

CONTAMINATED LAND INTRUSIVE INVESTIGATION

Mortimers Farm
Mortimers Lane
Fair Oak
Hampshire
SO50 7EA



February 2024

Contents

	Company information	4
1	Introduction and scope of work	5
2	Methodology	7
3	On-site observations	9
4	Results from soil analyses	24
5	Interpretation	47
6	Results evaluation	51
7	Review of conceptual site model	52
8	Summary and recommendations	54
9	Limitations	55
10	References and specified sources of information	56
	Appendices	
	Laboratory data	58
	Calibration certification	94

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1 Introduction and scope of work

Apple Environmental has been appointed to undertake an intrusive soil contamination investigation at Mortimers Farm, in Fair Oak, Hampshire.

An environmental desk-study and preliminary risk assessment previously undertaken at the site by Apple Environmental (Report Ref. CL/3538/MF) had identified a potential land contamination concern, due principally to the former use of the site as a farm.

In view of the proposal to construct new dwellings on the site, the conceptual model within the aforementioned desk study had highlighted a perceived risk from the above source, with potentially significant pathway linkages that could enable contamination to reach receptors.

In considering this, the contaminants deemed to be potentially present included general inorganics, hydrocarbons (both petroleum and poly-aromatic), asbestos and possibly ground gases.

An intrusive investigation was subsequently recommended in order to determine the presence and extent of any such contamination, and to assess the overall risk more fully.

The aims of this work therefore have been to devise and implement an appropriate strategy such that it has been possible to:

- determine the nature of the sub-surface material on-site;
- determine the presence of unacceptable ground contamination in specified areas, along with its nature and extent;
- assess the degree to which the site itself could be contributing to the contamination of environmental media off-site;
- observe or presume contaminant-pathway-receptor relationships on site; and
- assess the risk to future users of the site, as well as building structures and services.

This type of assessment relies upon visual examination of the area and sub-surface material, as well as the laboratory analysis of material samples.

As such, the specific objectives are:

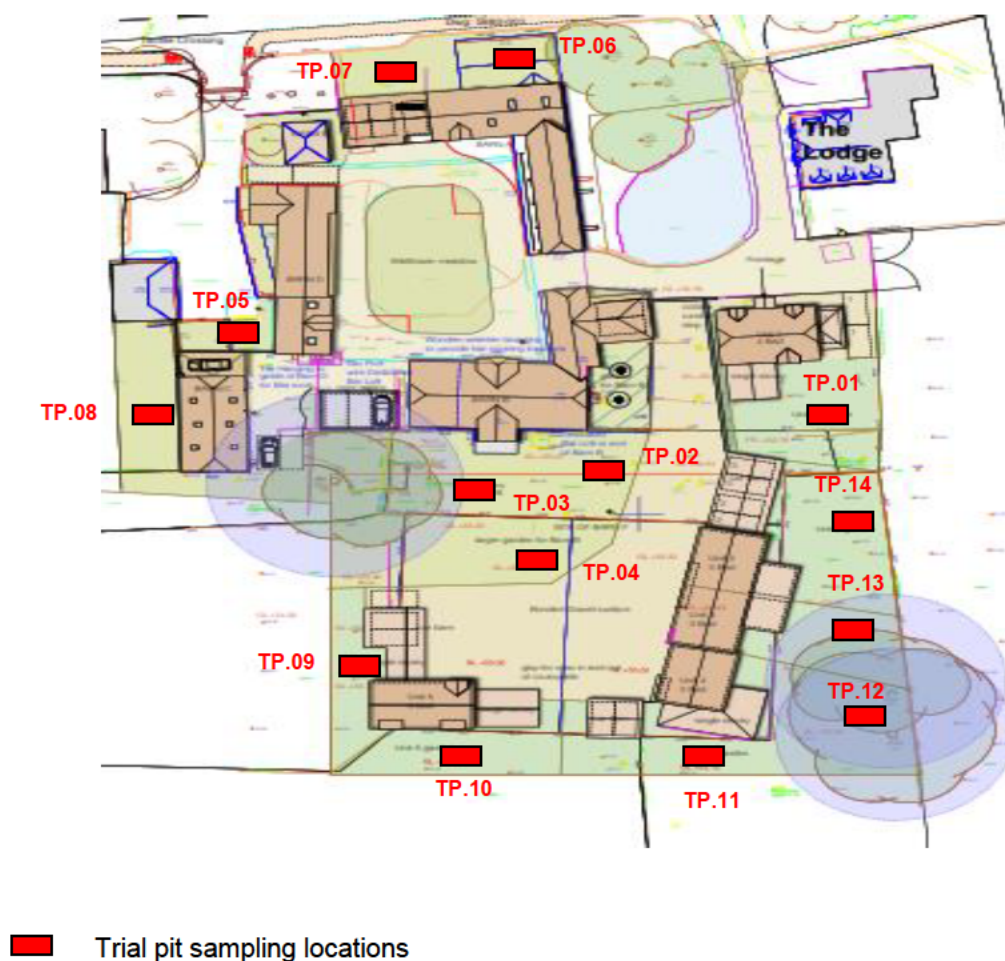
- to excavate fourteen trial pits at the site to a minimum depth of 1000mm;
- to characterise the nature of the sub-surface material at each of these locations;
- to collect at least 2 soil samples from each of the pits for laboratory analysis generally representing the direct and indirect contact zones;
- to collect additional soil samples from where there may be any other specific or noticeable contamination concern;
- to analyse the soil samples for a range of contamination indicators;
- to ascertain the significance of all chemical or physical data obtained;
- to determine the risk to future users based upon residential usage; and
- to make appropriate recommendations in order to reduce and/or eliminate any risks, as identified.

2 Methodology

As stated above, the overall aim of this investigation is to assess the sub-surface of the site in order to determine any risk that may be present as a result of ground contamination.

For this purpose, fourteen trial pits were excavated across the site to a minimum depth of 1000mm, at the locations shown below in Figure 1.

Figure 1 Plan showing the sampling locations



The soil profile from each investigated location has been logged within Section 3 below, along with photographs showing the excavated arisings.

Soil samples were collected from each of the highlighted locations representing depths of 100 - 200mm and 500 - 600mm, (the upper samples obtained from trial pits TP.01 - TP.07 were collected from a depth of 150 - 250mm due to the concrete).

All of the samples were placed immediately into a sterilised container and transferred into refrigerated cold-boxes until removed for analysis.

Chemical analysis was undertaken for the following determinands:

- arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc;
- sulphate, sulphide, chloride, cyanide, ammonia and asbestos;
- benzene, toluene, ethylbenzene and xylene (all isomers);
- polycyclic aromatic hydrocarbons (speciated), petroleum hydrocarbons (banded TPHCWG); and
- phenols and non-speciated VOCs*

* Photo-ionisation detection was undertaken in-situ on the removed soil in order to detect vapours originating from any VOC residue (fuels/solvents etc.) that may be present in each excavated area.

This was performed by means of an externally calibrated Phocheck Tiger PID. Calibration certification has been appended to this report.

All chemical analyses were undertaken by a UKAS accredited laboratory. Laboratory certification has been appended to this report.

3 On-site observations

The only known use of the site has been as a farm.

The ground surface generally exists as hard landscaping, although there are some soft landscaped areas (TP.08 - TP.14).

It is understood from BGS data that the bedrock beneath the site is characterised by the London Clay Formation with no overlying superficial deposits. This was confirmed during the investigation.

The sub-surface material strata logs have been reproduced below in Tables 1 to 14 along with any detailed observations.

Photographs showing the removed material have been appended to each strata log (Photographs 1 to 14).

The intrusive investigation was undertaken on the 7th February 2024.

Table 1 Strata log - Location **TP.01**

Location ID	Depth (mm)	Notes
TP.01	0 - 150	Concrete.
	150 - 250	Sub-base comprising scalpings and gravelly soil.
	250 - 1000	Mottled green/grey, silty, sandy, wet clay.
Groundwater	-	Groundwater was not reached.

Photograph 1 Trial pit and removed soil material - Location TP.01



Table 2 Strata log - Location **TP.02**

Location ID	Depth (mm)	Notes
TP.02	0 - 150	Concrete.
	150 - 250	Sub-base comprising sand and gravelly soil.
	250 - 1000	Orange, sandy, soft, wet clay with angular gravels (10-40mm diameter).
Groundwater	-	Groundwater was not reached.

Photograph 2 Trial pit and removed soil material - Location TP.02



Table 3 Strata log - Location **TP.03**

Location ID	Depth (mm)	Notes
TP.03	0 - 150	Concrete.
	150 - 250	Sub-base comprising gravels and angular flints (10-30mm diameter).
	250 - 1000	Orange, silty, sandy, firm clay.
Groundwater	-	Groundwater was not reached.

Photograph 3 Trial pit and removed soil material - Location TP.03



Table 4 Strata log - Location **TP.04**

Location ID	Depth (mm)	Notes
TP.04	0 - 150	Concrete.
	150 - 400	Chalky sub-base.
	400 - 1000	Mid-brown, silty, sandy, firm clay.
Groundwater	-	Groundwater was not reached.

Photograph 4 Trial pit and removed soil material - Location TP.04



Table 5 Strata log - Location **TP.05**

Location ID	Depth (mm)	Notes
TP.05	0 - 150	Concrete.
	150 - 250	Sub-base and made-ground comprising bricks, gravels and angular flints (20-80mm diameter).
	250 - 1000	Mottled orange/green sandy clay with a noticeable hydrocarbon odour.
Groundwater	-	Groundwater was not reached.

Photograph 5 Trial pit and removed soil material - Location TP.05



Table 6 Strata log - Location **TP.06**

Location ID	Depth (mm)	Notes
TP.06	0 - 150	Concrete.
	150 - 450	Sub-base comprising scalpings.
	450 - 800	Fill material comprising brick, ceramic tiles, chalk and metal wire.
	800 - 1000	Dark grey/green silty, sandy, soft clay.
Groundwater	-	Groundwater was not reached.

Photograph 6 Trial pit and removed soil material - Location TP.06



Table 7 Strata log - Location **TP.07**

Location ID	Depth (mm)	Notes
TP.07	0 - 150	Concrete.
	150 - 350	Sub-base and made-ground comprising scalpings, ceramic tiles and brick fragments. A pipe was present at 350mm with surrounding fill on my side of the pit only.
	350 - 1000	Mottled green/grey/orange, silty, sandy, soft clay.
Groundwater	-	Groundwater was not reached.

Photograph 7 Trial pit and removed soil material - Location TP.07



Table 8 Strata log - Location **TP.08**

Location ID	Depth (mm)	Notes
TP.08	0 - 50	Grass.
	50 - 200	Dark-brown silty made-ground comprising brick fragments and rootlets.
	200 - 350	Mid-brown silty subsoil.
	350 - 1000	Orange, silty, sandy, soft clay.
Groundwater	-	Groundwater was not reached.

Photograph 8 Trial pit and removed soil material - Location TP.08



Table 9 Strata log - Location **TP.09**

Location ID	Depth (mm)	Notes
TP.09	0 - 50	Grass.
	50 - 250	Mid-brown, silty topsoil.
	250 - 1000	Orange, silty, sandy, firm-soft clay.
Groundwater	-	Groundwater was not reached.

Photograph 9 Trial pit and removed soil material - Location **TP.09**



Table 10 Strata log - Location **TP.10**

Location ID	Depth (mm)	Notes
TP.10	0 - 50	Grass.
	50 - 150	Dark-brown, silty topsoil.
	150 - 1000	Orange, silty, sandy, soft clay.
Groundwater	-	Groundwater was not reached.

Photograph 10 Trial pit and removed soil material - Location TP.10



Table 11 Strata log - Location **TP.11**

Location ID	Depth (mm)	Notes
TP.11	0 - 50	Grass.
	50 - 100	Dark-brown, silty topsoil.
	100 - 400	Made-ground within a clayey matrix comprising road planings.
	400 - 500	Made-ground comprising chalk.
	500 - 1000	Dark-brown, silty, soft clay.
Groundwater	-	Groundwater was not reached.

Photograph 11 Trial pit and removed soil material - Location TP.11



Table 12 Strata log - Location **TP.12**

Location ID	Depth (mm)	Notes
TP.12	0 - 50	Grass.
	50 - 280	Dark-brown/orange, silty, sandy, sticky clay.
	280 - 1000	White, moist, friable chalk with angular flints (10-60mm diameter) and small chalk lithorelicts. (Suspected made-ground).
Groundwater	-	Groundwater was not reached.

Photograph 12 Trial pit and removed soil material - Location TP.12



Table 13 Strata log - Location **TP.13**

Location ID	Depth (mm)	Notes
TP.13	0 - 50	Grass.
	50 - 300	Mid-brown, silty, sandy, firm clay.
	300 - 400	Weathered chalk. (Suspected made-ground).
	400 - 1000	White, hard chalk with chalk lithorelicts. (Suspected made-ground).
Groundwater	-	Groundwater was not reached.

Photograph 13 Trial pit and removed soil material - Location TP.13



Table 14 Strata log - Location **TP.14**

Location ID	Depth (mm)	Notes
TP.14	0 - 50	Grass.
	50 - 280	White, clayey chalk with small angular flints (10-50mm diameter). (Suspected made-ground).
	280 - 510	Dark-brown, silty, sandy, soft clay with some small brick fragments.
	510 - 1000	Orange, silty, sandy firm clay.
Groundwater	-	Groundwater was not reached.

Photograph 14 Trial pit and removed soil material - Location TP.14



4 Results from soil analyses

The results from the soil analyses are displayed in Tables 15 to 19 below. Any determinand detected has been highlighted in **bold** type.

Table 15 Results for specified inorganics in soil - metals

Determinand (mg/kg)	TP.01		TP.02		TP.03	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Arsenic	11	14	10	10	8	15
Boron	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	29	34	30	31	26	37
Hexavalent chromium	< 2	< 2	< 2	< 2	< 2	< 2
Copper	41	8	11	12	9	13
Lead	14	13	10	12	13	12
Mercury (total)	< 1	< 1	< 1	< 1	< 1	< 1
Nickel	10	12	18	21	13	30
Selenium	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	37	36	47	55	48	51

Table 15 (Cont.) Results for specified inorganics in soil - metals

Determinand (mg/kg)	TP.04		TP.05		TP.06	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Arsenic	< 2	11	12	11	17	9
Boron	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	0.4	< 0.2	< 0.2	< 0.2	0.5	< 0.2
Chromium	3	40	39	38	21	22
Hexavalent chromium	< 2	< 2	< 2	< 2	< 2	< 2
Copper	9	9	12	14	16	15
Lead	5	11	13	14	44	23
Mercury (total)	< 1	< 1	< 1	< 1	< 1	< 1
Nickel	< 3	16	20	28	10	9
Selenium	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	16	45	50	64	88	42

Table 15 (Cont.) Results for specified inorganics in soil - metals

Determinand (mg/kg)	TP.07		TP.08		TP.09	
	Depth 150-250mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Arsenic	7	8	6	9	7	9
Boron	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2
Chromium	18	34	18	25	16	29
Hexavalent chromium	< 2	< 2	< 2	< 2	< 2	< 2
Copper	11	10	13	9	11	8
Lead	24	10	35	14	20	12
Mercury (total)	< 1	< 1	< 1	< 1	< 1	< 1
Nickel	11	16	9	11	8	12
Selenium	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	52	40	71	38	54	36

Table 15 (Cont.) Results for specified inorganics in soil - metals

Determinand (mg/kg)	TP.10		TP.11		TP.12	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Arsenic	5	6	12	5	8	3
Boron	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	< 0.2	< 0.2	1.1	< 0.2	< 0.2	0.6
Chromium	13	17	10	14	21	5
Hexavalent chromium	< 2	< 2	< 2	< 2	< 2	< 2
Copper	9	8	15	8	11	12
Lead	15	17	83	33	19	608
Mercury (total)	< 1	< 1	< 1	< 1	< 1	< 1
Nickel	6	8	8	7	15	6
Selenium	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	53	39	196	43	50	46

Table 15 (Cont.) Results for specified inorganics in soil - metals

Determinand (mg/kg)	TP.13		TP.14	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Arsenic	6	9	4	13
Boron	< 1	< 1	< 1	< 1
Cadmium	0.4	< 0.2	0.2	< 0.2
Chromium	6	26	5	45
Hexavalent chromium	< 2	< 2	< 2	< 2
Copper	29	13	10	11
Lead	108	22	20	15
Mercury (total)	3.7	< 1	< 1	< 1
Nickel	6	17	5	17
Selenium	< 2	< 2	< 2	< 2
Zinc	74	58	27	53

Table 16 Results for specified inorganics in soil - non-metals

Determinand (mg/kg)	TP.01		TP.02		TP.03	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Cyanide (total)	< 1	< 1	< 1	< 1	< 1	< 1
Sulphate (total)	270	295	<200	<200	535	<200
Sulphide	10	10	< 5	< 5	< 5	< 5
Chloride	25	50	10	14	20	26
Asbestos	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
Determinand (mg/kg)	TP.04		TP.05		TP.06	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Cyanide (total)	< 1	< 1	< 1	< 1	< 1	< 1
Sulphate (total)	772	<200	<200	<200	4341	630
Sulphide	< 5	< 5	< 5	< 5	< 5	< 5
Chloride	61	31	12	9	126	35
Asbestos	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected

Table 16 (Cont.) Results for specified inorganics in soil - non-metals

Determinand (mg/kg)	TP.07		TP.08		TP.09	
	Depth 150-250mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Cyanide (total)	< 1	< 1	< 1	< 1	< 1	< 1
Sulphate (total)	553	230	574	219	474	<200
Sulphide	< 5	< 5	13	< 5	< 5	< 5
Chloride	21	17	10	10	9	5
Asbestos	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
Determinand (mg/kg)	TP.10		TP.11		TP.12	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Cyanide (total)	< 1	< 1	< 1	< 1	< 1	< 1
Sulphate (total)	552	332	692	398	251	513
Sulphide	< 5	< 5	< 5	< 5	< 5	< 5
Chloride	6	7	12	8	14	10
Asbestos	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected

Table 16 (Cont.) Results for specified inorganics in soil - non-metals

Determinand (mg/kg)	TP.13		TP.14	
	Depth 150-250mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Cyanide (total)	< 1	< 1	< 1	< 1
Sulphate (total)	712	212	629	<200
Sulphide	< 5	< 5	< 5	< 5
Chloride	12	17	9	15
Asbestos	Not detected	Not detected	Not detected	Not detected

Table 17 Results for specified hydrocarbons in soil

Determinand (mg/kg)	TP.01		TP.02		TP.03	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Benzene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	< 0.002	< 0.002	0.023	< 0.002	< 0.002	< 0.002
p & m-Xylene	< 0.002	< 0.002	0.018	< 0.002	< 0.002	< 0.002
o-Xylene	< 0.002	< 0.002	0.005	< 0.002	< 0.002	< 0.002
MTBE	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Phenols	<2	<2	<2	<2	<2	<2
Determinand (mg/kg)	TP.04		TP.05		TP.06	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Benzene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
p & m-Xylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
MTBE	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Phenols	<2	<2	<2	<2	<2	<2

Table 17 (Cont). Results for specified hydrocarbons in soil

Determinand (mg/kg)	TP.07		TP.08		TP.09	
	Depth 150-250mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Benzene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
p & m-Xylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
MTBE	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Phenols	<2	<2	<2	<2	<2	<2
Determinand (mg/kg)	TP.10		TP.11		TP.12	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Benzene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
p & m-Xylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
MTBE	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Phenols	<2	<2	<2	<2	<2	<2

Table 17 (Cont). Results for specified hydrocarbons in soil

Determinand (mg/kg)	TP.13		TP.14	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Benzene	< 0.002	< 0.002	< 0.002	< 0.002
Toluene	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	< 0.002	< 0.002	< 0.002	< 0.002
p & m-Xylene	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	< 0.002	< 0.002	< 0.002	< 0.002
MTBE	< 0.005	< 0.005	< 0.005	< 0.005
Phenols	<2	<2	<2	<2

Table 18 Results for poly-aromatic hydrocarbons in soil

Determinand (mg/kg)	TP.01		TP.02		TP.03	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(123-cd)pyrene	< 0.1	< 0.1	< 0.1	0.15	< 0.1	< 0.1
Dibenzo(ah)anthracene	< 0.1	< 0.1	< 0.1	0.14	< 0.1	< 0.1
Benzo(ghi)perylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Coronene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAHs	<1.6	<1.6	< 1.6	< 1.6	<1.6	<1.6

Table 18 (Cont). Results for poly-aromatic hydrocarbons in soil

Determinand (mg/kg)	TP.04		TP.05		TP.06	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	< 0.1	< 0.1	< 0.1	< 0.1	0.39	0.24
Anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	1.69	0.59
Pyrene	< 0.1	< 0.1	< 0.1	< 0.1	1.99	0.51
Benzo(a)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	1.15	0.33
Chrysene	< 0.1	< 0.1	< 0.1	< 0.1	1.40	0.41
Benzo(b)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	1.75	0.41
Benzo(k)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	0.59	0.16
Benzo(a)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	1.56	0.33
Indeno(123-cd)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	1.07	0.24
Dibenzo(ah)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	0.19	< 0.1
Benzo(ghi)perylene	< 0.1	< 0.1	< 0.1	< 0.1	1.24	0.27
Coronene	< 0.1	< 0.1	< 0.1	< 0.1	0.18	< 0.1
Total PAHs	<1.6	<1.6	<1.6	<1.6	13	3.5

Table 18 (Cont.) Results for poly-aromatic hydrocarbons in soil

Determinand (mg/kg)	TP.07		TP.08		TP.09	
	Depth 150-250mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	1.14	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	2.33	< 0.1	0.19	< 0.1	< 0.1	< 0.1
Pyrene	1.89	< 0.1	0.18	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	1.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	1.37	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	1.44	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	0.58	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	1.14	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(123-cd)pyrene	0.76	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(ah)anthracene	0.16	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	0.85	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Coronene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAHs	12.7	<1.6	<1.6	<1.6	<1.6	<1.6

Table 18 (Cont.) Results for poly-aromatic hydrocarbons in soil

Determinand (mg/kg)	TP.10		TP.11		TP.12	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(123-cd)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(ah)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	< 0.1	< 0.1	0.14	< 0.1	< 0.1	< 0.1
Coronene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAHs	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6

Table 18 (Cont.) Results for poly-aromatic hydrocarbons in soil

Determinand (mg/kg)	TP.13		TP.14	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	< 0.1	< 0.1	0.18	< 0.1
Pyrene	< 0.1	< 0.1	0.18	< 0.1
Benzo(a)anthracene	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	< 0.1	< 0.1	0.14	< 0.1
Benzo(b)fluoranthene	< 0.1	< 0.1	0.17	< 0.1
Benzo(k)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	< 0.1	< 0.1	0.15	< 0.1
Indeno(123-cd)pyrene	< 0.1	< 0.1	0.13	< 0.1
Dibenzo(ah)anthracene	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	< 0.1	< 0.1	0.14	< 0.1
Coronene	< 0.1	< 0.1	< 0.1	< 0.1
Total PAHs	<1.6	<1.6	<1.6	<1.6

Table 19 Results for petroleum hydrocarbons in soil

Determinand (mg/kg)	TP.01		TP.02		TP.03	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Aliphatic C5 - C6	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C12 - C16	< 3	10	< 3	< 3	< 3	< 3
Aliphatic C16 - C21	< 3	5	< 3	< 3	3	< 3
Aliphatic C21 - C34	35	< 10	< 10	< 10	57	< 10
Aliphatic C35 - C40	< 10	< 10	< 10	< 10	13	< 10
Total Aliphatic (C5 - 40)	35	< 21	< 21	< 21	60	< 21
Aromatic C5 - C7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C12 - C16	< 2	8	< 2	< 2	< 2	< 2
Aromatic C16 - C21	< 3	12	< 2	< 3	< 2	< 3
Aromatic C21 - C35	< 10	< 10	< 10	< 10	73	< 10
Aromatic C35 - C40	< 10	< 10	< 10	< 10	37	< 10
Total Aromatic (C5 -35)	< 21	< 21	< 21	< 21	73	< 21
Total (C6 - 40)	< 42	< 42	< 42	< 42	184	< 42

Table 19 (Cont.) Results for petroleum hydrocarbons in soil

Determinand (mg/kg)	TP.04		TP.05		TP.06	
	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
Aliphatic C5 - C6	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C12 - C16	< 3	< 3	42	8	< 3	< 3
Aliphatic C16 - C21	< 3	< 3	73	18	< 3	< 3
Aliphatic C21 - C34	< 10	< 10	19	< 10	< 10	< 10
Aliphatic C35 - C40	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic (C5 - 40)	< 21	< 21	143	26	< 21	< 21
Aromatic C5 - C7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C12 - C16	< 2	< 2	15	< 2	< 2	< 2
Aromatic C16 - C21	< 3	< 3	54	< 3	10	3
Aromatic C21 - C35	< 10	< 10	< 10	< 10	12	< 10
Aromatic C35 - C40	< 10	< 10	< 10	< 10	< 10	< 10
Total Aromatic (C5 -35)	< 21	< 21	69	< 21	22	< 21
Total (C6 - 40)	< 42	< 42	212	< 42	< 42	< 42

Table 19 (Cont.) Results for petroleum hydrocarbons in soil

Determinand (mg/kg)	TP.07		TP.08		TP.09	
	Depth 150-250mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Aliphatic C5 - C6	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C12 - C16	< 3	< 3	< 3	< 3	< 3	< 3
Aliphatic C16 - C21	< 3	< 3	< 3	< 3	< 3	< 3
Aliphatic C21 - C34	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic C35 - C40	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic (C5 - 40)	< 21	< 21	< 21	< 21	< 21	< 21
Aromatic C5 - C7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C12 - C16	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C16 - C21	13	< 3	< 2	< 3	< 2	< 3
Aromatic C21 - C35	12	< 10	< 10	< 10	< 10	< 10
Aromatic C35 - C40	< 10	< 10	< 10	< 10	< 10	< 10
Total Aromatic (C5 -35)	25	< 21	< 21	< 21	< 21	< 21
Total (C6 - 40)	< 42	< 42	< 42	< 42	< 42	< 42

Table 19 (Cont.) Results for petroleum hydrocarbons in soil

Determinand (mg/kg)	TP.10		TP.11		TP.12	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Aliphatic C5 - C6	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic C12 - C16	< 3	< 3	< 3	< 3	< 3	< 3
Aliphatic C16 - C21	< 3	< 3	< 3	< 3	< 3	< 3
Aliphatic C21 - C34	< 10	< 10	39	< 10	< 10	< 10
Aliphatic C35 - C40	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic (C5 - 40)	< 21	< 21	39	< 21	< 21	< 21
Aromatic C5 - C7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7 - C8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic C8 - C10	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C10 - C12	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C12 - C16	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic C16 - C21	< 3	< 3	< 2	< 3	< 2	< 3
Aromatic C21 - C35	< 10	< 10	77	< 10	< 10	< 10
Aromatic C35 - C40	< 10	< 10	< 10	< 10	< 10	< 10
Total Aromatic (C5 - 35)	< 21	< 21	77	< 21	< 21	< 21
Total (C6 - 40)	< 42	< 42	125	< 42	< 42	< 42

Table 19 (Cont.) Results for petroleum hydrocarbons in soil

Determinand (mg/kg)	TP.13		TP.14	
	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
Aliphatic C5 - C6	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6 - C8	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic C8 - C10	< 2	< 2	< 2	< 2
Aliphatic C10 - C12	< 2	< 2	< 2	< 2
Aliphatic C12 - C16	< 3	< 3	< 3	< 3
Aliphatic C16 - C21	< 3	< 3	37	< 3
Aliphatic C21 - C34	< 10	< 10	119	< 10
Aliphatic C35 - C40	< 10	< 10	< 10	< 10
Total Aliphatic (C5 - 40)	< 21	< 21	156	< 21
Aromatic C5 - C7	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7 - C8	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic C8 - C10	< 2	< 2	< 2	< 2
Aromatic C10 - C12	< 2	< 2	< 2	< 2
Aromatic C12 - C16	< 2	< 2	< 2	< 2
Aromatic C16 - C21	< 3	< 3	< 2	< 3
Aromatic C21 - C35	< 10	< 10	< 10	< 10
Aromatic C35 - C40	< 10	< 10	< 10	< 10
Total Aromatic (C5 - 35)	< 21	< 21	< 21	< 21
Total (C6 - 40)	< 42	< 42	< 42	< 42

Table 20 Non-specified VOCs - measured by photo-ionisation detection in-situ

TP.01		TP.02		TP.03	
Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm
TP.04		TP.05		TP.06	
Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm	Depth 150-250mm	Depth 500-600mm
< 0.1 ppm	< 0.1 ppm	0.7 ppm	2.4 ppm	< 0.1 ppm	0.1 ppm
TP.07		TP.08		TP.09	
Depth 150-250mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
0.2 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm

Table 20 (Cont.) Non-specified VOCs - measured by photo-ionisation detection in-situ

TP.10		TP.11		TP.12	
Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm
< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	0.1 ppm	< 0.1 ppm
TP.13		TP.14			
Depth 100-200mm	Depth 500-600mm	Depth 100-200mm	Depth 500-600mm		
< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm		

5 Interpretation

Tables 21 to 23 below show the soil guideline concentrations used as part of this assessment.

Where Environment Agency guideline values are unavailable, soil guideline concentrations derived using CLEA software packages and other published guidelines have been consulted. In all instances guideline values for residential end-use with home-grown produce have been considered.

For the purposes of this assessment therefore, the following guideline criteria have been referred to:

- Environment Agency Category 4 Screening Levels (2014);
- CIEH (LQM) GAC 3rd Edition (residential end-use);
- Atkins ATRISK SSVs (residential end-use with home-grown produce);
- GAC CLEA generated value for residential end-use with home-grown produce; and
- others, as available.

Note that for some guideline values a choice of soil organic matter (SOM) concentration is provided whereby different guideline concentrations exist for SOM values of between 1% and 6%.

In this instance the guideline value for 1% SOM was referred to, as the mean organic content was determined as 1.4%; which approximates to 2.4% SOM.

Table 21 Soil guideline concentrations for inorganics referred to for this assessment

Determinand (mg/kg)	Guideline concentration for 1% SOM	Origin
Arsenic	37	Atkins ATRISK Category 4 Screening Level
Boron	290	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Cadmium	22.1	Atkins ATRISK Category 4 Screening Level
Chromium	14300	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Chromium VI	20.5	Atkins ATRISK Category 4 Screening Level
Copper	4730	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Lead	200	Category 4 Screening Level ^(a)
Mercury (elemental)	0.0863	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Mercury (inorganic Hg ²⁺)	180	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Nickel	136	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Selenium	375	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Zinc	20000	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Free Cyanide	34	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Sulphate	10000	ICRCL Action Value domestic gardens ^(b)
Sulphide	1000	ICRCL Action Value all uses ^(b)
Phenols (SOM 1%)	267	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Benzene (SOM 1%)	0.137	Atkins ATRISK (C4SL) for residential with home-grown produce
Toluene (SOM 1%)	113	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Ethylbenzene (SOM 1%)	50.7	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
o-Xylene (SOM 1%)	26.4	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
m-Xylene (SOM 1%)	25	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
p-Xylene (SOM 1%)	24	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce

(a) Quoted for residential land-use 0-7 year-old child taking into account bioavailability, with exposure parameters as detailed in report SR3.

(b) This 'withdrawn' value has been quoted in the absence of any other available published guideline.

Table 22 Soil guideline concentrations for PAHs referred to for this assessment

Determinand (mg/kg)	Guideline concentration for 1% SOM	Origin
Naphthalene	2.3	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Acenaphthylene	608	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Acenaphthene	210	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Fluorene	735	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Phenanthrene	95	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Anthracene	10200	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Fluoranthene	983	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Pyrene	668	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Benzo(a)anthracene	7.2	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Chrysene	15	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Benzo(b)fluoranthene	2.6	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Benzo(k)fluoranthene	77	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Benzo(a)pyrene	2.2	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Indeno(123-cd)pyrene	27	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Dibenzo(ah)anthracene	0.24	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Benzo(ghi)perylene	320	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce

Table 23 Soil guideline concentrations for TPHs referred to for this assessment

Determinand (mg/kg)	Guideline concentration for 1% SOM	Origin
Aliphatic TPH C5-C6	42.7	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aliphatic TPH C6-C8	99.3	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aliphatic TPH C8-C10	13.9	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aliphatic TPH C10-C12	81.7	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aliphatic TPH C12-C16	385	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aliphatic TPH C16-C35	210000	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aliphatic TPH C35-C44	65000	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce
Aromatic TPH C5-C7	0.137	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aromatic TPH C7-C8	113	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aromatic TPH C8-C10	20.5	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aromatic TPH C10-C12	70	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aromatic TPH C12-C16	165	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aromatic TPH C16-C21	319	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aromatic TPH C21-C35	1120	Atkins ATRISK (CLEA 1.07) for residential with home-grown produce
Aromatic TPH C5-C35	1100	LQM/CIEH S4ULs (CLEA 1.06) for residential with home-grown produce

6 Results evaluation

As detailed above, fourteen trial pits were excavated across the site to a maximum depth of 1000mm; from each of which two soil samples were collected for laboratory analysis, representing the direct and indirect contact zones.

In doing so, the results reproduced in Tables 15 to 20 above have shown that although there were a number of elevated determinands present on the site, there was just one determinand above their corresponding referenced soil guideline criteria, when considered for residential development.

More specifically, the concentration of lead in the soil taken from the deeper sample (500-600mm) within trial pit TP.12 of 608mg/kg exceeded the corresponding residential guideline value of 200mg/kg.

The significance of this elevated lead concentration can be considered by means of applying the mean value test, as outlined in the CLR7 document. For this purpose the mean lead concentration across all samples analysed was calculated as 44.2mg/kg, with a standard deviation of 113.

In order to determine the upper 95th percentile, the following formula has been used:

$$US_{95} = \bar{x} + \frac{t \cdot s}{\sqrt{n}}$$

Where:

- US is the upper bound value at the stated percentile
- $\bar{x}$ is the arithmetic mean of (calculated as 44.2)
- s is the unbiased standard deviation (calculated as 113)
- n is the number of samples analysed (28)
- t is the value taken from statistical 't distribution' tables (for n = 28)

Hence:

$$US_{95} = 44.2 + \frac{(1.703 \times 113)}{5.29} = \mathbf{80.5mg/kg}$$

In accordance with CLR7 as the calculated upper bound 95th percentile value of 80.5mg/kg is lower than the quoted soil guideline value for lead of 200mg/kg, therefore the presence of any lead residue in this area is considered to be statistically insignificant.

7 Review of conceptual model and risk assessment

Using the sampling results and observations made, the conceptual site model (CSM) from the Phase 1 desk study can now be reviewed and updated. In doing so any uncertainties highlighted within that report can now be readdressed and the corresponding risk reassessed.

In reviewing this conceptual model, Table 24 below highlights any perceived pollutant pathway linkages that may be present.

It should be noted that the following re-assessment of risk, has been made on the basis that there will be soft landscaped areas as part of the new residential development.

The risk matrix used for this purpose is reproduced below in Figure 2.

Figure 2 Risk assessment algorithm

Potential severity	Risk rating						Severity of hazard	Probability of hazard	Overall risk
	5	5	10	15	20	25	5 = Fatality	1 = Improbable	1 - 6 Low
	4	4	8	12	16	20	4 = Major	2 = Remote	8 - 12 Medium
	3	3	6	9	12	15	3 = Minor	3 = Possible	15 - 25 High
	2	2	4	6	8	10	2 = Negligible	4 = Probable	
	1	1	2	3	4	5	1 = None	5 = Certainty	
		1	2	3	4	5			
Probability						Severity of hazard x probability = risk rating			

Table 24 Perceived risk to receptors

Contaminants identified	Potential pathways	Perceived level of risk	Comments and reasoning
None detected	Ingestion of soil	4	In the absence of any identified soil contamination at the site, the corresponding risk from ingestion of soil is expected to be low.
	Dermal contact with soil	4	In the absence of any identified soil contamination at the site, the corresponding risk from direct and indirect contact with soil is expected to be low.
	Inhalation of soil dust	4	In the absence of any identified soil contamination at the site, the corresponding risk from the inhalation of soil dust is expected to be low.
	Consumption of home-grown vegetables	4	In the absence of any identified soil contamination at the site, the corresponding risk from ingesting contaminated vegetables is expected to be low.
	Inhalation or ignition of gases or vapours	4	In the absence of any identified soil contamination or made-ground at the site, the corresponding risk from gases or organic vapours is deemed to be low.
	Contact with mains services and building fabric below ground	4	In the absence of any identified soil contamination at the site, the corresponding risk to underground services and building fabric from aggressive chemical residue is expected to be low.
	Contact with groundwater, surface water and other off-site environmental media	4	In the absence of any identified soil contamination at the site, the likelihood of impacting groundwater and other off-site media is expected to be low.

8 Summary and recommendations

8.1 Summary

This report has aimed to determine whether or not there is any significant soil contamination beneath the surface of the site in the areas where the construction of new dwellings has been proposed.

For this purpose, fourteen trial pits were excavated across the site, down to a minimum depth of 1000mm, allowing the subsurface to be both visually characterised, and analytically assessed for possible contamination.

Soil samples were obtained from two separate depths at each location, and analysed for the determinands highlighted in the conceptual site model (CSM).

The results from this site investigation have shown that lead was present above its soil guideline concentration in one isolated location, for which the application of a statistical mean value test suggested that its presence here is not likely to be potentially significant overall.

On the basis of these findings therefore, the site appears to be suitable for residential development with soft landscaped areas.

8.2 Recommendations

Despite the fact that there has been no contamination concern identified on this site it is still recommended that an informal observation strategy should be put in place during any groundworks undertaken.

More specifically, care should be taken during the working of the site to investigate any soils, which are suspected by sight, odour or suspicion, to be contaminated.

In the event of any discovery of potentially contaminated soil, the location, type and quantity should be recorded, and the contaminated land officer at Eastleigh Borough Council notified immediately. Approval would need to be sought prior to continuing groundworks or implementing any mitigation.

9 Limitations

This work has been undertaken in accordance with Apple Environmental Limited's standard terms and conditions.

The findings represent the professional opinion of the report author. All work carried out has in accordance with Apple Environmental Limited's current professional knowledge and understanding. It is therefore stated that the conclusions of this report have been based upon information gathered from a number of sources and it can only be assumed that this information provided was accurate and correct.

Intrusive investigation undertaken as part of this work has been restricted to a level of detail required to achieve the stated objectives of this work. The results of any measurements taken may vary spatially or with time, and further confirmatory measurements may wish to be considered, as necessary.

It is also pointed out that soil sampling, may only provide a general indication of contamination present. There is always the possibility that other undetected contaminants exist, or, that detected contaminants may exist at a greater concentration than that specified in areas of the site that have not been intrusively investigated.

10 References and specific sources of information

1. Investigation of potentially contaminated sites - code of practice (BSI 10175:2011+A2:2017)
2. Land Contamination Risk Management (LCRM) - Environment Agency (April 2021)
3. Using Soil Guideline Values - Environment Agency Science Report SC050021/SGV (March 2009)
4. The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment CIEH 3rd Ed. - Land Quality Management Ltd. (2015)
5. Atkins ATRISK SSCs (July 2017)
6. CLEA Software (Version 1.05) Handbook - Environment Agency Science Report SC050021/SR4 (January 2014)
7. ICRL 59/83 Trigger Concentrations - Department of the Environment (1983)
8. Land Affected by Contamination - Planning Practice Guidance - The Department for Communities and Local Government (June 2014)
9. The National Planning Policy Framework (Revised) - December 2023
10. Model procedures for the management of contaminated land (CLR-11) - Environment Agency (September 2004)
11. Contaminated Land Risk Assessment: A Guide to Good Practice (C552) - CIRIA (2001)
12. SP1010 - Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination - CL:AIRE (September 2014)
13. British Geological Survey. Geology of Britain:
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html?>

APPENDICES

- i Laboratory data
- ii Calibration certification



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Derwentside Environmental Testing Services Ltd
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DETS Report No: 24-01345

Site Reference: None Supplied

Project / Job Ref: CL/3555/MF

Order No: None Supplied

Sample Receipt Date: 09/02/2024

Sample Scheduled Date: 09/02/2024

Report Issue Number: 1

Reporting Date: 15/02/2024

Authorised by:



Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



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Soil Analysis Certificate						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.01/01/3555	TP.01/02/3555	TP.03/01/3555	TP.03/02/3555	TP.04/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698392	698393	698394	698395	698396

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.4	7.5	8.8	7.9	11.0
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	270	295	535	< 200	772
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.03	0.03	0.05	< 0.02	0.08
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	17	27	109	49	108
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.02	0.03	0.11	0.05	0.11
Sulphide	mg/kg	< 5	NONE	10	10	< 5	< 5	< 5
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.8	0.8	0.6	0.5	1.5
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	25	50	20	26	61
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	12.6	24.8	10	13	30.3
Arsenic (As)	mg/kg	< 2	MCERTS	11	14	8	15	< 2
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.4
Chromium (Cr)	mg/kg	< 2	MCERTS	29	34	26	37	3
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	41	8	9	13	9
Lead (Pb)	mg/kg	< 3	MCERTS	14	13	13	12	5
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	10	12	13	30	< 3
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	MCERTS	37	36	48	51	16
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
TPH - Aliphatic >C35 - C40 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) Total : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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Soil Analysis Certificate						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.04/02/3555	TP.05/01/3555	TP.05/02/3555	TP.06/01/3555	TP.06/012/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698397	698398	698399	698400	698401

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.9	7.6	7.4	10.6	9.6
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200	< 200	< 200	4341	630
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02	< 0.02	< 0.02	0.43	0.06
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	30	16	14	233	134
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.03	0.02	0.01	0.23	0.13
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.5	0.6	0.4	1.6	1.2
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	31	12	9	126	35
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	15.6	5.8	4.4	63.1	17.7
Arsenic (As)	mg/kg	< 2	MCERTS	11	12	11	17	9
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.5	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	40	39	38	21	22
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	9	12	14	16	15
Lead (Pb)	mg/kg	< 3	MCERTS	11	13	14	44	23
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	16	20	28	10	9
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	MCERTS	45	50	64	88	42
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
TPH - Aliphatic >C35 - C40 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) Total : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	212	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.07/01/3555	TP.07/02/3555	TP.08/01/3555	TP.08/02/3555	TP.09/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698402	698403	698404	698405	698406

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.7	7.6	7.6	7.4	6.7
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	553	230	574	219	474
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.06	0.02	0.06	0.02	0.05
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	25	11	13	< 10	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.03	0.01	0.01	< 0.01	< 0.01
Sulphide	mg/kg	< 5	NONE	< 5	< 5	13	< 5	< 5
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	2.4	0.6	3.1	1.3	2.6
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	21	17	10	10	9
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	10.4	8.6	4.8	4.9	4.4
Arsenic (As)	mg/kg	< 2	MCERTS	7	8	6	9	7
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.2	< 0.2	0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	18	34	18	25	16
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	11	10	13	9	11
Lead (Pb)	mg/kg	< 3	MCERTS	24	10	35	14	20
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	11	16	9	11	8
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	MCERTS	52	40	71	38	54
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
TPH - Aliphatic >C35 - C40 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) Total : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.09/02/3555	TP.10/01/3555	TP.10/02/3555	TP.11/01/3555	TP.11/02/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698407	698408	698409	698410	698411

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.0	7.2	7.7	7.7	7.7
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200	552	332	692	398
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02	0.06	0.03	0.07	0.04
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.7	3.8	1.9	3.4	2
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	5	6	7	12	8
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	2.6	3.1	3.3	5.9	4.1
Arsenic (As)	mg/kg	< 2	MCERTS	9	5	6	12	5
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	1.1	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	29	13	17	10	14
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	8	9	8	15	8
Lead (Pb)	mg/kg	< 3	MCERTS	12	15	17	83	33
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	12	6	8	8	7
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	MCERTS	36	53	39	196	43
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
TPH - Aliphatic >C35 - C40 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) Total : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	< 42	< 42	125	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.12/01/3555	TP.12/02/3555	TP.13/01/3555	TP.13/02/3555	TP.14/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698412	698413	698414	698415	698416

Determinand	Unit	RL	Accreditation	(n)		(n)	
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.4	8.0	7.9	7.5
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	251	513	712	212
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.03	0.05	0.07	0.02
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	< 10	13	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	0.01	< 0.01
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	1.5	1	2.7	1.3
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	14	10	12	17
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	6.9	5.2	6	8.3
Arsenic (As)	mg/kg	< 2	MCERTS	8	3	6	9
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	0.6	0.4	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	21	5	6	26
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	11	12	29	13
Lead (Pb)	mg/kg	< 3	MCERTS	19	608	108	22
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	3.7	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	15	6	6	17
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	MCERTS	50	46	74	58
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
TPH - Aliphatic >C35 - C40 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10
TPH - Aliphatic / Aromatic (C6 - C40) Total : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 24-01345		Date Sampled	07/02/24			
Apple Environmental Ltd		Time Sampled	None Supplied			
Site Reference: None Supplied		TP / BH No	TP.14/02/3555			
Project / Job Ref: CL/3555/MF		Additional Refs	None Supplied			
Order No: None Supplied		Depth (m)	None Supplied			
Reporting Date: 15/02/2024		DETS Sample No	698417			

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected			
pH	pH Units	N/a	MCERTS	7.8			
Total Cyanide	mg/kg	< 1	NONE	< 1			
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200			
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	32			
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.03			
Sulphide	mg/kg	< 5	NONE	< 5			
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.5			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	15			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	7.6			
Arsenic (As)	mg/kg	< 2	MCERTS	13			
W/S Boron	mg/kg	< 1	NONE	< 1			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2			
Chromium (Cr)	mg/kg	< 2	MCERTS	45			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	11			
Lead (Pb)	mg/kg	< 3	MCERTS	15			
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	17			
Selenium (Se)	mg/kg	< 2	MCERTS	< 2			
Zinc (Zn)	mg/kg	< 3	MCERTS	53			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2			
TPH - Aliphatic >C35 - C40 :							
EH CU 1D AL	mg/kg	< 10	NONE	< 10			
TPH - Aromatic >C35 - C40 :							
EH CU 1D AR	mg/kg	< 10	NONE	< 10			
TPH - Aliphatic / Aromatic (C6 - C40)							
Total : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.01/01/3555	TP.01/02/3555	TP.03/01/3555	TP.03/02/3555	TP.04/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698392	698393	698394	698395	698396

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.04/02/3555	TP.05/01/3555	TP.05/02/3555	TP.06/01/3555	TP.06/012/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698397	698398	698399	698400	698401

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.39	0.24
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.69	0.59
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.99	0.51
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.15	0.33
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.40	0.41
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.75	0.41
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.59	0.16
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.56	0.33
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.07	0.24
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.19	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	1.24	0.27
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	0.18	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	7.7	1.9
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	9.1	2.6
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	13	3.5
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7	< 1.7	13.2	3.5



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.07/01/3555	TP.07/02/3555	TP.08/01/3555	TP.08/02/3555	TP.09/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698402	698403	698404	698405	698406

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	1.14	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	2.33	< 0.1	0.19	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	1.89	< 0.1	0.18	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	1.01	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	1.37	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.44	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.58	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.14	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.76	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.16	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.85	< 0.1	< 0.1	< 0.1	< 0.1
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	6.5	< 1	< 1	< 1	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	9.2	< 1	< 1	< 1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	12.7	< 1.6	< 1.6	< 1.6	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	12.7	< 1.7	< 1.7	< 1.7	< 1.7



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.09/02/3555	TP.10/01/3555	TP.10/02/3555	TP.11/01/3555	TP.11/02/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698407	698408	698409	698410	698411

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.14	< 0.1
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.12/01/3555	TP.12/02/3555	TP.13/01/3555	TP.13/02/3555	TP.14/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698412	698413	698414	698415	698416

Determinand	Unit	RL	Accreditation	(n)		(n)	
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.18
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.18
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.14
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.17
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.15
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.13
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.14
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7	< 1.7	< 1.7



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-01345	Date Sampled	07/02/24				
Apple Environmental Ltd	Time Sampled	None Supplied				
Site Reference: None Supplied	TP / BH No	TP.14/02/3555				
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied				
Order No: None Supplied	Depth (m)	None Supplied				
Reporting Date: 15/02/2024	DETS Sample No	698417				

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1			
Coronene	mg/kg	< 0.1	NONE	< 0.1			
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1			
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6			
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7			



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.01/01/3555	TP.01/02/3555	TP.03/01/3555	TP.03/02/3555	TP.04/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698392	698393	698394	698395	698396

Determinand	Unit	RL	Accreditation	(n)				
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.04/02/3555	TP.05/01/3555	TP.05/02/3555	TP.06/01/3555	TP.06/012/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698397	698398	698399	698400	698401

Determinand	Unit	RL	Accreditation	(n)				
Aliphatic >C5 - C6 : HS 1D MS AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8 : HS 1D MS AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	9	< 2	< 2	< 2
Aliphatic >C12 - C16 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	42	8	< 3	< 3
Aliphatic >C16 - C21 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	73	18	< 3	< 3
Aliphatic >C21 - C34 : EH CU 1D AL	mg/kg	< 10	MCERTS	< 10	19	< 10	< 10	< 10
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	143	26	< 21	< 21
Aromatic >C5 - C7 : HS 1D MS AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8 : HS 1D MS AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	15	< 2	< 2	< 2
Aromatic >C16 - C21 : EH CU 1D AR	mg/kg	< 3	MCERTS	< 3	54	< 3	10	3
Aromatic >C21 - C35 : EH CU 1D AR	mg/kg	< 10	MCERTS	< 10	< 10	< 10	12	< 10
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	69	< 21	22	< 21
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42	212	< 42	< 42	< 42



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.07/01/3555	TP.07/02/3555	TP.08/01/3555	TP.08/02/3555	TP.09/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698402	698403	698404	698405	698406

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	13	< 3	< 3	< 3	< 3
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	12	< 10	< 10	< 10	< 10
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	25	< 21	< 21	< 21	< 21
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.09/02/3555	TP.10/01/3555	TP.10/02/3555	TP.11/01/3555	TP.11/02/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698407	698408	698409	698410	698411

Determinand	Unit	RL	Accreditation	(n)				
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10	< 10	< 10	39	< 10
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 21	< 21	39	< 21
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	< 10	< 10	< 10	77	< 10
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	< 21	< 21	77	< 21
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42	< 42	< 42	116	< 42



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.12/01/3555	TP.12/02/3555	TP.13/01/3555	TP.13/02/3555	TP.14/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698412	698413	698414	698415	698416

Determinand	Unit	RL	Accreditation	(n)		(n)	
Aliphatic >C5 - C6 : HS 1D MS AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8 : HS 1D MS AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34 : EH CU 1D AL	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21
Aromatic >C5 - C7 : HS 1D MS AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8 : HS 1D MS AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aromatic >C10 - C12 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aromatic >C12 - C16 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aromatic >C16 - C21 : EH CU 1D AR	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3
Aromatic >C21 - C35 : EH CU 1D AR	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-01345	Date Sampled	07/02/24				
Apple Environmental Ltd	Time Sampled	None Supplied				
Site Reference: None Supplied	TP / BH No	TP.14/02/3555				
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied				
Order No: None Supplied	Depth (m)	None Supplied				
Reporting Date: 15/02/2024	DETS Sample No	698417				

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6 : HS 1D MS AL	mg/kg	< 0.01	NONE	< 0.01			
Aliphatic >C6 - C8 : HS 1D MS AL	mg/kg	< 0.05	NONE	< 0.05			
Aliphatic >C8 - C10 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C10 - C12 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C12 - C16 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3			
Aliphatic >C16 - C21 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3			
Aliphatic >C21 - C34 : EH CU 1D AL	mg/kg	< 10	MCERTS	< 10			
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21			
Aromatic >C5 - C7 : HS 1D MS AR	mg/kg	< 0.01	NONE	< 0.01			
Aromatic >C7 - C8 : HS 1D MS AR	mg/kg	< 0.05	NONE	< 0.05			
Aromatic >C8 - C10 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C10 - C12 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C12 - C16 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C16 - C21 : EH CU 1D AR	mg/kg	< 3	MCERTS	< 3			
Aromatic >C21 - C35 : EH CU 1D AR	mg/kg	< 10	MCERTS	< 10			
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21			
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42			



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.01/01/3555	TP.01/02/3555	TP.03/01/3555	TP.03/02/3555	TP.04/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698392	698393	698394	698395	698396

Determinand	Unit	RL	Accreditation	(n)				
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.04/02/3555	TP.05/01/3555	TP.05/02/3555	TP.06/01/3555	TP.06/012/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698397	698398	698399	698400	698401

Determinand	Unit	RL	Accreditation	(n)				
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5



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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.07/01/3555	TP.07/02/3555	TP.08/01/3555	TP.08/02/3555	TP.09/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698402	698403	698404	698405	698406

Determinand	Unit	RL	Accreditation					
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.09/02/3555	TP.10/01/3555	TP.10/02/3555	TP.11/01/3555	TP.11/02/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698407	698408	698409	698410	698411

Determinand	Unit	RL	Accreditation	(n)			
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-01345	Date Sampled	07/02/24	07/02/24	07/02/24	07/02/24	07/02/24
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: None Supplied	TP / BH No	TP.12/01/3555	TP.12/02/3555	TP.13/01/3555	TP.13/02/3555	TP.14/01/3555
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 15/02/2024	DETS Sample No	698412	698413	698414	698415	698416

Determinand	Unit	RL	Accreditation	(n)		(n)	
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-01345	Date Sampled	07/02/24				
Apple Environmental Ltd	Time Sampled	None Supplied				
Site Reference: None Supplied	TP / BH No	TP.14/02/3555				
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied				
Order No: None Supplied	Depth (m)	None Supplied				
Reporting Date: 15/02/2024	DETS Sample No	698417				

Determinand	Unit	RL	Accreditation				
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2			
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5			
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2			
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2			
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2			
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5			



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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-01345	
Apple Environmental Ltd	
Site Reference: None Supplied	
Project / Job Ref: CL/3555/MF	
Order No: None Supplied	
Reporting Date: 15/02/2024	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
698392	TP.01/01/3555	None Supplied	None Supplied	19	Grey clay
698393	TP.01/02/3555	None Supplied	None Supplied	21.8	Grey clay
698394	TP.03/01/3555	None Supplied	None Supplied	22.8	Light brown clay
698395	TP.03/02/3555	None Supplied	None Supplied	24.3	Light brown clay
698396	TP.04/01/3555	None Supplied	None Supplied	21.3	White chalk
698397	TP.04/02/3555	None Supplied	None Supplied	20.3	Light brown clay with chalk
698398	TP.05/01/3555	None Supplied	None Supplied	24.7	Light brown clay
698399	TP.05/02/3555	None Supplied	None Supplied	23.4	Light brown clay
698400	TP.06/01/3555	None Supplied	None Supplied	17.6	Brown sandy clay with stones
698401	TP.06/012/3555	None Supplied	None Supplied	16.3	Brown sandy clay with stones and concrete
698402	TP.07/01/3555	None Supplied	None Supplied	21	Grey sandy clay with chalk
698403	TP.07/02/3555	None Supplied	None Supplied	20.9	Grey clay
698404	TP.08/01/3555	None Supplied	None Supplied	26	Brown sandy clay with stones and vegetation
698405	TP.08/02/3555	None Supplied	None Supplied	22.9	Light brown clay
698406	TP.09/01/3555	None Supplied	None Supplied	28.2	Brown sandy clay with vegetation
698407	TP.09/02/3555	None Supplied	None Supplied	19.7	Light brown sandy clay
698408	TP.10/01/3555	None Supplied	None Supplied	29.6	Brown clay
698409	TP.10/02/3555	None Supplied	None Supplied	20.8	Brown sandy clay
698410	TP.11/01/3555	None Supplied	None Supplied	6.2	Brown sandy gravel with stones and chalk
698411	TP.11/02/3555	None Supplied	None Supplied	23.6	Brown sandy clay with chalk
698412	TP.12/01/3555	None Supplied	None Supplied	22.9	Brown sandy clay with vegetation
698413	TP.12/02/3555	None Supplied	None Supplied	17.2	White chalk with stones
698414	TP.13/01/3555	None Supplied	None Supplied	18.4	Grey sandy clay with chalk
698415	TP.13/02/3555	None Supplied	None Supplied	23.3	Light brown clay with vegetation
698416	TP.14/01/3555	None Supplied	None Supplied	12.4	Grey sandy clay with stones and chalk
698417	TP.14/02/3555	None Supplied	None Supplied	19.4	Light brown clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{1/5}



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-01345

Apple Environmental Ltd

Site Reference: None Supplied

Project / Job Ref: CL/3555/MF

Order No: None Supplied

Reporting Date: 15/02/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



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List of HWOL Acronyms and Operators

DETS Report No: 24-01345

Apple Environmental Ltd

Site Reference: None Supplied

Project / Job Ref: CL/3555/MF

Order No: None Supplied

Reporting Date: 15/02/2024

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C35 - C40 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aliphatic C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C35 - C40 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
TPH CWG - Total >C6 - C40 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS



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DETS Report No: 24-01705

Site Reference: None Supplied

Project / Job Ref: CL/3555/MF

Order No: None Supplied

Sample Receipt Date: 09/02/2024

Sample Scheduled Date: 20/02/2024

Report Issue Number: 1

Reporting Date: 26/02/2024

Authorised by:

Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.

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Soil Analysis Certificate

DETS Report No: 24-01705	Date Sampled	07/02/24	07/02/24			
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: None Supplied	TP / BH No	TP.02/01/3555	TP.02/02/3555			
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied			
Order No: None Supplied	Depth (m)	None Supplied	None Supplied			
Reporting Date: 26/02/2024	DETS Sample No	700087	700088			

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected			
pH	pH Units	N/a	MCERTS	8.1	8.2			
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1			
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200	< 200			
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02	< 0.02			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	11	24			
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.01	0.02			
Sulphide	mg/kg	< 5	NONE	< 5	< 5			
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	0.4	0.4			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	10	14			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	5.1	6.9			
Arsenic (As)	mg/kg	< 2	MCERTS	10	10			
W/S Boron	mg/kg	< 1	NONE	< 1	< 1			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2			
Chromium (Cr)	mg/kg	< 2	MCERTS	30	31			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	11	12			
Lead (Pb)	mg/kg	< 3	MCERTS	10	12			
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	18	21			
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2			
Zinc (Zn)	mg/kg	< 3	MCERTS	47	55			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2			
TPH - Aliphatic >C35 - C40 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10			
TPH - Aromatic >C35 - C40 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10			
TPH - Aliphatic / Aromatic (C6 - C40) Total : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	< 42			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs					
DETS Report No: 24-01705	Date Sampled	07/02/24	07/02/24		
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied		
Site Reference: None Supplied	TP / BH No	TP.02/01/3555	TP.02/02/3555		
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied		
Reporting Date: 26/02/2024	DETS Sample No	700087	700088		

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.15		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.14		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1		
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1		
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6		
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7		



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-01705	Date Sampled	07/02/24	07/02/24			
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: None Supplied	TP / BH No	TP.02/01/3555	TP.02/02/3555			
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied			
Order No: None Supplied	Depth (m)	None Supplied	None Supplied			
Reporting Date: 26/02/2024	DETS Sample No	700087	700088			

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3			
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3			
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10	< 10			
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 21			
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	< 3	< 3			
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	< 10	< 10			
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	< 21			
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42	< 42			



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Soil Analysis Certificate - BTEX / MTBE					
DETS Report No: 24-01705	Date Sampled	07/02/24	07/02/24		
Apple Environmental Ltd	Time Sampled	None Supplied	None Supplied		
Site Reference: None Supplied	TP / BH No	TP.02/01/3555	TP.02/02/3555		
Project / Job Ref: CL/3555/MF	Additional Refs	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied		
Reporting Date: 26/02/2024	DETS Sample No	700087	700088		

Determinand	Unit	RL	Accreditation				
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2		
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5		
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	23	< 2		
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	18	< 2		
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	5	< 2		
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5		



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 24-01705	
Apple Environmental Ltd	
Site Reference: None Supplied	
Project / Job Ref: CL/3555/MF	
Order No: None Supplied	
Reporting Date: 26/02/2024	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
\$ 700087	TP.02/01/3555	None Supplied	None Supplied	21.4	Light brown clay
\$ 700088	TP.02/02/3555	None Supplied	None Supplied	20.8	Light brown clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

\$ samples exceeded recommended holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-01705

Apple Environmental Ltd

Site Reference: None Supplied

Project / Job Ref: CL/3555/MF

Order No: None Supplied

Reporting Date: 26/02/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 dphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



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List of HWOL Acronyms and Operators

DETS Report No: 24-01705

Apple Environmental Ltd

Site Reference: None Supplied

Project / Job Ref: CL/3555/MF

Order No: None Supplied

Reporting Date: 26/02/2024

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C35 - C40 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aliphatic C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C35 - C40 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
TPH CWG - Total >C6 - C40 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS



Life-saving solutions

CERTIFICATE OF CALIBRATION

Tiger Select

CALIBRATION CERTIFICATE NO: 77217

ISSUED BY: SHAWCITY LIMITED
DATE: 02/08/2023

APPROVED SIGNATOR

NAME: Joe Herbert

CUSTOMER: Apple Environmental Ltd
INSTRUMENT: Tiger Select
SERIAL NUMBER: T-113211

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Isobutylene	WO397588-2	100 ppm	100 ppm
Isobutylene	WO380827-2	1000 ppm	1000 ppm
Benzene	WO407569-2	5 ppm	5 ppm

COMMENTS:

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is $\pm 2\%$
The results indicate that the instrument conforms to the applicable parts of the published specification.

HEALTH & SAFETY, OCCUPATIONAL HYGIENE AND ENVIRONMENTAL MONITORING INSTRUMENTS

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