Phase 2 Site Investigation

Land At Mill Hall Road - Aylesford

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Non-Technical Summary

What is Proposed?	It is understood that the site is proposed to be used as a commercial yard scheme that will be split into 6 separate plots (Plots 1-6). It is understood that proposals (specifically in Plot 3 and 4) include the provision of site wide hardstanding, a workshop, modular offices, and installation of formal drainage. The remaining plots will be limited to raised modular offices to allow continuous airflow underneath.
What is the Problem?	The following potential sources of contamination have been identified: ► **Contamination Issue 1** – Elevated concentrations of TPH / VOCs above the drinking water assessment criteria for PVC and PE pipes. ► **Contamination Issue 2** – Elevated concentrations of ground gases associated with the Made Ground and underlying organic rich Alluvium.
What is the Result?	As a result of the identified ground contamination issues: ► A **Moderate/low** risk to potable water pipes from the TPH / VOC impacted groundwater has been identified. ► A **Moderate** risk has been identified to site workers using the proposed workshop and modular offices from elevated ground gases.
What are the Next Steps?	To mitigate the above identified risks, it is **essential** that the following elements are carried out: ► Installation of Barrier pipe to prevent contamination of polymeric services. ► Gas protection measures comprising concrete structural barrier and gas resistant membrane. This report should be submitted to the local planning authority to support the planning application process.

Report Record

Project Name	Land At Mill Hall Road - Aylesford
Client	VIP Investments Ltd
Report Type	Phase 2 Site Investigation
Report Ref	R208-SI-03.0_4630
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Report Revisions

Revision Ref	Date	Author	Details

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To keep our reports as concise and simple as possible, we have put background information in a dedicated location. Click the magnifying glass icon seen throughout the report to navigate straight to relevant information in Appendix A.

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1.0 Introduction

1.1 This report presents the findings of a Phase 2 Site Investigation (Environmental) – an intrusive contamination assessment that has been prepared in line with best practice guidance and planning policy.

What is a Phase 2 Site Investigation?

1.2 Phase 2 Site Investigation is the second stage of a phased contaminated land assessment that is often required to discharge planning conditions or remove objections once planning permission has been granted. A Phase 2 is usually required following a Phase 1 Desk Study, where potential sources of contamination have been identified, and the risks from which require further understanding.

1.3 The purpose of a Phase 2 Site Investigation is to physically inspect the condition of the soil, groundwater etc that may have been impacted by the sources of contamination identified in the Phase 1 Desk Study. The Phase 2 Site Investigation is site specific with the methods of investigation chosen being dependent on a number of factors, such as access, operational constraints, geology, potential contaminant sources and the receptors to be targeted.

1.4 Recommendations may include the preparation of a Remediation Strategy to detail how any identified risks can be mitigated/remediated, or possibly further investigation. If no unacceptable risks are identified, then typically no further environmental assessment is required other than a Watching Brief during the construction phase. Find out more about Phase 2 Site Investigations here.

The Subject Site

Table 1 Site Details	
Address	Land East of Mill Hall Road, Aylesford, Kent, ME20 7FG
Eastings, Northings	571561, 159358
Area	6.95ha

1.5 The site, broadly rectangular in plan, currently comprises a large vacant plot of former industrial land located adjacent to the river Medway that has been recently cleared. The site

is located within a broadly commercial and light industrial land use area. The site area is shown in Figure 1.

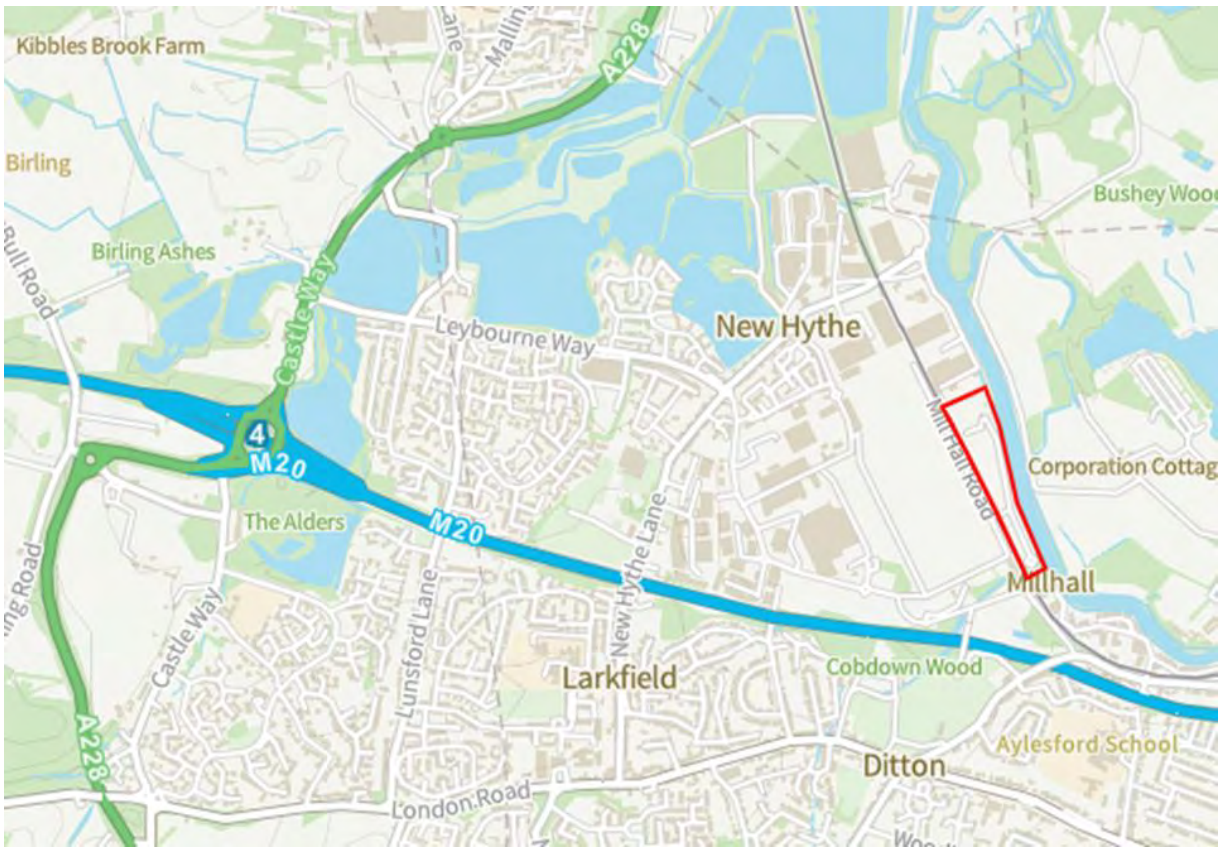

Figure 1 Site Location Plan

The Proposed Development

1.6 The proposals include the placement of a modular office building set above ground level on stilts as well as an adjacent workshop building, both of which are located in Plot 3 as shown in Figure 2.

1.7 Beyond Plot 3, no definitive proposed development plans have been decided aside from site wide hardstanding and formal drainage. However, it is understood that much of the site (comprising Plots 1, 2, 4 – 6) will have a yard type commercial land use, most likely to temporarily store bulk aggregates and construction materials. These plots may also be used to situate modular type buildings and workshops.

1.8 Across the site, there are no basements, undercroft car parking or other underground structures anticipated with below ground features limited to supporting foundations, hardstanding and buried services.

1.9 It is understood that site levels will remain relatively similar to that present.

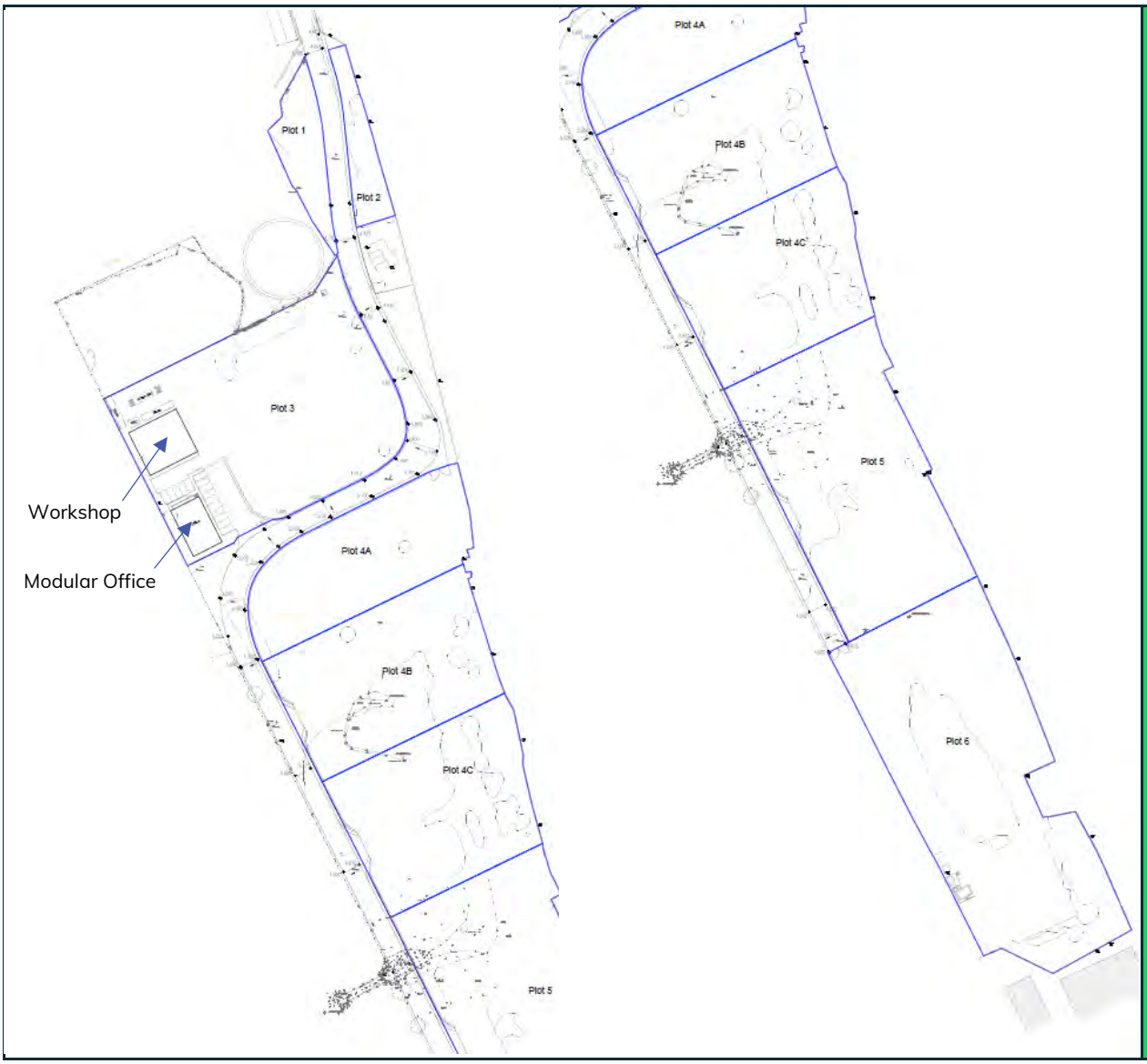

Figure 2 Proposed Development Plan

The Stakes & Objectives

1.10 As noted above, this Phase 2 Site Investigation forms the second stage of an iterative contaminated land assessment, to further investigate the potential sources of contamination and unacceptable risks identified during a Phase 1 Desk Study[1]. Key findings and stakes relating to this investigation are summarised below.

[1] Phase 1 Desk Study (Report Reference: 4630-20230908-CM)

1.11 ***Current and Former Site Uses:*** The site comprises a large vacant plot of former industrial land that has been recently cleared with the River Medway running along the eastern site boundary. Historically, the site was used as a water treatment works and combined heat and power plant for the neighbouring Aylesford Paper Mill to the west from the 1930s. The on-site water treatments work comprised of various reservoirs and water tanks as well as a pumping station, engine house, railways and sludge bed from the 1930s until 2018/19 when all buildings were cleared. Between 1999 and 2003, the sludge bed was infilled with arisings including boiler ash from the combined heat and power plant.

1.12 ***Geology, Hydrogeology and Hydrology:*** Based on the development history, a significant layer of Made Ground is considered likely. The site is underlain by superficial deposits comprising Alluvium overlying River Terrace Deposits. The majority of the site is shown to be underlain by bedrock geology comprising the Folkestone Formation. However, in the south of the site bedrock geology is noted to comprise Folkestone Formation, Sandgate Beds and Hythe Formation in quick succession which would suggest that the Folkestone Formation and Sandgate Beds become absent towards the south of the site. The Alluvium and River Terrace Deposits are Secondary Aquifers, and the bedrock geologies are Primary Aquifers. Shallow groundwater is considered likely within the River Terrace Deposits.

1.13 ***Potential Sources of Contamination:*** Bulk storage of hazardous liquids within historic above ground storage tanks (AST); an area of former landfilling of boiler ash within a former sludge bed to the north on site; London Mining Associates noted immediately north of the site with no significant site boundary between the subject site and this potential source.

1.14 Noteworthy, risk ratings flagged up during the preparation of the Phase 1 Desk study[1]:

- Plot 3 (predominantly underlain by the infilled sludge bed):
  - **High** risk to site users, buildings and construction workers from ground gases generated by landfilled ground on site.
  - **Moderate/low** risk to controlled waters and below ground infrastructure given the potential leaching of contaminants from landfilled waste.

- **Moderate** risk to potable water pipes given the previous industrial site use and the subsequent need to characterise the Made Ground.

- Plot 4 (partially underlain by the infilled sludge bed to north):
  - **Moderate/low** risk to site users and buildings, below ground foundations and construction workers given potentially elevated ground gas concentrations and aggressive ground.
  - **Moderate** risk to potable water pipes given the previous industrial site use and the subsequent need to characterise the Made Ground.
- Plots 1-2 and 5-6 (outside of the infilled sludge bed):
  - **Acceptably low** risk to site users and buildings given air flow beneath the modular buildings will impede the buildup of ground gases.
  - **Moderate/low** risk to construction workers given the previous industrial site use and the subsequent need to characterise the Made Ground.
  - **Moderate** risk to Potable Water Pipes given the previous industrial site use and the subsequent need to characterise the Made Ground.
- Offsite source London Mining Association Ltd which would predominantly impact Plots 1, 2 and 3 as follows:
  - **Moderate/low risk** to human health and groundwater given the insufficient boundary between the offsite source and the subject site combined with the potential for migration of dust, surface water and waste materials onto the subject site.

1.15 Full reference should be made to the desk study to understand the preliminary conceptual model and basis of this investigation. The methodology adopted in this site investigation is based on the source-pathway-receptor model as set out in the Land contamination risk management guidance (LCRM, October 2020).

1.16 The main objective of this investigation is to reduce uncertainty and validate the findings of the Phase 1, associated with the preliminary conceptual site model and risk assessment in addition to expanding the historic dataset for the site. This investigation aims to determine the general presence or absence of contamination within the context of an Exploratory Investigation. It is noted that an Exploratory Investigation usually requires a lower density sample spacing than a Main Investigation, and that further works may be required in the future. Noting the likely acceptable levels of uncertainty, access restrictions, project constraints etc at this stage of the project, an Exploratory Investigation, as defined in BS 10175, has been adopted and is considered appropriate to assess the general suitability of the site for the proposed development.

1.17 A separate report has been prepared on geotechnical matters, which should be referred to for information on ground hazards and foundation design etc.

Report Structure, Limitations & Changes

1.18 The investigation methodology is included in Chapter 2, with details on the ground conditions observed in Chapter 3. A summary of the generic risk assessments undertaken is presented in Chapter 4 and a wider discussion on the preliminary findings in the context of the CSM is provided in Chapter 5. Report conclusions and recommendations are set out in Chapter 6. Advisory items are detailed in Chapter 7.

1.19 This assessment has been undertaken in accordance with our Terms & Conditions. Full details on limitations and reliance are provided in those Terms. Third party information which has been reviewed and used to inform the assessments presented herein, including public records held by various regulatory authorities and environmental database data has been assumed to be true and accurate.

1.20 This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, based on the current development. Should revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

2.0 Site Investigation Methodology

2.1 The intrusive site investigation works were undertaken between 13th October and 31st October under the direct co-ordination of a suitably trained and qualified consultant employed by Lustre. The intrusive works were carried out with due regard to existing standards and good practice guidelines including *BS10175: 2011+ A2:2017*[2], *BS5930: 2015*[3] and guidance produced by the *AGS*[4].

Enabling Works

2.2 Prior to commencing with the intrusive works, each exploratory location was checked for any readily detectable shallow services. The method employed to avoid buried services involved the checking for shallow services detectible by a Cable Avoidance Tool only by Lustre.

2.3 Safety starter trial pits were advanced at each exploratory hole location prior to drilling to help reduce the likelihood of services being struck during drilling. The safety pits were excavated using a mechanical excavator operated by a representative of the Client, who had previously laid the services across the site and was aware of their location.

2.4 During the enabling works prior to Lustre's mobilisation to site, an unacceptable risk of unexploded ordinance (UXO) was noted on site. As such for the duration of the intrusive works a UXO Detection Engineer was present on site to clear each exploratory hole location by surveying the ground with a magnetometer to identify and assess potential UXO anomalies. One UXO anomaly was identified during intrusive works within WS6 at 1.0m bgl and as such this position was terminated.

Site Investigation Rationale

2.5 Exploratory locations advanced in this investigation are summarised below comments on rationale, termination depth and monitoring installations.

[2] British Standard – Code of Practice for Investigation of potentially contaminated sites. BS 10175: 2011 + A2:2017.
[3] British Standard – Code of Practice for Site Investigation. BS 5930: 2015.
[4] Association of Geotechnical & Geoenvironmental Specialists, AGS Guide to Environmental Sampling, 2010.

Table 2 Exploratory Position Details			
Hole ID	Base Depth (m bgl)	Objective	Monitoring Well
WS1	3.5	General Coverage	No
WS2	3.4	Within Infilled Sludge Bed	Yes
WS3	3.0	Within Infilled Sludge Bed	Yes
WS4	5.0	Within Infilled Sludge Bed	Yes
WS5	1.5	Within Infilled Sludge Bed	Yes
WS6	1.0	Within Infilled Sludge Bed	No (UXO anomaly)
WS7	4.6	Within Infilled Sludge Bed	Yes
WS8	4.0	Within Infilled Sludge Bed	Yes
WS9	2.9	Outside of Infilled Sludge Bed	Yes
WS10	2.0	Alluvium	Yes
TP1	1.5	Within Infilled Sludge Bed	No
TP2	1.5	Former Re-Fuelling Area	No
BH1	10	River Terrace Deposits	Yes
BH2	10	River Terrace Deposits	Yes
BH3	10	Within Infilled Sludge Bed	Yes

2.6 Exploratory holes were located to obtain the required information to meet the project objectives, whilst avoiding services, access and egress routes. Drawing 4630-002 shows the positions of all exploratory locations.

Windowless Sampler Boreholes

2.7 Ten windowless sampler boreholes were advanced on site to depths of between 1m bgl and 5m bgl using a conventional tracked windowless sampler drilling rig. In six locations the windowless sample borehole was advanced through surface soils and into the underlying natural soils. The remaining four locations were terminated within Made Ground.

2.8 Upon completion, eight windowless sample boreholes were installed with monitoring wells to facilitate the assessment of ground gases and of groundwater quality. The remaining two were backfilled with arisings and the soils compacted.

Cable Percussive Boreholes

2.9 Three cable percussive boreholes were advanced on site to a depth of 10m bgl. All three cable percussive boreholes were advanced through subsurface soils and into the underlying natural soils, using a conventional A-frame cable tool drilling rig.

2.10 Upon completion, all cable percussive boreholes were installed with monitoring wells to facilitate the assessment of ground gases and of groundwater quality.

Trial Pits

2.11 Two trial pits were advanced on site to depths of between 1.5 and 2.0m bgl. The trial pits were excavated using a tracked excavator and extended into the Made Ground the depth of which was not proven within these positions.

2.12 Upon completion, all excavations were backfilled with arisings and soils compacted.

In-Situ Field Tests

2.13 Headspace testing was carried out to determine the volatile content of soils (vapours) using a photo-ionisation detector (PID) with 10.6eV lamp.

Monitoring Installations

2.14 As noted above, selected boreholes were installed to enable subsequent return monitoring. Details on the monitoring installations, including well response zones and the general purpose of the wells, are provided in the table below.

2.15 In summary, eleven monitoring wells were installed as part of the works, as summarised in the table below. The wells comprised plain 50mm pipe to a maximum depth of 4m bgl, with a slotted 50mm diameter pipe to a maximum depth of 10m bgl. The annulus surrounding the slotted pipe was filled with washed gravel, which was then plugged with a 0.5m bentonite seal surrounding the plain pipe. The monitoring wells were completed with a gas tap and a flush lockable cover and finished to match existing ground cover.

Table 3 Well Design Summary

Hole ID	Response Zone	Gas Well	Groundwater Well
WS2	Infill Material	Yes	Yes
WS3	Infill Material	Yes	Yes
WS4	Infill Material (Including PFA)	Yes	Yes
WS5	Infill Material	Yes	Yes
WS7	Infill Material	Yes	Yes
WS8	Natural Material (River Terrace and Alluvium)	Yes	Yes
WS9	Infill and River Terrace	Yes	Yes
WS10	Infill Material	Yes	Yes
BH1	River Terrace Deposits	Yes	Yes
BH2	River Terrace Deposits	Yes	Yes
BH3	Infill Material (Including PFA)	Yes	Yes

Ground Gas Monitoring

2.16 Four rounds of ground gas monitoring were carried out as part of this investigation to gain an understanding of the ground gas regime at the site and update the findings of the previous investigations. A summary of the gas monitoring results is provided in Appendix D. The monitoring was undertaken at atmospheric pressures of 966 - 1008mb.

Groundwater Monitoring

2.17 Two rounds of groundwater monitoring were undertaken on 26th October 2020 and 7th November 2023. The first round involved the purging of windowless sampler monitoring wells and the retrieval of grab samples using a bailer.

2.18 The second round of groundwater monitoring included well development of the cable percussive boreholes using a submersible 12v pump and the retrieval of low flow samples using a peristaltic pump from all exploratory hole positions with sufficient groundwater (BH1, BH2, WS4, WS5, WS7). Well head field parameters including pH, redox potential (mV), conductivity (mS), dissolved oxygen (%) and visual and olfactory observations were recorded to ensure the groundwater sampled was representative of the aquifer.

2.19 On both occasions, all samples were deposited into suitable containers, prepared and dispatched to a UKAS accredited laboratory in accordance with good practice guidelines.

2.20 Basic field monitoring records are presented in Appendix D.

Chemical Analysis (Environmental)

2.21 A total of 11 soil samples were scheduled for chemical testing. Samples were analysed for a range of determinands, which considers the potential contaminants associated with the current/historical site uses, as follows:

- Metals and inorganics: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc;
- pH;
- Total phenols (monohydric);
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs, total and speciated EPA 16);
- Speciated Total Petroleum Hydrocarbons (TPH CWG);
- BTEX;
- Volatile Organic Compounds (VOCs);
- Asbestos screen.

NB: Not all samples were analysed for the full suite of determinands listed above.

2.22 A total of 7 groundwater samples were scheduled for chemical testing. Samples were analysed for a range of determinands, which considers the potential contaminants associated with the current/historical site uses, as follows:

- Metals and inorganics: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc;
- pH;
- Total phenols (monohydric);
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs, total and speciated EPA 16);
- Speciated Total Petroleum Hydrocarbons (TPH CWG).

2.23 Generally, where PID results indicated the potential of presence volatile contaminants or visual / olfactory evidence of contamination was noted, appropriate testing was scheduled in preference of those samples.

2.24 Waste Acceptance Criteria (WAC) testing was undertaken on one sample at 1.2m bgl from TP1.

3.0 Ground Conditions

3.1 This chapter collates all the factual information from the site investigation, including field observations and in-situ testing, to present a summary of the ground conditions encountered during the intrusive works. The information from the previous SI's have not been included in this Chapter due to the quality of the historic logs. Exploratory hole logs are presented in Appendix B.

3.2 A brief interpretation of any visual /olfactory contamination is provided at the end of the chapter, in the context of the potential sources of contamination. Field observations on the physical composition of the shallow soils is also considered in determining the suitability of the soils for retention in the proposed development (presence of sharps or deleterious materials).

Table 4 Summary Ground Model

Strata	Min Depth (m bgl)	Max Depth (m bgl)	Min Thickness (m)	Max Thickness (m)	Exploratory Holes
Made Ground	0	5	1	5	All
Re-worked Natural Material	0.5	1.2	0.7	0.7	WS2
Alluvium	2.4	4	1	1.6	WS7, WS8, BH3
River Terrace Deposits	1.1	10	0.4	8.9	WS1, WS2, WS3, WS8, WS9, TP2, BH1, BH2, BH3
Folkestone Formation	9	10	1	1	BH1, BH2

Made Ground

3.3 Made Ground was recorded in all exploratory holes from surface (minimum depth encountered) to a maximum base depth of 5m bgl (WS4). The base of the Made Ground was proved in WS1, WS2, WS3, WS7, WS8, WS9, TP2, BH1, BH2 and BH3.

3.4 In WS4, WS5, WS6, WS10 and TP1 the base of the Made Ground was not proven. In the case of WS5 the Made Ground was not penetrated given its density at that location. At WS6 a UXO anomaly was identified at 1m bgl and as such the exploratory hole was terminated within the Made Ground. Finally, regarding WS4, WS10 and TP1, these positions were

complete at 5m bgl, 2m bgl and 1.5m bgl, respectively. As such, they did not penetrate the base of the Made Ground simply as it extended deeper at these locations than the required depths of these exploratory hole positions.

Arisings from WS4

Granular Crush Layer

Spatial Distribution and Extent

3.5 The Made Ground was present as five layers which were largely encountered as a brown clayey sandy gravel at surface, underlain by infill material associated with previous phases of development and the infilled sludge bed situated to the north of the site (within Plot 3 and the north of Plot 4). This material was comprised of various cohesive and granular soils as detailed below including a distinct strata of pulverized fuel ash (PFA) at the base of the infilled sludge bed.

3.6 *Granular Surface Layer*:

- Brown clayey sandy GRAVEL was identified in all exploratory holes from surface (minimum depth encountered) and penetrated to a maximum base depth of 1.8m bgl. The thickness of the clayey sandy gravel ranged from 0.2m and 1.8m.

3.7 *General Made Ground:*

- A black silty gravelly SAND was identified in six exploratory holes both within (TP2, WS1, WS3, WS4, WS8, WS10) and outside (WS9) the infilled sludge bed. This Made Ground was encountered to a top depth of 0.3m bgl and the base of the strata was

penetrated in TP2, WS1, WS3, WS4, WS8 and WS9 at a maximum depth of 2m bgl (WS8). The base of the silty gravelly SAND was not proven in WS10. Gravels generally comprised brick, flint, metal, plastic and wire.

3.8 *Material within the infilled sludge bed:*

- *General Infill Material (also found outside the sludge bed within WS9):*
  - Brown mottled black / black Sandy gravelly SILT was identified in ten exploratory holes (BH3, TP1, WS1, WS2, WS3, WS6, WS7, WS8, WS9, WS10). The base of the sandy gravelly SILT was penetrated in all exploratory holes in which it was encountered and at a maximum depth of 1.6m bgl (WS9). The top depth it was encountered was 0.25m bgl. Gravels generally comprised brick, concrete, wood, metal, and tile. Cobbles comprised brick, concrete, and wood.
- *Re-Worked Natural Material:*
  - An orangish brown Gravelly CLAY was identified in a single exploratory hole (WS2) with a top depth of 0.3m bgl to a maximum base depth of 0.5m bgl. The thickness of the gravelly clay was measured at 0.2m. Gravels were noted to consist of ironstone and flint. The material appeared to be re-worked River Terrace Deposits.
- *Pulverized Fuel Ash (PFA):*
  - A grey SILT was identified in six exploratory holes (BH3, TP1, WS4, WS5, WS6, WS7) and typically beneath the general infill material. The PFA was penetrated in BH3 at a maximum depth of 3m bgl. In the remaining exploratory hole locations (TP1, WS4, WS5, WS6, WS7), the PFA was proven to a maximum depth of 5m bgl (WS4). A top depth of 0.6m bgl was encountered. The PFA appeared to be thicker towards the centre of the infilled sludge bed.

3.9 The Made Ground found throughout the infilled sludge bed were typically within the sequence presented above. Not all layers were present throughout the area however where a layer was absent, the next layer in the sequence was present.

Anthropogenic Components & Evidence of Contamination

3.10 Anthropogenic inclusions within the Made Ground generally included ashy soils, PFA, clinker, metal and wire. These inclusions are indicative of metals and hydrocarbon contamination however the presence or absence of this contamination is confirmed through the chemical testing.

3.11 The black colouring to the Sand and Silt soils identified 0.25m – 2.0m bgl within the infilled sludge bed provided visual evidence of contamination, namely hydrocarbon impact. In terms of olfactory evidence, a slight acetic odour was noted from the PFA where encountered.

3.12 In-situ headspace readings within the Made Ground ranged between 0ppm to 6ppm (TP2 at 0.5m bgl), with an average headspace reading of 1.3ppm.

3.13 Based on the soil arisings logged during the investigation, fragments of asbestos containing material (ACM) were not recorded.

Alluvium

3.14 Alluvium was recorded in three exploratory holes (BH3, WS7, WS8) with a top depth of 2.4m bgl. The base of the Alluvium was penetrated within BH3 at 4m bgl and proven elsewhere to a depth of 4.6m bgl (WS7) where the base was not encountered. These variations in depth across the site are considered in keeping based on the depositional environment.

3.15 Alluvium was encountered as a grey or black silty CLAY or clayey SILT with horizons encountered in WS8 identified as sandy SILT and sandy CLAY. There was a strong natural organic odour throughout the strata with evidence of plant debris within the strata.

3.16 In-situ headspace readings within the Alluvium were recorded at 1.4ppm.

Alluvium Recovered from WS7

Arisings from BH3

River Terrace Deposits

3.17 River Terrace Deposits were recorded in nine exploratory holes (BH1, BH2, BH3, TP2, WS1, WS2, WS3, WS8, WS9) with a top depth of 1m bgl. The base of the River Terrace Deposits was only penetrated within BH1 and BH2 at a depth of 9m bgl, it is considered that the base of the strata will be consistent across the site.

3.18 The River Terrace Deposits were encountered as three distinct strata's across the site:

- Orangish brown sandy slightly gravelly CLAY,
- Orangish brown gravelly SAND, and a
- Yellowish brown / orangish brown sandy GRAVEL.

3.19 These three strata's were generally encountered in the same order across the site indicating a cohesive layer present underlying the Alluvium over the two granular layers which indicate a coarsening with depth of the strata. These findings are as anticipated for the River Terrace Deposits in this area due to the proximity of the River Medway.

3.20 In-situ headspace readings within the River Terrace Deposits were recorded between 0ppm and 0.3ppm.

3.21 Groundwater was encountered within the River Terrace Deposits, with resting water levels recorded between 4m bgl (BH3) and 6m bgl (BH1, BH2).

Split Core of River Terrace Deposit

View of Granular Segment of the River Terrace Deposits from BH3

Folkestone Formation

3.22 The Folkestone Formations was recorded in two exploratory holes (BH1 and BH2) at a top depth of 9m bgl in both locations and proven to a depth of 10m bgl. The Folkestone Formation was not penetrated in either location in which it was encountered and is anticipated to extend to approximately 30m bgl.

3.23 The Folkestone Formation was encountered as wet yellow SAND.

Groundwater Summary – Return Monitoring

Groundwater Perched within the Made Ground

3.24 Perched groundwater was observed within the windowless sampler boreholes across the site and was noted to be present at various elevations, ranging from 2.34m bgl to 3.09m bgl (0.75m variation).

3.25 Considering this, the perched groundwater is likely discontinuous and as such a groundwater flow direction cannot be determined. Given the groundwater identified within the windowless sampler boreholes was considered perched, it was not reflective of the aquifer underlying the site within the River Terrace Deposits.

Groundwater within the River Terrace Deposits Aquifer

3.26 During the return monitoring, groundwater identified within the cable percussive boreholes drilled into the River Terrace Deposits was recorded at an average depth of 2.88m bgl to 3.16m bgl.

3.27 Based on the data available, groundwater flow appears to be towards the River Medway to the east, however this is based on a limited spatial dataset. Based on the depth of the groundwater it is considered that the aquifer present in the River Terrace Deposits are in hydraulic continuity with the adjacent River Medway.

3.28 The potential for groundwater levels to change due to seasonal and tidal influences should also be considered.

Summary of Land Quality Field Observations

Table 5 Field Observations

	Consideration Needed?
Evidence of Contamination	
Visual evidence of contamination has been identified during the site investigation in the form of black (hydrocarbon) staining and ashy soils. It is noted that areas of the infilled sludge pond include black coloured soils which is consistent with the historic landfilling of boiler ash and arisings from the combined heat and power plant.	
In-situ headspace testing, and olfactory observations did not indicate the presence of any volatile-type contamination.	Yes
The selection of samples for chemical testing and determinants analysed for has been based on the above field observations in the context of the conceptual site model and proposed development layout. These results are discussed in Chapter 4	
Gas Generation Potential	
The presence of PFA up to 3.5m in thickness beneath the site presents a risk of elevated concentrations ground gases given the proportion of putrescible organic material. This is considered in Chapter 4.	Yes
Physical Suitability	
Based on the physical composition of the shallow soils, which were noted to contain primarily brick and concrete but also metal, tile, clinker and wood. the shallow Made Ground may not be considered suitable for use as topsoil. However, given the site is to be laid entirely to hardstanding, a pathway between this material and potential receptor is unlikely to be feasible. As such shallow soils are suitable to remain	No

Table 5 Field Observations	
	Consideration Needed?
Evidence of Contamination	
beneath this layer of hardstanding. Should the proposed development be altered to include any areas of proposed soft landscaping, then these soils should be reassessed to identify any risks they may pose.	
Drainage Potential (Shallow Soils)	
Given the proposed site wide hardstanding and formal drainage, shallow soils are not expected to form part of the drainage system on site. However, should the proposed development be altered to include any area of soft landscaping then the drainage potential of these soils should be reassessed.	No

4.0 Risk Assessment - Soils

Introduction

4.1 Factual information from the site investigation and subsequent analytical data has been subjected to several semi-quantitative risk assessments. The results of these assessments are presented in Appendix E and summarised in this Chapter. The assessments undertaken include:

- Human health risk assessment (soils);
- Water pipeline suitability test;
- Soil Aggressivity (buried concrete);

Human Health Risk Assessment (Soils)

4.2 The Environment Agency 'Model Procedures for the Management of Land Contamination, CLR 11' report provides a risk management methodology for identifying hazards and assessing risk associated with land affected by contamination. CLR 11 adopts a tiered approach to determining risk, with the first tier involving the evaluation of pollutant linkages using assessment criteria / screening levels for contamination – this is known as a Generic Quantitative Risk Assessment.

4.3 We have adopted LQM/CIEH Suitable 4 Use Levels (S4ULs) for a commercial land use scenario where available. Lead has been assessed using the Category 4 Screening Level (C4SL). PCBs were assessed against Environment Agency SGVs from 2009 for a commercial land use scenario. This assessment has been used for soil analysis undertaken during both previous phases of site investigation as well as the current Lustre site investigation.

Previous Phases of Site Investigation: 2016 - 2018

4.4 Previous phases of works which included a chemical assessment of soils beneath the subject site were undertaken on two occasions as follows:

- Pell Frischmann: Aylesford Newsprint Environmental Statement Baseline Phase 2 Ground Conditions Assessment report reference RE13145G002A, dated August 2016
    - Soil assessment included analysis of ten samples for broad suite of potential contaminants including asbestos, metals, PAHs, TPH and BTEX. In addition, three samples were analysed for PCBs as well as one sample was analysed for VOCs and SVOCs.
- Pell Frischmann: Former Aylesford Newsprint Supplementary Phase 2 Ground Investigation report ref: RE13145G003/A, dated October 2018
    - Soils assessment included analysis of eight samples for a broad suite of potential contaminants including asbestos, metals, PAHs, TPH and BTEX. Selected samples were analysed for PCBs as well as VOCs and SVOCs.

4.5 A summary of key findings from each investigation is provided below further details are included within the Lustre Phase 1 Desk Study Report

- Asbestos was identified in four locations: WS08, BH11, TP204 and TP207. Quantification was undertaken on one sample which identified that concentration was <0.001% v/v. Asbestos was identified as combination of insulation lagging and loose fibres containing both amosite and chrysotile. In the context of commercial development this is not considered to present an unacceptable risk to human health of site workers or visitors due to the presence of site wide hardstanding.
- Assessment of all other contaminants including metals, PAHs, TPHs, BTEX, VOCs, SVOCs and PCBs did not identify any unacceptable risks to human health in context of a commercial land use. Concentrations of all contaminants were recorded at concentrations below their respective screening criteria.

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4.6 Lustre undertook analysis of soils to validate the findings of the previous phases of investigation and identify any risks to human health associated with commercial land use.

Soils were assessed against a broad suite of potential contaminants asbestos, metals, inorganics, PAHs, TPH, BTEX, phenols and PCBs.

4.7 Asbestos was detected in 4 out of the 11 samples analysed which included samples collected from TP2, WS1, WS6 and WS8 at depths ranging from 0.15 to 0.5m bgl. Quantification analysis was undertaken on all four samples which identified that the concentration was <0.001% v/v. Asbestos was identified as loose fibres containing both amosite and chrysotile. This is consistent with findings of the previous investigations undertaken. Trace concentrations of asbestos are therefore considered to be present sporadically across the site with shallow soils. However, the proposed commercial development includes presence of site wide hardstanding which breaks all potential pathway for future site users to come into contact with asbestos containing soils. Asbestos is therefore not considered to present an unacceptable risk to the human health of site workers or visitors in the context of the proposed commercial land use.

4.8 Concentrations of all other contaminants were found to be either below the limit of detection or below their respective screening criteria. This is consistent with findings of the previous phases of site investigation. Soils beneath the site are therefore not considered to pose n unacceptable risk to human health in the context of the proposed commercial land use.

Updated Risk Assessment

4.9 Overall, the assessment of shallow soils undertaken by Lustre validated the findings of the Lustre Phase 1 Desk Study that the risk to human health from contaminants within soils is acceptably low in the context of a commercial land use with no further assessment or mitigation required.

Water Pipeline Suitability Test

4.10 The development is likely to require the installation of new potable water pipes. UK Water Industry Research (UKWIR) guidance[5] sets chemical concentration thresholds that are used to specify a pipe design that is considered safe. Water pipes will likely be placed at a

[5] UK Water Industry Research (UKWIR). Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. Ref. 10/WM/03/21. 2010

minimum depth of 750mm as normally required by UK water authorities and therefore this will be in the Made Ground.

4.11 The available testing results indicate that soil concentrations pose a risk to potable water pipes. Soil data failed the tests relating to PE pipes for Mineral Oils (C11 to C20) and PVC pipes for Mineral Oils (C11 to C20). Upgraded potable water pipes in the form of barrier pipe will therefore be required as part of the proposed development.

Soil Aggressivity (Buried Concrete)

4.12 The analytical data for soil pH and water soluble sulphate is summarised in Appendix F, along with the corresponding BRE classification[6]. The 'brownfield' scenario was applied to the results from the Made Ground and the 'natural' scenario to results from the natural soils.

4.13 A static groundwater scenario has been selected for the buried concrete assessment for the Made Ground and a mobile scenario for the natural soils based on groundwater conditions observed on site.

4.14 From the Made Ground, 10 samples were tested along with one sample from the natural soils. The characteristic values for the Made Ground for pH and water soluble sulphate were determined as 7.9 and 0.591g/l respectively, giving a Design Sulphate (DS) classification of DS2 and an associated Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1s.

4.15 The characteristic values for the natural soils for pH and water soluble sulphate were determined as 7.9 and 0.18g/l respectively, giving a DS classification of DS1 and an associated ACEC classification of AC-1.

4.16 The potential for oxidisable sulphide has not been considered in this assessment as either pyrite is unlikely to be present in significant amounts, or the concrete is unlikely to be exposed to disturbed ground which might be vulnerable to oxidation.

[6]BRE Guidance Special Digest 1. Concrete in Aggressive Ground. 3rd Edition, 2005.

Summary of Soil Risk Assessments

Table 6 Soil Risk Assessment Summary

	Possible Issue Identified?
Human Health Risk Assessment (soils)	No
Water Pipeline Suitability Test	Yes
Soil Aggressivity (buried concrete)	No

5.0 Risk Assessment - Controlled Waters

Introduction

5.1 Factual information from the site investigation and subsequent analytical data has been subjected to several semi-quantitative risk assessments with respect to controlled waters. The results of these assessments are presented in Appendix E and summarised in this Chapter. The assessments detailed in this Chapter include:

- Assessment of leachability of contaminants from shallow soils
- Assessment of perched groundwater quality
- Assessment of groundwater quality within shallow aquifer
- Assessment of surface water

5.2 The assessment of leachate and water samples, set out in Appendix E, compares determinand concentrations against available screening values to determine the risk posed to controlled waters. The water quality risk assessment adopted in this review is based on the conceptual model of the site and the potential use of, and risks to, controlled waters. The water quality standards have been implemented in the following hierarchy: EQS FW then UK DWS and then WHO DWS.

Background from Previous Phases of Assessment

Previous Site Investigations

5.3 Two previous phase of site investigation had been undertaken by others in 2016 and 2018 as detailed in Section 4.4 which were reviewed as part of the Lustre Phase 1 Desk Study. Groundwater assessments undertaken as part of the previous assessment were limited, however, they indicated that groundwater was likely present beneath the site as two distinct water bodies. This included a discontinuous perched typically coinciding with Made Ground within the infilled sludge pond and a continuous shallow aquifer coinciding with the River Terrace Deposit. Surface water comprising River Medway was also present adjacent to the east of the site. A river wall is present along the eastern boundary of the site which is expected to act as barrier to the migration of perched groundwater, however, groundwater within the shallow aquifer is anticipated to be in hydraulic continuity with the river.

5.4 Chemical assessments were undertaken during previous assessments of both groundwater bodies although it is noted that the condition of the shallow aquifer was not assessed immediately beneath or down gradient of the former infilled sludge pond. In addition, no assessment of surface water was undertaken. The results of the previous chemical analysis were compared to EQS freshwater standards for a broad suite of potential contaminants. Elevated concentrations of four contaminants were identified that were considered to pose a risk to controlled water including copper, chromium, mercury and total phenols. With the exception of mercury elevated concentrations were only identified in perched groundwater samples from WS13 and WS17 located within the area of former landfilling. Mercury was elevated in all four samples although the concentrations were lower outside of the area of landfilling. Overall perched groundwater beneath the former infilled sludge pond was considered to be a potential area of concern with respect to risks to controlled waters.

5.5 Groundwater associated with the rest of the site was typically considered to be in good condition. Elevated concentration of two PAHs were identified including benzo(a)pyrene and fluoranthene within shallow groundwater in 2018. However, PAHs were noted to be elevated in the majority of samples analysed across the Aylesford Newsprint site by Land Science suggesting widespread shallow groundwater impacts. All the remaining contaminants analysed were recorded below their respective screening criteria.

Lustre Phase 1 Desk Study Risk Ratings

5.6 Initial risk ratings from Lustre Phase 1 Desk Study are set out below:

- Groundwater across wider site (excluding infilled sludge pond): **Acceptably low risk**. The contaminants of concern were limited to elevated PAHs identified in 2018 which identified to be a widespread issue affecting the whole of the Aylesford Newsprint site. PAHs were identified within shallow soils beneath the site; however, the concentrations were not considered to be representative of a significant source that would require remediation in the context of the proposed commercial development. The provision of site wide hardstanding and formal drainage would be considered suitable to prevent any ongoing risks to groundwater.

- Groundwater beneath the infilled sludge pond: **Moderate/low risk** due to presence of elevated contaminants identified within perched groundwater. Further assessment of groundwater quality was recommended within and adjacent to the former infilled sludge pond to further assess risks to groundwater within the shallow aquifer and adjacent surface water.

Lustre Site Investigation – October 2023

5.7 Lustre undertook an assessment of groundwater across the infilled sludge pond to validate the findings of the previous phases of investigation and to further assess potential risks to controlled waters in the context of a commercial land use. Groundwater was assessed against a broad suite of potential contaminants metals, inorganics, PAHs, TPH, BTEX and phenols.

Presence of Groundwater

5.8 No evidence of groundwater was observed during the site investigation within Made Ground; however, groundwater was encountered sporadically during return monitoring within shallow monitoring wells targeting Made Ground.

5.9 Groundwater strikes were identified within the River Terrace Deposits and were noted to rise during the 20-minute observation periods which indicate that the aquifer is confined. This was further supported by observations of ground condition which identified a consistent layer of cohesive soils either comprising Alluvium or weathered River Terrace Deposits overlying the granular material which the groundwater is associated with.

5.10 Overall, it was therefore considered that two hydraulically distinct groundwater bodies were present beneath the site in line with findings of the previous phases of assessment. This includes a localised perched and discontinuous groundwater body coinciding within Made Ground associated with infilled sludge pond as well as a continuous confined groundwater body within the River Terrace Deposits.

Chemical Assessment: Leachate

5.11 Leachate analysis was undertaken on five soil samples to identify whether onsite soils present an ongoing source of contamination that could pose a risk to controlled waters.

5.12 The following contaminants were recorded at concentration above one or more of their relevant groundwater screening criteria:

- Boron: WS8 from Made Ground at 0.7m bgl. Concentration within leachate was recorded at 340 µg/l which is marginally above WHO screening criteria of 300 µg/l.
- Chromium: WS7 from Made Ground at 0.7m bgl. Concentration within leachate was recorded at 57 µg/l which is marginally above both the UK DWS and WHO screening criteria of 50 µg/l. Based on laboratory results it is expected to predominantly comprise hexavalent chromium.

5.13 The remaining contaminants analysed were found to be either below the limit of detection or below their respective screening criteria. This indicates that these contaminants are present at low concentrations within soils and/or are not readily leachable. Onsite soils are therefore unlikely to present an ongoing risk to shallow groundwater with respect to these contaminants.

5.14 Overall, it is noted that none of contaminants were recorded above screening criteria for EQS FW and therefore soils are considered unlikely to pose a risk to surface water. Further consideration of risk from chromium and boron will be undertaken following chemical assessments of both surface water and groundwater.

Chemical Assessment: Groundwater Assessment

Perched Groundwater Quality

5.15 Three samples (WS4, WS5 and WS7) were collected of perched groundwater coinciding with Made Ground within the infilled sludge pond.

5.16 The following contaminants were recorded at concentration above one or more of their relevant groundwater screening criteria:

- Copper: all three locations ranging from 50 to 110 µg/l above EQS FW screening criteria of 5 µg/l
- Cyanide: WS5 at 120 µg/l and WS7 at 35 µg/l above EQS FW screening criteria of 1 µg/l
- Total Phenols: WS4 at 57 µg/l above EQS FW criteria of 30 µg/l and UK DWS of 0.5 µg/l
- Boron: WS4 at 600 µg/l above WHO screening criteria of 300 µg/l.
- Arsenic: WS5 at 25.3 µg/l above UK DWS and WHO screening criteria of 10 µg/l
- Nickel: WS5 at 41 µg/l above UK DWS and WHO screening criteria of 20 µg/l
- TPH Aromatic C16-21: WS5 at 110 µg/l above WHO criteria of 90 µg/l
- Sulphate: WS7 at 344 mg/kg above UK DWS screening criteria of 250 mg/kg

5.17 Alkaline pH values were also observed in all three locations ranging from 11.5 to 12.7. The remaining contaminants analysed were found to be either below the limit of detection or below their respective screening criteria.

5.18 Overall, several contaminants were identified to be elevated within perched groundwater although this were predominantly localised in nature. Further consideration of risks from each these contaminants will be undertaken following chemical assessments of both surface water and groundwater.

Shallow Groundwater Quality

5.19 Two samples (BH1 and BH3) were collected from shallow groundwater coinciding with River Terrace Deposits. Both locations were installed beneath the infilled sludge pond. BH1 was noted to be located within the down gradient area in close proximity to the River Medway whereas BH3 was located within the central area of the infilled sludge pond.

5.20 The following contaminants were recorded at concentration above one or more of their relevant groundwater screening criteria:

- Sulphate: BH1 at 303 mg/kg above UK DWS screening criteria of 250 mg/kg
- Arsenic: BH3 at 27.3 µg/l above UK DWS and WHO screening criteria of 10 µg/l

5.21 The remaining contaminants analysed were found to be either below the limit of detection or below their respective screening criteria. In addition, pH values were indicative of those expected within groundwater ranging from 7.2 to 7.4.

Surface Water Assessment

5.22 Two samples (SWUS and SWDS) were collected from River Medway. SWUS was located up gradient of the site and SWDS was located down gradient of the site to identify whether contamination from the site was leading to a worsening of surface water quality.

5.23 All contaminants analysed were found to be either below the limit of detection or below their respective screening criteria.

Updated Risk Assessment

5.24 Chemical analysis of soils did not identify a significant soil-based source of contamination with the potential to impact controlled waters. As a precaution, however, leachate analysis was undertaken which identified that boron and chromium whilst present at low concentration were readily leachable. A slightly elevated concentration of boron was recorded within perched groundwater in one location. However, all concentrations recorded in the shallow aquifer and surface water for both these contaminants were below groundwater screening criteria. Overall, the risk from these contaminants is therefore considered to be acceptably low.

5.25 Chemical assessments of water samples were also undertaken of both perched groundwater and shallow aquifer as well as adjacent surface water body. This identified that perched water was locally impacted by a range of contaminants. Further consideration of the potential impact of these contaminants has therefore been undertaken with respect to concentration identified in groundwater and surface water as follows:

- It is noted that pH concentrations in perched water were significantly more alkaline (11.5-12.7) when compared to pH concentrations within shallow aquifer (7.2-7.2) and surface water (7.7). This supports assessment that perched

groundwater is hydraulically distinct which will limit the potential for contaminants to impact controlled water receptors.

- Copper and cyanide were the only contaminants to be elevated with respect to EQS freshwater standard as well as in multiple samples. However, both these contaminants were recorded below EQS FW screening level within all samples collected from shallow groundwater and surface water. Overall, therefore risk from these contaminants is therefore considered to be acceptably low.

- Phenol, nickel and TPH aromatic (16-21) concentrations were identified be locally elevated within perched water. However, none of these contaminants were recorded above any of the groundwater screening criteria within samples collected from shallow groundwater or surface water. Overall, therefore risk from these contaminants is therefore considered to be acceptably low.

- Arsenic was identified to be locally elevated within perched groundwater (WS5) when compared to UK DWS standard and WHO screening criteria. In addition, arsenic was also elevated at a similar concentration within one sample from the shallow aquifer (BH3). Arsenic concentrations, however, were significantly lower within both surface water samples within no significant change observed between up gradient and down gradient samples.

- Sulphate was identified to be locally elevated within perched groundwater (WS7) when compared to UK DWS standard and WHO screening criteria. In addition, sulphate was also elevated at a similar concentration within one sample from the shallow aquifer (BH1). Sulphate concentrations, however, were identified to be significantly below groundwater screening criteria within both surface water samples.

5.26 Based on the conceptual model of the site, surface water is thought to be the most sensitive controlled water receptor. An assessment was undertaken of surface water which identified that concentrations of contaminants were all below relevant screening criteria. No evidence of soil based source of contamination was identified with elevated concentration predominantly identified within perched groundwater. It is noted that the potential for

migration of contamination from perched groundwater to controlled water receptors is limited due to presence of hydraulic barriers such as cohesive soils and river wall as well as the general discontinuous nature of the water body. Based on the assessments undertaken the risk to surface water from contamination beneath the subject site is considered to be acceptably low.

5.27 Minor impacts were identified to groundwater related to contaminants identified within perched groundwater including arsenic and sulphate. No evidence of an ongoing source of arsenic or readily leachate sulphate was identified within soils during current and/or previous phases of investigation and therefore this may be representative of wide groundwater quality rather than originating from subject site. In addition, it is noted that development proposals include the provision of site wide hardstanding and formal drainage. This will prevent the infiltration of surface water and act to further reduce any potential ongoing risks from these contaminants. It is therefore considered that the risk to groundwater from these contaminants is therefore acceptably low.

Summary of Quantitative Risk Assessments

Table 7 Controlled Waters Assessment Summary

	Possible Issue Identified?
Leachate Assessment (soils)	No
Perched Groundwater Assessment	No
Shallow Groundwater Assessment	No
Surface Water Assessment	No

6.0 Risk Assessment – Ground Gas and Vapours

Introduction

6.1 Factual information from the site investigation and subsequent analytical data has been subjected to several semi-quantitative risk assessments with respect to ground gas and vapours. The results of these assessments are presented in Appendix E and summarised in this Chapter. The assessments detailed in this Chapter include:

- Vapours
- Preliminary ground gas assessment.

Risk Assessment - Vapours

6.2 Vapours are not anticipated to pose an unacceptable risk to future and current receptors given that evidence of a substantial source is yet to be identified. Historically, soil concentrations of PAHs, BTEX, TPHs and VOCs (which could give rise to vapours), were recorded at concentrations below the laboratory limit of detection across all areas of the site. The same was found of the soil data during this investigation with in-situ PID headspace readings also confirming this with a maximum reading of 4.2ppm (WS3). This would suggest that a new source has not been introduced to the site during the intervening years.

Risk Assessment - Ground Gas

Background and Context

6.3 The site formally operated as a wastewater treatment works and combined heat and power plant for the neighbouring Aylesford Paper Mill with a sludge bed for the waste produced from the water treatment process present in the northern portion of the site (Figure 3). The sludge bed was later landfilled with boiler ash from the combined heat and power plant. This area of landfilling was identified as an on-site ground gas source during previous phases of investigation and as such ground gas monitoring has been undertaken previously by others.

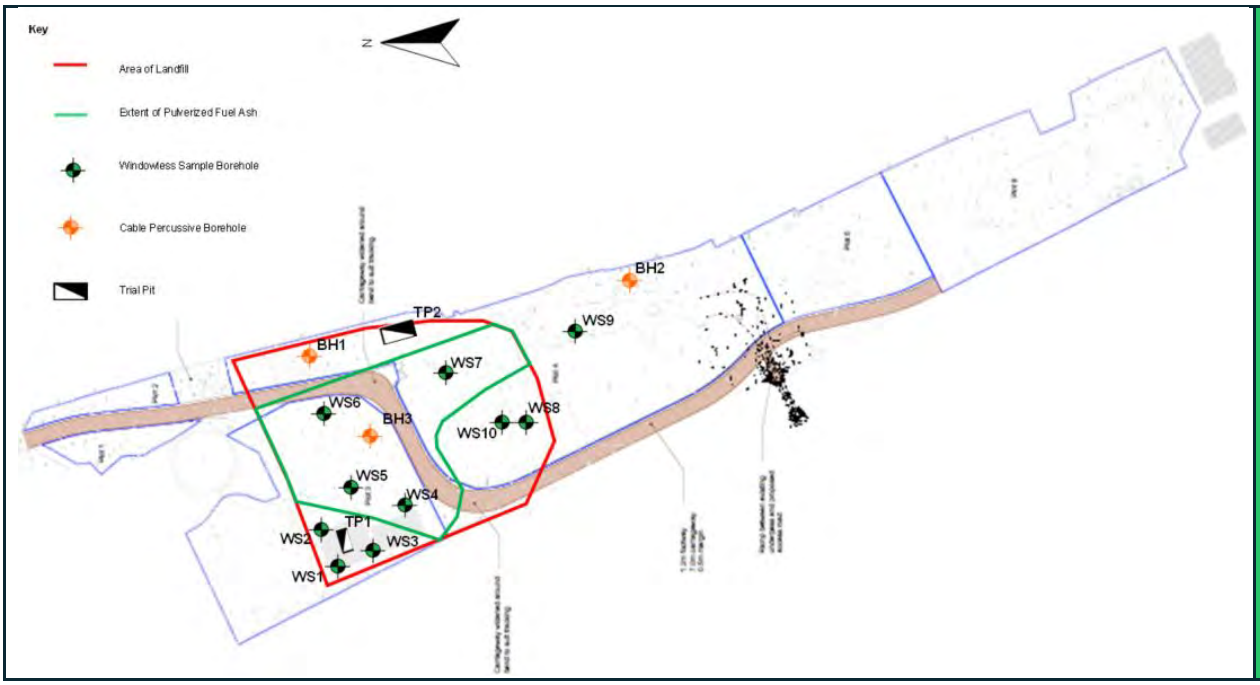

Figure 3 Exploratory Hole Plan

6.4 A Phase I Desk Study was produced by Lustre in October 2023[1] and provides a summary of the site's history and previous phases of investigation, undertaken by others and should be read in conjunction with this report.

6.5 Within the infilled sludge pond, ground gas monitoring identified elevated concentration of methane. Maximum concentrations ranged from 21% to 82.1 % v/v. Elevated flow rates were also recorded ranging from 4.8 to 24.3l/hr. No significantly elevated concentrations of carbon dioxide were identified. Ground gas screening values generated from worst case gas concentrations were 19.92 for methane and 3.305 for carbon dioxide. This area of the site was subsequently classified as Characteristic Situation (CS) 5.

6.6 Outside of the infilled sludge pond, gas screening values were calculated as 0.0003 for methane and 0.0054 for carbon dioxide. Maximum concentrations of methane ranged from 0.1% v/v to 4.2% v/v with maximum concentrations of carbon dioxide ranging from 0.2% v/v to 2.5% v/v. Maximum flow rates were recorded at 0.1l/hr and minimum oxygen was recorded depleted to 1.6%v/v. Given the concentrations of methane identified exceeded the 1% v/v threshold, CS2 was considered appropriate.

6.7 Ultimately the ground gas data generated by others, identified the infilled sludge pond as the primary source of ground gas generation with areas outside of the infilled sludge pond posing a significantly reduced risk to future site users.

Current Ground Gas Data

6.8 Four rounds of ground gas monitoring were conducted as part of this investigation to gain an understanding of the ground gas regime in the first instance given the presence of the onsite infilled sludge pond but also to clarify the previous findings and subsequent risks. A summary of the gas monitoring results is provided in the Environmental Assessment Appendix.

6.9 Worst case conditions were captured during the monitoring programme with three of the four monitoring visits conducted at low and/or falling pressure. Overall, visits were undertaken at atmospheric pressures between 961mb and 1008mb. Four monitoring wells (WS5 & BH1-3) were identified to have been flooded during monitoring visits and as such have not been considered further in this assessment.

6.10 Methane was recorded elevated up to 27.2% v/v and the maximum concentration of carbon dioxide peaked at 8% v/v. Oxygen was recorded depleted down to 0% (WS2, WS8-10), with readings below 10% observed in all wells monitored (WS2-4 & WS7-10) across all monitoring visits. One instance of positive flow was reported at 0.1l/hr within WS9 but on all other occasions no positive flow was identified.

6.11 Based on these values, Gas Screening Values (GSVs) for carbon dioxide and methane were calculated in accordance with BS8485:2015+A1:2019 using the maximum aforementioned recorded values, and the peak flow reading. The GSV for carbon dioxide was calculated as 0.008 l/hr and the GSV for methane was calculated as 0.0272l/hr which would suggest a Characteristic Situation of 1.

6.12 However, the methane and carbon dioxide levels encountered, exceed the special consideration thresholds of 1% v/v for methane and 5% v/v for carbon dioxide, which would upgrade the Characteristic Situation to at least CS2. Given the presence of infilled land on site, the thicknesses encountered and the ground gas generation potential of this fill material, it is considered appropriate to upgrade the site further to CS3.

Proposed Building Type Mitigation

6.13 Given the data previously identified ground gas mitigation measures have been included within the design for the proposed buildings. BS 8485:2015+A1:2019 uses a scoring system

to ensure that minimum gas protection criteria are met via the combination of two or more types of protection measures. The score must be achieved by any two of the following: a structural barrier of the floor slab, ventilation measures and a gas resistant membrane.

6.14 Under this standard, the proposed workshop will comprise a Type D building which based on the ground gas regime of the site (CS3), 3 points are required to mitigate the hazard potential. It is understood that the proposed workshop will include a reinforced ground bearing raft with minimal penetrations and as such, the construction method will provide 1.5 points for the structural barrier element of the gas protection system. A gas resistant membrane will also be installed and verified which will provide 2 points.

6.15 The proposed modular office is a temporary building and therefore cannot be assigned a building type from BS 8485:2015+A1:2019. However, given the intended use and size of this building, it would likely be categorised as a Type C building. The building is proposed to be set on stilts affording a >300mm void beneath the entire footprint of the modular office. The stilts are intended to be built on top of a ground bearing slab with minimal penetrations.

6.16 These design elements are likely to afford protection for future building occupants from ground gas on site. The >300mm void beneath the building will provide ventilation which will break the pathway between the ground gas and the building occupants by minimising the capability for ground gases to accumulate within the building. The slab on which the stilts will be founded will also contribute towards breaking the pathway between the ground gas and the building occupants given it will prevent ground gases from venting out from the ground beneath the modular building. Moreover, low flow rates recorded during monitoring visits across the site demonstrate that ground gas is venting slowly out of the ground. This works symbiotically with the proposed building design to reduce the likelihood of ground gases posing an unacceptable risk to future building occupants.

6.17 With respect to other plots, no proposed development plans have been provided but it is understood that the buildings expected are reflective of Type C (commercial with small to medium room sizes) and Type D (commercial/industrial with large rooms). Site wide hardstanding is also proposed which will include a reinforced raft or slab foundation to all buildings.

6.18 Buildings proposed within the area of the infilled sludge pond (northern end of Plot 4 and any additional development to Plot 3) would likely require mitigation measures in line with CS3 to mitigate the risks posed by ground gases. Buildings proposed outside of the infilled sludge pond (Plots 1, 2, 4, 5, 6 and the southern portion of Plot 4) would likely require measures to satisfy CS2 given the difference in source material within these locations as well as the lower readings observed during the monitoring visits.

6.19 Specific assessment of the risks posed by ground gases will be required once proposed development plans become available for Plots 1,2 4-6 to ensure that hazard potentials to building users are fully considered. In addition, the ground gas risk assessment conducted within this report is based on a commercial end use for the site. Should the end use or proposed development change, then further risk assessment should take place to ensure that all risks are captured and sufficiently assessed.

Ground Gas Conclusions

6.20 The number of points afforded by the proposed ground gas mitigation measures for each building therefore satisfies the number of points that could be applied for these building types under the higher hazard potential designation of CS4. Given that these measures exceed the level of protection required for CS3 they are considered more than enough to adequately reduce the risks posed by ground gas to acceptably low levels.

6.21 Moreover, from a review of the monitoring data produced by others and the design of the monitoring wells themselves, it is apparent that ground gas data was generated from flooded wells. This elucidates the CS5 designation previously assigned to the area within the infilled sludge pond as ground gas and flow readings would have been elevated given the presence of shallow groundwater within the response zones of these wells. In turn this created GSVs that were not wholly representative of the ground gas regime beneath the site.

6.22 With all of this considered, the designation of CS3 is considered sufficiently conservative to mitigate risks to future building occupants given the combined reduction in risk afforded by the proposed mitigation measures and the unrepresentative nature of the previous data.

Summary of Quantitative Risk Assessments

Table 8 Ground Gas Assessment Summary	
	Possible Issue Identified?
Preliminary Ground Gas Assessment	Yes

7.0 Phase 2 Conceptual Model & Risk Assessment

Introduction

7.1 A preliminary conceptual site model was included within the previous Desk Study report[1], which identified potential sources of contamination attributable to the historical and current site uses. This Phase 2 Site Investigation was subsequently designed to further assess the identified potential sources of contamination whilst also gathering information on the environmental setting and receptors (e.g. ground conditions, groundwater etc).

7.2 This chapter considers the results from the quantitative risk assessments in the context of the wider conceptual site model, particularly the proposed development layout, field observations and ground conditions recorded during the investigation, and any other relevant information such as groundwater flow etc, anticipated enabling work etc. Considering the quantitative risk assessment results alongside these factors provides an updated qualitative risk rating and represents a secondary more site-specific tier of assessment.

7.3 Where potential issues have been identified following the quantitative risk assessment in Chapter 4, these have been considered in this next phase of assessment, supplemented with the field observations set out in Chapter 3. Quantitative assessments which did not identify any issues have not been considered further.

Acceptably Low Risks – Final Development Context

7.4 Considering the risk assessment results in the context of the proposed site use and configuration of specific areas of active exposure pathways and the spatial distribution of contamination, or the wider context of controlled water sensitivity, the risk ratings may change.

7.5 Acceptably low risks are anticipated to be as follows:

- **Asbestos Impact to Shallow Made Ground**: Asbestos was detected in 4 out of the 11 samples analysed which included samples collected from TP2, WS1, WS6 and WS8 at depths ranging from 0.15 to 0.5m bgl. However, the proposed commercial development includes presence of site wide hardstanding which breaks all potential

pathway for future site users to come into contact with asbestos containing soils. Asbestos is therefore not considered to present a risk to the human health of site workers or visitors in the context of the proposed commercial land use.

- **Impact to Surface Waters**: the potential for migration of contamination from perched groundwater to controlled water receptors (i.e. the surface water of the River Medway) is limited due to the presence of hydraulic barriers such as cohesive soils and the river wall as well as the general discontinuous nature of the water body. Based on the assessments undertaken the risk to surface water and groundwater from contamination beneath the subject site is considered to be acceptably low.

- **Impact to Groundwater:** Minor contamination was identified within the perched groundwater from arsenic and sulphate which had the potential to impact groundwater beneath. No evidence of an ongoing source of arsenic or readily leachate sulphate was identified within soils during current and/or previous phases of investigation. Therefore, the elevated concentrations identified may be representative of wide groundwater quality rather than originating from subject site. In addition, the development proposals include the provision of site wide hardstanding and formal drainage which will prevent the infiltration of surface water and act to further reduce any potential ongoing risks from these contaminants. It is therefore considered that the risk to groundwater from these contaminants is therefore acceptably low.

- **Vapours**: risk to future building occupants considered likely to be acceptably low. No elevated PID readings were identified within soils or during return monitoring and chemical analysis did not identify presence of elevated volatile organic compounds.

Identified Risks of Concern – Final Development Context

7.6 Any issue(s) identified following the second phase of assessment have been grouped into relevant Contamination Issues. A Contamination Issue can either have a common source, contaminant or receptor, and either one or more risk ratings as a result. The following table(s) summarise the identified contamination issues.

CONTAMINATION ISSUE 1	
Area of Site	
Site Wide	
Contaminants of Concern	**Receptor Category at Risk**
TPH /VOCs	**Potable Water**
Source Details (occurrence and distribution)	
Concentrations of TPH within shallow Made Ground were recorded above the risk criteria where tested across the site.	
Context of Proposed Development and Layout	
Given that the maximum depth of Made Ground at the site is 0.7m bgl and that potable water pipes will be placed at a depth of >0.7m bgl in accordance with water supplier requirements, any new services may be located within Made Ground and as such be at risk.	
Risk Summary	
Drinking water pipes will likely extend across site and through areas of minor TPH contamination.	

Receptor	Risk Rating	Notes
Potable Water	**Moderate/ low**	-

Impact to Development
Risk rating could be mitigated though the placement of appropriate rated potable water pipes, breaking the exposure pathway.

CONTAMINATION ISSUE 2	
Area of Site	
Site Wide	
Contaminants of Concern	**Receptor Category at Risk**
Ground Gas (i.e. Carbon Dioxide, Methane, Carbon Monoxide)	**Human Health / Buildings**
Source Details (occurrence and distribution)	
A potential source of the ground gas is the Made Ground, which includes ashy soils as well as PFA itself, and underlying organic rich Alluvium. The site is considered **Characteristic Situation 3** given the concentrations of carbon dioxide and methane encountered as well as the presence of the infilled sludge pond onsite.	
Context of Proposed Development and Layout	
The proposed commercial units to Plot 3, represent a lower risk development type. The buildings are proposed within the infilled sludge pit mostly bordering the area of PFA, aside from the southeast corner which intersects with the area of PFA identified during this phase of investigation.	
Risk Summary	
Based on the gas data gathered to date:	

Receptor	Risk Rating	Notes
Buildings / Site Occupants	**Moderate**	All structures

Impact to Development
Risk ratings could be mitigated though the implementation of gas protection measures which focuses on breaking the exposure pathway.

8.0 Conclusions

8.1 A Phase 2 Site Investigation has been undertaken to support the proposed redevelopment of a site located off Mill Hall Road in Aylesford, Kent. The objective of the works was to provide information on the contaminative status of the site whilst obtaining information on the shallow ground conditions, reduce uncertainty and validate the findings of the Phase 1, by expanding the historic dataset for the site undertaken over previous years.

Ground Condition Summary

8.2 The site investigation identified that the ground conditions at the site comprised Made Ground with anthropogenic inclusions of gravels to cobbles of brick, concrete, wood and metal. Made Ground was encountered in all 16 exploratory hole locations and proven in all but 3 of those locations. Underlying natural material comprised Alluvium over the River Terrace Deposits and the Folkestone Formation.

8.3 No significant evidence of putrescible materials was identified by the investigation such as household waste or significant quantities of organic material. The main organic constituent identified was wood.

8.4 Evidence of contamination was identified visually and chemically. Visual evidence of contamination included black ashy soils associated with boiler ash (identified as pulverized fuel ash (PFA)) as well as clinker used in the infilled sludge pond. Chemical evidence included the identification of asbestos containing soils within the shallow Made Ground.

Contamination Risk

8.5 This investigation has shown that the contaminative status of the site should not be prohibitive to the proposed commercial use of the site.

8.6 As illustrated in Chapter 4, some of the contamination risks attributable to viable pollutant linkages were considered to be low and very low. However, elevated risks (moderate/low and moderate) have been found, and these will need remedial action to reduce the risks to identified receptors. In summary, the following risks require management to ensure that the site is safe and compliant. All risks can be effectively mitigated using routine remedial measures.

- **CONTAMINATION ISSUE 1** – Elevated concentrations of TPH / VOCs above the drinking water assessment criteria for PVC and PE pipes. **Moderate/low** risk to potable water pipes. **POTENTIAL REMEDIAL MEASURE – Placement of Protective Potable Water Pipes:** Barrier pipe will need to be installed for the potable water supply, not PVC or PE pipes.

- **CONTAMINATION ISSUE 2** – Elevated concentrations of ground gases associated with the Made Ground and underlying organic rich Alluvium. **Moderate** risk to buildings and site occupants. **POTENTIAL REMEDIAL MEASURE – Installation of Gas Protection Measures:** Gas protection measures will be required in all internal areas of buildings in accordance with BS 8485 2018 + A1 2019, with at least two levels of protection provided.

9.0 Planning Considerations & Next Steps

Statutory Designation

9.1 It is our opinion, based on the findings of this Phase 2 Site Investigation, that the site would not be designated as statutory contaminated land by the Local Authority in accordance with the published Statutory Guidance. It is advisable however that any recommendations to reduce the risk ratings noted in the previous chapter are implemented fully, to ensure the site becomes safe and compliant.

Non-specialist Environmental Watching Brief

9.2 It is prudent to ensure a watching brief is carried out by a suitable person on-site throughout the works who is experienced and capable of identifying signs of potential contamination, including, but not limited to, staining, unfamiliar odours and visual evidence of potentially contaminated/ hazardous materials such as asbestos.

9.3 If any suspected ground contamination such as unusual odours, visually impacted soils/water, suspected asbestos or any potentially hazardous waste not recorded during this investigation is encountered during the works, further sampling and testing should be carried out under supervision by Lustre. This will allow the determination of the appropriate management and mitigation measures to address any potential risks as part of the development of the site.

Unforeseen Ground Contamination

9.4 A reasonable amount of skill and care, as expected, has been used to deliver this investigation in accordance with the agreed scope of work and meet the required objectives. However, the potential for unforeseen contamination to be present, or encountered during future groundworks, maintenance works and/or site clearance/redevelopment works cannot be entirely eliminated. This will be particularly important when working within the vicinity of areas that were not investigated, or the method of investigation employed was limited due to safety (i.e. live underground services), access, financial, public relations, third party intervention and/or risk etc. which influenced the scope of the investigation. A site investigation can only provide a snapshot of the ground conditions encountered at the time

covering a relatively small proportion of the site, with samples only representing discrete parcels of ground. Care and diligence are advised even if a site investigation records a low or very low risk of contamination. Lustre cannot be held responsible for unforeseen contamination that may be present or encountered in the future.

Remedial Measures

9.5 It is understood that this report will be submitted to the local planning authority to support the application. On award of planning permission, it is expected that the requirement for verification of remedial measures will be conditioned by the Environmental Health Officer.

9.6 Upon approval of this report by the council, remedial measures can be implemented on site to reduce the risks associated by elevated concentrations of TPH and PAHs to potable water pipes and the risks associated with elevated concentrations of ground gas and future site users and buildings. Once these measures have been implemented, verification would be needed to demonstrate that the remedial works have been completed which typically involves site inspections and testing. A Verification Report would then be produced to compile this information and submitted to the council for approval.

Protective Potable Water Pipes

Remedial Measure Required
In accordance with UKWIR Guidance[7], installation of Barrier pipe will be required to prevent contamination of polymeric services.
Environmental Consultant Supervision Required?
✖ NO
Recommended Product / Material & Installation Guidelines
Barrier Pipe The Client should notify the water company of their proposed selection of pipe material and details of installation. The specification and construction method should be agreed with the water authority prior to installation. Normally, any potable water pipes will need to be placed at least 750mm below ground level to protect against frost susceptibility and any trafficked loads in line with the statutory water company's guidelines.
Contractor/ Client Documentation Required
Material specification of the product used on site along with photographs of the placement of the water pipe indicating depth and construction/ placement method for inclusion into the Verification Report.

[7] UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. 2010.

Validation Measures
Provided that the water pipes are extending through a known source of contamination that requires preventative measures to stop the creation of a preferential pathway, then inspection by the Environmental Consultant whilst not essential, would be recommended including a photographic record of the installation to support evidence of the installation.

GAS PROTECTION SYSTEM (BS8485:2015 COMPLIANT)

The site investigation undertaken has identified elevated ground gas (methane and carbon dioxide). The risk assessment undertaken using the Modified Wilson and Card method has determined the site as **Characteristic Situation 3** and therefore gas protection measures are required.

BS 8485:2015[8] uses a scoring system to ensure that minimum gas protection criteria are met via the combination of two or more types of protection measures. The score must be achieved by any two of the following: a structural barrier of the floor slab, ventilation measures and a gas resistant membrane. Based on the Characteristic Situation and development type, at least 3 points are required. (see table 4, pg 22 of 8485).

It is understood that the proposed build (workshop) will comprise a reinforced cast in-situ floor slab with minimal penetrations, with no sub floor void. As such, the construction method will provide **1.5 points** for the structural barrier element of the gas protection system. An additional **2 points** will come from a gas resistant membrane (minimum points available for a compliant membrane installation is 2 points).

The modular office building is proposed to be constructed on stilts at least 300mm above the concrete slab foundation. This design will provide additional protection given the void beneath the modular building's floor will help dissipate any gases from accumulating below the building's floor / above the slab. **2.5** points would typically be awarded for this protection measure, however given the modular office building is temporary, BS 8485 does not directly apply.

Remedial Measure
The development requires gas protection measures including the following measures: structural barrier and gas resistant membrane.
Environmental Consultant Supervision Required?
✔ YES
Recommended Material / Product
The gas resistant membrane should meet the following criteria: ► methane gas transmission rate <40.0 ml/day/m^2/atm; ► durable to remain serviceable for the anticipated life of the building and duration of gas emissions; ► strong to withstand the installation process and following trades until covered (e.g. penetrations); and

[8] BS 8485 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. 2015

- capable, after installation, of providing a complete barrier to the entry of gases.

The membrane must be installed in accordance with BS8586:2015, CIRIA Report 665[9] and BRE Report 414[10]. Any products proposed for use as a gas resistant membrane should be checked with the Environmental Consultant to confirm its suitability. A recommended product is the Visqueen Gas Barrier and details can be provided regarding this barrier and others upon request. The membrane must be installed with the use of product compliant installation methods, the membrane manufacture's ancillary components and materials, as per the manufacturer's instructions.

Scope / Instructions

STEP 1 – Documentation Review: Provide contractor's method statement, chosen membrane product and certification/qualification of installers. The membrane installer should be suitably qualified (i.e. NVQ level trained as a minimum). Typically, the product supplier can recommend suitable installers. Proposed slab and subfloor void drawings. Installer/client to confirm independent third party to undertake certification of completed membrane (see Step 4). *Lustre will undertake checks to ensure those persons intending to undertake the works are competent to do so and that the proposed methodology and products are suitable*.

STEP 2 - Preparation: Once the slab is formed all cracks, joints and service penetrations should be sealed. The installation surface should ideally be suitably prepared and level. All surfaces should be swept clean and free from any sharp edges or protrusions. The installation surface should be checked by the **installer** before placing the membrane.

STEP 3 – Installation: The membrane must be placed with the use of product compliant installation methods, ancillary components and materials, as per the manufacturer's instructions. The installation contractor should determine the most appropriate jointing method to ensure the above gas transmission rate is achieved post-installation, in accordance with the manufacturers installation guidance (e.g. using jointing tapes or conventional thermal (hot air/wedge) welding equipment). Any penetrations within the membrane should be effectively sealed using the appropriate accessories and recommended details based on the manufacturer's documentation. To ensure a robust system and to minimise any conflict of interest from a warranty standpoint, no alternative or replacement ancillary products should be used from different manufacturers once the main membrane product has been selected. All laps and junctions within the membrane should be overlapped by a minimum of 150mm, unless specified by the manufacturer.

STEP 4 – Integrity testing: Upon completion of the installation, the integrity of the membrane should be checked and tested in line with CIRIA C735[11]. The membrane installer will therefore be responsible for providing their own QA/QC record and the provision of an independent third party certificate providing evidence that the works have been carried out to a satisfactory standard, in accordance with the manufacturer's specification/guidance. This will include **Certificates of Conformity** for each ground floor dwelling/unit.

[9] CIRIA Publication C665. Assessing Risks Posed by Hazardous Ground Gases to Buildings. 2007

[10] Environment Agency and BRE, Protective Measures for Housing on Gas Contaminated Land. BRE 414. 2001

[11] CIRIA Publication C735. Good practice on the testing and verification of protection systems for buildings against hazardous ground gases.

Contractor/ Client Documentation Required
The following documents should be provided **before** works commence: ► Chosen product and specification ► Contractor's method statement and qualifications of installers ► Detailed drawings showing installation and any relevant details ► Installation programme The following documents should be provided **following** completion: ► Installers QA/QC records ► Independent verification certificates (Certificate of Conformity) ► As built construction drawings showing structural and ventilation elements
Validation Measures
Part-time attendance by the Environmental Consultant will be required as part of a watching brief to ensure appropriate installation (overlapping and sealing) in accordance with CIRIA Report 665 Assessing Risks Posed by Hazardous Ground Gases to Buildings[12] and BRE Report 414 Protective Measures for Housing on Gas Contaminated Land[13]. Verification by the consultant will include inspection of the installation method/approach, partial material examination (for defects), installation of membrane and vents and service penetration/sealing. Verification provided by the Environmental Consultant will only provide a general validation of the works undertaken – i.e. level of workmanship, material quality etc and may not include an inspection of all buildings/areas. Certification for the overall works must be provided by an **independent third-party inspector**. Lustre will only provide a document review of the information noted above. No site inspections are proposed by Lustre. It is understood that the sign-off of the installation will be undertaken by an independent third-party inspector and as such Lustre will not sign off any physical installation. Lustre will provide all factual information within the Verification Report.

[12] CIRIA Publication C665. Assessing Risks Posed by Hazardous Ground Gases to Buildings. 2007
[13] Environment Agency and BRE, Protective Measures for Housing on Gas Contaminated Land. BRE 414. 2001

10.0 Construction Phase Advisory Matters

10.1 Aside from land contamination issues that require consideration under the planning regime, the findings of this investigation impact other aspects of the construction phase. These items often require action to ensure that you continue to have a safe and compliant site and include matters such as waste soil classification, managing contamination during construction, drainage conditions, impacts of piling etc.

Waste Classification of Soils

10.2 The development will require soils to be removed from site as part of the groundworks and construction process. Guidance set out in the Waste Framework Directive and the Environment Agency's Technical Guidance WM3 Hazardous Waste, provides information and controls on how sites should manage and dispose of waste soils. Waste producers have a duty of care under the waste regulations which initially requires them to classify the waste they produce before it is collected, disposed of or recovered, to identify any controls that apply to the waste movement, to complete relevant documents and records, to identify suitably authorised waste management options and to prevent harm to people and the environment.

10.3 This section provides information on the preliminary waste classification of soils, which may require removal from site. It is important to note that the regulations require waste producers to classify any waste soils; however, the soils assessed as part of this investigation may not be representative of the soils being removed from site during redevelopment and therefore consideration should be given by the waste producer if further testing of waste soils is needed prior to disposal, to ensure the actual waste soils leaving the site is classified appropriately.

USEFUL INFORMATION ON WASTE, CODES AND DISPOSAL	
When do Soils Become a Waste?	Any man-made soils (such as Made Ground) or contaminated soils become a waste when excavated from the ground and must be disposed of off-site, unless suitable permits are granted to allow re-use. Uncontaminated natural soils which are excavated and have a certainty for re-use on site as part of redevelopment works are not considered a waste.
What are Mixed Soil Wastes?	Mixed wastes are soils which contain materials that could be classified differently. Mixed waste should be assessed separately and undergo a form of pre-treatment and/or segregation prior to disposal. Mixed wastes could

USEFUL INFORMATION ON WASTE, CODES AND DISPOSAL	
	include soils contaminated with ACM – in this case both the ACM fragments and soils would require separate assessment and disposal. Mixing of hazardous wastes and soils with different hazardous substances (hydrocarbons, asbestos etc) is prohibited under the Waste Framework Directive.
Do I Need to Segregate My Wastes?	Measures should be implemented on site to segregate waste streams with natural material stockpiled separately from any Made Ground. Any oversized and waste materials (such as construction waste, ACMs, plastics, metals etc), will require segregation from the soil (where practicable), and separate and appropriate disposal.
What are the Available Waste Classifications?	Waste soils must fall into one of two categories: Hazardous or Non-Hazardous. Each classification results in the following European Waste Codes (EWC codes): **Hazardous soils**: 17-05-03 (soil and stones containing hazardous substances) **Non-Hazardous soils**: 17-05-04 (soil and stones) The term 'inert' is not strictly a classification of waste. These codes relate to Chapter 17 in the List of Waste, as construction and demolition wastes (including excavated soil from contaminated sites). The case for hazardous waste is unrelated to soils that may have been identified as "hazardous" from a human health risk assessment.
What Makes a Waste Hazardous?	Concentrations of contaminants which exceed established hazardous properties (HP) and/or statements. This can include the presence of asbestos >0.1%, high concentrations of certain metals, significant hydrocarbon contamination etc. The Hazardous properties thresholds for waste classification are different to screening values for assessing risks to human health. A waste soil could be classified as hazardous based on the accumulative effect of contaminant concentrations, but not pose a risk to human health based individual contaminant concentrations.
What are the Landfill Options?	Waste soils can be disposed of at hazardous landfills, non-hazardous landfills and inert landfills. Some sites, which are not landfills such as recovery and restoration sites, often have similar but more stringent criteria for receiving inert soils. It is the responsibility of the waste producer to ensure that the chosen waste recovery or disposal site is able to accept the waste soils and that the EWC codes for waste soils from construction and demolition are included on the receiving sites Environmental Permit.
Soils Suitable for Disposal at an Inert Landfill	'Inert' is not a waste classification, but a category of waste recipient which can only accept waste that acts in an inert way when deposited. Soils suitable for disposal at an inert landfill must not undergo any significant physical, chemical or biological transformations (dissolve, burn, physically or chemically react, biodegrade etc) in a way likely to cause environmental pollution or harm to human health. **Practically it must be non-hazardous, not contain organic materials, plastics, metals, contamination etc, and meet the criteria for 'inert' disposal through Waste Acceptance Criteria (WAC) testing.** Given the variability of Made Ground and potential for this soil type to contain a significant amount of non-inert materials which cannot be readily segregated, Made Ground won't often be considered suitable for disposal at an inert landfill. However, if the soils contain an incidental amount of non-inert materials (following segregation), are relatively homogenous, non-

USEFUL INFORMATION ON WASTE, CODES AND DISPOSAL	
	hazardous and meet the inert WAC criteria then this material can be disposed of at an inert landfill. However, it is noted that certain wastes may be disposed of as inert without testing. Council Decision 20003/33/EC Annex, 2.1.1 lists those wastes that meet the definition of inert waste in Article 2(e) of the Landfill Directive. In the case of suspicion of contamination testing should be applied.
When do I Need a WAC Test?	WAC testing is only needed when soils are found to be hazardous or could be disposed of at an inert landfill. WAC testing is not required if the soils are non-hazardous and plan to be disposed of as a non-hazardous landfill. A WAC test does not classify the waste!

Preliminary Waste Assessment of Soils

10.4 Detailed information on the process adopted in this preliminary waste assessment is set out in Appendix A. The table below summaries the findings of the preliminary waste assessment based on the results of the chemical testing discussed earlier in this report.

Table 9 Preliminary Waste Assessment of Soils

Soil Type	Area / Type	Waste Classification	Waste Code	Disposal Route / WAC Result	Comments
Made Ground (Pulverized Fuel Ash)	Associated with TP1	Non-hazardous	17 05 04	Non-hazardous landfill	Presence of non-inert materials (organics, metals), elevated pH

10.5 Copies of all HazWasteOnline results are provided in Appendix E. WAC test certificates are provided in Appendix C.

Asbestos in Soils and Waste Classification

10.6 If asbestos contaminated soils are present on site, specific measures need to be put in place to safely manage these arisings. Any visible ACM fragments (>50mm) in soils will result in that material being classified as hazardous waste. If the visible fragments are removed and the free fibre content is below 0.1%, the soils would become non-hazardous waste (17-05-04, assuming no other hazardous properties have been identified in that material).

Waste Related Recommendations

10.7 As noted above, it is advisable that the waste producer considers the classification of soils above in the context of the exploratory locations advanced in this investigation and the actual locations and depths of soils requiring disposal (once this information is known).

10.8 If any tanks, drums, scrap metal or other wastes are present on site, these will require separate assessment and disposal to remove these materials. Records should be kept of the removal of these waste items.

10.9 In addition, the following site-specific recommendations are made regarding waste classification. It is noted that these recommendations only apply if soils in these locations require excavation and off-site disposal; if soils in these locations remain in-situ, these points do not require actioning:

- Quantification is recommended on all samples found to contain asbestos (if not already undertaken).
- Visible fragments of ACM will require removal from the soils by hand picking, undertaken under a suitable safe system of work. ACM should be stored in an asbestos skip and disposed of appropriately.
- Any oversized, non-inert and non-soil materials within the Made Ground (such as construction waste, metals, plastic and wood) should be segregated from the Made Ground for separate and appropriate disposal or recovery.
- Delineation through sampling and laboratory testing of the identified hazardous soils listed above to determine their extent (*Insert locations*) – to inform appropriate waste management practices.
- Further testing of soils in-situ to fully characterise the Made Ground across the site and inform waste disposal. This is required due to the identification of the material having variable classifications across the site including both hazardous and non-hazardous properties. Due to the sporadic distribution of the hazardous materials and lack of suitable visual or olfactory identifying characteristics, the current dataset is insufficient to appropriately classify the material in between the immediate vicinity of the exploratory locations.
- WAC testing may be required by the waste recipient if the disposal route is likely to be an inert landfill or a hazardous landfill.

General Responsibilities (Waste)

10.10 The Client and contractors involved in the excavation, segregation and off-site disposal are responsible for the correct management and pre-treatment of waste spoil generated by all

earthworks. These parties have a duty of care which requires suitable management and disposal of wastes in accordance with the regulations. Given that Lustre does not have any significant involvement during the earthworks phase, full responsibility for waste management rests with the principal contractor/waste producer.

10.11 The waste producer must retain a copy of *all* waste consignment notes, waste hauler documentation and waste recipient documentation and licenses.

Preferential Pathways (Foundations)

10.12 Deep foundations could result in the creation of preferential pathways and movement of potentially contaminated soils to depth. Depending on the site circumstances, these processes can result in a deterioration of groundwater quality. Given that the proposed foundations will comprise shallow footings, the risks from piling to groundwater need not been considered. However, should a deep foundation solution be adopted, a piling risk assessment may need to be carried out.

Increased Infiltration

10.13 The development proposals will reduce the amount of infiltration and formalise drainage. This will have a positive impact on the rates of any leaching and/or mobilisation of contaminants in the subsurface. The minimum depth of discharge from any soakaways must be below the base of any Made Ground; surface water should not be discharged from soakaways within the Made Ground.

Permeability of Soils

10.14 The soil infiltration rate at the location of any soakaways should be determined through infiltration testing.

Asbestos in Soils

10.15 This report does not specifically consider the risk from asbestos in soils to construction workers. It is generally recommended that if asbestos has been recorded in soils on site, the groundworks contractor should prepare a detailed method statement for the excavation, handling and storage of asbestos contaminated soil (ACS), in addition to implementing an

asbestos watching brief. As a minimum, the groundworks contractor should hold the appropriate level of asbestos awareness training and be competent in managing ACS. The risk from asbestos to groundworkers should be clearly understood and communicated to those working with soils on site.

Imported Soils and Recycled Crush

10.16 Any soils or crushed concrete imported to site during the development which will be retained on site should be checked to ensure they do not contain contaminants which may pose a risk to future site users. Evidence of due diligence in this regard is often requested by regulators to demonstrate that imported materials do not contain contaminants such as asbestos

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Drawings

Key

- Area of Landfill
- Extent of Pulverized Fuel Ash
- Windowless Sample Borehole
- Cable Percussive Borehole
- Trial Pit

Notes

Do not scale from this drawing. Approximate positions only. Report all errors and omissions to author.

Rev	Date	Description

Client / Project

VIP Investments Aylesford Ltd
Mill Hall Road, Aylesford
Land to the east of Mill Hall Road, in Aylesford, Kent, ME20 7FG

Drawing Title

Site Investigation Plan

Project Number	Drawing Number	Date	Designed by	Approved by
4630	002	15/11/23	Toby Hill	

Lustre Consulting Limited
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APPENDIX A: Reference Information

PHASE 2 REFERENCE INFORMATION

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APPROACH TO INVESTIGATIONS & CONTAMINATED LAND DEFINITIONS

Environmental site investigations are prepared in keeping with best practice and current planning guidance, where practicable and in accordance with the approved scope of work. The National Planning Policy Framework (NPPF)[14] advises regulatory consultees to ensure that adequate site investigation information is provided at the initial planning stage, whilst the Land contamination risk management guidance (LCRM, October 2020) requires a phased, risk based approach when dealing with land affected by contamination in the UK.

References to the term "contaminated land" in our reports relate to the statutory definition of contaminated land under the recently published Contaminated Land Statutory Guidance unless otherwise stated (also known as Category 1 and 2 under Part 2A). That definition is: "any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances on in or under the land that –

a) Significant harm is being caused or there is a significant possibility of such harm being caused; or
b) Significant pollution of water environment is being caused or there is significant possibility of such pollution being caused".

Other terms such as "land affected by contamination" or "land contamination" refer to the much broader categories of land where contaminants are present but usually not at a significant level of risk to be classified as contaminated land under the definition Part 2A (also known as Category 3 or Category 4 under Part 2A).

The National Planning Policy Framework (NPPF) states that "land should be suitable for its new use and as a minimum, after carrying out remediation (if required), the land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990".

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NOTES ON LOGGING & SAMPLING

For all exploratory holes excavated, soil arisings are recovered and logged to BS5930: 2015[15]. Where possible, observations on groundwater ingress and excavation stability are made. Soil arisings are then typically inspected for visual and olfactory evidence of contamination with samples recovered at varying depths for analysis depending on the scope of works. Disturbed and undisturbed samples (where applicable) are taken in accordance with guidance and deposited in suitable containers, prepared and dispatched to a UKAS (United Kingdom Accreditation Service) accredited laboratory.

If appropriate to the nature of the works, soil samples from the Made Ground or potentially contaminated soils are also deposited in sealable plastic bags to allow on-site headspace analysis. Samples are then left for at least 20 minutes before analysis and a photo-ionisation detector (PID) with 10.6eV lamp used to measure the concentration of volatile organic compounds (VOC) within the headspace. Soil samples are gently agitated during analysis to encourage the release of any volatiles.

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[14] Department for Communities and Local Government, National Planning Policy Framework, 2019.
[15] British Standard – Code of Practice for Site Investigation. BS 5939: 2015.

QUANTITATIVE RISK ASSESSMENTS

Human Health GQRA

To determine whether contamination presents an unacceptable level of risk to human health, concentrations of potential contaminants are screened against risk threshold values. Historically, these values had been in the form of Generic Assessment Criteria (GAC) and Soil Guideline Values (SGVs), published by regulatory and advisory bodies. However, in response to revised Part 2A Statutory Guidance, Defra published Category 4 Screening Levels (C4SLs) for six determinands to provide a simple test for deciding when land is 'suitable for use' and demonstrably not 'contaminated land'. The supporting documentation from Defra[16] acknowledges that where C4SLs exist, these values represent a greater risk threshold (i.e. low risk) rather than the previous SGVs/GACs (i.e. no risk). Acknowledging that the C4SLs were primarily intended for use under Part 2A Statutory Guidance, LQM in collaboration with the Chartered Institute of Environmental Health (CIEH), subsequently published a third set of generic assessment criteria known as LQM/CIEH Suitable 4 Use Levels (S4ULs)[17]. The S4ULs are based on the 'minimal or tolerable level of risk' as defined in previous Environment Agency guidance (namely SR2[18]) which underpinned all previous SGVs/GACs. The National Planning Policy Framework (NPPF)[19] requires that planning decisions undertaken by the Local Planning Authority should decide if a site is suitable for its new use and not just whether the site is determinable under Part 2A. Whilst Defra states that the C4SLs could be applied under the planning regime, it is acknowledged that these screening levels were primarily published to support the Part 2A Statutory Guidance. Taking this into account, the S4ULs are often used in the first instance. Where an exceedance above these levels is identified, comparison against C4SLs will generally be undertaken, with consideration given to the applicability of a less conservative threshold.

Water Pipeline Suitability Test

Often, at the time of site investigation, the route of any proposed potable water pipes are not known, or are largely inaccessible if an existing development is present. As such, potable water pipe assessments are based on the shallow soils across the site as a whole. In accordance with UKWIR guidance, we consider determinands for assessment based on the historical use of the site. Available analytical data is then compared against the UKWIR thresholds. The assessment of ethers, nitrobenzene, ketones, aldehydes and amines are often not considered applicable. The assessment of mineral oil is undertaken using the results from any speciated TPH test data, which provides a breakdown of the hydrocarbon fractions.

Groundwater GQRA

When assessing the risks to groundwater, the screening criteria adopted includes the UK Drinking Water Standards (DWS) as specified in Water Quality Regulations 2000[20], Environmental Quality Standards (EQS) for freshwater[21] and World Health Organisation (WHO) standards for drinking water quality[22]. The hierarchy that these are adopted is based on the conceptual site model and the most sensitive receptors in the context of the site and the local use of any groundwater. In the absence of UK published guidance values for total petroleum hydrocarbons, the WHO guideline values (provided in Petroleum Products

[16] SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, March 2014

[17] The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3455. All rights reserved

[18] Environment Agency, Human Health Toxicological Assessment of Contaminants in Soil (SR2), January 2009

[19] Department for Communities and Local Government, National Planning Policy Framework, 2019

[20] The Water Supply (Water Quality) Regulations 2000

[21] Environmental Quality Standards, The Water Supply (Water Quality) Regulations 2002

[22] World Health Organisation (WHO) Guidelines for Drinking Water Quality, 1984

in Drinking Water guidance) are adopted[23]. The use of the lowest screening criteria for an individual TPH fraction has been adopted as set out in the guidance, which provides a conservative assessment for TPH.

Ground Gas Risk Assessments

Ground gases such as methane and carbon dioxide can be generated naturally from the ground, particularly where decaying organic matter is present. These gases can also be generated by buried degradable waste or other organic compounds in Made Ground / infilled ground. Carbon dioxide and methane can migrate through the soil over significant distances and enter buildings via the subfloor void or other entry points. The hazard associated with methane is explosion, whilst for carbon dioxide the hazard is asphyxiation, particularly in confined spaces. BS 8485:2015[24] sets out a series of gas screening values to enable the assessment of risk, depending on the type and sensitivity of the proposed buildings on site.

CONCEPTUAL MODEL & QUALITATIVE RISK ASSESSMENTS

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The objective of a conceptual model is to firstly identify potential contaminant sources, pathways and receptors relating to the site and surrounding area based on the findings of this investigation. This information is then collated, and a qualitative risk assessment carried out in line with good practice and current guidance[25,26] to assess any viable source-pathway-receptor pollution linkages. The potential for a pollution event to occur is then evaluated using a risk classification tool[27]. The level of risk is assigned by considering the likelihood that a pollution event might occur with the consequence its occurrence. The consequence is essentially a measurement of the severity of a hazard or source (e.g. contaminated soil) and sensitivity of the receptor (e.g. aquifer type or end user).

REMEDIATION AND VALIDATION

RETURN

Following the identification of unacceptable risks to receptors in a site investigation, either more investigation is required to better understand the risk, or often remediation is required. Remediation aims to lower the risk to an acceptable level by either removing the source or breaking / reducing the pathway. The methodology for carrying out any remediation is documented in a Remediation Strategy, and typically forms the third stage in the iterative risk-based approach. The strategy requires regulatory approval before commencing the actual remedial work. Remediation requires careful management and planning, with inspections and testing by the consultant to verify that the remediation has been undertaken in accordance with Remediation Strategy. Information collected over the course of the remedial work is then compiled into a Verification Report in line with the Environment Agency's Evidence, Verification of Remediation of Land Contamination[28].

NOTES ON WASTE CLASSIFICATION (SOILS)

RETURN

Guidance set out in the Waste Framework Directive and the Environment Agency's Technical Guidance WM3 Hazardous Waste , provides information and controls on how sites should manage and control waste soils. The first stage of the waste assessment, as set out in Technical Guidance WM3 Hazardous Waste, requires the chemical composition of the soils to be

[23] Petroleum Products in Drinking-water, WHO (WHO/SDE/WSH/05.08/123)

[24] BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.

[25] Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66, NHBC, 2008.

[26] Construction Industry Research and Information Association (CIRIA). Contaminated Land Risk Assessment. A Guide to Good Practice. CIRIA C552 2001.

[27] Department of the Environment, Transport and the Regions, Environment Agency and Institute of Environmental Health. Guidelines for Environmental Risk Assessment and Management. HMSO July 2000.

[28] Environment Agency, Evidence, Verification of Remediation of Land Contamination, SC030114/R1, 2010

determined by analytical testing, in order to determine if the soils should be classified as hazardous or not hazardous. The second stage requires a Waste Acceptance Criteria (WAC) test to determine the case of inert or non-hazardous waste disposal routes for the soil. Landfills have set criteria for wastes which they can legally accept, and the WAC test therefore provides information on which type of landfill can accept the waste.

Only contaminated soils which are excavated will require classification and assessment for waste disposal as under the Waste Framework Directive, as these soils cannot be re-used on site. In-situ, unexcavated contaminated soils do not require classification. Also uncontaminated soils and other naturally occurring material excavated in the course of construction activities, when it is certain that the material will be used for the purposes of construction in its natural state, on the site from which it was excavated, also do not require classification.

Waste Classification Methodology

The first stage of this assessment is to assign a waste code to the soils requiring classification. This is obtained from the 20 Chapters of The List of Waste (England) Regulations 2005 and includes the consideration of both mirror entries and absolute entries. For mirror entries the soils requiring disposal will be assessed within the HazWasteOnline tool to determine if hazardous properties are present and therefore if the mirror hazardous or mirror non-hazardous code is applicable to the waste classification.

The results of the laboratory analysis are screened in a propriety hazardous waste assessment tool (HazWasteOnline) to determine if the soils would be considered hazardous from a waste disposal perspective. Concentrations of each contaminant are screened to determine if they exceed any of the sixteen hazardous properties (HP) and/or statements as set out the Environment Agency's Technical Guidance WM3 (Guidance on the classification and assessment of waste, 1st edition 2015).

The initial waste assessment on HazWasteOnline identifies those contaminants which exceed any of the sixteen hazardous properties / statements. This is based on the presence of individual anions or cations identified during the chemical analysis of the soils. However, this analysis does not always identify which specific components are present. Where possible, further information has been obtained on which precise substances are likely to be present within the soils, based on the known historical and current site uses and operations. This information can be used to rule out the presence of ‘worst case’ substances within the HazWasteOnline tool. Further information on the specific assumptions made during the waste assessment are provided in the Assumptions Section below and in the HazWasteOnline output sheet included as an attachment to this letter report.

Following the application of project specific assumptions, a detailed waste assessment has been generated. As part of the detailed waste assessment, consideration has also been given to whether the soils should be considered as a single population or as sub populations based on field observations or the presence of specific contaminants.

Waste Assessment Assumptions

Based on our current understanding of historical and current site operations, the following assumptions have been applied within the HazWasteOnline tool, unless explicitly stated in Chapter 7:

- HP3 Flammable has been discounted as a viable Hazardous Property as the soils considered within this assessment are a solid waste without a free draining liquid phase. This is likely due to advice from the laboratory indicates that testing for flammability was not appropriate due to the low level of TPH. The waste does not display this hazardous property.

- Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils.
- Based on the data available it is considered likely that any metallic compounds present within the soils underlying the site are most likely present in their oxide form, rather than as chlorides, sulphates, sulphides, carbonates or phosphates.

APPENDIX B: Exploratory Hole Logs

Borehole Log

Borehole No. **WS1**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 17/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40 - 0.50	ES	PID=0	0.60			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.75 - 0.85	ES	PID=0	1.10			Black slightly sandy slightly gravelly SILT. Sand is predominantly of fine to coarse ash. Gravel is fine to coarse subangular of concrete, flint, brick, wood, tile, metal, wire and clinker. 1No. cobble of metal rebar. (MADE GROUND)
		1.70 - 1.80	ES	PID=0	1.60			Black silty slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular of wire, brick, tile, plastic, flint and metal. (MADE GROUND)
		2.00		N=3 (1,0/1,1,0,1)				Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (RIVER TERRACE DEPOSITS)
		3.00		N=1 (1,0/0,1,0,0)				
		3.50		50 (25 for 0mm/50 for 0mm)	3.50			End of borehole at 3.50 m

Remarks

Trial pit dug to 1.80m bgl with a mechanical excavator for service clearance.

LUSTRE CONSULTING

Borehole Log

Borehole No. **WS2**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 16/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.30	ES	PID=0	0.30			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.40 - 0.50	ES	PID=0	0.50			Black and light brown slightly sandly slightly gravelly CLAY. Sand is fine to coarse predominantly of ash. Gravels is fine to coarse subangular of brick, flint, tile, wood, metal and wire. (MADE GROUND)
		1.00 - 1.10	ES	PID=0	1.20			Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (Re-worked Natural Material)
		1.30 - 1.40	ES	PID=0	1.40			Brown mottled black sandy gravelly SILT with a medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular of brick, flint, concrete, wood, tile, metal and tarmacadam. Cobbles are subangular of concrete, brick and wood. (MADE GROUND)
		1.50 - 1.60	ES	PID=0				
		2.00		N=6 (1,1/1,2,1,2)				
		2.50 - 2.60	ES	PID=0				
		3.00		N=50 (2,6/11,12,12,15)				Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (RIVER TERRACE DEPOSITS)
					3.45			End of borehole at 3.40 m

Remarks

Trial pit dug to 1.50m bgl with a mechanical excavator for service clearance.

AGS

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Borehole Log

Borehole No. **WS3**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 16/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.30	ES	PID=0	0.50			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.60 - 0.70	ES	PID=0	0.80			Black slightly sandy slightly gravelly SILT. Sand is predominantly of fine to coarse ash. Gravel is fine to coarse subangular of concrete, flint, brick, wood, tile, metal, wire, clinker. (MADE GROUND)
		1.00 - 1.10	ES	PID=0	1.40			Black silty slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular of wire, brick, tile, plastic, flint and metal. (MADE GROUND)
		1.50 - 1.60	ES	PID=0				Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (RIVER TERRACE DEPOSITS)
		2.00		N=8 (1,2/2,2,2,2)	2.40			Orangish brown gravelly fine to coarse SAND. Gravel is medium to coarse angular to subangular of flint and ragstone and fine of ironstone. Rare cobble sized fragments of flint. (RIVER TERRACE DEPOSITS)
		2.60 - 2.70	ES	PID=0	3.00			End of borehole at 3.00 m
		3.00		N=50 (4,9/50 for 225mm)				

Remarks

Trial pit dug to 1.70m bgl with a mechanical excavator for service clearance.

AGS

Borehole Log

Borehole No. **WS4**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 16/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15 - 0.25	ES	PID=0	0.30			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.50 - 0.60	ES	PID=0				Light grey and brown silty gravelly fine to coarse SAND with a medium cobble content. Gravel is fine to coarse subangular of PFA (pulverised fuel ash), flint, brick, metal, tile, clinker, wire, concrete. Cobbles are subangular of PFA and brick. (MADE GROUND)
		1.00 - 1.10	ES	PID=0	1.50			Light grey SILT - Pulverised Fuel Ash. Weak acetic odour. (MADE GROUND)
					5.00			End of borehole at 5.00 m

Remarks

Trial pit dug to 1.50m bgl with a mechanical excavator for service clearance.

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Borehole Log

Borehole No.
WS5
Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 17/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.30	ES	PID=0	0.40			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.50 - 0.60	ES	PID=0				Black and light brown sandy gravelly CLAY. Sand is fine to coarse predominantly of ash. Gravel is fine to coarse subangular of brick, flint, tile, wood, metal and wire. (MADE GROUND)
		1.50		50 (25 for 0mm/50 for 0mm)	1.40 1.50			Light grey SILT - Pulverised Fuel Ash. Weak acetic odour. (MADE GROUND) End of borehole at 1.50 m

Remarks
Trial pit dug to 1.60m bgl with a mechanical excavator for service clearance.

AGS

Borehole Log

Borehole No. **WS6**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 17/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15 - 0.25	ES	PID=0	0.25			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.30 - 0.40	ES	PID=0	0.60			Brown mottled black slightly sandy gravelly SILT with a medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular of brick, flint, concrete, wood, tile, metal. Cobbles are subangular to subrounded of concrete, brick and wood. (MADE GROUND)
					1.00			Light grey SILT - Pulverised Fuel Ash. Weak acetic odour. (MADE GROUND)
								End of borehole at 1.00 m

Remarks

Trial pit dug to 1.45m bgl with a mechanical excavator for service clearance.

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Borehole Log

Borehole No.
WS7
Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 17/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.30	ES	PID=0	0.30			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.50 - 0.60	ES	PID=0	0.60			Brown mottled black sandy gravelly SILT with a medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular of brick, flint, concrete, wood, tile, metal. Cobbles are subangular of concrete, brick and wood. (MADE GROUND)
		0.70 - 0.80	ES	PID=0				Light grey SILT - Pulverised Fuel Ash. Weak acetic odour. (MADE GROUND)
		3.60 - 3.70	ES	PID=0	3.50			Wet black clayey SILT. Distinct organic odour. (ALLUVIUM)
					4.60			End of borehole at 4.60 m

Remarks
Trial pit dug to 1.50m bgl with a mechanical excavator for service clearance.

AGS

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Borehole Log

Borehole No.
WS8
Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 16/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.30	ES	PID=0	0.40			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.70 - 0.80	ES	PID=0	1.00			Brown mottled black sandy gravelly SILT with a medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular of brick, flint, concrete, wood, tile, metal. Cobbles are subangular of concrete, brick and wood. (MADE GROUND)
		1.50 - 1.60	ES	PID=0	2.00			Black silty slightly gravelly fine to coarse SAND predominantly of ash. Gravel is fine to medium subangular of wire, brick, tile, plastic, flint and metal. (MADE GROUND)
		2.50 - 2.60	ES	PID=0	2.40			Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (RIVER TERRACE DEPOSITS)
								Greenish grey mottled black sandy SILT. Sand is fine to coarse. Slight organic odour. (ALLUVIUM)
		3.20 - 3.30	ES	PID=0	3.10			Firm grey mottled black silty CLAY. Slight organic odour. (ALLUVIUM)
		3.70 - 3.80	ES	PID=0	3.60			Firm greyish brown slightly sandy CLAY. Sand is fine to coarse. (ALLUVIUM)
					4.00			End of borehole at 4.00 m

Remarks
Trial pit dug to 1.60m bgl with a mechanical excavator for service clearance.

AGS

Borehole Log

Borehole No. **WS9**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 16/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
					0.60			Brown mottled black sandy gravelly SILT with a medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular of brick, flint, concrete, wood, tile, metal. Cobbles are subangular of concrete, brick and wood. (MADE GROUND)
					1.60			Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. Gravelly from 2.60m bgl. (RIVER TERRACE DEPOSITS)
					2.90			End of borehole at 2.90 m

Remarks

Trial pit dug to 1.80m bgl with a mechanical excavator for service clearance.

Borehole Log

Borehole No. **WS10**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: -	Hole Type WS
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 16/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40			Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
					1.00			Brown mottled black sandy gravelly SILT with a medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular of brick, flint, concrete, wood, tile, metal. Cobbles are subangular of concrete, brick and wood. (MADE GROUND)
					2.00			Black silty slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular of wire, brick, tile, plastic, flint and metal. (MADE GROUND)
								End of borehole at 2.00 m

Remarks

Trial pit dug to 1.60m bgl with a mechanical excavator for service clearance.

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Borehole Log

Borehole No. **BH1**

Sheet 1 of 1

Project Name: Mill Hall - BHs	Project No. 4630 - BHs	Co-ords: -	Hole Type BH
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 30/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.20	ES					Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.50 - 0.60	ES					
		1.00 - 1.10	ES					
					1.10			Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (RIVER TERRACE DEPOSITS)
					2.00			Firm orange mottled black slightly gravelly silty CLAY. Gravel is fine angular to subrounded of ironstone. (RIVER TERRACE FORMATION)
		2.50 - 2.60	ES					
	▼	6.00 - 6.10	ES		5.70			Yellowish brown sandy fine to coarse subangular to subrounded GRAVEL of flint and sandstone. Sand is fine to coarse. (RIVER TERRACE DEPOSITS)
					9.00			Wet yellow fine to coarse SAND. (FOLKESTONE FORMATION)
					10.00			End of borehole at 10.00 m

Remarks

Trial pit dug to 1.5m bgl with a mechanical excavator for service clearance. Bentonite seal @ 1.10m bgl. Borehole complete at 10m bgl.

AGS

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Borehole Log

Borehole No. **BH2**

Sheet 1 of 1

Project Name: Mill Hall - BHs	Project No. 4630 - BHs	Co-ords: -	Hole Type BH
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 13/10/2023 - 31/10/2023	Logged By Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.20	ES					Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.50 - 0.60	ES					
		1.00 - 1.10	ES					
					1.80			
					2.00			Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (RIVER TERRACE DEPOSITS)
		2.50 - 2.60	ES					Soft to firm orangish brown mottled black slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of ironstone. (RIVER TERRACE DEPOSITS)
					5.70			
	▼	6.00 - 6.10	ES					Yellowish brown sandy fine to coarse subangular to subrounded GRAVEL of flint, ironstone and sandstone. Sand is fine to coarse. One large angular sandstone cobble @ 6.1 m bgl (RIVER TERRACE DEPOSITS)
					9.00			Wet yellow fine to coarse SAND. (FOLKESTONE FORMATION)
					10.00			End of borehole at 10.00 m

Remarks

Trial pit dug to 1.4m bgl with a mechanical excavator for service clearance. Bentonite seal @ 3.7m bgl. Borehole complete at 10m bgl.

AGS

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Borehole Log

Borehole No.
BH3
Sheet 1 of 1

Project Name: Mill Hall - BHs	Project No. 4630 - BHs	Co-ords: -	Hole Type BH
Location: Aylesford		Level:	Scale 1:50
Client: VIP Investments		Dates: 31/10/2023 - 01/11/2023	Logged By Maddie Edwards

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30 - 0.40	ES	PID=0				Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
		0.80 - 0.90	ES	PID=0	0.70			Black slightly sandy slightly gravelly SILT. Sand is predominantly of fine to coarse ash. Gravel is fine to coarse subangular of concrete, flint, brick, wood, tile, metal, wire, clinker. One large cobble of sandstone at 1.2m. (MADE GROUND)
		2.00 - 2.10	ES	PID=0	1.40			Light grey SILT - Pulverised Fuel Ash. (MADE GROUND)
		3.30 - 3.40	ES	PID=1	3.00			Very soft to soft black CLAY. Moderate hydrocarbon (tar) odour. (ALLUVIUM)
	▼	4.00 - 4.10	ES	PID=1	4.00			Orangish brown sandy fine to coarse subangular to subrounded GRAVEL of flint and sandstone with a medium cobble content. Sand is fine to coarse. Cobbles are angular to subrounded of sandstone and flint. (RIVER TERRACE DEPOSITS)
		4.50 - 4.60	ES	PID=0	9.00			End of borehole at 9.00 m

Remarks
Trial pit dug to 1.4m bgl with a mechanical excavator for service clearance. Bentonite seal @ 4m bgl. Borehole terminated at 9m bgl on hard strata

AGS

Trial Pit Log

Trialpit No **TP1**

Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: - Level:	Date 16/10/2023
Location: Aylesford		Dimensions (m): Depth 1.50	Scale 1:25
Client: VIP Investments			Logged Toby Hill

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20 - 0.30	ES					Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
	0.50 - 0.60	ES		0.40			Black and light brown sandy gravelly CLAY. Sand is fine to coarse predominantly of ash. Gravel is fine to coarse subangular of brick, flint, tile, wood, metal and wire. (MADE GROUND)
	1.20 - 1.30	ES		1.10			Light grey SILT - Pulverised Fuel Ash. Weak acetic odour. (MADE GROUND)
				1.50			End of pit at 1.50 m

Remarks: Plant reference: Mechanical Excavator

Stability:

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Trial Pit Log

Trialpit No
TP2
Sheet 1 of 1

Project Name: Mill Hall, Aylesford	Project No. 4630	Co-ords: - Level:	Date 16/10/2023
Location: Aylesford		Dimensions (m): Depth 1.50	Scale 1:25
Client: VIP Investments			Logged Toby Hill

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20 - 0.30	ES	PID=3				Light brown clayey slightly sandy fine to coarse subangular to subrounded GRAVEL of flint, concrete, brick. Sand is fine to coarse. (MADE GROUND)
	0.50 - 0.60	ES	PID=6	0.40			Black silty slightly gravelly fine to coarse SAND predominantly of ash. Gravel is fine to medium subangular of wire, brick, tile, plastic, flint and metal. (MADE GROUND)
	0.75 - 0.85	ES	PID=3	1.10			Firm orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of flint and fine of ironstone. (RIVER TERRACE DEPOSITS)
				1.50			End of pit at 1.50 m

1
2
3
4
5

Remarks: Plant reference: Mechanical Excavator

Stability:

AGS

APPENDIX C: Laboratory Test Certificates

Claire Munns
Lustre Consulting Ltd
Suite 1
Second Floor North
The Fitted Rigging House
The Historic Dockyard
Chatham, Kent
ME4 4TZ

t: 01634 757 705

e: info@lustreconsulting.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 23-63397

Replaces Analytical Report Number: 23-63397, issue no. 2
Additional analysis undertaken.
Quantifications added to sample 2849884 as per client's request.

Project / Site name:	Mill Hall Aylesford	Samples received on:	18/10/2023
Your job number:	4630	Samples instructed on/ Analysis started on:	18/10/2023
Your order number:		Analysis completed by:	06/11/2023
Report Issue Number:	3	Report issued on:	06/11/2023
Samples Analysed:	5 leachate samples - 11 soil samples		

Signed:

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849877	2849878	2849879	2849880	2849881
Sample Reference				WS1	WS6	WS8	BH2	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.15	0.20	0.50	0.70
Date Sampled				13/10/2023	13/10/2023	13/10/2023	16/10/2023	13/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	-	-	-	-	< 0.1
Moisture Content	%	0.01	NONE	-	-	-	-	20
Total mass of sample received	kg	0.001	NONE	-	-	-	-	0.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	< 0.001	-	-
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	SPU	SPU	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-	-	11
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	670
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	0.333
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	333
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-	0.7

Phenols by GC-MS

Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	< 0.2
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	< 0.2
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
2-Nitrophenol	mg/kg	0.3	NONE	-	-	-	-	< 0.3
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	< 0.1
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	< 0.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Total Phenols (GC-MS)	mg/kg	1	NONE	-	-	-	-	< 1.0

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849877	2849878	2849879	2849880	2849881
Sample Reference				WS1	WS6	WS8	BH2	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.15	0.20	0.50	0.70
Date Sampled				13/10/2023	13/10/2023	13/10/2023	16/10/2023	13/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	0.43
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	0.13
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	0.75
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	0.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	0.37
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	0.34
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	0.44
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	0.17
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	0.21
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	0.23
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	-	-	-	4.14
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	7.8
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	3.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	-	-	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	190
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	34
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	180
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
o-xylene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	< 5.0

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849877	2849878	2849879	2849880	2849881
Sample Reference				WS1	WS6	WS8	BH2	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.15	0.20	0.50	0.70
Date Sampled				13/10/2023	13/10/2023	13/10/2023	16/10/2023	13/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	-	-	-	-	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	-	-	-	-	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.05	NONE	-	-	-	-	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	-	-	-	2.8
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	-	9.1
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	-	94
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	-	-	-	110
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	-	-	-	-	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	-	-	-	-	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.05	NONE	-	-	-	-	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	-	-	-	11
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849882	2849883	2849884	2849885	2849886
Sample Reference				WS9	TP1	TP2	WS7	WS8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	1.20	0.50	3.60	2.50
Date Sampled				16/10/2023	13/10/2023	16/10/2023	16/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	29	14	56	15
Total mass of sample received	kg	0.001	NONE	0.3	1.5	0.6	1.8	1.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	IZJ	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.1	11.1	8.2	8.7	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	600	430	1000	970	370
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.301	0.214	0.517	0.485	0.184
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	301	214	517	485	184
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.3	0.5	1.9	6.7	0.5

Phenols by GC-MS

Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-	< 0.2	< 0.2
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	-	-	< 0.2	< 0.2
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	< 0.3
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	< 0.3
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	-	-	< 0.3	< 0.3
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	< 0.1
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-	< 0.2	< 0.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Phenols (GC-MS)	mg/kg	1	NONE	< 1.0	-	-	< 1.0	< 1.0

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849882	2849883	2849884	2849885	2849886
Sample Reference				WS9	TP1	TP2	WS7	WS8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	1.20	0.50	3.60	2.50
Date Sampled				16/10/2023	13/10/2023	16/10/2023	16/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Speciated PAHs	%	0.1	NONE					
Naphthalene	mg/kg	0.05	MCERTS	1.9	< 0.05	0.22	0.1	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.15	< 0.05	0.08	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	2.2	< 0.05	0.06	0.08	< 0.05
Fluorene	mg/kg	0.05	MCERTS	1.9	< 0.05	0.07	0.12	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	9	0.16	0.59	0.4	0.1
Anthracene	mg/kg	0.05	MCERTS	2.6	< 0.05	0.19	0.14	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	10	0.26	1.4	0.92	0.17
Pyrene	mg/kg	0.05	MCERTS	9.2	0.23	1.4	0.91	0.15
Benzo(a)anthracene	mg/kg	0.05	MCERTS	4.5	0.14	0.74	0.46	0.15
Chrysene	mg/kg	0.05	MCERTS	4.5	0.13	0.91	0.66	0.16
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	5.7	0.18	1.3	0.73	0.26
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	2.8	0.07	0.36	0.33	0.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.4	0.17	0.81	0.49	0.26
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.9	0.11	0.43	0.37	0.15
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.72	< 0.05	0.11	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3	0.13	0.51	0.41	0.16

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	66.6	1.58	9.14	6.12	1.66

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	6	18	11	11
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	5.1	0.7	5.5	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.3	< 0.2	1.9	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	30	25	44	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	61	290	72	120	9.2
Lead (aqua regia extractable)	mg/kg	1	MCERTS	65	25	61	96	23
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.8	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	25	49	31	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	91	200	400	36

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849882	2849883	2849884	2849885	2849886
Sample Reference				WS9	TP1	TP2	WS7	WS8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	1.20	0.50	3.60	2.50
Date Sampled				16/10/2023	13/10/2023	16/10/2023	16/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Petroleum Hydrocarbons	%	0.1	NONE					
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	< 0.10	< 0.10	< 0.020	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	< 0.10	< 0.10	< 0.020	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.05	NONE	< 0.10	< 0.10	< 0.050	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.3	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	23	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	100	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	20	< 8.0	19	390	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	24	< 10	19	510	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	< 0.10	< 0.10	< 0.010	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	< 0.10	< 0.10	< 0.010	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.05	NONE	< 0.10	< 0.10	< 0.050	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	1.4	< 1.0	< 1.0	1	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	8.5	< 2.0	< 2.0	5.6	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	28	< 10	< 10	48	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	24	< 10	< 10	180	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	62	< 10	12	240	< 10
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	0.018	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	0.007	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	0.002	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	0.002	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	0.001	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	0.03	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849887
Sample Reference				TP2
Sample Number				None Supplied
Depth (m)				0.75
Date Sampled				16/10/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	22
Total mass of sample received	kg	0.001	NONE	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-
Asbestos Quantification Total	%	0.001	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	660
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.331
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	331
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.1

Phenols by GC-MS

Phenol	mg/kg	0.2	ISO 17025	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-
2-Methylphenol	mg/kg	0.3	MCERTS	-
2-Nitrophenol	mg/kg	0.3	NONE	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-
4-Methylphenol	mg/kg	0.2	NONE	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
Total Phenols (GC-MS)	mg/kg	1	NONE	-

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Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849887
Sample Reference				TP2
Sample Number				None Supplied
Depth (m)				0.75
Date Sampled				16/10/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Speciated PAHs	%	0.1	NONE	
Naphthalene	mg/kg	0.05	MCERTS	0.09
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.14
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.15
Pyrene	mg/kg	0.05	MCERTS	0.14
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.08
Chrysene	mg/kg	0.05	MCERTS	0.08
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.09
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.08
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	0.95

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14
Boron (water soluble)	mg/kg	0.2	MCERTS	3.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.7
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	95

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

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Lab Sample Number				2849887
Sample Reference				TP2
Sample Number				None Supplied
Depth (m)				0.75
Date Sampled				16/10/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Petroleum Hydrocarbons	%	0.1	NONE	
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.05	NONE	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.05	NONE	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-
PCB Congener 52	mg/kg	0.001	MCERTS	-
PCB Congener 101	mg/kg	0.001	MCERTS	-
PCB Congener 118	mg/kg	0.001	MCERTS	-
PCB Congener 138	mg/kg	0.001	MCERTS	-
PCB Congener 153	mg/kg	0.001	MCERTS	-
PCB Congener 180	mg/kg	0.001	MCERTS	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2849877	WS1	0.40	107	Loose Fibres	Chrysotile	< 0.001	< 0.001
2849878	WS6	0.15	113	Loose Fibres	Chrysotile	< 0.001	< 0.001
2849879	WS8	0.20	136	Loose Fibres	Chrysotile	< 0.001	< 0.001
2849884	TP2	0.50	106	Loose Fibres	Amosite	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number: 23-63397
Project / Site name: Mill Hall Aylesford

Lab Sample Number				2849888	2849889	2849890	2849891	2849892
Sample Reference				WS2	WS4	WS7	WS8	WS9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.00	0.70	0.70	1.80
Date Sampled				13/10/2023	13/10/2023	13/10/2023	13/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
pH (automated)	pH Units	N/A	ISO 17025	8	11.2	10.4	8.2	8.2
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	mg/l	0.1	ISO 17025	93.3	69.7	95.6	617	100
Total Organic Carbon (TOC)	mg/l	0.1	NONE	6.3	15.1	8.79	7.49	10.2
Hardness - Total	mgCaCO3/l	1	NONE	129	136	146	647	181
Phenols by GC-MS								
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	5	< 1.0	< 1.0	< 1.0
Boron (dissolved)	µg/l	10	ISO 17025	100	170	150	340	110
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	62	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.3	3	57	0.8	1.1
Copper (dissolved)	µg/l	0.7	ISO 17025	12	130	29	16	17
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

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Lab Sample Number				2849888	2849889	2849890	2849891	2849892
Sample Reference				WS2	WS4	WS7	WS8	WS9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.00	0.70	0.70	1.80
Date Sampled				13/10/2023	13/10/2023	13/10/2023	13/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Nickel (dissolved)	µg/l	0.3	ISO 17025	2	11	2.2	3.5	2.1
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	13	9.5	13	20	13
Calcium (dissolved)	mg/l	0.012	ISO 17025	47	54	58	220	68
Magnesium (dissolved)	mg/l	0.005	ISO 17025	2.6	0.23	0.45	24	2.7
Monoaromatics & Oxygenates								
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	25
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	30
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	55

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2849881	WS7	None Supplied	0.7	Brown sand with gravel.
2849882	WS9	None Supplied	1.8	Brown clay and sand with gravel.
2849883	TP1	None Supplied	1.2	Brown sand with gravel.
2849884	TP2	None Supplied	0.5	Brown clay and sand with gravel.
2849885	WS7	None Supplied	3.6	Brown sandy clay with gravel.
2849886	WS8	None Supplied	2.5	Brown clay and sand with gravel.
2849887	TP2	None Supplied	0.75	Brown clay and sand with gravel.

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Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Phenols, speciated, in leachate, by GCMS	Determination of speciated phenols in leachate by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Phenols, speciated, in soil, by GCMS	Determination of speciated phenols in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS

Analytical Report Number : 23-63397
Project / Site name: Mill Hall Aylesford

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	ISO 17025
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 23-63397
Project / Site name: Mill Hall Aylesford

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 23-63397
Project / Site name: Mill Hall Aylesford

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP2	None Supplied	S	2849884	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP2	None Supplied	S	2849884	b	Monohydric phenols in soil	L080-PL	b
TP2	None Supplied	S	2849884	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP2	None Supplied	S	2849884	b	TPHCWG (Soil)	L088/76-PL	b

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Analytical Report Number : 23-63401

Project / Site name:	Mill Hall Aylesford	Samples received on:	18/10/2023
Your job number:	4630	Samples instructed on / Analysis started on:	18/10/2023
Your order number:		Analysis completed by:	27/10/2023
Report Issue Number:	1	Report issued on:	27/10/2023
Samples Analysed:	1 wac multi sample		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Waste Acceptance Criteria Analytical Results

Report No:	23-63401						
					Client: LUSTRECONS		
Location	Mill Hall Aylesford						
Lab Reference (Sample Number)	2849901				Landfill Waste Acceptance Criteria Limits		
Sampling Date					Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP1						
Depth (m)	1.20						
Solid Waste Analysis							
TOC (%)**	0.4				3%	5%	6%
Loss on Ignition (%) **	6.1				--	--	10%
BTEX (µg/kg)**	< 10				6000	--	--
Sum of PCBs (mg/kg)**	< 0.30				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	1.58				100	--	--
pH (units)**	10.1				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	16				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		mg/kg			
Arsenic *	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium *	0.069	0.065		0.65	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	0.085	0.058		0.60	0.5	10	70
Copper *	0.047	0.011		0.14	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.031	0.011		0.13	0.5	10	30
Nickel *	< 0.0010	< 0.0010		0.0079	0.4	10	40
Lead *	< 0.0050	< 0.0050		< 0.020	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.0029	0.0030		0.030	4	50	200
Chloride *	20	7.5		85	800	15000	25000
Fluoride*	0.20	0.23		2.3	10	150	500
Sulphate *	17	17		170	1000	20000	50000
TDS*	710	600		6100	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	7.6	5.4		55	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.5						
Dry Matter (%)	71						
Moisture (%)	29						
Stage 1							
Volume Eluate L2 (litres)	0.25						
Filtered Eluate VE1 (litres)	0.14						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.

*= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation

** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Analytical Report Number : 23-63401
Project / Site name: Mill Hall Aylesford

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2849901	TP1	None Supplied	1.2	Brown sand with gravel.

Analytical Report Number : 23-63401
Project / Site name: Mill Hall Aylesford

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Preparation WAC leachate		In-house method	L043-PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270.	L064-PL	D	MCERTS
Chloride in WAC leachate (BS EN 12457-3 Prep)	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride in WAC leachate (BS EN 12457-3 Prep)	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033-PL	W	ISO 17025
Phenol Index in WAC leachate (BS EN 12457-3 Prep)	Determination of monohydric phenols in leachate by continuous flow analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Sulphate in WAC leachate (BS EN 12457-3 Prep)	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025
TDS in WAC leachate (BS EN 12457-3 Prep)	Determination of total dissolved solids in leachate by electrometric measurement.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L031-PL	W	ISO 17025
DOC in WAC leachate (BS EN 12457-3 Prep)	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037-PL	W	NONE
PCB's by GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
BTEX (Sum of BTEX compounds) in soil	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil in Soil C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS

Analytical Report Number : 23-63401
Project / Site name: Mill Hall Aylesford

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Metals in WAC leachate (BS EN 12457-3 Prep)	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 23-63401
Project / Site name: Mill Hall Aylesford

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP1	None Supplied	M	2849901	a	None Supplied	None Supplied	None Supplied

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Analytical Report Number : 23-63311

Project / Site name:	Mill Hill	Samples received on:	18/10/2023
Your job number:	4630	Samples instructed on/ Analysis started on:	18/10/2023
Your order number:	4630	Analysis completed by:	24/10/2023
Report Issue Number:	1	Report issued on:	24/10/2023
Samples Analysed:	2 water samples		

Signed:

Joanna Szwagrzak
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-63311
Project / Site name: Mill Hill

Your Order No: 4630

Lab Sample Number				2849508	2849509
Sample Reference				SWUS	SWDS
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				17/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
General Inorganics					
pH (L099)	pH Units	N/A	ISO 17025	7.7	7.7
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10
Sulphate as SO4	mg/l	0.045	ISO 17025	94.1	127
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	5.71	5.3
Hardness - Total	mgCaCO3/l	1	ISO 17025	304	407
Phenols by GC-MS					
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Total Phenols					
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10
Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	< 0.5
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16

Analytical Report Number: 23-63311
Project / Site name: Mill Hill

Your Order No: 4630

Lab Sample Number				2849508	2849509
Sample Reference				SWUS	SWDS
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				17/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
Heavy Metals / Metalloids					
Boron (dissolved)	µg/l	10	ISO 17025	180	220
Calcium (dissolved)	mg/l	0.012	ISO 17025	69	79
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Magnesium (dissolved)	mg/l	0.005	ISO 17025	32	51
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.24	1.33
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3	0.3
Copper (dissolved)	µg/l	0.5	ISO 17025	3.9	4.2
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.5	2.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	2.5	3.7
Zinc (dissolved)	µg/l	0.5	ISO 17025	7.2	13
Monoaromatics & Oxygenates					
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0
Petroleum Hydrocarbons					
TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-63311
Project / Site name: Mill Hill

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Phenols, speciated, in water, by GCMS	Determination of speciated phenols in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	ISO 17025

Analytical Report Number : 23-63311
Project / Site name: Mill Hill

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Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
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Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 23-67573

Replaces Analytical Report Number: 23-67573, issue no. 2
Client references/information amended.
Sample depth amended on sample 2871659 as per client's requested.

Project / Site name:	Millhall	Samples received on:	08/11/2023
Your job number:	4630	Samples instructed on/ Analysis started on:	08/11/2023
Your order number:	4630	Analysis completed by:	16/11/2023
Report Issue Number:	3	Report issued on:	21/11/2023
Samples Analysed:	5 water samples		

Signed:

Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-67573
Project / Site name: Millhall

Your Order No: 4630

Lab Sample Number				2871659	2871660	2871661	2871662	2871663
Sample Reference				WS4LF	WS5LF	BH3LF	BH1LF	WS7LF
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.5	1.00	6.00	6.00	3.00
Date Sampled				07/11/2023	07/11/2023	07/11/2023	07/11/2023	07/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
pH (L099)	pH Units	N/A	ISO 17025	12.7	11.5	7.4	7.2	11.5
Total Cyanide	µg/l	10	ISO 17025	< 10	120	< 10	< 10	35
Sulphate as SO4	µg/l	45	ISO 17025	45600	154000	100000	303000	344000
Sulphate as SO4	mg/l	0.045	ISO 17025	45.6	154	100	303	344
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	41.9	76.4	17.1	4.37	45.7
Hardness - Total	mgCaCO3/l	1	ISO 17025	38.4	105	312	574	389
Phenols by GC-MS								
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	1.81	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	57	< 10	< 10	< 10	< 10
Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	1.8	< 0.5	< 0.5	< 0.5
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16

Analytical Report Number: 23-67573
Project / Site name: Millhall

Your Order No: 4630

Lab Sample Number				2871659	2871660	2871661	2871662	2871663
Sample Reference				WS4LF	WS5LF	BH3LF	BH1LF	WS7LF
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.5	1.00	6.00	6.00	3.00
Date Sampled				07/11/2023	07/11/2023	07/11/2023	07/11/2023	07/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Boron (dissolved)	µg/l	10	ISO 17025	600	88	210	260	130
Calcium (dissolved)	mg/l	0.012	ISO 17025	15	42	100	200	160
Chromium (hexavalent)	µg/l	5	ISO 17025	U/S^^	U/S^^	< 5.0	< 5.0	30
Magnesium (dissolved)	mg/l	0.005	ISO 17025	0.01	0.035	12	16	0.065
Arsenic (dissolved)	µg/l	0.15	ISO 17025	5.71	25.3	27.3	0.27	7.27
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02	0.05	< 0.02	0.15	0.05
Chromium (dissolved)	µg/l	0.2	ISO 17025	7.4	5.7	< 0.2	< 0.2	25
Copper (dissolved)	µg/l	0.5	ISO 17025	50	110	1.3	1.8	82
Lead (dissolved)	µg/l	0.2	ISO 17025	0.8	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	6.3	41	2.2	5	20
Selenium (dissolved)	µg/l	0.6	ISO 17025	6.6	8.8	1.7	0.9	5.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.6	0.9	3.8	7.2	0.8
Monoaromatics & Oxygenates								
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	14.4	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	13	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	55	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	76	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	110	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	250	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	14	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	64	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	110	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	20	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	14	190	< 10	< 10	< 10

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Analytical Report Number : 23-67573
Project / Site name: Millhall

Water matrix abbreviations:
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Analytical Report Number : 23-67573
Project / Site name: Millhall

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GC	Gas Chromatography
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CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

^^ - Unsuitable for analysis due to high colour intensity

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HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

30E7L-LMCSJ-25IN7

Job name

Land East of Mill Hall, Aylesford - TP1

Description/Comments

TP1 Characterisation Data

Project

4630

Site

Mill Hall

Classified by

Name:
Toby Hill
Date:
28 Nov 2023 15:32 GMT
Telephone:
01634 757 705

Company:
Lustre Consulting
Suite 1, Second Floor North,
The Fitted Rigging House,
Chatham
ME4 4TZ

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	06 Oct 2022

Next 3 year Refresher due by Oct 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

Land East of Mill Hall Road, Aylesford, Kent, ME20 7FG **Post Code** ME20 7FG

SIC for the process giving rise to the waste

41100 Development of building projects

Description of industry/producer giving rise to the waste

Redevelopment of former water treatment works with infilled sludge pond.

Description of the specific process, sub-process and/or activity that created the waste

Waste generated during the excavation of soils to support development works.

Description of the waste

Made ground generated during the demolition of former industrial buildings associated with a water treatment works and the infilling of a former sludge pond with pulverized fuel ash and other arisings.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP1--13102023-1.20		Non Hazardous		3

Related documents

#	Name	Description
1	23-63397_HWOL_Results[3].hwol	i2 Analytical .hwol file used to populate the Job

Report

Created by: Toby Hill

Created date: 28 Nov 2023 15:32 GMT

Classification of sample: TP1--13102023-1.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP1--13102023-1.20
Moisture content:
29%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 29% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6 mg/kg	1.32	5.625 mg/kg	0.000562 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		5.1 mg/kg	3.22	11.659 mg/kg	0.00117 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3 mg/kg	1.142	0.243 mg/kg	0.0000243 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30 mg/kg	1.462	31.131 mg/kg	0.00311 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		290 mg/kg	1.126	231.82 mg/kg	0.0232 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	25 mg/kg		17.75 mg/kg	0.00178 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
9	nickel { dinickel hexacyanoferrate }	028-037-00-8	238-946-3	14874-78-3		25 mg/kg	2.806	49.799 mg/kg	0.00498 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
11	zinc { trizinc bis(orthophosphate) }	030-011-00-6	231-944-3	7779-90-0		91 mg/kg	1.968	127.178 mg/kg	0.0127 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<20 mg/kg		<20 mg/kg	<0.002 %		<**LOD**
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
19		pH				11.1	pH		11.1	pH	11.1 pH		
				PH									
20		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.16	mg/kg		0.114	mg/kg	0.0000114 %	✓	
			201-581-5	85-01-8									
25		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.26	mg/kg		0.185	mg/kg	0.0000185 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.23	mg/kg		0.163	mg/kg	0.0000163 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.14	mg/kg		0.0994	mg/kg	0.00000994 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.13	mg/kg		0.0923	mg/kg	0.00000923 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.18	mg/kg		0.128	mg/kg	0.0000128 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.07	mg/kg		0.0497	mg/kg	0.00000497 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.17	mg/kg		0.121	mg/kg	0.0000121 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				0.11	mg/kg		0.0781	mg/kg	0.00000781 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				0.13	mg/kg		0.0923	mg/kg	0.00000923 %	✓	
			205-883-8	191-24-2									
36		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
				P1186									
										Total:	0.0507 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

- **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

GB MCL index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

- **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic.

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility.

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history.

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass.

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight.

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight.

nickel {dinickel hexacyanoferrate}

Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils.

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight.

zinc {trizinc bis(orthophosphate)}

Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils. Given the soil has been exposed to the elements for a significant period of time, Zinc Sulphate and Zinc Chloride are unlikely to be present within the soil. Next worst case species selected.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide]

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.325.5817.10787 (21 Nov 2023)
HazWasteOnline Database: 2023.325.5817.10787 (21 Nov 2023)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021
GB MCL List v2.0 - version 2.0 of 20th October 2023

APPENDIX D: Field Monitoring Records

GAS MONITORING & GROUNDWATER LEVEL LOG

RND 1	Project No.:	4630	Date:	20/10/2023	Weather:	Wet & overcast
	Project Name:	Land at Mill Hall Road - Aylesford	Initials:	ME	24 hr Pressure:	Low & Falling

LUSTRE CONSULTING

BH ID	FLOW		PRESSURE		METHANE		CARBON DIOXIDE		OXYGEN		CO	H_2S	WATER LEVEL	BASE OF WELL	PID		GAS TAP OPEN	FLOODED WELL	TOP OF LNAPL	BASE OF LNAPL	ODOUR	COMMENTS
	Peak	Steady	Atmos.	Relative	Peak	Steady	Peak	Steady	Min	Steady	-	-	-	-	Peak	Steady						
	(Litres / hr)		(mb)		% V\V		% V\V		% V\V		(ppm)		(m bgl)		(ppm)		(Y/N)		(m bgl)			
WS2	0	0	976	0	0.8	0.6	2.8	2.5	1.9	9.1	7	1	-	-	1.6	1.3	N	?	N/A	N/A	None	Oxygen max 13.1. Headworks damaged, gas bung stuck in well.
WS3	0	0	976	0.03	14.5	14.2	0.9	0.7	4.7	11.5	53	1	Dry	1.98	2.1	1.4	N	N	N/A	N/A	None	Max CO 78 - varied lots along with O2
WS4	0	0	976	-0.22	19.1	16.5	0.1	0	2.4	5.4	26	2	3.07	4.75	0.4	0.3	N	N	N/A	N/A	None	Oxygen max 16.6. CO max 46
WS5																	N	Y	N/A	N/A	None	GW at top of Pipe
WS7	0	0	976	0	0.6	0.5	0	0	2.4	14.6	3	1	2.65	3.79	1.1	1	N	N	N/A	N/A	None	
WS8	0	0	976	0.09	9	6.5	5.4	4.1	2.1	3.6	9	1	3.56	4	1.1	1	N	N	N/A	N/A	None	Oxygen max 5.9
WS9	0	0	976	0.89	6.5	2.1	5.4	4.5	1.4	3.2	6	1	Dry	1.92	1.1	0.8	N	N	N/A	N/A	None	
WS10	0	0	976	0.17	9.2	8.5	3.2	2.5	2.1	4.4	7	2	Dry	2	0.6	0.5	N	N	N/A	N/A	None	

NOTES: Flow is recorded for a minimum of 60 seconds. If flow remains variable then monitoring continued to a maximum of 120 seconds.
NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	

GAS MONITORING & GROUNDWATER LEVEL LOG

RND 2	Project No.:	4630	Date:	26/10/2023	Weather:	Overcast then clear
	Project Name:	Land at Mill Hall Road - Aylesford	Initials:	ME & TH	24 hr Pressure:	Low & Falling

LUSTRE CONSULTING

BH ID	FLOW		PRESSURE		METHANE		CARBON DIOXIDE		OXYGEN		CO	H_2S	WATER LEVEL	BASE OF WELL	PID		GAS TAP OPEN	FLOODED WELL	TOP OF LNAPL	BASE OF LNAPL	ODOUR	COMMENTS
	Peak	Steady	Atmos.	Relative	Peak	Steady	Peak	Steady	Min	Steady	-	-	-	-	Peak	Steady						
	(Litres / hr)		(mb)		% V\V		% V\V		% V\V		(ppm)		(m bgl)		(ppm)		(Y/N)		(m bgl)			
WS2	0	0	992	0	0.4	0.4	3.7	3.7	0.1	0.1	6	1	Dry	1.97	1	0.6	N	N	N/A	N/A	None	
WS3	0	0	992	-0.21	1	0.7	1.9	1.2	0.2	8.4	300	1	Dry	1.97	4	4	N	N	N/A	N/A	None	PID Readings increasing after 300 seconds
WS4	0	0	992	-0.21	22.5	22.5	0	0	0.1	0.1	72	1	3.21	4.75	0.2	0.2	N	N	N/A	N/A	None	CO falling at 300 seconds. Grab Sample taken.
WS5													1.49	1.49			N	Y	N/A	N/A	None	Dip & Plum at the end of the day: Water Level: 1.23 Base of Well: 1.49
WS7	0	0	992	0.15	0.8	0.7	0.2	0.6	7.2	7.4	4	1	2.86	3.79	1.4	1.1	N	N	N/A	N/A	None	O2 Highest 21.4 Grab Sample taken
WS8	0	0	992	0	8.8	8.2	8	8	0.1	0.1	7	1	3.73	3.99	1.2	1.1	N	N	N/A	N/A	None	
WS9	0.1	0	992	0.12	2.4	2.4	2.6	2.6	0.1	0.1	4	1	Dry	1.92	0.8	0.8	N	N	N/A	N/A	None	
WS10	0	0	992	0.33	10.1	10.1	7.5	5.7	0	0	2	1	Dry	1.98	0.6	0.6	N	N	N/A	N/A	None	

NOTES: Flow is recorded for a minimum of 60 seconds. If flow remains variable then monitoring continued to a maximum of 120 seconds.
NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	

GAS MONITORING & GROUNDWATER LEVEL LOG

RND	Project No.:	4630	Date:	02/11/2023	Weather:	Wet & overcast
3	Project Name:	Land at Mill Hall Road - Aylesford	Initials:	TH	24 hr Pressure:	Low & Rising

LUSTRE CONSULTING

BH ID	FLOW		PRESSURE		METHANE		CARBON DIOXIDE		OXYGEN		CO	H_2S	WATER LEVEL	BASE OF WELL	PID		GAS TAP OPEN	FLOODED WELL	TOP OF LNAPL	BASE OF LNAPL	ODOUR	COMMENTS
	Peak	Steady	Atmos.	Relative	Peak	Steady	Peak	Steady	Min	Steady	-	-	-	-	Peak	Steady						
	(Litres / hr)		(mb)		% V\V		% V\V		% V\V		(ppm)		(m bgl)		(ppm)		(Y/N)		(m bgl)			
WS2	0	0	961	0.03	2.8	2.1	1.8	1.8	0	0	2	1	Dry	1.98	1.2	1.2	N	N	N/A	N/A	None	
WS3	0	0	961	-0.2	1.2	1.2	0.2	0.2	0.2	0.2	133	1	Dry	1.99	4.2	4.2	N	N	N/A	N/A	None	
WS4	0	0	966	-0.12	27.2	26.7	0	0	0.4	0.1	27	1	2.75	4.75	0.2	0.2	N	N	N/A	N/A	None	
WS5	4.7	1.6	966	-27.01	11.9	11.9	0.1	0	9.6	9.6	4	1	0.67	1.48	0.5	0.5	N	Y	N/A	N/A	None	
WS7	0	0	965	-0.31	2	0.7	1.4	0	1.2	2.5	1	1	2.62	3.81	0.9	0.9	N	N	N/A	N/A	None	
WS8	0	0	961	0.08	1.7	0.2	1.6	0.1	1.5	1.6	0	1	3.75	3.98	0.1	0	N	N	N/A	N/A	None	
WS9	0	0	961	-0.21	2.1	2.1	1.3	1.1	0.1	0.1	4	1	Dry	1.91	0.9	0.9	N	N	N/A	N/A	None	
WS10	0	0	961	0.17	10.8	10.5	5.9	5.9	0.1	0.1	3	1	Dry	1.98	0.4	0.4	N	N	N/A	N/A	None	
BH1	6.5	5.2	966	-20.63	0.5	0.2	0.4	0.4	18.7	18.7	9.5	1	2.68	9.75	0.7	0.7	N	Y	N/A	N/A	None	
BH2	0	0	961	-37.02	9.7	0.3	5.1	0.2	2.3	16.8	59	1	2.99	10.19	1.9	1.9	N	Y	N/A	N/A	None	
BH3	0	0	966	0.21	57.2	56.6	7.5	6	6.3	6.3	59	1	2.98	8.69	0	0	N	Y	N/A	N/A	None	

NOTES: Flow is recorded for a minimum of 60 seconds. If flow remains variable then monitoring continued to a maximum of 120 seconds.
NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	

GAS MONITORING & GROUNDWATER LEVEL LOG

RND 4	Project No.:	4630	Date:	07/11/2023	Weather:	Clear
	Project Name:	Land at Mill Hall Road - Aylesford	Initials:	ME & TH	24 hr Pressure:	Rising

LUSTRE CONSULTING

BH ID	FLOW		PRESSURE		METHANE		CARBON DIOXIDE		OXYGEN		CO	H_2S	WATER LEVEL	BASE OF WELL	PID		GAS TAP OPEN	FLOODED WELL	TOP OF LNAPL	BASE OF LNAPL	ODOUR	COMMENTS
	Peak	Steady	Atmos.	Relative	Peak	Steady	Peak	Steady	Min	Steady	-	-	-	-	Peak	Steady						
	(Litres / hr)		(mb)		% V\V		% V\V		% V\V		(ppm)		(m bgl)		(ppm)		(Y/N)		(m bgl)			
WS2	0	0	1008	-0.16	0.9	0.9	2.8	2.8	0	0.1	1	1	Dry	1.97	1	0.9	N	N	N/A	N/A	None	
WS3	-0.1	1	1008	-0.1	18.6	0.3	2.4	1.9	1.1	2.6	11	1	Dry	1.99	0.2	0.2	N	N	N/A	N/A	None	Oxygen peaked at 10.7
WS4	0	0	1008	0.09	22.6	22.1	0.1	0	0.1	0.1	27	1	2.87	4.74	0.3	0	N	N	N/A	N/A	None	
WS5													0.49	1.49			N	Y	N/A	N/A	None	
WS7	0	0	1008	-0.09	0.9	0.7	2.7	0	1.3	5.7	1	1	2.31	3.78	1.1	1.1	N	N	N/A	N/A	None	
WS8	0	0	1008	-0.02	10.2	8.6	6.5	6.5	0	0	18	1	3.7	3.98	1.1	0.9	N	N	N/A	N/A	None	
WS9	0	0	1008	-0.15	7.3	4	6.4	6.4	0	0	2	1	Dry	1.91	0.9	0.7	N	N	N/A	N/A	None	
WS10	0	0	1008	-0.02	10.7	10.7	5.6	5.6	0	0	1	1	1.97	1.98	0.2	0.2	N	N	N/A	N/A	None	
BH1	-0.1	-0.1	1009	-1.6	1.3	0.2	0.3	0.2	8.3	8.7	43	1	3.2	9.63	1.1	0.8	N	Y	N/A	N/A	None	
BH2																						Borehole inaccesible
BH3	-0.1	-0.1	1009	-14.3	33.3	29.7	0.7	0.6	9.1	9.9	28	1	3.11	8.47	0.1	0.1	N	Y	N/A	N/A	None	

NOTES: Flow is recorded for a minimum of 60 seconds. If flow remains variable then monitoring continued to a maximum of 120 seconds.
NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	

RETURN

APPENDIX E: Assessment Tables

HUMAN HEALTH QUANTITATIVE RISK ASSESSMENT - SOILS

MADE GROUND

4630

Land at Mill Hall Road - Aylesford

LUSTRE CONSULTING

Assessment Scenario: Commercial

Assessment Criteria Source: SGVs, GACs and S4ULs

Soil Organic Matter (%): SOM = 1%

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	*Sample Ref* ASSESSMENT CRITERIA	No. > AC	*2849883* *TP1* *1.2*	*2849884* *TP2* *0.5*	*2849887* *TP2* *0.75*	*2849877* *WS1* *0.4*	*2849878* *WS6* *0.15*	*2849881* *WS7* *0.7*	*2849879* *WS8* *0.2*	*2849882* *WS9* *1.8*	*2849880* *BH2* *0.5*	*2868179* *BH2* *3.6*	*2868177* *BH3* *2*	*2868178* *BH3* *3.3*
Asbestos in Soil	N/A	N/A	N/A	N/A	11	Detected	4	Not-detected	**Detected**	Not-detected	**Detected**	**Detected**	Not-detected	**Detected**	Not-detected	Not-detected	-	Not-detected	Not-detected
pH - Automated	no units	7.90	9.54	11.30	7	No Criteria	0	11.1	8.2	8.2	-	-	11	-	9.1	-	-	11.3	7.9
Total Cyanide	mg/kg	<LOD	1.07	1.50	7	53.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	1.5
Arsenic	mg/kg	6.00	11.69	18.00	7	640.00	0	6	18	14	-	-	7.8	-	17	-	-	6	13
Cadmium	mg/kg	<LOD	0.62	1.90	7	190.00	0	0.3	<LOD	0.6	-	-	0.4	-	0.6	-	-	0.3	1.9
Chromium	mg/kg	23.00	30.57	46.00	7	8600.00	0	30	25	26	-	-	30	-	23	-	-	34	46
Copper	mg/kg	26.00	141.29	290.00	7	68000.00	0	290	72	26	-	-	190	-	61	-	-	230	120
Lead	mg/kg	25.00	50.86	110.00	7	2330.00	0	25	61	31	-	-	34	-	65	-	-	30	110
Mercury	mg/kg	<LOD	0.57	1.00	7	3600.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	1
Nickel	mg/kg	25.00	33.86	49.00	7	980.00	0	25	49	35	-	-	33	-	35	-	-	28	32
Selenium	mg/kg	<LOD	1.53	1.70	7	12000.00	0	<LOD	<LOD	1.7	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
Zinc	mg/kg	91.00	173.71	390.00	7	730000.00	0	91	200	95	-	-	180	-	140	-	-	120	390
Naphthalene	mg/kg	<LOD	0.36	1.90	7	190.00	0	<LOD	0.22	0.09	-	-	<LOD	-	1.9	-	-	<LOD	0.13
Acenaphthylene	mg/kg	<LOD	0.08	0.15	7	83000.00	0	<LOD	0.08	<LOD	-	-	<LOD	-	0.15	-	-	<LOD	0.11
Acenaphthene	mg/kg	<LOD	0.36	2.20	7	84000.00	0	<LOD	0.06	<LOD	-	-	<LOD	-	2.2	-	-	<LOD	0.08
Fluorene	mg/kg	<LOD	0.32	1.90	7	63000.00	0	<LOD	0.07	<LOD	-	-	<LOD	-	1.9	-	-	<LOD	0.09
Phenanthrene	mg/kg	0.14	1.58	9.00	7	22000.00	0	0.16	0.59	0.14	-	-	0.43	-	9	-	-	0.25	0.5
Anthracene	mg/kg	<LOD	0.47	2.60	7	520000.00	0	<LOD	0.19	<LOD	-	-	0.13	-	2.6	-	-	0.08	0.18
Fluoranthene	mg/kg	0.15	2.07	10.00	7	23000.00	0	0.26	1.4	0.15	-	-	0.75	-	10	-	-	0.46	1.5
Pyrene	mg/kg	0.14	1.93	9.20	7	54000.00	0	0.23	1.4	0.14	-	-	0.7	-	9.2	-	-	0.41	1.4
Benzo(a)anthracene	mg/kg	0.08	0.99	4.50	7	170.00	0	0.14	0.74	0.08	-	-	0.37	-	4.5	-	-	0.26	0.85
Chrysene	mg/kg	0.08	1.01	4.50	7	350.00	0	0.13	0.91	0.08	-	-	0.34	-	4.5	-	-	0.23	0.9
Benzo(b)fluoranthene	mg/kg	0.09	1.33	5.70	7	44.00	0	0.18	1.3	0.09	-	-	0.44	-	5.7	-	-	0.27	1.3
Benzo(k)fluoranthene	mg/kg	<LOD	0.57	2.80	7	1200.00	0	0.07	0.36	<LOD	-	-	0.17	-	2.8	-	-	0.14	0.41
Benzo(a)pyrene	mg/kg	0.08	1.13	5.40	7	35.00	0	0.17	0.81	0.08	-	-	0.37	-	5.4	-	-	0.25	0.85
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	0.63	2.90	7	500.00	0	0.11	0.43	0.05	-	-	0.21	-	2.9	-	-	0.14	0.6
Dibenz(a,h)anthracene	mg/kg	<LOD	0.17	0.72	7	3.50	0	<LOD	0.11	<LOD	-	-	<LOD	-	0.72	-	-	<LOD	0.19
Benzo(ghi)perylene	mg/kg	0.05	0.68	3.00	7	3900.00	0	0.13	0.51	0.05	-	-	0.23	-	3	-	-	0.16	0.7
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	<LOD	<LOD	<LOD	7	3200.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	<LOD	<LOD	<LOD	7	7800.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	<LOD	<LOD	<LOD	7	2000.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	<LOD	0.61	1.30	7	9700.00	0	<LOD	<LOD	1.3	-	-	<LOD	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	<LOD	4.04	23.00	7	59000.00	0	<LOD	<LOD	23	-	-	2.8	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	<LOD	15.94	100.00	7	800000.00	0	<LOD	<LOD	100	-	-	9.1	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	<LOD	76.00	390.00	7	800000.00	0	<LOD	19	390	-	-	94	-	20	-		<LOD	<LOD
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	<LOD	<LOD	<LOD	7	26000.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	<LOD	<LOD	<LOD	7	56000.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	<LOD	<LOD	<LOD	7	3500.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-		<LOD	<LOD
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	<LOD	0.70	1.40	7	16000.00	0	<LOD	<LOD	1	-	-	<LOD	-	1.4	-		<LOD	<LOD
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	<LOD	2.37	8.50	7	36000.00	0	<LOD	<LOD	5.6	-	-	<LOD	-	8.5	-		<LOD	<LOD
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	<LOD	11.21	48.00	7	14000.00	0	<LOD	<LOD	48	-	-	<LOD	-	28	-		<LOD	<LOD
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	<LOD	31.29	180.00	7	14000.00	0	<LOD	<LOD	180	-	-	<LOD	-	24	-		<LOD	<LOD
Benzene	mg/kg	<LOD	<LOD	<LOD	7	27.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
Toluene	mg/kg	<LOD	<LOD	<LOD	7	56000.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
Ethylbenzene	mg/kg	<LOD	<LOD	<LOD	7	5700.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
p & m-xylene	mg/kg	<LOD	<LOD	<LOD	7	5900.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
o-Xylene	mg/kg	<LOD	<LOD	<LOD	7	6600.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
Total Phenols (monohydric)	mg/kg	<LOD	<LOD	<LOD	7	440.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	<LOD	<LOD	<LOD	7	7900.00	0	<LOD	<LOD	<LOD	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
2-Nitrophenol	mg/kg	<LOD	<LOD	<LOD	4	No Criteria	0	-	-	-	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
2,4-Dichlorophenol	mg/kg	<LOD	<LOD	<LOD	4	3500.00	0	-	-	-	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
2-Chlorophenol	mg/kg	<LOD	<LOD	<LOD	4	3500.00	0	-	-	-	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
2,4-Dimethylphenol	mg/kg	<LOD	<LOD	<LOD	4	16000.00	0	-	-	-	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
2,4,6-Trichlorophenol	mg/kg	<LOD	<LOD	<LOD	4	3500.00	0	-	-	-	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
2,4,5-Trichlorophenol	mg/kg	<LOD	<LOD	<LOD	4	3500.00	0	-	-	-	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
4-Chloro-3-methylphenol	mg/kg	<LOD	<LOD	<LOD	4	No Criteria	0	-	-	-	-	-	<LOD	-	<LOD	-	-	<LOD	<LOD
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.16	0.35	0.59	7	No Criteria	0	0.214	0.517	0.331	-	-	0.333	-	0.301	-	-	0.155	0.591

HUMAN HEALTH QUANTITATIVE RISK ASSESSMENT - SOILS
NATURAL GROUND
4630
Land at Mill Hall Road - Aylesford

LUSTRE CONSULTING

Assessment Scenario: Commercial
Assessment Criteria Source: SGVs, GACs and S4ULs
Soil Organic Matter (%): SOM = 1%

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	*Sample Ref* ASSESSMENT CRITERIA	No. > AC	*2849885* WS7 *3.6*	*2849886* WS8 *2.5*				
Asbestos in Soil	N/A	N/A	N/A	N/A	2	Detected	0	Not-detected	Not-detected				
pH - Automated	no units	7.90	8.30	8.70	2	No Criteria	0	8.7	7.9				
Total Cyanide	mg/kg	<LOD	<LOD	<LOD	2	53.00	0	<LOD	<LOD				
Arsenic	mg/kg	11.00	11.00	11.00	2	640.00	0	11	11				
Cadmium	mg/kg	<LOD	1.08	1.90	2	190.00	0	1.9	<LOD				
Chromium	mg/kg	22.00	33.00	44.00	2	8600.00	0	44	22				
Copper	mg/kg	9.20	64.60	120.00	2	68000.00	0	120	9.2				
Lead	mg/kg	23.00	59.50	96.00	2	2330.00	0	96	23				
Mercury	mg/kg	<LOD	0.65	0.80	2	3600.00	0	0.8	<LOD				
Nickel	mg/kg	18.00	24.50	31.00	2	980.00	0	31	18				
Selenium	mg/kg	<LOD	<LOD	<LOD	2	12000.00	0	<LOD	<LOD				
Zinc	mg/kg	36.00	218.00	400.00	2	730000.00	0	400	36				
Naphthalene	mg/kg	<LOD	0.08	0.10	2	190.00	0	0.1	<LOD				
Acenaphthylene	mg/kg	<LOD	<LOD	<LOD	2	83000.00	0	<LOD	<LOD				
Acenaphthene	mg/kg	<LOD	0.07	0.08	2	84000.00	0	0.08	<LOD				
Fluorene	mg/kg	<LOD	0.09	0.12	2	63000.00	0	0.12	<LOD				
Phenanthrene	mg/kg	0.10	0.25	0.40	2	22000.00	0	0.4	0.1				
Anthracene	mg/kg	<LOD	0.10	0.14	2	520000.00	0	0.14	<LOD				
Fluoranthene	mg/kg	0.17	0.55	0.92	2	23000.00	0	0.92	0.17				
Pyrene	mg/kg	0.15	0.53	0.91	2	54000.00	0	0.91	0.15				
Benzo(a)anthracene	mg/kg	0.15	0.31	0.46	2	170.00	0	0.46	0.15				
Chrysene	mg/kg	0.16	0.41	0.66	2	350.00	0	0.66	0.16				
Benzo(b)fluoranthene	mg/kg	0.26	0.50	0.73	2	44.00	0	0.73	0.26				
Benzo(k)fluoranthene	mg/kg	0.10	0.22	0.33	2	1200.00	0	0.33	0.1				
Benzo(a)pyrene	mg/kg	0.26	0.38	0.49	2	35.00	0	0.49	0.26				
Indeno(1,2,3-cd)pyrene	mg/kg	0.15	0.26	0.37	2	500.00	0	0.37	0.15				
Dibenz(a,h)anthracene	mg/kg	<LOD	<LOD	<LOD	2	3.50	0	<LOD	<LOD				
Benzo(ghi)perylene	mg/kg	0.16	0.29	0.41	2	3900.00	0	0.41	0.16				
Benzene	mg/kg	<LOD	<LOD	<LOD	2	27.00	0	<LOD	<LOD				
Toluene	mg/kg	<LOD	<LOD	<LOD	2	56000.00	0	<LOD	<LOD				
Ethylbenzene	mg/kg	<LOD	<LOD	<LOD	2	5700.00	0	<LOD	<LOD				
p & m-xylene	mg/kg	<LOD	<LOD	<LOD	2	5900.00	0	<LOD	<LOD				
o-Xylene	mg/kg	<LOD	<LOD	<LOD	2	6600.00	0	<LOD	<LOD				
Total Phenols (monohydric)	mg/kg	<LOD	<LOD	<LOD	2	440.00	0	<LOD	<LOD				
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	<LOD	<LOD	<LOD	2	7900.00	0	<LOD	<LOD				
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	<LOD	<LOD	<LOD	2	7900.00	0	<LOD	<LOD				
Benzene	mg/kg	<LOD	<LOD	<LOD	2	27.00	0	<LOD	<LOD				
Toluene	mg/kg	<LOD	<LOD	<LOD	2	56000.00	0	<LOD	<LOD				
o-Xylene	mg/kg	<LOD	<LOD	<LOD	2	6600.00	0	<LOD	<LOD				
2-Nitrophenol	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	<LOD	<LOD				
2,4-Dichlorophenol	mg/kg	<LOD	<LOD	<LOD	2	3500.00	0	<LOD	<LOD				
2-Chlorophenol	mg/kg	<LOD	<LOD	<LOD	2	3500.00	0	<LOD	<LOD				
2,4-Dimethylphenol	mg/kg	<LOD	<LOD	<LOD	2	16000.00	0	<LOD	<LOD				
2,4,6-Trichlorophenol	mg/kg	<LOD	<LOD	<LOD	2	3500.00	0	<LOD	<LOD				
2,4,5-Trichlorophenol	mg/kg	<LOD	<LOD	<LOD	2	3500.00	0	<LOD	<LOD				
4-Chloro-3-methylphenol	mg/kg	<LOD	<LOD	<LOD	2	No Criteria	0	<LOD	<LOD				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.18	0.33	0.49	2	No Criteria	0	0.485	0.184				

CONTROLLED WATERS RISK ASSESSMENT

4630
Land at Mill Hall Road - Aylesford

Water Quality Standard (WQS) Selection Hierarchy:	
Level 1	EQS FW
Level 2	UK DWS
Level 3	WHO DWS

Average $CaCO_3$:
217842.86 µg/l

Data Source: Environment Agency H1 Environmental Risk Assessment – Annex J, v2.0, April 2010 & Petroleum Products in Drinking-Water, WHO (WHO/SDE/WSH/05.08/123)

											Sample Ref	***2849888***	***2849889***	***2849890***	***2849891***	***2849892***	***2868180***	***2868181***
DETERMINAND	**UNITS**	**MINIMUM**	**AVERAGE**	**MAXIMUM**	**No. of TESTS**	**UK DWS**	**No. > AC**	**EQS FW**	**No. > AC**	**WHO**	**No. > AC**	**WS2**	**WS4**	**WS7**	**WS8**	**WS9**	**BH3**	***BH3***
												13/10/2023	*13/10/2023*	*13/10/2023*	*13/10/2023*	*16/10/2023*	*11/01/2023*	*31/10/2023*
Total Cyanide	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Sulphate as SO_4	µg/l	54	156	617	7	250000	0	400000	0	250000	0	93.3	69.7	95.6	617	100	54.4	63.8
Hardness - Total	mg/l	48.90	217.84	647.00	7	No criteria	0	No criteria	0	No criteria	0	129	136	146	647	181	237	48.9
Total Organic Carbon (TOC)	µg/l	6.30	17.17	61.60	7	No criteria	0	No criteria	0	No criteria	0	6.3	15.1	8.79	7.49	10.2	10.7	61.6
Arsenic (dissolved)	µg/l	4.50	5.47	6.90	7	10.00	0	50.00	0	10.00	0	<LOD	5	<LOD	<LOD	<LOD	4.5	6.9
Boron (dissolved)	µg/l	60.00	165.71	340.00	7	1000.00	0	2000.00	0	300.00	1	100	170	150	340	110	60	230
Cadmium (dissolved)	µg/l	0.10	0.10	0.10	7	5.00	0	5.00	0	3.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	< 0.08	0.1
Chromium (dissolved)	µg/l	0.80	11.85	57.00	6	50.00	1	250.00	0	50.00	1	1.3	3	57	0.8	1.1	7.9	-
Copper (dissolved)	µg/l	12.00	49.29	130.00	7	2000.00	0	200.00	0	2000.00	0	12	130	29	16	17	100	41
Lead (dissolved)	µg/l	2.80	2.80	2.80	7	10.00	0	250.00	0	10.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	2.8
Mercury (dissolved)	µg/l	<LOD	<LOD	<LOD	7	1.00	0	1.00	0	1.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Nickel (dissolved)	µg/l	2.00	4.24	11.00	7	20.00	0	28.00	0	20.00	0	2	11	2.2	3.5	2.1	2.9	6
Selenium (dissolved)	µg/l	5.20	5.20	5.20	7	10.00	0	No criteria	0	10.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	5.2
Zinc (dissolved)	µg/l	6.00	13.36	20.00	7	5000.00	0	500.00	0	3000.00	0	13	9.5	13	20	13	6	19
Total Phenols (monohydric)	µg/l	<LOD	<LOD	<LOD	7	0.50	0	30.00	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C10 - C12	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C12 - C16	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C16 - C21	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C21 - C35	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C5 - C6	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	15000.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C6 - C8	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	15000.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C8 - C10	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C10 - C12	µg/l	25.00	25.00	25.00	7	No criteria	0	No criteria	0	100.00	0	<LOD	<LOD	<LOD	<LOD	25	<LOD	<LOD
TPH-CWG - Aromatic >C12 - C16	µg/l	30.00	30.00	30.00	7	No criteria	0	No criteria	0	100.00	0	<LOD	<LOD	<LOD	<LOD	30	<LOD	<LOD
TPH-CWG - Aromatic >C16 - C21	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	90.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C21 - C35	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	90.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C5 - C7	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	10.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C7 - C8	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	50.00	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C8 - C10	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	20.00	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Anthracene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	0.02	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Fluoranthene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	0.02	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Naphthalene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	10.00	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(a)pyrene	µg/l	<LOD	<LOD	<LOD	7	0.01	0	0.03	0	0.70	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(b)fluoranthene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(ghi)perylene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(k)fluoranthene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Indeno(1,2,3-cd)pyrene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
MTBE (Methyl Tertiary Butyl Ether)	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzene	µg/l	<LOD	<LOD	<LOD	7	1.00	0	30.00	0	10.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Ethylbenzene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	300.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Toluene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	50.00	0	700.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
p & m-xylene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
o-xylene	µg/l	<LOD	<LOD	<LOD	7	No criteria	0	No criteria	0	No criteria	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD

PHYTOTOXICITY RISK ASSESSMENT
4630
Land at Mill Hall Road - Aylesford

Risk Criteria: British Standard BS 3882:2007 (Specification for topsoil and requirements for use)

LUSTRE CONSULTING

TABLE SHOWING PHYTOTOXICITY ASSESSMENT FOR MADE GROUND

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	DETAILS
Copper	mg/kg	26.00	141.29	290.00	7	200.00	2	TP1 (1.2 m bgl) at 290mg/kg, BH3 (2 m bgl) at 230mg/kg
Nickel	mg/kg	25.00	-	49.00	7	110.00	0	-
Zinc	mg/kg	91.00	173.71	390.00	7	300.00	1	BH3 (3.3 m bgl) at 390mg/kg

TABLE SHOWING PHYTOTOXICITY ASSESSMENT FOR NATURAL GROUND

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	DETAILS
Copper	mg/kg	9.20	-	120.00	2	200.00	0	-
Nickel	mg/kg	18.00	-	31.00	2	110.00	0	-
Zinc	mg/kg	36.00	218.00	400.00	2	300.00	1	WS7 (3.6 m bgl) at 400mg/kg

POTABLE WATER PIPELINE RISK ASSESSMENT

4630

Land at Mill Hall Road - Aylesford

TABLE SHOWING WATER PIPELINE ASSESSMENT

DETERMINAND	UNITS	THRESHOLD		THRESHOLD		MAXIMUM CONCENTRATION
		PE	EXCEEDED	PVC	EXCEEDED	
GROUP 1						
Total VOC (with TICs)*	µg/kg	500.00	NO	125.00	NO	<LOD
BTEX & MTBE	µg/kg	100.00	NO	30.00	NO	<LOD
GROUP 2						
**Total SVOC Suite (with TIC)	mg/kg	2.00	NO	1.40	NO	
Phenols	mg/kg	2.00	NO	0.40	NO	<LOD
Cresols & Chlorinated Phenols	mg/kg	2.00	NO	0.04	NO	
†Ethers	mg/kg	0.50	-	1.00	-	
†Nitrobenzene	mg/kg	0.50	-	0.40	-	
†Ketones	mg/kg	0.50	-	0.02	-	
†Aldehydes	mg/kg	0.50	-	0.02	-	
GROUP 3						
Mineral Oils (C11 to C20)	mg/kg	10.00	YES	No effect	NO	100.00
GROUP 4						
Mineral Oils (C21 to C40)	mg/kg	500.00	YES	No effect	NO	630.00
GROUP 5^						
Conductivity	µ2/cm	-	-	-	-	-
Redox Potential	mV	-	-	-	-	-
pH	-	-		-		-
GROUP 6						
†Amines	ug/kg	N/A	-	No effect	-	-

NOTES:

*Minus total concentration of BTEX + MTBE.

**Minus total concentration of phenols, cresols and chlorinated phenols.

†Only required if current or historical site use indicates they may be present.

^Only applicable when selecting suitable barrier pipe (see UKWIR Guidance document)

RISK CRITERIA:

UK Water Industry Research (UKWIR). Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. Ref. 10/WM/03/21. 2010

BURIED CONCRETE ASSESSMENT

4630

Land at Mill Hall Road - Aylesford

TABLE SHOWING BURIED CONCRETE ASSESSMENT

SOIL GROUP	DETERMINAND	UNITS	NO. OF TESTS	MIN	MAX	CHARACTERISTIC VALUE	BRE CLASSIFICATION
MADE GROUND	Total Potential Sulfate	%	-	-	-	-	DS1
	Water Soluble Sulphate as SO4	g/l	7	0.16	0.59	0.591	
	pH	-	7	7.9	11.3	7.9	AC-1s
NATURAL GROUND	Total Potential Sulfate	%	-	-	-	-	DS1
	Water Soluble Sulphate as SO4	g/l	2	0.18	0.49	0.485	
	pH	-	2	7.9	8.7	7.9	AC-1s
GROUNDWATER	Sulphate as SO4	g/l	7	0.05	0.62	0.62	DS2
	pH	-	0				AC-2

OTHER FACTORS CONSIDERED:

Pyritic soils (Made Ground) have not been encountered or considered in this assessment.

Pyritic soils (Natural Ground) have not been encountered in this assessment.

GENERAL NOTES:

The Characteristic Value is based on lowest pH value / highest SO4.

Where the DS Class if different for soluble sulphates and total potential sulphates, the highest DS Class is adopted in accordance with BRE Special Digest 1:2005, 3rd Edition, 'Concrete in Aggressive Ground.' However, if the assessment of TPS is not appropriate (owing to low oxidisable sulphates) only the soluble sulphates have been considered.

CONTROLLED WATERS RISK ASSESSMENT

4630
Land at Mill Hall Road - Aylesford

Water Quality Standard (WQS) Selection Hierarchy:	
Level 1	EQS FW
Level 2	UK DWS
Level 3	WHO DWS

Average $CaCO_3$:
284577.78 µg/l

Data Source: Environment Agency H1 Environmental Risk Assessment – Annex J, v2.0, April 2010 & Petroleum Products in Drinking-Water, WHO (WHO/SDE/WSH/05.08/123)

												Sample Ref	***2849508***	***2849509***	***2860682***	***2860683***	***2871659***	***2871660***	***2871663***	***2871661***
DETERMINAND	**UNITS**	**MINIMUM**	**AVERAGE**	**MAXIMUM**	**No. of TESTS**	**UK DWS**	**No. > AC**	**EQS FW**	**No. > AC**	**WHO**	**No. > AC**		**SWUS**	**SWDS**	**WS4 GS**	**WS7 GS**	**WS4PS**	**WS5PS**	***WS7PS***	***BH3PS***
													17/10/2023	*16/10/2023*	*26/10/2023*	*26/10/2023*	*11/07/2023*	*11/07/2023*	*11/07/2023*	*11/07/2023*
pH	NA	7.20	9.98	12.80	9	No criteria	0	No criteria	0	No criteria	0		7.7	7.7	12.8	11.3	12.7	11.5	11.5	7.4
Total Cyanide	µg/l	23.00	56.50	120.00	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	23	48	<LOD	120	35	<LOD
Sulphate as SO_4	µg/l	50	105279	344000	9	250000	2	400000	0	250000	2		94.1	127	49.9	641	45600	154000	344000	100000
Hardness - Total	mg/l	38.40	284.58	574.00	9	No criteria	0	No criteria	0	No criteria	0		304	407	43.8	388	38.4	105	389	312
Total Organic Carbon (TOC)	µg/l	4.37	33.31	76.40	9	No criteria	0	No criteria	0	No criteria	0		5.71	5.3	47.9	55.4	41.9	76.4	45.7	17.1
Boron (dissolved)	µg/l	88.00	254.22	600.00	9	1000.00	0	2000.00	0	300.00	2		180	220	460	140	600	88	130	210
Arsenic (dissolved)	µg/l	0.27	8.82	27.30	9	10.00	2	50.00	0	10.00	2		1.24	1.33	3.46	7.48	5.71	25.3	7.27	27.3
Cadmium (dissolved)	µg/l	0.02	0.06	0.15	9	5.00	0	5.00	0	3.00	0		<LOD	<LOD	0.03	0.07	0.02	0.05	0.05	<LOD
Chromium (dissolved)	µg/l	0.30	8.26	25.00	9	50.00	0	250.00	0	50.00	0		0.3	0.3	4.1	15	7.4	5.7	25	<LOD
Copper (dissolved)	µg/l	1.30	45.69	110.00	9	2000.00	0	28.00	5	2000.00	0		3.9	4.2	110	48	50	110	82	1.3
Lead (dissolved)	µg/l	0.40	1.07	2.00	9	10.00	0	250.00	0	10.00	0		<LOD	<LOD	2	0.4	0.8	<LOD	<LOD	<LOD
Mercury (dissolved)	µg/l	<LOD	<LOD	<LOD	9	1.00	0	1.00	0	1.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Nickel (dissolved)	µg/l	2.20	11.82	41.00	9	20.00	2	200.00	0	20.00	2		2.5	2.4	10	17	6.3	41	20	2.2
Selenium (dissolved)	µg/l	0.90	4.92	8.80	9	10.00	0	No criteria	0	10.00	0		2.5	3.7	6.2	8.3	6.6	8.8	5.6	1.7
Zinc (dissolved)	µg/l	0.80	5.16	13.00	9	5000.00	0	500.00	0	3000.00	0		7.2	13	6.9	3	3.6	0.9	0.8	3.8
Total Phenols (monohydric)	µg/l	1.80	34.95	70.00	9	0.50	4	30.00	2	No criteria	0		<LOD	<LOD	70	11	57	1.8	<LOD	<LOD
TPH-CWG - Aliphatic >C10 - C12	µg/l	13.00	13.00	13.00	9	No criteria	0	No criteria	0	300.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	13	<LOD	<LOD
TPH-CWG - Aliphatic >C12 - C16	µg/l	55.00	55.00	55.00	9	No criteria	0	No criteria	0	300.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	55	<LOD	<LOD
TPH-CWG - Aliphatic >C16 - C21	µg/l	76.00	76.00	76.00	9	No criteria	0	No criteria	0	300.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	76	<LOD	<LOD
TPH-CWG - Aliphatic >C21 - C35	µg/l	110.00	110.00	110.00	9	No criteria	0	No criteria	0	300.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	110	<LOD	<LOD
TPH-CWG - Aliphatic >C5 - C6	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	15000.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C6 - C8	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	15000.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >C8 - C10	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	300.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C10 - C12	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	100.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C12 - C16	µg/l	64.00	64.00	64.00	9	No criteria	0	No criteria	0	100.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	64	<LOD	<LOD
TPH-CWG - Aromatic >C16 - C21	µg/l	110.00	110.00	110.00	9	No criteria	0	No criteria	0	90.00	1		<LOD	<LOD	<LOD	<LOD	<LOD	110	<LOD	<LOD
TPH-CWG - Aromatic >C21 - C35	µg/l	20.00	20.00	20.00	9	No criteria	0	No criteria	0	90.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	20	<LOD	<LOD
TPH-CWG - Aromatic >C5 - C7	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	10.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C7 - C8	µg/l	10.00	12.20	14.40	9	No criteria	0	50.00	0	300.00	0		<LOD	<LOD	10	<LOD	14.4	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >C8 - C10	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	20.00	0	300.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Anthracene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	0.02	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Fluoranthene	µg/l	0.24	0.24	0.24	9	No criteria	0	0.02	1	No criteria	0		<LOD	<LOD	0.24	<LOD	<LOD	<LOD	<LOD	<LOD
Naphthalene	µg/l	0.50	0.50	0.50	9	No criteria	0	10.00	0	No criteria	0		<LOD	<LOD	0.5	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(a)pyrene	µg/l	<LOD	<LOD	<LOD	9	0.01	0	0.03	0	0.70	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(b)fluoranthene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(ghi)perylene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzo(k)fluoranthene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Indeno(1,2,3-cd)pyrene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
MTBE (Methyl Tertiary Butyl Ether)	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Benzene	µg/l	<LOD	<LOD	<LOD	9	1.00	0	30.00	0	10.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Ethylbenzene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	300.00	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Toluene	µg/l	10.40	12.40	14.40	9	No criteria	0	50.00	0	700.00	0		<LOD	<LOD	10.4	<LOD	14.4	<LOD	<LOD	<LOD
p & m-xylene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
o-xylene	µg/l	<LOD	<LOD	<LOD	9	No criteria	0	No criteria	0	No criteria	0		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD

CONTROLLED WATERS RISK ASSESSMENT

4630
Land at Mill Hall Road - Aylesford

DETERMINAND	*2871662* *BH1PS* *11/07/2023*
pH	7.2
Total Cyanide	<LOD
Sulphate as SO_4	303000
Hardness - Total	574
Total Organic Carbon (TOC)	4.37
Boron (dissolved)	260
Arsenic (dissolved)	0.27
Cadmium (dissolved)	0.15
Chromium (dissolved)	<LOD
Copper (dissolved)	1.8
Lead (dissolved)	<LOD
Mercury (dissolved)	<LOD
Nickel (dissolved)	5
Selenium (dissolved)	0.9
Zinc (dissolved)	7.2
Total Phenols (monohydric)	<LOD
TPH-CWG - Aliphatic >C10 - C12	<LOD
TPH-CWG - Aliphatic >C12 - C16	<LOD
TPH-CWG - Aliphatic >C16 - C21	<LOD
TPH-CWG - Aliphatic >C21 - C35	<LOD
TPH-CWG - Aliphatic >C5 - C6	<LOD
TPH-CWG - Aliphatic >C6 - C8	<LOD
TPH-CWG - Aliphatic >C8 - C10	<LOD
TPH-CWG - Aromatic >C10 - C12	<LOD
TPH-CWG - Aromatic >C12 - C16	<LOD
TPH-CWG - Aromatic >C16 - C21	<LOD
TPH-CWG - Aromatic >C21 - C35	<LOD
TPH-CWG - Aromatic >C5 - C7	<LOD
TPH-CWG - Aromatic >C7 - C8	<LOD
TPH-CWG - Aromatic >C8 - C10	<LOD
Anthracene	<LOD
Fluoranthene	<LOD
Naphthalene	<LOD
Benzo(a)pyrene	<LOD
Benzo(b)fluoranthene	<LOD
Benzo(ghi)perylene	<LOD
Benzo(k)fluoranthene	<LOD
Indeno(1,2,3-cd)pyrene	<LOD
MTBE (Methyl Tertiary Butyl Ether)	<LOD
Benzene	<LOD
Ethylbenzene	<LOD
Toluene	<LOD
p & m-xylene	<LOD
o-xylene	<LOD

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