. And Geo-Env. Constraints Plan

HE514465-ACM-SGT-M54_SW_PR_Z-DR-GE-1014

Ground Investigation Location Plans

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1009

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1010

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1011

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1012

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1013

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1014

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1015

HE514465-ACM-SGT-M54_ZZ_ZZ_Z-DR-GE-1016

Geological Long Sections

HE514465-ACM-SGT-Z1_ML_PR_Z-DR-GE-1019

HE514465-ACM-SGT-Z1_ML_PR_Z-DR-GE-1012

HE514465-ACM-SGT-Z2_ML_PR_Z-DR-GE-1013

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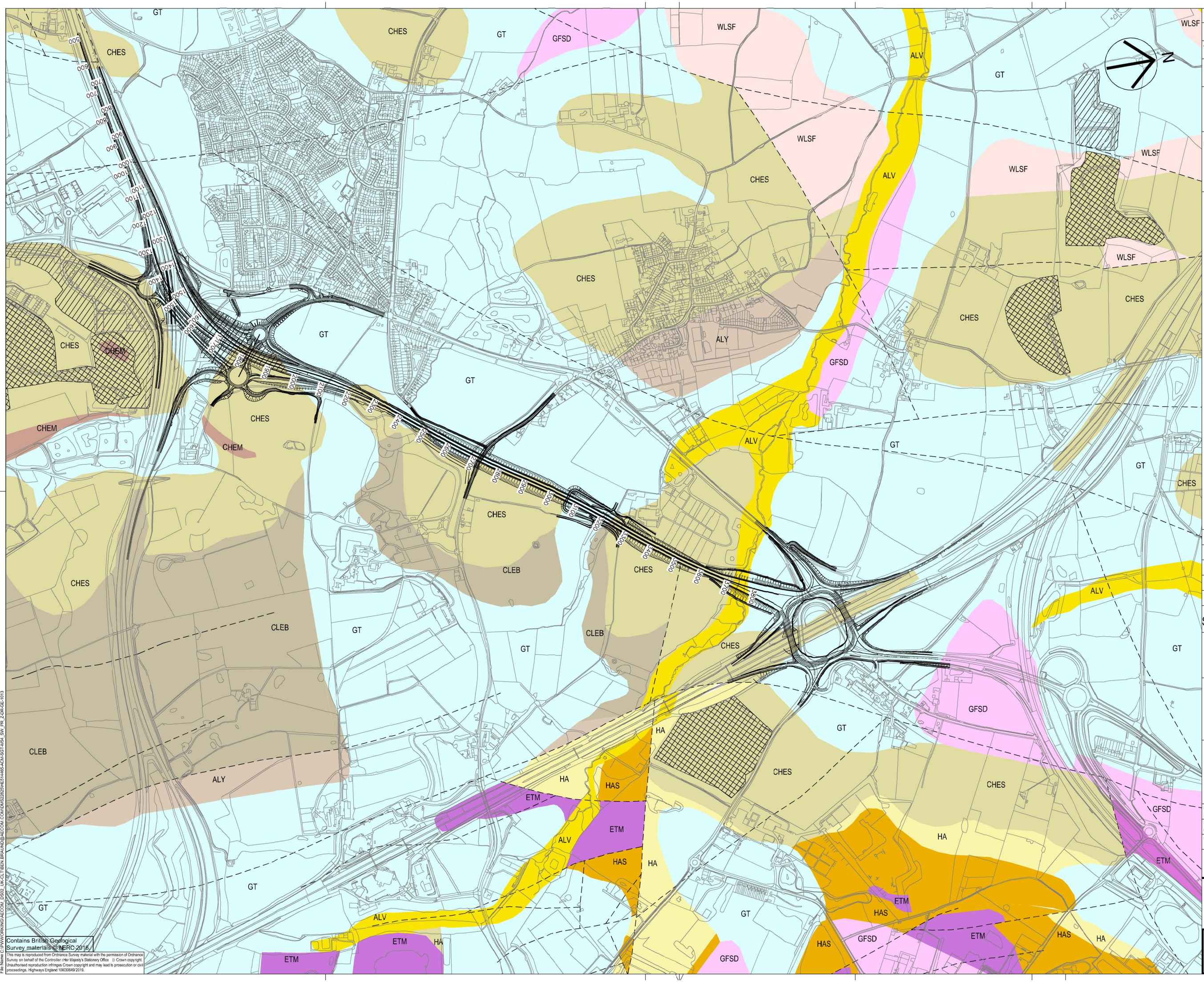
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Ground Gas and Groundwater Monitoring Location Plan

HE514465-ACM-EGT-M54_ZZ_ZZ_Z-DR-GS-0002

Updated Schematic Conceptual Site Model

HE514465-ACM-EGN-M54_ZZ_ZZ_Z-DR-GS-0004



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KEY

SUPERFICIAL DEPOSITS

- GFSD GLACIOFLUVIAL
- GT GLACIAL TILL
- ALV ALLUVIUM

BEDROCK

- WLSF WILMSLOW SANDSTONE FORMATION (SHERWOOD SANDSTONE GROUP)
- CHEM CHESTER FORMATION - MUDSTONE (SHERWOOD SANDSTONE GROUP)
- CHES CHESTER FORMATION - SANDSTONE (SHERWOOD SANDSTONE GROUP)
- CLEB CLENT FORMATION AND ENVILLE MEMBER OF SALOP FORMATION (WARWICKSHIRE GROUP)
- ALY ALVELEY MEMBER OF SALOP FORMATION (WARWICKSHIRE GROUP)
- HA HALESOWEN FORMATION - SANDSTONE (WARWICKSHIRE GROUP)
- HAS HALESOWEN FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE (WARWICKSHIRE GROUP)
- ETM ETRURIA FORMATION (WARWICKSHIRE GROUP)

DISTURBED GROUND

- MADE GROUND
- INFILLED GROUND
- FAULT LINE (INDICATIVE)

First Issue	AK / PM	28/01/19	P01
Second Issue	AK / PM	16/04/19	P02
Third Issue	AK / PM	03/05/19	P03
For Technical Quality Review	AK / PM	02/12/19	P04
Revision Details	By / Check	Date	Suffix

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Working on behalf of highways england

Project Title

M54 to M6 Link Road

Drawing Title

GEOLOGY PLAN

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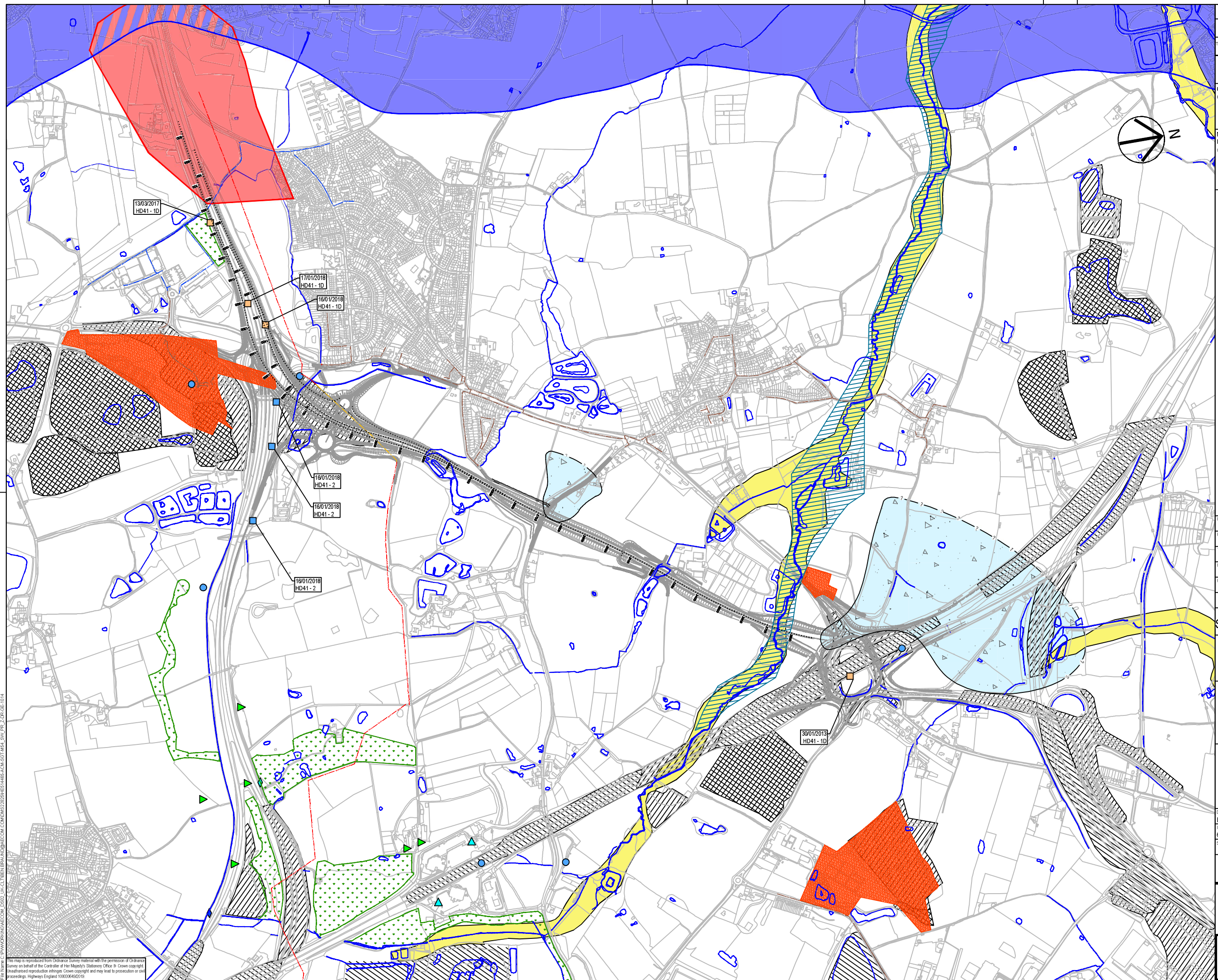
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CONSTRUCTION
HD41 FEATURE GRADE (1-5)

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION
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KEY.

- DISCHARGE CONSENT
- POLLUTION INCIDENT TO CONTROLLED WATERS
- WATER ABSTRACTION
- HISTORIC LANDFILL
- POTENTIALLY INFILLED LAND (WATER)
- POTENTIALLY INFILLED LAND (NON-WATER)
- LOCAL AUTHORITY POLLUTION AND PREVENTION CONTROL
- ALLUVIUM
- ANCIENT WOODLANDS
- FLOOD PLAIN
- EXISTING WATERCOURSE
- HAGDMS - DEFECT CATEGORY 1D (HD41/15)
- HAGDMS - DEFECT CATEGORY 2 (HD41/15)
- GAS MAIN (LP)
- GAS MAIN (HP) NATIONAL GRID
- GAS MAIN (MP) NATIONAL GRID
- GAS MAIN (LP) NATIONAL GRID
- MADE GROUND
- INFILLED GROUND
- GLACIAL CHANNEL (NW EXTENT UNKNOWN)
- UXO - VERY HIGH RISK
- SPZ 3 TOTAL CATCHMENT

Revision Details	By	Check	Date	Suffix
First Issue	AK	PM	28/01/19	P01
First Issue	AK	PM	16/04/19	P02
Third Issue	AK	PM	03/05/19	P03
For Technical Quality Review	AK	PM	02/12/19	P04
For Technical Quality Review	AK	PM	10/01/20	P05

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Project Title
M54 to M6 Link Road

Drawing Title
GEOTECH. AND GEO-ENV. CONSTRAINTS PLAN

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BB	AK	BB	PM	10/01/20

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	Geotechnical

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M54_SW_PR_Z		-DR-GE-1014		

SJ90SW196
SJ90SW54
SJ90SW55
SJ90SW197
SJ90SW58
SJ90SW57
SJ90SW56
SJ90SW198
SJ90SW59

CONTINUED ON SHEET 2

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KEY
- GROUND INVESTIGATION BOREHOLE LOCATION
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

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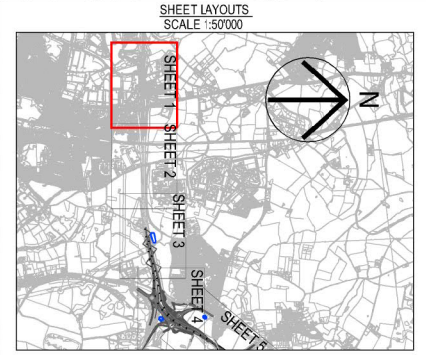
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M54 to M6 Link Road

Drawing Title

GROUND INVESTIGATION LOCATION PLAN (SHEET 1 OF 8)

SHEET LAYOUTS
SCALE 1:50000



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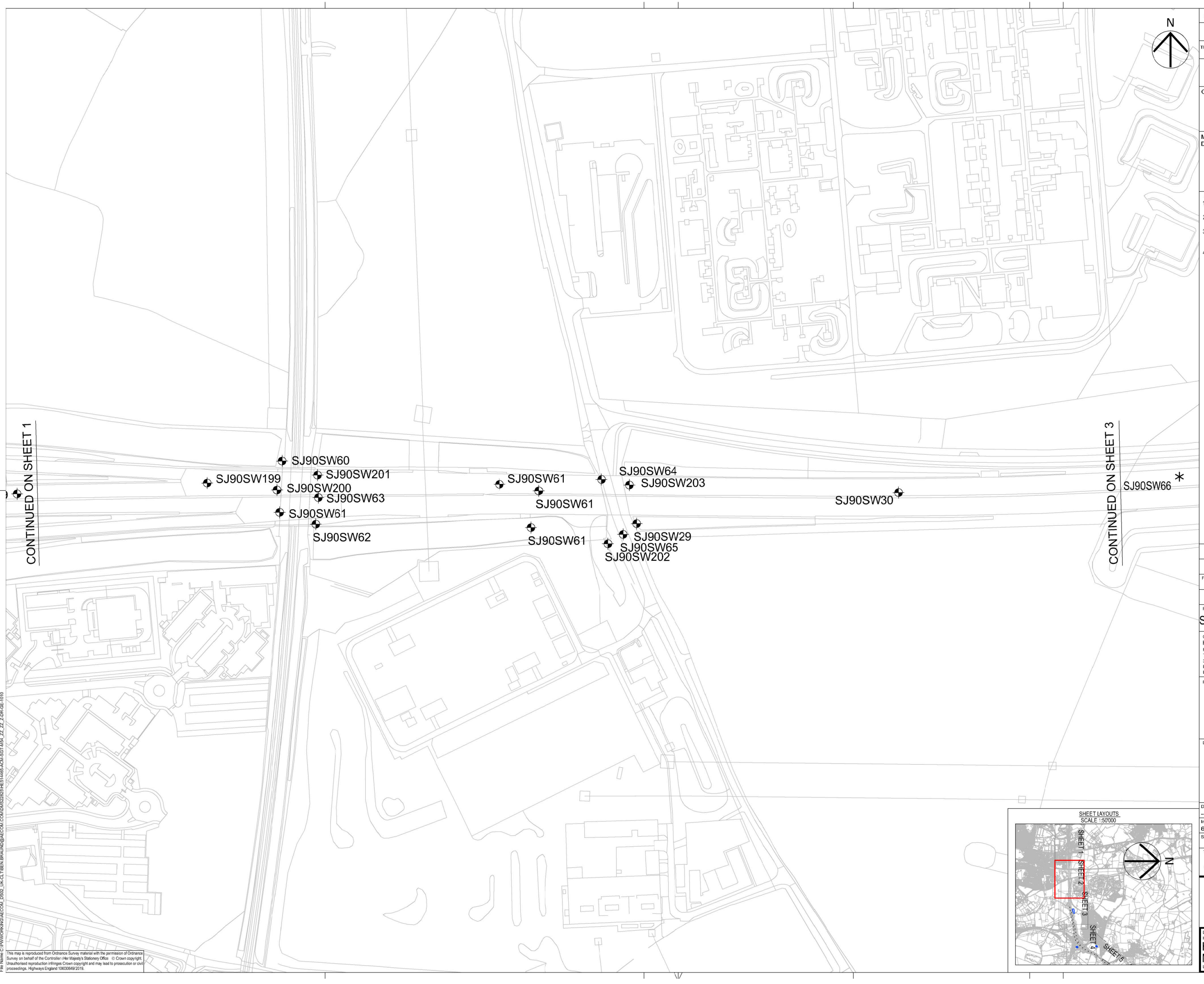
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KEY
- GROUND INVESTIGATION BOREHOLE LOCATION
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

For Technical Quality Review	AK / PM		28/11/19	P01
Revision Details	By / Check		Date	Suffix

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Working on behalf of highways england

Project Title
M54 to M6 Link Road

Drawing Title
GROUND INVESTIGATION LOCATION PLAN (SHEET 2 OF 8)

SHEET LAYOUTS
SCALE 1:50'000

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	28/11/19

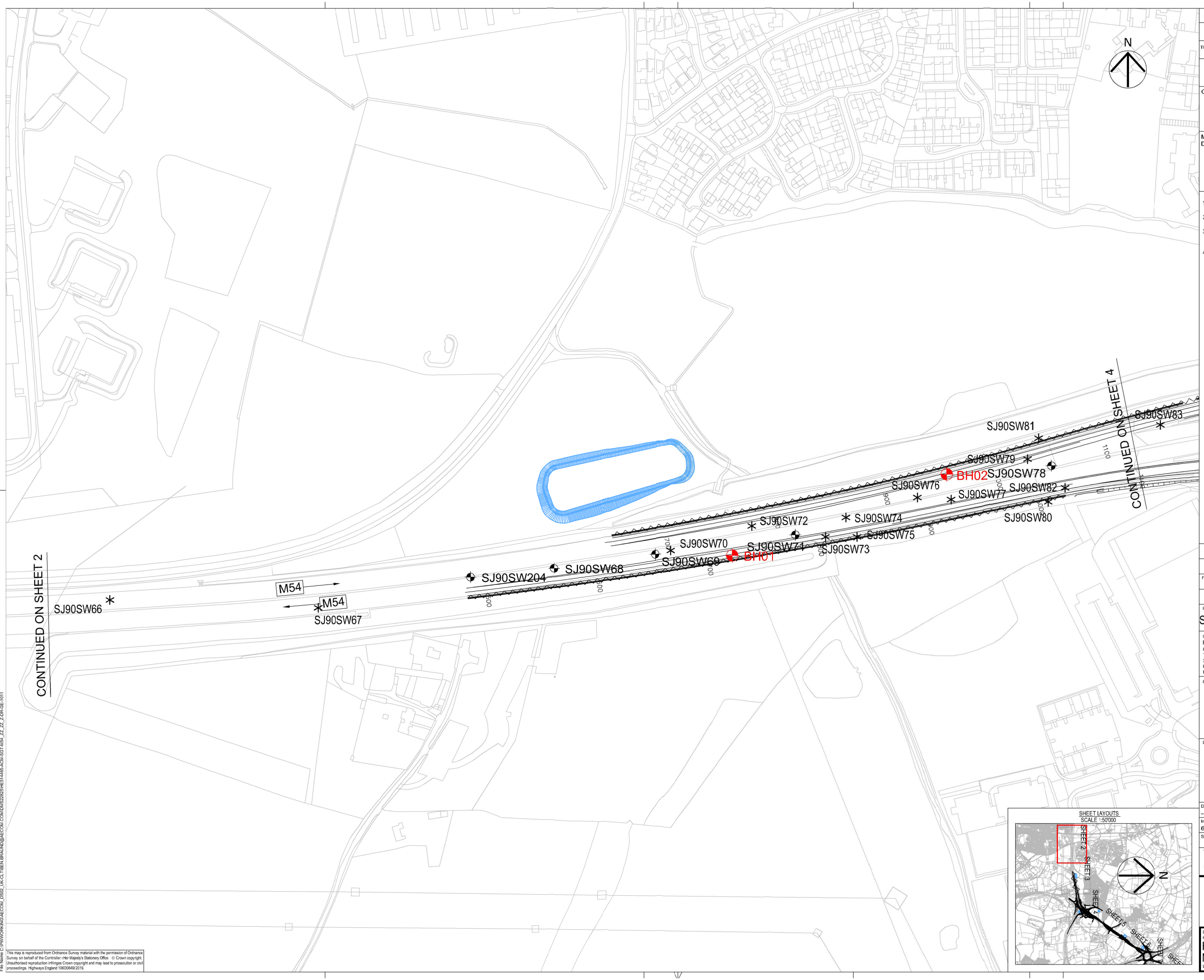
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KEY

- GROUND INVESTIGATION BOREHOLE LOCATION
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

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Project Title

M54 to M6 Link Road

Drawing Title

GROUND INVESTIGATION LOCATION PLAN (SHEET 3 OF 8)

SHEET LAYOUTS
SCALE 1:50'000

Designed	Drawn	Checked	Approved	Date
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FEATHERSTONE

FEATHERSTONE OVERBRIDGE

NEW FREE FLOW LINKS BETWEEN M54 & LINK ROAD

CONTINUED ON SHEET 3

CONTINUED ON SHEET 5

NEW M54 OVERBRIDGE

M54 J1

M54

TP10 BH12 BH11 TP07 BH10 TP08 TP06 BH09 BH08A BH30 TP02 BH03 TP03 TP05 BH06 BH07 TP01 TP04 BH04 BH05

SJ90NW58 SJ90NW60 SJ90NW59 SJ90SW232 SJ90SW240 SJ90SW233 SJ90SW92 SJ90SW239 SJ90SW238 SJ90SW87 SJ90SW205 SJ90SW88 SJ90SW206 SJ90SW83 SJ90SW84 SJ90SW86 SJ90SW85 SJ90SW95 SJ90SW94 SJ90SW90 SJ90SW93 SJ90SW89 SJ90SW97 SJ90SW96 SJ90SW31 SJ90SW207

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KEY

- GROUND INVESTIGATION BOREHOLE LOCATION
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

For Technical Quality Review	AK / PM	28/11/19	P01
Revision Details	By / Check	Date	Suffix

Purpose of issue

SUITABLE FOR REVIEW & COMMENT

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Working on behalf of highways england

Project Title

M54 to M6 Link Road

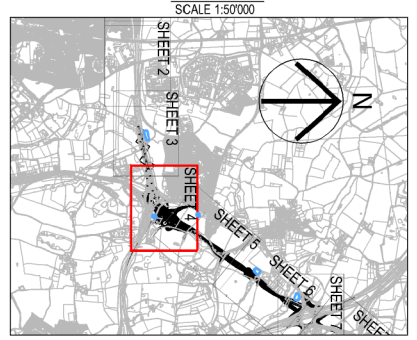
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GROUND INVESTIGATION LOCATION PLAN (SHEET 4 OF 8)

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	28/11/19

Internal Project No.	Suitability
60536736	S3
Scale @ A1	Zone
	Geotechnical

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Drawing Number
Highways England PIN | Orginator | Volume
HE514465 - ACM - SGT -
M54_ZZ_ZZ_Z - DR-GE-1012
Location | Type | Role | Number

Rev P01

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SHEET LAYOUTS
SCALE 1:50000

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Drawing Number				Rev
Highways England PIN	Originator	Volume		
HE514465	ACM	SGT	-	P01
Location		Type	Role	Number
M54_ZZ_ZZ_Z		DR	GE	1013

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Scale @ A1		Zone	Geotechnical
Info mation Project No.		Suitability	
60536736		S3	

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	28/11/19

Drawing Title
GROUND INVESTIGATION
LOCATION PLAN
(SHEET 5 OF 8)

Project Title
M54 to M6 Link Road

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Working on behalf of highways england

Purpose of Issue
SUITABLE FOR REVIEW & COMMENT

Revision Details	By	Check	Date	Sk/Fix
For Technical Quality Review	AK	PM	28/11/19	P01

KEY
- GROUND INVESTIGATION BOREHOLE LOCATION (BH / TP)
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

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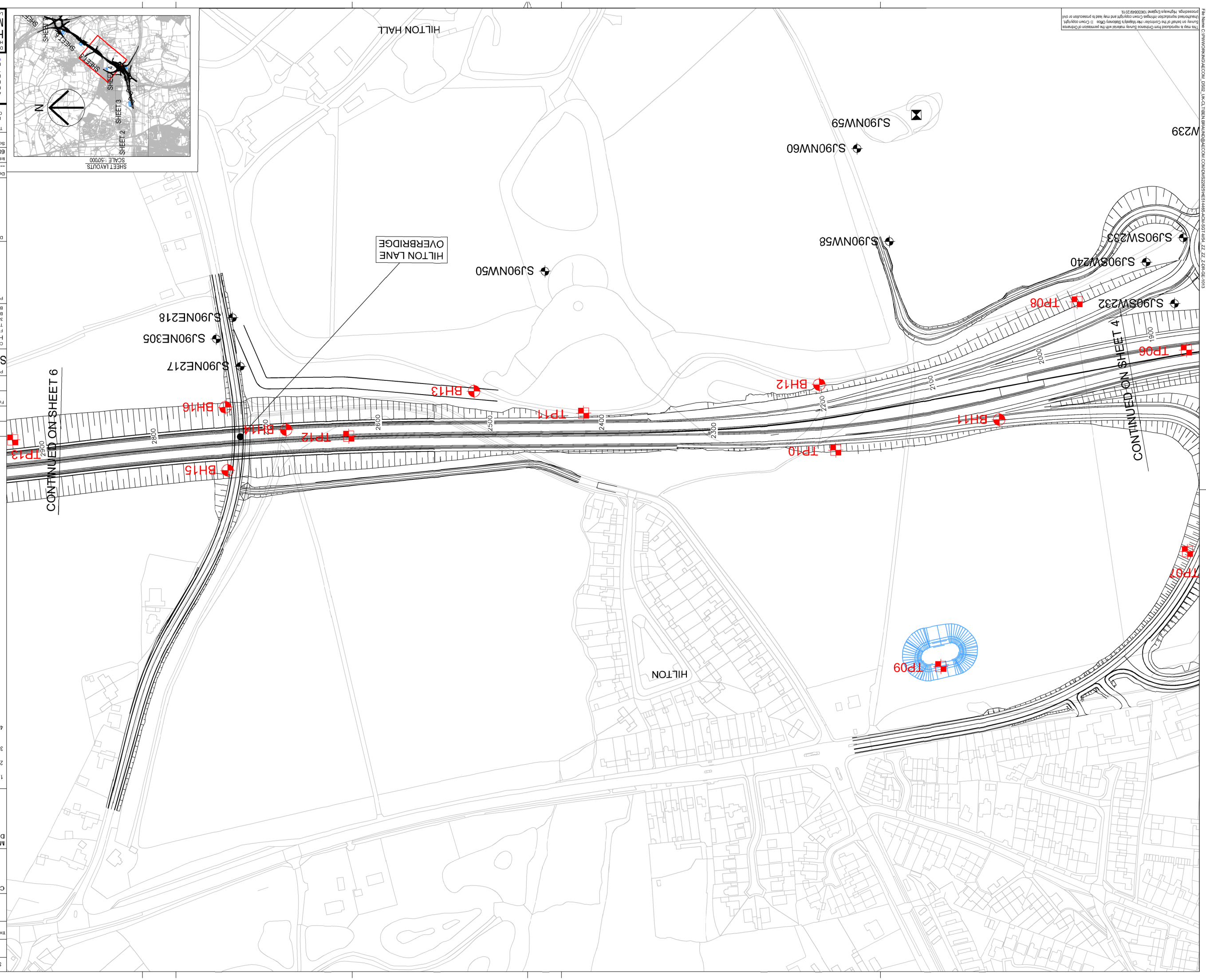
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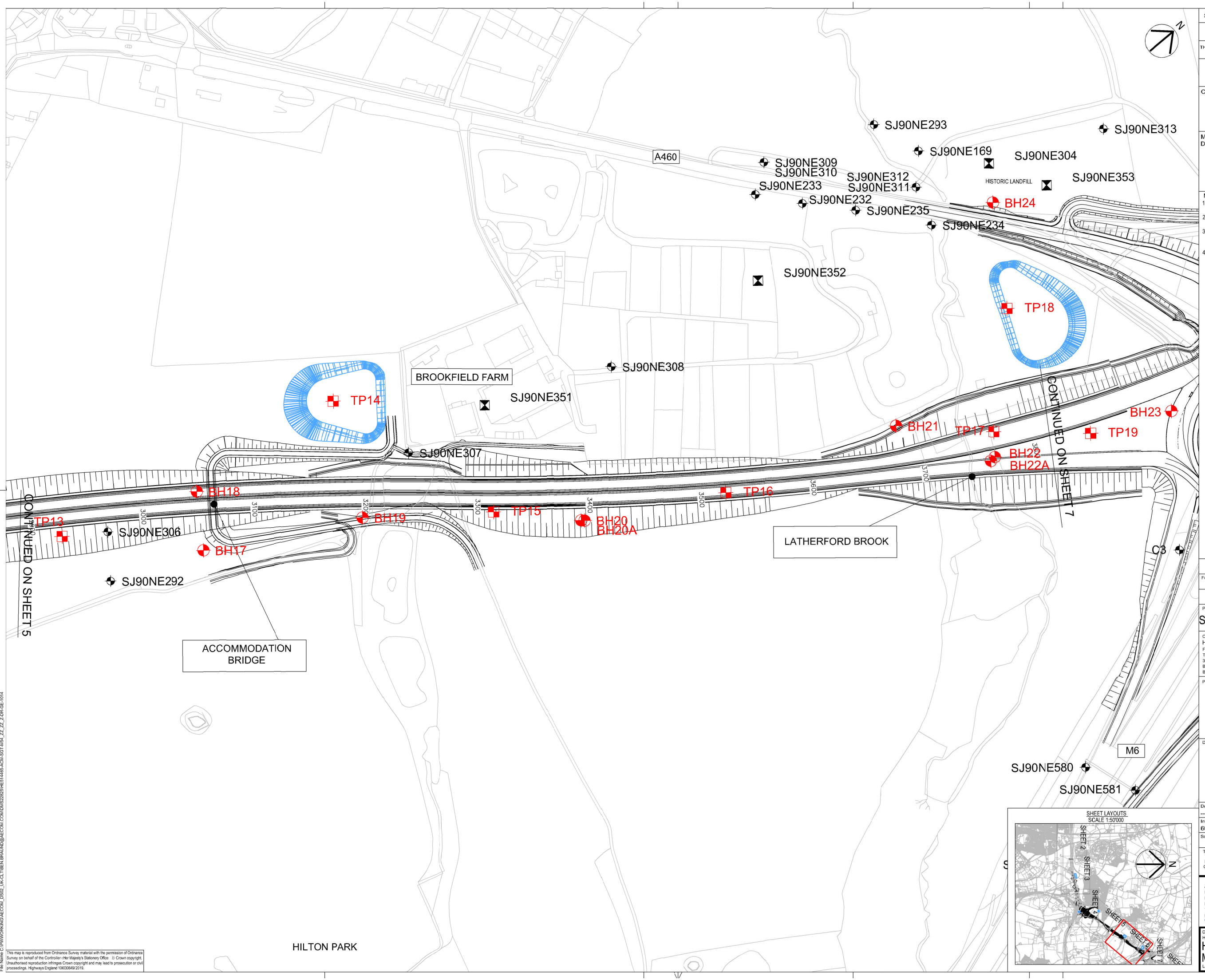
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KEY

- GROUND INVESTIGATION BOREHOLE LOCATION
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

For Technical Quality Review	AK	PM	28/11/19	P01
Revision Details	By	Check	Date	Suffix

Purpose of issue

SUITABLE FOR REVIEW & COMMENT

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Working on behalf of
highways england

Project Title

M54 to M6 Link Road

Drawing Title

GROUND INVESTIGATION LOCATION PLAN (SHEET 6 OF 8)

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	28/11/19

Internal Project No. 60536736	Suitability S3
Scale @ A1	Zone Geotechnical

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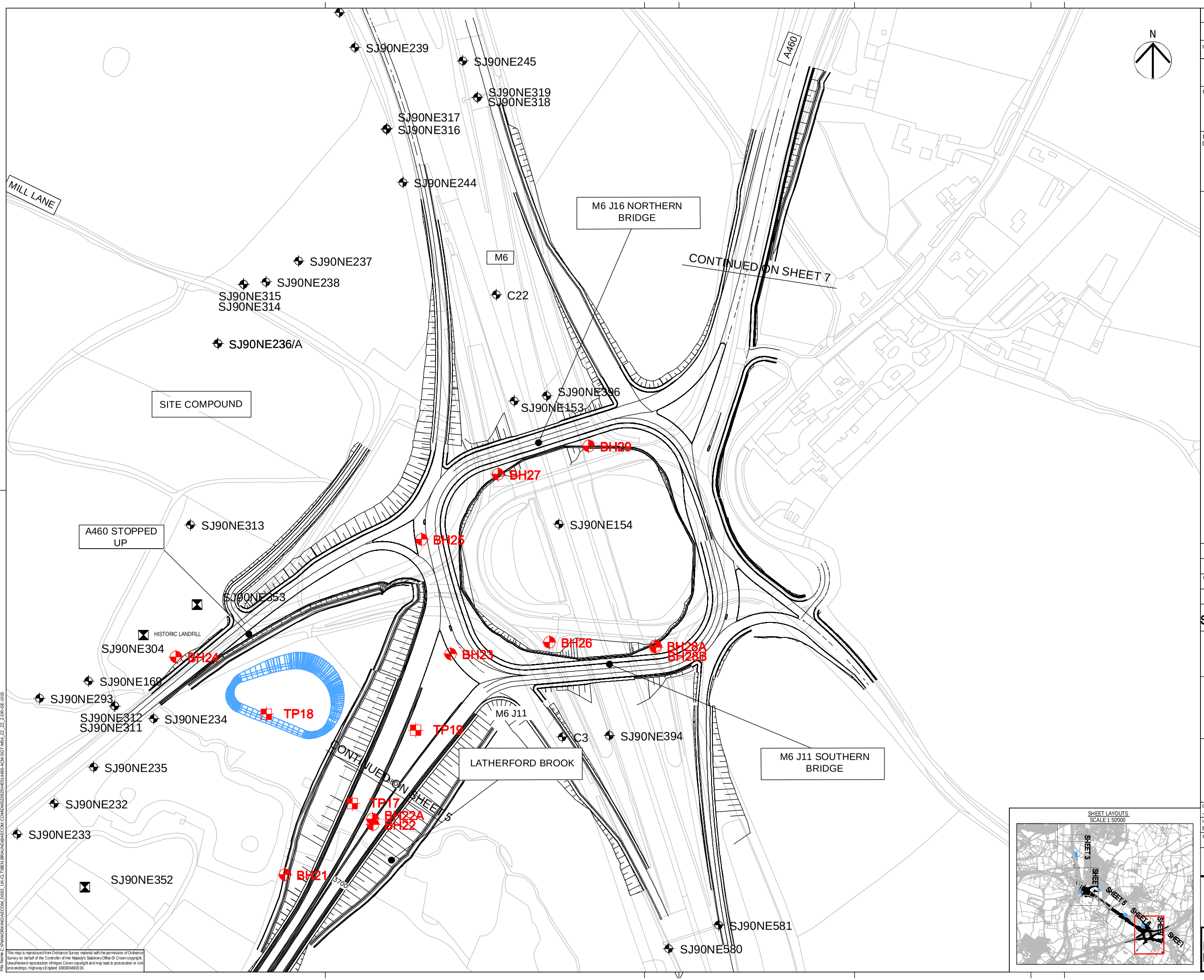
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Drawing Number				Rev
Highways England PIN	Orginator	Volume		
HE514465	ACM	SGT		P01
M54_ZZ_ZZ_Z		DR	GE 1014	
Location		Type	Role Number	

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KEY

- GROUND INVESTIGATION BOREHOLE LOCATION
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

For Technical Quality Review	AK / PM	28/11/19	P0:	
Revision Details	By / Check	Date	Suff	

Purpose of issue

SUITABLE FOR REVIEW & COMMEN

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Working on behalf of highways england

Project Title

M54 to M6 Link Road

Drawing Title

GROUND INVESTIGATION LOCATION PLAN (SHEET 7 OF 8)

SHEET LAYOUTS
SCALE 1:50000

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	28/11/19

Internal Project No.	Suitability
60536736	S3
Scale @ A1	Zone
	Geotechnical

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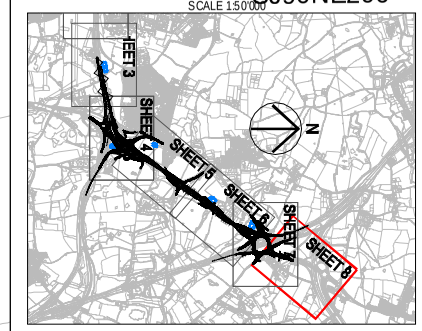
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Drawing Number				Rev
Highways England PIN	Originator	Volume		
HE514465	ACM	SGT		P01
M54_ZZ_ZZ_Z		DR	GE-1015	
Location		Type	Role Number	

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CONTINUED ON SHEET 6
M6 TOLL
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SHEET LAYOUT
SCALE 1:50000



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KEY

- GROUND INVESTIGATION BOREHOLE LOCATION
- GROUND INVESTIGATION TRIAL PIT LOCATION
- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- PROPOSED POND

Revision Details	By	Check	Date	Suffix
For Technical Quality Review	AK	PM	28/11/19	P01

Purpose of Issue
SUITABLE FOR REVIEW & COMMENT

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Working on behalf of
highways england

Project Title
M54 to M6 Link Road

Drawing Title
GROUND INVESTIGATION LOCATION PLAN (SHEET 8 OF 8)

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	28/11/19

Internal Project No.	Suitability
60536736	S3
Scale @ A1	Zone
	Geotechnical

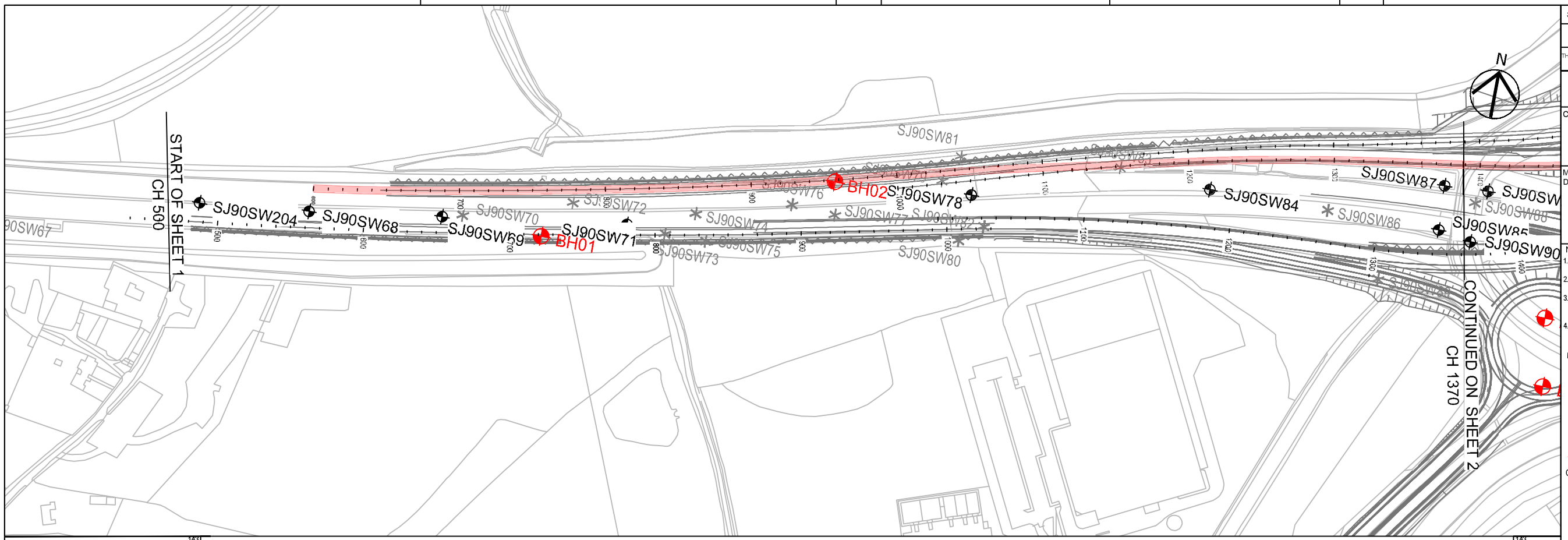
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Drawing Number
Highways England PIN | Originator | Volume
HE514465 - ACM - SGT -
M54_ZZ_ZZ_Z - DR - GE - 1016
Location | Type | Role | Number

Rev
P01



THE GEOLOGICAL BOUNDARIES SHOWN ILLUSTRATE A POSSIBLE INTERPRETATION OF THE GEOLOGICAL STRUCTURE PROJECTED ALONG THE SECTION LINE.

HOWEVER, SIGNIFICANT LATERAL VARIATION HAS BEEN RECORDED IN THE GI, PARTICULARLY IN THE GLACIAL PROFILE. THIS INCLUDES POSSIBLE CHANNELS, INFILLED HOLLOWS AND POSSIBLE FEATURES SUCH AS KAMES.

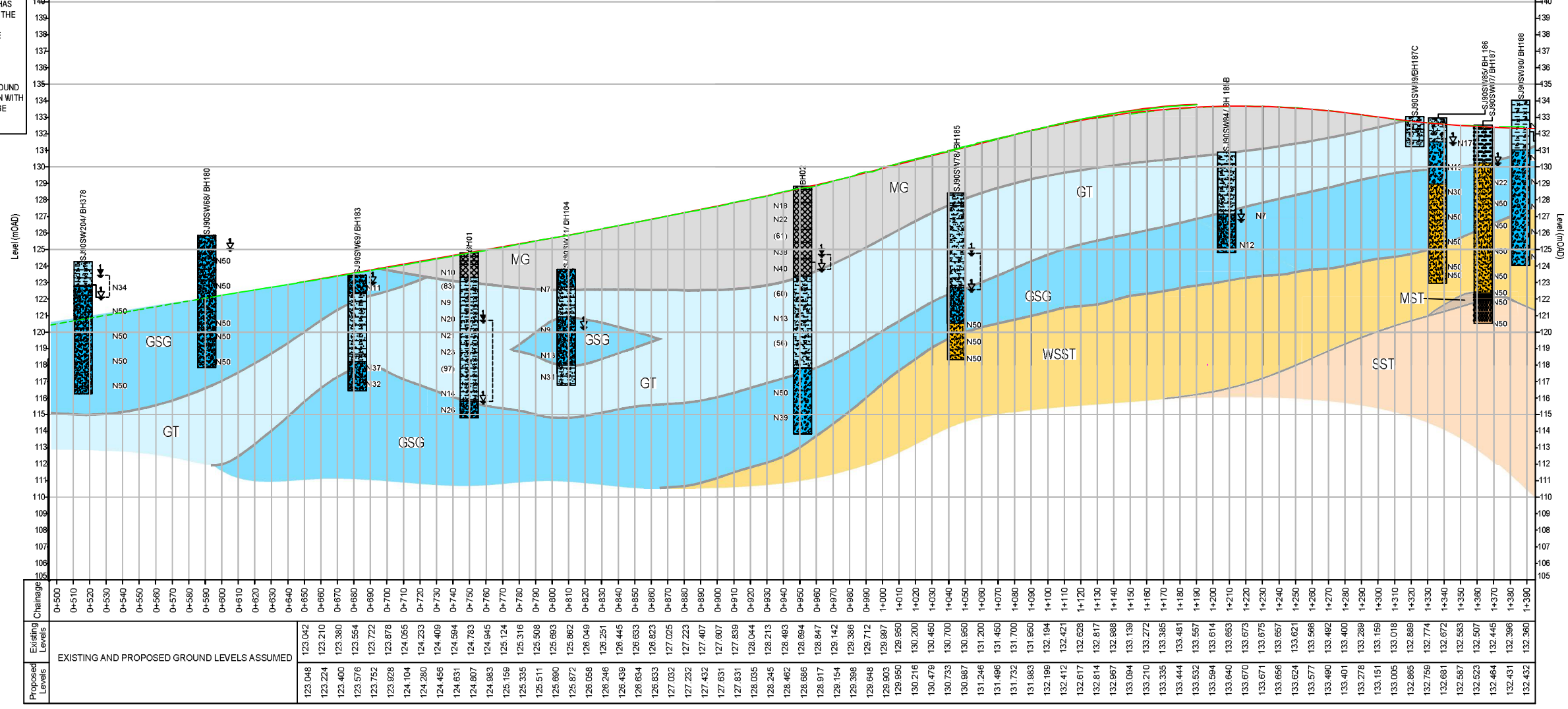
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PLAN

SCALE 1:1500

SECTION

SCALE 1:1500 H 1:150 V



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES

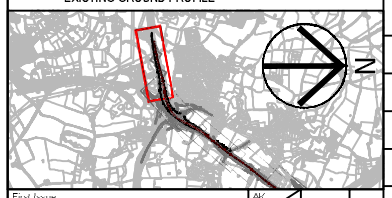
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KEY

- HISTORIC BOREHOLE LOCATION
- HISTORIC TRIAL PIT LOCATION
- HISTORIC HAND AUGER LOCATION
- BH GROUND INVESTIGATION BOREHOLE LOCATION
- TP GROUND INVESTIGATION TRIAL PIT LOCATION
- GROUND WATER RISES
- GROUND WATER STRIKES
- N50 = SPT
- (60) = U100

GEOLOGY KEY

- MADE GROUND (MG)
- PEAT (PT)
- GLACIAL TILL (GT)
- GLACIAL SAND AND GRAVELS (GSG)
- WEATHERED MUDSTONE (WMST)
- MUDSTONE (MST)
- SILTSTONE (SLST)
- CONGLOMERATE (CONG)
- NO RECOVERY (NR)
- WEATHERED SANDSTONE (WSST)
- SANDSTONE (SST)
- ALLUVIUM (ALL)
- PROPOSED GROUND PROFILE
- MAIN ALIGNMENT
- EXISTING GROUND PROFILE



Revision Details	By / Check	Date	Suffix
First Issue	AK / PM	02/12/19	P01
For Technical Quality Review	AK / PM	10/01/20	P02

Purpose of issue

SUITABLE FOR REVIEW & COMMENT

Client
Highways England
The Cube
199 Wharfside Street
Birmingham
B1 1RN

Working on behalf of highways england

Project Title

M54 to M6 Link Road

Drawing Title

GEOLOGICAL LONG SECTION (SHEET 1 OF 5)

Designed	Drawn	Checked	Approved	Date
—	AK	BB	PM	10/01/20

Internal Project No.	Suitability
60536736	S3
Scale @ A1	Zone
	Geotechnical

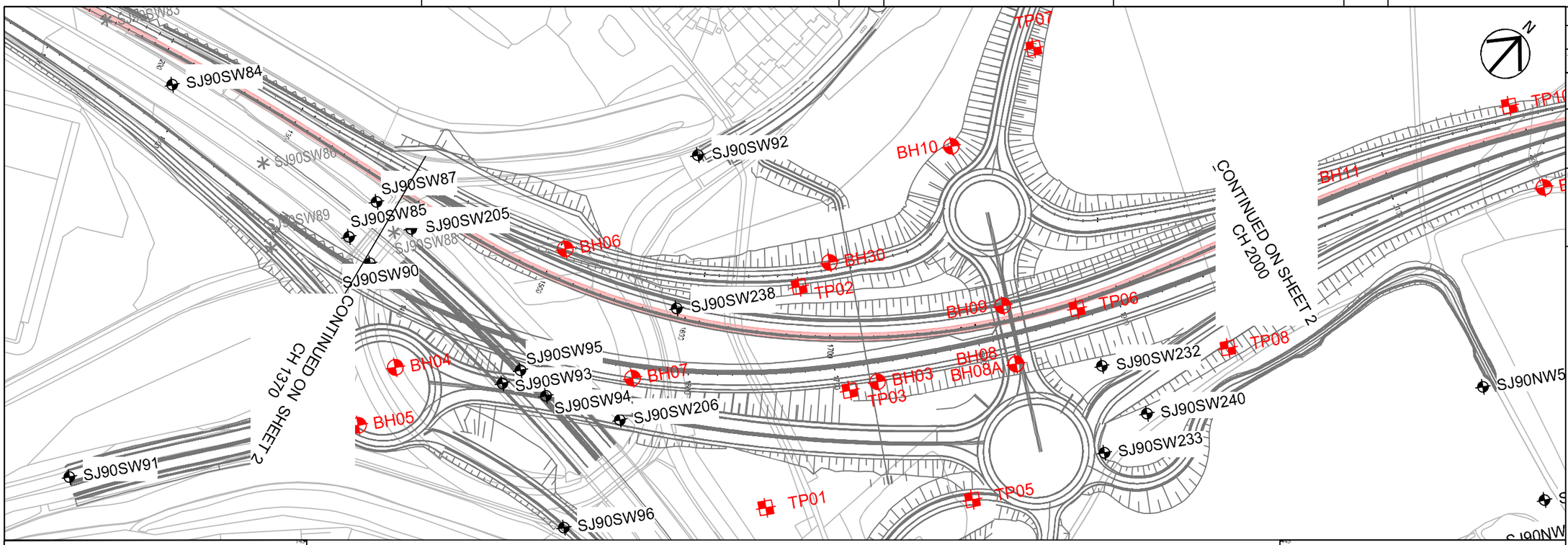
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Drawing Number	Originator	Volume	Rev
Highways England PIN: HE514465	-ACM	-SGT - Z1_ML_PR_Z	P02
Location	Type	Role	Number
		-DR-GE-1019	

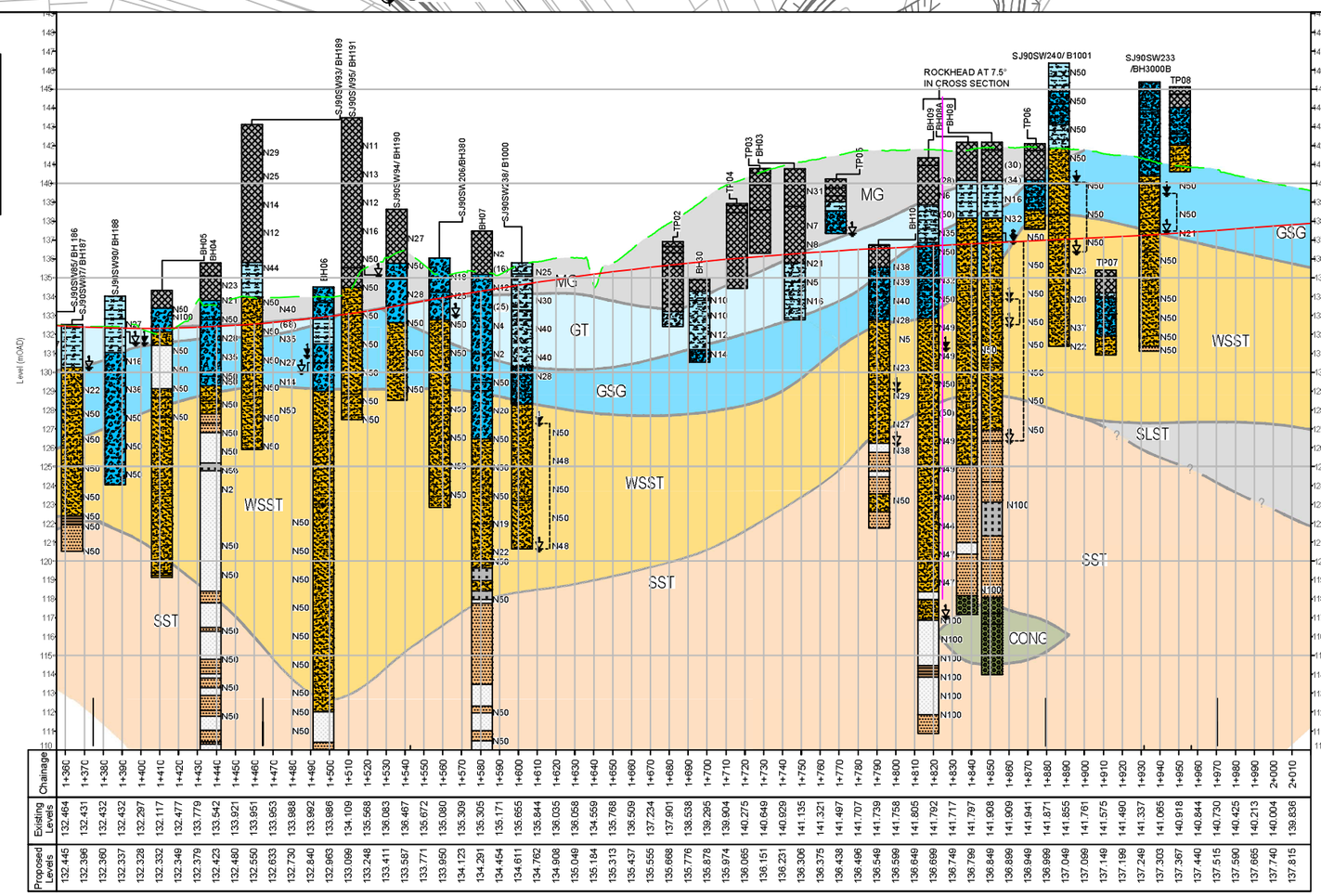
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THE GEOLOGICAL BOUNDARIES SHOWN ILLUSTRATE A POSSIBLE INTERPRETATION OF THE GEOLOGICAL STRUCTURE PROJECTED ALONG THE SECTION LINE.

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SECTION

SCALE 1:1500 H 1:150 V

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File Name: C:\PWORKING\AECOM_GSD_LW-CL.TBEN.BRAUN@AECOM.COM\D0452\82\HE514465-ACM-SGT-Z1_ML_PR_Z-DR-GE-1012

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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- BH GROUND INVESTIGATION BOREHOLE LOCATION
- TP GROUND INVESTIGATION TRIAL PIT LOCATION
- GROUND WATER RISES
- GROUND WATER STRIKES
- N50 = SPT
- (60) = U100

GEOLOGY KEY

- MADE GROUND (MG)
- PEAT (PT)
- GLACIAL TILL (GT)
- GLACIAL SAND AND GRAVELS (GSG)
- WEATHERED MUDSTONE (WMST)
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- SANDSTONE (SST)
- ALLUVIUM (ALL)
- PROPOSED GROUND PROFILE
- EXISTING GROUND PROFILE
- MAIN ALIGNMENT CHAINAGE



First Issue	AK	PM	02/12/19	P01
For Technical Quality Review	AK	PM	10/01/20	P02

Revision Details	By	Check	Date	Suffix

Purpose of issue

SUITABLE FOR REVIEW & COMMENT

Client
Highways England
The Cube
199 Wharfside Street
Birmingham
B1 1RN

Working on behalf of highways england

Project Title

M54 to M6 Link Road

Drawing Title

GEOLOGICAL LONG SECTION (SHEET 2 OF 5)

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	10/01/20

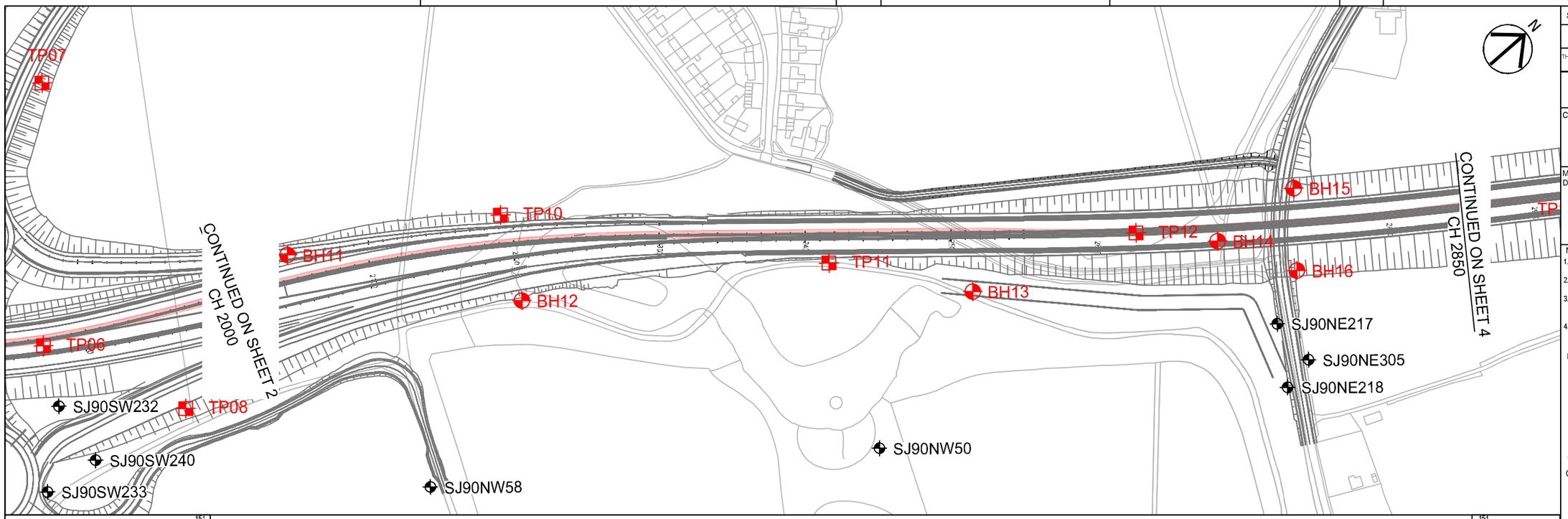
Internal Project No	Suitability
60536736	S3
Scale @ A1	Zone
	Geotechnical

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Drawing Number				Rev
Highways England PIN	Originator	Volume		
HE514465	-ACM	-SGT -		P02
Z1_ML_PR_Z		-DR-GE-1012		
Location		Type	Role	Number

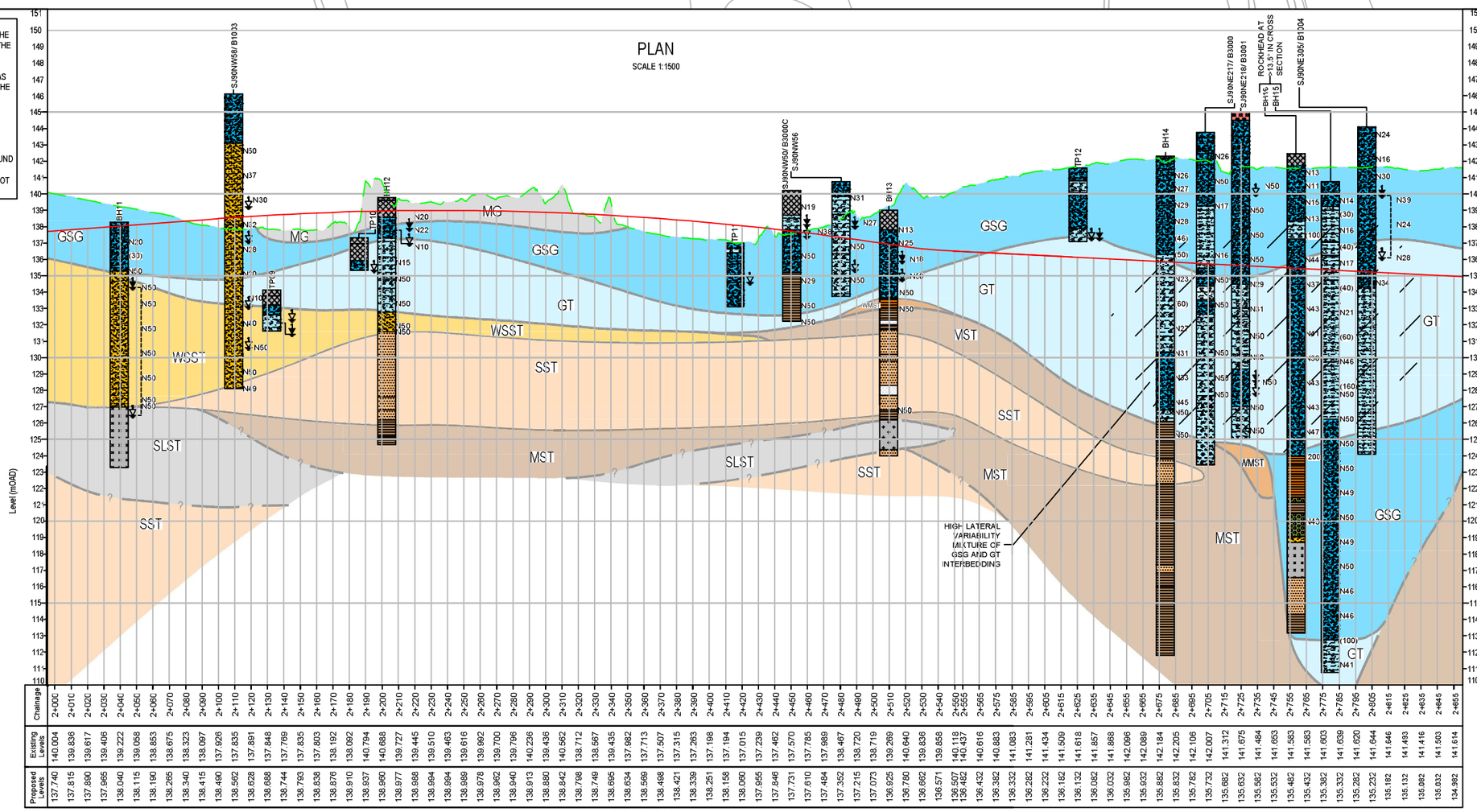


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PLAN
SCALE 1:1500



SECTION
SCALE 1:1500 H 1:150 V

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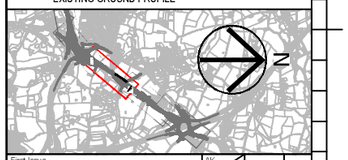
CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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Revision Details	By / Check	Date	Suffix
First Issue	AK / PM	02/12/19	P01
For Technical Quality Review	AK / PM	10/01/20	P02

Purpose of issue
SUITABLE FOR REVIEW & COMMENT

Client
Highways England
The Cube
199 Wharfside Street
Birmingham
B1 1RN

Working on behalf of highways england

Project Title
M54 to M6 Link Road

Drawing Title
GEOLOGICAL LONG SECTION (SHEET 3 OF 5)

Designed	Drawn	Checked	Approved	Date
—	AK	BB	PM	10/01/20

Internal Project No	Suitability
60536736	S3
Scale @ A1	Zone
	Geotechnical

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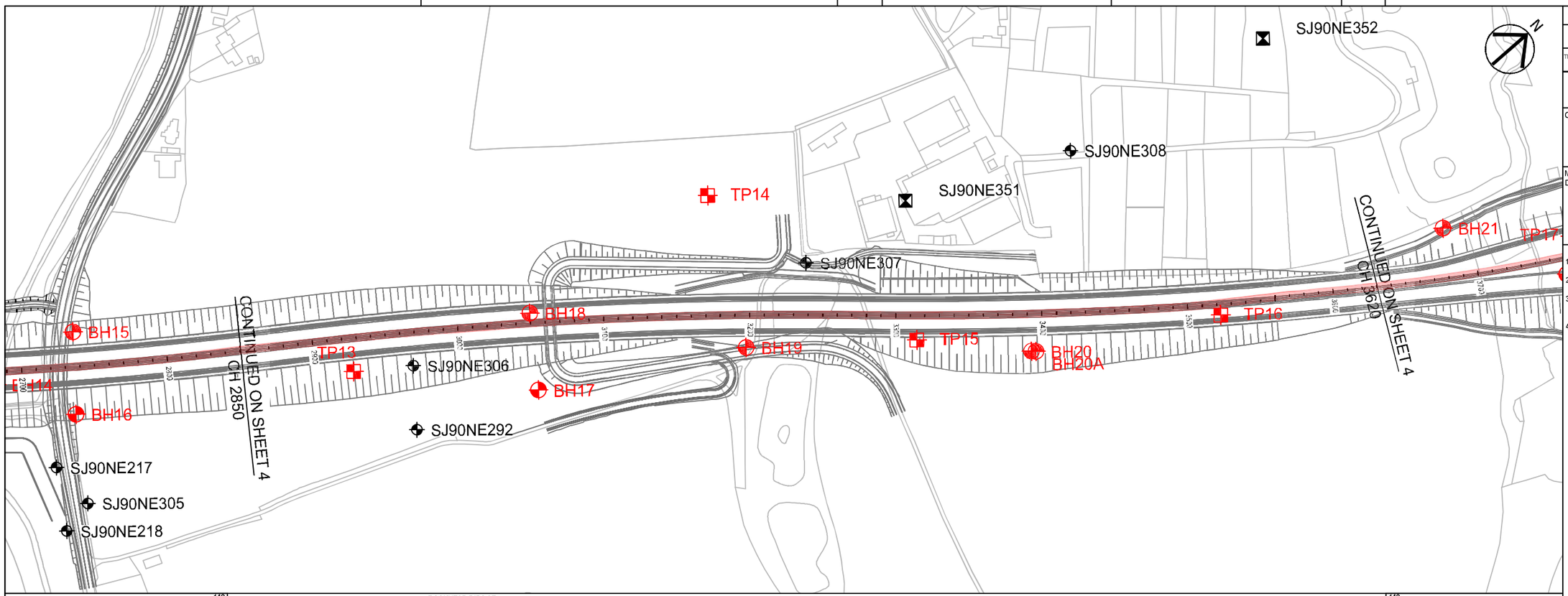
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Drawing Number	Originator	Volume	Rev
HE514465 Z2_ML_PR_Z	-ACM Location	-SGT - -DR-GE-1013 Type / Role / Number	P02

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Plot Date: 12 January 2020 13:31:09
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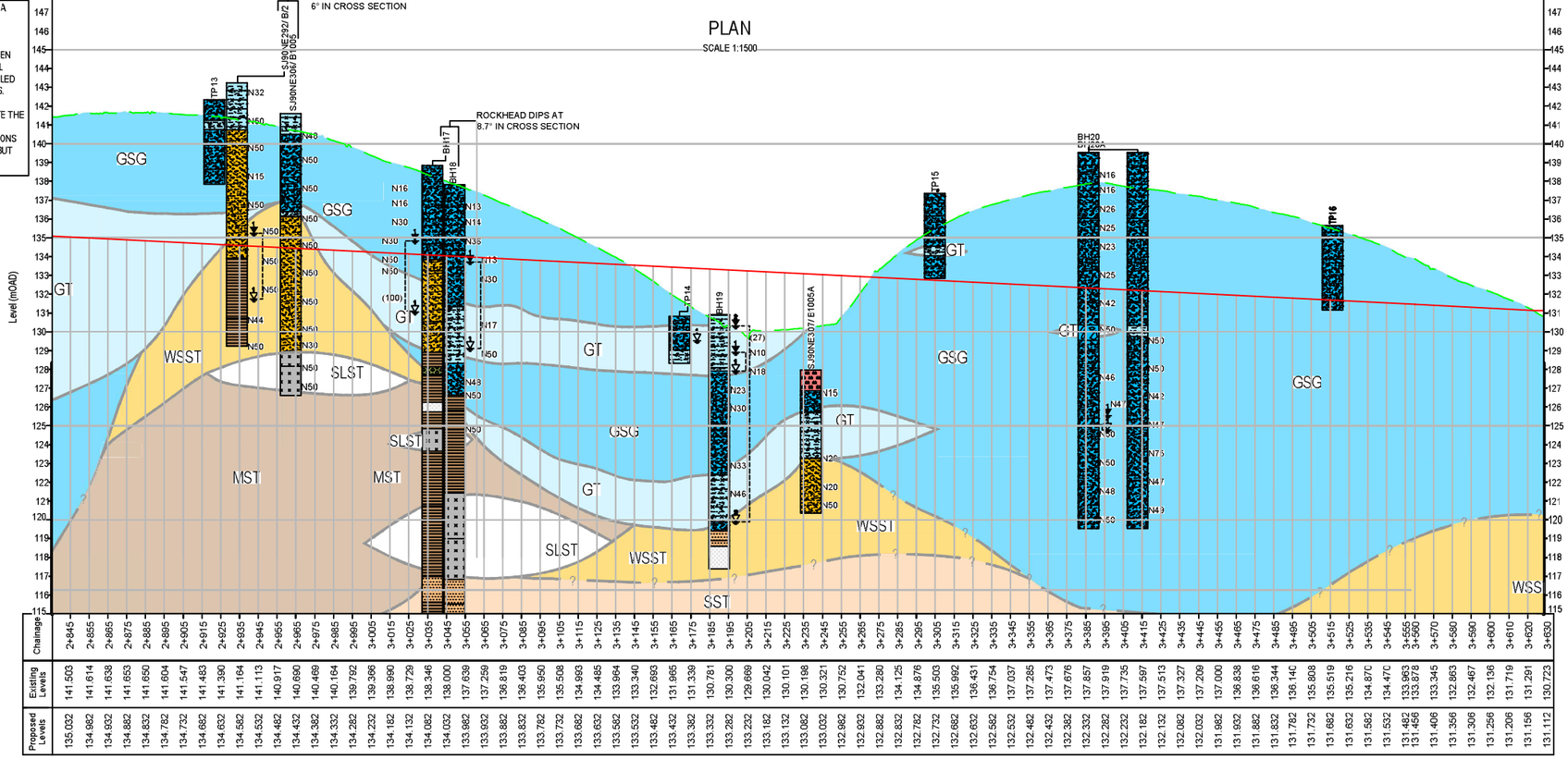


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PLAN
SCALE 1:1500



Chainage	2+845	2+855	2+865	2+875	2+885	2+895	2+905	2+915	2+925	2+935	2+945	2+955	2+965	2+975	2+985	2+995	3+005	3+015	3+025	3+035	3+045	3+055	3+065	3+075	3+085	3+095	3+105	3+115	3+125	3+135	3+145	3+155	3+165	3+175	3+185	3+195	3+205	3+215	3+225	3+235	3+245	3+255	3+265	3+275	3+285	3+295	3+305	3+315	3+325	3+335	3+345	3+355	3+365	3+375	3+385	3+395	3+405	3+415	3+425	3+435	3+445	3+455	3+465	3+475	3+485	3+495	3+505	3+515	3+525	3+535	3+545	3+555	3+560	3+570	3+580	3+590	3+600	3+610	3+620	3+630
Existing Levels	141.503	141.614	141.638	141.653	141.650	141.604	141.547	141.483	141.390	141.164	141.113	140.917	140.690	140.469	140.164	139.792	139.366	138.990	138.729	138.346	138.000	137.639	137.259	136.819	136.403	135.950	135.508	134.993	134.485	133.964	133.540	133.340	132.693	131.965	131.339	130.781	130.300	130.042	130.101	130.198	130.321	130.752	132.041	133.280	134.125	134.876	135.503	135.982	136.431	136.754	137.037	137.285	137.473	137.676	137.857	137.919	137.735	137.597	137.513	137.327	137.209	137.000	136.838	136.616	136.344	136.140	135.808	135.519	135.216	134.870	134.470	133.963	133.878	133.345	132.863	132.467	132.136	131.719	131.291	130.723
Proposed Levels	135.032	134.982	134.932	134.882	134.832	134.782	134.732	134.682	134.632	134.582	134.532	134.482	134.432	134.382	134.332	134.282	134.232	134.182	134.132	134.082	134.032	133.982	133.932	133.882	133.832	133.782	133.732	133.682	133.632	133.582	133.532	133.482	133.432	133.382	133.332	133.282	133.232	133.182	133.132	133.082	133.032	132.982	132.932	132.882	132.832	132.782	132.732	132.682	132.632	132.582	132.532	132.482	132.432	132.382	132.332	132.282	132.232	132.182	132.132	132.082	132.032	131.982	131.932	131.882	131.832	131.782	131.732	131.682	131.632	131.582	131.532	131.482	131.466	131.406	131.356	131.306	131.256	131.206	131.156	131.112

SECTION
SCALE 1:1500 H 1:150 V

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Revision Details	By	Check	Date	Suffix
First Issue	AK	PM	02/12/19	P01
For Technical Quality Review	AK	PM	10/01/20	P02

Purpose of issue
SUITABLE FOR REVIEW & COMMENT

Client
Highways England
The Cube
199 Wharfside Street
Birmingham
B1 1RN

Working on behalf of highways england

Project Title
M54 to M6 Link Road

Drawing Title
GEOLOGICAL LONG SECTION (SHEET 4 OF 5)

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	10/01/20

Internal Project No	Suitability
60536736	S3
Scale @ A1	Zone
	Geotechnical

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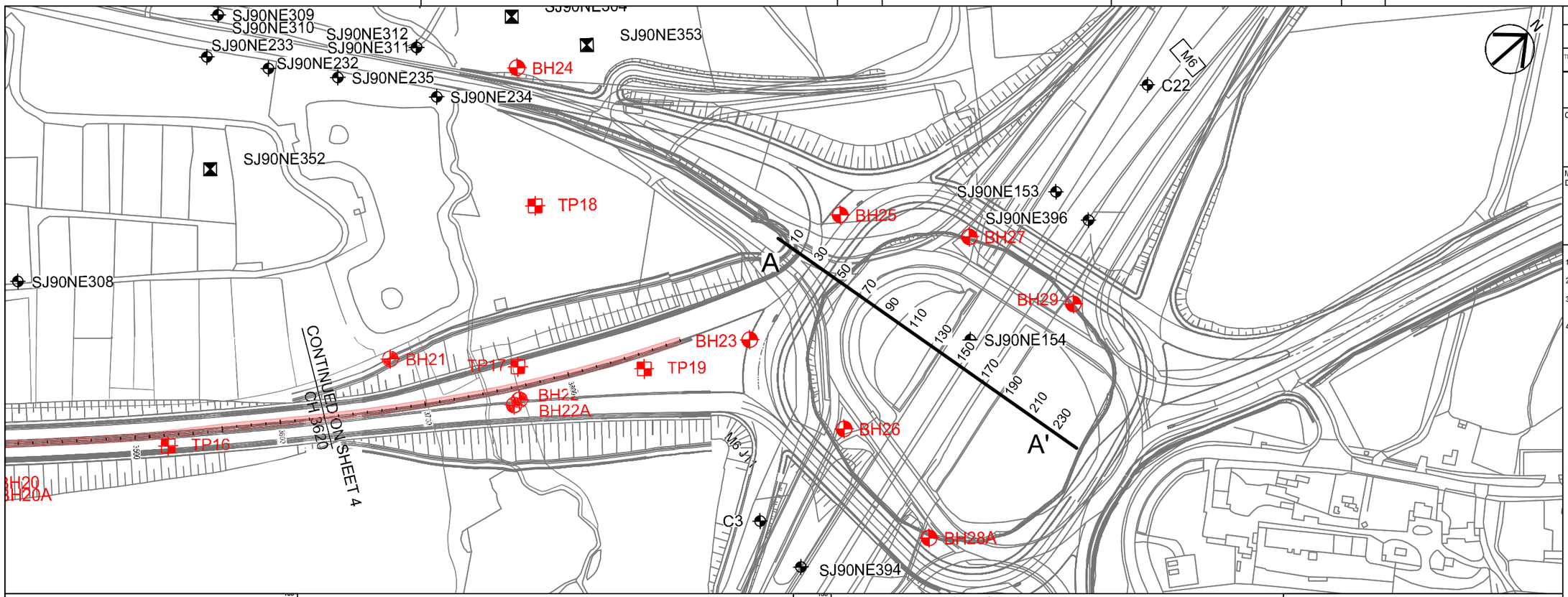
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Drawing Number
Highways England PIN: HE514465
Originator: -ACM
Volume: -SGT -
Location: Z2_ML_PR_Z
Type | Role | Number: -DR-GE-1014
Rev: P02

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Plot Date: 12 January 2020 13:39:58
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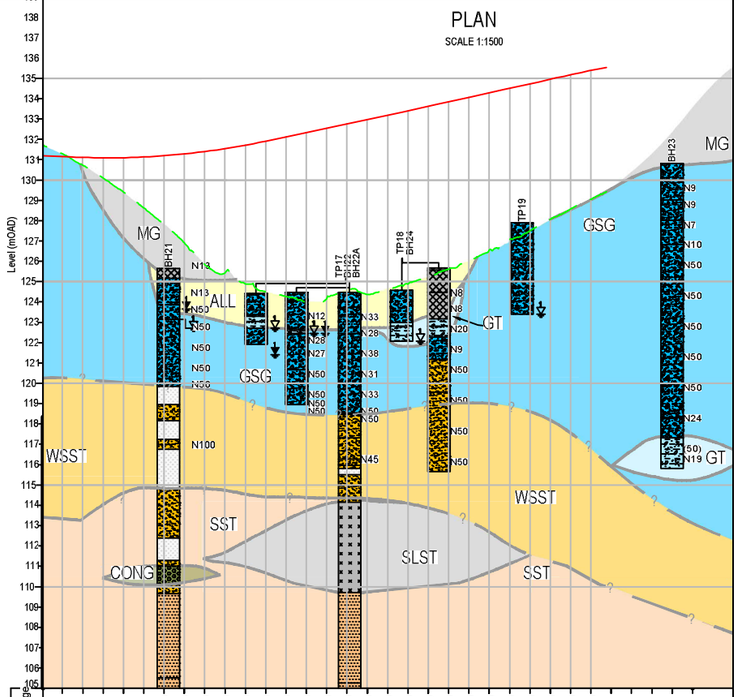
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PLAN

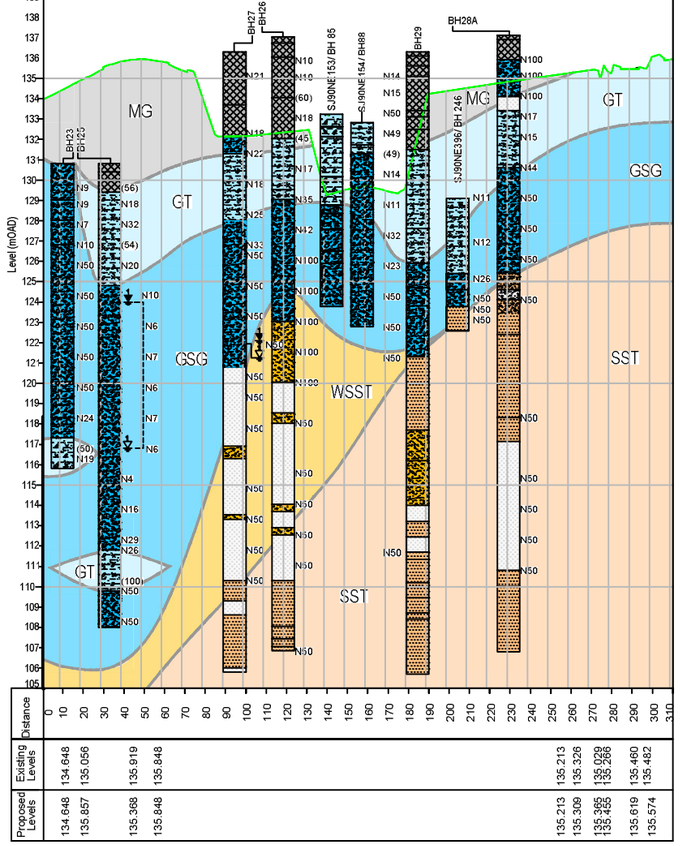
SCALE 1:1500



Chainage	3+620	3+630	3+640	3+650	3+660	3+670	3+680	3+690	3+700	3+710	3+720	3+730	3+740	3+750	3+760	3+770	3+780	3+790	3+800	3+810	3+820	3+830	3+840	3+850	3+860	3+870	3+880
Existing Levels	131.291	130.723	130.099	129.411	128.627	127.832	126.907	125.848	125.432	124.895	124.496	124.275	123.812	124.187	124.603	124.374	124.620	124.882	125.206	125.621	126.043	126.545	127.032	127.508	128.070	128.578	129.046
Proposed Levels	131.156	131.112	131.092	131.100	131.135	131.196	131.285	131.401	131.543	131.713	131.910	132.121	132.333	132.546	132.760	132.975	133.190	133.407	133.625	133.844	134.064	134.285	134.507	134.730	134.953	135.171	135.383

LONG SECTION

SCALE 1:1500 H 1:150 V



Distance	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310
Existing Levels	134.648	135.056			135.919	135.848																					135.213	135.326	135.029	135.286	135.460	135.462		
Proposed Levels	134.648	135.857			135.368	135.848																					135.213	135.309	135.365	135.455	135.619	135.574		

SECTION A - A'

SCALE 1:1500 H 1:150 V

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For Technical Quality Review	AK / PM	10/01/20	P02

Purpose of issue

SUITABLE FOR REVIEW & COMMENT

Client
Highways England
The Cube
199 Wharfside Street
Birmingham
B1 1RN

Working on behalf of highways england

Project Title

M54 to M6 Link Road

Drawing Title

GEOLOGICAL LONG SECTION (SHEET 5 OF 5)

Designed	Drawn	Checked	Approved	Date
---	AK	BB	PM	10/01/20

Internal Project No	Suitability
60536736	S3
Scale @ A1	Zone
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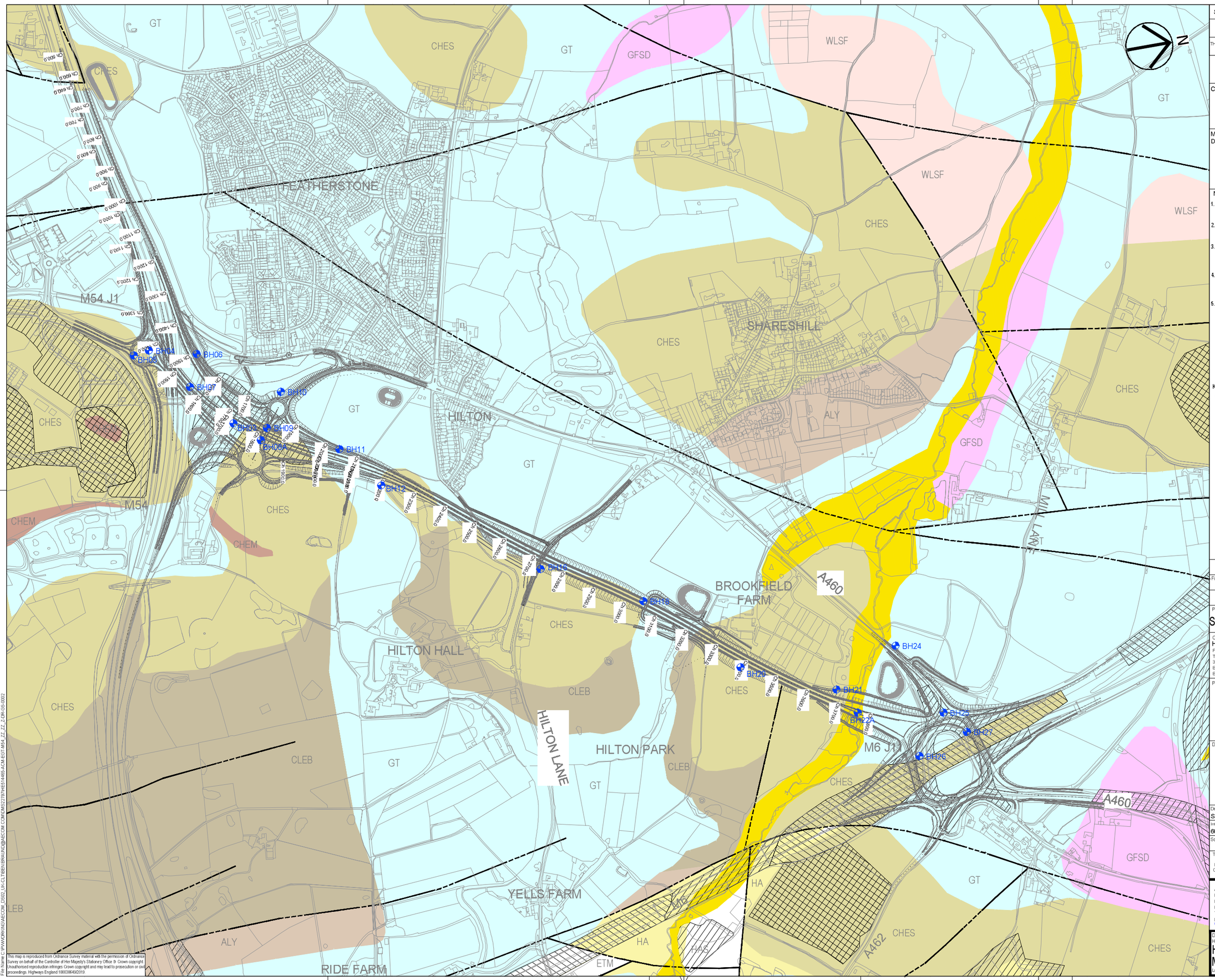
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Registered office: Scott House, Alencon Link,
Basingstoke, Hampshire RG21 7PP

Drawing Number
Highways England PIN: HE514465 -ACM -SGT - Z3_ML_PR_Z -DR-GE-1015
Location | Type | Role | Number

Rev: P02

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Plot Date: 12 January 2020 13:44:04
File Name: C:\PWWORKING\AECOM_DS03_UK-CLTBEBRAUN@AECOM.COM\DMS\278298\HE514465-ACM-SGT-Z3_ML_PR_Z-DR-GE-1015



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Plot Date: 13 January 2020 10:24:50
File Name: C:\PWWORKING\AECOM_DS02_UK-CLTEEN1BRA\ACM@AECOM.COM\DMS\27097\HE514465-ACM-EGT-M54_ZZ_ZZ_Z-DR-GS-0002

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

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EXCEPTIONAL RISKS RELATING TO THE WORKS ASSOCIATED WITH THIS DRAWING ARE IDENTIFIED BELOW.

CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.
5. THE BOUNDARY SHOWN IS NOT A RED LINE BOUNDARY IN THE CONTEXT OF AREA OF INTEREST FOR DEVELOPMENT CONSENT ORDER. IT IS THE ANTICIPATED LAND TAKE REQUIREMENT FOR THE SCHEME OUTSIDE OF THE EXISTING HIGHWAY BOUNDARY BASED ON A 10M OFFSET FROM THE TOE OF EARTHWORKS. IT DOES NOT CURRENTLY INCLUDE ANY ADDITIONAL LAND THAT MAY BE REQUIRED FOR MITIGATION OR TEMPORARY WORKS.

KEY

BH PROPOSED BOREHOLE LOCATION (INDICATIVE)

First Issue	GC / DE		03/12/19	P01
Revision Details	By / Check		Date	Suffix

Purpose of issue

SUITABLE FOR REVIEW & COMMENT

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Working on behalf of highways england

Project Title

M54 to M6 Link Road

Drawing Title

GROUND GAS AND GROUND WATER MONITORING LOCATION PLAN

Designed	Drawn	Checked	Approved	Date
SB	GC	SB	DE	03/12/19

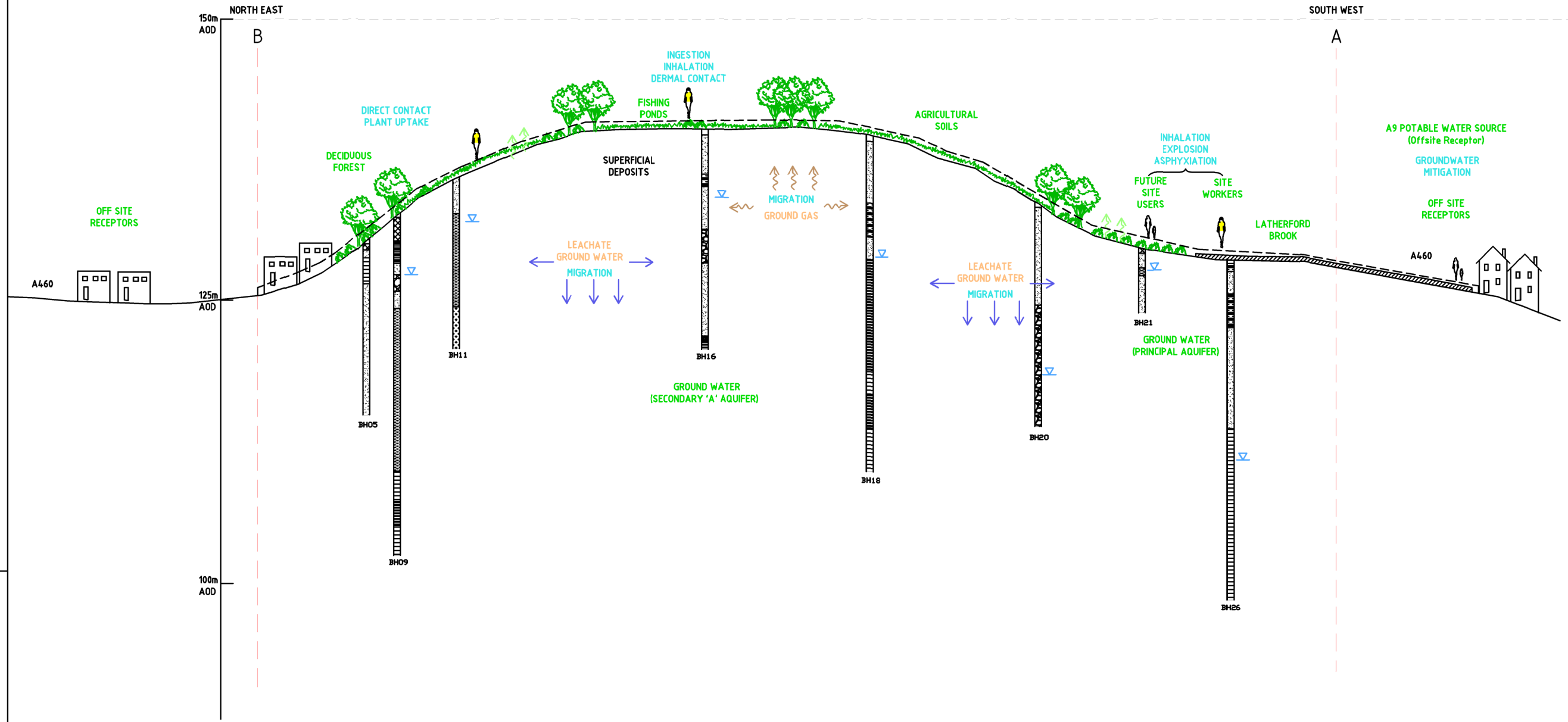
Internal Project No	Suitability
60536736	S3
Scale @ A1	Zone
	Geology and Soils

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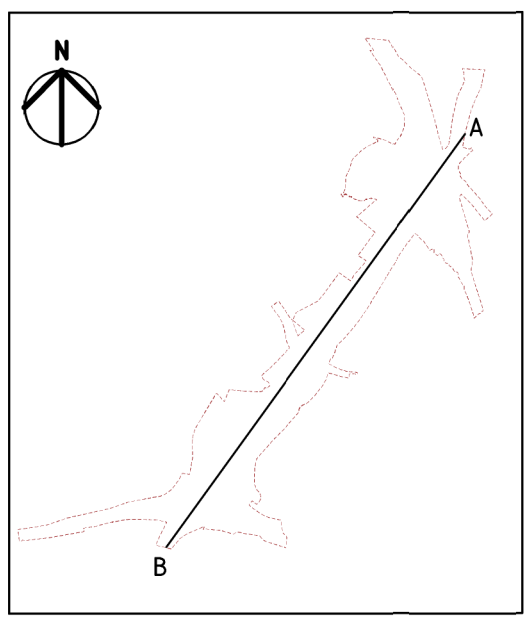
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Royal Court
Basil Close, Chesterfield
Derbyshire. S41 7SL
Tel01246 209221
Fax01246 209229
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Registered in England Registered number. 8803216
Registered office: Scott House, Alencon Link,
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Drawing Number				Rev
Highways England PIN	Originator	Volume		
HE514465	-ACM	-EGT -		P01
Location		Type	Role / Number	
M54_ZZ_ZZ_Z			-DR-GS-0002	



Map of Line of Cross Section



Scale 1:10000

KEY

- Ground Gas Migration
- Organic Vapors
- Groundwater Migration
- ABC Source
- ABC Pathway
- ABC Receptor
- Site Boundary

- Topsoil
- Made Ground
- Sand
- Silty Clayey Sand
- Sandstone
- Mudstone
- Siltstone
- Clay
- Gravel
- Water Strike

- Agricultural Land
- Deciduous Woodland
- Road
- Proposed Road
- Existing Commercial Building

- Existing Residential Buildings
- Future Site Users
- Construction Site Workers

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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

Revision Details	By	Check	Date	Suffix
First Issue	SB	DE	03/12/19	P01

Purpose of issue: SUITABLE FOR REVIEW & COMMENT

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, Birmingham, B4 6BN

Working on behalf of: highways england

Project Title: M54 to M6 Link Road

Drawing Title: FIGURE 9.3 UPDATED CONCEPTUAL SITE MODEL

Designed	Drawn	Checked	Approved	Date
SB	SB	DE	DE	03/12/19

Internal Project No.	Suitability
60536736	S3
Scale @ A3	Zone: Environment General

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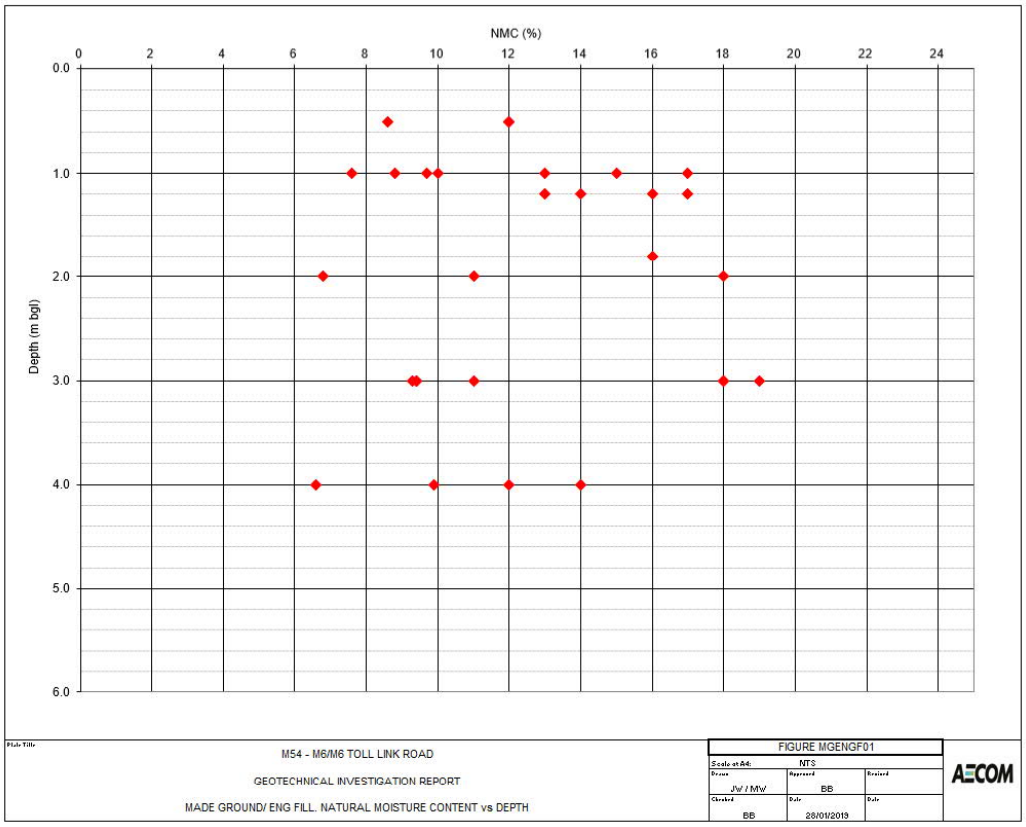
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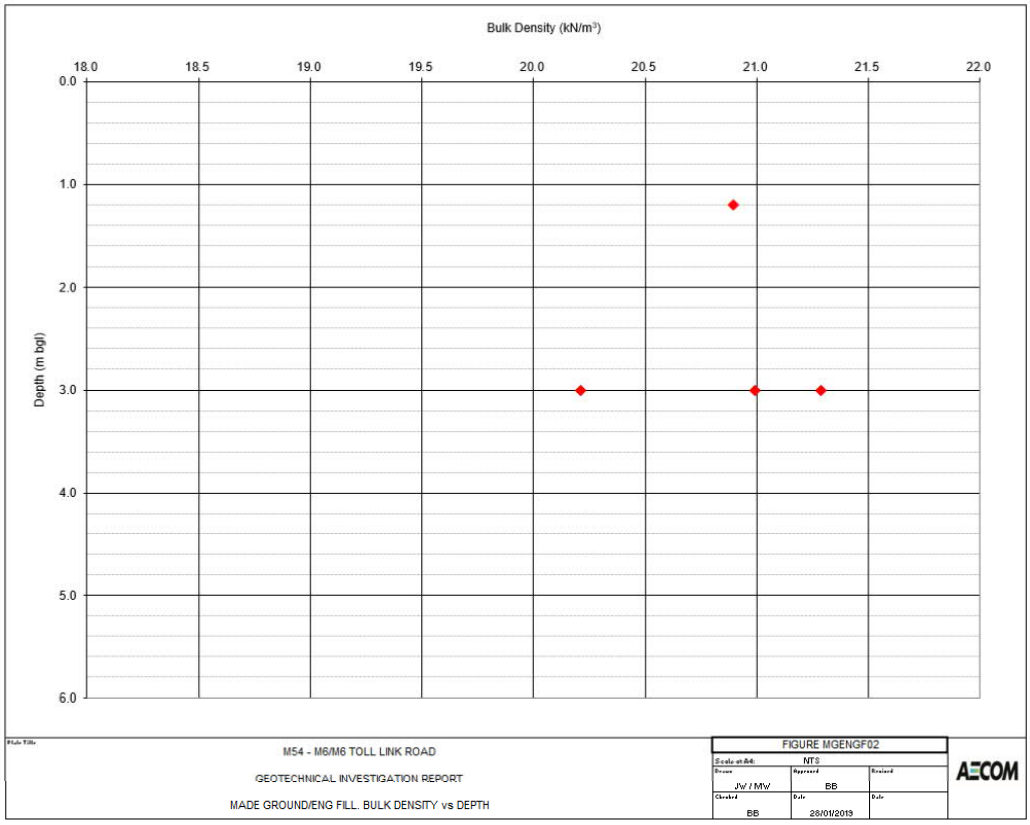
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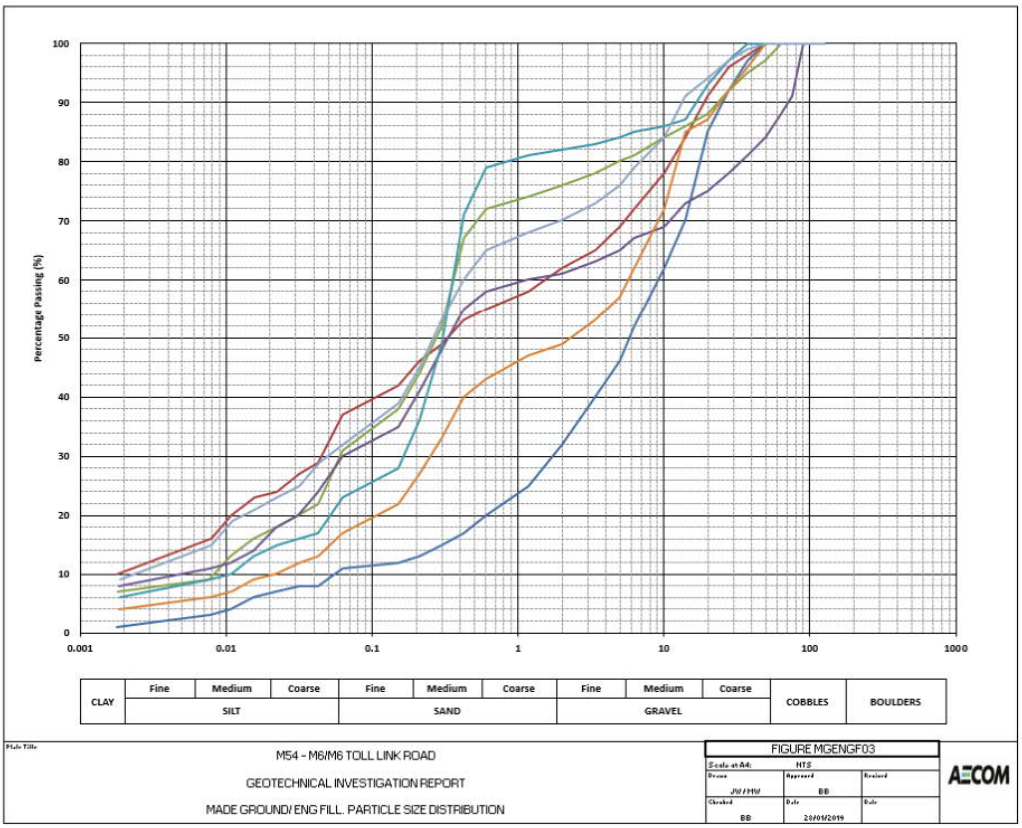
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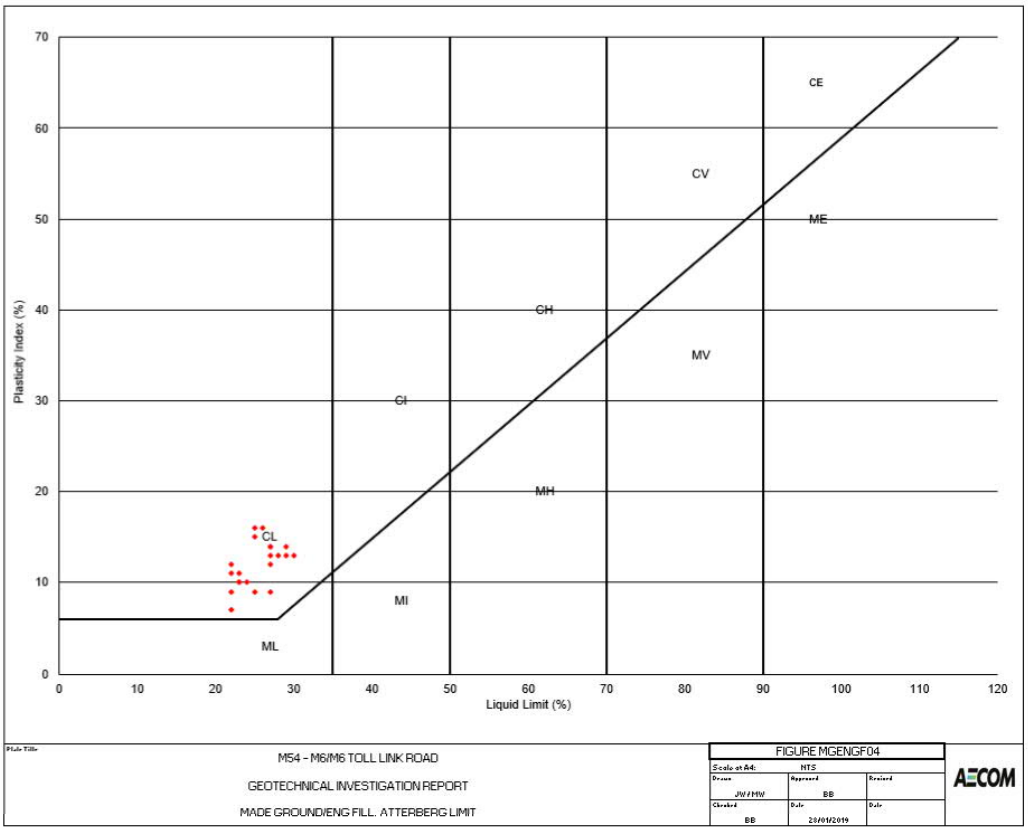
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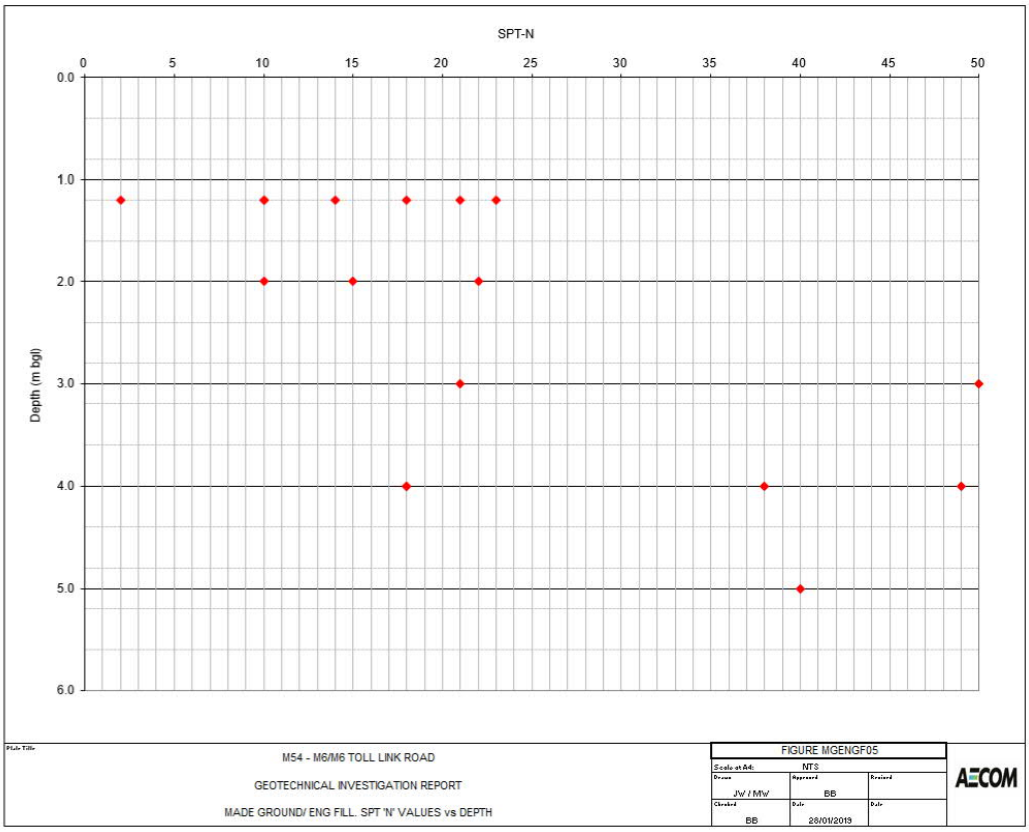
Appendix B. Parametric Study Charts

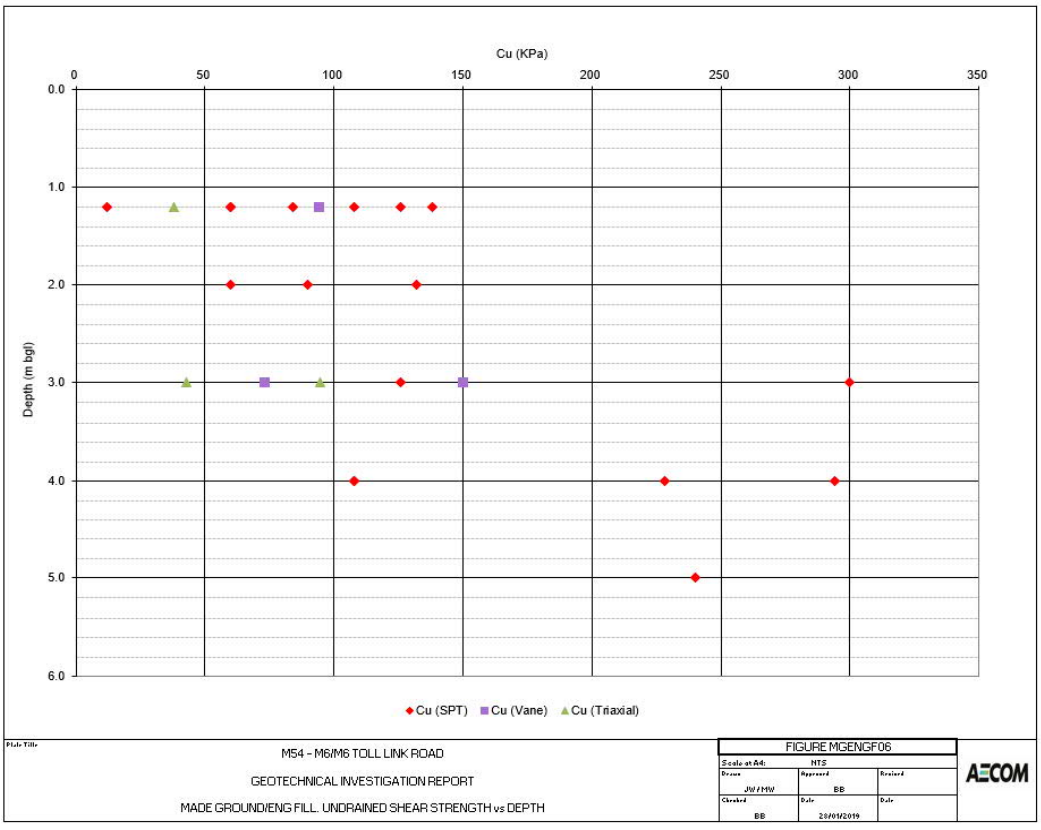


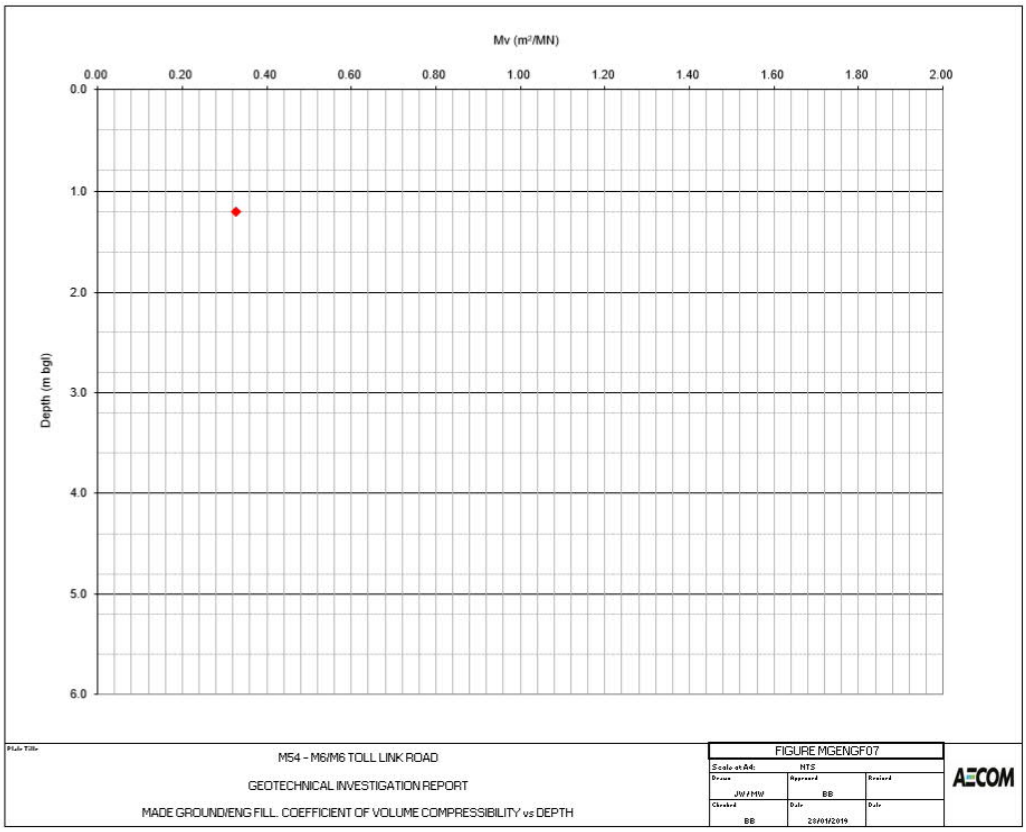


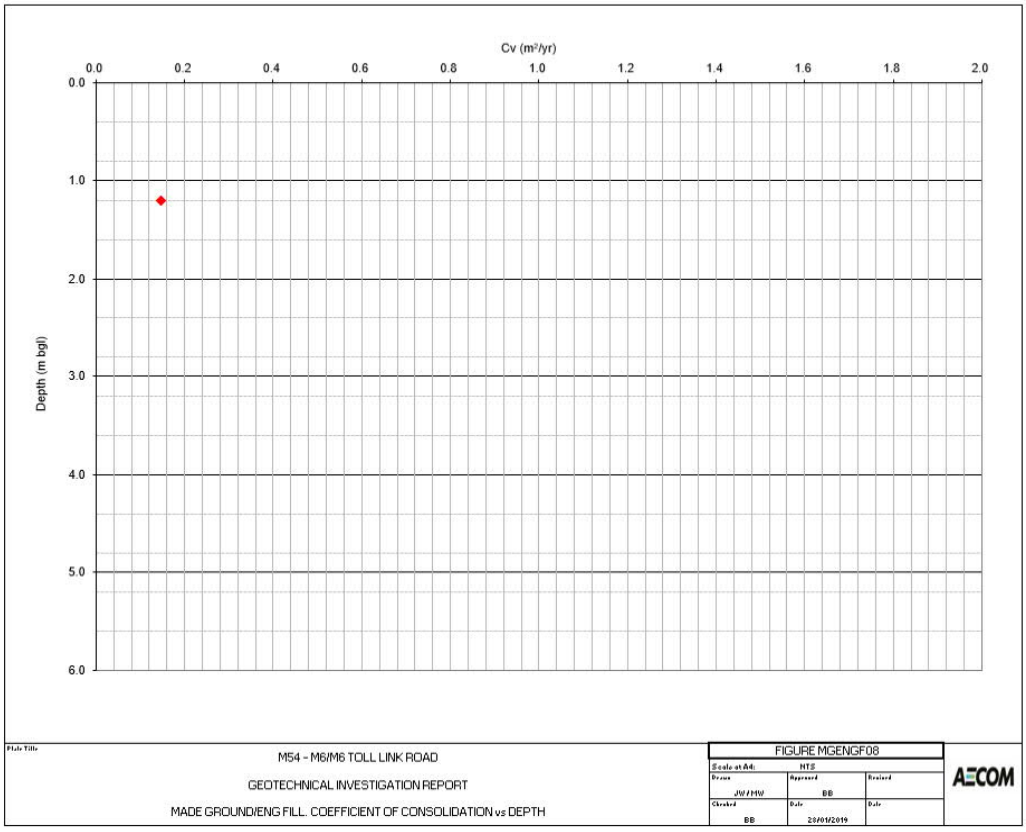

Percentage Passing (%)
100
90
80
70
60
50
40
30
20
10
0
0.001
0.01
0.1
1
10
100
1000
CLAY
Fine
Medium
Coarse
SILT
Fine
Medium
Coarse
SAND
Fine
Medium
Coarse
GRAVEL
COBBLES
BOULDERS
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND/ ENG FILL. PARTICLE SIZE DISTRIBUTION
FIGURE MGENGF03
Scale at A4: NTS
Drawn JW / MW
Approved BB
Checked BB
Date 28/01/2019
AECOM

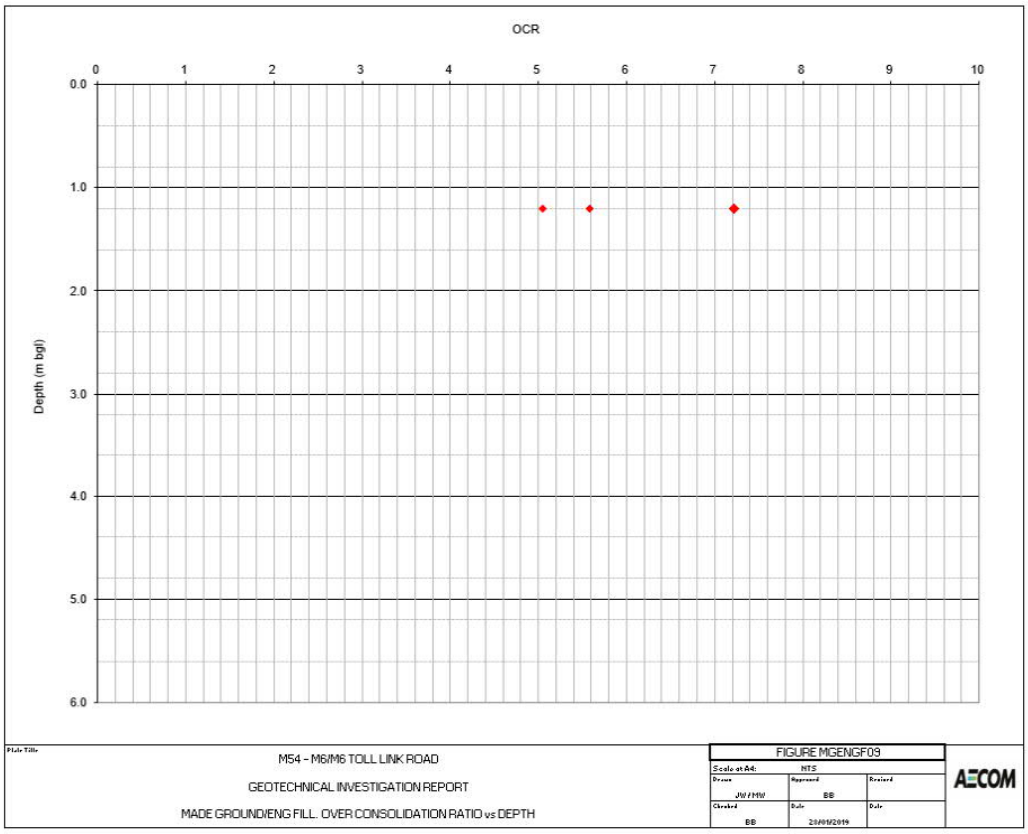

Plasticity Index (%)
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
110
120
Liquid Limit (%)
CE
CV
ME
CH
MV
CI
MH
CL
MI
ML
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND/ENG FILL. ATTERBERG LIMIT
FIGURE MGENGF04
Scale at A4: NTS
Drawn JW / MW
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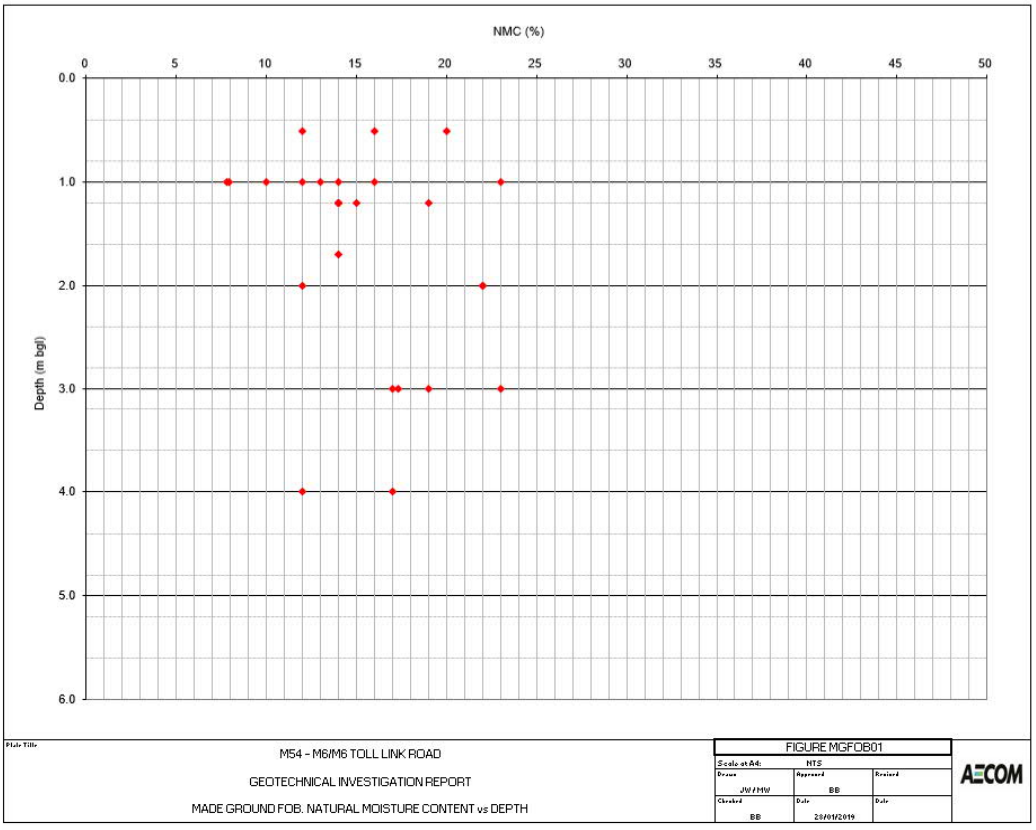

SPT-N
0
5
10
15
20
25
30
35
40
45
50
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND/ ENG FILL. SPT 'N' VALUES vs DEPTH
FIGURE MGENGF05
NTS
JV / MW
BB
BB
28/01/2019
AECOM

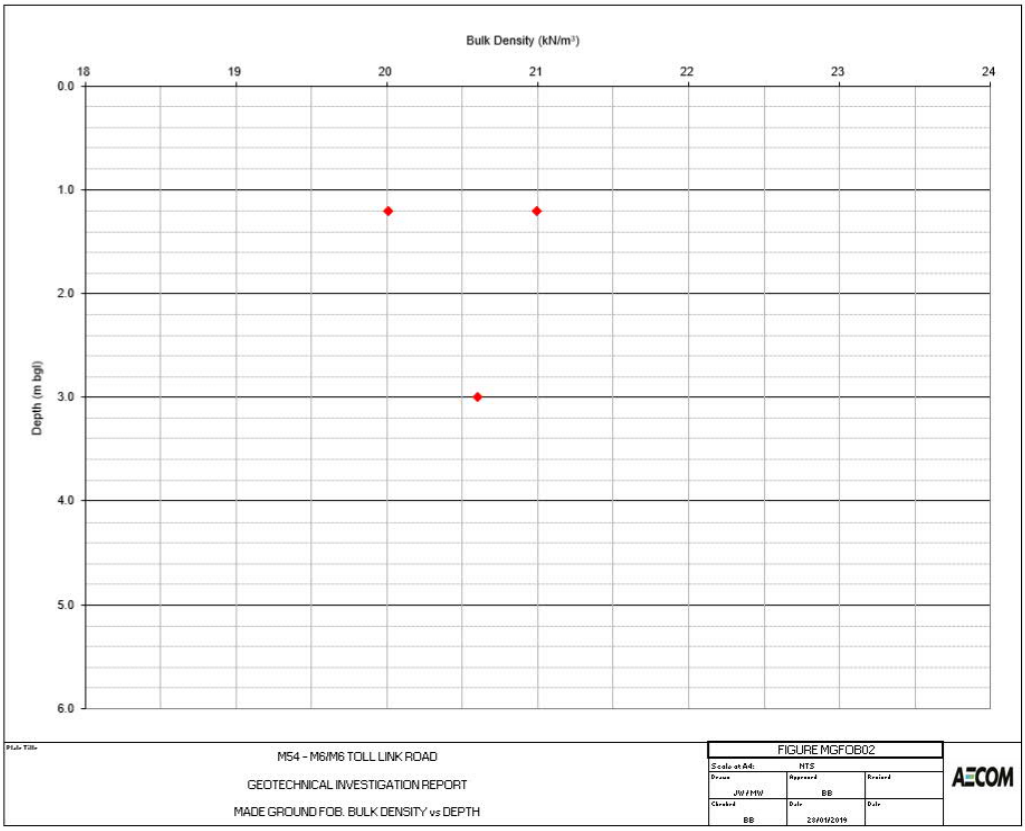

Cu (KPa)
0
50
100
150
200
250
300
350
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
Cu (SPT)
Cu (Vane)
Cu (Triaxial)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND/ENG FILL. UNDRAINED SHEAR STRENGTH vs DEPTH
FIGURE MGENGF06
NTS
JV / MW
BB
BB
28/01/2019
AECOM

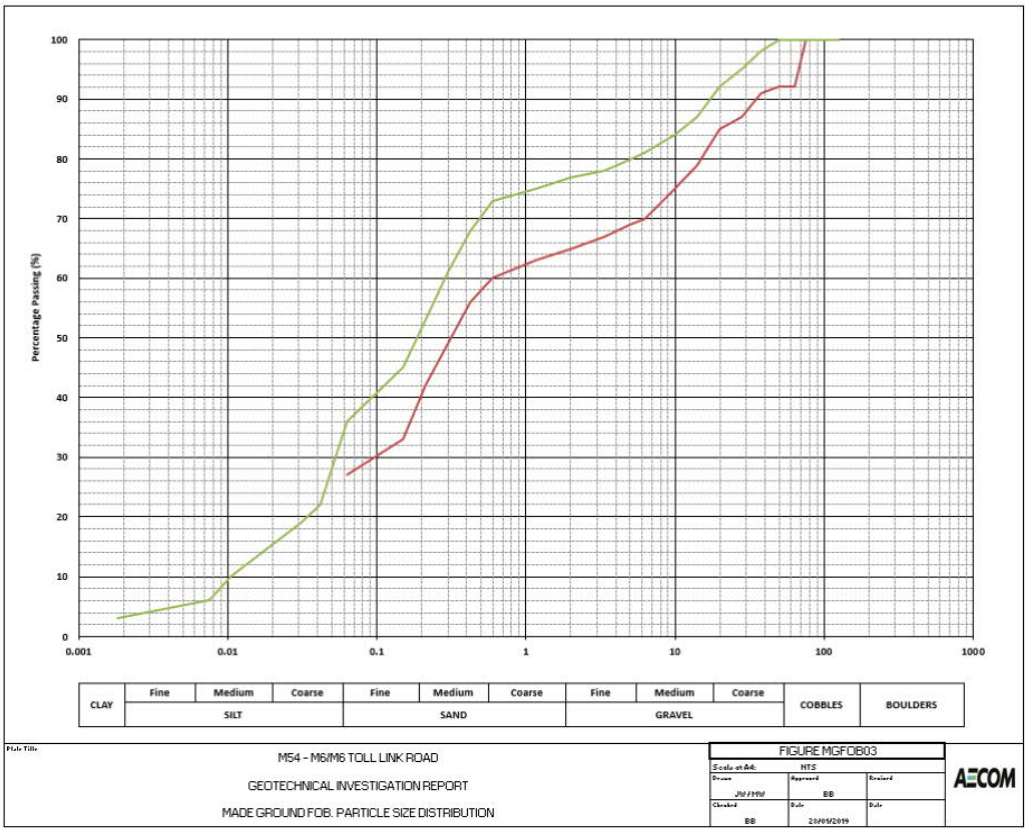

Mv (m²/MN)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
2.00
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND/ENG FILL. COEFFICIENT OF VOLUME COMPRESSIBILITY vs DEPTH
FIGURE MGENGF07
Scale at A4: NTS
Drawn JW / MW
Approved BB
Checked BB
Date 28/01/2019
AECOM

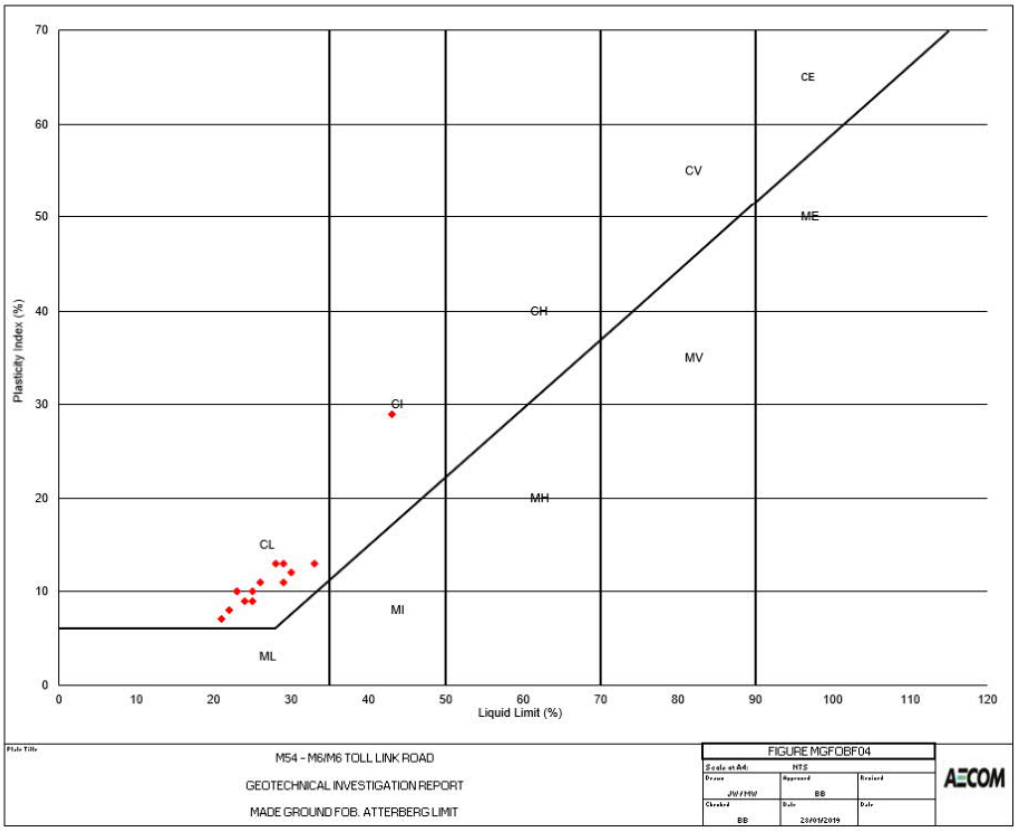

Cv (m²/yr)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND/ENG FILL. COEFFICIENT OF CONSOLIDATION vs DEPTH
FIGURE MGENGF08
Scale at A4: NTS
Drawn JW / MW
Approved BB
Checked BB
Date 28/01/2019
AECOM

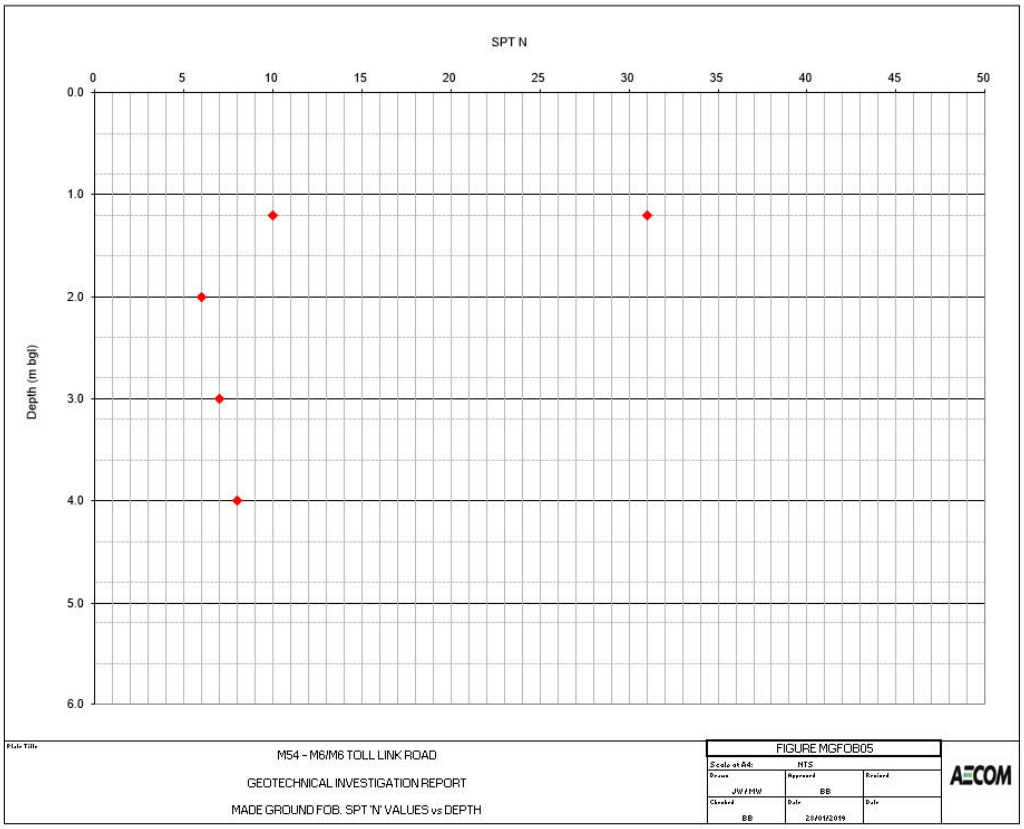

OCR
0
1
2
3
4
5
6
7
8
9
10
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND/ENG FILL. OVER CONSOLIDATION RATIO vs DEPTH
FIGURE MGENGF09
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/01/2019
AECOM

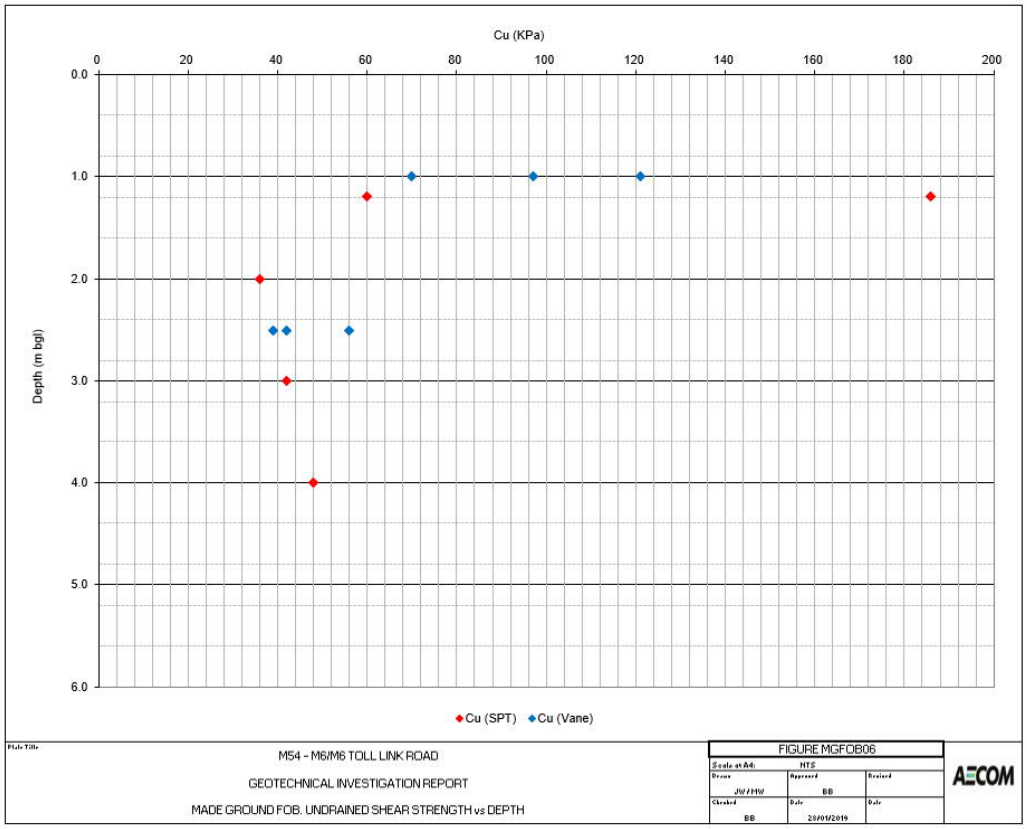

NMC (%)
0
5
10
15
20
25
30
35
40
45
50
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. NATURAL MOISTURE CONTENT vs DEPTH
FIGURE MGFOB01
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/01/2019
AECOM

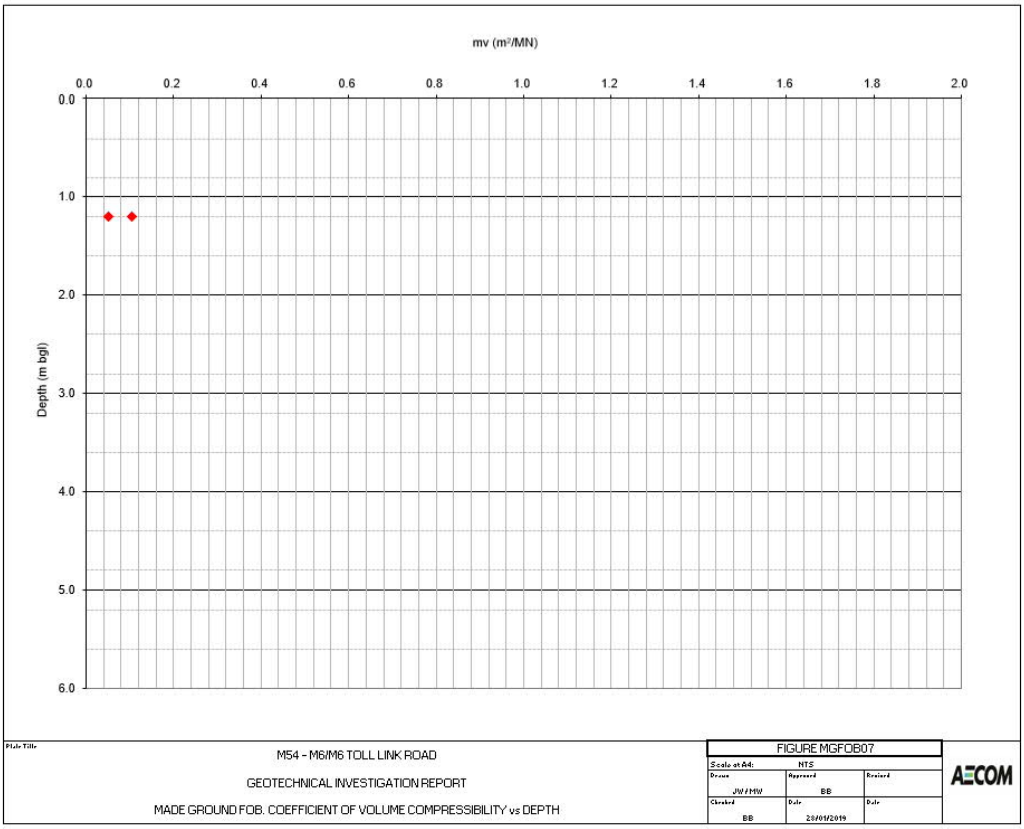

Bulk Density (kN/m³)
18
19
20
21
22
23
24
Depth (m bgl)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. BULK DENSITY vs DEPTH
FIGURE MGFOB02
Scale at A4: NTS
Drawn JW / MW
Approved BB
Revised
Checked BB
Date 28/01/2019
Date
AECOM

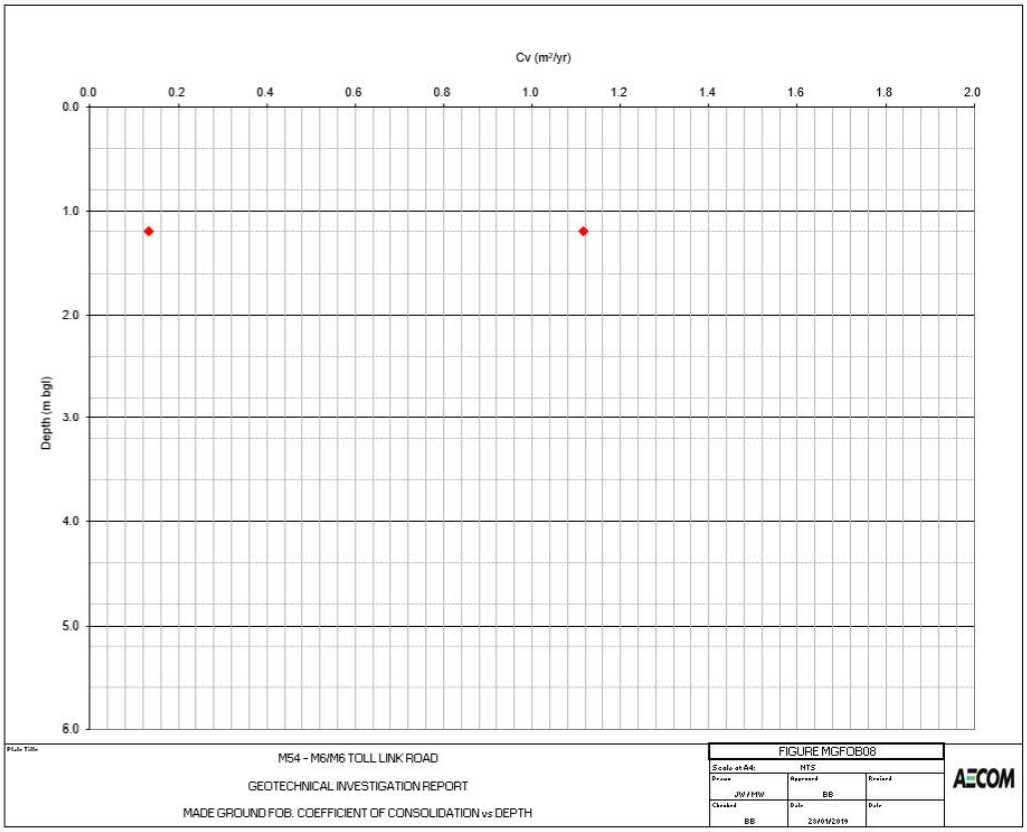

Percentage Passing (%)
100
90
80
70
60
50
40
30
20
10
0
0.001
0.01
0.1
1
10
100
1000
CLAY
Fine
Medium
Coarse
SILT
Fine
Medium
Coarse
SAND
Fine
Medium
Coarse
GRAVEL
COBBLES
BOULDERS
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. PARTICLE SIZE DISTRIBUTION
FIGURE MGFOB03
Scale at A4: NTS
Drawn JW / MW
Approved BB
Revised
Checked BB
Date 28/01/2019
Date
AECOM

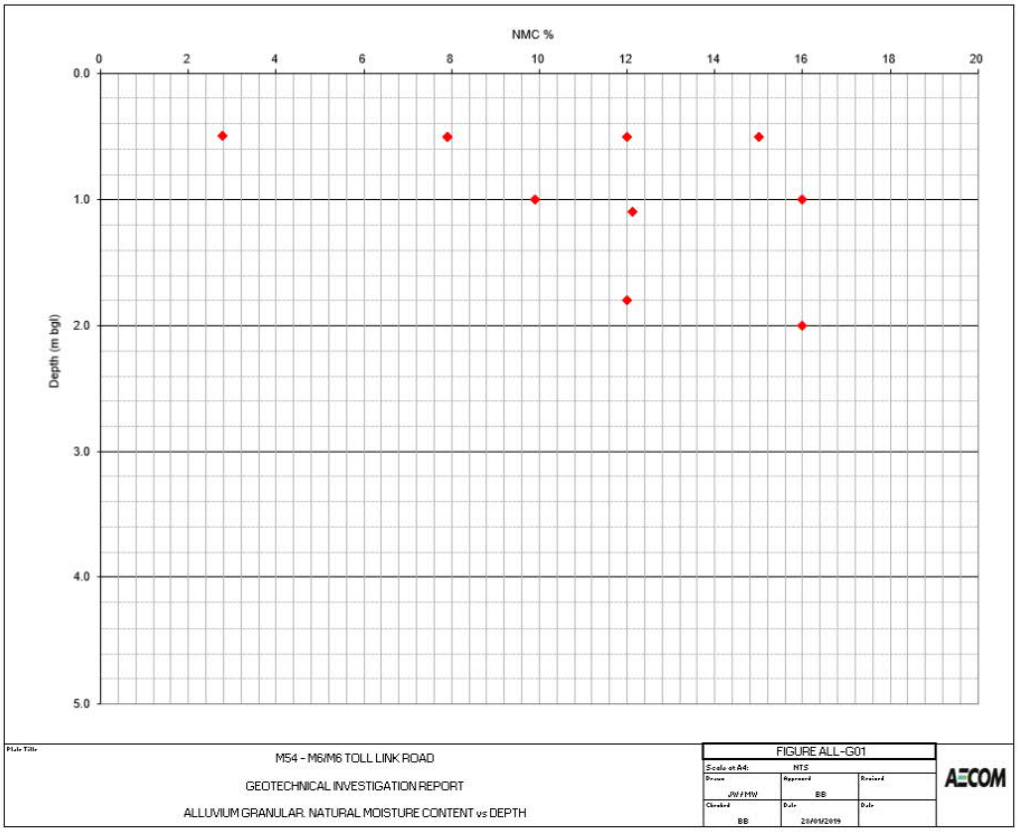

Plasticity Index (%)
Liquid Limit (%)
CE
CV
ME
CH
MV
CI
MH
CL
MI
ML
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. ATTERBERG LIMIT
FIGURE MGFOBF04
AECOM

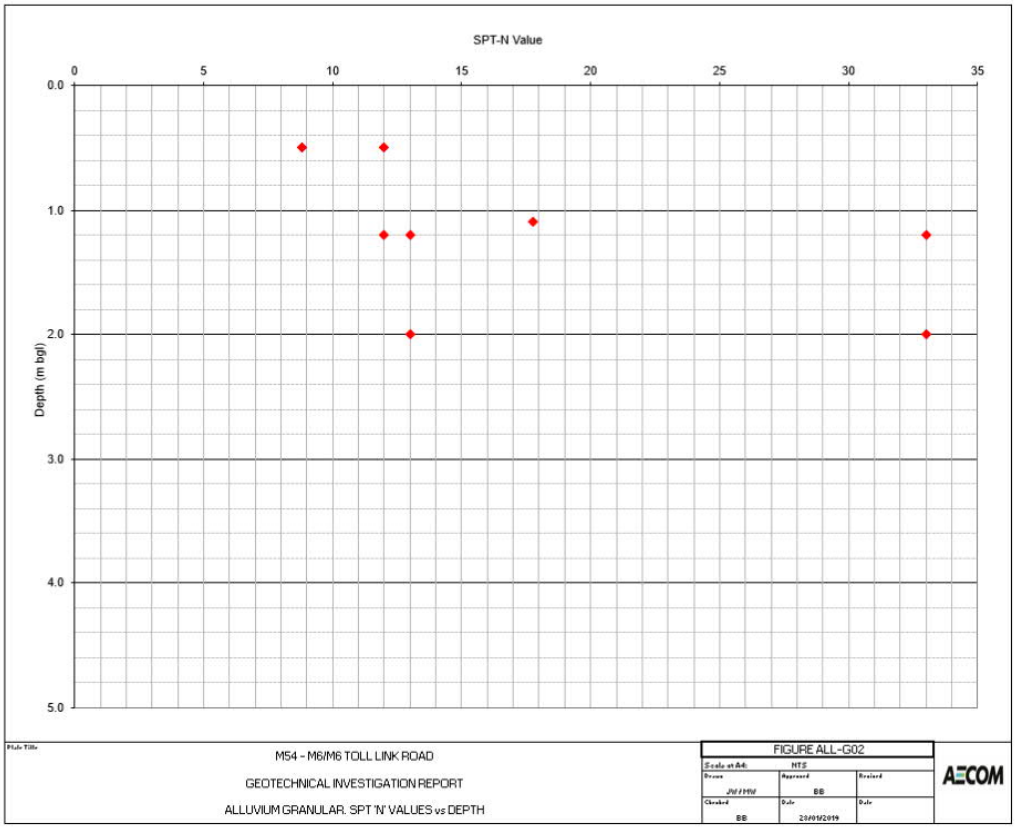

SPT N
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. SPT 'N' VALUES vs DEPTH
FIGURE MGFOB05
AECOM

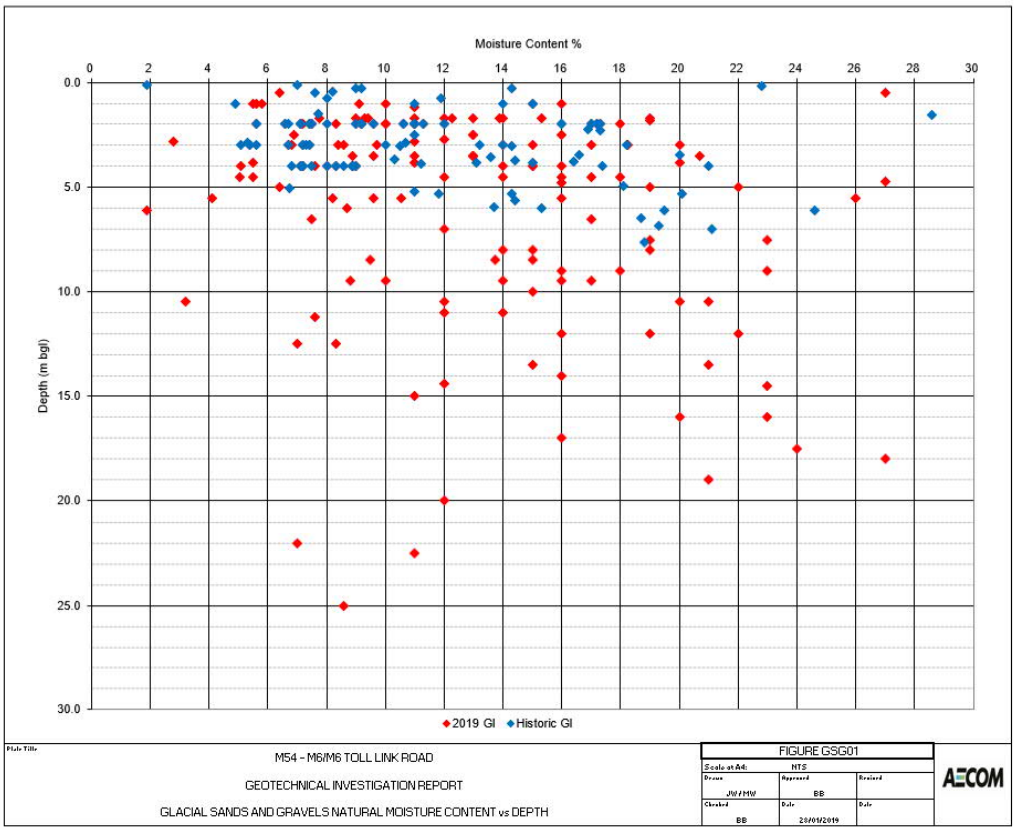

Cu (KPa)
0
20
40
60
80
100
120
140
160
180
200
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
Cu (SPT)
Cu (Vane)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. UNDRAINED SHEAR STRENGTH vs DEPTH
FIGURE MGFOB06
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/01/2019
AECOM

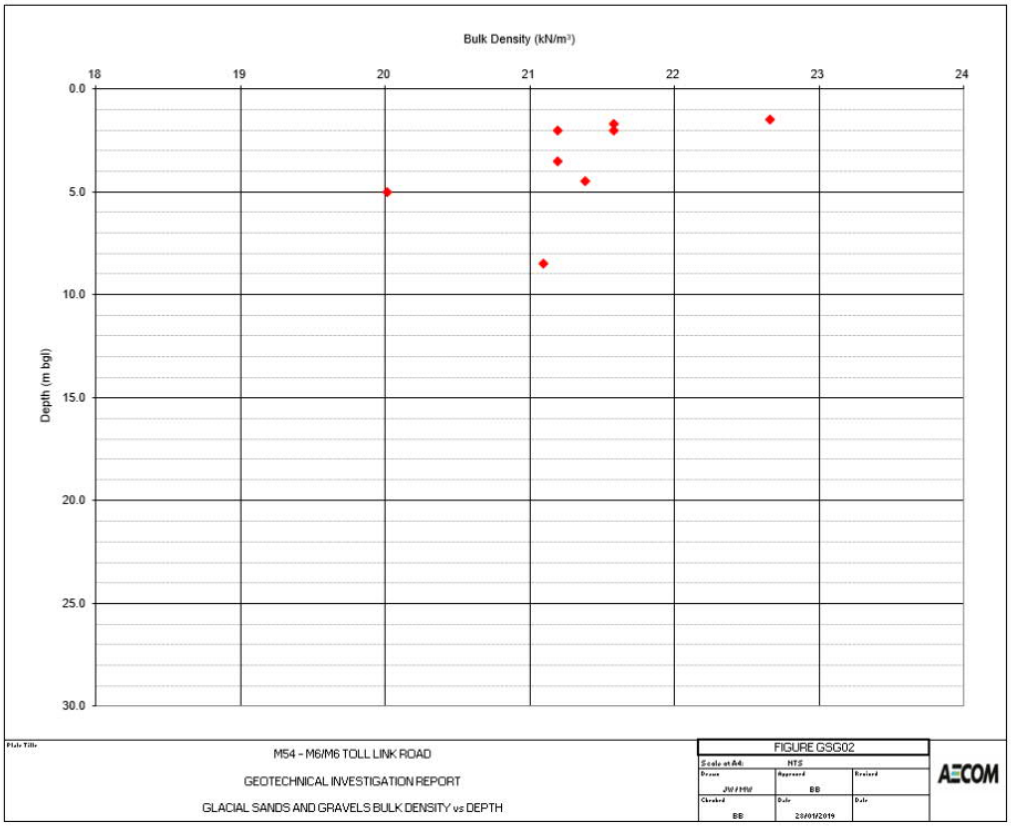

mv (m²/MN)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. COEFFICIENT OF VOLUME COMPRESSIBILITY vs DEPTH
FIGURE MGFOB07
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/01/2019
AECOM

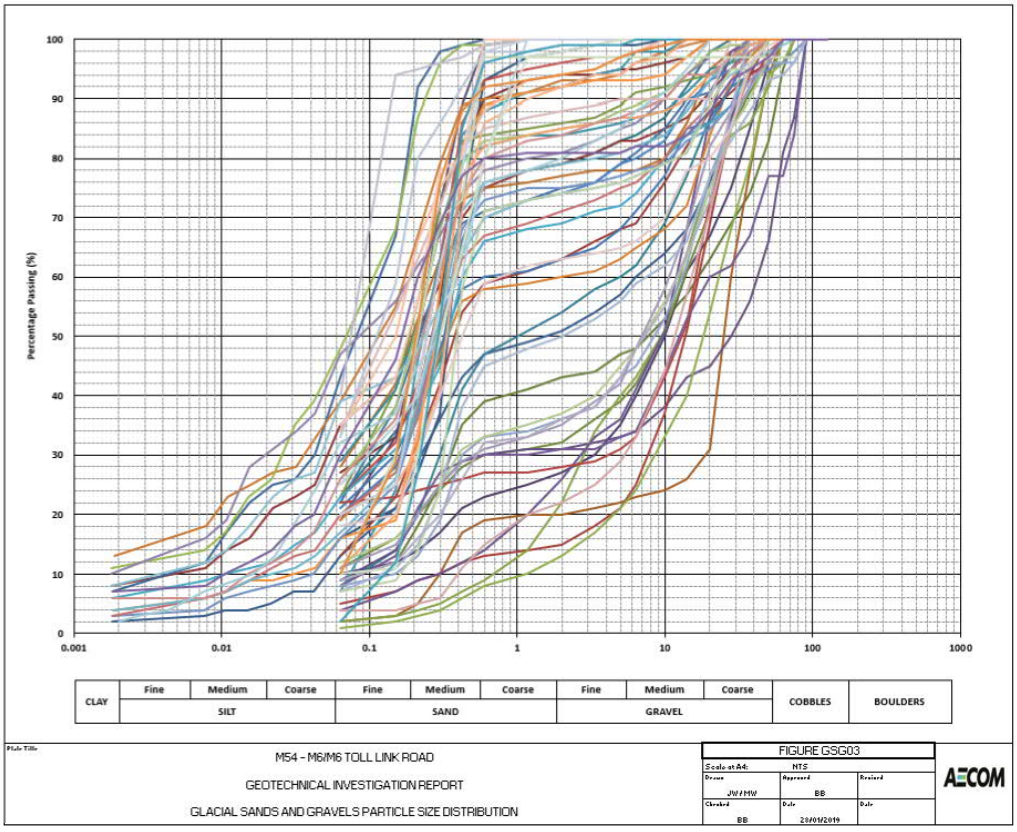

Cv (m²/yr)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Depth (m bgl)
1.0
2.0
3.0
4.0
5.0
6.0
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MADE GROUND FOB. COEFFICIENT OF CONSOLIDATION vs DEPTH
FIGURE MGFOB08
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/01/2019
AECOM

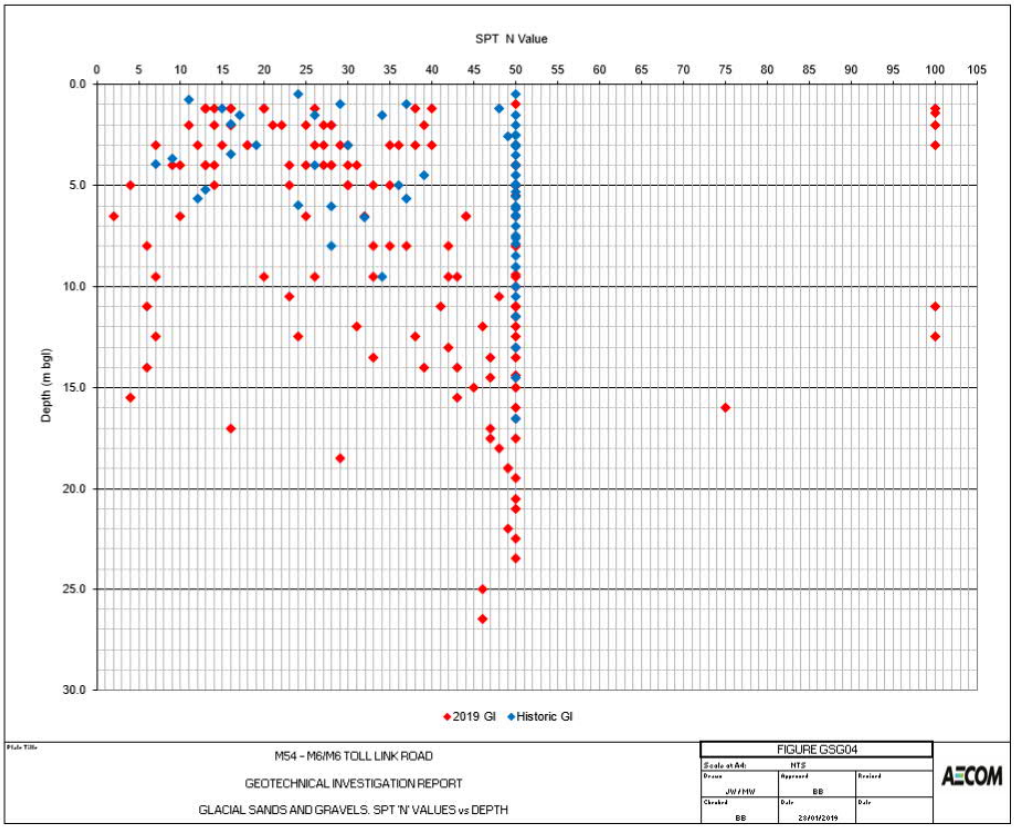

NMC %
0
2
4
6
8
10
12
14
16
18
20
Depth (m bgl)
1.0
2.0
3.0
4.0
5.0
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
ALLUVIUM GRANULAR. NATURAL MOISTURE CONTENT vs DEPTH
FIGURE ALL-G01
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/01/2019
AECOM

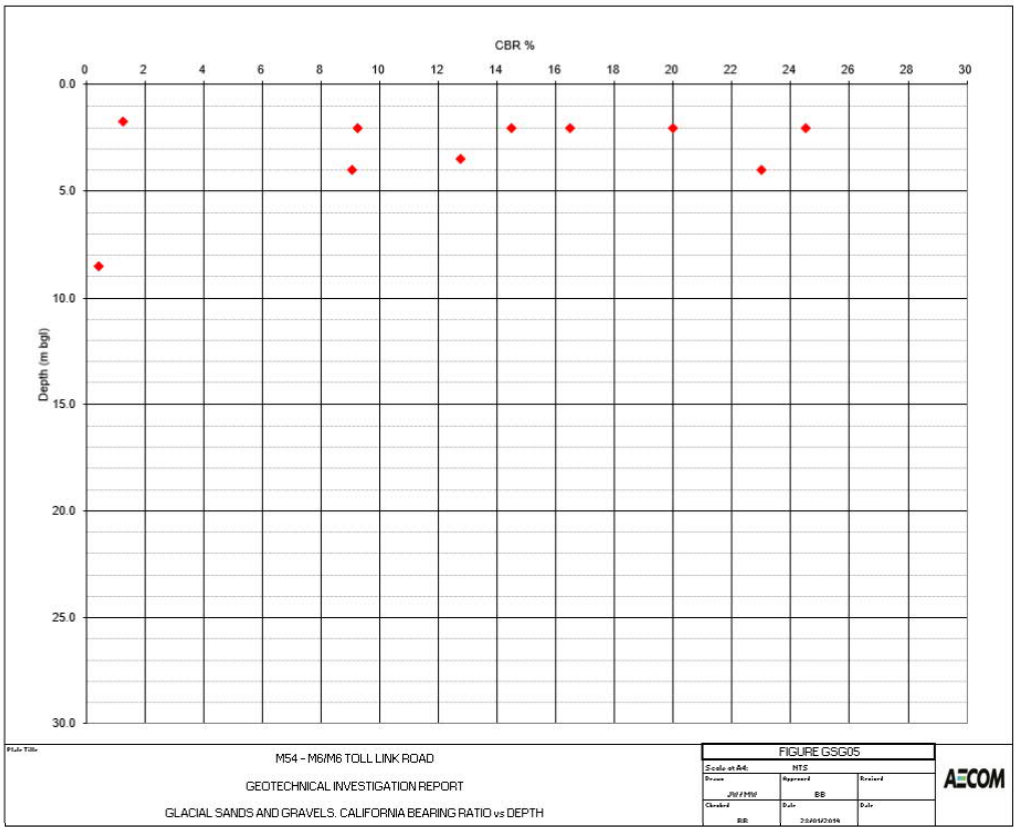

SPT-N Value
0
5
10
15
20
25
30
35
0.0
1.0
2.0
3.0
4.0
5.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
ALLUVIUM GRANULAR: SPT 'N' VALUES vs DEPTH
FIGURE ALL-G02
AECOM

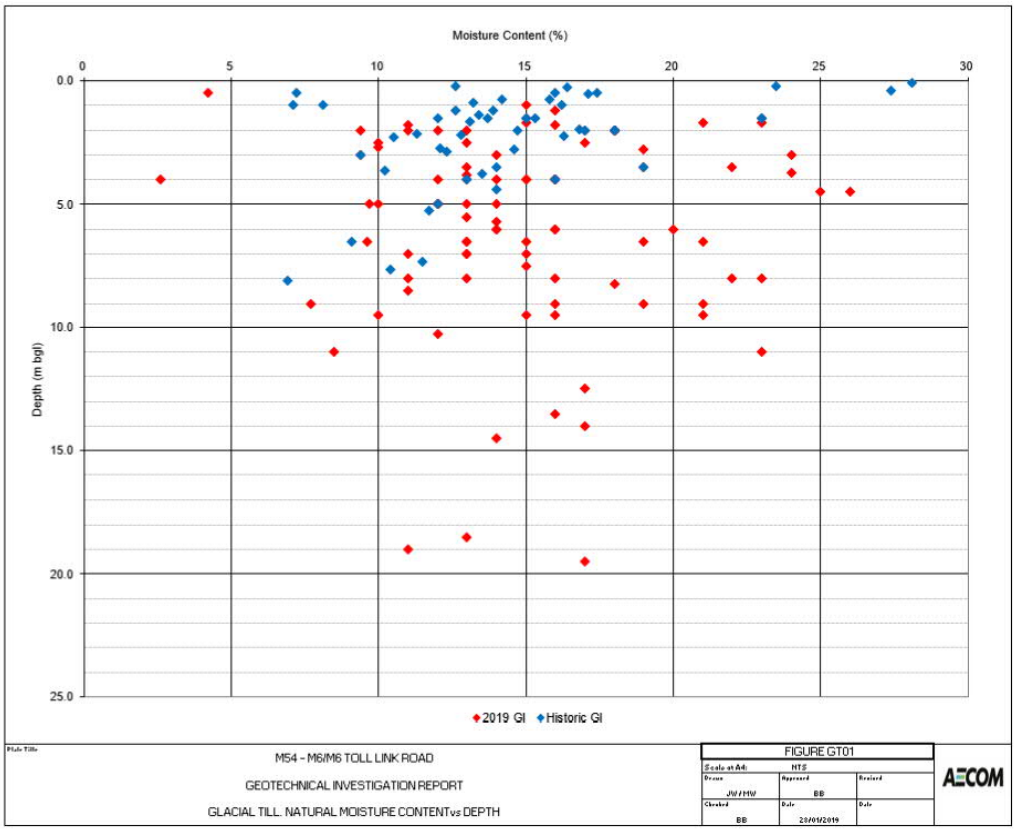

Moisture Content %
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL SANDS AND GRAVELS NATURAL MOISTURE CONTENT vs DEPTH
FIGURE GSG01
AECOM

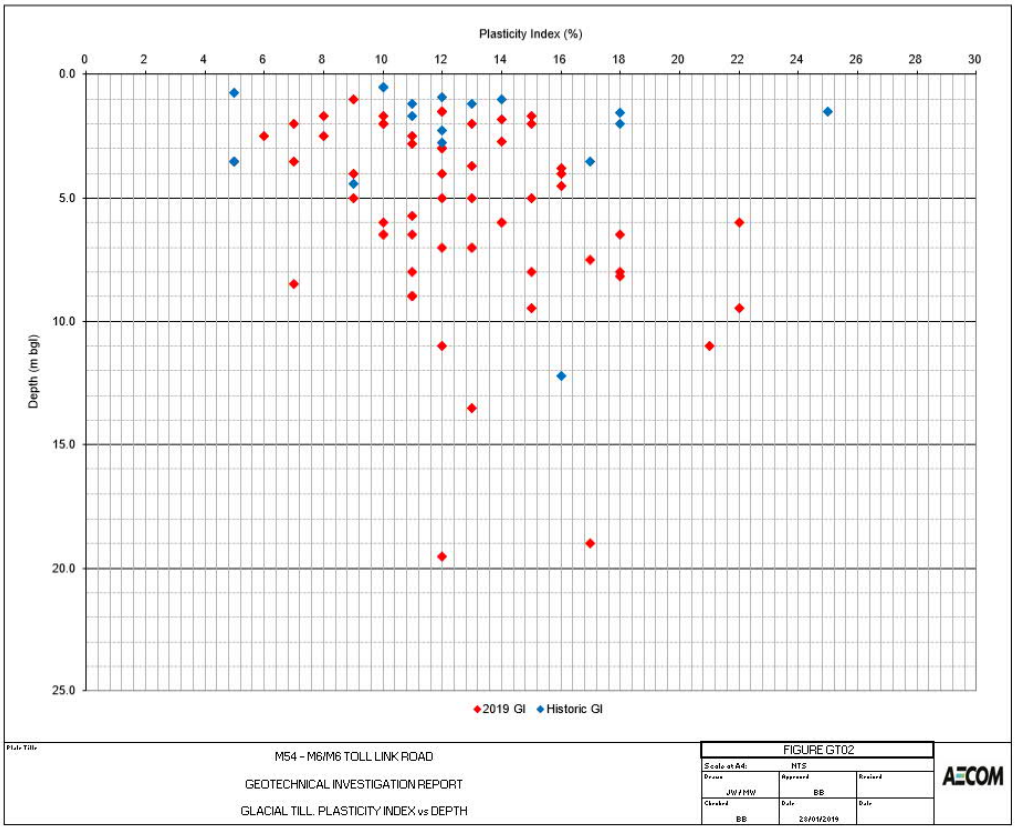

Bulk Density (kN/m³)
18
19
20
21
22
23
24
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Depth (m bgl)
M54 – M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL SANDS AND GRAVELS BULK DENSITY vs DEPTH
FIGURE GSG02
Scale at A4: NTS
Drawn JW / HW
Prepared BB
Reviewed
Checked BB
Date 28/01/2019
Date
AECOM

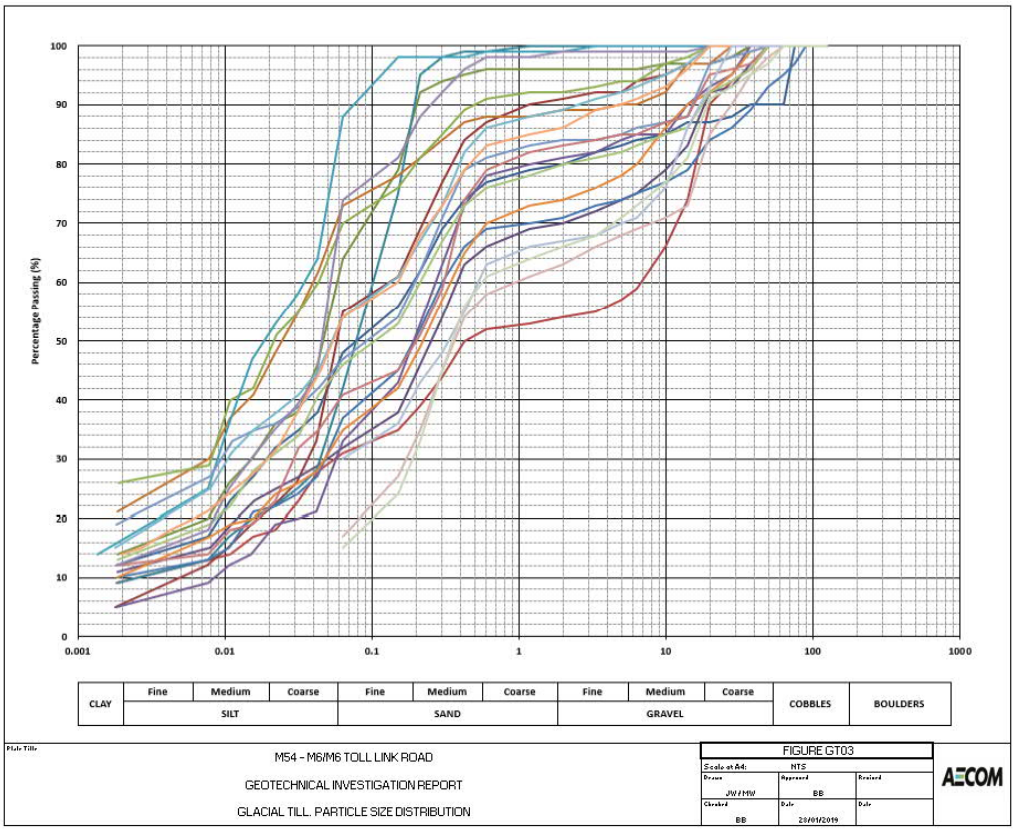

Percentage Passing (%)
100
90
80
70
60
50
40
30
20
10
0
0.001
0.01
0.1
1
10
100
1000
CLAY
Fine
Medium
Coarse
SILT
Fine
Medium
Coarse
SAND
Fine
Medium
Coarse
GRAVEL
COBBLES
BOULDERS
M54 – M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL SANDS AND GRAVELS PARTICLE SIZE DISTRIBUTION
FIGURE GSG03
Scale at A4: NTS
Drawn JW / HW
Prepared BB
Reviewed
Checked BB
Date 28/01/2019
Date
AECOM

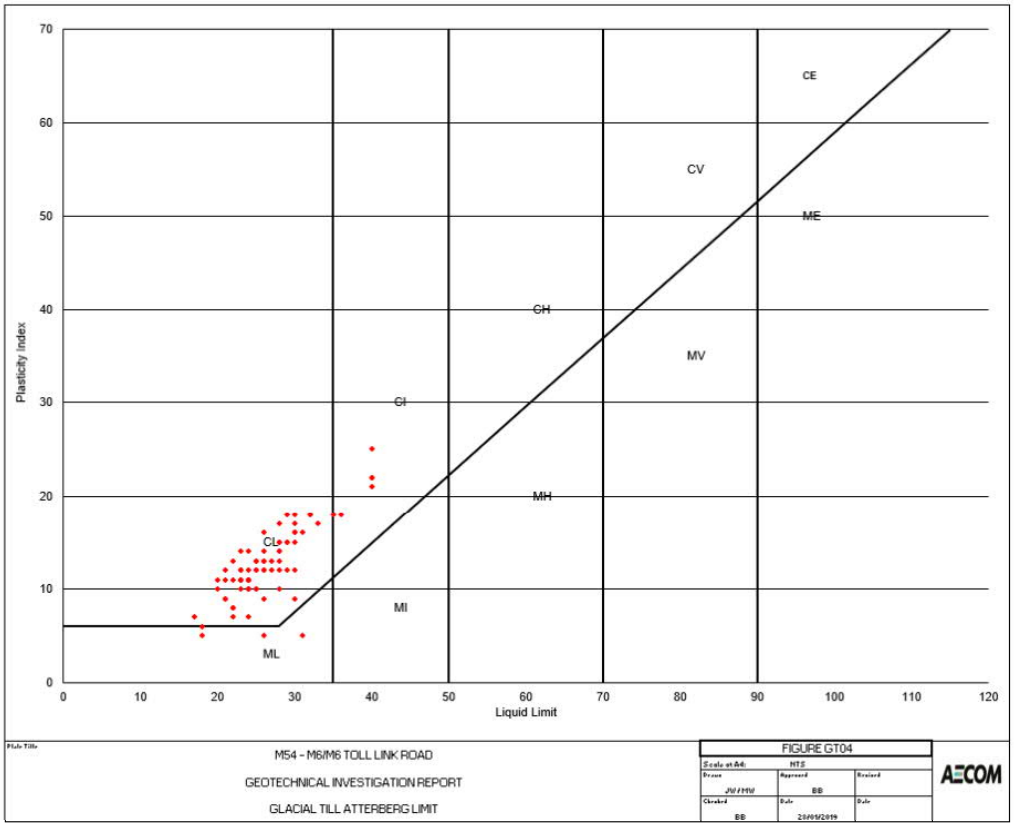

SPT N Value
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105
0.0 5.0 10.0 15.0 20.0 25.0 30.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL SANDS AND GRAVELS. SPT 'N' VALUES vs DEPTH
FIGURE GSG04
AECOM

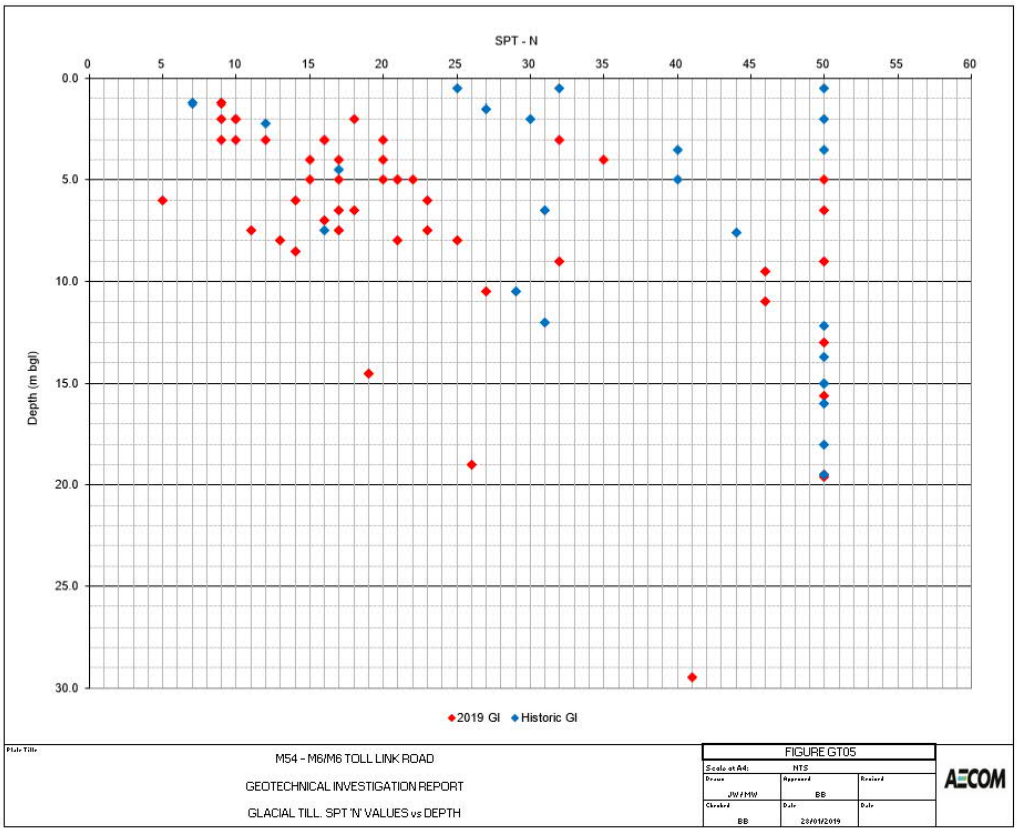

CBR %
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
0.0 5.0 10.0 15.0 20.0 25.0 30.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL SANDS AND GRAVELS. CALIFORNIA BEARING RATIO vs DEPTH
FIGURE GSG05
AECOM


Moisture Content (%)
0
5
10
15
20
25
30
0.0
5.0
10.0
15.0
20.0
25.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL. NATURAL MOISTURE CONTENT vs DEPTH
FIGURE GT01
Scale at A4: NTS
Drawn: JW / HW
Approved: BB
Checked: BB
Date: 28/01/2019
AECOM

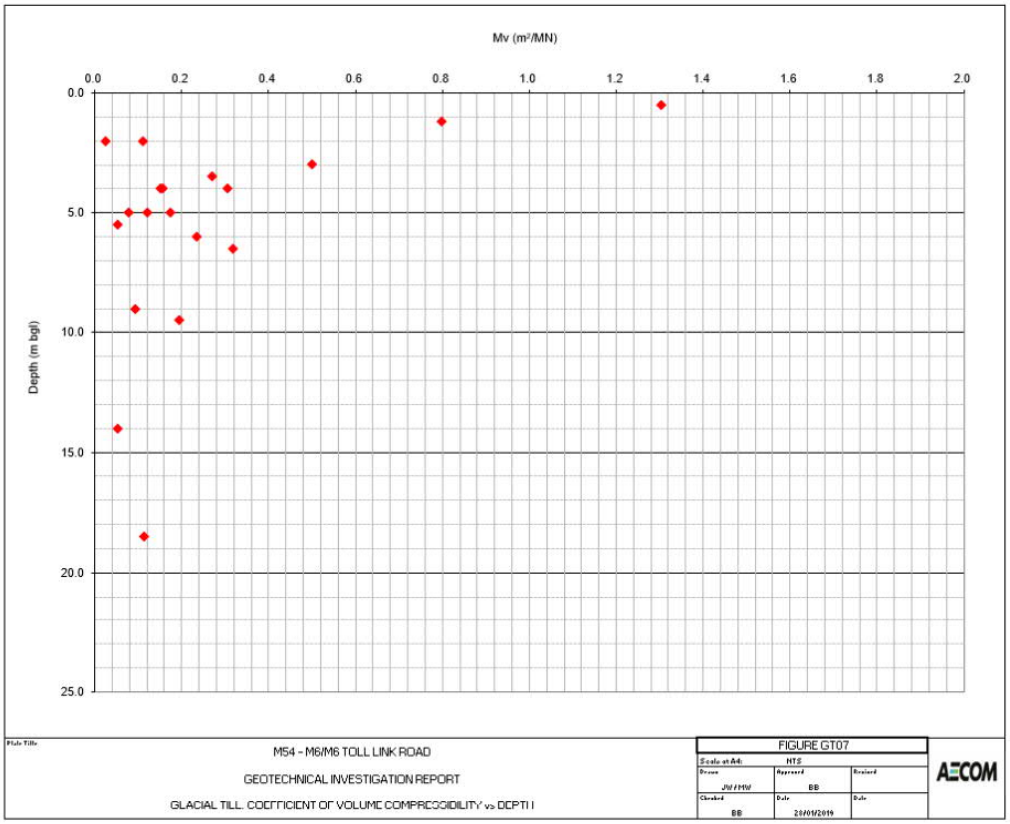

Plasticity Index (%)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
0.0
5.0
10.0
15.0
20.0
25.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL. PLASTICITY INDEX vs DEPTH
FIGURE GT02
Scale at A4: NTS
Drawn: JW / HW
Approved: BB
Checked: BB
Date: 28/01/2019
AECOM

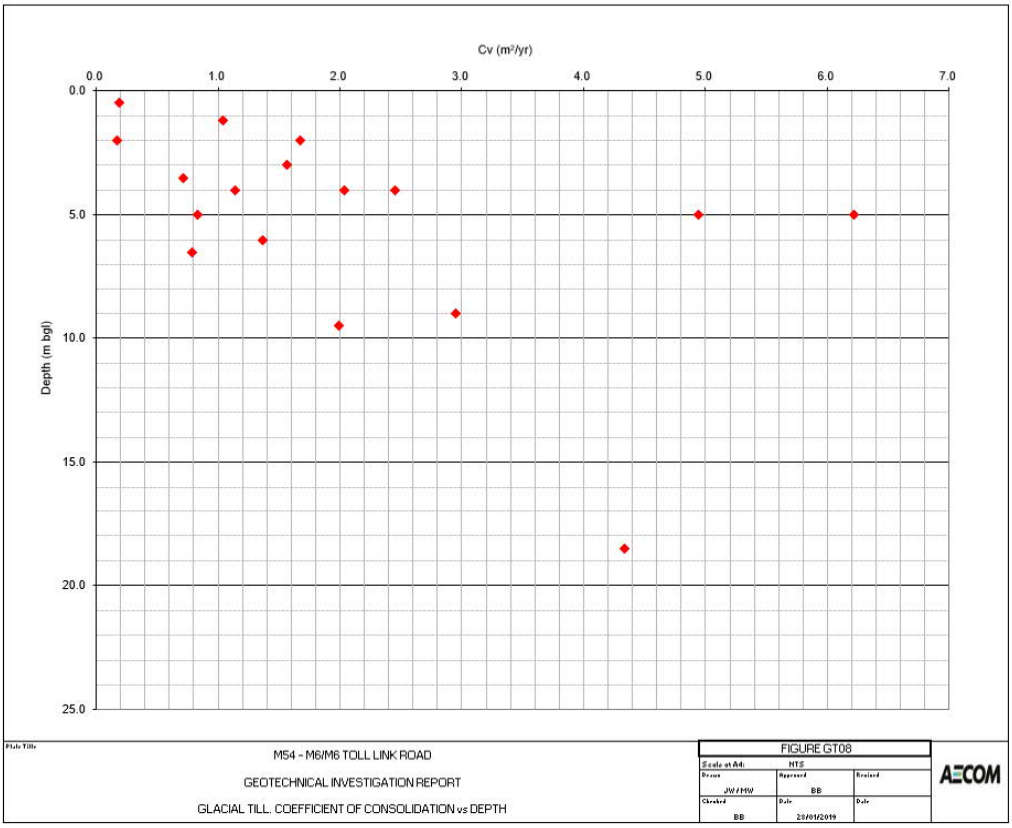

Percentage Passing (%)
100
90
80
70
60
50
40
30
20
10
0
0.001
0.01
0.1
1
10
100
1000
CLAY
Fine
Medium
Coarse
SILT
Fine
Medium
Coarse
SAND
Fine
Medium
Coarse
GRAVEL
COBBLES
BOULDERS
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL. PARTICLE SIZE DISTRIBUTION
FIGURE GT03
Scale at A4: NTS
AECOM

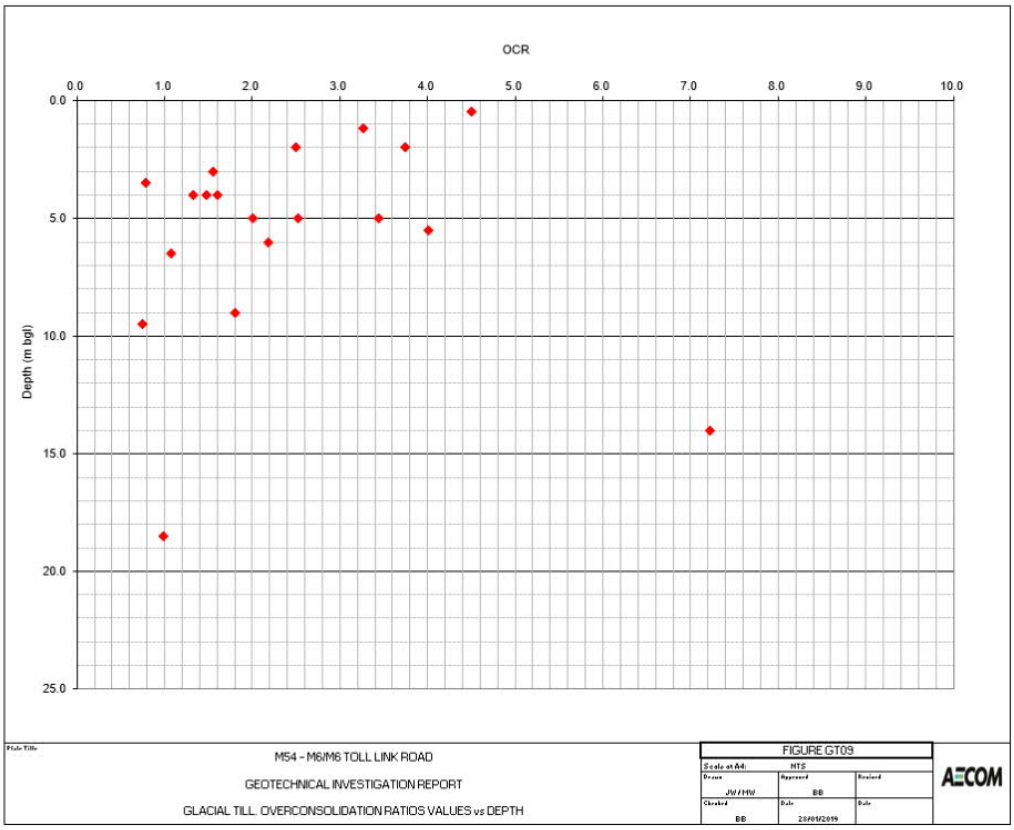

Plasticity Index
Liquid Limit
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
110
120
CE
CV
ME
CH
MV
CI
MH
CL
MI
ML
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL ATTERBERG LIMIT
FIGURE GT04
Scale at A4: NTS
AECOM

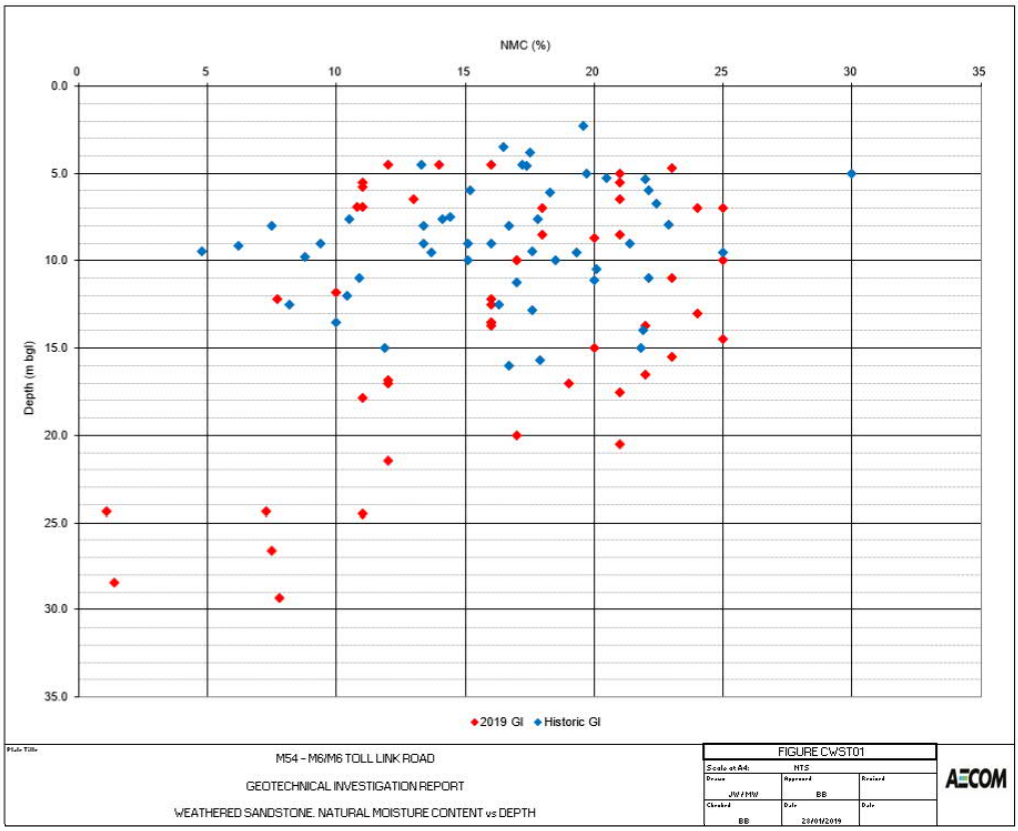

SPT - N
0
5
10
15
20
25
30
35
40
45
50
55
60
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL. SPT 'N' VALUES vs DEPTH
FIGURE GT05
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/01/2019
AECOM

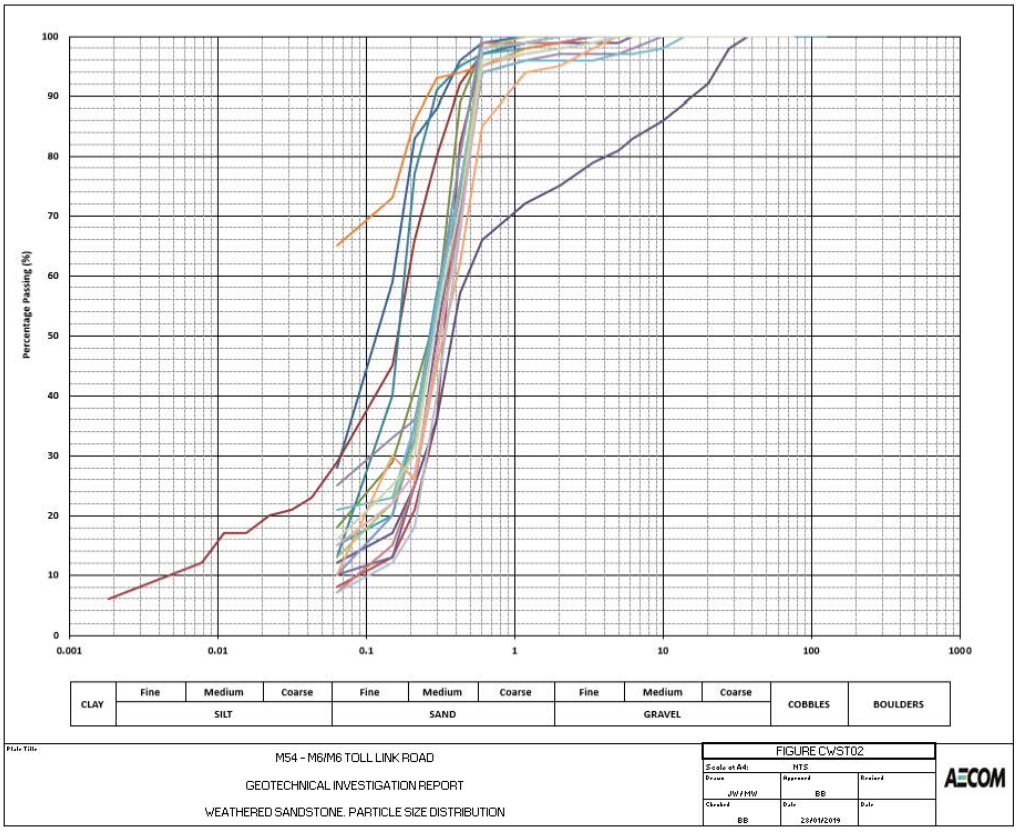

Cu (kPa)
0
50
100
150
200
250
300
350
0.0
5.0
10.0
15.0
20.0
25.0
Depth (m bgl)
Cu (SPT)
Cu (Triaxial)
Cu (Vane)
Cu (PP)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL. UNDRAINED SHEAR STRENGTH vs DEPTH
FIGURE GT06
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 29/01/2019
AECOM

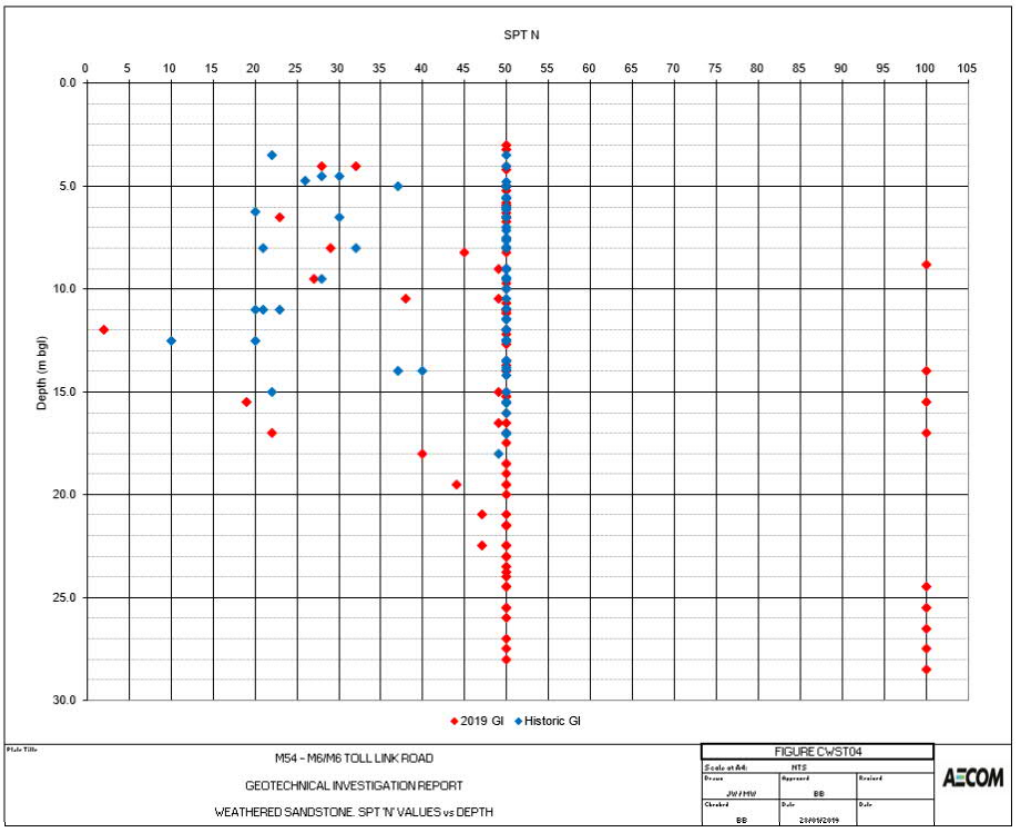

Mv (m²/MN)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Depth (m bgl)
0.0
5.0
10.0
15.0
20.0
25.0
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL: COEFFICIENT OF VOLUME COMPRESSIBILITY vs DEPTH
FIGURE GT07
AECOM

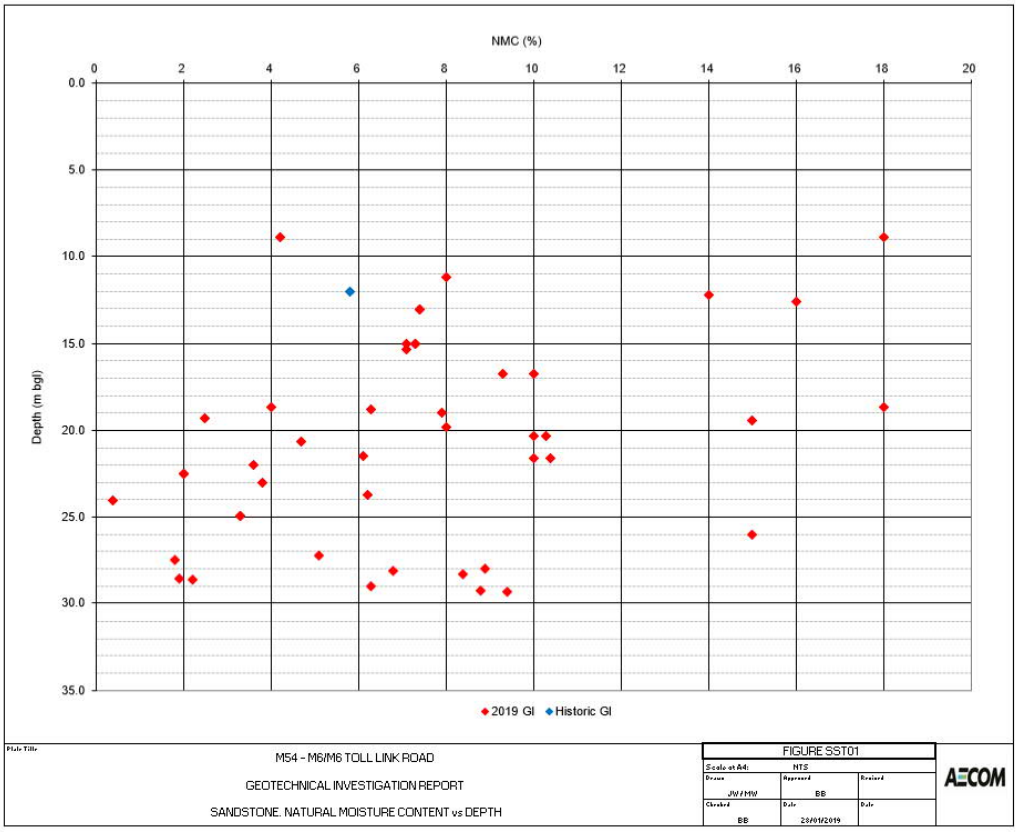

Cv (m²/yr)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Depth (m bgl)
0.0
5.0
10.0
15.0
20.0
25.0
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL: COEFFICIENT OF CONSOLIDATION vs DEPTH
FIGURE GT08
AECOM

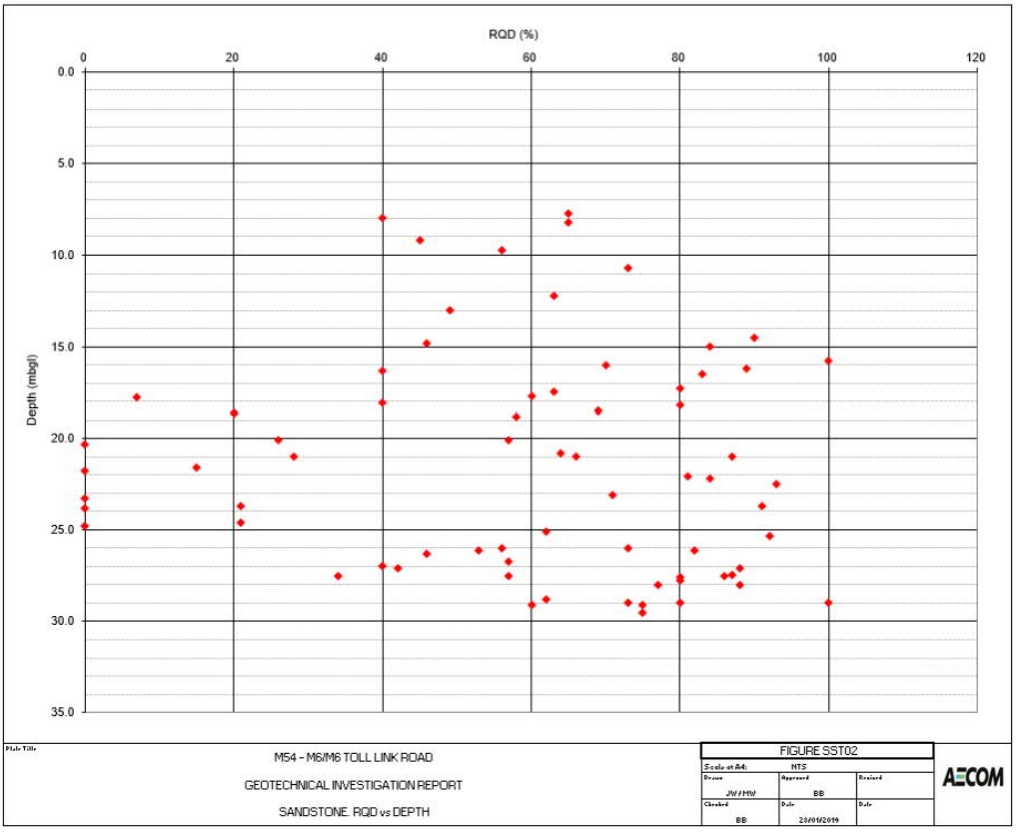

OCR
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
Depth (m bgl)
0.0
5.0
10.0
15.0
20.0
25.0
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
GLACIAL TILL. OVERCONSOLIDATION RATIOS VALUES vs DEPTH
FIGURE GT09
AECOM

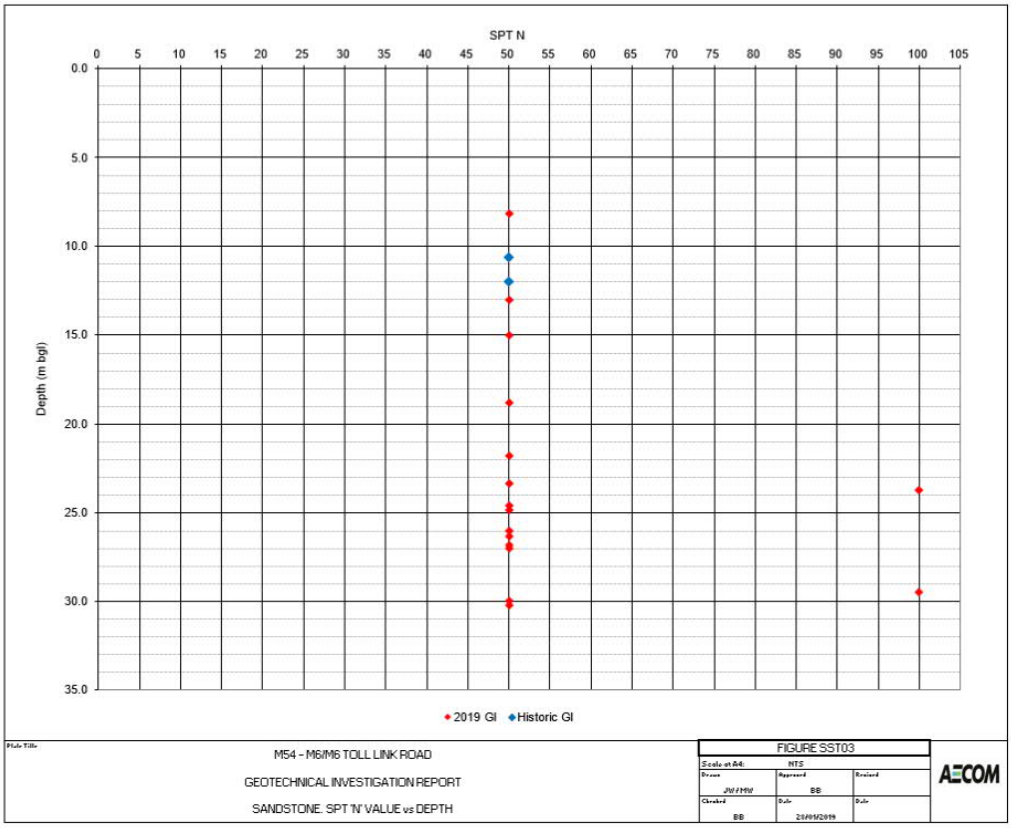

NMC (%)
0
5
10
15
20
25
30
35
Depth (m bgl)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
WEATHERED SANDSTONE. NATURAL MOISTURE CONTENT vs DEPTH
FIGURE CWST01
AECOM

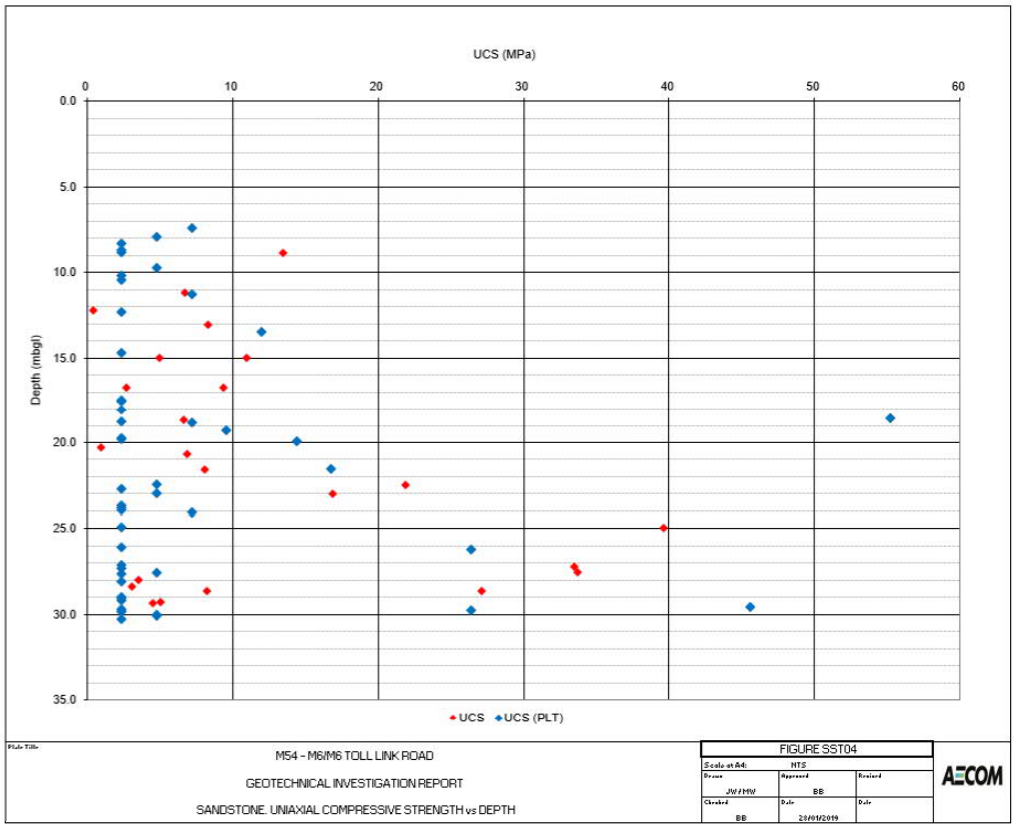

Percentage Passing (%)
100
90
80
70
60
50
40
30
20
10
0
0.001
0.01
0.1
1
10
100
1000
CLAY
Fine
Medium
Coarse
SILT
Fine
Medium
Coarse
SAND
Fine
Medium
Coarse
GRAVEL
COBBLES
BOULDERS
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
WEATHERED SANDSTONE. PARTICLE SIZE DISTRIBUTION
FIGURE CWST02
AECOM

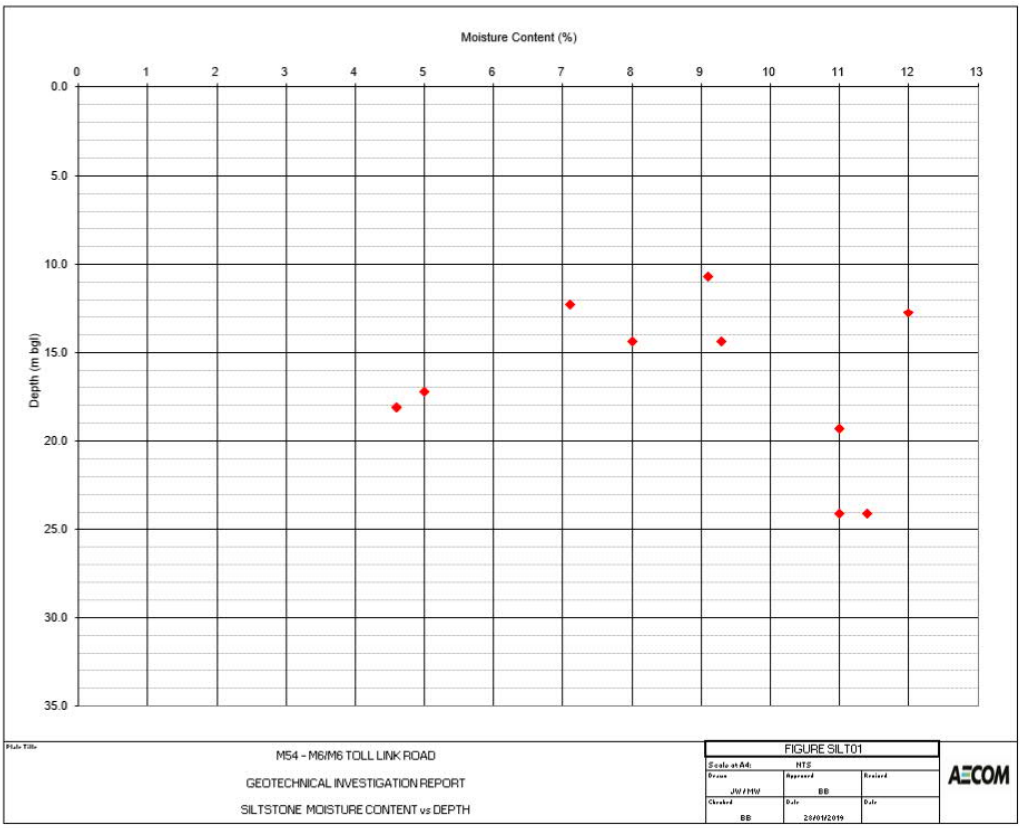

SPT N
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
Depth (m bgl)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
WEATHERED SANDSTONE. SPT 'N' VALUES vs DEPTH
FIGURE CWST04
AECOM

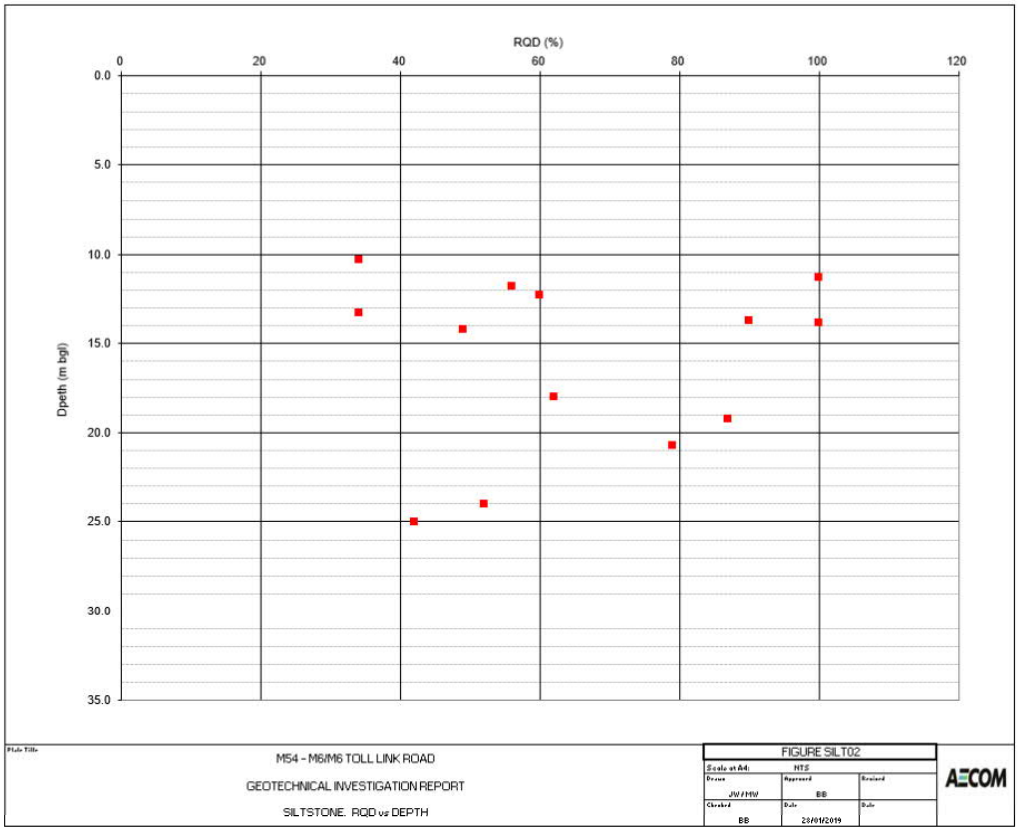

NMC (%)
0
2
4
6
8
10
12
14
16
18
20
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SANDSTONE. NATURAL MOISTURE CONTENT vs DEPTH
FIGURE SST01
Scale at A4: NTS
Drawn JW / MW
Approved BB
Reviewed
Checked BB
Date 28/01/2019
Date
AECOM

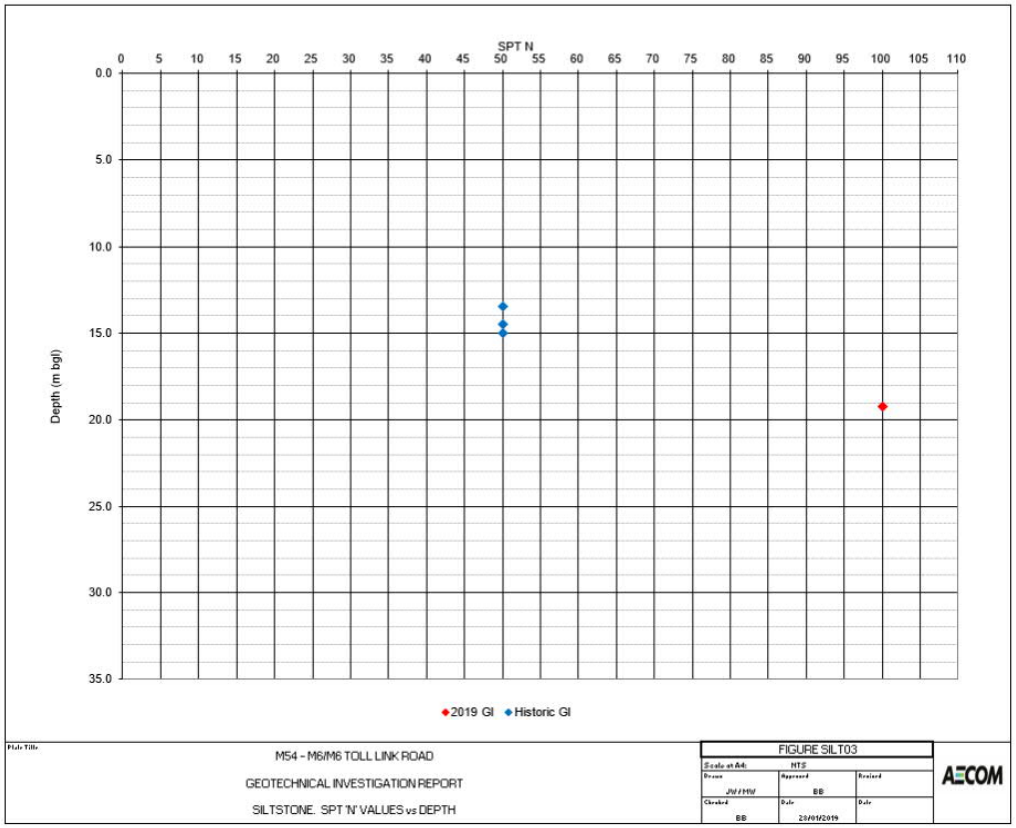

RQD (%)
0
20
40
60
80
100
120
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Depth (mbgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SANDSTONE. RQD vs DEPTH
FIGURE SST02
Scale at A4: NTS
Drawn JW / MW
Approved BB
Reviewed
Checked BB
Date 28/01/2019
Date
AECOM

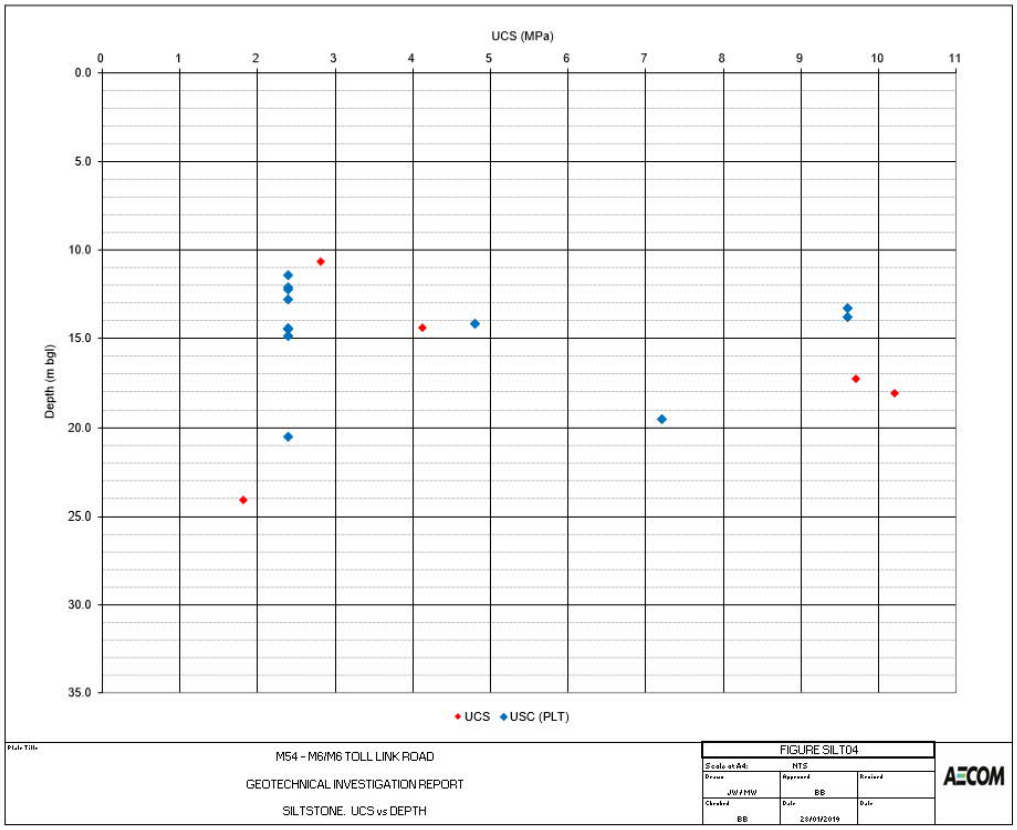

SPT N
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SANDSTONE. SPT 'N' VALUE vs DEPTH
FIGURE SST03
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/05/2019
AECOM

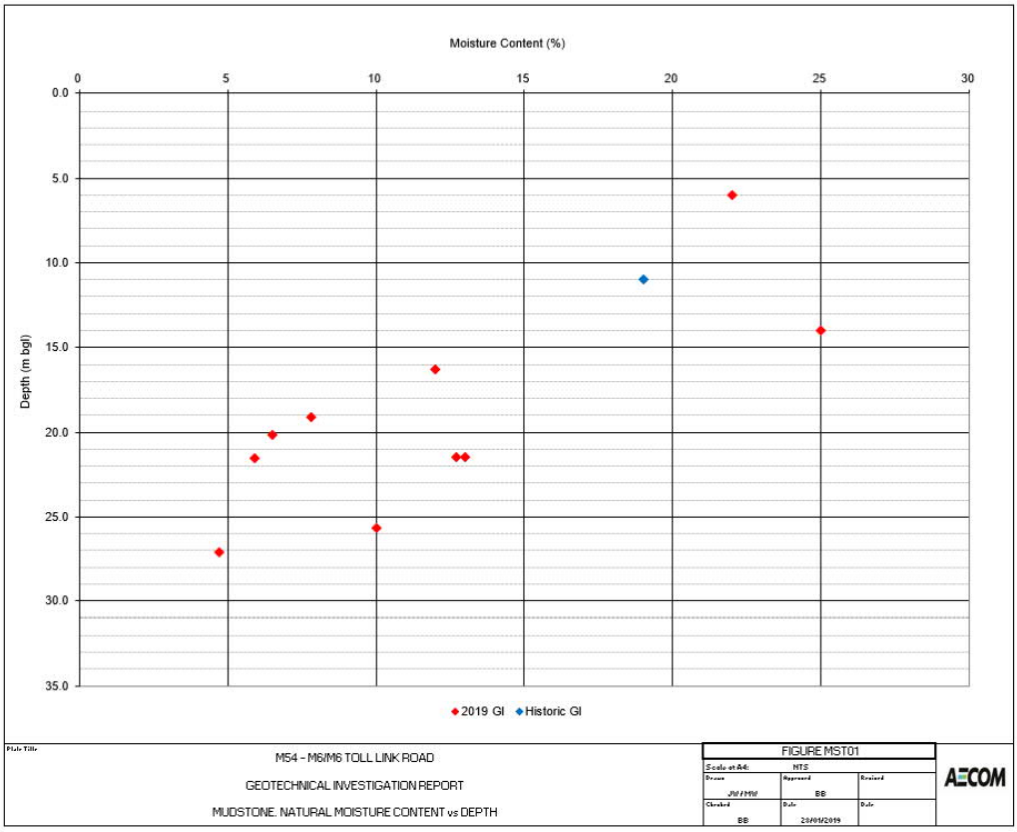

UCS (MPa)
0 10 20 30 40 50 60
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0
Depth (mbgl)
UCS
UCS (PLT)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SANDSTONE. UNIAXIAL COMPRESSIVE STRENGTH vs DEPTH
FIGURE SST04
Scale at A4: NTS
Drawn JW / HW
Approved BB
Checked BB
Date 28/05/2019
AECOM

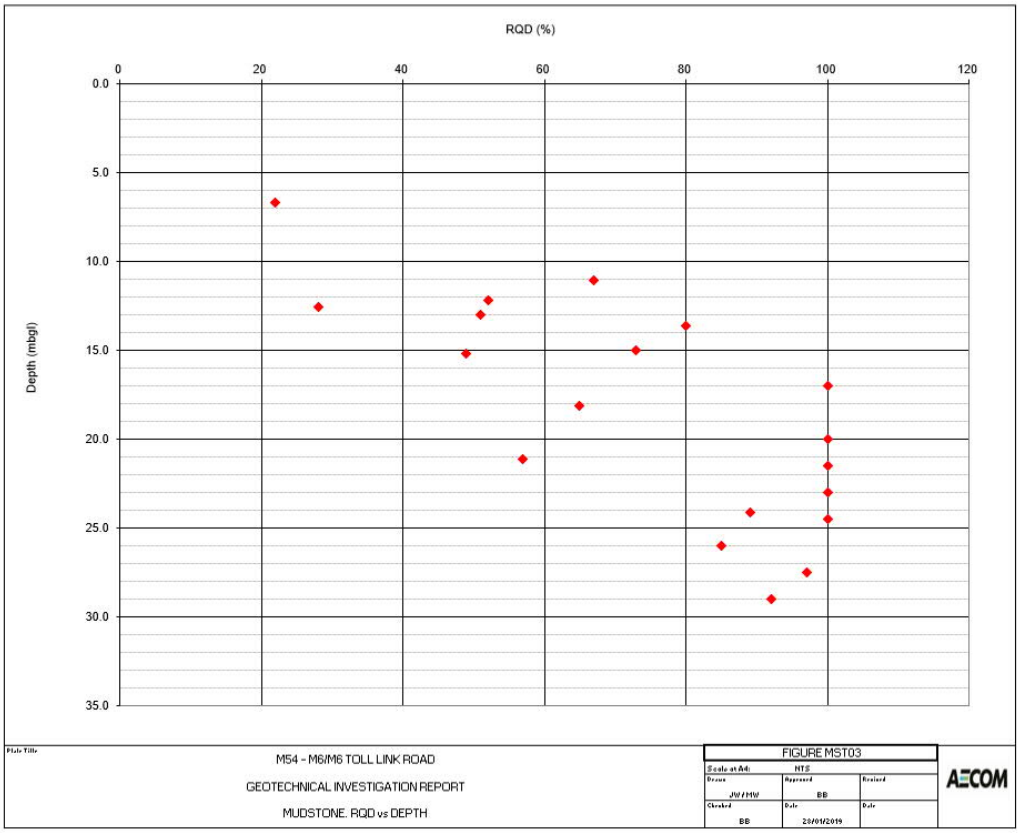

Moisture Content (%)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SILTSTONE MOISTURE CONTENT vs DEPTH
FIGURE SILT01
AECOM

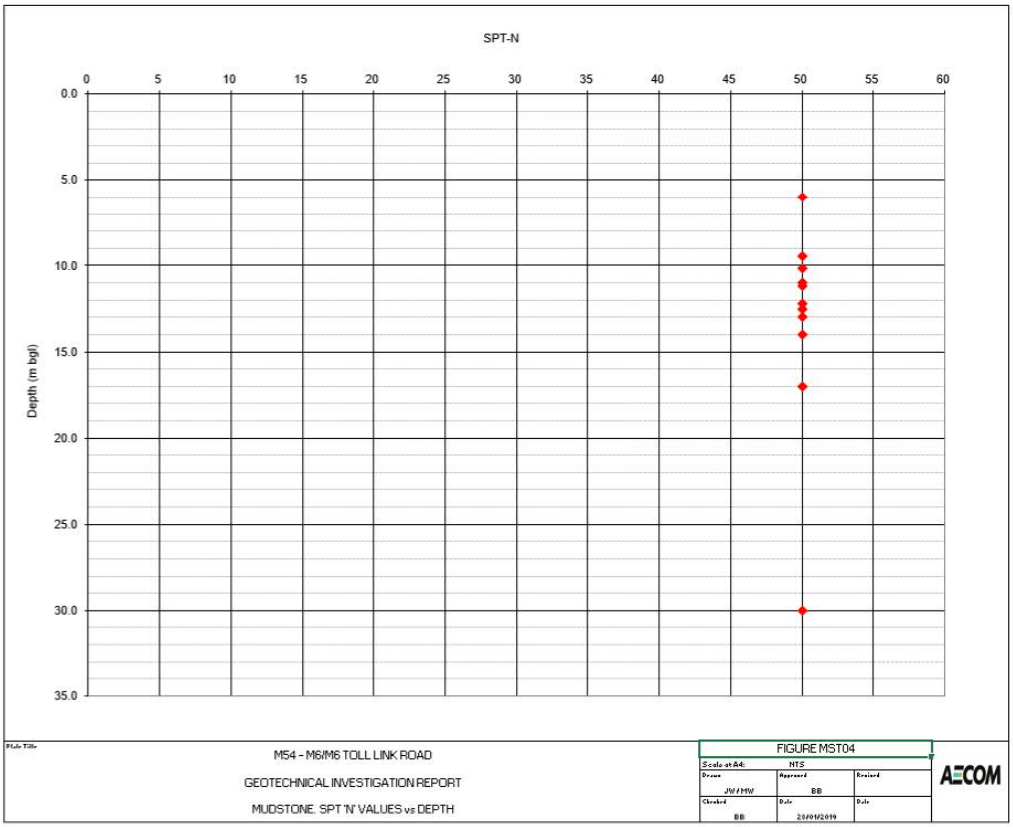

RQD (%)
0
20
40
60
80
100
120
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Dpeth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SILTSTONE. RQD vs DEPTH
FIGURE SILT02
AECOM

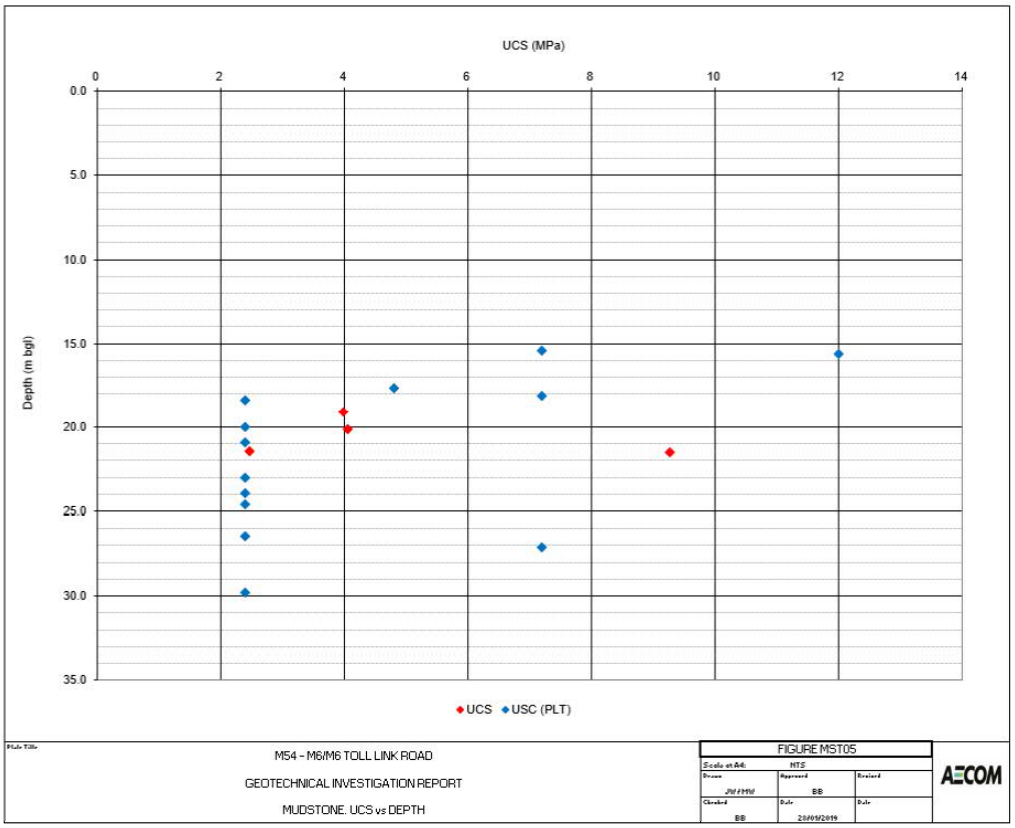

SPT N
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SILTSTONE. SPT 'N' VALUES vs DEPTH
FIGURE SILT03
AECOM


UCS (MPa)
0 1 2 3 4 5 6 7 8 9 10 11
0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0
Depth (m bgl)
UCS
USC (PLT)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
SILTSTONE. UCS vs DEPTH
FIGURE SILT04
AECOM


Moisture Content (%)
0
5
10
15
20
25
30
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Depth (m bgl)
2019 GI
Historic GI
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MUDSTONE. NATURAL MOISTURE CONTENT vs DEPTH
FIGURE MST01
AECOM


RQD (%)
0
20
40
60
80
100
120
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Depth (mbgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MUDSTONE. RQD vs DEPTH
FIGURE MST03
AECOM


SPT-N
Depth (m bgl)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MUDSTONE. SPT 'N' VALUES vs DEPTH
FIGURE MST04
AECOM


UCS (MPa)
Depth (m bgl)
UCS
USC (PLT)
M54 - M6/M6 TOLL LINK ROAD
GEOTECHNICAL INVESTIGATION REPORT
MUDSTONE. UCS vs DEPTH
FIGURE MST05
AECOM

Appendix C. Chemical Screening Results

Groundwater in Made Ground
Rounds 1, 2 and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH03	BH03	BH03	BH26	BH26	BH26
Location_Code	BH03	BH03	BH03	BH26	BH26	BH26
Well	-	-	-	-	-	-
Sampled_Date_Time	06/11/2019	14/11/2019	18/11/2019	05/11/2019	12/11/2019	19/11/2019
Monitoring_Round	1	2	3	1	2	3
Monitoring_Unit	MG	MG	MG	MG, GT	MG, GT	MG, GT
Matrix_Type	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh						
CARBON	Dissolved Organic Carbon (Filtered)	mg/L	3			387	149	115	444	273	218
EPHCWG	>C12-C16 Aliphatics	µg/L	10	300[#2]		23	<10	<10	97	175	-
	>C16-C21 Aliphatics	µg/L	10	300[#2]		98	<10	<10	1160	446	-
	>C16-C35 Aliphatics	µg/L	10			330	<10	<10	5440	2190	-
	>C21-C35 Aliphatics	µg/L	10	300[#2]		232	<10	<10	4270	1740	-
	>C12-C35 Aliphatics	µg/L	10			353	<10	<10	5530	2360	-
	>EC12-EC16 Aromatics	µg/L	10	90[#2]		61	<10	10	49	12	-
	>EC16-EC21 Aromatics	µg/L	10	90[#2]		108	11	<10	424	73	-
	>EC21-EC35 Aromatics	µg/L	10	90[#2]		367	21	26	1090	441	-
	>EC12-EC35 Aromatics	µg/L	10			536	32	36	1560	526	-
GRO	GRO >C5-C12	µg/L	50			1060	712	700	714	778	-
	>C5-C6 Aliphatics	µg/L	10	15,000[#2]		23	<10	<10	33	28	-
	>C6-C8 Aliphatics	µg/L	10	15,000[#2]		185	54	43	216	223	-
	>C8-C10 Aliphatics	µg/L	10	300[#2]		412	248	235	149	182	-
	>C10-C12 Aliphatics	µg/L	10	300[#2]		99	66	85	61	72	-
	>EC5-EC7 Aromatics	µg/L	10	1[#1]	10[#8]	<10	<10	<10	<10	<10	-
	>EC7-EC8 Aromatics	µg/L	10	700[#2]	74[#7]	<10	<10	<10	<10	<10	-
	>EC8-EC10 Aromatics	µg/L	10	300[#2]		274	292	273	213	223	-
	>EC10-EC12 Aromatics	µg/L	10	90[#2]		66	44	57	41	48	-
	MTBE	µg/L	3	1,800[#15]	5,100[#13]	<3	<3	<3	<3	<3	-
	Benzene	µg/L	7	1[#1]	10[#8]	<7	<7	<7	<7	<7	-
	Toluene	µg/L	4	700[#3]	74[#7]	<4	<4	<4	<4	<4	-
	Ethylbenzene	µg/L	5	300[#3]	20[#12]	<5	34	37	45	36	-
	Xylene (m & p)	µg/L	8			<8	<8	<8	<8	<8	-
	Xylene Total	µg/L	11	500[#3]	30[#12]	<11	91	78	68	66	-
	Xylene (o)	µg/L	3	190[#10]		<3	91	78	68	66	-
	Total BTEX	µg/L	28			<28	125	115	113	102	-
INORGANICS	Cyanide (Free) (Filtered)	mg/L	0.003	0.05[#1]	0.001[#12]	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
	Cyanide Total (Filtered)	mg/L	0.005	0.05[#1]	0.001[#7]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Ammoniacal Nitrogen as N (Filtered)	mg/L	0.01		300 (total ammonia as nitrogen)[#7]	5.46	2.66	2.53	0.102	0.0417	-
METALS	Chromium (hexavalent) (Filtered)	µg/L	3	50[#1]	3.4[#7]	27.8	9.32	10.7	16.6	<3	<3
METALS_CVAF_DIS	Mercury (Filtered)	µg/L	0.01	Use Mercury (total)[#1]	Use Mercury (total)[#6]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
METALS_ICP	Arsenic (Filtered)	µg/L	0.5	10[#1]	50[#7]	33.9	33	24.8	16.2	13	8.47
	Boron (Filtered)	µg/L	10	1,000[#1]	2,000[#12]	101	56	46.6	74.2	60.2	63.1
	Cadmium (Filtered)	µg/L	0.08	5[#1]	0.08[#8]	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
	Copper (Filtered)	µg/L	0.3	2,000[#1]	1[#7]	0.936	1.04	0.597	0.495	5.32	0.646
	Lead (Filtered)	µg/L	0.2	10[#1]	1.2[#8]	<0.2	<0.2	<0.2	<0.2	0.575	<0.2
	Nickel (Filtered)	µg/L	0.4	20[#1]	4[#8]	6.26	5.13	6.71	4.17	5.78	7.95
	Selenium (Filtered)	µg/L	1	10[#1]		1.75	1.59	1.77	1.89	1.22	1.2
	Zinc (Filtered)	µg/L	1	6,000[#10]	10.9[#7]	1.83	5.13	3.06	<1	6.66	2.4
PAH	Naphthalene	µg/L	0.01	6[#15]	2[#8]	0.39	0.22	0.172	7.49	9.3	-
	Acenaphthylene	µg/L	0.005	18[#15]		0.0802	0.0318	0.051	0.0908	0.0448	-
	Acenaphthene	µg/L	0.005	18[#15]		1.29	0.764	0.539	0.556	0.495	-
	Fluorene	µg/L	0.005	12[#15]		1.15	0.511	0.331	0.82	0.652	-
	Phenanthrene	µg/L	0.005	4[#15]		8.38	2.41	1.65	1.9	1.1	-
	Anthracene	µg/L	0.005	90[#15]	0.1[#8]	2.2	0.546	0.441	0.259	0.123	-
	Fluoranthene	µg/L	0.005	4[#3]	0.0063[#8]	11	2.83	2.83	1.91	0.705	-
	Pyrene	µg/L	0.005	9[#15]		9.62	2.55	2.61	1.78	0.62	-
	Benz(a)anthracene	µg/L	0.005	3.5[#15]		6.54	1	1.06	0.74	0.054	-
	Chrysene	µg/L	0.005	7[#15]		6.68	1.1	1.05	0.973	0.0445	-
	Benzo(a) pyrene	µg/L	0.002	0.01[#1]	0.00017[#8]	15.9	1.57	1.69	1.86	0.934	-
	Indeno(1,2,3-c,d)pyrene	µg/L	0.005	0.1[#1]		12.8	1.06	1.62	1.25	0.563	-
	Dibenz(a,h)anthracene	µg/L	0.005	0.07[#15]		1.88	0.222	0.282	0.32	0.151	-
	Benzo(g,h,i)perylene	µg/L	0.005	0.1[#1]	0.0082[#6]	4.04	1.35	1.68	1.74	0.742	-

Groundwater in Made Ground
Rounds 1, 2 and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH03	BH03	BH03	BH26	BH26	BH26
Location_Code	BH03	BH03	BH03	BH26	BH26	BH26
Well	-	-	-	-	-	-
Sampled_Date_Time	06/11/2019	14/11/2019	18/11/2019	05/11/2019	12/11/2019	19/11/2019
Monitoring_Round	1	2	3	1	2	3
Monitoring_Unit	MG	MG	MG	MG, GT	MG, GT	MG, GT
Matrix_Type	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh						
	Benzo(b)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	**24.5**	**2.61**	**2.6**	**3.41**	**1.52**	-
	Benzo(k)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	**7.74**	**1.05**	**1.04**	**1.37**	**0.584**	-
	PAH 16 Total	µg/L	0.082			114	19.8	19.6	26.5	17.6	-
PH_METER	pH (Lab)	pH_Units	1			6.89	7.81	8.45	9.41	7.5	7.76
PHENOL	2,3,5,6-Tetrachlorophenol	µg/L	0.5			<0.5	<0.5	<0.5	<2	<0.5	<0.5
	2-chlorophenol	µg/L	0.5	91[#10]	50[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	µg/L	0.5	930[#10]		<1	<0.5	<0.5	<1	0.55	<0.5
	2-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dichlorophenol	µg/L	0.5	46[#10]	4.2[#7]	<0.5	<0.5	<0.5	<1.5	<0.5	<0.5
	2,4-dimethylphenol	µg/L	0.5	360[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,5-trichlorophenol	µg/L	0.5	1,200[#10]		<0.5	<0.5	<0.5	<1.5	<0.5	<0.5
	2,4,6-trichlorophenol	µg/L	0.5	200[#3]		<0.5	<0.5	<0.5	<1	<0.5	<0.5
	4-chloro-3-methylphenol	µg/L	0.5	1,400[#10]	40[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-methylphenol	µg/L	0.5	1,900[#10]		40.7	33.2	31.6	4.69	5.33	4.72
	4-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pentachlorophenol	µg/L	2	9[#3]	0.4[#8]	**<2**	**<2**	**<2**	**<4**	**<2**	**<2**
	Phenol	µg/L	0.5	5,800[#10]	7.7[#7]	**<9**	3.71	4.64	**13.6**	**9.23**	6.41
	Phenol (Filtered)	µg/L	2.5	5,800[#10]	7.7[#7]	-	<5	<5	-	**16.8**	**14.4**
	2,4-dinitrophenol	µg/L	2.5	39[#10]		<7.5	<2.5	<7.5	<5	<2.5	<5
	3-Methylphenol	µg/L	0.5	930[#10]		<1.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4,6-Dinitro-2-methylphenol	µg/L	3	1.5[#10]		<9	<3	<9	<9	<3	<6
	4-chlorophenol	µg/L	0.5			<1.5	<0.5	<0.5	10.9	<0.5	<0.5
	Dinoseb	µg/L	4	15[#10]		<8	<4	<12	<8	<4	<8
PHENOLS_HPLC	Phenol (Filtered)	µg/L	2	5,800[#10]	7.7[#7]	<2	-	-	**10**	-	-
	Cresol Total (Filtered)	µg/L	6	1,500[#10]		350	-	-	10	-	-
	Cresols by HPLC (W) (Filtered)	µg/L	2.5			-	75.4	56	-	15.3	5.87
	Total Monohydric Phenols (S) Corrected (Filtered)	µg/L	16			350	-	-	20	-	-
	Phenols (Mono) (Filtered)	µg/L	0.5			-	75.4	56	-	32.1	23.1
	Xylenols (Filtered)	µg/L	2.5			<8	<5	<5	<8	<2.5	2.81

Groundwater in Made Ground
Rounds 1, 2 and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH03	BH03	BH03	BH26	BH26	BH26
Location_Code	BH03	BH03	BH03	BH26	BH26	BH26
Well	-	-	-	-	-	-
Sampled_Date_Time	06/11/2019	14/11/2019	18/11/2019	05/11/2019	12/11/2019	19/11/2019
Monitoring_Round	1	2	3	1	2	3
Monitoring_Unit	MG	MG	MG	MG, GT	MG, GT	MG, GT
Matrix_Type	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh						
SVOC	Naphthalene	µg/L	4	6[#15]	2[#8]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Acenaphthylene	µg/L	4	18[#15]		<50	<4	<4	<40	<8	-
	Acenaphthene	µg/L	4	18[#15]		<50	<4	<4	<40	<8	-
	Fluorene	µg/L	4	12[#15]		<50	<4	<4	<40	<8	-
	Phenanthrene	µg/L	4	4[#15]		<50	<4	<4	<40	<8	-
	Anthracene	µg/L	4	90[#15]	0.1[#8]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Fluoranthene	µg/L	4	4[#3]	0.0063[#8]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Pyrene	µg/L	4	9[#15]		<50	<4	<4	<40	<8	-
	Benz(a)anthracene	µg/L	4	3.5[#15]		<50	<4	<4	<40	<8	-
	Chrysene	µg/L	4	7[#15]		<50	<4	<4	<40	<8	-
	Benzo(a) pyrene	µg/L	4	0.01[#1]	0.00017[#8]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Indeno(1,2,3-c,d)pyrene	µg/L	4	0.1[#1]		**<50**	<4	<4	**<40**	<8	-
	Dibenz(a,h)anthracene	µg/L	4	0.07[#15]		<50	<4	<4	<40	<8	-
	Benzo(g,h,i)perylene	µg/L	4	0.1[#1]	0.0082[#6]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Benzo(b)fluoranthene	µg/L	4	0.1[#1]	0.017[#6]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Benzo(k)fluoranthene	µg/L	4	0.1[#1]	0.017[#6]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	1,3-dichlorobenzene	µg/L	4			<50	<4	<4	<40	<8	-
	1,4-dichlorobenzene	µg/L	4	300[#3]		<50	<4	<4	<40	<8	-
	1,2-dichlorobenzene	µg/L	4	1,000[#3]		<50	<4	<4	<40	<8	-
	1,2,4-trichlorobenzene	µg/L	4	0.1[#1]		**<50**	<4	<4	**<40**	<8	-
	Hexachlorobutadiene	µg/L	4	0.1[#1]	0.6[#6]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	2-chlorophenol	µg/L	4	91[#10]	50[#12]	<50	<4	<4	<40	<8	-
	2-methylphenol	µg/L	4	930[#10]		<50	<4	<4	<40	<8	-
	2-nitrophenol	µg/L	4			<50	<4	<4	<40	<8	-
	2,4-dichlorophenol	µg/L	4	46[#10]	4.2[#7]	**<50**	<4	<4	**<40**	**<8**	-
	2,4-dimethylphenol	µg/L	4	360[#10]		<50	<4	<4	<40	<8	-
	2,4,5-trichlorophenol	µg/L	4	1,200[#10]		<50	<4	<4	<40	<8	-
	2,4,6-trichlorophenol	µg/L	4	200[#3]		<50	<4	<4	<40	<8	-
	4-chloro-3-methylphenol	µg/L	4	1,400[#10]	40[#12]	**<50**	<4	<4	<40	<8	-
	4-methylphenol	µg/L	4	1,900[#10]		149	62.7	37	<40	<8	-
	4-nitrophenol	µg/L	4			<50	<4	<4	<40	<8	-
	Pentachlorophenol	µg/L	4	9[#3]	0.4[#8]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Phenol	µg/L	4	5,800[#10]	7.7[#7]	**<50**	<4	<4	**<40**	**<8**	-
	2-chloronaphthalene	µg/L	4	750[#10]		<50	<4	<4	<40	<8	-
	2-methylnaphthalene	µg/L	4	36[#10]		<50	<4	<4	<40	<8	-
	Bis(2-ethylhexyl) phthalate	µg/L	8	8[#3]	1.3[#8]	**<100**	**<8**	**<8**	**127**	**26.9**	-
	Butyl benzyl phthalate	µg/L	4	16[#10]	7.5[#7]	**<50**	<4	<4	**<40**	**<8**	-
	Di-n-butyl phthalate	µg/L	4	900[#10]	8[#12]	**<50**	<4	<4	**<40**	<8	-
	Di-n-octyl phthalate	µg/L	20	200[#10]	20[#12]	**<250**	<20	<20	**<200**	**<40**	-
	Diethylphthalate	µg/L	4	15,000[#10]	200[#12]	<50	<4	<4	<40	<8	-
	Dimethyl phthalate	µg/L	4		800[#12]	<50	<4	<4	<40	<8	-
	2-nitroaniline	µg/L	4	190[#10]		<50	<4	<4	<40	<8	-
	2,4-Dinitrotoluene	µg/L	4	0.24[#10]		<50	<4	<4	<40	<8	-
	2,6-dinitrotoluene	µg/L	4	0.049[#10]		<50	<4	<4	<40	<8	-
	3-nitroaniline	µg/L	4			<50	<4	<4	<40	<8	-
	4-bromophenyl phenyl ether	µg/L	4			<50	<4	<4	<40	<8	-
	4-chloroaniline	µg/L	4	0.37[#10]		<50	<4	<4	<40	<8	-
	4-chlorophenyl phenyl ether	µg/L	4			<50	<4	<4	<40	<8	-
	4-nitroaniline	µg/L	4	3.8[#10]		<50	<4	<4	<40	<8	-
	Azobenzene	µg/L	4	0.12[#10]		<50	<4	<4	<40	<8	-
	Bis(2-chloroethoxy) methane	µg/L	4	59[#10]		<50	<4	<4	<40	<8	-
	Bis(2-chloroethyl)ether	µg/L	4	0.014[#10]		<50	<4	<4	<40	<8	-
	Carbazole	µg/L	4			<50	<4	<4	<40	<8	-
	Dibenzofuran	µg/L	4	7.9[#10]		<50	<4	<4	<40	<8	-
	Hexachlorobenzene	µg/L	4	0.1[#1]	0.05[#6]	**<50**	**<4**	**<4**	**<40**	**<8**	-
	Hexachlorocyclopentadiene	µg/L	4	0.41[#10]		<50	<4	<4	<40	<8	-

Groundwater in Made Ground
Rounds 1, 2 and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH03	BH03	BH03	BH26	BH26	BH26
Location_Code	BH03	BH03	BH03	BH26	BH26	BH26
Well	-	-	-	-	-	-
Sampled_Date_Time	06/11/2019	14/11/2019	18/11/2019	05/11/2019	12/11/2019	19/11/2019
Monitoring_Round	1	2	3	1	2	3
Monitoring_Unit	MG	MG	MG	MG, GT	MG, GT	MG, GT
Matrix_Type	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh						
	Hexachloroethane	µg/L	4	0.33[#10]		<50	<4	<4	<40	<8	-
	Isophorone	µg/L	4	78[#10]		<50	<4	<4	<40	<8	-
	N-nitrosodi-n-propylamine	µg/L	4	0.011[#10]		<50	<4	<4	<40	<8	-
	Nitrobenzene	µg/L	4	8 to 63[#3]		<50	<4	<4	<40	<8	-
TOTMETALS	Chromium (III+VI)	µg/L	3	50[#1]		415	47.2	65.7	76.5	86.9	39
TPHCWG	>C5-C35 Aliphatics & Aromatics	µg/L	10			1950	744	737	7810	3670	-
UNK	Iron	µg/L	130	200[#1]	1,000[#7]	469,000	29,700	42,000	56,600	55,600	16,200
	Iron (Filtered)	µg/L	19	200[#1]	1,000[#7]	36,100	181	51.3	28.9	192	21.7
VOC	1,3,5-Trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	-
	Naphthalene	µg/L	1	6[#15]	2[#8]	<1	<1	<1	2.94	2.65	-
	Dichlorodifluoromethane	µg/L	1	200[#10]		<1	<1	<1	<1	<1	-
	MTBE	µg/L	1	1,800[#15]	5,100[#13]	<1	<1	<1	<1	<1	-
	Chloromethane	µg/L	1	190[#10]		<1	<1	<1	<1	<1	-
	Vinyl chloride	µg/L	1	0.5[#1]	77[#13]	<1	<1	<1	<1	<1	-
	Bromomethane	µg/L	1	7.5[#10]		<1	<1	<1	<1	<1	-
	Chloroethane	µg/L	1	21,000[#10]		<1	<1	<1	<1	<1	-
	Trichlorofluoromethane	µg/L	1	5,200[#10]		<1	<1	<1	<1	<1	-
	1,1-dichloroethene	µg/L	1	140[#3]	9[#13]	<1	<1	<1	<1	<1	-
	Dichloromethane	µg/L	3	20[#3]	20[#8]	<3	<3	<3	<3	<3	-
	trans-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	-
	1,1-dichloroethane	µg/L	1	2.8[#10]		<1	<1	<1	<1	<1	-
	cis-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	-
	2,2-dichloropropane	µg/L	1			<1	<1	<1	<1	<1	-
	Bromochloromethane	µg/L	1	83[#10]		<1	<1	<1	<1	<1	-
	Chloroform	µg/L	1		2.5[#8]	<1	<1	<1	<1	<1	-
	1,1,1-trichloroethane	µg/L	1	2,000[#3]	100[#12]	<1	<1	<1	<1	<1	-
	1,1-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	-
	Carbon tetrachloride	µg/L	1	3[#1]	12[#8]	<1	<1	<1	<1	<1	-
	1,2-dichloroethane	µg/L	1	3[#1]	10[#8]	<1	<1	<1	<1	<1	-
	Benzene	µg/L	1	1[#1]	10[#8]	<1	<1	<1	<1	<1	-
	Trichloroethene	µg/L	1		10[#8]	<1	<1	<1	<1	<1	-
	1,2-dichloropropane	µg/L	1	40[#3]		<1	<1	<1	<1	<1	-
	Dibromomethane	µg/L	1	8.3[#10]		<1	<1	<1	<1	<1	-
	Bromodichloromethane	µg/L	1			<1	<1	<1	<1	<1	-
	cis-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	-
	Toluene	µg/L	1	700[#3]	74[#7]	<1	<1	<1	<1	<1	-
	trans-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	-
	1,1,2-trichloroethane	µg/L	1	0.28[#10]	400[#12]	<1	<1	<1	<1	<1	-
	Tetrachloroethene	µg/L	1		10[#8]	<1	<1	<1	<1	<1	-
	1,3-dichloropropane	µg/L	1	370[#10]		<1	<1	<1	<1	<1	-
	Chlorodibromomethane	µg/L	1			<1	<1	<1	<1	<1	-
	1,2-dibromoethane	µg/L	1	0.4[#3]		<1	<1	<1	<1	<1	-
	Chlorobenzene	µg/L	1	300[#3]		<1	<1	<1	<1	<1	-
	1,1,1,2-tetrachloroethane	µg/L	1	0.57[#10]		<1	<1	<1	<1	<1	-
	Ethylbenzene	µg/L	1	300[#3]	20[#12]	<1	<1	<1	<1	<1	-
	Xylene (m & p)	µg/L	1			<1	<1	<1	<1	<1	-
	Xylene (o)	µg/L	1	190[#10]		<1	<1	<1	<1	<1	-
	Styrene	µg/L	1	20[#3]	50[#12]	<1	<1	<1	<1	<1	-
	Bromoform	µg/L	1			<1	<1	<1	<1	<1	-
	Isopropylbenzene	µg/L	1	450[#10]		<1	<1	<1	<1	<1	-
	1,1,2,2-tetrachloroethane	µg/L	1	0.076[#10]	140[#7]	<1	<1	<1	<1	<1	-
	Bromobenzene	µg/L	1	62[#10]		<1	<1	<1	<1	<1	-
	1,2,3-trichloropropane	µg/L	1	0.00075[#10]		<1	<1	<1	<1	<1	-
	n-propylbenzene	µg/L	1	660[#10]		<1	<1	<1	<1	<1	-
	2-chlorotoluene	µg/L	1	240[#10]		<1	<1	<1	<1	<1	-
	1,3,5-trimethylbenzene	µg/L	1	60[#10]		<1	<1	<1	<1	<1	-

Groundwater in Made Ground
Rounds 1, 2 and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH03	BH03	BH03	BH26	BH26	BH26
Location_Code	BH03	BH03	BH03	BH26	BH26	BH26
Well	-	-	-	-	-	-
Sampled_Date_Time	06/11/2019	14/11/2019	18/11/2019	05/11/2019	12/11/2019	19/11/2019
Monitoring_Round	1	2	3	1	2	3
Monitoring_Unit	MG	MG	MG	MG, GT	MG, GT	MG, GT
Matrix_Type	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh						
	4-chlorotoluene	µg/L	1	250[#10]		<1	<1	<1	<1	<1	-
	tert-butylbenzene	µg/L	1	690[#10]		<1	<1	<1	<1	<1	-
	1,2,4-trimethylbenzene	µg/L	1	56[#10]		<1	<1	<1	<1	<1	-
	sec-butylbenzene	µg/L	1	2,000[#10]		<1	<1	<1	<1	<1	-
	p-isopropyltoluene	µg/L	1			<1	<1	<1	<1	<1	-
	1,3-dichlorobenzene	µg/L	1			<1	<1	<1	<1	<1	-
	1,4-dichlorobenzene	µg/L	1	300[#3]		<1	<1	<1	<1	<1	-
	n-butylbenzene	µg/L	1	1000[#10]		<1	<1	<1	<1	<1	-
	1,2-dichlorobenzene	µg/L	1	1000[#3]		<1	<1	<1	<1	<1	-
	1,2-dibromo-3-chloropropane	µg/L	1	1[#3]		<1	<1	<1	<1	<1	-
	1,2,4-trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	-
	Hexachlorobutadiene	µg/L	1	0.1[#1]	0.6[#6]	**<1**	**<1**	**<1**	**<1**	**<1**	-
	1,2,3-trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	-
	Carbon disulfide	µg/L	1	810[#10]		<1	1.7	1.97	3.41	1.26	-
	Tert Amyl Methyl Ether	µg/L	1		510[#13]	<1	<1	<1	<1	<1	-

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [Nov 2019]
#11 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#12 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#13 PNEC (EU REACH) - Freshwater
#14 California Draft health protective concentration
#15 AECOM DWG (WHO method)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

	Exceedance of CW/WE Water. DWS - England/Wales
XXX	Exceedance of CW/WE Water. Aquatic Toxicity - England/Wales - Freshwater

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH04	BH04	BH04	BH05	BH05	BH05	BH06	BH06	BH06	BH07	BH07	BH07	BH08A	BH08A	BH08a	BH09	BH09
Location_Code	BH04	BH04	BH04	BH05	BH05	BH05	BH06	BH06	BH06	BH07	BH07	BH07	BH08A	BH08A	BH08a	BH09	BH09
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	06/11/2019	14/11/2019	18/11/2019	06/11/2019	14/11/2019
Monitoring_Round	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2
Monitoring_Unit	GSG, CWST, SST, SILT	GSG, CWST, SST, SILT	GSG, CWST, SST, SILT	CWST	CWST	CWST	GSG, CWST	GSG, CWST	GSG, CWST	CWST	CWST	CWST	SST, CONG	SST, CONG	SST, CONG	CWST, MST	CWST, MST
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh															
CARBON	Dissolved Organic Carbon (Filtered)	mg/L	3			77.9	52.6	46	13.7	10.3	4.53	16.3	6.76	<3	659	249	211	<3	3.57	<3	23	5.38
EPHCWG	>C12-C16 Aliphatics	µg/L	10	300[#2]		1240	2250	1490	10	<20	<10	20	<50	<10	<10	<100	<100	34	<10	<10	14	<50
	>C16-C21 Aliphatics	µg/L	10	300[#2]		124	252	162	45	<20	<10	53	<50	<10	14	<100	<100	<10	<10	<10	54	<50
	>C16-C35 Aliphatics	µg/L	10			2440	4320	2480	243	171	50	339	<50	31	185	<100	<100	69	<10	<10	254	<50
	>C21-C35 Aliphatics	µg/L	10	300[#2]		2310	4070	2320	198	171	50	286	<50	31	171	<100	<100	69	<10	<10	200	<50
	>C12-C35 Aliphatics	µg/L	10			3680	6560	3980	253	171	50	359	<50	31	185	<100	<100	103	<10	<10	268	<50
	>EC12-EC16 Aromatics	µg/L	10	90[#2]		<10	<50	<50	<10	<20	<10	<10	<50	<10	<10	<100	<100	<10	<10	<10	<10	<50
	>EC16-EC21 Aromatics	µg/L	10	90[#2]		28	<50	<50	<10	<20	<10	42	<50	<10	<10	<100	<100	<10	<10	<10	<10	<50
	>EC21-EC35 Aromatics	µg/L	10	90[#2]		497	423	341	19	<20	<10	241	<50	<10	11	<100	<100	<10	<10	<10	<10	<50
	>EC12-EC35 Aromatics	µg/L	10			525	423	341	19	<20	<10	283	<50	<10	11	<100	<100	<10	<10	<10	<10	<50
GRO	GRO >C5-C12	µg/L	50			291	196	157	<50	<50	<50	<50	<50	<50	1300	314	400	<50	<50	<50	<50	<50
	>C5-C6 Aliphatics	µg/L	10	15,000[#2]		<10	<10	<10	<10	<10	<10	<10	<10	<10	69	18	19	<10	<10	<10	<10	<10
	>C6-C8 Aliphatics	µg/L	10	15,000[#2]		36	26	24	<10	<10	<10	<10	<10	<10	426	106	125	<10	<10	<10	<10	<10
	>C8-C10 Aliphatics	µg/L	10	300[#2]		96	54	42	<10	<10	<10	<10	<10	<10	390	75	98	<10	<10	<10	<10	<10
	>C10-C12 Aliphatics	µg/L	10	300[#2]		45	31	26	<10	<10	<10	<10	<10	<10	90	23	28	<10	<10	<10	<10	<10
	>EC5-EC7 Aromatics	µg/L	10	1[#1]	10[#8]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC7-EC8 Aromatics	µg/L	10	700[#2]	74[#7]	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC8-EC10 Aromatics	µg/L	10	300[#2]		64	51	38	<10	<10	<10	<10	<10	<10	260	76	110	<10	<10	<10	<10	<10
	>EC10-EC12 Aromatics	µg/L	10	90[#2]		30	21	18	<10	<10	<10	<10	<10	<10	60	15	19	<10	<10	<10	<10	<10
	MTBE	µg/L	3	1,800[#15]	5,100[#13]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Benzene	µg/L	7	1[#1]	10[#8]	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Toluene	µg/L	4	700[#3]	74[#7]	11	6	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Ethylbenzene	µg/L	5	300[#3]	20[#12]	<5	7	6	<5	<5	<5	<5	<5	<5	<5	7	11	<5	<5	<5	<5	<5
	Xylene (m & p)	µg/L	8			<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	Xylene Total	µg/L	11	500[#3]	30[#12]	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	18	33	<11	<11	<11	<11	<11
	Xylene (o)	µg/L	3	190[#10]		<3	7	4	<3	<3	<3	<3	<3	<3	<3	18	33	<3	<3	<3	<3	<3
	Total BTEX	µg/L	28			<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	44	<28	<28	<28	<28	<28
INORGANICS	Cyanide (Free) (Filtered)	mg/L	0.003	0.05[#1]	0.001[#12]	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
	Cyanide Total (Filtered)	mg/L	0.005	0.05[#1]	0.001[#7]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Ammoniacal Nitrogen as N (Filtered)	mg/L	0.01		300[#7]	0.998	0.789	0.198	0.0423	0.042	0.0196	0.28	0.127	0.118	0.167	0.025	0.109	0.0289	0.013	<0.01	0.209	0.185
METALS	Chromium (hexavalent) (Filtered)	µg/L	3	50[#1]	3.4[#7]	<3	<3	<3	<3	<3	<3	<3	<3	<3	14.4	<3	<3	<3	<3	6.74	<3	<3
METALS_CVAF_DIS	Mercury (Filtered)	µg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
METALS_ICP	Arsenic (Filtered)	µg/L	0.5	10[#1]	50[#7]	5.06	4.02	3.85	1.88	2.31	1.75	4.5	2.39	1.06	13.7	6.27	6.45	0.836	1.21	0.88	4.19	1.17
	Boron (Filtered)	µg/L	10	1,000[#1]	2,000[#12]	62.3	62.4	63.2	160	166	160	30.3	26.8	23.2	60.7	54.2	48.1	49.1	47.8	40.8	82	84.5
	Cadmium (Filtered)	µg/L	0.08	5[#1]	0.08[#8]	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.121
	Copper (Filtered)	µg/L	0.3	2,000[#1]	1[#7]	0.876	0.879	0.812	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.875	0.412	0.496	2.21	1.91	1.92	<0.3	1.06
	Lead (Filtered)	µg/L	0.2	10[#1]	1.2[#8]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.205	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Nickel (Filtered)	µg/L	0.4	20[#1]	4[#8]	2.14	1.59	1.92	2.88	2.28	2.55	1.15	1.51	1.7	7.03	3.42	4.46	2.19	2.16	2.57	9.96	7.81
	Selenium (Filtered)	µg/L	1	10[#1]		1.67	1.2	1.1	1.69	1.37	1.39	<1	<1	<1	3.25	1	1.38	<1	<1	<1	<1	<1
	Zinc (Filtered)	µg/L	1	6,000[#10]	10.9[#7]	<1	<1	3.29	<1	2.22	<1	3.26	2.63	4.86	1.17	2.51	6.74	5.14	1.01	<1	3.19	11.7
PAH	Naphthalene	µg/L	0.01	6[#15]	2[#8]	0.338	0.442	0.303	0.019	0.0221	0.0107	0.402	<0.05	<0.01	0.0252	0.151	0.109	<0.01	<0.01	<0.01	<0.01	0.108
	Acenaphthylene	µg/L	0.005	18[#15]		0.0553	<0.025	0.0878	0.0117	0.0114	0.00682	0.0761	<0.025	<0.005	0.00666	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.025
	Acenaphthene	µg/L	0.005	18[#15]		0.0522	<0.025	0.0799	0.00984	<0.01	0.00583	<0.005	<0.025	<0.005	0.0136	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.025
	Fluorene	µg/L	0.005	12[#15]		0.0524	0.0574	<0.025	0.0119	<0.01	<0.005	<0.005	<0.025	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.005	0.00774	<0.025
	Phenanthrene	µg/L	0.005	4[#15]		0.398	0.447	0.32	0.0918	0.08	0.032	0.208	<0.025	0.0123	0.0271	0.0567	0.0708	<0.005	<0.005	<0.005	0.0238	0.0442
	Anthracene	µg/L	0.005	90[#15]	0.1[#8]	0.0848	0.0969	0.071	0.0246	0.0182	0.00887	0.094	<0.025	<0.005	0.00559	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.025
	Fluoranthene	µg/L	0.005	4[#3]	0.0063[#8]	0.69	0.783	0.464	0.309	0.227	0.0845	0.2	<0.025	0.0136	0.0494	<0.05	<0.05	0.0226	<0.005	<0.005	0.0249	<0.025
	Pyrene	µg/L	0.005	9[#15]		0.696	0.85	0.494	0.324	0.223	0.0929	0.182	<0.025	0.0232	0.0355	<0.05	<0.05	0.0288	<0.005	<0.005	0.0289	<0.025
	Benz(a)anthracene	µg/L	0.005	3.5[#15]		0.402	0.432	0.245	0.142	0.121	0.0398	<0.005	<0.025	<0.005	0.0146	<0.05	<0.05	<0.005	<0.005	<0.005	0.00566	<0.025
	Chrysene	µg/L	0.005	7[#15]		0.415	0.466	0.262	0.166	0.123	0.0505	<0.005	<0.025	<0.005	<0.005	<0.05	<0.05	0.0072	<0.005	<0.005	<0.005	<0.025
	Benzo(a) pyrene	µg/L	0.002	0.01[#1]	0.00017[#8]	1.21	0.829	0.375	0.303	0.192	0.063	<0.002	<0.01	0.00909	0.0108	<0.02	<0.02	0.0119	<0.002	<0.002	0.0154	<0.01
	Indeno(1,2,3-c,d)pyrene	µg/L	0.005	0.1[#1]		0.763	0.733	0.318	0.225	0.154	0.0552	<0.005	<0.025	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.025
	Dibenz(a,h)anthracene	µg/L	0.005	0.07[#15]		0.147	0.159	0.0832	0.0477	0.0313	0.0108	<0.005	<0.025	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.025
	Benzo(g,h,i)perylene	µg/L	0.005	0.1[#1]	0.0082[#5]	1.31	1.03	0.546	0.288	0.211	0.0878	<0.005	<0.025	<0.005	0.0248	<0.05	<0.05	0.00969	<0.005	<0.005	0.0124	<0.025
	Benzo(b)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	1.75	1.18	0.517	0.507	0.322	0.107	<0.005	<0.025	0.0114	0.0155	<0.05	<0.05	0.013	<0.005	<0.005	0.0186	<0.025
	Benzo(k)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	0.709	0.486	0.252	0.234	0.137	0.0489	<0.005	<0.025	0.00626	0.00779	<0.05	<0.05	0.0054	<0.005	<0.005	0.0096	<0.025
	PAH 16 Total	µg/L	0.082			9.08	8	4.42	2.71	1.87	0.705	1.16	<0.41	<0.082	0.237	<0.82	<0.82	0.0986	<0.082	<0.082	0.147	<0.41
PH_METER	pH (Lab)	pH_Units	1			7.39	7.49	8.36	6.95	6.73	6.94	7.8	7.19	7.21	7.55	7.33	7.58	7.82	7.58	7.97	7.26	7.21
PHENOL	2,3,5,6-Tetrachlorophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	µg/L	0.5	91[#10]	50[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	µg/L	0.5	930[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dichlorophenol	µg/L	0.5	46[#10]	4.2[#7]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	µg/L	0.5	360[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,5-trichlorophenol	µg/L	0.5	1,200[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,6-trichlorophenol	µg/L	0.5	200[#3]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-chloro-3-methylphenol	µg/L	0.5	1,400[#10]	40[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-methylphenol	µg/L	0.5	1,900[#10]		<0.5	1.15	1.7	<0.5	<0.5	<0.5	16.8	<0.5	<0.5	8.94	3.89	4.22	<0.5	<0.5	<0.5	<0.5	<0.5
	4-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pentachlorophenol	µg/L	2	9[#3]	0.4[#8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	0.5	5,800[#10]	7.7[#7]	<4	1.29	<2	<3.5	<0.5	<1	9.07	<0.5	<1	<3.5	1.95	<2.5	<3	<0.5	<1	<4	<0.5
	Phenol (Filtered)	µg/L	0.5	5,800[#10]	7.7[#7]	<1	1.18	1.44	<0.5	<0.5	<0.5	5.64	<0.5	<0.5	20.3	6.27	4.77	<0.5	<0.5	<0.5	1.45	<0.5
	2,4-dinitrophenol	µg/L	2.5	39[#10]		<5	<2.5	<5	<5	<2.5	<5	<5	<2.5	<5	<5	<2.5	<5	<7.5	<2.5	<7.5	<7.5	<2.5
	3-Methylphenol	µg/L	0.5	930[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4,6-Dinitro-2-methylphenol	µg/L	3	1.5[#10]		<9	<3	<6	<9	<3	<6	<9	<3	<6	<9	<3	<6	<9	<3	<9	<9	<3
	4-chlorophenol	µg/L	0.5			<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	<1.5	<0.5
	Dinoseb	µg/L	4	15[#10]		<8	<4	<8	<8	<4	<8	<8	<4	<8	<8	<4	<8	<8	<4	<12	<8	<4
PHENOLS_HPLC	Phenol (Filtered)	µg/L	2	5,800[#10]	7.7[#7]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH04	BH04	BH04	BH05	BH05	BH05	BH06	BH06	BH06	BH07	BH07	BH07	BH08A	BH08A	BH08a	BH09	BH09
Location_Code	BH04	BH04	BH04	BH05	BH05	BH05	BH06	BH06	BH06	BH07	BH07	BH07	BH08A	BH08A	BH08a	BH09	BH09
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	06/11/2019	14/11/2019	18/11/2019	06/11/2019	14/11/2019
Monitoring_Round	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2
Monitoring_Unit	GSG, CWST, SST, SILT	GSG, CWST, SST, SILT	GSG, CWST, SST, SILT	CWST	CWST	CWST	GSG, CWST	GSG, CWST	GSG, CWST	CWST	CWST	CWST	SST, CONG	SST, CONG	SST, CONG	CWST, MST	CWST, MST
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh															
	Cresol Total (Filtered)	µg/L	6	1,500[#10]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cresols by HPLC (W) (Filtered)	µg/L	0.5			5.42	5.53	1.73	<0.5	<0.5	<0.5	28.9	1.51	<0.5	21.4	4.98	7.33	<0.5	<0.5	<0.5	2.47	0.54
	Total Monohydric Phenols (S) Corrected (Filtered)	µg/L	16			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenols (Mono) (Filtered)	µg/L	0.5			5.42	6.71	3.17	<0.5	<0.5	<0.5	34.5	1.51	<0.5	41.7	11.3	12.1	<0.5	<0.5	<0.5	3.92	0.54
	Xylenols (Filtered)	µg/L	0.5			<1	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<5	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5
SVOC	Naphthalene	µg/L	1	6[#15]	2[#8]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Acenaphthylene	µg/L	1	18[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Acenaphthene	µg/L	1	18[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Fluorene	µg/L	1	12[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Phenanthrene	µg/L	1	4[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Anthracene	µg/L	1	90[#15]	0.1[#8]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Fluoranthene	µg/L	1	4[#3]	0.0063[#8]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Pyrene	µg/L	1	9[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Benz(a)anthracene	µg/L	1	3.5[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Chrysene	µg/L	1	7[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Benzo(a) pyrene	µg/L	1	0.01[#1]	0.00017[#8]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Indeno(1,2,3-c,d)pyrene	µg/L	1	0.1[#1]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Dibenz(a,h)anthracene	µg/L	1	0.07[#15]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Benzo(g,h,i)perylene	µg/L	1	0.1[#1]	0.0082[#6]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Benzo(b)fluoranthene	µg/L	1	0.1[#1]	0.017[#6]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Benzo(k)fluoranthene	µg/L	1	0.1[#1]	0.017[#6]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	1,3-dichlorobenzene	µg/L	1			<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	1,4-dichlorobenzene	µg/L	1	300[#3]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	1,2-dichlorobenzene	µg/L	1	1,000[#3]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	1,2,4-trichlorobenzene	µg/L	1	0.1[#1]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Hexachlorobutadiene	µg/L	1	0.1[#1]	0.6[#6]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2-chlorophenol	µg/L	1	91[#10]	50[#12]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2-methylphenol	µg/L	1	930[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2-nitrophenol	µg/L	1			<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2,4-dichlorophenol	µg/L	1	46[#10]	4.2[#7]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2,4-dimethylphenol	µg/L	1	360[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2,4,5-trichlorophenol	µg/L	1	1,200[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2,4,6-trichlorophenol	µg/L	1	200[#3]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	4-chloro-3-methylphenol	µg/L	1	1,400[#10]	40[#12]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	4-methylphenol	µg/L	1	1,900[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	4-nitrophenol	µg/L	1			<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Pentachlorophenol	µg/L	1	9[#3]	0.4[#8]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Phenol	µg/L	1	5,800[#10]	7.7[#7]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2-chloronaphthalene	µg/L	1	750[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2-methylnaphthalene	µg/L	1	36[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Bis(2-ethylhexyl) phthalate	µg/L	2	8[#3]	1.3[#8]	<40	<8	<80	<20	<16	<8	<40	<8	<80	<80	<40	<100	<16	<2	<2	<40	<8
	Butyl benzyl phthalate	µg/L	1	16[#10]	7.5[#7]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Di-n-butyl phthalate	µg/L	1	900[#10]	8[#12]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Di-n-octyl phthalate	µg/L	5	200[#10]	20[#12]	<100	<20	<200	<50	<40	<20	<100	<20	<200	<200	<100	<250	<40	<5	<5	<100	<20
	Diethylphthalate	µg/L	1	15,000[#10]	200[#12]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Dimethyl phthalate	µg/L	1		800[#12]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2-nitroaniline	µg/L	1	190[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2,4-Dinitrotoluene	µg/L	1	0.24[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	2,6-dinitrotoluene	µg/L	1	0.049[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	3-nitroaniline	µg/L	1			<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	4-bromophenyl phenyl ether	µg/L	1			<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	4-chloroaniline	µg/L	1	0.37[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	4-chlorophenyl phenyl ether	µg/L	1			<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	4-nitroaniline	µg/L	1	3.8[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Azobenzene	µg/L	1	0.12[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Bis(2-chloroethoxy) methane	µg/L	1	59[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Bis(2-chloroethyl)ether	µg/L	1	0.014[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Carbazole	µg/L	1			<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Dibenzofuran	µg/L	1	7.9[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Hexachlorobenzene	µg/L	1	0.1[#1]	0.05[#6]	<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Hexachlorocyclopentadiene	µg/L	1	0.41[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Hexachloroethane	µg/L	1	0.33[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Isophorone	µg/L	1	78[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	N-nitrosodi-n-propylamine	µg/L	1	0.011[#10]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
	Nitrobenzene	µg/L	1	8 to 63[#3]		<20	<4	<40	<10	<8	<4	<20	<4	<40	<40	<20	<50	<8	<1	<1	<20	<4
TOTMETALS	Chromium (III+VI)	µg/L	3	50[#1]		242	68.8	55.2	41.3	24.2	18.7	86.8	28	35.2	97.4	26.9	47.6	21.6	6.16	5.97	222	119
TPHCWG	>C5-C35 Aliphatics & Aromatics	µg/L	10			4500	7180	4470	275	178	50	645	<10	31	1500	314	399	103	<10	<10	268	<10
UNK	Iron	µg/L	24	200[#1]	1,000[#7]	75,800	23,700	18,400	32,000	15,700	8990	71,600	24,200	30,600	85,400	23,700	45,200	16,400	4730	4620	99,500	61,600
	Iron (Filtered)	µg/L	19	200[#1]	1,000[#7]	<19	<19	<19	1650	2090	1870	1140	508	129	23.5	1040	<19	<19	<19	<19	903	304
VOC	1,3,5-Trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1	6[#15]	2[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dichlorodifluoromethane	µg/L	1	200[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MTBE	µg/L	1	1,800[#15]	5,100[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloromethane	µg/L	1	190[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vinyl chloride	µg/L	1	0.5[#1]	77[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromomethane	µg/L	1	7.5[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroethane	µg/L	1	21,000[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Trichlorofluoromethane	µg/L	1	5,200[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloroethene	µg/L	1	140[#3]	9[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dichloromethane	µg/L	3	20[#3]	20[#8]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH04	BH04	BH04	BH05	BH05	BH05	BH06	BH06	BH06	BH07	BH07	BH07	BH08A	BH08A	BH08a	BH09	BH09
Location_Code	BH04	BH04	BH04	BH05	BH05	BH05	BH06	BH06	BH06	BH07	BH07	BH07	BH08A	BH08A	BH08a	BH09	BH09
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	08/11/2019	13/11/2019	20/11/2019	06/11/2019	14/11/2019	18/11/2019	06/11/2019	14/11/2019
Monitoring_Round	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2
Monitoring_Unit	GSG, CWST, SST, SILT	GSG, CWST, SST, SILT	GSG, CWST, SST, SILT	CWST	CWST	CWST	GSG, CWST	GSG, CWST	GSG, CWST	CWST	CWST	CWST	SST, CONG	SST, CONG	SST, CONG	CWST, MST	CWST, MST
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh																
	trans-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloroethane	µg/L	1	2.8 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	cis-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,2-dichloropropane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromochloromethane	µg/L	1	83 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroform	µg/L	1	Use trihalomethanes #1	2.5 #8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,1-trichloroethane	µg/L	1	2,000 #3	100 #12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Carbon tetrachloride	µg/L	1	3 #1	12 #8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichloroethane	µg/L	1	3 #1	10 #8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzene	µg/L	1	1 #1	10 #8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Trichloroethene	µg/L	1	Use PCE + TCE #1	10 #8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichloropropane	µg/L	1	40 #3		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibromomethane	µg/L	1	8.3 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromodichloromethane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	cis-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	1	700 #3	74 #7	8.05	4.81	3.38	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	trans-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,2-trichloroethane	µg/L	1	0.28 #10	400 #12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Tetrachloroethene	µg/L	1	Use PCE + TCE #1	10 #8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3-dichloropropane	µg/L	1	370 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chlorodibromomethane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dibromoethane	µg/L	1	0.4 #3		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chlorobenzene	µg/L	1	300 #3		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,1,2-tetrachloroethane	µg/L	1	0.57 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/L	1	300 #3	20 #12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (m & p)	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (o)	µg/L	1	190 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Styrene	µg/L	1	20 #3	50 #12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromoform	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Isopropylbenzene	µg/L	1	450 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,2,2-tetrachloroethane	µg/L	1	0.076 #10	140 #7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromobenzene	µg/L	1	62 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,3-trichloropropane	µg/L	1	0.00075 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	n-propylbenzene	µg/L	1	660 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorotoluene	µg/L	1	240 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3,5-trimethylbenzene	µg/L	1	60 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	4-chlorotoluene	µg/L	1	250 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	tert-butylbenzene	µg/L	1	690 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,4-trimethylbenzene	µg/L	1	56 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	sec-butylbenzene	µg/L	1	2,000 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	p-isopropyltoluene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3-dichlorobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,4-dichlorobenzene	µg/L	1	300 #3		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	n-butylbenzene	µg/L	1	1000 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichlorobenzene	µg/L	1	1000 #3		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dibromo-3-chloropropane	µg/L	1	1 #3		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,4-trichlorobenzene	µg/L	1	0.1 #1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Hexachlorobutadiene	µg/L	1	0.1 #1	0.6 #6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,3-trichlorobenzene	µg/L	1	0.1 #1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Carbon disulfide	µg/L	1	810 #10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.44	<1	<1	<1	<1	<1
	Tert Amyl Methyl Ether	µg/L	1		510 #13	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Envt Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [Nov 2019]
#11 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#12 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#13 PNEC (EU REACH) - Freshwater
#14 California Draft health protective concentration
#15 AECOM DWG (WHO method)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
CW: Controlled Waters

	Exceedance of CW/WE Water. DWS - England/Wales
xxx	Exceedance of CW/WE Water. Aquatic Toxicity - England/Wales - Freshwater

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH09	BH10	BH10	BH10	BH11	BH11	BH12	BH12	BH16	BH16	BH16	BH18	BH18	BH18	BH20	BH20	BH20
Location_Code	BH09	BH10	BH10	BH10	BH11	BH11	BH12	BH12	BH16	BH16	BH16	BH18	BH18	BH18	BH20	BH20	BH20
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	18/11/2019	06/11/2019	14/11/2019	18/11/2019	06/11/2019	25/11/2019	06/11/2019	25/11/2019	07/11/2019	12/11/2019	19/11/2019	07/11/2019	12/11/2019	19/11/2019	07/11/2019	12/11/2019	19/11/2019
Monitoring_Round	3	1	2	3	1	2	1	2	1	2	3	1	2	3	1	2	3
Monitoring_Unit	CWST, MST	CWST, SST	CWST, SST	CWST, SST	CWST, SILT	CWST, SILT	GSG, GT	GSG, GT	GSG	GSG	GSG	GSG, GT, MST	GSG, GT, MST	GSG, GT, MST	GSG	GSG	GSG
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh															
CARBON	Dissolved Organic Carbon (Filtered)	mg/L	3			4.62	<3	<3	<3	3.21	<3	220	105	32	45	33.3	41.4	15.6	7.51	9.35	9.69	56.5
EPHCWG	>C12-C16 Aliphatics	µg/L	10	300[#2]		<10	31	<10	<10	21	<10	112	27	4890	5110	502	18	<100	<10	<10	<20	<10
	>C16-C21 Aliphatics	µg/L	10	300[#2]		13	41	<10	<10	10	<10	135	29	59	<100	<50	78	166	11	28	<20	16
	>C16-C35 Aliphatics	µg/L	10			143	119	<10	<10	65	18	370	105	609	354	<50	1450	3540	25	59	<20	40
	>C21-C35 Aliphatics	µg/L	10	300[#2]		130	78	<10	<10	55	18	235	76	550	354	<50	1370	3370	14	31	<20	24
	>C12-C35 Aliphatics	µg/L	10			143	150	<10	<10	86	18	482	132	5500	5460	502	1460	3540	25	59	<20	40
	>EC12-EC16 Aromatics	µg/L	10	90[#2]		<10	<10	<10	<10	<10	<10	31	<10	16	<100	<50	<10	<100	<10	<10	<20	<10
	>EC16-EC21 Aromatics	µg/L	10	90[#2]		<10	<10	<10	<10	<10	<10	29	<10	46	<100	<50	<10	<100	<10	<10	<20	<10
	>EC21-EC35 Aromatics	µg/L	10	90[#2]		<10	<10	<10	<10	<10	<10	91	38	738	274	<50	169	<100	<10	<10	<20	<10
	>EC12-EC35 Aromatics	µg/L	10			<10	<10	<10	<10	<10	<10	151	38	800	274	<50	169	<100	<10	<10	<20	<10
GRO	GRO >C5-C12	µg/L	50			<50	<50	<50	<50	<50	<50	963	232	<50	99	70	137	62	<50	<50	<50	80
	>C5-C6 Aliphatics	µg/L	10	15,000[#2]		<10	<10	<10	<10	<10	<10	40	<10	<10	<10	<10	25	<10	<10	<10	<10	<10
	>C6-C8 Aliphatics	µg/L	10	15,000[#2]		<10	<10	<10	<10	<10	<10	232	49	<10	32	14	18	<10	<10	<10	<10	14
	>C8-C10 Aliphatics	µg/L	10	300[#2]		<10	<10	<10	<10	<10	<10	305	61	<10	19	17	33	15	<10	<10	<10	21
	>C10-C12 Aliphatics	µg/L	10	300[#2]		<10	<10	<10	<10	<10	<10	108	33	<10	11	10	14	10	<10	<10	<10	10
	>EC5-EC7 Aromatics	µg/L	10	1[#1]	10[#8]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC7-EC8 Aromatics	µg/L	10	700[#2]	74[#7]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC8-EC10 Aromatics	µg/L	10	300[#2]		<10	<10	<10	<10	<10	<10	204	58	13	23	19	33	12	<10	<10	<10	27
	>EC10-EC12 Aromatics	µg/L	10	90[#2]		<10	<10	<10	<10	<10	<10	72	22	<10	<10	<10	<10	<10	<10	<10	<10	<10
	MTBE	µg/L	3	1,800[#15]	5,100[#13]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Benzene	µg/L	7	1[#1]	10[#8]	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Toluene	µg/L	4	700[#3]	74[#7]	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	6	5	<4	<4	<4	<4
	Ethylbenzene	µg/L	5	300[#3]	20[#12]	<5	<5	<5	<5	<5	<5	<5	9	<5	<5	<5	<5	<5	<5	<5	<5	12
	Xylene (m & p)	µg/L	8			<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	Xylene Total	µg/L	11	500[#3]	30[#12]	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	11	<11	<11	<11	<11	<11
	Xylene (o)	µg/L	3	190[#10]		<3	<3	<3	<3	<3	<3	<3	8	4	8	6	11	<3	<3	<3	<3	<3
	Total BTEX	µg/L	28			<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
INORGANICS	Cyanide (Free) (Filtered)	mg/L	0.003	0.05[#1]	0.001[#12]	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
	Cyanide Total (Filtered)	mg/L	0.005	0.05[#1]	0.001[#7]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Ammoniacal Nitrogen as N (Filtered)	mg/L	0.01		300[#7]	0.114	0.0305	0.021	0.039	0.0429	0.0314	0.0734	0.116	0.105	0.0544	0.134	0.113	0.129	0.094	0.0654	0.0725	0.0624
METALS	Chromium (hexavalent) (Filtered)	µg/L	3	50[#1]	3.4[#7]	<3	<3	<3	6.48	<3	<3	20.2	<3	<3	<3	<3	<3	<3	<3	<3	<3	9.1
METALS_CVAF_DIS	Mercury (Filtered)	µg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
METALS_ICP	Arsenic (Filtered)	µg/L	0.5	10[#1]	50[#7]	1.24	<0.5	<0.5	<0.5	1.24	0.927	8.92	7.03	13.9	10.4	10.9	13.9	13.3	7.81	0.83	0.653	0.877
	Boron (Filtered)	µg/L	10	1,000[#1]	2,000[#12]	83.5	43.6	43.9	40.1	16.4	11.7	68.5	65.7	182	183	175	57.7	52.3	49.5	62.5	59.8	55
	Cadmium (Filtered)	µg/L	0.08	5[#1]	0.08[#8]	0.259	4.21	4.61	5.09	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.817	0.496	0.603
	Copper (Filtered)	µg/L	0.3	2,000[#1]	1[#7]	<0.3	0.659	0.864	0.762	<0.3	<0.3	12.4	0.779	0.482	<0.3	<0.3	0.314	<0.3	1.83	4.68	3.8	4.23
	Lead (Filtered)	µg/L	0.2	10[#1]	1.2[#8]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.284	0.228	<0.2	<0.2	<0.2	<0.2	0.555	<0.2	0.333	<0.2
	Nickel (Filtered)	µg/L	0.4	20[#1]	4[#8]	7.59	22.2	23.2	26.7	<0.4	0.404	14.6	4.05	4.2	3.31	3.03	6.32	2.82	4.21	6.38	4.2	4.11
	Selenium (Filtered)	µg/L	1	10[#1]		<1	<1	<1	<1	<1	<1	2.57	<1	<1	<1	<1	1.09	<1	<1	<1	<1	1.81
	Zinc (Filtered)	µg/L	1	6,000[#10]	10.9[#7]	6.05	7.39	11.7	9.31	<1	<1	<1	6.24	2.34	1.9	1.05	<1	<1	10.6	15.3	40.1	32.4
PAH	Naphthalene	µg/L	0.01	6[#15]	2[#8]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0422	0.0295	0.0642	0.122	<0.05	0.0293	0.139	<0.01	0.0186	0.0346	<0.01
	Acenaphthylene	µg/L	0.005	18[#15]		<0.005	0.00614	<0.005	<0.005	<0.005	<0.005	0.0132	<0.005	0.228	0.176	<0.025	0.00548	<0.05	<0.005	<0.005	<0.01	<0.005
	Acenaphthene	µg/L	0.005	18[#15]		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.164	0.0827	0.018	<0.05	<0.005	<0.005	<0.01	<0.005
	Fluorene	µg/L	0.005	12[#15]		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0114	<0.005	<0.005	<0.05	<0.025	0.0186	<0.05	<0.005	0.00597	<0.01	<0.005
	Phenanthrene	µg/L	0.005	4[#15]		0.00893	0.0097	<0.005	<0.005	<0.005	<0.005	0.0498	0.0203	0.0719	0.099	0.0306	0.0491	0.0917	0.0204	0.0162	0.011	<0.005
	Anthracene	µg/L	0.005	90[#15]	0.1[#8]	<0.005	0.00526	<0.005	<0.005	<0.005	<0.005	0.0125	0.006	0.0115	<0.05	<0.025	<0.005	<0.05	<0.005	<0.005	<0.01	<0.005
	Fluoranthene	µg/L	0.005	4[#3]	0.0063[#8]	0.0135	0.0402	0.00646	<0.005	0.0115	0.00915	0.151	0.0574	0.0651	0.178	0.0416	0.0528	0.0976	0.0167	0.0185	<0.01	<0.005
	Pyrene	µg/L	0.005	9[#15]		0.0159	0.0561	0.0091	0.00545	0.0145	0.00992	0.166	0.104	0.0766	0.087	0.0392	0.0481	0.0734	0.0204	0.0197	<0.01	0.00677
	Benz(a)anthracene	µg/L	0.005	3.5[#15]		<0.005	0.0203	<0.005	<0.005	<0.005	<0.005	<0.005	0.0229	<0.005	<0.05	<0.025	<0.005	<0.05	<0.005	<0.005	<0.01	<0.005
	Chrysene	µg/L	0.005	7[#15]		<0.005	0.0304	<0.005	<0.005	0.00835	<0.005	0.0298	0.0325	<0.005	<0.05	<0.025	<0.005	<0.05	<0.005	<0.005	<0.01	<0.005
	Benzo(a) pyrene	µg/L	0.002	0.01[#1]	0.00017[#8]	0.00846	0.041	0.00555	<0.002	0.00971	<0.002	0.165	0.06	0.109	<0.02	0.0453	<0.002	<0.02	0.0138	<0.002	<0.004	<0.002
	Indeno(1,2,3-c,d)pyrene	µg/L	0.005	0.1[#1]		0.013	0.0271	<0.005	<0.005	<0.005	<0.005	0.0917	0.052	<0.005	<0.05	<0.025	<0.005	<0.05	<0.005	<0.005	<0.01	<0.005
	Dibenz(a,h)anthracene	µg/L	0.005	0.07[#15]		0.00731	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0131	<0.005	<0.05	<0.025	<0.005	<0.05	<0.005	<0.005	<0.01	<0.005
	Benzo(g,h,i)perylene	µg/L	0.005	0.1[#1]	0.0082[#6]	0.0196	0.0391	<0.005	<0.005	0.0104	<0.005	0.139	0.0534	<0.005	<0.05	<0.025	<0.005	<0.05	<0.005	<0.005	<0.01	<0.005
	Benzo(b)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	0.0144	0.0618	0.00793	<0.005	0.0127	<0.005	0.273	0.0951	0.15	<0.05	0.0584	<0.005	<0.05	0.0135	<0.005	<0.01	<0.005
	Benzo(k)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	0.00773	0.0223	<0.005	<0.005	0.00745	<0.005	0.1	0.0383	0.0862	<0.05	0.0322	<0.005	<0.05	0.00556	<0.005	<0.01	<0.005
	PAH 16 Total	µg/L	0.082			0.109	0.36	<0.082	<0.082	<0.082	<0.082	1.25	0.585	0.862	0.827	<0.41	0.221	<0.82	0.0903	<0.082	<0.164	<0.082
PH_METER	pH (Lab)	pH_Units	1			7.08	6.9	6.7	6.97	7.45	8.13	11	7.79	7.7	7.61	7.44	7.59	7.83	7.8	7	6.85	6.86
PHENOL	2,3,5,6-Tetrachlorophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	µg/L	0.5	91[#10]	50[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	µg/L	0.5	930[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dichlorophenol	µg/L	0.5	46[#10]	4.2[#7]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	µg/L	0.5	360[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,5-trichlorophenol	µg/L	0.5	1,200[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,6-trichlorophenol	µg/L	0.5	200[#3]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-chloro-3-methylphenol	µg/L	0.5	1,400[#10]	40[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-methylphenol	µg/L	0.5	1,900[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	17.3	15.2	<2	2.39	13.4	<1	<0.5	<0.5	<0.5	<0.5	<0.5
	4-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pentachlorophenol	µg/L	2	9[#3]	0.4[#8]	<4	<2	<2	<2	<2	<4	<4	<4	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	0.5	5,800[#10]	7.7[#7]	<1	<3	<0.5	<1	<2.5	<1	<9	<5	<4.5	<0.5	<2.5	<5.5	<0.5	<1	<3.5	<0.5	<1.5
	Phenol (Filtered)	µg/L	0.5	5,800[#10]	7.7[#7]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	14.6	3.76	1.33	2.18	<0.5	8.41	5.1	<0.5	<0.5	<0.5	<0.5
	2,4-dinitrophenol	µg/L	2.5	39[#10]		<7.5	<7.5	<2.5	<7.5	<7.5	<12.5	<7.5	<12.5	<5	<2.5	<5	<5	<2.5	<5	<5	<2.5	<5
	3-Methylphenol	µg/L	0.5	930[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4,6-Dinitro-2-methylphenol	µg/L	3	1.5[#10]		<9	<9	<3	<9	<9	<3	<9	<3	<9	<3	<6	<9	<3	<6	<9	<3	<6
	4-chlorophenol	µg/L	0.5			<0.5	<1	<0.5	<0.5	<1	<0.5	<1	<0.5	<1.5	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5
	Dinoseb	µg/L	4	15[#10]		<12	<8	<4	<12	<8	<12	<8	<12	<8	<4	<8	<8	<4	<8	<8	<4	<8
PHENOLS_HPLC	Phenol (Filtered)	µg/L	2	5,800[#10]	7.7[#7]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH09	BH10	BH10	BH10	BH11	BH11	BH12	BH12	BH16	BH16	BH16	BH18	BH18	BH18	BH20	BH20	BH20
Location_Code	BH09	BH10	BH10	BH10	BH11	BH11	BH12	BH12	BH16	BH16	BH16	BH18	BH18	BH18	BH20	BH20	BH20
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	18/11/2019	06/11/2019	14/11/2019	18/11/2019	06/11/2019	25/11/2019	06/11/2019	25/11/2019	07/11/2019	12/11/2019	19/11/2019	07/11/2019	12/11/2019	19/11/2019	07/11/2019	12/11/2019	19/11/2019
Monitoring_Round	3	1	2	3	1	2	1	2	1	2	3	1	2	3	1	2	3
Monitoring_Unit	CWST, MST	CWST, SST	CWST, SST	CWST, SST	CWST, SILT	CWST, SILT	GSG, GT	GSG, GT	GSG	GSG	GSG	GSG, GT, MST	GSG, GT, MST	GSG, GT, MST	GSG	GSG	GSG
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh																
	Cresol Total (Filtered)	µg/L	6	1,500[#10]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cresols by HPLC (W) (Filtered)	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	1.1	<0.5	22.8	21.7	4.5	2.66	9.86	10.8	9.85	<0.5	<0.5	<0.5	0.76
	Total Monohydric Phenols (S) Corrected (Filtered)	µg/L	16			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenols (Mono) (Filtered)	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	1.1	<0.5	37.4	25.5	5.83	4.84	9.86	19.2	15	<0.5	<0.5	<0.5	0.76
	Xylenols (Filtered)	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SVOC	Naphthalene	µg/L	1	6[#15]	2[#8]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Acenaphthylene	µg/L	1	18[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Acenaphthene	µg/L	1	18[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Fluorene	µg/L	1	12[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Phenanthrene	µg/L	1	4[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Anthracene	µg/L	1	90[#15]	0.1[#8]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Fluoranthene	µg/L	1	4[#3]	0.0063[#8]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Pyrene	µg/L	1	9[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Benz(a)anthracene	µg/L	1	3.5[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Chrysene	µg/L	1	7[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Benzo(a) pyrene	µg/L	1	0.01[#1]	0.00017[#8]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Indeno(1,2,3-c,d)pyrene	µg/L	1	0.1[#1]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Dibenz(a,h)anthracene	µg/L	1	0.07[#15]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Benzo(g,h,i)perylene	µg/L	1	0.1[#1]	0.0082[#6]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Benzo(b)fluoranthene	µg/L	1	0.1[#1]	0.017[#6]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Benzo(k)fluoranthene	µg/L	1	0.1[#1]	0.017[#6]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	1,3-dichlorobenzene	µg/L	1			<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	1,4-dichlorobenzene	µg/L	1	300[#3]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	1,2-dichlorobenzene	µg/L	1	1,000[#3]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	1,2,4-trichlorobenzene	µg/L	1	0.1[#1]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Hexachlorobutadiene	µg/L	1	0.1[#1]	0.6[#6]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2-chlorophenol	µg/L	1	91[#10]	50[#12]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2-methylphenol	µg/L	1	930[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2-nitrophenol	µg/L	1			<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2,4-dichlorophenol	µg/L	1	46[#10]	4.2[#7]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2,4-dimethylphenol	µg/L	1	360[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2,4,5-trichlorophenol	µg/L	1	1,200[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2,4,6-trichlorophenol	µg/L	1	200[#3]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	4-chloro-3-methylphenol	µg/L	1	1,400[#10]	40[#12]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	4-methylphenol	µg/L	1	1,900[#10]		<4	<4	<2	<1	<4	<4	19.7	9.09	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	4-nitrophenol	µg/L	1			<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Pentachlorophenol	µg/L	1	9[#3]	0.4[#8]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Phenol	µg/L	1	5,800[#10]	7.7[#7]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2-chloronaphthalene	µg/L	1	750[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2-methylnaphthalene	µg/L	1	36[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Bis(2-ethylhexyl) phthalate	µg/L	2	8[#3]	1.3[#8]	<8	<8	<4	<2	<8	<8	<20	<16	<80	<40	<200	<80	<40	<2000	<20	<8	<40
	Butyl benzyl phthalate	µg/L	1	16[#10]	7.5[#7]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Di-n-butyl phthalate	µg/L	1	900[#10]	8[#12]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Di-n-octyl phthalate	µg/L	5	200[#10]	20[#12]	<20	<20	<10	<5	<20	<20	<50	<40	<200	<100	<500	<200	<100	<5000	<50	<20	<100
	Diethylphthalate	µg/L	1	15,000[#10]	200[#12]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Dimethyl phthalate	µg/L	1		800[#12]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2-nitroaniline	µg/L	1	190[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2,4-Dinitrotoluene	µg/L	1	0.24[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	2,6-dinitrotoluene	µg/L	1	0.049[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	3-nitroaniline	µg/L	1			<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	4-bromophenyl phenyl ether	µg/L	1			<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	4-chloroaniline	µg/L	1	0.37[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	4-chlorophenyl phenyl ether	µg/L	1			<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	4-nitroaniline	µg/L	1	3.8[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Azobenzene	µg/L	1	0.12[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Bis(2-chloroethoxy) methane	µg/L	1	59[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Bis(2-chloroethyl)ether	µg/L	1	0.014[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Carbazole	µg/L	1			<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Dibenzofuran	µg/L	1	7.9[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Hexachlorobenzene	µg/L	1	0.1[#1]	0.05[#6]	<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Hexachlorocyclopentadiene	µg/L	1	0.41[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Hexachloroethane	µg/L	1	0.33[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Isophorone	µg/L	1	78[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	N-nitrosodi-n-propylamine	µg/L	1	0.011[#10]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
	Nitrobenzene	µg/L	1	8 to 63[#3]		<4	<4	<2	<1	<4	<4	<10	<8	<40	<20	<100	<40	<20	<1000	<10	<4	<20
TOTMETALS	Chromium (III+VI)	µg/L	3	50[#1]		90.3	10.8	<3	<3	12.2	11.1	64.3	73.3	44.8	178	103	<300	185	128	38.3	23.8	26.3
TPHCWG	>C5-C35 Aliphatics & Aromatics	µg/L	10			143	150	<10	<10	86	18	1600	401	6340	5840	571	1770	3600	25	59	<10	121
UNK	Iron	µg/L	24	200[#1]	1,000[#7]	44,600	3700	1800	1640	9810	9200	102,000	61,500	25,600	113,000	75,800	138,000	160,000	107,000	33,000	14,900	16,800
	Iron (Filtered)	µg/L	19	200[#1]	1,000[#7]	96	<19	<19	<19	<19	<19	84.4	134	182	1460	2460	<19	137	93.7	37.1	28	24
VOC	1,3,5-Trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1	6[#15]	2[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dichlorodifluoromethane	µg/L	1	200[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MTBE	µg/L	1	1,800[#15]	5,100[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloromethane	µg/L	1	190[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vinyl chloride	µg/L	1	0.5[#1]	77[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromomethane	µg/L	1	7.5[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroethane	µg/L	1	21,000[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Trichlorofluoromethane	µg/L	1	5,200[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloroethene	µg/L	1	140[#3]	9[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dichloromethane	µg/L	3	20[#3]	20[#8]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH09	BH10	BH10	BH10	BH11	BH11	BH12	BH12	BH16	BH16	BH16	BH18	BH18	BH18	BH20	BH20	BH20
Location_Code	BH09	BH10	BH10	BH10	BH11	BH11	BH12	BH12	BH16	BH16	BH16	BH18	BH18	BH18	BH20	BH20	BH20
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	18/11/2019	06/11/2019	14/11/2019	18/11/2019	06/11/2019	25/11/2019	06/11/2019	25/11/2019	07/11/2019	12/11/2019	19/11/2019	07/11/2019	12/11/2019	19/11/2019	07/11/2019	12/11/2019	19/11/2019
Monitoring_Round	3	1	2	3	1	2	1	2	1	2	3	1	2	3	1	2	3
Monitoring_Unit	CWST, MST	CWST, SST	CWST, SST	CWST, SST	CWST, SILT	CWST, SILT	GSG, GT	GSG, GT	GSG	GSG	GSG	GSG, GT, MST	GSG, GT, MST	GSG, GT, MST	GSG	GSG	GSG
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh																
	trans-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloroethane	µg/L	1	2.8[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	cis-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,2-dichloropropane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromochloromethane	µg/L	1	83[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroform	µg/L	1	Use trihalomethanes[#1]	2.5[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,1-trichloroethane	µg/L	1	2,000[#3]	100[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Carbon tetrachloride	µg/L	1	3[#1]	12[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichloroethane	µg/L	1	3[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzene	µg/L	1	1[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Trichloroethene	µg/L	1	Use PCE + TCE[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichloropropane	µg/L	1	40[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibromomethane	µg/L	1	8.3[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromodichloromethane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	cis-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	1	700[#3]	74[#7]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	6.13	3.49	<1	<1	<1
	trans-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,2-trichloroethane	µg/L	1	0.28[#10]	400[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Tetrachloroethene	µg/L	1	Use PCE + TCE[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3-dichloropropane	µg/L	1	370[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chlorodibromomethane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dibromoethane	µg/L	1	0.4[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chlorobenzene	µg/L	1	300[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,1,2-tetrachloroethane	µg/L	1	0.57[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/L	1	300[#3]	20[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (m & p)	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	1.12	<1	<1	<1	<1	<1	<1
	Xylene (o)	µg/L	1	190[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Styrene	µg/L	1	20[#3]	50[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromoform	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Isopropylbenzene	µg/L	1	450[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,2,2-tetrachloroethane	µg/L	1	0.076[#10]	140[#7]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromobenzene	µg/L	1	62[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,3-trichloropropane	µg/L	1	0.00075[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	n-propylbenzene	µg/L	1	660[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorotoluene	µg/L	1	240[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3,5-trimethylbenzene	µg/L	1	60[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	4-chlorotoluene	µg/L	1	250[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	tert-butylbenzene	µg/L	1	690[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,4-trimethylbenzene	µg/L	1	56[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	sec-butylbenzene	µg/L	1	2,000[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	p-isopropyltoluene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3-dichlorobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,4-dichlorobenzene	µg/L	1	300[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	n-butylbenzene	µg/L	1	1000[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichlorobenzene	µg/L	1	1000[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dibromo-3-chloropropane	µg/L	1	1[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,4-trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Hexachlorobutadiene	µg/L	1	0.1[#1]	0.6[#6]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,3-trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Carbon disulfide	µg/L	1	810[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Tert Amyl Methyl Ether	µg/L	1		510[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [Nov 2019]
#11 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#12 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#13 PNEC (EU REACH) - Freshwater
#14 California Draft health protective concentration
#15 AECOM DWG (WHO method)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
CW: Controlled Waters

	Exceedance of CW/WE Water. DWS - England/Wales
xxx	Exceedance of CW/WE Water. Aquatic Toxicity - England/Wales - Freshwater

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH21A	BH21	BH21	BH22A	BH22	BH22A	BH24	BH24	BH24	BH25	BH2S	BH25	BH27	BH27	BH27
Location_Code	BH21	BH21	BH21	BH22A	BH22A	BH22A	BH24	BH24	BH24	BH25	BH25	BH25	BH27	BH27	BH27
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	12/11/2019	19/11/2019	25/11/2019	05/11/2019	12/11/2019	19/11/2019	07/11/2019	13/11/2019	20/11/2019	08/11/2019	12/11/2019	19/11/2019	12/11/2019	19/11/2019	25/11/2019
Monitoring_Round	2	3	4	1	2	3	1	2	3	1	2	3	2	3	4
Monitoring_Unit	ALL, GSG	ALL, GSG	ALL, GSG	ALL, GSG, SILT, SST,	ALL, GSG, SILT, SST,	ALL, GSG, SILT, SST, CWST	GT, GSG, CWST	GT, GSG, CWST	GT, GSG, CWST	GSG	GSG	GSG	GSG, CWST	GSG, CWST	GSG, CWST
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh													
CARBON	Dissolved Organic Carbon (Filtered)	mg/L	3			166	399	325	32.1	19.2	16.2	13.6	15.9	72.7	93.6	25.5	12.1	36.1	6.22	5.28
EPHCWG	>C12-C16 Aliphatics	µg/L	10	300[#2]		2050	1400	1280	<10	<10	<10	<10	<100	<10	<10	51	47	<100	<10	<10
	>C16-C21 Aliphatics	µg/L	10	300[#2]		66	40	68	<10	<10	<10	<10	<100	16	18	61	65	420	64	<10
	>C16-C35 Aliphatics	µg/L	10			279	148	151	<10	<10	<10	26	<100	106	363	735	881	1630	360	11
	>C21-C35 Aliphatics	µg/L	10	300[#2]		213	108	83	<10	<10	<10	26	<100	90	345	674	816	1210	296	11
	>C12-C35 Aliphatics	µg/L	10			2330	1550	1430	<10	<10	<10	26	<100	106	363	786	928	1630	360	11
	>EC12-EC16 Aromatics	µg/L	10	90[#2]		<10	11	<10	<10	<10	<10	<10	<100	<10	<10	<10	<10	<100	<10	<10
	>EC16-EC21 Aromatics	µg/L	10	90[#2]		<10	<10	<10	<10	<10	<10	<10	<100	17	<10	<10	<10	269	19	<10
	>EC21-EC35 Aromatics	µg/L	10	90[#2]		<10	<10	<10	<10	<10	<10	<10	<100	131	24	36	107	1210	123	<10
	>EC12-EC35 Aromatics	µg/L	10			<10	11	<10	<10	<10	<10	<10	<100	148	24	36	107	1480	142	<10
GRO	GRO >C5-C12	µg/L	50			325	839	467	132	133	131	<50	<50	<50	115	63	<50	<50	<50	<50
	>C5-C6 Aliphatics	µg/L	10	15,000[#2]		14	37	18	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>C6-C8 Aliphatics	µg/L	10	15,000[#2]		83	247	128	16	17	16	<10	<10	<10	29	13	<10	12	<10	<10
	>C8-C10 Aliphatics	µg/L	10	300[#2]		74	232	110	44	45	44	<10	<10	<10	30	14	<10	11	<10	<10
	>C10-C12 Aliphatics	µg/L	10	300[#2]		29	55	34	18	18	18	<10	<10	<10	17	12	<10	<10	<10	<10
	>EC5-EC7 Aromatics	µg/L	10	1[#1]	10[#8]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC7-EC8 Aromatics	µg/L	10	700[#2]	74[#7]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	>EC8-EC10 Aromatics	µg/L	10	300[#2]		101	229	152	35	35	34	<10	<10	<10	20	12	<10	<10	<10	<10
	>EC10-EC12 Aromatics	µg/L	10	90[#2]		19	37	23	12	12	12	<10	<10	<10	11	<10	<10	<10	<10	<10
	MTBE	µg/L	3	1,800[#15]	5,100[#13]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Benzene	µg/L	7	1[#1]	10[#8]	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Toluene	µg/L	4	700[#3]	74[#7]	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Ethylbenzene	µg/L	5	300[#3]	20[#12]	6	40	19	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Xylene (m & p)	µg/L	8			<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	Xylene Total	µg/L	11	500[#3]	30[#12]	46	34	60	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
	Xylene (o)	µg/L	3	190[#10]		46	34	60	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Total BTEX	µg/L	28			56	74	79	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
INORGANICS	Cyanide (Free) (Filtered)	mg/L	0.003	0.05[#1]	0.001[#12]	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
	Cyanide Total (Filtered)	mg/L	0.005	0.05[#1]	0.001[#7]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Ammoniacal Nitrogen as N (Filtered)	mg/L	0.01		300[#7]	0.385	0.763	0.353	0.0244	0.022	0.014	0.0905	0.054	0.0534	0.539	0.522	0.595	0.126	0.143	0.188
METALS	Chromium (hexavalent) (Filtered)	µg/L	3	50[#1]	3.4[#7]	<3	<3	<3	18.5	5.3	11.7	<3	<3	<3	<3	<3	<3	11.9	<3	<3
METALS_CVAF_DIS	Mercury (Filtered)	µg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
METALS_ICP	Arsenic (Filtered)	µg/L	0.5	10[#1]	50[#7]	14.7	7.91	6.36	0.598	0.715	<3	0.973	1.08	1.07	3.59	3.68	3.36	15.5	8.1	5.41
	Boron (Filtered)	µg/L	10	1,000[#1]	2,000[#12]	39.6	47.3	35.3	15.5	<10	<60	167	158	174	29	22.8	25.2	58.4	77.7	75.4
	Cadmium (Filtered)	µg/L	0.08	5[#1]	0.08[#8]	<0.08	<0.08	<0.08	<0.08	<0.08	<0.48	0.116	0.0908	0.0969	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
	Copper (Filtered)	µg/L	0.3	2,000[#1]	1[#7]	0.431	6.41	4	0.822	1.14	<1.8	5.54	5.67	6.32	<0.3	0.433	0.305	0.77	<0.3	<0.3
	Lead (Filtered)	µg/L	0.2	10[#1]	1.2[#8]	<0.2	<0.2	<0.2	<0.2	<0.2	<1.2	<0.2	0.322	<0.2	<0.2	<0.2	<0.2	0.22	<0.2	<0.2
	Nickel (Filtered)	µg/L	0.4	20[#1]	4[#8]	2.37	8.77	8.11	1.47	0.813	<2.4	2	2.25	2.2	1.95	2.5	2.14	1.42	1.67	1.71
	Selenium (Filtered)	µg/L	1	10[#1]		1.02	4.63	4.22	<1	<1	<6	1.41	1.05	1.7	1.31	<1	<1	1.06	<1	<1
	Zinc (Filtered)	µg/L	1	6,000[#10]	10.9[#7]	1.36	1.16	1.42	<1	2.5	<6	9.2	26.2	8.26	1.76	3.75	3.9	1.7	2.89	<1
PAH	Naphthalene	µg/L	0.01	6[#15]	2[#8]	0.0412	0.0383	<0.03	0.0346	0.0454	0.03	0.0213	<0.1	0.0138	0.0453	0.0217	0.0173	0.143	0.0209	<0.01
	Acenaphthylene	µg/L	0.005	18[#15]		0.0605	0.0466	0.0474	<0.005	<0.005	<0.005	0.0186	0.076	0.0493	0.00899	0.0109	0.0135	<0.05	0.0076	<0.005
	Acenaphthene	µg/L	0.005	18[#15]		0.123	<0.005	<0.005	<0.005	<0.005	<0.005	0.0129	0.0532	0.0251	0.0173	0.017	<0.005	<0.05	0.013	<0.005
	Fluorene	µg/L	0.005	12[#15]		<0.005	<0.005	<0.005	<0.005	0.00653	0.00584	0.0186	<0.05	0.0238	0.0122	0.00684	0.00877	0.0579	0.0171	<0.005
	Phenanthrene	µg/L	0.005	4[#15]		0.019	0.0189	0.0116	<0.005	0.00795	<0.005	0.148	0.412	0.279	0.0462	0.0416	0.0515	0.3	0.101	0.0155
	Anthracene	µg/L	0.005	90[#15]	0.1[#8]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0478	0.153	0.109	0.00994	0.00535	0.00717	0.0682	0.0243	<0.005
	Fluoranthene	µg/L	0.005	4[#3]	0.0063[#8]	0.0182	0.0118	0.00873	<0.005	<0.005	<0.005	0.866	1.94	1.5	0.0429	0.0603	0.0843	0.608	0.176	0.0229
	Pyrene	µg/L	0.005	9[#15]		0.0214	0.0135	0.00956	<0.005	<0.005	<0.005	0.882	2.07	1.59	0.0404	0.0621	0.0855	0.625	0.165	0.0228
	Benz(a)anthracene	µg/L	0.005	3.5[#15]		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.497	1.11	0.687	<0.005	0.017	0.0168	0.306	0.0509	<0.005
	Chrysene	µg/L	0.005	7[#15]		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.57	1.3	0.858	<0.005	0.0259	0.0325	0.299	0.0952	<0.005
	Benzo(a) pyrene	µg/L	0.002	0.01[#1]	0.00017[#8]	0.0204	0.00652	<0.002	<0.002	<0.002	<0.002	1.07	1.91	1.51	<0.002	0.0388	0.0425	0.537	0.165	0.0128
	Indeno(1,2,3-c,d)pyrene	µg/L	0.005	0.1[#1]		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.08	1.9	1.49	<0.005	<0.005	<0.005	0.342	0.116	<0.005
	Dibenz(a,h)anthracene	µg/L	0.005	0.07[#15]		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.16	0.357	0.3	<0.005	<0.005	<0.005	0.0845	<0.005	<0.005
	Benzo(g,h,i)perylene	µg/L	0.005	0.1[#1]	0.0082[#6]	0.00845	<0.005	<0.005	<0.005	<0.005	<0.005	1.25	2.46	1.79	<0.005	0.0236	0.0273	0.499	0.159	<0.005
	Benzo(b)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	0.0365	<0.005	<0.005	<0.005	<0.005	<0.005	1.98	3.19	2.48	<0.005	0.0651	0.069	0.893	0.267	0.0197
	Benzo(k)fluoranthene	µg/L	0.005	0.1[#1]	0.017[#6]	0.0173	<0.005	<0.005	<0.005	<0.005	<0.005	0.956	1.22	1.05	<0.005	0.0216	0.033	0.406	0.111	0.00879
	PAH 16 Total	µg/L	0.082			0.366	0.136	<0.082	<0.082	<0.082	<0.082	9.58	18.2	13.8	0.223	0.418	0.489	5.17	1.49	0.103
PH_METER	pH (Lab)	pH_Units	1			7.53	8.16	7.39	11.1	8.61	7.89	7.03	6.91	7.05	7.38	7.49	7.93	8.78	7.84	7.67
PHENOL	2,3,5,6-Tetrachlorophenol	µg/L	0.5			<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1
	2-chlorophenol	µg/L	0.5	91[#10]	50[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	µg/L	0.5	930[#10]		<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dichlorophenol	µg/L	0.5	46[#10]	4.2[#7]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	µg/L	0.5	360[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,5-trichlorophenol	µg/L	0.5	1,200[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4,6-trichlorophenol	µg/L	0.5	200[#3]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-chloro-3-methylphenol	µg/L	0.5	1,400[#10]	40[#12]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4-methylphenol	µg/L	0.5	1,900[#10]		3.06	13.8	20.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<3.5	<0.5	<0.5	0.53	<0.5	<0.5
	4-nitrophenol	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pentachlorophenol	µg/L	2	9[#3]	0.4[#8]	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<4	<4
	Phenol	µg/L	0.5	5,800[#10]	7.7[#7]	4.1	<3.5	<4.5	<5	<0.5	<1.5	<4.5	<0.5	<1.5	<5.5	<0.5	<1	<0.5	<1	<1
	Phenol (Filtered)	µg/L	0.5	5,800[#10]	7.7[#7]	9.67	10.1	9.24	<0.5	<0.5	<0.5	<0.5	<0.5	0.92	4.94	1.34	0.81	<0.5	<0.5	<0.5
	2,4-dinitrophenol	µg/L	2.5	39[#10]		<2.5	<5	<12.5	<5	<2.5	<5	<5	<2.5	<5	<5	<2.5	<5	<2.5	<5	<12.5
	3-Methylphenol	µg/L	0.5	930[#10]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	4,6-Dinitro-2-methylphenol	µg/L	3	1.5[#10]		<3	<6	<3	<9	<3	<6	<9	<3	<6	<9	<3	<6	<3	<6	<3
	4-chlorophenol	µg/L	0.5			<0.5	<0.5	<0.5	<1.5	<0.5	<0.5	<1.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5
	Dinoseb	µg/L	4	15[#10]		<4	<8	<12	<8	<4	<8	<8	<4	<8	<8	<4	<8	<4	<8	<12
PHENOLS_HPLC	Phenol (Filtered)	µg/L	2	5,800[#10]	7.7[#7]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH21A	BH21	BH21	BH22A	BH22	BH22A	BH24	BH24	BH24	BH25	BH2S	BH25	BH27	BH27	BH27
Location_Code	BH21	BH21	BH21	BH22A	BH22A	BH22A	BH24	BH24	BH24	BH25	BH25	BH25	BH27	BH27	BH27
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	12/11/2019	19/11/2019	25/11/2019	05/11/2019	12/11/2019	19/11/2019	07/11/2019	13/11/2019	20/11/2019	08/11/2019	12/11/2019	19/11/2019	12/11/2019	19/11/2019	25/11/2019
Monitoring_Round	2	3	4	1	2	3	1	2	3	1	2	3	2	3	4
Monitoring_Unit	ALL, GSG	ALL, GSG	ALL, GSG	ALL, GSG, SILT, SST,	ALL, GSG, SILT, SST,	ALL, GSG, SILT, SST, CWST	GT, GSG, CWST	GT, GSG, CWST	GT, GSG, CWST	GSG	GSG	GSG	GSG, CWST	GSG, CWST	GSG, CWST
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh														
	Cresol Total (Filtered)	µg/L	6	1,500[#10]		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cresols by HPLC (W) (Filtered)	µg/L	0.5			77.7	41.1	28.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.01	2.29	1.56	0.75	<0.5	<0.5
	Total Monohydric Phenols (S) Corrected (Filtered)	µg/L	16			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenols (Mono) (Filtered)	µg/L	0.5			87.4	51.2	37.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.92	9.95	3.63	2.37	0.75	<0.5	<0.5
	Xylenols (Filtered)	µg/L	0.5			<5	<2.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5
SVOC	Naphthalene	µg/L	1	6[#15]	2[#8]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Acenaphthylene	µg/L	1	18[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Acenaphthene	µg/L	1	18[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Fluorene	µg/L	1	12[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Phenanthrene	µg/L	1	4[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Anthracene	µg/L	1	90[#15]	0.1[#8]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Fluoranthene	µg/L	1	4[#3]	0.0063[#8]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Pyrene	µg/L	1	9[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Benz(a)anthracene	µg/L	1	3.5[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Chrysene	µg/L	1	7[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Benzo(a) pyrene	µg/L	1	0.01[#1]	0.00017[#8]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Indeno(1,2,3-c,d)pyrene	µg/L	1	0.1[#1]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Dibenz(a,h)anthracene	µg/L	1	0.07[#15]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Benzo(g,h,i)perylene	µg/L	1	0.1[#1]	0.0082[#6]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Benzo(b)fluoranthene	µg/L	1	0.1[#1]	0.017[#6]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Benzo(k)fluoranthene	µg/L	1	0.1[#1]	0.017[#6]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	1,3-dichlorobenzene	µg/L	1			<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	1,4-dichlorobenzene	µg/L	1	300[#3]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	1,2-dichlorobenzene	µg/L	1	1,000[#3]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	1,2,4-trichlorobenzene	µg/L	1	0.1[#1]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Hexachlorobutadiene	µg/L	1	0.1[#1]	0.6[#6]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2-chlorophenol	µg/L	1	91[#10]	50[#12]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2-methylphenol	µg/L	1	930[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2-nitrophenol	µg/L	1			<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2,4-dichlorophenol	µg/L	1	46[#10]	4.2[#7]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2,4-dimethylphenol	µg/L	1	360[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2,4,5-trichlorophenol	µg/L	1	1,200[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2,4,6-trichlorophenol	µg/L	1	200[#3]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	4-chloro-3-methylphenol	µg/L	1	1,400[#10]	40[#12]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	4-methylphenol	µg/L	1	1,900[#10]		<4	<40	19	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	4-nitrophenol	µg/L	1			<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Pentachlorophenol	µg/L	1	9[#3]	0.4[#8]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Phenol	µg/L	1	5,800[#10]	7.7[#7]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2-chloronaphthalene	µg/L	1	750[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2-methylnaphthalene	µg/L	1	36[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Bis(2-ethylhexyl) phthalate	µg/L	2	8[#3]	1.3[#8]	<8	<80	<16	<2	<2	<2	<2	<40	<20	<80	<80	<20	<2000	<20	<80	<16
	Butyl benzyl phthalate	µg/L	1	16[#10]	7.5[#7]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Di-n-butyl phthalate	µg/L	1	900[#10]	8[#12]	5.52	<40	11.6	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Di-n-octyl phthalate	µg/L	5	200[#10]	20[#12]	<20	<200	<40	<5	<5	<5	<5	<100	<50	<200	<200	<50	<5000	<50	<200	<40
	Diethylphthalate	µg/L	1	15,000[#10]	200[#12]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Dimethyl phthalate	µg/L	1		800[#12]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2-nitroaniline	µg/L	1	190[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2,4-Dinitrotoluene	µg/L	1	0.24[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	2,6-dinitrotoluene	µg/L	1	0.049[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	3-nitroaniline	µg/L	1			<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	4-bromophenyl phenyl ether	µg/L	1			<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	4-chloroaniline	µg/L	1	0.37[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	4-chlorophenyl phenyl ether	µg/L	1			<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	4-nitroaniline	µg/L	1	3.8[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Azobenzene	µg/L	1	0.12[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Bis(2-chloroethoxy) methane	µg/L	1	59[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Bis(2-chloroethyl)ether	µg/L	1	0.014[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Carbazole	µg/L	1			<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Dibenzofuran	µg/L	1	7.9[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Hexachlorobenzene	µg/L	1	0.1[#1]	0.05[#6]	<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Hexachlorocyclopentadiene	µg/L	1	0.41[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Hexachloroethane	µg/L	1	0.33[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Isophorone	µg/L	1	78[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	N-nitrosodi-n-propylamine	µg/L	1	0.011[#10]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
	Nitrobenzene	µg/L	1	8 to 63[#3]		<4	<40	<8	<1	<1	<1	<1	<20	<10	<40	<40	<10	<1000	<10	<40	<8
TOTMETALS	Chromium (III+VI)	µg/L	3	50[#1]		34	10	19.8	7.96	<3	<3	<3	193	220	162	134	102	193	170	62.9	97.9
TPHCWG	>C5-C35 Aliphatics & Aromatics	µg/L	10			2660	2400	1890	132	134	130	26	<10	269	502	885	1040	3160	502	11	
UNK	Iron	µg/L	24	200[#1]	1,000[#7]	42,000	15,700	26,100	34.3	45.3	72.1	180,000	213,000	177,000	99,500	78,500	144,000	136,000	64,600	88,900	
	Iron (Filtered)	µg/L	19	200[#1]	1,000[#7]	10,700	77.7	68.6	<19	<19	<114	51	104	24.8	151	125	123	74.1	252	301	
VOC	1,3,5-Trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1	6[#15]	2[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dichlorodifluoromethane	µg/L	1	200[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MTBE	µg/L	1	1,800[#15]	5,100[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloromethane	µg/L	1	190[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vinyl chloride	µg/L	1	0.5[#1]	77[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromomethane	µg/L	1	7.5[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroethane	µg/L	1	21,000[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Trichlorofluoromethane	µg/L	1	5,200[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloroethene	µg/L	1	140[#3]	9[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dichloromethane	µg/L	3	20[#3]	20[#8]	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3

Groundwater in Natural Deposits
Rounds 1, 2, and 3
Analytical Results
M54-M6 Link Road
Highways England

Field_ID	BH21A	BH21	BH21	BH22A	BH22	BH22A	BH24	BH24	BH24	BH25	BH2S	BH25	BH27	BH27	BH27
Location_Code	BH21	BH21	BH21	BH22A	BH22A	BH22A	BH24	BH24	BH24	BH25	BH25	BH25	BH27	BH27	BH27
Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sampled_Date_Time	12/11/2019	19/11/2019	25/11/2019	05/11/2019	12/11/2019	19/11/2019	07/11/2019	13/11/2019	20/11/2019	08/11/2019	12/11/2019	19/11/2019	12/11/2019	19/11/2019	25/11/2019
Monitoring_Round	2	3	4	1	2	3	1	2	3	1	2	3	2	3	4
Monitoring_Unit	ALL, GSG	ALL, GSG	ALL, GSG	ALL, GSG, SILT, SST,	ALL, GSG, SILT, SST,	ALL, GSG, SILT, SST, CWST	GT, GSG, CWST	GT, GSG, CWST	GT, GSG, CWST	GSG	GSG	GSG	GSG, CWST	GSG, CWST	GSG, CWST
Matrix_Type	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water

Method_Type	ChemName	output unit	EQL	GAC_WTV_EN/WA_DWS	GAC_WTV_EN/WA_EQS-Fresh														
	trans-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloroethane	µg/L	1	2.8[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	cis-1,2-dichloroethene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,2-dichloropropane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromochloromethane	µg/L	1	83[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chloroform	µg/L	1	Use trihalomethanes[#1]	2.5[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,1-trichloroethane	µg/L	1	2,000[#3]	100[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Carbon tetrachloride	µg/L	1	3[#1]	12[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichloroethane	µg/L	1	3[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzene	µg/L	1	1[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Trichloroethene	µg/L	1	Use PCE + TCE[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichloropropane	µg/L	1	40[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibromomethane	µg/L	1	8.3[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromodichloromethane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	cis-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	1	700[#3]	74[#7]	3.33	2.5	1.13	2.81	2.17	1.63	<1	<1	<1	1.19	<1	<1	<1	<1
	trans-1,3-dichloropropene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,2-trichloroethane	µg/L	1	0.28[#10]	400[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Tetrachloroethene	µg/L	1	Use PCE + TCE[#1]	10[#8]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3-dichloropropane	µg/L	1	370[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chlorodibromomethane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dibromoethane	µg/L	1	0.4[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chlorobenzene	µg/L	1	300[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,1,2-tetrachloroethane	µg/L	1	0.57[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/L	1	300[#3]	20[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (m & p)	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (o)	µg/L	1	190[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Styrene	µg/L	1	20[#3]	50[#12]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromoform	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Isopropylbenzene	µg/L	1	450[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,1,2,2-tetrachloroethane	µg/L	1	0.076[#10]	140[#7]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bromobenzene	µg/L	1	62[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,3-trichloropropane	µg/L	1	0.00075[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	n-propylbenzene	µg/L	1	660[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorotoluene	µg/L	1	240[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3,5-trimethylbenzene	µg/L	1	60[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	4-chlorotoluene	µg/L	1	250[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	tert-butylbenzene	µg/L	1	690[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,4-trimethylbenzene	µg/L	1	56[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	sec-butylbenzene	µg/L	1	2,000[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	p-isopropyltoluene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,3-dichlorobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,4-dichlorobenzene	µg/L	1	300[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	n-butylbenzene	µg/L	1	1000[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dichlorobenzene	µg/L	1	1000[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2-dibromo-3-chloropropane	µg/L	1	1[#3]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,4-trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Hexachlorobutadiene	µg/L	1	0.1[#1]	0.6[#6]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2,3-trichlorobenzene	µg/L	1	0.1[#1]		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Carbon disulfide	µg/L	1	810[#10]		<1	<1	<1	<1	<1	<1	<1	<1	<1	1.05	<1	<1	<1	<1
	Tert Amyl Methyl Ether	µg/L	1		510[#13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Envt Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [Nov 2019]
#11 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#12 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#13 PNEC (EU REACH) - Freshwater
#14 California Draft health protective concentration
#15 AECOM DWG (WHO method)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
CW: Controlled Waters

	Exceedance of CW/WE Water. DWS - England/Wales
xxx	Exceedance of CW/WE Water. Aquatic Toxicity - England/Wales - Freshwater

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	BH01	BH03		BH04	BH08	BH09	BH10
Date	03/07/2019	17/07/2019		02/07/2019	18/06/2019	19/06/2019	28/06/2019
Sample_Depth_Range	-0.5	-1.5	-4.5	-0.5	-1.5	-0.5	-1.2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Boron (Water Soluble)	mg/kg			0.4	0.7	0.5	0.5	2.5	0.6	<0.2
Tribromomethane	mg/kg			<0.001	<0.001	-	-	-	<0.001	-
Freon 113	mg/kg		28000[#11]	<0.001	<0.001	-	-	-	<0.001	-
Xylenols & Ethylphenols	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
TPH										
>C5-C6 Aliphatics	mg/kg		3200[#15]	<0.001	-	-	<0.001	<0.001	<0.001	<0.001
>C6-C8 Aliphatics	mg/kg		7800[#15]	<0.001	-	-	<0.001	<0.001	<0.001	<0.001
>C8-C10 Aliphatics	mg/kg		2000[#15]	<0.001	-	-	<0.001	<0.001	<0.001	<0.001
>C10-C12 Aliphatics	mg/kg		9700[#15]	4	-	-	<1	<1	<1	<1
>C12-C16 Aliphatics	mg/kg		59000[#15]	23	-	-	<2	<2	<2	<2
>C16-C21 Aliphatics	mg/kg			32	-	-	<8	<8	<8	8.8
>C21-C35 Aliphatics	mg/kg			51	-	-	<8	30	<8	78
>C35-C40 Aliphatics	mg/kg			<10	-	-	<10	<10	<10	13
>C5-C35 Aliphatics	mg/kg			110	-	-	<10	32	<10	89
>EC5-EC7 Aromatics	mg/kg		26000[#15]	<0.001	-	-	<0.001	<0.001	<0.001	<0.001
>EC7-EC8 Aromatics	mg/kg		56000[#15]	<0.001	-	-	<0.001	<0.001	<0.001	<0.001
>EC8-EC10 Aromatics	mg/kg		3500[#15]	<0.001	-	-	<0.001	<0.001	<0.001	<0.001
>EC10-EC12 Aromatics	mg/kg		16000[#15]	<1	-	-	<1	<1	<1	<1
>EC12-EC16 Aromatics	mg/kg		36000[#15]	<2	-	-	<2	3.1	<2	<2
>EC16-EC21 Aromatics	mg/kg		28000[#15]	<10	-	-	<10	52	<10	<10
>EC21-EC35 Aromatics	mg/kg		28000[#15]	<10	-	-	<10	120	28	<10
>EC35-EC40 Aromatics	mg/kg			<10	-	-	<10	23	<10	<10
>EC5-EC35 Aromatics	mg/kg			<10	-	-	<10	180	33	<10
>C5-C40 Aliphatics & Aromatics	mg/kg			110	-	-	<10	230	28	100
BTEX										
Benzene	mg/kg		27[#15]	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
Toluene	mg/kg		56000[#15]	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/kg		5700[#15]	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
Xylene (m & p)	mg/kg			<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
Xylene (o)	mg/kg		6600[#15]	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
Oxygenates										
MTBE	mg/kg		7900[#16]	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
Chlorinated Hydrocarbons										
Chloromethane	mg/kg		1[#16]	<0.001	<0.001	-	-	-	<0.001	-
Vinyl chloride	mg/kg		0.059[#15]	<0.001	<0.001	-	-	-	<0.001	-
Chloroethane	mg/kg		960[#16]	<0.001	<0.001	-	-	-	<0.001	-
1,1-dichloroethene	mg/kg		26[#16]	<0.001	<0.001	-	-	-	<0.001	-
trans-1,2-dichloroethene	mg/kg		22[#16]	<0.001	<0.001	-	-	-	<0.001	-
1,1-dichloroethane	mg/kg		280[#16]	<0.001	<0.001	-	-	-	<0.001	-
cis-1,2-dichloroethene	mg/kg		14[#16]	<0.001	<0.001	-	-	-	<0.001	-
Chloroform	mg/kg		99[#15]	<0.001	<0.001	-	-	-	<0.001	-
1,1,1-trichloroethane	mg/kg		660[#15]	<0.001	<0.001	-	-	-	<0.001	-
Carbon tetrachloride	mg/kg		2.9[#15]	<0.001	<0.001	-	-	-	<0.001	-
Trichloroethene	mg/kg		1.2[#15]	<0.001	<0.001	-	-	-	<0.001	-
1,1,2-trichloroethane	mg/kg		94[#16]	<0.001	<0.001	-	-	-	<0.001	-
Tetrachloroethene	mg/kg		19[#15]	<0.001	<0.001	-	-	-	<0.001	-
VOC										

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	BH01	BH03		BH04	BH08	BH09	BH10
Date	03/07/2019	17/07/2019		02/07/2019	18/06/2019	19/06/2019	28/06/2019
Sample_Depth_Range	-0.5	-1.5	-4.5	-0.5	-1.5	-0.5	-1.2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
2,2-dichloropropane	mg/kg			<0.001	<0.001	-	-	-	<0.001	-
1,1-dichloropropene	mg/kg			<0.001	<0.001	-	-	-	<0.001	-
1,2-dichloroethane	mg/kg		0.67[#15]	<0.001	<0.001	-	-	-	<0.001	-
1,2-dichloropropane	mg/kg		3.3[#16]	<0.001	<0.001	-	-	-	<0.001	-
Dibromomethane	mg/kg		99[#11]	<0.001	<0.001	-	-	-	<0.001	-
Bromodichloromethane	mg/kg		1.3[#11]	<0.001	<0.001	-	-	-	<0.001	-
cis-1,3-dichloropropene	mg/kg			<0.001	<0.001	-	-	-	<0.001	-
trans-1,3-dichloropropene	mg/kg			<0.001	<0.001	-	-	-	<0.001	-
1,3-dichloropropane	mg/kg		23000[#11]	<0.001	<0.001	-	-	-	<0.001	-
Chlorodibromomethane	mg/kg		39[#11]	<0.001	<0.001	-	-	-	<0.001	-
1,1,1,2-tetrachloroethane	mg/kg		110[#15]	<0.001	<0.001	-	-	-	<0.001	-
Styrene	mg/kg		3300[#16]	<0.001	<0.001	-	-	-	<0.001	-
Isopropylbenzene	mg/kg		1400[#16]	<0.001	<0.001	-	-	-	<0.001	-
1,1,2,2-tetrachloroethane	mg/kg		270[#15]	<0.001	<0.001	-	-	-	<0.001	-
n-propylbenzene	mg/kg		4100[#16]	<0.001	<0.001	-	-	-	<0.001	-
1,3,5-trimethylbenzene	mg/kg		1500[#11]	<0.001	<0.001	-	-	-	<0.001	-
tert-butylbenzene	mg/kg		120000[#11]	<0.001	<0.001	-	-	-	<0.001	-
1,2,4-trimethylbenzene	mg/kg		42[#16]	<0.001	<0.001	-	-	-	<0.001	-
sec-butylbenzene	mg/kg		120000[#11]	<0.001	<0.001	-	-	-	<0.001	-
p-isopropyltoluene	mg/kg			<0.001	<0.001	-	-	-	<0.001	-
n-butylbenzene	mg/kg		58000[#11]	<0.001	<0.001	-	-	-	<0.001	-
1,2-dibromo-3-chloropropane	mg/kg		0.064[#11]	<0.001	<0.001	-	-	-	<0.001	-
Hexachlorobutadiene	mg/kg		31[#15]	<0.001	<0.001	-	-	-	<0.001	-
PAH										
Naphthalene	mg/kg		190[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Acenaphthylene	mg/kg		83000[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Acenaphthene	mg/kg		84000[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Fluorene	mg/kg		63000[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Phenanthrene	mg/kg		22000[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Anthracene	mg/kg		520000[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Fluoranthene	mg/kg		23000[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Pyrene	mg/kg		54000[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Benz(a)anthracene	mg/kg		170[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Chrysene	mg/kg		350[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Benzo(a) pyrene	mg/kg		35[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg		500[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Dibenz(a,h)anthracene	mg/kg		3.5[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Benzo(g,h,i)perylene	mg/kg		3900[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Benzo(b)fluoranthene	mg/kg		44[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
Benzo(k)fluoranthene	mg/kg		1200[#15]	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
PAH 16 Total	mg/kg			<0.8	<0.8	<0.8	<0.8	-	<0.8	<0.8
SVOC										
2-methylnaphthalene	mg/kg		3000[#11]	<0.0001	<0.0001	-	-	-	<0.0001	-
4-bromophenyl phenyl ether	mg/kg			<0.0002	<0.0002	-	-	-	<0.0002	-
4-chlorophenyl phenyl ether	mg/kg			<0.0003	<0.0003	-	-	-	<0.0003	-
Azobenzene	mg/kg		26[#11]	<0.0003	<0.0003	-	-	-	<0.0003	-
Bis(2-chloroethoxy) methane	mg/kg		2500[#11]	<0.0003	<0.0003	-	-	-	<0.0003	-

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	BH01	BH03		BH04	BH08	BH09	BH10
Date	03/07/2019	17/07/2019		02/07/2019	18/06/2019	19/06/2019	28/06/2019
Sample_Depth_Range	-0.5	-1.5	-4.5	-0.5	-1.5	-0.5	-1.2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Bis(2-chloroethyl)ether	mg/kg		1[#11]	<0.0002	<0.0002	-	-	-	<0.0002	-
Carbazole	mg/kg			<0.0003	<0.0003	-	-	-	<0.0003	-
Dibenzofuran	mg/kg		1000[#11]	<0.0002	<0.0002	-	-	-	<0.0002	-
Hexachloroethane	mg/kg		22[#16]	<0.00005	<0.00005	-	-	-	<0.00005	-
Bis(2-chloroisopropyl) ether	mg/kg		47000[#11]	<0.0001	<0.0001	-	-	-	<0.0001	-
Phenolics										
2-methylphenol	mg/kg		160000[#16]	<0.3	<0.3	<0.3	<0.3	-	<0.0003	<0.3
2-nitrophenol	mg/kg			<0.3	<0.3	<0.3	<0.3	-	<0.0003	<0.3
2,4-dimethylphenol	mg/kg		16000[#16]	<0.3	<0.3	<0.3	<0.3	-	<0.0003	<0.3
4-chloro-3-methylphenol	mg/kg		82000[#11]	<0.1	<0.1	<0.1	<0.1	-	<0.0001	<0.1
4-methylphenol	mg/kg		160000[#16]	<0.2	<0.2	<0.2	<0.2	-	<0.0002	<0.2
Phenol	mg/kg		440[#15]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-chloronaphthalene	mg/kg		390[#16]	<0.0001	<0.0001	-	-	-	<0.0001	-
Cresol Total	mg/kg		160000[#16]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phenols	mg/kg			<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
resorcinol (m-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
catechol (o-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,5-trimethyl phenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-isopropylphenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anilines										
Aniline	mg/kg		400[#11]	<0.0001	<0.0001	-	-	-	<0.0001	-
4-chloroaniline	mg/kg		11[#11]	<0.0001	<0.0001	-	-	-	<0.0001	-
4-nitroaniline	mg/kg		110[#11]	<0.0002	<0.0002	-	-	-	<0.0002	-
Explosives										
2,4-Dinitrotoluene	mg/kg		3700[#16]	<0.0002	<0.0002	-	-	-	<0.0002	-
2,6-dinitrotoluene	mg/kg		1900[#16]	<0.0001	<0.0001	-	-	-	<0.0001	-
Nitrobenzene	mg/kg		22[#11]	<0.0003	<0.0003	-	-	-	<0.0003	-
Halogenated Benzenes										
Chlorobenzene	mg/kg		56[#15]	<0.001	<0.001	-	-	-	<0.001	-
Bromobenzene	mg/kg		97[#16]	<0.001	<0.001	-	-	-	<0.001	-
2-chlorotoluene	mg/kg		23000[#11]	<0.001	<0.001	-	-	-	<0.001	-
4-chlorotoluene	mg/kg		23000[#11]	<0.001	<0.001	-	-	-	<0.001	-
1,3-dichlorobenzene	mg/kg		30[#15]	<0.001	<0.001	-	-	-	<0.001	-
1,4-dichlorobenzene	mg/kg		4400[#15]	<0.001	<0.001	-	-	-	<0.001	-
1,2-dichlorobenzene	mg/kg		2000[#15]	<0.001	<0.001	-	-	-	<0.001	-
1,2,4-trichlorobenzene	mg/kg		220[#15]	<0.001	<0.001	-	-	-	<0.001	-
1,2,3-trichlorobenzene	mg/kg		102[#15]	<0.001	<0.001	-	-	-	<0.001	-
Hexachlorobenzene	mg/kg		110[#15]	<0.0003	<0.0003	-	-	-	<0.0003	-
Halogenated Hydrocarbons										
Bromomethane	mg/kg		30[#11]	<0.001	<0.001	-	-	-	<0.001	-
Trichlorofluoromethane	mg/kg		350000[#11]	<0.001	<0.001	-	-	-	<0.001	-
1,2-dibromoethane	mg/kg		0.16[#11]	<0.001	<0.001	-	-	-	<0.001	-
Halogenated Phenols										
2-chlorophenol	mg/kg		5800[#11]	<0.1	<0.1	<0.1	<0.1	-	<0.0001	<0.1
2,4-dichlorophenol	mg/kg		2500[#11]	<0.3	<0.3	<0.3	<0.3	-	<0.0003	<0.3
2,4,5-trichlorophenol	mg/kg		82000[#11]	<0.2	<0.2	<0.2	<0.2	-	<0.0002	<0.2
2,4,6-trichlorophenol	mg/kg		210[#11]	<0.1	<0.1	<0.1	<0.1	-	<0.0001	<0.1

Soil Results for Made Ground
Analytical Results
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Highways England

Location	BH01	BH03		BH04	BH08	BH09	BH10
Date	03/07/2019	17/07/2019		02/07/2019	18/06/2019	19/06/2019	28/06/2019
Sample_Depth_Range	-0.5	-1.5	-4.5	-0.5	-1.5	-0.5	-1.2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Phthalates									
Butyl benzyl phthalate	mg/kg		940000[#16]	<0.0003	<0.0003	-	-	-	<0.0003	-
Di-n-butyl phthalate	mg/kg		15000[#16]	<0.0002	<0.0002	-	-	-	<0.0002	-
Diethylphthalate	mg/kg		150000[#16]	<0.0002	<0.0002	-	-	-	<0.0002	-
Dimethyl phthalate	mg/kg			<0.0001	<0.0001	-	-	-	<0.0001	-
Solvents									
Isophorone	mg/kg		2400[#11]	<0.0002	<0.0002	-	-	-	<0.0002	-
Metals									
Arsenic	mg/kg		640[#15]	4.3	5.3	5.3	5.8	7.4	4.6	4.9
Cadmium	mg/kg		190[#15]	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
Copper	mg/kg		68000[#15]	42	26	18	20	29	24	14
Iron	mg/kg		820000[#11]	28,000	15,000	20,000	16,000	18,000	16,000	15,000
Lead	mg/kg		2300[#17]	5.3	16	7.1	15	35	18	7.6
Mercury	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Nickel	mg/kg		980[#15]	15	14	22	16	22	13	12
Selenium	mg/kg		12000[#15]	<1	<1	1.5	<1	<1	<1	<1
Zinc	mg/kg		730000[#15]	56	46	40	54	100	51	25
Chromium (hexavalent)	mg/kg		33[#15]	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Organics									
Organic Matter	%			0.4	1.6	0.8	1.5	2.9	2.2	0.6
Inorganics									
Cyanide (Free)	mg/kg			<1	<1	<1	<1	<1	<1	<1
Cyanide Total	mg/kg		150[#11]	<1	<1	<1	<1	<1	<1	<1
Moisture	%			2.6	13	11	11	14	9.4	9.8
Ammoniacal Nitrogen as N	mg/kg			<0.5	1.6	3.1	<0.5	12	<0.5	<0.5
pH (Lab)	pH_Units			9.6	7.9	7.8	8.4	7.5	7.5	7.8

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [May 2019]
#11 USEPA RSL (May 2019)
#12 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#13 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#14 PNEC (EU REACH) - Freshwater
#15 LQM/CIEH S4ULs 2015
#16 EIC/AGS/CL:AIRE
#17 Defra C4SL 12/2014
#18 California Draft health protective concentration
#19 AECOM DWG (WHO method)

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	BH12	BH24	BH29		BH30	TP01	TP02
Date	24/07/2019	11/07/2019	05/07/2019		18/07/2019	02/07/2019	03/07/2019
Sample_Depth_Range	-0.5	-0.5	-1	-3	-0.5	-1	-2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Boron (Water Soluble)	mg/kg			0.8	0.6	1.1	0.8	0.9	7.2	1.2
Tribromomethane	mg/kg			-	-	-	<0.001	<0.001	-	<0.001
Freon 113	mg/kg		28000[#11]	-	-	-	<0.001	<0.001	-	<0.001
Xylenols & Ethylphenols	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
TPH										
>C5-C6 Aliphatics	mg/kg		3200[#15]	<0.001	-	-	<0.001	<0.001	-	<0.001
>C6-C8 Aliphatics	mg/kg		7800[#15]	<0.001	-	-	<0.001	<0.001	-	<0.001
>C8-C10 Aliphatics	mg/kg		2000[#15]	<0.001	-	-	<0.001	<0.001	-	<0.001
>C10-C12 Aliphatics	mg/kg		9700[#15]	<1	-	-	40	<1	-	10
>C12-C16 Aliphatics	mg/kg		59000[#15]	<2	-	-	260	<2	-	57
>C16-C21 Aliphatics	mg/kg			<8	-	-	340	<8	-	68
>C21-C35 Aliphatics	mg/kg			11	-	-	720	<8	-	24
>C35-C40 Aliphatics	mg/kg			<10	-	-	86	<10	-	11
>C5-C35 Aliphatics	mg/kg			-	-	-	1,400	<10	-	160
>EC5-EC7 Aromatics	mg/kg		26000[#15]	<0.001	-	-	<0.001	<0.001	-	<0.001
>EC7-EC8 Aromatics	mg/kg		56000[#15]	<0.001	-	-	<0.001	<0.001	-	<0.001
>EC8-EC10 Aromatics	mg/kg		3500[#15]	<1	-	-	0.038	<0.001	-	<0.001
>EC10-EC12 Aromatics	mg/kg		16000[#15]	<2	-	-	350	<1	-	<1
>EC12-EC16 Aromatics	mg/kg		36000[#15]	<10	-	-	1,100	<2	-	<2
>EC16-EC21 Aromatics	mg/kg		28000[#15]	12	-	-	3,300	<10	-	<10
>EC21-EC35 Aromatics	mg/kg		28000[#15]	<10	-	-	3,900	<10	-	<10
>EC35-EC40 Aromatics	mg/kg			23	-	-	590	<10	-	<10
>EC5-EC35 Aromatics	mg/kg			-	-	-	8,600	<10	-	<10
>C5-C40 Aliphatics & Aromatics	mg/kg			-	-	-	11,000	<10	-	170
BTEX										
Benzene	mg/kg		27[#15]	<0.001	-	-	<0.001	<0.001	-	<0.001
Toluene	mg/kg		56000[#15]	<0.001	-	-	<0.001	<0.001	-	<0.001
Ethylbenzene	mg/kg		5700[#15]	<0.001	-	-	0.0026	<0.001	-	<0.001
Xylene (m & p)	mg/kg			<0.001	-	-	0.0078	<0.001	-	<0.001
Xylene (o)	mg/kg		6600[#15]	<0.001	-	-	0.0049	<0.001	-	<0.001
Oxygenates										
MTBE	mg/kg		7900[#16]	<0.001	-	-	<0.001	<0.001	-	<0.001
Chlorinated Hydrocarbons										
Chloromethane	mg/kg		1[#16]	-	-	-	<0.001	<0.001	-	<0.001
Vinyl chloride	mg/kg		0.059[#15]	-	-	-	<0.001	<0.001	-	<0.001
Chloroethane	mg/kg		960[#16]	-	-	-	<0.001	<0.001	-	<0.001
1,1-dichloroethene	mg/kg		26[#16]	-	-	-	<0.001	<0.001	-	<0.001
trans-1,2-dichloroethene	mg/kg		22[#16]	-	-	-	<0.001	<0.001	-	<0.001
1,1-dichloroethane	mg/kg		280[#16]	-	-	-	<0.001	<0.001	-	<0.001
cis-1,2-dichloroethene	mg/kg		14[#16]	-	-	-	<0.001	<0.001	-	<0.001
Chloroform	mg/kg		99[#15]	-	-	-	<0.001	<0.001	-	<0.001
1,1,1-trichloroethane	mg/kg		660[#15]	-	-	-	<0.001	<0.001	-	<0.001
Carbon tetrachloride	mg/kg		2.9[#15]	-	-	-	<0.001	<0.001	-	<0.001
Trichloroethene	mg/kg		1.2[#15]	-	-	-	<0.001	<0.001	-	<0.001
1,1,2-trichloroethane	mg/kg		94[#16]	-	-	-	<0.001	<0.001	-	<0.001
Tetrachloroethene	mg/kg		19[#15]	-	-	-	<0.001	<0.001	-	<0.001
VOC										

Soil Results for Made Ground
Analytical Results
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Location	BH12	BH24	BH29		BH30	TP01	TP02
Date	24/07/2019	11/07/2019	05/07/2019		18/07/2019	02/07/2019	03/07/2019
Sample_Depth_Range	-0.5	-0.5	-1	-3	-0.5	-1	-2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
2,2-dichloropropane	mg/kg			-	-	-	<0.001	<0.001	-	<0.001
1,1-dichloropropene	mg/kg			-	-	-	<0.001	<0.001	-	<0.001
1,2-dichloroethane	mg/kg		0.67[#15]	-	-	-	<0.001	<0.001	-	<0.001
1,2-dichloropropane	mg/kg		3.3[#16]	-	-	-	<0.001	<0.001	-	<0.001
Dibromomethane	mg/kg		99[#11]	-	-	-	<0.001	<0.001	-	<0.001
Bromodichloromethane	mg/kg		1.3[#11]	-	-	-	<0.001	<0.001	-	<0.001
cis-1,3-dichloropropene	mg/kg			-	-	-	<0.001	<0.001	-	<0.001
trans-1,3-dichloropropene	mg/kg			-	-	-	<0.001	<0.001	-	<0.001
1,3-dichloropropane	mg/kg		23000[#11]	-	-	-	<0.001	<0.001	-	<0.001
Chlorodibromomethane	mg/kg		39[#11]	-	-	-	<0.001	<0.001	-	<0.001
1,1,1,2-tetrachloroethane	mg/kg		110[#15]	-	-	-	<0.001	<0.001	-	<0.001
Styrene	mg/kg		3300[#16]	-	-	-	<0.001	<0.001	-	<0.001
Isopropylbenzene	mg/kg		1400[#16]	-	-	-	<0.001	<0.001	-	<0.001
1,1,2,2-tetrachloroethane	mg/kg		270[#15]	-	-	-	<0.001	<0.001	-	<0.001
n-propylbenzene	mg/kg		4100[#16]	-	-	-	<0.001	<0.001	-	<0.001
1,3,5-trimethylbenzene	mg/kg		1500[#11]	-	-	-	0.0067	<0.001	-	<0.001
tert-butylbenzene	mg/kg		120000[#11]	-	-	-	<0.001	<0.001	-	<0.001
1,2,4-trimethylbenzene	mg/kg		42[#16]	-	-	-	0.016	<0.001	-	<0.001
sec-butylbenzene	mg/kg		120000[#11]	-	-	-	<0.001	<0.001	-	<0.001
p-isopropyltoluene	mg/kg			-	-	-	<0.001	<0.001	-	<0.001
n-butylbenzene	mg/kg		58000[#11]	-	-	-	<0.001	<0.001	-	<0.001
1,2-dibromo-3-chloropropane	mg/kg		0.064[#11]	-	-	-	<0.001	<0.001	-	<0.001
Hexachlorobutadiene	mg/kg		31[#15]	-	<0.0001	-	<0.001	<0.001	-	<0.001
PAH										
Naphthalene	mg/kg		190[#15]	-	<0.05	-	55	0.00035	<0.05	<0.00005
Acenaphthylene	mg/kg		83000[#15]	-	<0.05	-	<0.05	<0.00005	<0.05	<0.00005
Acenaphthene	mg/kg		84000[#15]	-	<0.05	-	120	<0.00005	<0.05	<0.00005
Fluorene	mg/kg		63000[#15]	-	<0.05	-	110	<0.00005	<0.05	<0.00005
Phenanthrene	mg/kg		22000[#15]	-	<0.05	-	550	0.0003	1.4	<0.00005
Anthracene	mg/kg		520000[#15]	-	<0.05	-	160	<0.00005	0.29	<0.00005
Fluoranthene	mg/kg		23000[#15]	-	<0.05	-	350	<0.00005	2.7	<0.00005
Pyrene	mg/kg		54000[#15]	-	<0.05	-	260	<0.00005	2.3	<0.00005
Benz(a)anthracene	mg/kg		170[#15]	-	<0.05	-	100	<0.00005	1.2	<0.00005
Chrysene	mg/kg		350[#15]	-	<0.05	-	81	<0.00005	1.2	<0.00005
Benzo(a) pyrene	mg/kg		35[#15]	-	<0.05	-	80	<0.00005	1.3	<0.00005
Indeno(1,2,3-c,d)pyrene	mg/kg		500[#15]	-	<0.05	-	37	<0.00005	0.75	<0.00005
Dibenz(a,h)anthracene	mg/kg		3.5[#15]	-	<0.05	-	8.9	<0.00005	<0.05	<0.00005
Benzo(g,h,i)perylene	mg/kg		3900[#15]	-	<0.05	-	45	<0.00005	0.78	<0.00005
Benzo(b)fluoranthene	mg/kg		44[#15]	-	<0.05	-	86	<0.00005	1.6	<0.00005
Benzo(k)fluoranthene	mg/kg		1200[#15]	-	<0.05	-	45	<0.00005	0.57	<0.00005
PAH 16 Total	mg/kg			-	<0.8	-	2,080	-	14.1	-
SVOC										
2-methylnaphthalene	mg/kg		3000[#11]	-	<0.0001	-	0.15	0.0006	-	<0.0001
4-bromophenyl phenyl ether	mg/kg			-	<0.0002	-	<0.0002	<0.0002	-	<0.0002
4-chlorophenyl phenyl ether	mg/kg			-	<0.0003	-	<0.0003	<0.0003	-	<0.0003
Azobenzene	mg/kg		26[#11]	-	<0.0003	-	<0.0003	<0.0003	-	<0.0003
Bis(2-chloroethoxy) methane	mg/kg		2500[#11]	-	<0.0003	-	<0.0003	<0.0003	-	<0.0003

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	BH12	BH24	BH29		BH30	TP01	TP02
Date	24/07/2019	11/07/2019	05/07/2019		18/07/2019	02/07/2019	03/07/2019
Sample_Depth_Range	-0.5	-0.5	-1	-3	-0.5	-1	-2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Bis(2-chloroethyl)ether	mg/kg		1[#11]	-	<0.0002	-	<0.0002	<0.0002	-	<0.0002
Carbazole	mg/kg			-	<0.0003	-	0.039	<0.0003	-	<0.0003
Dibenzofuran	mg/kg		1000[#11]	-	<0.0002	-	0.051	<0.0002	-	<0.0002
Hexachloroethane	mg/kg		22[#16]	-	<0.00005	-	<0.00005	<0.00005	-	<0.00005
Bis(2-chloroisopropyl) ether	mg/kg		47000[#11]	-	<0.0001	-	<0.0001	<0.0001	-	<0.0001
Phenolics										
2-methylphenol	mg/kg		160000[#16]	-	<0.3	-	<0.3	<0.0003	<0.3	<0.3
2-nitrophenol	mg/kg			-	<0.3	-	<0.3	<0.0003	<0.3	<0.3
2,4-dimethylphenol	mg/kg		16000[#16]	-	<0.3	-	<0.3	<0.0003	<0.3	<0.3
4-chloro-3-methylphenol	mg/kg		82000[#11]	-	<0.1	-	<0.1	<0.0001	<0.1	<0.1
4-methylphenol	mg/kg		160000[#16]	-	<0.2	-	<0.2	<0.0002	<0.2	<0.2
Phenol	mg/kg		440[#15]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-chloronaphthalene	mg/kg		390[#16]	-	<0.0001	-	<0.0001	<0.0001	-	<0.0001
Cresol Total	mg/kg		160000[#16]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phenols	mg/kg			<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
resorcinol (m-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
catechol (o-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,5-trimethyl phenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-isopropylphenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anilines										
Aniline	mg/kg		400[#11]	-	<0.0001	-	<0.0001	<0.0001	-	<0.0001
4-chloroaniline	mg/kg		11[#11]	-	<0.0001	-	<0.0001	<0.0001	-	<0.0001
4-nitroaniline	mg/kg		110[#11]	-	<0.0002	-	<0.0002	<0.0002	-	<0.0002
Explosives										
2,4-Dinitrotoluene	mg/kg		3700[#16]	-	<0.0002	-	<0.0002	<0.0002	-	<0.0002
2,6-dinitrotoluene	mg/kg		1900[#16]	-	<0.0001	-	<0.0001	<0.0001	-	<0.0001
Nitrobenzene	mg/kg		22[#11]	-	<0.0003	-	<0.0003	<0.0003	-	<0.0003
Halogenated Benzenes										
Chlorobenzene	mg/kg		56[#15]	-	-	-	<0.001	<0.001	-	<0.001
Bromobenzene	mg/kg		97[#16]	-	-	-	<0.001	<0.001	-	<0.001
2-chlorotoluene	mg/kg		23000[#11]	-	-	-	<0.001	<0.001	-	<0.001
4-chlorotoluene	mg/kg		23000[#11]	-	-	-	<0.001	<0.001	-	<0.001
1,3-dichlorobenzene	mg/kg		30[#15]	-	<0.0002	-	<0.001	<0.001	-	<0.001
1,4-dichlorobenzene	mg/kg		4400[#15]	-	<0.0002	-	<0.001	<0.001	-	<0.001
1,2-dichlorobenzene	mg/kg		2000[#15]	-	<0.0001	-	<0.001	<0.001	-	<0.001
1,2,4-trichlorobenzene	mg/kg		220[#15]	-	<0.0003	-	<0.001	<0.001	-	<0.001
1,2,3-trichlorobenzene	mg/kg		102[#15]	-	-	-	<0.001	<0.001	-	<0.001
Hexachlorobenzene	mg/kg		110[#15]	-	<0.0003	-	<0.0003	<0.0003	-	<0.0003
Halogenated Hydrocarbons										
Bromomethane	mg/kg		30[#11]	-	-	-	<0.001	<0.001	-	<0.001
Trichlorofluoromethane	mg/kg		350000[#11]	-	-	-	<0.001	<0.001	-	<0.001
1,2-dibromoethane	mg/kg		0.16[#11]	-	-	-	<0.001	<0.001	-	<0.001
Halogenated Phenols										
2-chlorophenol	mg/kg		5800[#11]	-	<0.1	-	<0.1	<0.0001	<0.1	<0.1
2,4-dichlorophenol	mg/kg		2500[#11]	-	<0.3	-	<0.3	<0.0003	<0.3	<0.3
2,4,5-trichlorophenol	mg/kg		82000[#11]	-	<0.2	-	<0.2	<0.0002	<0.2	<0.2
2,4,6-trichlorophenol	mg/kg		210[#11]	-	<0.1	-	<0.1	<0.0001	<0.1	<0.1

Soil Results for Made Ground
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Location	BH12	BH24	BH29		BH30	TP01	TP02
Date	24/07/2019	11/07/2019	05/07/2019		18/07/2019	02/07/2019	03/07/2019
Sample_Depth_Range	-0.5	-0.5	-1	-3	-0.5	-1	-2
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Phthalates									
Butyl benzyl phthalate	mg/kg		940000[#16]	-	<0.0003	-	<0.0003	<0.0003	-	<0.0003
Di-n-butyl phthalate	mg/kg		15000[#16]	-	<0.0002	-	<0.0002	<0.0002	-	<0.0002
Diethylphthalate	mg/kg		150000[#16]	-	<0.0002	-	<0.0002	<0.0002	-	<0.0002
Dimethyl phthalate	mg/kg			-	<0.0001	-	<0.0001	<0.0001	-	<0.0001
Solvents									
Isophorone	mg/kg		2400[#11]	-	<0.0002	-	<0.0002	<0.0002	-	<0.0002
Metals									
Arsenic	mg/kg		640[#15]	94	6.8	3.3	3.9	6.7	15	5.9
Cadmium	mg/kg		190[#15]	<0.2	<0.2	<0.2	<0.2	<0.2	0.8	0.3
Copper	mg/kg		68000[#15]	23	14	14	21	24	120	12
Iron	mg/kg		820000[#11]	13,000	21,000	17,000	31,000	21,000	44,000	19,000
Lead	mg/kg		2300[#17]	66	7.9	5.3	11	21	130	22
Mercury	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Nickel	mg/kg		980[#15]	11	16	12	15	19	32	16
Selenium	mg/kg		12000[#15]	<1	<1	1.1	<1	<1	<1	<1
Zinc	mg/kg		730000[#15]	49	28	29	44	52	380	68
Chromium (hexavalent)	mg/kg		33[#15]	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Organics									
Organic Matter	%			3.3	0.8	2.6	4.2	3.6	5	2.9
Inorganics									
Cyanide (Free)	mg/kg			<1	<1	<1	<1	<1	<1	<1
Cyanide Total	mg/kg		150[#11]	<1	<1	<1	<1	<1	<1	<1
Moisture	%			8.8	6.6	5.6	7.6	7.9	13	16
Ammoniacal Nitrogen as N	mg/kg			<0.5	0.5	<0.5	2.1	<0.5	<0.5	26
pH (Lab)	pH_Units			7.5	7.8	8.7	8.7	7.8	8.5	7.9

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [May 2019]
#11 USEPA RSL (May 2019)
#12 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#13 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#14 PNEC (EU REACH) - Freshwater
#15 LQM/CIEH S4ULs 2015
#16 EIC/AGS/CL:AIRE
#17 Defra C4SL 12/2014
#18 California Draft health protective concentration
#19 AECOM DWG (WHO method)

Soil Results for Made Ground
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Location	TP03		TP04		TP05	TP06	TP07
Date	02/07/2019		11/07/2019		01/07/2019	03/07/2019	03/07/2019
Sample_Depth_Range	-1	-3	-1	-3	-1	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Boron (Water Soluble)	mg/kg			0.9	0.7	1.8	4.6	0.6	0.6	0.3
Tribromomethane	mg/kg			<0.001	-	<0.001	-	-	-	<0.001
Freon 113	mg/kg		28000[#11]	<0.001	-	<0.001	-	-	-	<0.001
Xylenols & Ethylphenols	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
TPH										
>C5-C6 Aliphatics	mg/kg		3200[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
>C6-C8 Aliphatics	mg/kg		7800[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
>C8-C10 Aliphatics	mg/kg		2000[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
>C10-C12 Aliphatics	mg/kg		9700[#15]	1.3	<1	<1	<1	-	-	<1
>C12-C16 Aliphatics	mg/kg		59000[#15]	5.2	3.1	5.9	17	-	-	<2
>C16-C21 Aliphatics	mg/kg			12	<8	13	43	-	-	<8
>C21-C35 Aliphatics	mg/kg			40	16	140	<8	-	-	<8
>C35-C40 Aliphatics	mg/kg			<10	<10	55	27	-	-	<10
>C5-C35 Aliphatics	mg/kg			58	27	160	61	-	-	<10
>EC5-EC7 Aromatics	mg/kg		26000[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
>EC7-EC8 Aromatics	mg/kg		56000[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
>EC8-EC10 Aromatics	mg/kg		3500[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
>EC10-EC12 Aromatics	mg/kg		16000[#15]	<1	<1	<1	<1	-	-	<1
>EC12-EC16 Aromatics	mg/kg		36000[#15]	<2	<2	6.6	20	-	-	<2
>EC16-EC21 Aromatics	mg/kg		28000[#15]	<10	<10	39	98	-	-	<10
>EC21-EC35 Aromatics	mg/kg		28000[#15]	<10	<10	360	280	-	-	<10
>EC35-EC40 Aromatics	mg/kg			<10	<10	210	79	-	-	<10
>EC5-EC35 Aromatics	mg/kg			<10	<10	410	400	-	-	<10
>C5-C40 Aliphatics & Aromatics	mg/kg			58	19	840	560	-	-	<10
BTEX										
Benzene	mg/kg		27[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
Toluene	mg/kg		56000[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
Ethylbenzene	mg/kg		5700[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
Xylene (m & p)	mg/kg			<0.001	<0.001	<0.001	<0.001	-	-	<0.001
Xylene (o)	mg/kg		6600[#15]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
Oxygenates										
MTBE	mg/kg		7900[#16]	<0.001	<0.001	<0.001	<0.001	-	-	<0.001
Chlorinated Hydrocarbons										
Chloromethane	mg/kg		1[#16]	<0.001	-	<0.001	-	-	-	<0.001
Vinyl chloride	mg/kg		0.059[#15]	<0.001	-	<0.001	-	-	-	<0.001
Chloroethane	mg/kg		960[#16]	<0.001	-	<0.001	-	-	-	<0.001
1,1-dichloroethene	mg/kg		26[#16]	<0.001	-	<0.001	-	-	-	<0.001
trans-1,2-dichloroethene	mg/kg		22[#16]	<0.001	-	<0.001	-	-	-	<0.001
1,1-dichloroethane	mg/kg		280[#16]	<0.001	-	<0.001	-	-	-	<0.001
cis-1,2-dichloroethene	mg/kg		14[#16]	<0.001	-	<0.001	-	-	-	<0.001
Chloroform	mg/kg		99[#15]	<0.001	-	<0.001	-	-	-	<0.001
1,1,1-trichloroethane	mg/kg		660[#15]	<0.001	-	<0.001	-	-	-	<0.001
Carbon tetrachloride	mg/kg		2.9[#15]	<0.001	-	<0.001	-	-	-	<0.001
Trichloroethene	mg/kg		1.2[#15]	<0.001	-	<0.001	-	-	-	<0.001
1,1,2-trichloroethane	mg/kg		94[#16]	<0.001	-	<0.001	-	-	-	<0.001
Tetrachloroethene	mg/kg		19[#15]	<0.001	-	<0.001	-	-	-	<0.001
VOC										

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	TP03		TP04		TP05	TP06	TP07
Date	02/07/2019		11/07/2019		01/07/2019	03/07/2019	03/07/2019
Sample_Depth_Range	-1	-3	-1	-3	-1	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
2,2-dichloropropane	mg/kg			<0.001	-	<0.001	-	-	-	<0.001
1,1-dichloropropene	mg/kg			<0.001	-	<0.001	-	-	-	<0.001
1,2-dichloroethane	mg/kg		0.67[#15]	<0.001	-	<0.001	-	-	-	<0.001
1,2-dichloropropane	mg/kg		3.3[#16]	<0.001	-	<0.001	-	-	-	<0.001
Dibromomethane	mg/kg		99[#11]	<0.001	-	<0.001	-	-	-	<0.001
Bromodichloromethane	mg/kg		1.3[#11]	<0.001	-	<0.001	-	-	-	<0.001
cis-1,3-dichloropropene	mg/kg			<0.001	-	<0.001	-	-	-	<0.001
trans-1,3-dichloropropene	mg/kg			<0.001	-	<0.001	-	-	-	<0.001
1,3-dichloropropane	mg/kg		23000[#11]	<0.001	-	<0.001	-	-	-	<0.001
Chlorodibromomethane	mg/kg		39[#11]	<0.001	-	<0.001	-	-	-	<0.001
1,1,1,2-tetrachloroethane	mg/kg		110[#15]	<0.001	-	<0.001	-	-	-	<0.001
Styrene	mg/kg		3300[#16]	<0.001	-	<0.001	-	-	-	<0.001
Isopropylbenzene	mg/kg		1400[#16]	<0.001	-	<0.001	-	-	-	<0.001
1,1,2,2-tetrachloroethane	mg/kg		270[#15]	<0.001	-	<0.001	-	-	-	<0.001
n-propylbenzene	mg/kg		4100[#16]	<0.001	-	<0.001	-	-	-	<0.001
1,3,5-trimethylbenzene	mg/kg		1500[#11]	<0.001	-	<0.001	-	-	-	<0.001
tert-butylbenzene	mg/kg		120000[#11]	<0.001	-	<0.001	-	-	-	<0.001
1,2,4-trimethylbenzene	mg/kg		42[#16]	<0.001	-	<0.001	-	-	-	<0.001
sec-butylbenzene	mg/kg		120000[#11]	<0.001	-	<0.001	-	-	-	<0.001
p-isopropyltoluene	mg/kg			<0.001	-	<0.001	-	-	-	<0.001
n-butylbenzene	mg/kg		58000[#11]	<0.001	-	<0.001	-	-	-	<0.001
1,2-dibromo-3-chloropropane	mg/kg		0.064[#11]	<0.001	-	<0.001	-	-	-	<0.001
Hexachlorobutadiene	mg/kg		31[#15]	<0.001	-	<0.001	-	<0.0001	<0.0001	<0.001
PAH										
Naphthalene	mg/kg		190[#15]	<0.05	<0.05	<0.05	<0.05	<0.00005	<0.05	<0.00005
Acenaphthylene	mg/kg		83000[#15]	<0.05	<0.05	<0.05	0.29	<0.00005	<0.05	<0.00005
Acenaphthene	mg/kg		84000[#15]	<0.05	<0.05	0.22	0.38	<0.00005	<0.05	<0.00005
Fluorene	mg/kg		63000[#15]	<0.05	<0.05	0.24	0.39	<0.00005	<0.05	<0.00005
Phenanthrene	mg/kg		22000[#15]	0.38	0.23	1.4	3	<0.00005	<0.05	<0.00005
Anthracene	mg/kg		520000[#15]	0.12	<0.05	0.38	0.91	<0.00005	<0.05	<0.00005
Fluoranthene	mg/kg		23000[#15]	0.61	0.28	1.9	5.6	<0.00005	<0.05	<0.00005
Pyrene	mg/kg		54000[#15]	0.49	0.27	1.7	4.9	<0.00005	<0.05	<0.00005
Benz(a)anthracene	mg/kg		170[#15]	0.28	<0.05	1	2.5	<0.00005	<0.05	<0.00005
Chrysene	mg/kg		350[#15]	0.23	<0.05	0.7	2.4	<0.00005	<0.05	<0.00005
Benzo(a) pyrene	mg/kg		35[#15]	0.27	<0.05	0.98	3	<0.00005	<0.05	<0.00005
Indeno(1,2,3-c,d)pyrene	mg/kg		500[#15]	<0.05	<0.05	0.49	1.6	<0.00005	<0.05	<0.00005
Dibenz(a,h)anthracene	mg/kg		3.5[#15]	<0.05	<0.05	<0.05	0.41	<0.00005	<0.05	<0.00005
Benzo(g,h,i)perylene	mg/kg		3900[#15]	<0.05	<0.05	0.6	1.9	<0.00005	<0.05	<0.00005
Benzo(b)fluoranthene	mg/kg		44[#15]	0.23	<0.05	0.97	3.3	<0.00005	<0.05	<0.00005
Benzo(k)fluoranthene	mg/kg		1200[#15]	0.21	<0.05	0.54	1.5	<0.00005	<0.05	<0.00005
PAH 16 Total	mg/kg			2.82	<0.8	11.1	32	-	<0.8	-
SVOC										
2-methylnaphthalene	mg/kg		3000[#11]	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001
4-bromophenyl phenyl ether	mg/kg			<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
4-chlorophenyl phenyl ether	mg/kg			<0.0003	-	<0.0003	-	<0.0003	<0.0003	<0.0003
Azobenzene	mg/kg		26[#11]	<0.0003	-	<0.0003	-	<0.0003	<0.0003	<0.0003
Bis(2-chloroethoxy) methane	mg/kg		2500[#11]	<0.0003	-	<0.0003	-	<0.0003	<0.0003	<0.0003

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	TP03		TP04		TP05	TP06	TP07
Date	02/07/2019		11/07/2019		01/07/2019	03/07/2019	03/07/2019
Sample_Depth_Range	-1	-3	-1	-3	-1	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Bis(2-chloroethyl)ether	mg/kg		1[#11]	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Carbazole	mg/kg			<0.0003	-	<0.0003	-	<0.0003	<0.0003	<0.0003
Dibenzofuran	mg/kg		1000[#11]	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Hexachloroethane	mg/kg		22[#16]	<0.00005	-	<0.00005	-	<0.00005	<0.00005	<0.00005
Bis(2-chloroisopropyl) ether	mg/kg		47000[#11]	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001
Phenolics										
2-methylphenol	mg/kg		160000[#16]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.0003	<0.0003
2-nitrophenol	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.0003	<0.0003
2,4-dimethylphenol	mg/kg		16000[#16]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.0003	<0.0003
4-chloro-3-methylphenol	mg/kg		82000[#11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	<0.0001
4-methylphenol	mg/kg		160000[#16]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.0002
Phenol	mg/kg		440[#15]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-chloronaphthalene	mg/kg		390[#16]	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001
Cresol Total	mg/kg		160000[#16]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phenols	mg/kg			<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
resorcinol (m-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
catechol (o-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,5-trimethyl phenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-isopropylphenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anilines										
Aniline	mg/kg		400[#11]	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001
4-chloroaniline	mg/kg		11[#11]	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001
4-nitroaniline	mg/kg		110[#11]	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Explosives										
2,4-Dinitrotoluene	mg/kg		3700[#16]	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
2,6-dinitrotoluene	mg/kg		1900[#16]	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001
Nitrobenzene	mg/kg		22[#11]	<0.0003	-	<0.0003	-	<0.0003	<0.0003	<0.0003
Halogenated Benzenes										
Chlorobenzene	mg/kg		56[#15]	<0.001	-	<0.001	-	-	-	<0.001
Bromobenzene	mg/kg		97[#16]	<0.001	-	<0.001	-	-	-	<0.001
2-chlorotoluene	mg/kg		23000[#11]	<0.001	-	<0.001	-	-	-	<0.001
4-chlorotoluene	mg/kg		23000[#11]	<0.001	-	<0.001	-	-	-	<0.001
1,3-dichlorobenzene	mg/kg		30[#15]	<0.001	-	<0.001	-	<0.0002	<0.0002	<0.001
1,4-dichlorobenzene	mg/kg		4400[#15]	<0.001	-	<0.001	-	<0.0002	<0.0002	<0.001
1,2-dichlorobenzene	mg/kg		2000[#15]	<0.001	-	<0.001	-	<0.0001	<0.0001	<0.001
1,2,4-trichlorobenzene	mg/kg		220[#15]	<0.001	-	<0.001	-	<0.0003	<0.0003	<0.001
1,2,3-trichlorobenzene	mg/kg		102[#15]	<0.001	-	<0.001	-	-	-	-
Hexachlorobenzene	mg/kg		110[#15]	<0.0003	-	<0.0003	-	<0.0003	<0.0003	<0.0003
Halogenated Hydrocarbons										
Bromomethane	mg/kg		30[#11]	<0.001	-	<0.001	-	-	-	<0.001
Trichlorofluoromethane	mg/kg		350000[#11]	<0.001	-	<0.001	-	-	-	<0.001
1,2-dibromoethane	mg/kg		0.16[#11]	<0.001	-	<0.001	-	-	-	<0.001
Halogenated Phenols										
2-chlorophenol	mg/kg		5800[#11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	<0.0001
2,4-dichlorophenol	mg/kg		2500[#11]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.0003	<0.0003
2,4,5-trichlorophenol	mg/kg		82000[#11]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.0002
2,4,6-trichlorophenol	mg/kg		210[#11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	<0.0001

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	TP03		TP04		TP05	TP06	TP07
Date	02/07/2019		11/07/2019		01/07/2019	03/07/2019	03/07/2019
Sample_Depth_Range	-1	-3	-1	-3	-1	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC						
Phthalates									
Butyl benzyl phthalate	mg/kg		940000[#16]	<0.0003	-	<0.0003	-	<0.0003	<0.0003	<0.0003
Di-n-butyl phthalate	mg/kg		15000[#16]	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Diethylphthalate	mg/kg		150000[#16]	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Dimethyl phthalate	mg/kg			<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001
Solvents									
Isophorone	mg/kg		2400[#11]	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Metals									
Arsenic	mg/kg		640[#15]	5.7	6.4	3.3	11	1.6	4.6	7.3
Cadmium	mg/kg		190[#15]	<0.2	<0.2	0.5	0.5	<0.2	<0.2	<0.2
Copper	mg/kg		68000[#15]	17	16	34	110	6.2	22	21
Iron	mg/kg		820000[#11]	12,000	9,800	7,800	14,000	1,200	18,000	23,000
Lead	mg/kg		2300[#17]	11	17	26	82	9.8	8.8	7.4
Mercury	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Nickel	mg/kg		980[#15]	18	17	9	19	1.5	20	23
Selenium	mg/kg		12000[#15]	<1	<1	<1	<1	<1	<1	<1
Zinc	mg/kg		730000[#15]	38	68	67	120	7.8	33	39
Chromium (hexavalent)	mg/kg		33[#15]	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Organics									
Organic Matter	%			0.8	1.7	2.1	3.3	0.8	0.6	0.6
Inorganics									
Cyanide (Free)	mg/kg			<1	<1	<1	<1	<1	<1	<1
Cyanide Total	mg/kg		150[#11]	<1	<1	<1	<1	<1	<1	<1
Moisture	%			10	11	7.6	11	14	8.4	11
Ammoniacal Nitrogen as N	mg/kg			<0.5	11	2.4	23	<0.5	<0.5	<0.5
pH (Lab)	pH_Units			8.4	7.7	10.5	8.8	6.7	8.6	7.5

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [May 2019]
#11 USEPA RSL (May 2019)
#12 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#13 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#14 PNEC (EU REACH) - Freshwater
#15 LQM/CIEH S4ULs 2015
#16 EIC/AGS/CL:AIRE
#17 Defra C4SL 12/2014
#18 California Draft health protective concentration
#19 AECOM DWG (WHO method)

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	TP08	TP10
Date	05/07/2019	05/07/2019
Sample_Depth_Range	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC		
Boron (Water Soluble)	mg/kg			0.6	0.4
Tribromomethane	mg/kg			-	-
Freon 113	mg/kg		28000[#11]	-	-
Xylenols & Ethylphenols	mg/kg			<0.3	<0.3
TPH					
>C5-C6 Aliphatics	mg/kg		3200[#15]	-	<0.001
>C6-C8 Aliphatics	mg/kg		7800[#15]	-	<0.001
>C8-C10 Aliphatics	mg/kg		2000[#15]	-	<0.001
>C10-C12 Aliphatics	mg/kg		9700[#15]	-	<1
>C12-C16 Aliphatics	mg/kg		59000[#15]	-	<2
>C16-C21 Aliphatics	mg/kg			-	<8
>C21-C35 Aliphatics	mg/kg			-	<8
>C35-C40 Aliphatics	mg/kg			-	<10
>C5-C35 Aliphatics	mg/kg			-	<10
>EC5-EC7 Aromatics	mg/kg		26000[#15]	-	<0.001
>EC7-EC8 Aromatics	mg/kg		56000[#15]	-	<0.001
>EC8-EC10 Aromatics	mg/kg		3500[#15]	-	<0.001
>EC10-EC12 Aromatics	mg/kg		16000[#15]	-	<1
>EC12-EC16 Aromatics	mg/kg		36000[#15]	-	<2
>EC16-EC21 Aromatics	mg/kg		28000[#15]	-	<10
>EC21-EC35 Aromatics	mg/kg		28000[#15]	-	<10
>EC35-EC40 Aromatics	mg/kg			-	<10
>EC5-EC35 Aromatics	mg/kg			-	13
>C5-C40 Aliphatics & Aromatics	mg/kg			-	<10
BTEX					
Benzene	mg/kg		27[#15]	-	<0.001
Toluene	mg/kg		56000[#15]	-	<0.001
Ethylbenzene	mg/kg		5700[#15]	-	<0.001
Xylene (m & p)	mg/kg			-	<0.001
Xylene (o)	mg/kg		6600[#15]	-	<0.001
Oxygenates					
MTBE	mg/kg		7900[#16]	-	<0.001
Chlorinated Hydrocarbons					
Chloromethane	mg/kg		1[#16]	-	-
Vinyl chloride	mg/kg		0.059[#15]	-	-
Chloroethane	mg/kg		960[#16]	-	-
1,1-dichloroethene	mg/kg		26[#16]	-	-
trans-1,2-dichloroethene	mg/kg		22[#16]	-	-
1,1-dichloroethane	mg/kg		280[#16]	-	-
cis-1,2-dichloroethene	mg/kg		14[#16]	-	-
Chloroform	mg/kg		99[#15]	-	-
1,1,1-trichloroethane	mg/kg		660[#15]	-	-
Carbon tetrachloride	mg/kg		2.9[#15]	-	-
Trichloroethene	mg/kg		1.2[#15]	-	-
1,1,2-trichloroethane	mg/kg		94[#16]	-	-
Tetrachloroethene	mg/kg		19[#15]	-	-
VOC					

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	TP08	TP10
Date	05/07/2019	05/07/2019
Sample_Depth_Range	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC		
2,2-dichloropropane	mg/kg			-	-
1,1-dichloropropene	mg/kg			-	-
1,2-dichloroethane	mg/kg		0.67[#15]	-	-
1,2-dichloropropane	mg/kg		3.3[#16]	-	-
Dibromomethane	mg/kg		99[#11]	-	-
Bromodichloromethane	mg/kg		1.3[#11]	-	-
cis-1,3-dichloropropene	mg/kg			-	-
trans-1,3-dichloropropene	mg/kg			-	-
1,3-dichloropropane	mg/kg		23000[#11]	-	-
Chlorodibromomethane	mg/kg		39[#11]	-	-
1,1,1,2-tetrachloroethane	mg/kg		110[#15]	-	-
Styrene	mg/kg		3300[#16]	-	-
Isopropylbenzene	mg/kg		1400[#16]	-	-
1,1,2,2-tetrachloroethane	mg/kg		270[#15]	-	-
n-propylbenzene	mg/kg		4100[#16]	-	-
1,3,5-trimethylbenzene	mg/kg		1500[#11]	-	-
tert-butylbenzene	mg/kg		120000[#11]	-	-
1,2,4-trimethylbenzene	mg/kg		42[#16]	-	-
sec-butylbenzene	mg/kg		120000[#11]	-	-
p-isopropyltoluene	mg/kg			-	-
n-butylbenzene	mg/kg		58000[#11]	-	-
1,2-dibromo-3-chloropropane	mg/kg		0.064[#11]	-	-
Hexachlorobutadiene	mg/kg		31[#15]	-	<0.0001
PAH					
Naphthalene	mg/kg		190[#15]	-	<0.00005
Acenaphthylene	mg/kg		83000[#15]	-	<0.00005
Acenaphthene	mg/kg		84000[#15]	-	<0.00005
Fluorene	mg/kg		63000[#15]	-	<0.00005
Phenanthrene	mg/kg		22000[#15]	-	0.0015
Anthracene	mg/kg		520000[#15]	-	0.00036
Fluoranthene	mg/kg		23000[#15]	-	0.0014
Pyrene	mg/kg		54000[#15]	-	0.0012
Benz(a)anthracene	mg/kg		170[#15]	-	0.00048
Chrysene	mg/kg		350[#15]	-	0.00048
Benzo(a) pyrene	mg/kg		35[#15]	-	0.00043
Indeno(1,2,3-c,d)pyrene	mg/kg		500[#15]	-	0.00017
Dibenz(a,h)anthracene	mg/kg		3.5[#15]	-	<0.00005
Benzo(g,h,i)perylene	mg/kg		3900[#15]	-	0.00021
Benzo(b)fluoranthene	mg/kg		44[#15]	-	0.0005
Benzo(k)fluoranthene	mg/kg		1200[#15]	-	0.00019
PAH 16 Total	mg/kg			-	-
SVOC					
2-methylnaphthalene	mg/kg		3000[#11]	-	<0.0001
4-bromophenyl phenyl ether	mg/kg			-	<0.0002
4-chlorophenyl phenyl ether	mg/kg			-	<0.0003
Azobenzene	mg/kg		26[#11]	-	<0.0003
Bis(2-chloroethoxy) methane	mg/kg		2500[#11]	-	<0.0003

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	TP08	TP10
Date	05/07/2019	05/07/2019
Sample_Depth_Range	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC		
Bis(2-chloroethyl)ether	mg/kg		1[#11]	-	<0.0002
Carbazole	mg/kg			-	<0.0003
Dibenzofuran	mg/kg		1000[#11]	-	<0.0002
Hexachloroethane	mg/kg		22[#16]	-	<0.00005
Bis(2-chloroisopropyl) ether	mg/kg		47000[#11]	-	<0.0001
Phenolics					
2-methylphenol	mg/kg		160000[#16]	-	<0.0003
2-nitrophenol	mg/kg			-	<0.0003
2,4-dimethylphenol	mg/kg		16000[#16]	-	<0.0003
4-chloro-3-methylphenol	mg/kg		82000[#11]	-	<0.0001
4-methylphenol	mg/kg		160000[#16]	-	<0.0002
Phenol	mg/kg		440[#15]	<0.1	<0.1
2-chloronaphthalene	mg/kg		390[#16]	-	<0.0001
Cresol Total	mg/kg		160000[#16]	<0.3	<0.3
Phenols	mg/kg			<1.3	<1.3
resorcinol (m-dihydroxybenzene)	mg/kg			<0.1	<0.1
catechol (o-dihydroxybenzene)	mg/kg			<0.1	<0.1
2,3,5-trimethyl phenol	mg/kg			<0.1	<0.1
2-isopropylphenol	mg/kg			<0.1	<0.1
Anilines					
Aniline	mg/kg		400[#11]	-	<0.0001
4-chloroaniline	mg/kg		11[#11]	-	<0.0001
4-nitroaniline	mg/kg		110[#11]	-	<0.0002
Explosives					
2,4-Dinitrotoluene	mg/kg		3700[#16]	-	<0.0002
2,6-dinitrotoluene	mg/kg		1900[#16]	-	<0.0001
Nitrobenzene	mg/kg		22[#11]	-	<0.0003
Halogenated Benzenes					
Chlorobenzene	mg/kg		56[#15]	-	-
Bromobenzene	mg/kg		97[#16]	-	-
2-chlorotoluene	mg/kg		23000[#11]	-	-
4-chlorotoluene	mg/kg		23000[#11]	-	-
1,3-dichlorobenzene	mg/kg		30[#15]	-	<0.0002
1,4-dichlorobenzene	mg/kg		4400[#15]	-	<0.0002
1,2-dichlorobenzene	mg/kg		2000[#15]	-	<0.0001
1,2,4-trichlorobenzene	mg/kg		220[#15]	-	<0.0003
1,2,3-trichlorobenzene	mg/kg		102[#15]	-	-
Hexachlorobenzene	mg/kg		110[#15]	-	<0.0003
Halogenated Hydrocarbons					
Bromomethane	mg/kg		30[#11]	-	-
Trichlorofluoromethane	mg/kg		350000[#11]	-	-
1,2-dibromoethane	mg/kg		0.16[#11]	-	-
Halogenated Phenols					
2-chlorophenol	mg/kg		5800[#11]	-	<0.0001
2,4-dichlorophenol	mg/kg		2500[#11]	-	<0.0003
2,4,5-trichlorophenol	mg/kg		82000[#11]	-	<0.0002
2,4,6-trichlorophenol	mg/kg		210[#11]	-	<0.0001

Soil Results for Made Ground
Analytical Results
M54-M6 Link Road
Highways England

Location	TP08	TP10
Date	05/07/2019	05/07/2019
Sample_Depth_Range	-0.5	-0.5
Matrix_Description	Made Ground	Made Ground

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC		
Phthalates					
Butyl benzyl phthalate	mg/kg		940000[#16]	-	<0.0003
Di-n-butyl phthalate	mg/kg		15000[#16]	-	<0.0002
Diethylphthalate	mg/kg		150000[#16]	-	<0.0002
Dimethyl phthalate	mg/kg			-	<0.0001
Solvents					
Isophorone	mg/kg		2400[#11]	-	<0.0002
Metals					
Arsenic	mg/kg		640[#15]	2.2	5
Cadmium	mg/kg		190[#15]	<0.2	<0.2
Copper	mg/kg		68000[#15]	7.3	15
Iron	mg/kg		820000[#11]	7,700	25,000
Lead	mg/kg		2300[#17]	9.9	5
Mercury	mg/kg			<0.3	<0.3
Nickel	mg/kg		980[#15]	4.4	21
Selenium	mg/kg		12000[#15]	<1	<1
Zinc	mg/kg		730000[#15]	21	37
Chromium (hexavalent)	mg/kg		33[#15]	<1.2	<1.2
Organics					
Organic Matter	%			0.8	0.3
Inorganics					
Cyanide (Free)	mg/kg			<1	<1
Cyanide Total	mg/kg		150[#11]	<1	<1
Moisture	%			6	11
Ammoniacal Nitrogen as N	mg/kg			<0.5	<0.5
pH (Lab)	pH_Units			7.5	7.6

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - MAC-EQS Inland
#7 WFD England/Wales. 2015 - Freshwater Standards
#8 WFD England/Wales. 2015 - AA-EQS Inland
#9 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#10 USEPA RSL (tapwater) [May 2019]
#11 USEPA RSL (May 2019)
#12 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#13 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#14 PNEC (EU REACH) - Freshwater
#15 LQM/CIEH S4ULs 2015
#16 EIC/AGS/CL:AIRE
#17 Defra C4SL 12/2014
#18 California Draft health protective concentration
#19 AECOM DWG (WHO method)

Soil Results for Natural Deposits
Analytical Results
M54-M6 Link Road
Highways England

Location	BH06	BH11	BH13	BH14	BH15	BH16	BH17	BH18
Date	18/06/2019	05/07/2019	16/07/2019	07/07/2019	10/07/2019	18/07/2019	11/07/2019	16/07/2019
Sample_Depth_Range	-3	-2.5	-2.5	-1.5	-1.5	-2.5	-1.5	-0.5
Matrix_Description	Clay	Sand	Sand	Sand	Clay	Sand	Gravel	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Methacriphos	mg/kg			-	-	-	-	-	-	-	-
Trietazine	mg/kg			-	-	-	-	-	-	-	-
Boron (Water Soluble)	mg/kg			0.9	0.4	0.6	0.7	0.7	0.4	0.5	0.5
Tribromomethane	mg/kg			-	-	-	<0.001	-	-	-	-
Freon 113	mg/kg		28000[#1]	-	-	-	<0.001	-	-	-	-
Chlorothalonil	mg/kg		740[#1]	-	-	-	-	-	-	-	-
Tecnazene	mg/kg			-	-	-	-	-	-	-	-
Etrimphos	mg/kg			-	-	-	-	-	-	-	-
Propetamphos	mg/kg			-	-	-	-	-	-	-	-
2,4-DB	mg/kg			-	-	-	-	-	-	-	-
Xylenols & Ethylphenols	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phosphamidon I	mg/kg			-	-	-	-	-	-	-	-
tetrachlorobenzene	mg/kg			-	-	-	-	-	-	-	-
Organic											
Terbutylazine	mg/kg			-	-	-	-	-	-	-	-
TPH											
>C5-C6 Aliphatics	mg/kg		3200[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
>C6-C8 Aliphatics	mg/kg		7800[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
>C8-C10 Aliphatics	mg/kg		2000[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
>C10-C12 Aliphatics	mg/kg		9700[#2]	-	-	<1	<1	<1	<1	-	<1
>C12-C16 Aliphatics	mg/kg		59000[#2]	-	-	<2	<2	<2	<2	-	<2
>C16-C21 Aliphatics	mg/kg			-	-	<8	<8	<8	<8	-	<8
>C21-C35 Aliphatics	mg/kg			-	-	<8	<8	<8	<8	-	<8
>C35-C40 Aliphatics	mg/kg			-	-	<10	<10	<10	<10	-	<10
>C5-C35 Aliphatics	mg/kg			-	-	<10	<10	<10	<10	-	<10
>EC5-EC7 Aromatics	mg/kg		26000[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
>EC7-EC8 Aromatics	mg/kg		56000[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
>EC8-EC10 Aromatics	mg/kg		3500[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
>EC10-EC12 Aromatics	mg/kg		16000[#2]	-	-	<1	<1	<1	<1	-	<1
>EC12-EC16 Aromatics	mg/kg		36000[#2]	-	-	<2	<2	<2	<2	-	<2
>EC16-EC21 Aromatics	mg/kg		28000[#2]	-	-	<10	<10	<10	<10	-	<10
>EC21-EC35 Aromatics	mg/kg		28000[#2]	-	-	<10	<10	<10	<10	-	<10
>EC35-EC40 Aromatics	mg/kg			-	-	<10	<10	<10	<10	-	<10
>EC5-EC35 Aromatics	mg/kg			-	-	<10	<10	<10	<10	-	<10
>C5-C40 Aliphatics & Aromatics	mg/kg			-	-	<10	<10	<10	<10	-	<10
BTEX											
Benzene	mg/kg		27[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
Toluene	mg/kg		56000[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
Ethylbenzene	mg/kg		5700[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
Xylene (m & p)	mg/kg			-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
Xylene (o)	mg/kg		6600[#2]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
Oxygenates											
MTBE	mg/kg		7900[#3]	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.001
Chlorinated Hydrocarbons											
Chloromethane	mg/kg		1[#3]	-	-	-	<0.001	-	-	-	-
Vinyl chloride	mg/kg		0.059[#2]	-	-	-	<0.001	-	-	-	-
Chloroethane	mg/kg		960[#3]	-	-	-	<0.001	-	-	-	-

Soil Results for Natural Deposits
Analytical Results
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Highways England

Location	BH06	BH11	BH13	BH14	BH15	BH16	BH17	BH18
Date	18/06/2019	05/07/2019	16/07/2019	07/07/2019	10/07/2019	18/07/2019	11/07/2019	16/07/2019
Sample_Depth_Range	-3	-2.5	-2.5	-1.5	-1.5	-2.5	-1.5	-0.5
Matrix_Description	Clay	Sand	Sand	Sand	Clay	Sand	Gravel	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
1,1-dichloroethene	mg/kg		26[#3]	-	-	-	<0.001	-	-	-	-
trans-1,2-dichloroethene	mg/kg		22[#3]	-	-	-	<0.001	-	-	-	-
1,1-dichloroethane	mg/kg		280[#3]	-	-	-	<0.001	-	-	-	-
cis-1,2-dichloroethene	mg/kg		14[#3]	-	-	-	<0.001	-	-	-	-
Chloroform	mg/kg		99[#2]	-	-	-	<0.001	-	-	-	-
1,1,1-trichloroethane	mg/kg		660[#2]	-	-	-	<0.001	-	-	-	-
Carbon tetrachloride	mg/kg		2.9[#2]	-	-	-	<0.001	-	-	-	-
Trichloroethene	mg/kg		1.2[#2]	-	-	-	<0.001	-	-	-	-
1,1,2-trichloroethane	mg/kg		94[#3]	-	-	-	<0.001	-	-	-	-
Tetrachloroethene	mg/kg		19[#2]	-	-	-	<0.001	-	-	-	-
VOC											
2,2-dichloropropane	mg/kg			-	-	-	<0.001	-	-	-	-
1,1-dichloropropene	mg/kg			-	-	-	<0.001	-	-	-	-
1,2-dichloroethane	mg/kg		0.67[#2]	-	-	-	<0.001	-	-	-	-
1,2-dichloropropane	mg/kg		3.3[#3]	-	-	-	<0.001	-	-	-	-
Dibromomethane	mg/kg		99[#1]	-	-	-	<0.001	-	-	-	-
Bromodichloromethane	mg/kg		1.3[#1]	-	-	-	<0.001	-	-	-	-
cis-1,3-dichloropropene	mg/kg			-	-	-	<0.001	-	-	-	-
trans-1,3-dichloropropene	mg/kg			-	-	-	<0.001	-	-	-	-
1,3-dichloropropane	mg/kg		23000[#1]	-	-	-	<0.001	-	-	-	-
Chlorodibromomethane	mg/kg		39[#1]	-	-	-	<0.001	-	-	-	-
1,1,1,2-tetrachloroethane	mg/kg		110[#2]	-	-	-	<0.001	-	-	-	-
Styrene	mg/kg		3300[#3]	-	-	-	<0.001	-	-	-	-
Isopropylbenzene	mg/kg		1400[#3]	-	-	-	<0.001	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		270[#2]	-	-	-	<0.001	-	-	-	-
n-propylbenzene	mg/kg		4100[#3]	-	-	-	<0.001	-	-	-	-
1,3,5-trimethylbenzene	mg/kg		1500[#1]	-	-	-	<0.001	-	-	-	-
tert-butylbenzene	mg/kg		120000[#1]	-	-	-	<0.001	-	-	-	-
1,2,4-trimethylbenzene	mg/kg		42[#3]	-	-	-	<0.001	-	-	-	-
sec-butylbenzene	mg/kg		120000[#1]	-	-	-	<0.001	-	-	-	-
p-isopropyltoluene	mg/kg			-	-	-	<0.001	-	-	-	-
n-butylbenzene	mg/kg		58000[#1]	-	-	-	<0.001	-	-	-	-
1,2-dibromo-3-chloropropane	mg/kg		0.064[#1]	-	-	-	<0.001	-	-	-	-
Hexachlorobutadiene	mg/kg		31[#2]	-	-	-	<0.001	-	-	-	<0.0001
PAH											
Naphthalene	mg/kg		190[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Acenaphthylene	mg/kg		83000[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Acenaphthene	mg/kg		84000[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Fluorene	mg/kg		63000[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Phenanthrene	mg/kg		22000[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Anthracene	mg/kg		520000[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Fluoranthene	mg/kg		23000[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Pyrene	mg/kg		54000[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Benz(a)anthracene	mg/kg		170[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Chrysene	mg/kg		350[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Benzo(a) pyrene	mg/kg		35[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg		500[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05

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Analytical Results
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Highways England

Location	BH06	BH11	BH13	BH14	BH15	BH16	BH17	BH18
Date	18/06/2019	05/07/2019	16/07/2019	07/07/2019	10/07/2019	18/07/2019	11/07/2019	16/07/2019
Sample_Depth_Range	-3	-2.5	-2.5	-1.5	-1.5	-2.5	-1.5	-0.5
Matrix_Description	Clay	Sand	Sand	Sand	Clay	Sand	Gravel	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Dibenz(a,h)anthracene	mg/kg		3.5[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	mg/kg		3900[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	mg/kg		44[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	mg/kg		1200[#2]	-	<0.05	<0.05	<0.00005	-	<0.05	<0.05	<0.05
PAH 16 Total	mg/kg			-	<0.8	<0.8	-	-	<0.8	<0.8	<0.8
SVOC											
2-methylnaphthalene	mg/kg		3000[#1]	-	-	-	<0.0001	-	-	-	<0.0001
4-bromophenyl phenyl ether	mg/kg			-	-	-	<0.0002	-	-	-	<0.0002
4-chlorophenyl phenyl ether	mg/kg			-	-	-	<0.0003	-	-	-	<0.0003
Azobenzene	mg/kg		26[#1]	-	-	-	<0.0003	-	-	-	<0.0003
Bis(2-chloroethoxy) methane	mg/kg		2500[#1]	-	-	-	<0.0003	-	-	-	<0.0003
Bis(2-chloroethyl)ether	mg/kg		1[#1]	-	-	-	<0.0002	-	-	-	<0.0002
Carbazole	mg/kg			-	-	-	<0.0003	-	-	-	<0.0003
Dibenzofuran	mg/kg		1000[#1]	-	-	-	<0.0002	-	-	-	<0.0002
Hexachloroethane	mg/kg		22[#3]	-	-	-	<0.00005	-	-	-	<0.00005
Bis(2-chloroisopropyl) ether	mg/kg		47000[#1]	-	-	-	<0.0001	-	-	-	<0.0001
Phenolics											
2-methylphenol	mg/kg		16000[#3]	-	-	-	<0.0003	-	-	-	<0.0003
2-nitrophenol	mg/kg			-	-	-	<0.0003	-	-	-	<0.0003
2,4-dimethylphenol	mg/kg		16000[#3]	-	-	-	<0.0003	-	-	-	<0.0003
4-chloro-3-methylphenol	mg/kg		82000[#1]	-	-	-	<0.0001	-	-	-	<0.0001
4-methylphenol	mg/kg		16000[#3]	-	-	-	<0.0002	-	-	-	<0.0002
Phenol	mg/kg		440[#2]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-chloronaphthalene	mg/kg		390[#3]	-	-	-	<0.0001	-	-	-	<0.0001
Cresol Total	mg/kg		160000[#3]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phenols	mg/kg			<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
resorcinol (m-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
catechol (o-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,5-trimethyl phenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-isopropylphenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fungicides											
Triadimefon	mg/kg		28000[#1]	-	-	-	-	-	-	-	-
Herbicides											
Pendimethalin	mg/kg		250000[#1]	-	-	-	-	-	-	-	-
Trifluralin	mg/kg		420[#1]	-	-	-	-	-	-	-	-
Hedonal	mg/kg		9600[#1]	-	-	-	-	-	-	-	-
Dicamba	mg/kg		25000[#1]	-	-	-	-	-	-	-	-
2,4-Dichlorprop	mg/kg			-	-	-	-	-	-	-	-
2-Methyl-4-chlorophenoxyacetic acid	mg/kg		410[#1]	-	-	-	-	-	-	-	-
2-Methyl-4-Chlorophenoxy Butanoic Acid	mg/kg		3600[#1]	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenoxy Acetic Acid	mg/kg		8200[#1]	-	-	-	-	-	-	-	-
Atrazine	mg/kg		9300[#2]	-	-	-	-	-	-	-	-
Simazine	mg/kg		19[#1]	-	-	-	-	-	-	-	-
Chlorotoluron	mg/kg			-	-	-	-	-	-	-	-
Cyanazine	mg/kg		2.7[#1]	-	-	-	-	-	-	-	-
Dichlobenil	mg/kg			-	-	-	-	-	-	-	-
Dinoseb	mg/kg		820[#1]	-	-	-	-	-	-	-	-

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Highways England

Location	BH06	BH11	BH13	BH14	BH15	BH16	BH17	BH18
Date	18/06/2019	05/07/2019	16/07/2019	07/07/2019	10/07/2019	18/07/2019	11/07/2019	16/07/2019
Sample_Depth_Range	-3	-2.5	-2.5	-1.5	-1.5	-2.5	-1.5	-0.5
Matrix_Description	Clay	Sand	Sand	Sand	Clay	Sand	Gravel	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Fluometuron	mg/kg		11000[#1]	-	-	-	-	-	-	-	-
Isoproturon	mg/kg			-	-	-	-	-	-	-	-
Mecoprop	mg/kg		820[#1]	-	-	-	-	-	-	-	-
Picloram	mg/kg		57000[#1]	-	-	-	-	-	-	-	-
Prometryn	mg/kg		33000[#1]	-	-	-	-	-	-	-	-
Pronamide	mg/kg		62000[#1]	-	-	-	-	-	-	-	-
Propazine	mg/kg		16000[#1]	-	-	-	-	-	-	-	-
Tebuthiuron	mg/kg		57000[#1]	-	-	-	-	-	-	-	-
Terbutryn	mg/kg		820[#1]	-	-	-	-	-	-	-	-
Diuron	mg/kg		1600[#1]	-	-	-	-	-	-	-	-
Linuron	mg/kg		6300[#1]	-	-	-	-	-	-	-	-
Pesticides											
Isodrin	mg/kg			-	-	-	-	-	-	-	-
Parathion	mg/kg		4900[#1]	-	-	-	-	-	-	-	-
Pirimiphos-methyl	mg/kg		57[#1]	-	-	-	-	-	-	-	-
Diflubenzuron	mg/kg		16000[#1]	-	-	-	-	-	-	-	-
Organochlorine Pesticides											
Aldrin	mg/kg		170[#2]	-	-	-	-	-	-	-	-
Chlordane (cis)	mg/kg			-	-	-	-	-	-	-	-
Dieldrin	mg/kg		170[#2]	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg		5600[#2]	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg		6300[#2]	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg		4900[#1]	-	-	-	-	-	-	-	-
Endrin	mg/kg		250[#1]	-	-	-	-	-	-	-	-
Heptachlor	mg/kg		0.63[#1]	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg		0.33[#1]	-	-	-	-	-	-	-	-
DDT	mg/kg		8.5[#1]	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg		4100[#1]	-	-	-	-	-	-	-	-
DDD	mg/kg		9.6[#1]	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg			-	-	-	-	-	-	-	-
DDE	mg/kg			-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg			-	-	-	-	-	-	-	-
Endrin ketone	mg/kg			-	-	-	-	-	-	-	-
Organophosphorous Pesticides											
Azinphos Ethyl	mg/kg			-	-	-	-	-	-	-	-
Azinophos methyl	mg/kg		2500[#1]	-	-	-	-	-	-	-	-
Carbophenothion	mg/kg			-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg		570[#1]	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg		820[#1]	-	-	-	-	-	-	-	-
Diazinon	mg/kg		570[#1]	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg		140[#2]	-	-	-	-	-	-	-	-
Dimethoate	mg/kg		1800[#1]	-	-	-	-	-	-	-	-
Ethion	mg/kg		410[#1]	-	-	-	-	-	-	-	-
Fenitrothion	mg/kg			-	-	-	-	-	-	-	-
Fenthion	mg/kg			-	-	-	-	-	-	-	-
Malathion	mg/kg		16000[#1]	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg		210[#1]	-	-	-	-	-	-	-	-

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Highways England

Location	BH06	BH11	BH13	BH14	BH15	BH16	BH17	BH18
Date	18/06/2019	05/07/2019	16/07/2019	07/07/2019	10/07/2019	18/07/2019	11/07/2019	16/07/2019
Sample_Depth_Range	-3	-2.5	-2.5	-1.5	-1.5	-2.5	-1.5	-0.5
Matrix_Description	Clay	Sand	Sand	Sand	Clay	Sand	Gravel	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Demeton-O	mg/kg			-	-	-	-	-	-	-	-
Demeton-S	mg/kg			-	-	-	-	-	-	-	-
Phorate	mg/kg		160[#1]	-	-	-	-	-	-	-	-
Anilines											
Aniline	mg/kg		400[#1]	-	-	-	<0.0001	-	-	-	<0.0001
4-chloroaniline	mg/kg		11[#1]	-	-	-	<0.0001	-	-	-	<0.0001
4-nitroaniline	mg/kg		110[#1]	-	-	-	<0.0002	-	-	-	<0.0002
Explosives											
2,4-Dinitrotoluene	mg/kg		3700[#3]	-	-	-	<0.0002	-	-	-	<0.0002
2,6-dinitrotoluene	mg/kg		1900[#3]	-	-	-	<0.0001	-	-	-	<0.0001
Nitrobenzene	mg/kg		22[#1]	-	-	-	<0.0003	-	-	-	<0.0003
Halogenated Benzenes											
Chlorobenzene	mg/kg		56[#2]	-	-	-	<0.001	-	-	-	-
Bromobenzene	mg/kg		97[#3]	-	-	-	<0.001	-	-	-	-
2-chlorotoluene	mg/kg		23000[#1]	-	-	-	<0.001	-	-	-	-
4-chlorotoluene	mg/kg		23000[#1]	-	-	-	<0.001	-	-	-	-
1,3-dichlorobenzene	mg/kg		30[#2]	-	-	-	<0.001	-	-	-	<0.0002
1,4-dichlorobenzene	mg/kg		4400[#2]	-	-	-	<0.001	-	-	-	<0.0002
1,2-dichlorobenzene	mg/kg		2000[#2]	-	-	-	<0.001	-	-	-	<0.0001
1,2,4-trichlorobenzene	mg/kg		220[#2]	-	-	-	<0.001	-	-	-	<0.0003
1,2,3-trichlorobenzene	mg/kg		102[#2]	-	-	-	<0.001	-	-	-	-
Hexachlorobenzene	mg/kg		110[#2]	-	-	-	<0.0003	-	-	-	<0.0003
Pentachlorobenzene	mg/kg		640[#2]	-	-	-	-	-	-	-	-
Trichlorobenzene (total)	mg/kg			-	-	-	-	-	-	-	-
Halogenated Hydrocarbons											
Bromomethane	mg/kg		30[#1]	-	-	-	<0.001	-	-	-	-
Trichlorofluoromethane	mg/kg		350000[#1]	-	-	-	<0.001	-	-	-	-
1,2-dibromoethane	mg/kg		0.16[#1]	-	-	-	<0.001	-	-	-	-
Halogenated Phenols											
2-chlorophenol	mg/kg		5800[#1]	-	-	-	<0.0001	-	-	-	<0.0001
2,4-dichlorophenol	mg/kg		2500[#1]	-	-	-	<0.0003	-	-	-	<0.0003
2,4,5-trichlorophenol	mg/kg		82000[#1]	-	-	-	<0.0002	-	-	-	<0.0002
2,4,6-trichlorophenol	mg/kg		210[#1]	-	-	-	<0.0001	-	-	-	<0.0001
Phthalates											
Butyl benzyl phthalate	mg/kg		940000[#3]	-	-	-	<0.0003	-	-	-	<0.0003
Di-n-butyl phthalate	mg/kg		15000[#3]	-	-	-	<0.0002	-	-	-	<0.0002
Diethylphthalate	mg/kg		150000[#3]	-	-	-	<0.0002	-	-	-	<0.0002
Dimethyl phthalate	mg/kg			-	-	-	<0.0001	-	-	-	<0.0001
Solvents											
Isophorone	mg/kg		2400[#1]	-	-	-	<0.0002	-	-	-	<0.0002
Metals											
Arsenic	mg/kg		640[#2]	5.3	4.3	4.2	5.2	7.9	3.5	3.7	5.5
Cadmium	mg/kg		190[#2]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	mg/kg		68000[#2]	19	13	38	8.9	45	14	18	20
Iron	mg/kg		820000[#1]	25,000	24,000	18,000	21,000	19,000	9,200	13,000	18,000
Lead	mg/kg		2300[#4]	4.6	20	5.8	5.9	67	6	7	8.7
Mercury	mg/kg			<0.3	<0.3	<0.3	<0.3	0.8	<0.3	<0.3	<0.3

Soil Results for Natural Deposits
Analytical Results
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Highways England

Location	BH06	BH11	BH13	BH14	BH15	BH16	BH17	BH18
Date	18/06/2019	05/07/2019	16/07/2019	07/07/2019	10/07/2019	18/07/2019	11/07/2019	16/07/2019
Sample_Depth_Range	-3	-2.5	-2.5	-1.5	-1.5	-2.5	-1.5	-0.5
Matrix_Description	Clay	Sand	Sand	Sand	Clay	Sand	Gravel	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Nickel	mg/kg		980[#2]	27	10	9.8	13	13	8.8	9	13
Selenium	mg/kg		12000[#2]	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	mg/kg		730000[#2]	46	23	21	19	53	24	20	28
Chromium (hexavalent)	mg/kg		33[#2]	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Organics											
Organic Matter	%			0.6	0.5	0.7	0.4	0.4	0.7	0.3	0.4
Inorganics											
Cyanide (Free)	mg/kg			<1	<1	<1	<1	<1	<1	<1	<1
Cyanide Total	mg/kg		150[#1]	<1	<1	<1	<1	<1	<1	<1	<1
Moisture	%			12	9	9.8	12	6.5	11	10	8
Ammoniacal Nitrogen as N	mg/kg			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
pH (Lab)	pH_Units			6.7	8.3	6.7	5.6	7.3	7.5	7.8	7.5
Other											
Phosalone	mg/kg			-	-	-	-	-	-	-	-
Triazophos	mg/kg			-	-	-	-	-	-	-	-

Comments
#1 USEPA RSL (May 2019)
#2 LQM/CIEH S4ULs 2015
#3 EIC/AGS/CL:AIRE
#4 Defra C4SL 12/2014

Soil Results for Natural Deposits
Analytical Results
M54-M6 Link Road
Highways England

Location	BH21	BH23	BH24	TP11	TP13	TP14	TP15	TP16
Date	23/07/2019	15/07/2019	11/07/2019	11/07/2019	09/07/2019	10/07/2019	09/07/2019	10/07/2019
Sample_Depth_Range	-1.5	-0.5	-4.5	-0.2	-0.5	-0.5	-0.5	-2
Matrix_Description	Sand	Sand	Sand	Gravel	Sand	Sand	Sand	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Methacriphos	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Trietazine	mg/kg			-	-	-	-	<0.1	<0.1	<0.1	-
Boron (Water Soluble)	mg/kg			0.3	0.9	0.4	0.5	0.3	0.4	0.3	0.5
Tribromomethane	mg/kg			-	-	<0.001	-	-	<0.001	-	-
Freon 113	mg/kg		28000[#1]	-	-	<0.001	-	-	<0.001	-	-
Chlorothalonil	mg/kg		740[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Tecnazene	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Etrimphos	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Propetamphos	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
2,4-DB	mg/kg			-	-	-	-	<0.02	<0.02	<0.02	-
Xylenols & Ethylphenols	mg/kg			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phosphamidon I	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
tetrachlorobenzene	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Organic											
Terbutylazine	mg/kg			-	-	-	-	<0.1	<0.1	<0.1	-
TPH											
>C5-C6 Aliphatics	mg/kg		3200[#2]	-	-	<0.001	-	-	-	-	-
>C6-C8 Aliphatics	mg/kg		7800[#2]	-	-	<0.001	-	-	-	-	-
>C8-C10 Aliphatics	mg/kg		2000[#2]	-	-	<0.001	-	-	-	-	-
>C10-C12 Aliphatics	mg/kg		9700[#2]	-	-	<1	-	-	-	-	-
>C12-C16 Aliphatics	mg/kg		59000[#2]	-	-	<2	-	-	-	-	-
>C16-C21 Aliphatics	mg/kg			-	-	<8	-	-	-	-	-
>C21-C35 Aliphatics	mg/kg			-	-	<8	-	-	-	-	-
>C35-C40 Aliphatics	mg/kg			-	-	<10	-	-	-	-	-
>C5-C35 Aliphatics	mg/kg			-	-	<10	-	-	-	-	-
>EC5-EC7 Aromatics	mg/kg		26000[#2]	-	-	<0.001	-	-	-	-	-
>EC7-EC8 Aromatics	mg/kg		56000[#2]	-	-	<0.001	-	-	-	-	-
>EC8-EC10 Aromatics	mg/kg		3500[#2]	-	-	<0.001	-	-	-	-	-
>EC10-EC12 Aromatics	mg/kg		16000[#2]	-	-	<1	-	-	-	-	-
>EC12-EC16 Aromatics	mg/kg		36000[#2]	-	-	<2	-	-	-	-	-
>EC16-EC21 Aromatics	mg/kg		28000[#2]	-	-	<10	-	-	-	-	-
>EC21-EC35 Aromatics	mg/kg		28000[#2]	-	-	<10	-	-	-	-	-
>EC35-EC40 Aromatics	mg/kg			-	-	<10	-	-	-	-	-
>EC5-EC35 Aromatics	mg/kg			-	-	<10	-	-	-	-	-
>C5-C40 Aliphatics & Aromatics	mg/kg			-	-	<10	-	-	-	-	-
BTEX											
Benzene	mg/kg		27[#2]	-	-	<0.001	-	-	<0.001	-	-
Toluene	mg/kg		56000[#2]	-	-	<0.001	-	-	<0.001	-	-
Ethylbenzene	mg/kg		5700[#2]	-	-	<0.001	-	-	<0.001	-	-
Xylene (m & p)	mg/kg			-	-	<0.001	-	-	<0.001	-	-
Xylene (o)	mg/kg		6600[#2]	-	-	<0.001	-	-	<0.001	-	-
Oxygenates											
MTBE	mg/kg		7900[#3]	-	-	<0.001	-	-	<0.001	-	-
Chlorinated Hydrocarbons											
Chloromethane	mg/kg		1[#3]	-	-	<0.001	-	-	<0.001	-	-
Vinyl chloride	mg/kg		0.059[#2]	-	-	<0.001	-	-	<0.001	-	-
Chloroethane	mg/kg		960[#3]	-	-	<0.001	-	-	<0.001	-	-

Soil Results for Natural Deposits
Analytical Results
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Highways England

Location	BH21	BH23	BH24	TP11	TP13	TP14	TP15	TP16
Date	23/07/2019	15/07/2019	11/07/2019	11/07/2019	09/07/2019	10/07/2019	09/07/2019	10/07/2019
Sample_Depth_Range	-1.5	-0.5	-4.5	-0.2	-0.5	-0.5	-0.5	-2
Matrix_Description	Sand	Sand	Sand	Gravel	Sand	Sand	Sand	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
1,1-dichloroethene	mg/kg		26[#3]	-	-	<0.001	-	-	<0.001	-	-
trans-1,2-dichloroethene	mg/kg		22[#3]	-	-	<0.001	-	-	<0.001	-	-
1,1-dichloroethane	mg/kg		280[#3]	-	-	<0.001	-	-	<0.001	-	-
cis-1,2-dichloroethene	mg/kg		14[#3]	-	-	<0.001	-	-	<0.001	-	-
Chloroform	mg/kg		99[#2]	-	-	<0.001	-	-	<0.001	-	-
1,1,1-trichloroethane	mg/kg		660[#2]	-	-	<0.001	-	-	<0.001	-	-
Carbon tetrachloride	mg/kg		2.9[#2]	-	-	<0.001	-	-	<0.001	-	-
Trichloroethene	mg/kg		1.2[#2]	-	-	<0.001	-	-	<0.001	-	-
1,1,2-trichloroethane	mg/kg		94[#3]	-	-	<0.001	-	-	<0.001	-	-
Tetrachloroethene	mg/kg		19[#2]	-	-	<0.001	-	-	<0.001	-	-
VOC											
2,2-dichloropropane	mg/kg			-	-	<0.001	-	-	<0.001	-	-
1,1-dichloropropene	mg/kg			-	-	<0.001	-	-	<0.001	-	-
1,2-dichloroethane	mg/kg		0.67[#2]	-	-	<0.001	-	-	<0.001	-	-
1,2-dichloropropane	mg/kg		3.3[#3]	-	-	<0.001	-	-	<0.001	-	-
Dibromomethane	mg/kg		99[#1]	-	-	<0.001	-	-	<0.001	-	-
Bromodichloromethane	mg/kg		1.3[#1]	-	-	<0.001	-	-	<0.001	-	-
cis-1,3-dichloropropene	mg/kg			-	-	<0.001	-	-	<0.001	-	-
trans-1,3-dichloropropene	mg/kg			-	-	<0.001	-	-	<0.001	-	-
1,3-dichloropropane	mg/kg		23000[#1]	-	-	<0.001	-	-	<0.001	-	-
Chlorodibromomethane	mg/kg		39[#1]	-	-	<0.001	-	-	<0.001	-	-
1,1,1,2-tetrachloroethane	mg/kg		110[#2]	-	-	<0.001	-	-	<0.001	-	-
Styrene	mg/kg		3300[#3]	-	-	<0.001	-	-	<0.001	-	-
Isopropylbenzene	mg/kg		1400[#3]	-	-	<0.001	-	-	<0.001	-	-
1,1,2,2-tetrachloroethane	mg/kg		270[#2]	-	-	<0.001	-	-	<0.001	-	-
n-propylbenzene	mg/kg		4100[#3]	-	-	<0.001	-	-	<0.001	-	-
1,3,5-trimethylbenzene	mg/kg		1500[#1]	-	-	<0.001	-	-	<0.001	-	-
tert-butylbenzene	mg/kg		120000[#1]	-	-	<0.001	-	-	<0.001	-	-
1,2,4-trimethylbenzene	mg/kg		42[#3]	-	-	<0.001	-	-	<0.001	-	-
sec-butylbenzene	mg/kg		120000[#1]	-	-	<0.001	-	-	<0.001	-	-
p-isopropyltoluene	mg/kg			-	-	<0.001	-	-	<0.001	-	-
n-butylbenzene	mg/kg		58000[#1]	-	-	<0.001	-	-	<0.001	-	-
1,2-dibromo-3-chloropropane	mg/kg		0.064[#1]	-	-	<0.001	-	-	<0.001	-	-
Hexachlorobutadiene	mg/kg		31[#2]	-	-	<0.001	-	<0.01	<0.001	<0.01	-
PAH											
Naphthalene	mg/kg		190[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Acenaphthylene	mg/kg		83000[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Acenaphthene	mg/kg		84000[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Fluorene	mg/kg		63000[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Phenanthrene	mg/kg		22000[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Anthracene	mg/kg		520000[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Fluoranthene	mg/kg		23000[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Pyrene	mg/kg		54000[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Benz(a)anthracene	mg/kg		170[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Chrysene	mg/kg		350[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Benzo(a) pyrene	mg/kg		35[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		500[#2]	-	-	<0.00005	-	-	<0.00005	-	-

Soil Results for Natural Deposits
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Location	BH21	BH23	BH24	TP11	TP13	TP14	TP15	TP16
Date	23/07/2019	15/07/2019	11/07/2019	11/07/2019	09/07/2019	10/07/2019	09/07/2019	10/07/2019
Sample_Depth_Range	-1.5	-0.5	-4.5	-0.2	-0.5	-0.5	-0.5	-2
Matrix_Description	Sand	Sand	Sand	Gravel	Sand	Sand	Sand	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Dibenz(a,h)anthracene	mg/kg		3.5[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Benzo(g,h,i)perylene	mg/kg		3900[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Benzo(b)fluoranthene	mg/kg		44[#2]	-	-	<0.00005	-	-	<0.00005	-	-
Benzo(k)fluoranthene	mg/kg		1200[#2]	-	-	<0.00005	-	-	<0.00005	-	-
PAH 16 Total	mg/kg			-	-	-	-	-	-	-	-
SVOC											
2-methylnaphthalene	mg/kg		3000[#1]	-	-	<0.0001	-	-	<0.0001	-	-
4-bromophenyl phenyl ether	mg/kg			-	-	<0.0002	-	-	<0.0002	-	-
4-chlorophenyl phenyl ether	mg/kg			-	-	<0.0003	-	-	<0.0003	-	-
Azobenzene	mg/kg		26[#1]	-	-	<0.0003	-	-	<0.0003	-	-
Bis(2-chloroethoxy) methane	mg/kg		2500[#1]	-	-	<0.0003	-	-	<0.0003	-	-
Bis(2-chloroethyl)ether	mg/kg		1[#1]	-	-	<0.0002	-	-	<0.0002	-	-
Carbazole	mg/kg			-	-	<0.0003	-	-	<0.0003	-	-
Dibenzofuran	mg/kg		1000[#1]	-	-	<0.0002	-	-	<0.0002	-	-
Hexachloroethane	mg/kg		22[#3]	-	-	<0.00005	-	-	<0.00005	-	-
Bis(2-chloroisopropyl) ether	mg/kg		47000[#1]	-	-	<0.0001	-	-	<0.0001	-	-
Phenolics											
2-methylphenol	mg/kg		16000[#3]	-	-	<0.0003	-	-	<0.0003	-	<0.3
2-nitrophenol	mg/kg			-	-	<0.0003	-	-	<0.0003	-	<0.3
2,4-dimethylphenol	mg/kg		16000[#3]	-	-	<0.0003	-	-	<0.0003	-	<0.3
4-chloro-3-methylphenol	mg/kg		82000[#1]	-	-	<0.0001	-	-	<0.0001	-	<0.1
4-methylphenol	mg/kg		16000[#3]	-	-	<0.0002	-	-	<0.0002	-	<0.2
Phenol	mg/kg		440[#2]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-chloronaphthalene	mg/kg		390[#3]	-	-	<0.0001	-	-	<0.0001	-	-
Cresol Total	mg/kg		160000[#3]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Phenols	mg/kg			<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
resorcinol (m-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
catechol (o-dihydroxybenzene)	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,5-trimethyl phenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-isopropylphenol	mg/kg			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fungicides											
Triadimefon	mg/kg		28000[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Herbicides											
Pendimethalin	mg/kg		250000[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Trifluralin	mg/kg		420[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Hedonal	mg/kg		9600[#1]	-	-	-	-	<0.02	<0.02	<0.02	-
Dicamba	mg/kg		25000[#1]	-	-	-	-	<0.02	<0.02	<0.02	-
2,4-Dichlorprop	mg/kg			-	-	-	-	<0.02	<0.02	<0.02	-
2-Methyl-4-chlorophenoxyacetic acid	mg/kg		410[#1]	-	-	-	-	<0.02	<0.02	<0.02	-
2-Methyl-4-Chlorophenoxy Butanoic Acid	mg/kg		3600[#1]	-	-	-	-	<0.02	<0.02	<0.02	-
2,4,5-Trichlorophenoxy Acetic Acid	mg/kg		8200[#1]	-	-	-	-	<0.02	<0.02	<0.02	-
Atrazine	mg/kg		9300[#2]	-	-	-	-	<0.1	<0.1	<0.1	-
Simazine	mg/kg		19[#1]	-	-	-	-	<0.1	<0.1	<0.1	-
Chlorotoluron	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Cyanazine	mg/kg		2.7[#1]	-	-	-	-	<0.1	<0.1	<0.1	-
Dichlobenil	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Dinoseb	mg/kg		820[#1]	-	-	-	-	<0.02	<0.02	<0.02	-

Soil Results for Natural Deposits
Analytical Results
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Location	BH21	BH23	BH24	TP11	TP13	TP14	TP15	TP16
Date	23/07/2019	15/07/2019	11/07/2019	11/07/2019	09/07/2019	10/07/2019	09/07/2019	10/07/2019
Sample_Depth_Range	-1.5	-0.5	-4.5	-0.2	-0.5	-0.5	-0.5	-2
Matrix_Description	Sand	Sand	Sand	Gravel	Sand	Sand	Sand	Sand

Parameter	Units	Method Detection Limit	GAC_HH_COM/IND_SLOAM_0.58-1.45%TOC							
Fluometuron	mg/kg		11000[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Isoproturon	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Mecoprop	mg/kg		820[#1]	-	-	-	-	<0.02	<0.02	<0.02	-
Picloram	mg/kg		57000[#1]	-	-	-	-	<0.02	<0.02	<0.02	-
Prometryn	mg/kg		33000[#1]	-	-	-	-	<0.1	<0.1	<0.1	-
Pronamide	mg/kg		62000[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Propazine	mg/kg		16000[#1]	-	-	-	-	<0.1	<0.1	<0.1	-
Tebuthiuron	mg/kg		57000[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Terbutryn	mg/kg		820[#1]	-	-	-	-	<0.1	<0.1	<0.1	-
Diuron	mg/kg		1600[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Linuron	mg/kg		6300[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Pesticides											
Isodrin	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Parathion	mg/kg		4900[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Pirimiphos-methyl	mg/kg		57[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Diflubenzuron	mg/kg		16000[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Organochlorine Pesticides											
Aldrin	mg/kg		170[#2]	-	-	-	-	<0.01	<0.01	<0.01	-
Chlordane (cis)	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Dieldrin	mg/kg		170[#2]	-	-	-	-	<0.01	<0.01	<0.01	-
Endosulfan I	mg/kg		5600[#2]	-	-	-	-	<0.01	<0.01	<0.01	-
Endosulfan II	mg/kg		6300[#2]	-	-	-	-	<0.01	<0.01	<0.01	-
Endosulfan sulphate	mg/kg		4900[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Endrin	mg/kg		250[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Heptachlor	mg/kg		0.63[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Heptachlor epoxide	mg/kg		0.33[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
DDT	mg/kg		8.5[#1]	-	-	-	-	<0.001	<0.001	<0.001	-
Methoxychlor	mg/kg		4100[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
DDD	mg/kg		9.6[#1]	-	-	-	-	<0.001	<0.001	<0.001	-
Chlordane (trans)	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
DDE	mg/kg			-	-	-	-	<0.001	<0.001	<0.001	-
Endrin aldehyde	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Endrin ketone	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Organophosphorous Pesticides											
Azinphos Ethyl	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Azinophos methyl	mg/kg		2500[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Carbophenothion	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Chlorfenvinphos	mg/kg		570[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Chlorpyrifos	mg/kg		820[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Diazinon	mg/kg		570[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Dichlorvos	mg/kg		140[#2]	-	-	-	-	<0.01	<0.01	<0.01	-
Dimethoate	mg/kg		1800[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Ethion	mg/kg		410[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Fenitrothion	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Fenthion	mg/kg			-	-	-	-	<0.01	<0.01	<0.01	-
Malathion	mg/kg		16000[#1]	-	-	-	-	<0.01	<0.01	<0.01	-
Methyl parathion	mg/kg		210[#1]	-	-	-	-	<0.01	<0.01	<0.01	-