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Attachment D.2 – Baseline Report

Pfizer Ireland (Ringaskiddy)

Soil and Groundwater Baseline Assessment

Pfizer Ireland Pharmaceuticals

Project reference: PR-423449

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between 08 July 2019 and 02 August 2019 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

The exploratory holes carried out during the fieldwork, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The comments made and recommendations given in this Report are based on the ground conditions apparent at the site of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this Report.

The comments made on groundwater conditions are based on observations made during site work and the on-going monitoring programme. It should be noted that groundwater levels might vary owing to seasonal or other effects.

The opinions expressed in this Report concerning any contamination found and the risks arising there from are based on current good practice simple statistical assessment and comparison with available soil guideline values, AECOM generic assessment criteria and other guidance values.

It should be noted that the effects of ground and water borne contamination on the environment are constantly under review, and authoritative guidance values are potentially subject to change. AECOM may, at our sole discretion, amend, revise or supplement this Report to take account of changes to these values or for any other reason. The conclusions presented herein are strictly based on the guidance values available at the time this Report was first prepared, however, no liability by AECOM can be accepted for the retrospective effects of any changes or amendments to these values.

Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Reference to historical Ordnance Survey (OS) maps and/or data provides invaluable information regarding the land use history of a site. However, it should be noted that historical evidence will be incomplete for the period pre-dating the first edition and between the release of successive maps and/or data.

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1. Introduction

1.1 Project Background

Pfizer Ireland Pharmaceuticals (Pfizer Ringaskiddy) operate a pharmaceutical manufacturing plant at Ballintaggart, Ringaskiddy, Co. Cork (the site) under Industrial Emissions Licence (IEL) P0013-04 granted by the Environmental Protection Agency (EPA). AECOM understands that Pfizer Ringaskiddy are required to make amendments to the site's Waste Water Treatment Plant (WWTP) to ensure compliance with applicable BAT-AELs as specified in the Commission Implementing Decision [CID] 2016/902.

The issue of the CID 2016/902 has obliged the site to complete a limited review of the IEL to ensure compliance with applicable BAT-AELs. As part of the IEL review application, Pfizer Ringaskiddy are obliged to produce a Baseline report. Pfizer Ringaskiddy appointed AECOM Ireland Limited (AECOM) to assist in the production of this Baseline Report.

A site location map and site layout are presented in Appendix A as Figures 1 and 2, respectively.

1.2 Baseline Assessment

When the European Union Directive on Industrial Emissions[1] came into force, it became necessary for licensees to consider baseline conditions with regard to soil and groundwater contamination when activity on the site involves the use, production or release of relevant hazardous substances, under either of the following scenarios:

- When applying for an IEL to operate a new installation; and,
- When revising the permit for an existing licensed installation.

Under the Industrial Emissions Directive, a *Relevant Hazardous Substance* is a raw material, product, intermediary, by-product, emission or waste which, as a result of hazardousness, mobility, persistence and biodegradability (as well as other characteristics), is capable of contaminating soil or groundwater.

1.3 Project Objective

The main objective of the project is to complete a baseline assessment for the site in support of the limited licence review as specified above.

1.4 Scope of Work

The aim of baseline assessment is to generate a report which, on cessation of the licensed activity, will allow for direct comparison to determine if contamination has been added in the course of the licensed activity since the baseline was established.

The Official Journal of the European Union has issued guidance[2] on the stages to be completed and the scope of content for baseline reports. In total there are eight stages to be completed, as listed below:

- Stage 1 – Identification of hazardous substances used;
- Stage 2 – Identification of relevant hazardous substances used;
- Stage 3 – Assessment of the site-specific pollution possibility;
- Stage 4 – Site history;

[1] Industrial Emissions Directive, Directive 2010/75/EU
[2] European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions (2014)

- Stage 5 – Environmental setting;
- Stage 6 – Site characterisation;
- Stage 7 – Site investigation; and,
- Stage 8 – Production of the baseline report.

1.5 References

1.5.1 Reports

In preparation of this report, the following reports have been reviewed as prepared by AECOM and legacy AECOM companies Dames & Moore (D&M) and URS:

- Dames & Moore, 1995: Phase III Groundwater Investigation and February 1995 Groundwater Monitoring Results for the Ringaskiddy, Cork Facility on Behalf of Pfizer Pharmaceuticals, report reference 17717-018-401, dated 15 May 1995;
- Dames & Moore, 1996: Additional Investigations at OSP1 and of Groundwater Methanol Levels, letter report reference 17717-028-447, dated 22 October 1996;
- Dames & Moore, 1998: OSP4 Trial Pit Investigation Pfizer Pharmaceuticals Ringaskiddy, Co. Cork, report reference 17717-040, dated 26 March 1998;
- Dames & Moore, 1998: OSP4 Groundwater Investigation Pfizer Pharmaceuticals Ringaskiddy, Co. Cork, report reference 17717-041, dated 02 April 1998;
- Dames & Moore, 1998: Results Of May/June Groundwater Monitoring Programme Including Underground Storage Tank Farm Area, letter report reference 17717\042, dated 14 July 1998;
- Dames & Moore, 1998: Remedial Investigation Product Recovery And May - June 1998 Groundwater Quality Results, report reference 17717-045, dated 20 November 1998;
- Dames & Moore, 1999: 1998 Groundwater Programme, letter report reference 17717\043\1998, dated 15 February 1999;
- Dames & Moore, 1999: Soil Treatment Bed Sample Results, June 1999, letter report reference 17717\048, dated 22 July 1999;
- URS, 2004: Results of June 2004 Soil Sampling next to Boiler House, letter report reference 17717\153-447, dated 11 August 2004;
- URS, 2004: Soil Sampling From Soils Excavated For The Construction Of An OSP1 Elevator Shaft At The Pfizer, Ringaskiddy Facility, report reference 17717-153-Soil Sampling February 2004, dated 11 March 2004;
- URS, 2004: Results of March 2004 Soil Sampling, letter report reference 17717-153-Soil Sampling March 2004, dated 02 April 2004;
- URS, 2004: Results of Sampling Following the WWTP Pipe Overflow, Ringaskiddy API, 23 April 2004, letter report reference 17717-153-447 WWTP Sampling, dated 12 May 2004;
- URS, 2005: Shallow Limestone Characterisation Programme And Product Recovery System Design – Southern UST Farm, report reference 17717-075, dated 05 May 2005;
- URS, 2006: Pfizer Ringaskiddy Controlled Water Quantitative Risk Assessment, report reference 45078513/CKRP0001 Issue 2, dated 12 October 2006;
- URS, 2006: Feasibility Report on Decommissioning of RC Wells - Pfizer Ringaskiddy, report reference 4617688/CKRP0002 Issue 1, dated 31 May 2006;
- AECOM, Pfizer Ringaskiddy Groundwater Remediation Assessment 2014, AECOM report reference 47092735/CKRP0001, February 2015; and,

In addition, groundwater monitoring reports prepared by AECOM and predecessor companies between 1997 and 2019 were also reviewed with the most recent results summarised in:

- AECOM, 2019: Pfizer Ringaskiddy Groundwater Monitoring Round 1 (May) 2019 IEL Report, report reference PR-412276_ACM_RP_EN_001.

1.5.2 Online References

- Site sensitivity research, including geology, hydrology, hydrogeology, areas of ecological significance and a review of potentially polluting activities in the area, from:
  - Geological Survey of Ireland (GSI) website http://www.gsi.ie, accessed 24 July 2019 (for Public Viewer and Groundwater Web Maps); and,
  - Environmental Protection Agency (EPA) website http://www.epa.ie, accessed 24 July 2019 (for Map Viewer).
- Flood risk data (as available), from: Office of Public Works (OPW) National Flood Hazard Mapping tool http://www.floodinfo.ie, accessed 26 July 2019.

2. Identification of Hazardous Substances (Stage 1)

The first stage in preparing a baseline assessment is to identify the hazardous substances that are used, produced or released at the site.

Substances were classified as hazardous if:

1. They were identified as 'Hazardous' by the EPA in the document *Classification of Hazardous and Non- Hazardous Substances in Groundwater* (2010)[3] ;
2. If they have a relevant hazard statement on the European Chemicals Agency website[4]. A total of 14 relevant environmental hazard statements have been identified:
   - H340 – May cause genetic defects
   - H341 – Suspected of causing genetic defects
   - H350 – May cause cancer
   - H351 – Suspected of causing cancer
   - H360D – May damage unborn child
   - H360F – May damage fertility
   - H361 – Suspected of damaging fertility or the unborn child
   - H400 – Very toxic to aquatic life
   - H401 – Toxic to aquatic life
   - H402 – Harmful to aquatic life
   - H410 – Very toxic to aquatic life with long lasting effects
   - H411 – Toxic to aquatic life with long lasting effects
   - H412 – Harmful to aquatic life with long lasting effects
   - H413 – May cause long lasting harmful effects to aquatic life

In addition, the safety data sheet for the firefighting foam used and stored on site was reviewed to ascertain whether it contains per/poly-fluorinated alkyl substances (PFAS). PFAS is an emerging group of environmentally persistent compounds known to have been commonly used in aqueous film forming foams (AFFF) such as those used in firefighting. The supplier of the firefighting foam used at Pfizer Ringaskiddy confirmed that the foam used and stored at site at present and historically has been PFAS free.

Several final products and intermediaries are also stored on site. Where relevant hazard statements cannot be assessed, these substances were not screened out in Stage 1.

A list of the hazardous substances identified in Stage 1 are listed in Appendix B, Table 1.

[3] http://www.epa.ie/pubs/reports/water/ground/classificationofhazardousandnon-hazardoussubstancesingroundwater.html
[4] http://echa.europa.eu/

3. Identification of 'Relevant Hazardous Substances' (Stage 2)

Stage 2 screens the hazardous substances identified following Stage 1 for potential pollution risk due to their chemical or physical properties.

This risk-based assessment screens the list of substances given in Appendix B Table 1 in consideration of:

- The physical state of substances that will be used and stored on site, e.g. solids and gases can be removed from the list as part of the screening process; and,
- The overall quantity used on site. The EU Guidance states that "where very small quantities are used, produced or released on the site of the installation then the possibility of contamination is likely to be insignificant for the purpose of producing a baseline report".

A planned annual usage of >250 L (or >250 kg) was used as the threshold above which substances used on site were considered in this assessment. Those substances that will be used/stored in small quantities on site have not been considered, for example substances used in laboratories or in the canteen.

Fifty Relevant Hazardous Substances were identified in Stage 2.

4. Assessment of Site-Specific Pollution Possibility (Stage 3)

In Stage 3, the hazardous substances taken forward from Stage 2 were considered in the context of the site to determine whether circumstances exist which may result in the potential release of a substance in sufficient quantities to pose a pollution risk. Specific circumstances include:

- The quantity of each hazardous substance or groups of similar hazardous substances;
- How and where hazardous substances are stored and used on site;
- How the hazardous substances are transported around the installation; and,
- In case of existing installations, the measures that have been adopted to ensure that it is impossible in practice for contamination of soil or groundwater to take place (including the presence and integrity of containment mechanisms, condition of site drainage, etc.).

For the list of on-site relevant hazardous substances derived at Stage 2, AECOM assessed the storage arrangement of each chemical substance, together with its associated handling procedures.

At Pfizer Ringaskiddy, the storage and handling of process materials is undertaken in accordance with the EPA Guidance Document *IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities*, EPA 2004[5]. Details on the site containment systems were obtained from the site's Environmental Liabilities Risk Assessment Update 2018/2019 prepared by AECOM[6] and from the Pfizer Ringaskiddy Environment Team.

Brief details of the storage arrangements of the planned on-site relevant hazardous chemical substances and associated containment measures for each of the hazardous substances are provided in Appendix B Table 2.

Based on the information provided by Pfizer Ringaskiddy to AECOM, it is expected that, as a result of current storage, containment and handling practices, the likelihood of possible significant impact to soils and groundwater from the on-site hazardous substances is low. However, areas of soil and groundwater impacts are known to exist on site from historic losses.

The following sections detail specific storage arrangements for relevant hazardous substances (or groups of substances) assessed at Stage 3.

4.1 Benzene

Benzene is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Benzene is no longer stored on site but was historically stored in single-skinned underground storage tanks (USTs) in the former northern and southern tank farms (prior to 1999/2000). Benzene-impacted material was also used as fill during the reclamation of Monkstown Creek creating a secondary source area in the north east of the site.

Benzene is currently analysed for during biannual groundwater monitoring as part of the Volatile Organic Compound (VOC) suite and has been reported as detected in groundwater from wells 7, 205, 404, 501 and C1 and is still reported as detected in the majority of these wells, though at declining concentrations.

As benzene is reported as detected in groundwater it is considered a Relevant Hazardous Substance.

[5] http://www.epa.ie/pubs/advice/licensee/guidancetostorageandtransferofmaterialsforscheduledactivities.html
[6] AECOM (2019) PR-261839-ACM-RP-EN-001-3- Pfizer Ireland Pharmaceuticals Environmental Liabilities Risk Assessment Update 2018/2019

4.2 Chloroform

Chloroform is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Chloroform is no longer stored on site but was historically stored in single-skinned USTs in the former northern and southern tank farms (prior to 1999/2000).

Chloroform is currently analysed for during biannual groundwater monitoring as part of the VOC suite and is intermittently reported as detected in groundwater from wells 409 and 702.

As chloroform is occasionally reported as detected in groundwater it is considered a Relevant Hazardous Substance.

4.3 Dichloromethane (DCM)

Dichloromethane (DCM) is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Bulk DCM is currently stored in bunded above ground storage tanks (ASTs) in the tank farm. The DCM AST and bund have been designed to the appropriate engineering standards for solvent storage. In the event of a loss of DCM from primary and secondary containment, the tank farm area drains through the weak effluent system to the WWTP providing tertiary containment.

Bulk DCM is conveyed to its point of use through above ground pipelines. All tanks, bunds, sumps and drains are on a rigorous preventative maintenance system and bunds are integrity tested on a three-year cycle. The solvent loading and unloading areas are located on impervious hardstanding which drains to the weak effluent system to the WWTP. In the event of a leak or spill during transport, DCM will not be able to enter soil and groundwater. It will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where it would be reported as detected by the continuous pH and/or Total Organic Carbon (TOC) meter and be diverted to the storm water retention pond, where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Given the above design and operational mitigation measures and documented procedures on material use and storage, the risk of DCM entering soil and/or groundwater from contemporary sources is considered low. However, DCM was historically stored in single-skinned USTs in the former northern and southern tank farms (prior to 1999/2000). In addition, DCM is currently analysed for during biannual groundwater monitoring as part of the VOC suite and has been intermittently reported as detected.

As DCM is intermittently reported as detected in groundwater it is considered a Relevant Hazardous Substance.

4.4 Diesel

Diesel is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Diesel is stored in eight bunded ASTs close to its points of use. Diesel tanks are primarily used to store fuel for on-site trucks and forklifts. Diesel is also used to provide power for the emergency generators and fire pumps on site.

Diesel is delivered to site by tanker. Diesel bunds have been designed for a minimum 110% capacity of the diesel tank volume. The diesel tanks and bunds have been designed to the appropriate engineering standards for diesel storage.

The diesel tank, delivery system, supply pipework to the generators and the generators are all on a rigorous preventative maintenance system and are visually inspected by shift personnel during routine plant walkdowns. In the event of a spill and release from secondary containment diesel will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Diesel is not currently analysed for as part of biannual groundwater monitoring suite, however key components of diesel (such as naphthalene and trimethylbenzene) are analysed for as part of the VOC suite.

The risk of diesel entering soil and/or groundwater is considered low, however as diesel is stored in bulk it is considered a Relevant Hazardous Substance. Specific analysis for diesel hydrocarbons will be added to the biannual groundwater monitoring analytical suite.

4.5 1,2-Dichlorobenzene

1,2-Dichlorobenzene is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. 1,2-Dichlorobenzene is not currently stored on site however, it was historically stored in single-skinned USTs in the former northern and southern tank farms (prior to 1999/2000). 1,2-Dichlorobenzene is currently analysed for during biannual groundwater monitoring as part of the VOC suite and has not been reported as detected in groundwater during routine monitoring.

As 1,2-dichlorobenzene has not been reported as detected in groundwater and as it is no longer stored on site, it is not considered a Relevant Hazardous Substance.

4.6 Dimethylacetamide

Dimethylacetamide is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Dimethylacetamide is not currently stored on site however, it was historically stored on site and it is possible that it may have been stored in bulk. Dimethylacetamide is not analysed for in routine groundwater monitoring.

As dimethylacetamide has potentially been stored in bulk on site historically, it is considered a Relevant Hazardous Substance.

Dimethylacetamide will be added to the analytical suite (as a VOC tentatively identified compound (TIC)) for biannual groundwater monitoring, however, as it is no longer stored on site, if it is not reported as detected in two consecutive biannual groundwater monitoring rounds then its removal from further sampling events should be agreed with the EPA.

4.7 Dowtherm J

Dowtherm J (diethyl benzenes) is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Dowtherm J is used as a cooling liquid within Organic Synthesis Plant (OSP) 3 and is stored in a bunded AST in OSP3. The Dowtherm J AST and bund have been designed to the appropriate engineering standards. In the event of a loss from primary and secondary containment, OSP3 drains through the weak effluent system via a weak effluent tank in OSP3 which pumps on level control to the WWTP which acts as tertiary containment.

Bulk Dowtherm J is conveyed to its point of use through above ground pipelines within OSP 3. All tanks, bunds, sumps and drains are on a rigorous preventative maintenance system and bunds are integrity tested on a three-year cycle. Should Dowtherm J be lost during transfer it will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Dowtherm J has not been historically stored in bulk in areas without secondary and tertiary containment.

Given the above design and operational mitigation measures and documented procedures on material use and storage, the risk of Dowtherm J entering soil and/or groundwater is considered very low and it is not considered a Relevant Hazardous Substance.

4.8 2,2,4-Trimethylpentane

2,2,4-Trimethylpentane is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground.

2,2,4-Trimethylpentane is no longer used or stored on site, however it was historically stored in single-skinned USTs in the former northern and southern tank farms. 2,2,4-Trimethylpentane is not analysed for in routine groundwater monitoring.

As 2,2,4-trimethylpentane has been historically stored without secondary containment it is considered a Relevant Hazardous Substance.

As 2,2,4-trimethylpentane is no longer stored on site, if it is not reported as detected (as a VOC TIC) in two consecutive biannual groundwater monitoring rounds then its removal from further sampling events should be agreed with the EPA.

4.9 Sodium Bromate

Sodium bromate is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground.

Sodium bromate is no longer stored on site however, it was historically stored in single-skinned USTs in the former northern and southern tank farms and bromate is not regularly analysed for during groundwater monitoring, so sodium bromate is considered a Relevant Hazardous Substance.

As sodium bromate is no longer stored on site and if it is not reported as detected (analysed as bromate in groundwater) in the two consecutive biannual groundwater monitoring rounds then its removal from further sampling events should be agreed with the EPA.

4.10 n-Hexane

n-Hexane is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. n-Hexane is stored in bulk in bunded ASTs in the tank farm. The n-hexane AST and bund have been designed to the appropriate engineering standards for solvent storage. Should bulk n-hexane primary and secondary containment fail, the tank farm area drains through the weak effluent system to the WWTP providing tertiary treatment. Bulk n-hexane is conveyed to its point of use through above ground pipelines.

All tanks, bunds, sumps and drains are on a rigorous preventative maintenance system and bunds are integrity tested on a three-year cycle. The solvent loading and unloading areas are located on impervious hardstanding which drains to the weak effluent system. In the event of a leak or spill during transport n-hexane will not be able to enter soil and groundwater. It will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Given the above design and operational mitigation measures and documented procedures on material use and storage, the risk of n-hexane entering soil and/or groundwater from contemporary sources is considered low. However, n-hexane was historically stored in pure and spent forms in single-skinned USTs in the northern and southern tank farms.

n-Hexane is not currently analysed for during biannual groundwater monitoring. As n-hexane is stored in bulk and has been historically stored without secondary containment it is considered a Relevant Hazardous Substance. n-Hexane will be added to future analytical suites (as a VOC TIC) for biannual groundwater monitoring.

4.11 Cyclohexane

Cyclohexane is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Cyclohexane is stored in pure and spent form in bulk and in drums. Bulk cyclohexane

is stored in bunded ASTs in the tank farm. The cyclohexane AST and bund have been designed to the appropriate engineering standards for solvent storage. Should bulk cyclohexane primary and secondary containment fail, the tank farm area drains through the weak effluent system to the WWTP providing tertiary containment. Bulk cyclohexane is conveyed to its point of use through above ground pipelines.

All tanks, bunds, sumps and drains are on a rigorous preventative maintenance system and bunds are integrity tested on a three-year cycle. The solvent loading and unloading areas are located on impervious hardstanding which drain to the weak effluent system to the WWTP. In the event of a leak or spill during transport, cyclohexane will not be able to enter soil or groundwater. It will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it will be contained and subsequently treated in the WWTP.

In addition, cyclohexane will also be stored in smaller quantities in drums located within the covered drum store. A loss from a drum would be of limited quantity and will drain to the weak effluent system. The drums are transported to its point of use by forklift. The forklifts travel over areas of hard standing only. In the event of a leak or spill during transport, cyclohexane will not be able to enter soil or groundwater. It will either enter the weak effluent system where it can be contained or the storm water drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Given the above design and operational mitigation measures and documented procedures on material use and storage, the risk of cyclohexane entering soil and/or groundwater from contemporary sources is considered low.

However, cyclohexane was historically stored in pure and spent forms in single-skinned USTs in the former northern and southern tank farms and is intermittently reported as detected during biannual groundwater monitoring as part of the extended alcohol and acetate suite. Therefore, cyclohexane is considered a Relevant Hazardous Substance.

4.12 Tetrahydrofuran (THF)

Tetrahydrofuran (THF) is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. THF is stored in pure and spent form in bulk and in drums. Bulk THF is stored in bunded ASTs in the tank farm. The THF AST and bund have been designed to the appropriate engineering standards for solvent storage. Should bulk THF primary and secondary containment fail, the tank farm area drains through the weak effluent system to the WWTP providing tertiary containment. Bulk THF is conveyed to its point of use through above ground pipelines.

All tanks, bunds, sumps and drains are on a rigorous preventative maintenance system and bunds are integrity tested on a three-year cycle. The solvent loading and unloading areas are located on impervious hardstanding which drains to the weak effluent system.

In addition, THF will also be stored in smaller quantities in drums located within the covered drum store. A loss from a drum would be of limited quantity and will drain to the weak effluent system. The drums are transported to its point of use by forklift. The forklifts travel over areas of hard standing only. In the event of a leak or spill during transport THF will not be able to enter soil or groundwater. It will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Given the above design and operational mitigation measures and documented procedures on material use and storage, the risk of THF entering soil and/or groundwater from contemporary sources is considered low.

However, THF was historically stored in pure and spent forms in single-skinned USTs in the former northern and southern tank farms. THF is currently analysed for during biannual groundwater monitoring as part of the extended alcohol and acetate suite, and is regularly reported as detected in groundwater. Therefore, THF is considered a Relevant Hazardous Substance.

4.13 Toluene

Toluene is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Toluene is stored in pure and spent form in bulk and in drums. Bulk toluene is stored in bunded ASTs in the tank farm. The toluene AST and bund have been designed to the appropriate engineering standards for solvent storage. Should bulk toluene primary and secondary containment fail, the tank farm area drains through the weak effluent system to the WWTP providing tertiary treatment. Bulk toluene is conveyed to its point of use through above ground pipelines.

All tanks, bunds, sumps and drains are on a rigorous preventative maintenance system and bunds are integrity tested on a three-year cycle. The solvent loading and unloading areas are located on impervious hardstanding which drains to the weak effluent system.

In addition, toluene will also be stored in smaller quantities in drums located within the covered drum store. A loss from a drum would be of limited quantity and will drain to the weak effluent system. The drums are transported to its point of use by forklift. The forklifts travel over areas of hard standing only. In the event of a leak or spill during transport toluene will not be able to enter soil or groundwater. It will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Given the above design and operational mitigation measures and documented procedures on material use and storage, the risk of toluene entering soil and/or groundwater from contemporary sources is considered low.

However, toluene was historically stored in pure and spent forms in single-skinned USTs in the former northern and southern tank farm. Toluene is currently analysed for during biannual groundwater monitoring as part of the standard VOC suite and is regularly reported as detected. Therefore, toluene is considered a Relevant Hazardous Substance.

4.14 Xylene

Xylene is a liquid at room temperature and has the potential to impact soil and/or groundwater if lost to ground. Xylene is stored in pure and spent form in bulk and in drums. Bulk xylene is stored in bunded ASTs in the tank farm. The xylene AST and bund have been designed to the appropriate engineering standards for solvent storage. Should bulk xylene primary and secondary containment fail, the tank farm area drains through the weak effluent system to the WWTP providing tertiary treatment. Bulk xylene is conveyed to its point of use through above ground pipelines.

All tanks, bunds, sumps and drains are on a rigorous preventative maintenance system and bunds are integrity tested on a three-year cycle. The solvent loading and unloading areas are located on impervious hardstanding which drains to the weak effluent system.

In addition, xylene is also be stored in smaller quantities in drums located within the covered drum store. A loss from a drum would be of limited quantity and will drain to the weak effluent system. The drums are transported to its point of use by forklift. The forklifts travel over areas of hard standing only. In the event of a leak or spill during transport xylene will not be able to enter soil or groundwater. It will either enter the weak effluent system where it can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) of the storm water drainage system where it would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where it would be contained. The material can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Given the above design and operational mitigation measures and documented procedures on material use and storage, the risk of xylene entering soil and/or groundwater from contemporary sources is considered low.

However, xylene was historically stored in pure and spent forms in single-skinned USTs in the former northern and southern tank farms. Xylene is currently analysed for during biannual groundwater monitoring as part of the standard VOC suite and reported as detected regularly. Due to historic losses, most notably in 1998 from these former USTs, xylene is considered a Relevant Hazardous Substance.

4.15 Products and Intermediaries

Several substances that might be considered hazardous to the environment are produced on site. These substances and their intermediaries are processed and handled using highly controlled procedures and processes due to the value of the substances.

These substances are not stored in bulk, but rather in drums of up to approximately 200 L capacity. They are produced in the OSP buildings. In the event of a spill within the OSP buildings, liquids would drain through the weak effluent system to in the WWTP. Drums may also be stored within the covered drum store. A loss from a drum would be of limited quantity and will drain to the weak effluent system.

Due to highly controlled processes and procedures and the storage methods used on site, the likelihood of products and intermediaries entering soil and/or groundwater is considered very low and products and intermediary substances have been screened out as a Relevant Hazardous Substance.

4.16 Utility and Maintenance Chemicals

Shell Diala Bg, Spectrus NX1101, Spectrus OX1203, Dianodic DN2301, Esso Zerice 100 and Esso Zerice 68 are lubricants, insulating oils, corrosion inhibitors or biocides considered together as utility and maintenance chemicals. These are not stored in bulk. They are stored in small quantities, typically 200 L drums or less and are stored in bunds close to their point of use or in the oil store. A loss from a drum would be of limited quantity and would drain to the weak effluent system. The drums are transported to their point of use by forklift. The forklifts travel over areas of hard standing only.

In the event of a leak or spill during transport these chemicals will not be able to enter soil or groundwater. They will enter the weak effluent system where they can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where they would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where they would be contained. These materials can then be managed by off-site treatment or treatment in the WWTP if deemed suitable for treatment in the WWTP.

Due to the small storage quantities and engineered containment systems, the risk of these utility and maintenance chemicals entering soil and/or groundwater is considered very low and they have been screened out as Relevant Hazardous Substances.

4.17 Non-bulk Storage Materials

Several potential hazardous substances are currently stored on site in smaller containers. These are:

- 1,2 Dimethoxyethane;
- 1,8-Diazabicyclo[5.4.0]undec-7-ene;
- Ammonium hydroxide;
- Chloroacetyl chloride;
- Cyclohexylmagnesium chloride in THF;
- Cyclopentylamine;
- Dimethyl aniline;
- Dimethylformamide;

- Hydroxylamine solution;
- Isopropylmagnesium chloride in THF;
- Lithium Hexamethyldisilazide (20% in THF);
- Methyl iodide;
- Methyl(5R)-3-cyano-5-methyloctanoate;
- n-Heptane;
- n-Methyl pyrrolidone;
- Sodium hypochlorite;
- Tert-butylmagnesium chloride in THF; and
- Triethylsilane.

These substances are all liquids at room temperature and have the potential to impact soil and/or groundwater if lost to ground. These substances are stored in small quantities in drums, or cylinders located within the covered drum store. The containers are transported to their point of use by forklift. The forklifts travel over areas of hard standing only. In the event of a leak or spill during transport these substances will not be able to enter soil or groundwater. They will either enter the weak effluent system where they can be contained / treated in the WWTP (if deemed suitable for treatment in the WWTP) or the storm water drainage system where they would be reported as detected by the continuous pH and/or TOC meter and be diverted to the storm water retention pond where they will be contained and subsequently treated in the WWTP.

Due to the small size of the containers used and the provision of engineered containment systems, the risk of these substances entering soil and/or groundwater is considered very low and they all have been screened out as Relevant Hazardous Substances.

In addition, bromine and formaldehyde were historically stored on site in small containers. These substances have similar physical properties to current non-bulk hazardous materials and were stored and transported in a similar manner.

Due to the small size of the containers used and the provision of engineered containment systems, the risk of these historic substances having entered soil and/or groundwater is considered very low and they have been screened out as Relevant Hazardous Substances.

5. Site History (Stage 4)

5.1 Site Development

The parcel of land which includes the current Pfizer Ringaskiddy facility was a greenfield site until 1969, when construction work on the Pfizer Ringaskiddy citric acid plant began to the west of the current pharmaceutical plant. Pfizer Ringaskiddy began citric acid production at the site in 1971 (the citric acid plant was later sold to Archer Daniels Midlands (ADM) in 1990 and continued operating until 2005).

Pharmaceutical production at Ringaskiddy commenced in 1972 in OSP1. Since then, there has been on-going development of the plant, with the construction of new buildings and expansion of existing buildings, up-grading of facilities and addition of new facilities. Three major expansion projects, completed in 1984 (OSP2), 1994 (OSP3), and 2001 (OSP4), added significantly to pharmaceutical production capacity at the site.

Towards the end of 2007, Pfizer Ringaskiddy ceased manufacturing activities in OSP2, as part of a business rationalisation plan to eliminate excess production capacity. The physical building infrastructure has been retained and a section of it has been refurbished as the New Product Technology Laboratory (NPTL), which was officially opened in May 2014.

The former ADM facility was located immediately to the west of the Pfizer Ringaskiddy plant and was acquired, decommissioned and dismantled by Corrin MDA in 2006-2007. The IPPC licence for the ADM site (P0053-01, which was held by Corrin MDA) was surrendered in September 2007, following completion of the site decommissioning and a successful exit audit carried out by the EPA.

Pfizer (Pfizer Biotechnology Ireland, PBI) subsequently acquired the property and constructed a small-scale biologics facility in the previously-undeveloped western portion of the former ADM facility. The PBI facility was separate from the pre-existing site and operated under a separate IEL, P0864-01. In 2011, the PBI facility was sold to BioMarin Manufacturing Ireland, now known as BioMarin International Limited, and underwent significant expansion in 2016/17.

5.2 Historic Incidents

Previous reports consulted, and communications with site personnel, indicate that there are three historic incidents of potential environmental concern on site:

- Former Northern and Southern UST Farms;
- Monkstown Creek Reclamation; and,
- Weak Effluent Leak.

5.2.1 Northern and Southern Underground Storage Tank Farms

Losses of organic solvents to ground have been reported to have occurred historically at the site in the former northern and southern UST farm areas (pre-2000). These historical leaks form the primary source area.

The process of replacing the USTs with bunded ASTs began in 1996. In total sixteen new ASTs and associated infrastructure were installed between 1996 and 1998. (D&M, 1998 letter 17717z043z1998 Report).

In early 1998 a mixture of solvents and aqueous wastes leaked from UST FA432 and in October 1998 a mixture of methanol and xylene was lost following overfilling at UST FA445.

The first three USTs were removed from the northern tank farm in November 1998, impacted soil and fill from around the tanks were excavated and treated on-site using ex-situ remediation.

Recovery wells were installed in the UST farm area in response to the 1998 losses. Pumping from the limestone aquifer continued in recovery well R6 using a total fluid pump until September 1999,

following which wells R2, R5 and R6 were abandoned in advance of excavation of the southern UST farm area.

The six multi compartment USTs in the southern UST farm were removed in 1999. The final three USTs in the northern tank farm were removed in 2000.

A series of recovery wells (RC1 to RC6) were installed in the former southern UST farm area during July 2000. The locations of these historic wells are shown in Appendix A Figure 3. Dissolved phase solvent recovery commenced using two total fluids pumps during August 2000. Groundwater abstraction from the RC-wells on-site ceased in May 2005 and the wells were decommissioned in August 2007.

5.2.2 Monkstown Creek Reclamation

Benzene and THF have been reported as detected in groundwater wells installed in the north-eastern part of the site. The wells were installed in fill material used to reclaim part of Monkstown Creek. The fill material was impacted prior to placement and does not indicate a loss of hazardous materials in the north-eastern part of the site. This area of fill acts as a secondary source of impact on site.

5.2.3 Weak Effluent Leak

Prior to significant inspection and upgrade works, which started in 1995 the weak effluent system was known as an on-going source of impact. A regular three-yearly inspection schedule was implemented to prevent further impact, (D&M, 1998 report 17717-018-41). In 2015, leaks were identified in two weak effluent manholes CS116 and CS124 located in the primary source area during routine testing. Repairs to the manholes were completed in February 2016, with both manholes passing EN1610 pressure testing.

5.3 Historic Site Investigations

5.3.1 1993 – 1994 Ove Arup and Dames & Moore Site Investigation

The OVE Arup, and D&M 1993 and 1994 site investigations were summarised in the 2006 URS CWQRA report. An initial nine groundwater wells (wells 1-9) were installed in the drift overburden by OVE Arup in 1993. Results of groundwater sampling and analysis from well 4, located east of OSP1, identified dissolved phase VOCs in the groundwater.

D&M conducted further site investigations in 1994. A soil gas survey was completed to identify locations of VOC vapours in the shallow unsaturated zone from what were considered to be potential source areas of the dissolved phase impact identified in well 4. These potential source areas included the solvent recovery area, the northern and southern UST farms and OSP1. Results of the soil vapour survey were used to refine the locations of a number of narrow diameter soil sampling boreholes.

Soil samples were obtained from a maximum depth of 4.0 m. Analytical results of the soil samples taken identified concentrations of many VOCs. The suite of compounds reported as detected was dominated by BTEX[7] hydrocarbons and cyclohexane, which have low solubilities, and alcohols, which are miscible.

Well 4 was re-sampled and the presence of dissolved phase impact was confirmed. Expansion of the groundwater monitoring network was recommended, together with preliminary testing of aquifer parameters and tidal response.

5.3.2 1994 Dames & Moore Investigation

The above recommendations were carried out by D&M in 1994 (D&M report 17717-015-401). Eleven 200-series groundwater monitoring wells were installed across the site, installed into the shallow drift and deeper limestone gravel (broken limestone bedrock). Pumping tests were conducted and hydraulic aquifer parameters were estimated for both the drift and underlying fractured limestone. Impacted soils in the UST farm area were identified as a significant source, as at this location the

[7] BTEX: benzene, toluene, ethyl benzene and xylenes.

limestone aquifer is unconfined and there is no barrier to migration of impacts down into the limestone aquifer. It was found that groundwater from within the fractured limestone aquifer was more impacted than that within the drift. The analytical results inferred the presence of Light Non-Aqueous Phase Liquids (LNAPL), i.e. a floating layer of organic solvents, on the water table within the limestone.

The direction of groundwater flow within limestone was identified as being toward the east. It was expected to enter the harbour beneath the ADM jetty. As the drift deposits became thicker to the east no monitoring wells were installed into the limestone, therefore the extent of impact within the limestone aquifer to the east was not identified. It was recommended that the network of groundwater monitoring wells be extended to the east.

5.3.3 1995 Dames & Moore Investigation

In 1995, eight additional groundwater-monitoring wells (400-series) were installed, primarily in limestone and primarily in the east of the site. The objectives of the investigation were to determine shallow geology and groundwater flow regime in the eastern section of the site, to evaluate the limestone aquifer rock properties and to assess the magnitude and extent of groundwater impact in the shallow bedrock aquifer (D&M report 17717-018-401).

Two of the boreholes were cored and selected cores were laboratory tested for porosity, hydraulic permeability, dry bulk density and fraction of organic carbon.

It was found that the groundwater flow direction became more northerly below the former storm water retention pond (current drum storage area). It was also found that an upward hydraulic gradient from the limestone to the drift was present in the east of the site. The lower contaminant concentrations reported as detected in the 400-series wells confirmed in-situ degradation to be an effective process of attenuation.

It was recommended that hydraulic containment be adopted to prevent dissolved phase plume migration off-site. Following completion of these three separate phases of site investigation and characterisation, abstraction wells C1 – C3 were drilled and the hydraulic containment system was commissioned in February 1996.

5.3.4 1996 Dames & Moore Methanol Investigation

During the June 1996 groundwater monitoring round, methanol concentrations were noted down-gradient of the known UST farm source area. In addition, well 4 located in the source area was found to be unusable due to collapse of the standpipe.

Well 501 was installed as a direct replacement for well 4. Well 502 was installed immediately down-gradient of OSP1 to assesses if the area has been affected by the loss of solvent on the production area.

A groundwater sampling round conducted in August 1996 at wells 204, 205, 208, 404, C1 and C2 returned relatively low methanol concentrations in all sampled wells except well 204 located down-gradient of the UST source area. The report (D&M, report 17717-028-447) concluded that the concentrations reported as detected in June 1996 were most likely due to laboratory error.

5.3.5 1998 Dames & Moore OSP4 Soil Investigation

In February 1998, D&M excavated sixteen trial pits in the OSP4 area. Samples were screened using a handheld photoionisation detector (PID). A total of thirteen soil samples were collected including one duplicate.

D&M reported (report 17717\040) that the site is underlain by a variable thickness of filled material consisting of reworked soils containing scrap metal, cabling, plastic, bricks and tarmac materials. All field headspace testing returned a result of zero. Laboratory results indicated that the fill did not contain concentrations of VOCs, alcohols, pesticides, polychlorinated biphenyl (PCBs), total petroleum hydrocarbons (TPHs), metals or other inorganics.

5.3.6 1998 Dames & Moore OSP4 Groundwater Investigation

In February 1998 boreholes 701 to 704 were installed near OSP4. Borehole 702 was redrilled as groundwater was not encountered at the original location. The majority of the OPS4 area was found to be underlain with grey crystalline limestone with grey and brown shale noted under the southern section of the area.

Groundwater was found to flow in a northern to north-easterly direction towards Cork Harbour. No production-related VOCs, alcohols or metals were recorded in groundwater samples taken in March 1998.

5.3.7 1998 Dames & Moore 1998 Groundwater Programme

The 1998 groundwater report (D&M report 17717\043\1998 Report) states that remediation works were carried out in 1998 during which the first three tanks in the northern UST farm were removed. Surrounding made ground and fill was excavated and remediated on site by ex-situ bioremediation.

5.3.8 1998 Dames & Moore Remedial Investigation Product Recovery

In 1998, Pfizer reported a loss of aqueous waste and solvent waste from UST FA432 in the southern UST farm to D&M. The conclusions of the subsequent investigation were reported in D&M letter report 17717\042\EPA Report.

URS drilled a series of shallow holes (801 – 807) around the USTs. Six product recovery wells (R1 – R6) were drilled. A total fluids product recovery system was installed in wells R2 and R3. Free-product was removed to an interceptor before the remaining groundwater was pumped to the WWTP. Collected product was stored in an existing on-site UST prior to disposal off-site.

The report states that unlike in the northern UST farm, where a clay/silt layer was observed beneath the tanks, the southern UST farm tanks rested directly on the limestone bedrock or on a thin bed of fill above the bedrock.

Increasing VOC concentrations between June and December 1997 indicated that a gradual release prior to a sudden failure in 1998 resulted in the release of the solvent mixture. The presence of xylene, which was not contained within the failed tank was reported as being from another nearby tank which had been overfilled.

The report concluded that losses of solvent infiltrated the limestone bedrock though a complicated, steeply-inclined fracture network. Only limited lateral migration of miscible and dissolved phase immiscible solvents were noted. Free-phase product appears to have been trapped in the source area by the hydraulic transition from unconfined to confined conditions in the limestone aquifer.

5.3.9 2000 Dames & Moore Investigation

Between May 2000 and September 2000 following the removal of the remaining USTs, a series of recovery wells (RC1 to RC6) were installed in the former southern UST farm area. Rock coring at all six locations allowed detailed mapping of the bedrock fracture network beneath the former UST farm. Dissolved phase solvent recovery commenced using two total fluids pumps during August 2000. Two bedrock monitoring wells (601 and 602) were installed in the tank farm area in May 2000. Well 601 was screened deeper (total depth of 16 m bgl) within the limestone aquifer than the other wells in this area to assess deeper groundwater quality beneath the former southern UST farm (between recovery wells RC1 and RC6, which had the highest dissolved phase contaminant concentrations of the RC wells). Monitoring well 602 was installed within the area where the two eastern-most USTs in the northern UST tank farm had been situated.

5.3.10 2004 URS OSP1 Soil Stockpile Sampling

In February 2004, URS retrieved six composite samples from a stockpile of excavated material. The material was excavated to allow installation of a new lift shaft in OSP1. The purpose of the investigation was to assess if soils excavated during the works required specialist disposal. Samples were analysed for VOCs, SVOCS, PAHs, heavy metals and pH. URS concluded (letter report 17717-

153/Soil Sampling February 2004) that VOCs, SVOCs, metals and PAHs were not reported as detected at levels considered to be of environmental concern.

5.3.11 2004 URS Storm Water Pipe Soil Stockpile Sampling

In March 2004, Pfizer noted water entering the firewater retention pond. As storm water was not being diverted to the retention pond at this time it was suspected that groundwater was entering the pipe. The soil surrounding the pipe was excavated to allow repair works to take place. The pipe was found to be below groundwater level. The area was dewatered to allow access to the pipe. URS took one sample from the base of the excavation and a composite sample from the stockpile of excavated material. Samples were analysed for VOCs, SVOCS and heavy metals. URS concluded (letter report 17717-153-447/Soil Sampling March 2004) that VOCs, SVOCs and metals were not reported as detected at levels considered to be of environmental concern.

5.3.12 2004 URS Boiler House Soil Sampling

In March 2004, Pfizer retrieved four soil samples prior to the expansion of the boiler house. The purpose of the investigation was to assess if soils excavated during planned construction works required specialist disposal. Samples were analysed for VOCs and Diesel Range Organics (DRO). Pfizer asked URS to assess the results of the soil sampling. URS concluded (letter report 17717-447/Soil Sampling March 2004) that VOCs and DRO were not reported as detected at levels considered to be of environmental concern.

5.3.13 2004 URS WWTP Soil and Groundwater Sampling

In April 2004, when pumping water from the firewater retention pond to the WWTP a blockage occurred in the pipe causing water and sludge to escape through a manhole and enter a recently opened soil excavation.

URS took a soil sample from the soil excavation. Groundwater samples were retrieved from nearby wells C2, 210 and 407. Laboratory results presented in URS letter report 17717-153-447/WWTP did not indicate any immediate adverse effects on groundwater or soil quality as a result of the overflow.

5.3.14 2006 URS Decommissioning of RC Series Wells

In 2006, Pfizer Ringaskiddy requested that URS review the potential impact of decommissioning the six RC-series wells and well 602 prior to construction works taking place in the area. All seven wells were located within the footprint of the former southern UST tank farm. Mass recovery in the RC wells had decreased over time from up to 2,132 kg of solvent between November 2000 and May 2001 to 0.3 kg between November 2003 and May 2004. Pumping ceased in May 2006 with EPA approval. URS concluded that, as containment wells C1 and C2 will continue to operate, hydraulic containment provided by these wells will continue to prevent off-site migration of impacted groundwater from the site.

6. Environmental Setting (Stage 5)

6.1 Site Setting and Topography

The Pfizer Ringaskiddy landholding comprises approximately 21 hectares on the southern shore of Monkstown Creek in Cork Harbour, approximately 11 km south-east of Cork City, see Appendix A Figure 1.

The site has a relatively steep topographic gradient, with ground on the western portion of the site (OSP1) at approximately 15 metres above Ordnance Datum (m OD) sloping towards Monkstown Creek (<5 m OD) and the greater Cork Harbour area (~400 – 500 m away) to the north and east.

Land use in the vicinity of the site is a mix of industrial and agricultural, as summarised below:

- North and East – Monkstown Creek (an inlet of Cork Harbour and a proposed national heritage area (pNHA)) and the greater Cork Harbour area (a designated special protection area (SPA)) are located north and east of the site. Ringaskiddy Port and Deep Water Terminal borders the site to the east, with Ringaskiddy village some 800 m south-east of the site.
- South – The N28 national primary road runs east-west along the southern site boundary. IDA-owned land, currently in agricultural use, is present to the south of the N28, with Janssen Biologics (formerly Centocor) located 470 m to the south of Pfizer OSP4 building and with the Novartis (former Sandoz) Ringaskiddy Limited active pharmaceutical ingredient facility 750 m to the south.
- West – BioMarin International Limited, with the Raffeen Creek Sports Club lands (owned by Pfizer) further to the west. Shanbally village is located 750 m west of the site boundary.

6.2 Hydrology

The site is located in the Owenboy[Cork] sub catchment (Water Framework Directive (WFD) sub-catchment code Owenboy[Cork]_SC_010) which forms part of the Lee, Cork Harbour and Youghal Bay Hydrometric Area (HA09) [8].

The site is bounded to the north and east by an estuary known as Monkstown Creek, which is a tidal inlet located on the western side of Cork Harbour. Coastal and estuarine water quality in Cork Harbour (code IE_SW_060_0000) is classified as 'Good' by the EPA. The risk status of the Cork Harbour Waterbody of not maintaining 'Good' status is currently under review[9].

AECOM reviewed the OPW (Office of Public Works) flood mapping system for a record of previous flooding events on the site. The flood map for the area indicates that there have been no flood events recorded on the site.

6.3 Geology

Geological Survey of Ireland (GSI) data[10] indicate that the bedrock geology underlying the site consists of Waulsortian Limestone. This massive, fine grained, unbedded limestone is Carboniferous in age. Two fault lines traverse the site, the first runs almost parallel with the site's southern boundary and the second, in the eastern section of the site, runs in a north to south orientation.

Older Carboniferous marine interbedded grey/brown sandstone, siltstone and mudstones, referred to as the Cuskinny Formation of the Kinsale Group (Lower Carboniferous age), occur to the south of the southern fault.

According to the GSI, subsoil consists of made ground across the majority of the site, with bedrock outcropping in places. Previous AECOM field studies have identified two separate geological units

[8] www.epa.ie – accessed 24 July 2019
[9] www.epa.ie – accessed 24 July 2019
[10] www.gsi.ie – accessed 10 June 2019

beneath the site, which include relatively low permeability subsoil deposits (comprising of soft, grey to greenish brown silts, with some fine sand and gravel) overlying Carboniferous Limestone bedrock.

Subsoil thickness varies considerably across the site, with a thickness east of OSP1 of 4.3 m and increasing to 11.8 m north of the wastewater treatment plant. These silty subsoils thicken in an inferred infilled glacial channel (roughly co-incident with the mapped north-south fault line), in the area north of the nature pond. Eastward from this point the subsoils decrease in thickness again until limestone bedrock outcrops at points along the site's eastern boundary.

Pale grey to bluish grey, fine grained, crystalline limestone, often weathered to varying depths, lies beneath the subsoils. This fractured rock is considered to have a relatively high hydraulic conductivity. Geological logging of the bedrock (D&M, 1995 report 17717-018-401/MF/pl) indicated the limestone aquifer is complex, with a characteristic upper-weathered zone, the lower horizons of which are brecciated or fractured to the point of being gravelly in nature, and with three distinct joint orientations (one vertical). The bedrock porosity was found to be between 1% and 3%, with weathered bedrock porosity estimated to be an average value of 15% (estimations due to variability of weathered limestone). Caves and karstic voids are reported in the limestone bedrock on or in the vicinity of the site.

Depths to the top of competent (i.e. intact) bedrock range between <3.3 m (east of the containment wells) and 16.7 m bgl (north of the containment wells).

6.4 Hydrogeology

According to the GSI website, the bedrock aquifer beneath the site is classified as a "Locally important aquifer – Karstified (Lk)". Due to the fractured nature of bedrock beneath the site identified in previous investigations, the aquifer is considered to be relatively productive in this area. The GSI's classification of vulnerability of the underlying aquifer is "High" to "Extreme" vulnerability, with bedrock locally exposed at the surface.

Hydrogeological conditions at the site (groundwater flow direction, dilution and degradation of contaminants) have been examined in several investigations since 1993.

General depths to groundwater range from about 1 m to 11 m below casing top (m bct) across the site.

Ultimately, groundwater in the limestone is interpreted to flow in an easterly direction under normal groundwater conditions (natural gradient). However, when this flow reaches the infilled glacial channel in the eastern portion of the site, it swings northward to discharge to Monkstown Creek on the site's northern boundary.

A hydraulic containment system has been in operation since February 1996, comprising two active abstraction wells, C1 and C2. This system alters natural gradient conditions and hydraulically contains groundwater within an area north of the nature pond (see Appendix A Figure 4) and is designed to prevent groundwater with low concentrations of VOCs from reaching the northern site boundary.

In previous site investigations in the mid- to late-1990s, an upward hydraulic gradient was identified between the subsoil and bedrock aquifers, suggesting groundwater confined in the bedrock aquifer was being forced up into the subsoils above.

The groundwater contour map for the overburden aquifer in May 2019 is illustrated in Appendix A Figure 5 and is typical of previous contour maps for the overburden aquifer.

6.4.1 Wells and Springs

A search of the GSI well database identified four wells within 1000 m of the site.

Wells C1, C2 and C3 are the three site abstraction wells but are incorrectly recorded in the GSI database as being located approximately 100 m to the west of the site (GSI well references: 1705NWW078, 1705NWW077 and 1705NWW079). These wells are recorded as being drilled in 1995 and between 23 m and 25 m in total depth.

A fourth well is noted in the database at a distance of 0.9 km west of the site, well reference 1705NWW014. It was reportedly drilled to a depth of 49.7 m for industrial use, the yield was reported as being excellent, 1374.7 m^3/d. This well is one of network of six water supply wells installed by Pfizer on lands it owned to the west of the Raffeen Creek Golf Course prior to 1976. The well network (increased to twenty-three wells by later expansions further to the north and west) was used for the site water supply prior to the provision of a greatly enlarged public mains water supply in the late 1970s/early 1980s. These wells are all redundant and no surface trace of well 1705NWW014 remains.

No springs are recorded in the GSI well database within 1 km of the site. A spring, marked as 'foreshore spring', is noted in historic groundwater reports (see Figure 3).

There are no drinking water supply source protection areas mapped within a 5 km radius of the site.

6.5 Biodiversity

Special Areas of Conservation (SAC) are habitats and species which must be protected under the Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna).

Special Protection Areas (SPA) are designated under the Birds Directive (Council Directive 2009/147/EC on the Conservation of Wild Birds) to protect a range of bird populations.

Together, SAC and SPA form a pan-European network of so-called *European sites* for nature conservation (also known as Natura 2000 sites).

One European site has been identified down-gradient of the site[11]: Cork Harbour SPA (code 004030)

Monkstown Creek has also been classed as a proposed Natural Heritage Area (pHNA, 001979).

6.6 Site Drainage Systems

6.6.1 Storm Water Runoff Drainage Systems

An extensive storm water drainage network currently serves the entire site and conveys rainwater run-off by gravity from all areas of the site to a single monitored location (Storm Water Outfall) prior to discharge into the Monkstown Creek which is located directly to the north of the site.

At the Storm Water Outfall surface water is continuously monitored for pH and TOC. There is an up-stream and down-stream chamber with pH and TOC continuously monitored in both. In the event of a spill from into the storm water system, the storm water drainage system will be diverted using an automated diversion valve to the firewater containment pond. Water in the firewater containment pond may then be transferred to the WWTP for treatment, if suitable, or be removed for off-site disposal.

6.6.2 Weak Effluent System

The weak effluent drainage network drains water collected in floor sumps located within the internal production areas, the external production services area, the drum pad, the AST farm and loading/unloading areas. The weak effluent lines are located underground and convey liquids to the WWTP equalisation tanks. All underground lines are integrity tested on a rolling three-year cycle as required by the site's IEL.

6.6.3 Strong Effluent Line

Strong effluent lines, consisting of waste streams from manufacturing convey effluent to a holding tank in the WWTP system. Strong effluent lines are all located above ground level. A loss of effluent from the strong effluent line would result in escaped substances entering the weak effluent system, where they would be contained within the WWTP system or the storm water system, where they would be contained in the storm water retention pond. Escaped strong effluent stored in the storm

[11] https://gis.epa.ie/EPAMaps/ - Accessed 24 July 2019

water retention pond would be transferred to the WWTP for treatment or sent for off-site disposal. In the WWTP, weak effluent in the equalisation tank is mixed with strong effluent which is transferred at a controlled rate from the strong effluent holding tank depending on the loading.

6.7 Storage and Containment

Bulk chemicals are stored at the site in a series of bulk ASTs located in the tank farm area. All relevant tanks are locally bunded with a minimum retention capacity of 110% of the largest tanks. Bunds are tested over a three-year cycle in accordance with Condition 6.9 of the site's IE licence and are inspected regularly as part of the site's preventative maintenance program.

Drummed materials, including raw materials and waste, are stored in the covered drum pad. The drum pad includes two dedicated loading areas which drain to the weak effluent system in the event of a spill. The former drum storage yard, located west of the NPTL, acted as the main storage yard until 1984. Drum storage areas, OSP buildings, the AST farm and production areas all drain to the weak effluent system.

6.8 Loading and Unloading Areas

Chemicals, solvents and oil are delivered to site on a daily basis. Loading and unloading of any substances dangerous to the environment takes place in designated contained areas. In the event of a loss from primary containment during loading and unloading, the material will drain to the weak effluent system and drain to the WWTP. Where possible, the materials will be treated in the WWTP. Unsuitable substances will be removed and treated by off-site incineration.

In the event of a loss of a hazardous substance on-site prior to arrival at the loading point the substance will be contained on hardstanding and enter the site's main stormwater drainage system. The automated diversion valve will be triggered by the continuous monitoring system or by alarm. The impacted material in the drainage system will be diverted to the firewater retention pond providing remote secondary containment.

6.9 Permitted Activities

The site is licensed for Classes 5.16, 11.2 (E), 11.4(a)(i) and 11.6 of listed activities in the First Schedule of the EPA Act 1992 (as amended) defined as requiring an IE Licence:

> *5.16 The production of pharmaceutical products including intermediates (production means the production on an industrial scale by chemical or biological processing)*
>
> *11.2 (e) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving solvent reclamation or regeneration*
>
> *11.4 (a)(i) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the following activities: biological treatment*
>
> *11.6 Temporary storage of hazardous waste, (other than waste referred to in paragraph 11.5) pending any of the activities referred to in paragraph 11.2, I I .3, 11.5 or 1 I. 7 with a total capacity exceeding 50 tonnes, other than temporary storage, pending collection, on the site where the waste is generated*

7. Site Characterisation (Stage 6)

Potential pollutant linkages are considered viable where there is a source of impact on site which can migrate via a defined pathway to identified receptors. Receptors can be either environmental or human, and located either within or outside the site boundary.

7.1 Sources

Since 1993, the main impacted source area identified during site investigations was located in the former southern UST farm, north of OSP1.

Other source zones (of smaller extent) were identified in areas to the north and north-west of the containment wells (see Appendix A Figure 2). The controlled water quantitative risk assessment (AECOM, 2016) concluded that, in the event of containment wells C1 and C2 being turned off, impacted groundwater from the identified source areas would not pose a significant risk to Monkstown Creek.

Historically, VOCs have been reported as detected in groundwater from the site, most notably: BTEX hydrocarbons, alcohols and THF. Alcohol detections are intermittent, while BTEX and THF tend to persist, though with long-term declining concentration trends being apparent.

7.2 Pathways

As noted in Section 5.2, there is one area of impact and one lesser area of impact on site associated with historic activities.

Potential pathways to human receptors include ingestion of soils or groundwater, dermal contact with impacted soils and water or inhalation of indoor or outdoor vapours from residual impact in the subsurface.

Potential pathways to controlled waters would be through lateral migration from the source areas through the weathered upper portion of the limestone bedrock. Given that the UST's previously located within the former southern UST tank farm rested directly on the limestone bedrock, it is considered that historic leaks from USTs would not be restricted by the silt/clay overburden found in the northern UST tank farm.

The hydraulic containment system was installed in 1996 (wells C1 and C2) to contain impacted groundwater on site and reduce the mass of dissolved phase VOCs migrating off-site to Cork Harbour. To this end, groundwater is abstracted from wells C1 and C2 on a continuous basis. The mass of solvent recovered through operation of the hydraulic containment system is estimated from pumping rates and analytical data from biannual monitoring. Assessment of containment system efficiency and the need for rehabilitation works is incorporated in biannual monitoring reports.

Since the hydraulic containment system was commissioned, dissolved phase VOC and THF concentrations have reduced further.

A review of remedial options for the site was conducted in 2014 and 2015 (AECOM 2015 report 47092735/CKRP0001). It was concluded that the benefits of any scheme, over and above the mass recovery obtained with the current hydraulic containment system, are likely to be limited in nature due to the difficulties in effectively targeting any treatment within the source zone and given the uncertainty of contaminant mass distribution within the complex limestone bedrock aquifer and/or the silty-sandy gravel drift unit directly overlying it. Practicality issues, particularly relating to access in the ATEX-rated operational solvent recovery and solvent tank farm areas, together with health and safety requirements, are likely to limit the effectiveness of the design of any scheme for enhancing mass recovery from the source area. The benefits of any of the options assessed are considered likely to be outweighed by low sustainability.

7.3 Receptors

Given the site's coastal setting and the fact that groundwater in this area is likely to be brackish, it is unlikely that wells for potable use are/will be located in the vicinity of the site, the main potential receptor of contaminants to ground at the site is identified as Monkstown Creek, which is in direct hydraulic continuity with groundwater from the site. The weathered upper portion of the limestone bedrock is considered to represent the most sensitive pathway. Monkstown Creek is considered the only potential controlled waters receptor for the site.

The mass of dissolved contaminants in groundwater migrating laterally through the bedrock aquifer from the source area towards Monkstown Creek is considered low. Two hydraulic containment wells capture groundwater with dissolved contamination. In addition, dissolved phase organic contaminants are being significantly attenuated along the groundwater flow path (through sorption, in-situ degradation, dilution and dispersion).

Human health receptors are on-site and off-site workers and, in particular, workers undertaking subsurface works. The potential for ingestion of impacted soil/dust and groundwater is low. The former northern and southern UST farms, key source areas for impacted soil and groundwater, were removed in 1998 and 1999 (along with associated impacted soils, which were bio-remediated on site), respectively, reducing contaminant concentrations in groundwater. On-site personnel do not have routine contact with either soil or groundwater. Similarly, the potential for dermal contact with impacted soil/dust and groundwater is low, for the reasons outlined above.

The potential for indoor inhalation of contaminant vapours on site is low, as the nearest occupied building in the vicinity of the source area is up-topographical and hydraulic gradient (OSP1). Outdoor inhalation of volatile compounds emanating from impacted soil and groundwater is also considered low, as impacted soil and groundwater in the source areas have been remediated to an acceptable level with regard to exposure to human health via vapour inhalation.

The potential for indoor/outdoor inhalation of contaminant vapours by workers on off-site properties is considered negligible, as there are no occupied properties down-gradient of the site and impacted groundwater is either captured by the containment wells or discharges to Monkstown Creek from the site.

There is a potential for on-site workers to be exposed to low level impact in the source area of the site if redevelopment requiring excavation is undertaken. However, if such works were to be undertaken, then project-specific additional health and safety procedures would be put in place to protect site workers (e.g. permit system, air monitoring with action levels, PPE, etc.).

7.4 Potential Pollutant Linkages

A summary of potential Source-Pathway-Receptor (SPR) linkages is outlined in the table below.

Potential SPR Linkages

Sources	Pathways	Potential Receptors
S1 Residual impact remaining beneath the former southern underground storage tank (UST) farm area – BTEX, alcohols and THF **S2** Residual impact remaining below ground in the area north of the containment wells – BTEX, THF and cyclohexane	**Human Health** **P1** Ingestion of soil/dust, groundwater and/or surface water **P2** Dermal contact with soil/ dust, groundwater and/or surface water **P3** Inhalation of indoor and outdoor contaminant vapours which can arise directly from residual contaminants in the unsaturated overburden itself and indirectly via the dissolved phase in groundwater	**Human Health** **S1** On-site workers **S2** Off-site workers **S3** Workers on-site undertaking subsurface works

Potential SPR Linkages

Sources	Pathways	Potential Receptors
S3 Residual impact remaining below ground in the area north-west of the containment wells –MTBE	**Controlled Waters** **P4** Lateral migration of contaminants through the bedrock aquifer	**Controlled Waters** **S4** Monkstown Creek (pNHA 001979) **S5** Cork Harbour (SPA 004030)

8. Site Investigation (Stage 7)

8.1 Groundwater Investigation

8.1.1 Introduction

Biannual groundwater monitoring is conducted from a series of seven wells located across the site, most recently in May 2019 (AECOM 2019, PR-412276_ACM_RP_EN_001).

The wells sampled as part of the biannual round are: 7, 205, 404, 409, 501, 702 and C1.

Groundwater trends relating to relevant hazardous substances are discussed below.

8.1.2 Relevant Hazardous Substances Long Term Trends

Groundwater monitoring data is available for the site dating back over twenty years (to 1994/5). Historically, VOCs have been reported as detected in groundwater from the site. In general, dissolved organic compound concentrations across the site have decreased significantly since the mid-1990s. This is due to a combination of factors, including:

- Engineering upgrades;
- UST removal in the northern and southern UST farms north of OSP1;
- Biodegradation and sorption of organic compounds in-situ; and;
- Impacted groundwater recovery and continued operation of the hydraulic containment system.

Recent trends (~10 years) in VOC concentrations in the source area (well 501) have followed a declining trend. VOC concentrations reported as detected in the IEL monitoring wells in May 2019 are among the lowest on record for the site. Trend tables for VOCs and alcohols are presented in Appendix C.

8.1.3 Assessment Guidelines

Results of laboratory analysis of groundwater samples are compared with a range of generic groundwater assessment criteria, specifically the EPA Interim Guideline Values (IGVs), the Groundwater Threshold Values (GTVs) and the Dutch Intervention Values (DIVs).

IGVs were developed by the EPA using a number of existing water quality guidelines in use in Ireland, including existing national environmental quality standards, proposed common indicators for the new groundwater directive, drinking water standards and Geological Survey of Ireland trigger values.

GTVs are defined in Irish law in Statutory Instrument No. 366 of 2016, European Union Environmental Objectives (Groundwater) (Amendment) Regulations, 2016. The GTVs are regulatory guidelines, which were developed to give effect to the EU Groundwater Directive. Exceedance of a threshold value triggers further investigation to confirm whether a “Poor” groundwater chemical status for the groundwater body as a whole is indicated.

DIVs represent concentrations above which there may be a risk to human receptors and above which more detailed site-specific risk assessment or remediation may be required in The Netherlands. These guidelines have no legal standing in Ireland but are included as they have historically been used as a screening tool for contaminants at the Ringaskiddy site since 1994/5.

8.1.3.1 Benzene

Benzene is sampled as part of the standard VOC suite. Benzene has not been reported as detected in wells 409 and 702 since records began.

Benzene has been historically reported as detected at wells 7, 205, 404 in excess of the GTV (0.00075 mg/L), IGV (0.001 mg/L) and DIV (0.03 mg/L).

Benzene was last reported as detected in groundwater from well 7 in May 2006 (0.026 mg/L) and in well 205 in November 2016 (0.002 mg/L).

Benzene is intermittently reported as detected in groundwater from well 404. Benzene was most recently reported as detected in excess of the IGV and GTV in November 2017 (0.017 mg/L).

Benzene has been reported as detected in groundwater from well 501 in every round since May 2009 at a concentration ranging between 0.003 mg/L (May 2017) and 0.081 mg/L (May 2009).

Benzene has been reported as detected in groundwater from well C1 in the majority of sampling rounds since June 1996 at a concentration above the assessment criteria ranging between 0.026 mg/L (May 2017) and 6.5 mg/L (June 1996).

Benzene concentrations generally follow a declining trend (see Appendix A Figures 6.1 and 6.2).

8.1.3.2 Chloroform

Chloroform is sampled as part of the standard VOC suite. Chloroform has not been reported as detected in groundwater from wells 7, 205, 404, 501 and C1 since records began.

Chloroform was reported as detected in groundwater from well 702 in May 2019 at a concentration of 0.007 mg/L below the IGV (0.012 mg/L) and DIV (0.4 mg/L). There is no GTV defined for chloroform. Well 702 is located near OSP4 and is cross gradient to the former UST farms where chloroform would have been stored historically. Reported detections of chloroform at well 702 in November 2018 (0.018 mg/L) and May 2019 are considered to be input from chlorinated mains supply rather than from a loss of solvent.

Chloroform is intermittently reported as detected in groundwater from well 409 at concentrations ranging between 0.001 mg/L and 0.022 mg/L. The majority of detections remained below relevant assessment criteria with the exception of one detection in November 2007 (0.022 mg/L). The results of groundwater analysis on site since 1995 do not indicate significant impact from chloroform. As this substance is no longer used on site there is unlikely to be significant future impact caused by chloroform.

8.1.3.3 Dichloromethane (DCM)

DCM is sampled as part of the standard VOC suite. DCM has not been reported as detected at well 702 since records began. DCM was reported as detected at least once, but at a concentration which did not exceed the IGV (0.010 mg/L), GTV (0.015 mg/L) or DIV (1 mg/L) in groundwater from wells 7, 409 and C1.

DCM has remained below the MDL in groundwater from well 205 in all but two rounds since records began in July 1994. DCM was reported as detected in May 2008 (0.002 mg/L) and November 2008 (0.011 mg/L). The November 2008 result exceeded the IGV but not the GTV or DIV.

DCM has been reported as detected intermittently in groundwater from well 404 since November 2008. DCM exceeded the IGV and GTV in November 2008 (0.12 mg/L) and May 2010 (8.98 mg/L). DCM was last reported as detected at well 404 in November 2018 (0.077 mg/L).

DCM has been reported as detected intermittently in groundwater from well 501 since June 1997. Where reported as detected, the concentration has exceeded the IGV, GTV and DIV with concentrations ranging between 0.048 mg/L (November 2015) and 8.1 mg/L (June 1997). DCM was last reported as detected in November 2015.

DCM detections are reported intermittently and do not indicate an on-going source of impact on site.

8.1.3.4 Diesel

Diesel has not been analysed for directly, however constituents of diesel such as trimethylbenzenes are analysed for as part of the standard VOC suite.

1,2,4-Trimethylbenzene has been reported as detected in groundwater from well 501 since November 2014 at declining concentrations with the concentration decreasing from 0.036 mg/L in November 2014 to 0.004 mg/L in May 2019. There are no assessment criteria defined for 1,2,4-trimethylbenzene.

1,3,5-Trimethylbenzene has followed the same trend in groundwater from well 501 with the concentration decreasing from 0.044 mg/L in November 2014 to below the MDL in May 2019. There are no assessment criteria defined for 1,3,5-trimethylbenzene.

1,2,4-Trimethylbenzene and 1,3,5-trimethylbenzene detections since November 2014 are unlikely to indicate diesel losses as diesel is not stored or used within the ATEX zone surrounding well 501.

8.1.3.5 Dimethylacetamide

Dimethylacetamide has not been included in biannual IEL groundwater monitoring analytical suite to date.

8.1.3.6 n-Hexane

n-Hexane has not been included in biannual IEL groundwater monitoring analytical suite to date.

8.1.3.7 Sodium Bromate

Sodium bromate has not been included in biannual IEL groundwater monitoring analytical suite to date.

8.1.3.8 2,2,4-Trimethylpentane

2,2,4-Trimethylpentane has not been included in biannual IEL groundwater monitoring analytical suite to date.

8.1.3.9 Toluene

Toluene is analysed as part of the standard VOC suite. Toluene has not been reported as detected in groundwater from well 409 since records began.

Toluene has been intermittently reported as detected at wells 7, 702 and C1. Toluene was last reported as detected in excess of the IGV (0.01 mg/L) in May 2009 (0.035 mg/L, May 2011 (0.036 mg/L) and November 2009 (0.100 mg/L) at wells 7, 702 and C1, respectively.

Historically toluene was regularly reported as detected in groundwater in excess of assessment criteria from wells 205 and 404 until November 2001 and November 2002, respectively. Toluene was last reported as detected in groundwater from well 205 in excess of the IGV in November 2009 (0.027 mg/L) and from well 404 in May 2010 (2.321 mg/L).

Toluene has been reported as detected in every round from well 501 since records began in December 1996. Toluene had been following a decreasing trend, with concentrations declining from 270 mg/L (September 1998) to 0.029 mg/L (May 2017).

Toluene concentrations generally follow a declining trend (see Appendix A Figures 7.1 and 7.2).

8.1.3.10 Xylene

Xylene is analysed as part of the standard VOC suite. Xylene has not been reported as detected in groundwater from well 409 since records began.

Xylene has been intermittently reported as detected in excess of the IGV and DIV at wells 7, 205, 404, 702 and C1. Most recent xylene detections reported for wells 7, 205, 404, 702 and C1 have been in May 2009 (0.035 mg/L), November 2013 (0.033 mg/L), May 2011 (0.036 mg/L) and May 2019 (0.031 mg/L), respectively.

Xylene has been reported as detected in every round in groundwater from well 501 since records began in December 1996. Xylene had been following a decreasing trend, with concentrations ranging between 160 mg/L (May 1998) and 0.576 mg/L (May 2019).

Xylene detections have been reportedly less frequently over time and at lower concentrations. Xylene is now consistently reported as detected over relevant assessment criteria in the source area only.

Xylene concentrations generally follow a declining trend (see Appendix A Figures 8.1 and 8.2).

8.1.3.11 Tetrahydrofuran (THF)

THF is analysed as part of the extended alcohol and acetate suite. THF has not been reported as detected in groundwater from well 702 since records began.

Historically THF has been regularly reported as detected in excess of the GTV (0.115 mg/L) and occasionally above the DIV (0.300 mg/L) in groundwater from wells 7 and 205 until November 2002 and November 2010, respectively. Since then, THF has been reported as detected intermittently in

excess of assessment criteria. THF was last reported as detected in excess of the GTV at well 7 in May 2009 (0.23 mg/L) and at well 205 in November 2010 (0.19 mg/L).

THF has been reported as detected at well 404 since records began in February 1995. THF has been regularly reported as detected in excess of the GTV and DIV with concentrations ranging from 84 mg/L (May 2009) down to 0.017 mg/L (May and November 2014). THF was last reported as detected at well 404 in excess of the GTV in May 2016 (0.140 mg/L) and in excess of the DIV in November 2011 (0.54 mg/L).

THF was reported as detected at well 409 once in excess of the GTV at a concentration of 0.21 mg/L in May 2009.

THF has been reported as detected at well 501 since records began in December 1996. THF has been regularly reported as detected in excess of the GTV and DIV with concentrations ranging from 3,230 mg/L (May 1998) down to 0.002 mg/L (May 2019). THF was last reported as detected in excess of the GTV and DIV in November 2015 (2.1 mg/L) in groundwater from well 501.

THF has been reported as detected at well C1 since records began in June 1996. THF has been regularly reported as detected in excess of the GTV and DIV with concentrations ranging from 13 mg/L (November 1999) down to 0.073 mg/L (May 2015). THF was last reported as detected in well C1 in excess of the GTV in May 2017 (0.14 mg/L) and the DIV in November 2009 (0.72 mg/L).

THF concentrations in other wells have generally remained low, other than occasional detections prior to 2016 (see Appendix A Figures 9.1 and 9.2).

8.1.3.12 Cyclohexane

Cyclohexane is analysed as part of the extended alcohol and acetate suite. Cyclohexane has not been reported as detected in groundwater from wells 409 and 702 since records began. The DIV (15 mg/L) has not been exceeded in any of the groundwater wells sampled on site. There is no IGV or GTV defined.

Historically cyclohexane was widely reported as detected (excluding the OSP4 area). Concentrations in groundwater have decreased over time and are now only regularly reported as detected in the primary source area.

Cyclohexane had been reported as detected prior to 2010 in groundwater from wells 7, 205 and C1.

Cyclohexane is reported as detected intermittently at wells 404 and 501, most recently in May 2018 (0.130 mg/L) and May 2019 (0.114 mg/L) respectively.

Cyclohexane concentrations generally follow a declining trend (see Appendix A Figures 10.1 and 10.2).

8.1.4 Groundwater Conclusions

Several relevant hazardous substances (benzene, DCM, cyclohexane, THF, toluene and xylene) are reported as detected in groundwater, albeit following decreasing concentration trends.

Chloroform is reported as detected intermittently at the site but it likely derived from chlorinated mains water rather than from historic losses.

n-Hexane and diesel are currently stored on the site but have not been included in groundwater monitoring to date and should be included in future rounds.

Sodium bromate, dimethylacetamide and 2,2,4-trimethylpentane have not been included in groundwater monitoring to date, but are no longer stored on site. These should be analysed for in the next two groundwater rounds, as bromate and as VOC TICs, respectively. If not reported as detected they should be removed (with EPA agreement), as there is no potential for further contamination from these substances.

8.2 Shallow Soil Investigation

8.2.1 Introduction

An intrusive shallow soil investigation was completed by AECOM in July 2019 as part of the baseline investigation. A total of 65 soil/fill samples were taken from the 27 soil bores advanced across the site.

The sample locations were chosen based on a combination of targeted and non-targeted sampling, with the aim of both obtaining areal coverage of the site and targeting known source areas of historic impact across the site. Analytical results are presented in Appendix D.

Soil bores were advanced by Causeway Geotech (Causeway) using a small track-mounted direct push-type drilling rig. Drilling logs are presented in Appendix E.

8.2.2 Objectives

The objective of this site investigation was to evaluate current soil conditions with respect to relevant hazardous substances as part of the Baseline report.

The objective was achieved by:

- Drilling soil boreholes across the site and close to source area of historic impact to assess soil conditions beneath the site;
- Analysing soil samples for a range of potential substances relating to historical chemical and materials use on the site.

8.2.3 Scope of Works

Drilling and soil sampling works were undertaken at the site between 22 July and 30 July 2019.

The site investigation was conducted in line with BS 10175:2011+A2:2017 Code of Practice for Investigation of Potentially Impacted Sites, the UK Environmental Agency CLR11 and by taking into account BS5930 (2015) Code of Practice for Site Investigations (where applicable). Sampling was carried out with techniques suitable to the conditions and materials encountered on site and logged in accordance with BS5930.

8.2.3.1 Health and Safety

A site-specific Safety, Health & Environment (SHE) Plan was prepared for the works, which covered all elements of the site works undertaken by AECOM.

The SHE Plan outlined the nature of the works and included a hazard assessment, along with mitigation measures, so that the works were undertaken in a safe and controlled manner from both a health and safety and environmental perspective. The document included staff roles, staff training and competency requirements, method statements, risk assessments and emergency procedures, as well as site-specific information.

The SHE plan for the site investigation works specifically addressed precautions in terms of the borehole drilling and soil sampling.

The SHE Plan was made available to all AECOM staff and to Pfizer staff prior to the site works and was a ‘live’ document which was updated and amended on-site as part of ongoing dynamic risk assessment.

8.2.3.2 Service Clearance

In accordance with the AECOM subsurface clearance protocol, utility clearance of the proposed borehole locations was completed prior to intrusive works commencing on-site, which included the following tasks:

- Review of available service plans to support the identification and location of relevant underground services;

- On-site utility survey of each proposed borehole location for underground utilities by specialist surveyors (Murphy Surveys Limited) using a Cable Avoidance Tool (CAT) and Ground Penetrating Radar (GPR); and
- Hand digging of all borehole locations to a depth to 1.2 m below ground level (bgl) prior to drilling to prove the absence of live underground services.

An AECOM field scientist supervised the on-site utility clearance works. A total of 28 drilling locations were cleared for utilities by Murphy Surveys Limited between 08 July and 11 July 2019.

Borehole BH15 was removed from the drilling schedule due to a high concentration of utilities shown by the geophysical utility surveys to be present across the proposed area.

A 150 mm ribbed yellow plastic pipe, not identified by the utility survey, was encountered at a depth of 0.85 m bgl, but not damaged, during the hand dig at location BH26. The hand dug excavation at BH26 was extended away from the uncovered service, as per standard procedure. A further 150 mm black plastic pipe, also not identified by the utility survey, was then encountered, also at 0.85 m bgl but not damaged. Location BH26 was not advanced further due to the presence of a large concrete kerb and mapped utilities in the area, which limited any further lateral extension of the hand-dug excavation.

A 100 mm black plastic pipe, not identified by the utility survey, was encountered at a depth of 0.80 m bgl, but not damaged, during the hand dig at location BH27. The excavation at BH27 was extended away from the uncovered service and was dug to a depth of 1.2 m bgl without encountering any further underground utilities.

No other underground services were encountered during the intrusive site works.

8.2.3.3 Drilling and Soil Sampling

Site Establishment

At the outset of the drilling works Causeway established an equipment laydown area in an area of the site that would cause no impact to the site's daily operations. A decontamination area was made available to Causeway in the WWTP to the north east of the site.

The equipment decontamination / wash-down area was located in the WWTP in a bunded area. All drilling equipment was pressure washed before arrival to site, prior to use and between each borehole location.

Prior to drilling at each location, a hot works permit (if necessary) and a permit to work were obtained from the relevant Pfizer area supervision personnel. Prior to receiving the permit to work, each permit issuer received a copy of the health and safety documentation, information on the scope of works and the exact location for each borehole.

Temporary barriers were erected around each borehole location to cordon-off the area during the hand dig and subsequent drilling and soil sampling.

Shallow Soil Drilling

The twenty-seven (27) shallow soil drilling locations are listed below and illustrated in Appendix A Figure 11.

Name	Location	Rationale
BH1-BH4	Former ADM Site	Spatial coverage
BH5	West of the Kilo Lab (201)	Spatial coverage
BH6	South of the Kilo Lab (201)	Spatial coverage
BH7	East of Tanker Unloading Bay (198)	Spatial coverage

Name	Location	Rationale
BH8	West of Deluge House No.2/North of Solvent Recovery	Former source area
BH9	East of WWTP (175)	Spatial coverage
BH10	Southwest of TOC Monitoring House No.3	Spatial coverage
BH11	North-East of Drum Storage (165)	Spatial coverage
BH12	Contractor Area, east of gate of track to NHA woodland	Spatial coverage
BH13	East of API Milling Facility (185)	Spatial coverage
BH14	South of API Milling Facility (185)	Spatial coverage
BH16	Eastern Car Park	Spatial coverage
BH17	South West of OSP4 (190)	Spatial coverage
BH18	East of Fire Station/Project Stores (184)	Spatial coverage
BH19	Open area east of OSP3 (178)	Spatial coverage
BH20	South of Drum Store (165)	Spatial coverage
BH21	Between OSP3 (178) and solvent tanks to north	Spatial coverage
BH22	East of OSP3 (178) and Hydrog.2 (168)	Former source area
BH23	East of OSP3 (178) and Hydrog.1 (167)	Former source area
BH24	South of Solvent Recovery Area 162	Former source area
BH25	South of OSP1 (163) and Labs & Offices	Former source area
BH26	South of OSP3 (178), south east of NPTL (170)	Spatial coverage
BH27	On south side of Maintenance Stores (169)	Spatial coverage
BH28	West of API Milling Facility (185), north of ponded area	Spatial coverage

At each borehole location, the underlying material was removed during the hand dig using insulated hand tools to a depth of 1.2 m bgl, to minimise the risk of damaging potential underground services.

The following issues were encountered:

- BH1, BH2 and BH25 - concrete slabs were cored using a diamond coring drill before the hand dig.
- BH2 - the concrete slab was cored to the maximum depth attainable with the core barrel (0.60 m), however, the floor slab was not penetrated. Other suitable locations were advance in close proximity to the original BH2 location, however the concrete slab could also not be

penetrated at these locations. Therefore, location BH2 was not completed and a sample was collected from the soil material encountered above the concrete slab.

- BH26 only advanced by hand digging to a depth of 0.85 m bgl due to the presence of multiple underground services.

The remaining 25 borehole locations were all drilled to a depth of 2 m bgl.

An experienced AECOM field engineer supervised all drilling works. Geological logs were recorded noting major and minor grain size, colour, moisture content and field evidence of impact (i.e., colour, staining, ambient odour and photoionisation detector (PID) headspace readings).

Groundwater was not encountered in any of the 27 shallow soil bores and they were not installed as monitoring wells. On completion, the bores were backfilled to ground level with arisings and, where appropriate, concrete.

Borehole logs including descriptions of materials encountered during the drilling and reinstatement details are provided in Appendix E.

Sampling and Analysis

Excavated material was inspected for visual or olfactory evidence of impact. To assess the presence of VOCs, field headspace testing using a calibrated PID was undertaken on soil samples retrieved at approximately 1 m intervals during excavation or drilling. Soil samples were placed in plastic zip-lock bags and allowed to equilibrate prior to on-site headspace testing.

Two composite soil samples were taken at each location at nominal depth intervals of 0-1 m bgl and 1-2 m bgl. Soil samples were analysed for VOCs including TICs, semi-volatile organic compounds (SVOCs) including TICs, total petroleum hydrocarbons – criteria working group (TPH-CWG) and heavy metals. Where impacted zones of soil were apparent during drilling, an extra soil sample was taken of the impacted material.

Soil samples were collected into laboratory-supplied sample containers appropriate to the intended analysis. The sample containers were labelled with a unique sample name and were stored on-site in a chilled cool box and refrigerated overnight at an off-site AECOM storage facility pending transport to the laboratory.

The AECOM field scientists wore single-use disposable nitrile gloves, which were changed at each sampling location and depth to avoid cross-contamination of soil samples.

Soil samples were shipped to the Element Materials Technology Laboratories in the UK for analysis. All soil samples were transported to the contract analytical laboratory by overnight courier in cooler boxes with frozen, laboratory-supplied ice packs and appropriate chain-of-custody documentation.

8.2.4 Field Observations

8.2.4.1 Geological Observations

Geological logs are presented in Appendix E, with a summary provided below.

Bedrock and groundwater were not encountered during drilling at any of the shallow soil bores across the site.

Name	Dominant Material
BH1-BH4	MADEGROUND & Sandy, Gravelly CLAY
BH5-BH8	MADEGROUND (Gravels & Clays)
BH9	SANDS, GRAVELS & Gravelly CLAY
BH10-BH12	MADEGROUND & Gravelly CLAY

Name	Dominant Material
BH13	Gravelly, Sandy CLAY
BH14	MADEGROUND & Gravelly CLAY
BH16	Sandy, Silty GRAVEL
BH17-18	MADEGROUND & Gravelly CLAY
BH19-BH20	MADEGROUND & Gravelly CLAY
BH21	MADEGROUND & Gravelly CLAY
BH22-BH24	MADEGROUND (Gravels)
BH25	MADEGROUND & Gravelly, Silty CLAY
BH26	MADEGROUND (Gravels)
BH27	MADEGROUND & Gravelly CLAY
BH28	MADEGROUND (Clays)

8.2.4.2 Field Evidence of Soil Impact

Evidence of soil impact in the form of odours or discolouration was noted only at BH22 at a depth of 1.6 m bgl. A PID soil headspace reading of 8.9 ppm was recorded at this depth.

The maximum PID soil headspace reading was 1000 ppm (BH8 at 1.0 -2.0 m bgl) but no obvious odours or discolouration were noted during drilling and subsequent sampling of BH8.

PID soil headspace readings above 5 ppm were recorded from the deeper samples at BH11, BH20, BH21, BH22, BH23, BH24 and BH28 ranging from 5.4 ppm (BH20) to 70.3 ppm (BH21).

No obvious odours or discolouration were noted in any other soil samples retrieved for laboratory analysis and all other field PID soil headspace readings were less than 5 ppm.

8.2.5 Soil Analytical Results

A detailed sample inventory is presented in Appendix D Table 1.

8.2.5.1 Soil Screening Criteria

In accordance with the guidance presented in CLR 11[12] for impacted land risk assessment, the soil laboratory results were compared with Generic Assessment Criteria (GACs).

The GAC are conservative screening criteria protective of human health (assuming on-going commercial / industrial use of the site) and controlled waters (groundwater and surface waters). Separate GAC are given for human health and controlled waters.

For an assessment of the potential risk to human health and controlled waters, AECOM's in-house Stage 2 GAC for Commercial / Industrial land use was chosen.

Soil analytical results were compared against these GAC and if concentrations were less than the GAC, then the risks to human health or controlled waters were considered negligible. Conversely, if

[12] UK DEFRA and EA, 2002, CLR 11 - 'Model Procedures for the Management of Land Contamination.'

concentrations were identified above the GAC, a potential risk to human health or controlled waters was identified.

AECOM considers that the GAC are consistent with the principles of human health protection in guidance from the Irish Environmental Protection Agency, UK DEFRA and UK Environment Agency.

If reported concentrations are below both sets of GAC, then the risks to human health and controlled waters are considered negligible. However, if reported concentrations are above GAC, then there is a potential risk to the relevant receptor. It is possible for a result to be reported above the GAC for one receptor and not the other, e.g. to exceed the human health GAC but not controlled waters GAC, and vice versa.

It should be noted that the GAC protective of human health assumes a continued industrial end use and does not consider short-term exposure pathways to construction workers during redevelopment works. An assessment of impacts to construction workers is outside the current scope of work.

8.2.5.2 Soil Results

The results of laboratory analysis of soil samples are presented in Appendix D Tables 2 – 7.

Soil laboratory certificates are presented as Appendix F.

Volatile Organic Compounds (VOCs)

Soil VOC results are presented in Appendix D Table 2.

Benzene was reported as detected at a concentration of 9.0 µg/kg in soil sampled from BH21_1.0-2.0 m bgl. This detection marginally exceeds the Controlled Waters GAC for benzene (8.7 µg/kg).

p/m-Xylene was reported as detected in soil sampled from BH2_0.6 m bgl (9.0 µg/kg), BH4_1.0-2.0 m bgl (16 µg/kg), BH21_1.0-2.0 m bgl (313 µg/kg) and BH22_0.0-1.6 m bgl (6.0 µg/kg). Only the p/m-xylene concentration at BH21 exceeded the Controlled Water GAC for p/m-xylene (67 µg/kg). o-Xylene was also reported as detected in soil samples BH2_0.6 m bgl (4.0 µg/kg), BH4_1.0-2.0 m bgl (14 µg/kg).

Naphthalene was reported at 73 µg/kg from soil at BH4_1.0-2.0 m bgl, exceeding the Controlled Waters GAC for naphthalene (19 µg/kg).

All other soil VOCs reported as detected above laboratory method detection limits (MDLs) from the remaining soil samples did not exceed the relevant GAC, where applicable.

VOC Tentatively Identified Compounds (TICs)

Soil VOC TIC results are presented in Appendix D Table 3 and summarised below.

VOC TICs were reported as detected above a 90% confidence in 7 of the 65 soil samples. No relevant assessment criteria were available for the VOC TICs reported as detected.

None of the reported as detected VOC TICs were identified as site-related relevant hazardous substances.

Semi Volatile Organic Compounds (SVOCs)

Soil SVOC results are presented in Appendix D Table 4 and summarised below.

Phenol was reported as detected in soil from BH28_1.0-2.0 m bgl (214 µg/kg) which exceeded the Controlled Water GAC of 4.1 µg/kg for phenol. Phenol was not reported as detected in any other soil sample analysed.

PAHs were below laboratory method detection limits (MDLs) at 19 of the 27 borehole locations.

Concentrations of naphthalene in soil from BH24_1.0-2.0 m bgl (47 µg/kg) and BH16_0.0-1.0 m bgl (21 µg/kg) exceeded the Controlled Water GAC of 19 µg/kg for naphthalene.

Anthracene was reported in soil from BH9_1.0-2.0 m bgl (24 µg/kg) and BH22_0.6 m bgl (107 µg/kg) which exceeded the Controlled Water GAC 8.2 µg/kg for anthracene.

Reported detections of fluoranthene in soil from BH9_1.0-2.0m bgl (153 µg/kg), BH21_0.0-1.0 m bgl (16 µg/kg), BH27_0.0-1.0 m bgl (24 µg/kg) and BH28_0.0-1.0 m bgl (12 µg/kg) were the only ones which exceeded the Controlled Water GAC of 1.7 µg/kg for fluoranthene.

Benzo(a)pyrene was reported as detected in soil from BH9_1.0-2.0 m bgl (72 µg/kg), BH14_1.0-2.0 m bgl (14 µg/kg), BH21_0.0-1.0 m bgl (14 µg/kg) and BH27_0.0-1.0 m bgl (15 µg/kg) which exceeded the Controlled Water GAC of 0.32 µg/kg for benzo(a)pyrene.

Phthalates were below MDLs at 25 of the 27 borehole locations.

Di-n-butyl phthalate was only reported as detected above the Controlled Water GAC of 202 µg/kg in soil from BH1_0.0-1.0 m bgl (1,475 µg/kg).

Other SVOCs were only reported as detected above their respective MDLs in soil from BH22_1.6 m bgl. No relevant assessment criteria were available for these detections.

SVOC TICs

Soil SVOC TIC results are presented in Appendix D Table 5 and summarised below.

SVOC TICs were reported as detected above a 90% confidence in 10 of the 65 soil samples. No relevant assessment criteria were available for the SVOC TICs reported as detected. All SVOC TICs reported as detected were not identified as site-related relevant hazardous substances.

Total Petroleum Hydrocarbons (TPHs)

Soil TPH results are presented in Appendix D Table 6.

Speciated hydrocarbons were reported as detected above the MDL in soils from BH2_0.6 m bgl, BH4_1.0-2.0 m bgl, BH6_1.0-2.0 m, BH11_1.0-2.0 m bgl, BH19_1.0-2.0 m bgl, BH21_1.0-2.0 m bgl, BH22_1.6 m bgl, BH22_1.0-2.0 m bgl, BH23_1.0-2.0 m bgl, BH24_1.0-2.0 m bgl and BH28_1.0-2.0 m bgl. All reported detections fell below the relevant assessment criteria for speciated hydrocarbons, where applicable.

Metals

Soil metal results are presented in Appendix D Table 7.

Chromium VI and mercury were not reported as detected above the MDL in any of the 65 soil samples analysed.

Arsenic was reported in all 65 soil samples with concentrations ranging between 1.0 mg/kg (BH24_1.0-2.0 m bgl) and 44.0 mg/kg (BH7_1.0-2.0 m bgl). Results for a total of 33 out of the 65 soil samples exceeded the Controlled Water GAC of 10 mg/kg for arsenic. Reported soils arsenic results other than sample BH1_1.0-2.0 m bgl (40 mg/kg) and BH7_1.0-2.0 m bgl (44 mg/kg) were below 22 mg/kg.

Barium was reported in all 65 soil samples with concentrations ranging between 15 mg/kg (BH22_0.0-1.0 m bgl and BH23_1.0-2.0 m bgl) and 77 mg/kg (BH17_1.0-2.0 m bgl). All reported barium detections fell below the relevant assessment criteria, where applicable.

Beryllium was reported in 54 of the 65 soil samples and concentrations ranging between 0.5 mg/kg (BH11_1.0-2.0 m bgl and BH18_0.0-1.0 m bgl) and 2.4 mg/kg (BH25_1.0-2.0 m bgl). All reported beryllium soil results are below relevant assessment criteria, where applicable.

Cadmium was reported in 53 of the 65 soil samples, where reported as detected concentrations ranged between 0.1 mg/kg (BH3_0.0-1.0m bgl) and 3.6 mg/kg (BH17_1.0-2.0m bgl). All 53 reported detections of cadmium were in excess of the Controlled Waters GAC of 0.02 mg/kg.

Chromium III was reported in all 65 soil samples above the MDL with concentrations ranging between 13 mg/kg (BH24_1.0-2.0 m bgl) and 68 mg/kg (BH2_0.6 m bgl). No reported detections of chromium III exceeded the relevant assessment criteria, where applicable.

Copper was reported in all 65 soil samples with concentrations ranging between 4 mg/kg (BH22_0.0-1.0 m bgl) and 43 mg/kg (BH2_0.6 m bgl). All reported detections exceed the Controlled Waters GAC of 0.50 mg/kg for copper.

Lead was reported in 63 of the 65 soil samples with concentrations ranging between 5 mg/kg (BH23_0.0-1.0 m bgl) and 220 mg/kg (BH3_0.0-1.0 m bgl). All reported detections of lead exceeded the Controlled Waters GAC of 3.5 mg/kg.

Nickel was reported in all 65 soil samples with concentrations ranging between 3.4 mg/kg (BH23_1.0-2.0 m bgl) and 236 mg/kg (BH2_0.6 m bgl). Nickel concentrations in soil from 63 of the 65 samples exceeded the Controlled Waters GAC of 4.3 mg/kg.

Selenium was reported in 17 of the 65 soil samples, with concentrations ranging between 1.0 mg/kg (various) and 3.0 mg/kg (BH12_0.0-1.0 m bgl). The reported detections of selenium did not exceed the relevant assessment criteria, where applicable.

Vanadium was reported in all 65 soil samples with concentrations ranging between 2.0 mg/kg (BH23_1.0-2.0 m bgl) and 31 mg/kg (BH25_1.0-2.0 m bgl).

Water soluble boron was reported in all 65 soil samples with concentrations ranging between 0.1 mg/kg (BH22_0.0-1.0 m bgl, BH23_1.0-2.0 m bgl and BH 24_0.0-1.0 m bgl) and 2.3 mg/kg (BH14_1.0-2.0 m bgl). No reported detections of water soluble boron exceed the relevant assessment criteria.

Zinc was reported in all 65 soil samples in excess of the Controlled Waters GAC of 1.5 mg/kg. Soil sample concentrations ranged between 20 mg/kg (BH16_1.0-2.0 m bgl and BH23_1.0-2.0 m bgl) and 275 mg/kg (BH25_1.0-2.0 m bgl).

8.2.6 Screening of Soil Analytical Results

8.2.6.1 Human Health

No soil results for any of the 65 soil samples exceeded the Stage 2 GAC protective of human health receptors on-site under an Industrial / Commercial scenario.

8.2.6.2 Controlled Waters

Several soil VOCs, SVOCs and metals were reported as detected above the Stage 2 GAC protective of controlled waters receptors.

Results are summarised below:

SOIL VOC RESULTS ABOVE STAGE 2 GAC PROTECTIVE OF CONTROLLED WATERS

Parameter	Range (µg/kg)	GAC (µg/kg)	Samples > GAC-CW
Benzene	<3 – 9	8.7	**BH21_**1.0-2.0 m bgl
p/m-Xylene	<6 – 313	67	**BH21**_1.0-2.0 m bgl
Naphthalene	<27 – 73	19	**BH4_**1.0-2.0 m bgl

SOIL SVOC RESULTS ABOVE STAGE 2 GAC PROTECTIVE OF CONTROLLED WATERS

Parameter	Range (µg/kg)	GAC (µg/kg)	Samples > GAC-CW
Phenol	<10 – 214	4.1	**BH28_**1.0-2.0 m bgl
Naphthalene (PAH)	<10 – 47	19	**BH24_**1.0-2.0 m bgl **BH16_**0.0-1.0 m bgl
Anthracene	<10 – 107	8.2	**BH9**_1.0-2.0 m bgl **BH22**_0.6 m bgl

SOIL VOC RESULTS ABOVE STAGE 2 GAC PROTECTIVE OF CONTROLLED WATERS			
Fluoranthene	<10 – 153	1.7	**BH9**_1.0-2.0 m bgl **BH21**_0.0-1.0 m bgl **BH27**_0.0-1.0 m bgl **BH28**_0.0-1.0 m bgl
Benzo(a)pyrene	<10 – 72	0.32	**BH9**_1.0-2.0 m bgl **BH14**_1.0-2.0 m bgl **BH21**_0.0-1.0 m bgl **BH27**_0.0-1.0 m bgl
Di-n-butyl phthalate	<100 – 1,475	202	**BH1**_0.0-1.0 m bgl

SOIL METAL RESULTS ABOVE STAGE 2 GAC PROTECTIVE OF CONTROLLED WATERS				
Parameter	**Range (mg/kg)**	**Typical Soil Concentrations - Ringaskiddy area (mg/kg)**	**GAC (mg/kg)**	**Samples >GAC-CW**
Arsenic	<1 – 44	9-12	10	**33/65 soil samples**
Cadmium	<0.1 – 3.6	0.21-0.4	0.02	**53/65 soil samples**
Copper	<4.0 – 43	20-25	0.5	**All 65 soil samples**
Lead	<5.0 – 220	20-40	3.5	**All 65 soil samples**
Nickel	<3.4 – 236	22-30	4.3	**63/65 soil samples**
Vanadium	<2.0 – 31	75-90+	1.3	**All 65 soil samples**
Zinc	<20 – 275	60-80	1.5	**All 65 soil samples**

Note - Typical soil values derived (where available) from maps in Teagasc “Soil Geochemical Atlas of Ireland” 2007

The estimated soil GAC for heavy metals are calculated using conservative soil:water partitioning coefficients and result in theoretical soil leaching values for metals that are likely to be very conservative. Typical concentration ranges for particular metals in soil data from Teagasc for the Ringaskiddy area are generally higher than the soil GAC. Therefore, greater reliance is placed by AECOM on actual, site-specific, measured concentrations of these substances in groundwater, if available, to assess the potential risks to controlled waters in the vicinity of the site.

Given that these parameters, with the exception of arsenic, were not reported in groundwater above the respective GACs, AECOM concludes that the reported soil concentrations do not post an unacceptable risk to human health or the environment.

The source of these trace arsenic detections in groundwater is considered to be from naturally-occurring metallic minerals in the underlying limestone bedrock. Arsenic solubility increases under anaerobic groundwater conditions, such as those found beneath the site.

There are no appropriate assessment criteria for the tentatively identified compounds.

8.2.7 Duplicate Sampling

Six blind duplicate samples (Dup01-Dup06) were taken as a QA/QC check on the laboratory analysis. The purpose of duplicate sampling is to assess the reproducibility of sample preparation.

Primary Sample	Duplicate
BH8	DUP01
BH11	DUP02
BH13	DUP03
BH16	DUP04
BH6	DUP05
BH3	DUP06

Relative percentage differences (RPDs) calculated between the primary and duplicate samples are typically higher when detections are at lower concentrations (i.e. close to the detection limit) in the samples. A higher RPD is acceptable when the reported as detected concentrations are not 'significantly' above (taken as ten times) the MDL for a particular analyte.

There was generally a good correlation between primary and duplicate results from all samples for, VOC, SVOC and alcohol analyses performed.

There was generally good correlation for TPHs and metals in the majority of samples. However, an RPD of between 44% and 52% is noted for Chromium between primary and duplicate samples at BH16_1.0-2.0m bgl, BH6_0.0-1.0m bgl, BH6_1.0-2.0m bgl and BH3_1.0-2.0m bgl. Elevated RPDs are noted for several analytes between primary and duplicate samples BH11_1.0-2.0m bgl and BH3_0.0-1.0m bgl.

Differences in concentrations between primary and duplicate samples are likely due to heterogeneity in the composite soil samples.

8.3 Relevant Hazardous Substances in Soils

In total, eleven relevant hazardous substances were identified from the screening process.

Of these, chloroform, DCM, n-hexane, 2,2,4-trimethylpentane, THF and cyclohexane were not reported as detected in soil samples above their respective MDLs.

8.3.1 Benzene

Benzene was reported as detected in one soil sample BH21_1.0-2.0 m bgl at a concentration of 9.0 µg/kg in excess of the Controlled Waters GAC (8.7 µg/kg). Benzene was below the MDL (3 µg/kg) in the remaining samples.

8.3.2 Diesel

TPH was reported as detected in several soil samples across the site at low concentrations which do not exceed assessment criteria.

8.3.3 Sodium Bromate

Bromate was not directly analysed, but bromide was reported as detected in 3 of the 55 samples at a maximum concentration of 0.7 mg/kg. There are no assessment criteria defined for bromide.

8.3.4 Toluene

Toluene was not reported as detected in any of the 55 samples above the Controlled Waters GAC (31 µg/kg) or Human Health GAC 28,000,000 µg/kg.

8.3.5 Xylenes

Total xylenes were reported as detected in one soil sample BH21_1.0-2.0 m bgl at a concentration of 313.0 µg/kg in excess of the Controlled Waters GAC (67 µg/kg). Total xylenes were below the assessment criteria in the remaining samples.

8.4 Shallow Soil Site Investigation Conclusions

The majority of relevant hazardous substances were either below laboratory MDLs or below relevant assessment criteria across site. Benzene and xylene were both reported as detected above the Controlled Waters GAC at BH21 located down-gradient of the former source area, where historic solvent losses have been reported (see Section 5.2.1) and known groundwater impact is hydraulically captured and treated via two groundwater abstraction wells, C1 and C2.

Metal concentrations were reported as detected above the Controlled Waters GAC in every bore on site, however, metal concentrations, with the exception of arsenic, are generally similar to typical soil concentrations from the area and are below their respective MDLs in groundwater. The source of the trace arsenic detections in groundwater is considered to be from naturally-occurring metallic minerals in the underlying limestone bedrock.

9. Production of Baseline Report (Stage 8)

Stage 8 of the baseline process is preparation of this report summarising the information gathered in Stages 1- 7 of the process.

9.1 Stage 1 - Identification of Hazardous Substances

In Stage 1 an inventory of raw materials, products, intermediaries, by-products, emissions and wastes which was provided by Pfizer was screened to identify hazardous substances used on site, as described in Section 2 of this report.

9.2 Stage 2 – Identification of 'Relevant Hazardous Substances'

Hazardous substances identified during Stage 1 were screened to identify 'Relevant Hazardous Substances'.

Fifty substances were identified at Stage 2 of the screening process as described in Section 3 of this report.

9.3 Stage 3 – Assessment of Site Specific Pollution Possibility

The relevant hazardous substances identified in Stage 2 were assessed based on their:

- Storage and usage location;
- Usage quantity;
- Storage and transport methods; and,
- Review of secondary containment systems and procedures.

After completion of the screening process in Stage 3 as described in Section 4 of this report, the following twelve relevant hazardous substances were identified:

- Benzene
- Chloroform
- DCM
- Sodium Bromate
- Cyclohexane
- n-Hexane
- 2,2,4-Trimethylpentane
- THF
- Toluene
- Xylene
- Diesel
- Dimethylacetamide

However, it is noted that sodium bromate, dimethylacetamide and 2,2,4-trimethylpentane are no longer used or stored on site and they were not analysed for during the 2019 shallow soils investigation. They should be included (as bromate and as a VOC TICs, respectively) in the two subsequent biannual groundwater monitoring rounds. If they are not reported as detected, then their removal from further sampling events should be agreed with the EPA.

9.4 Stage 4 – Site History

The site history, including information on historical incidents which resulted in losses to ground and a description of historical site investigations and monitoring, is summarised in Sections 5 and 8 of this report.

9.5 Stage 5 – Environmental Setting

The existing environment, including, topology, geology, hydrogeology, land use and drainage systems are assessed in Section 6 of this report.

9.6 Stage 6 – Site Characterisation

The site characterisation is presented in Section 7 of this report.

9.7 Stage 7 – Site Investigation

A groundwater site investigation was not needed as sufficient information is available from historic site investigations to characterise the site. A shallow soils investigation was completed in July 2019. Groundwater monitoring results and the results of the 2019 soils investigation are presented in Section 8 of this report.

Five of the identified relevant hazardous substances were reported as detected in soil samples with concentrations of benzene and xylenes exceeding relevant GACs in several samples. Benzene and xylenes are reported as detected in groundwater beneath the site which is addressed through a hydraulic containment system to limit migration to Monkstown Creek and Cork Harbour.

Appendix A Figures

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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DRAWING TITLE

FIGURE 1 _ SITE LOCATION PLAN

PROJECT

SOIL AND GROUNDWATER BASELINE 2019
RINGASKIDDY API, CORK, IRELAND

DRAWN	TRACED	CHECKED	APPROVED	DATE
BMC		EO'H	KF	AUG 2019

SCALE	DRG NO.
AS SHOWN	**PR-423449-ACM-RP-EN-001**

NOTES

:

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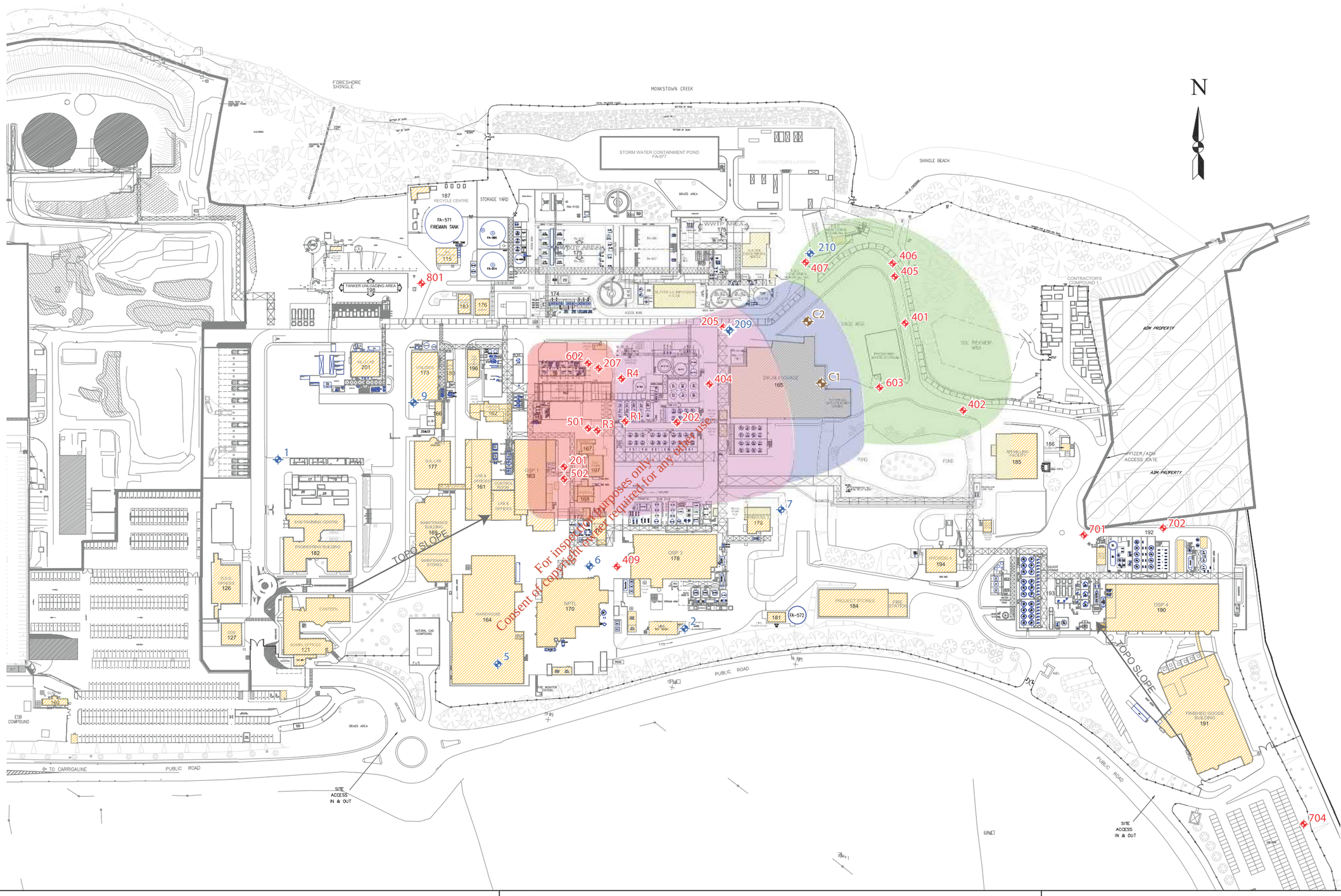

CLIENT

PFIZER IRELAND PHARMACEUTICALS

PROJECT

SOIL AND GROUNDWATER BASELINE 2019
RINGASKIDDY API, Co. CORK

DRAWING TITLE

FIGURE 2 _ SITE LAYOUT PLAN
SHOWING MONITORING WELL LOCATIONS

DRAWN	TRACED	CHECKED	APPROVED	DATE
RMG		EO'H	KF	JUN 2019
SCALE	DRG NO.			
AS SHOWN	**PR-423449-ACM-RP-EN-001**			

NOTES

- Hydraulic Containment Well
- Groundwater Monitoring Well (In Limestone)
- Groundwater Monitoring Well (In Drift)
- Source Area
- Down-gradient of Source Area
- Containment Well Area
- Down-gradient of Containment Well Area

NOTE: THE MAP HAS BEEN PROVIDED BY THE CLIENT

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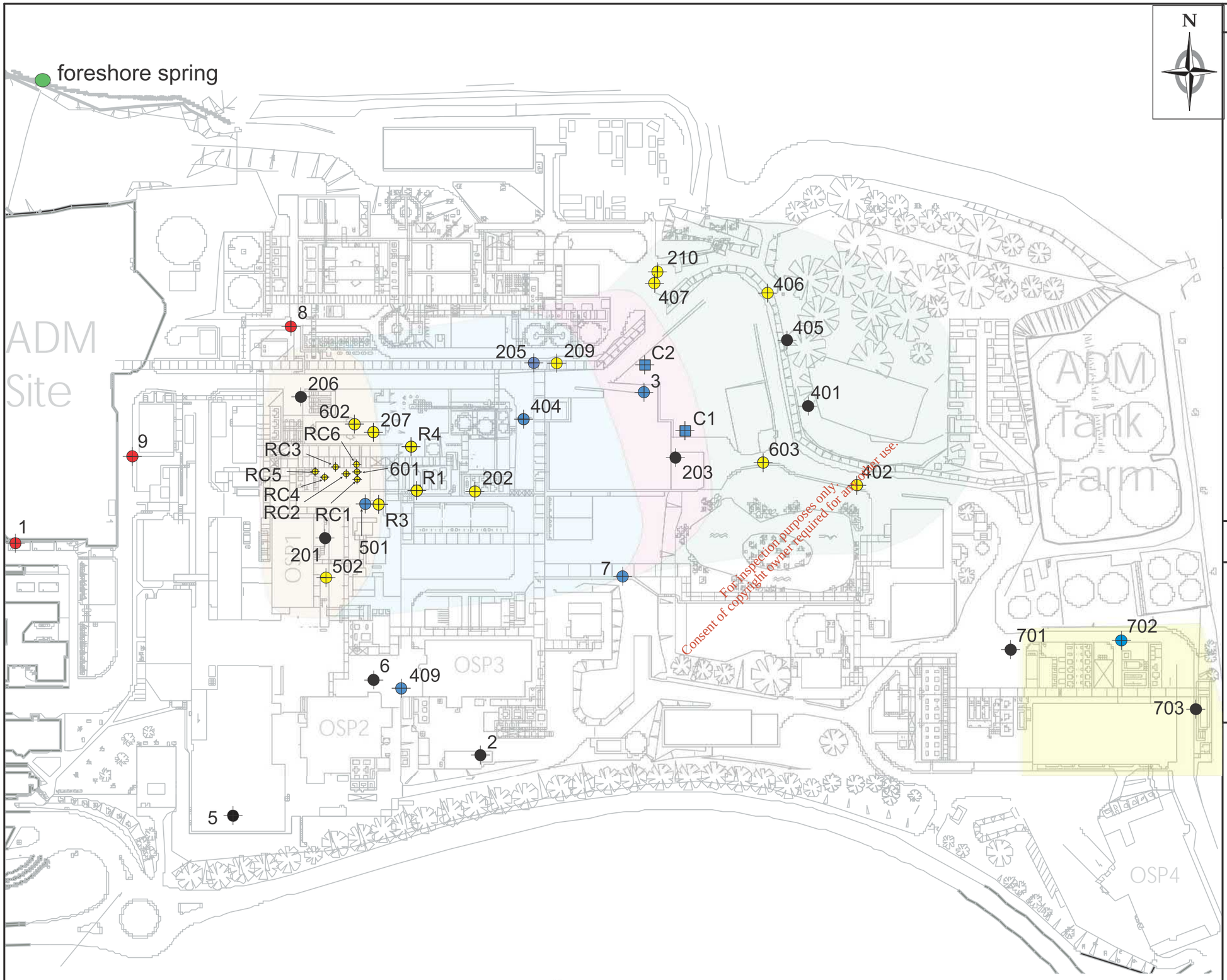

N

NOTES

- 401 MONITORING WELL SAMPLED FOR ADM BOUNDARY MONITORING
- 401 EXISTING GROUNDWATER MONITORING WELL (NOT SAMPLED)
- 401 MONITORING WELL SAMPLED FOR VOC's AND ALCOHOLS
- 401 MONITORING WELL SAMPLED FOR FULL EPA SUITE
- C1 CONTAINMENT WELL SAMPLED FOR FULL EPA SUITE

GROUNDWATER MONITORING ZONES:

- SOURCE AREA
- DOWN-GRADIENT OF SOURCE AREA
- CONTAINMENT WELL AREA
- DOWN-GRADIENT OF CONTAINMENT WELL AREA
- OSP4 AREA

STATUS

DRAFT

ENVIRONMENTAL CONSULTANTS

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CLIENT

Pfizer Ireland Pharmaceuticals

PROJECT

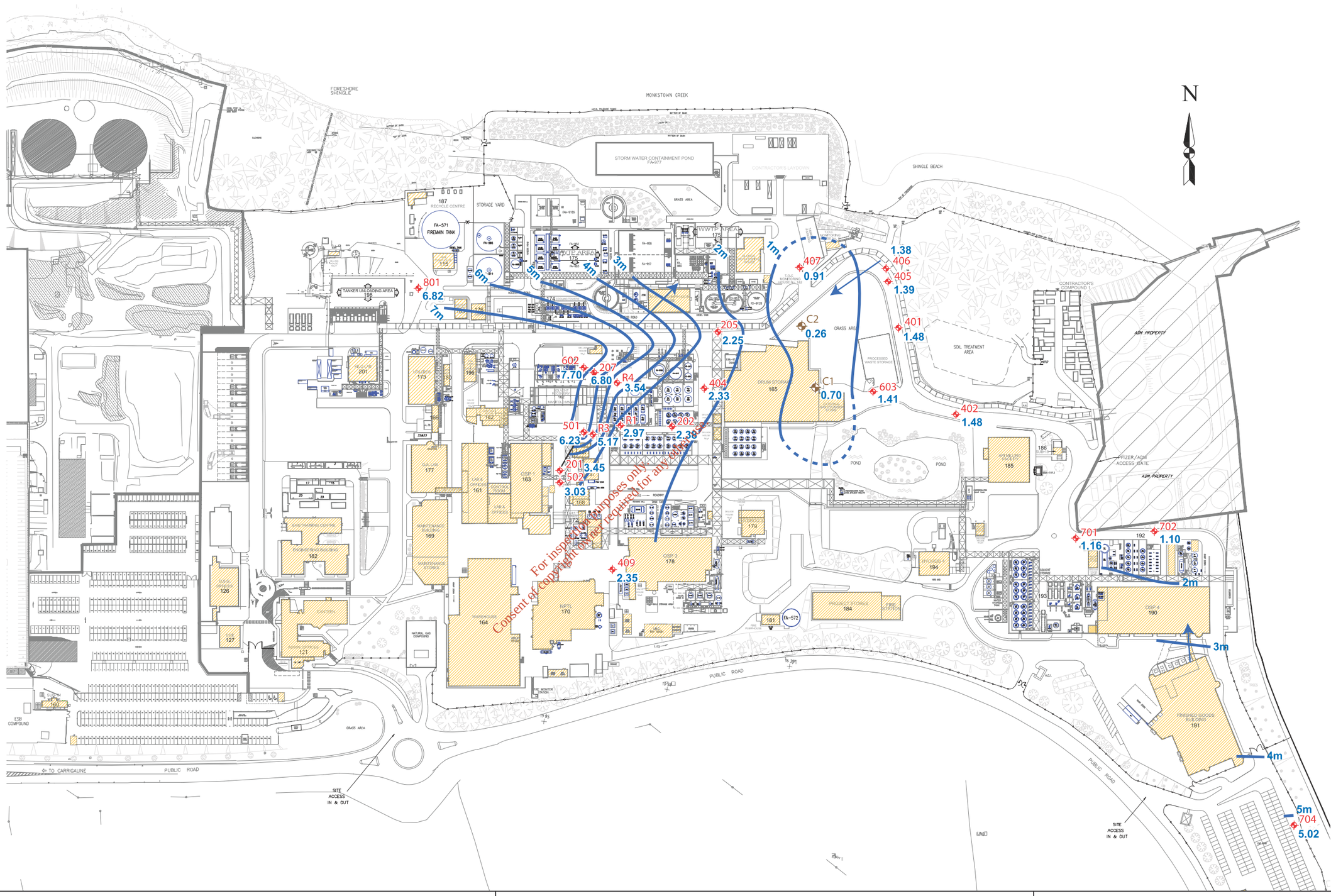
Ringaskiddy, Co. Cork

DRAWING TITLE

FIGURE 3 _ HISTORIC MONITORING WELLS

DRAWN	TRACED	CHECKED	APPROVED	DATE
BMC		KF	EO'H	AUG_2019

SCALE	Job No:
AS SHOWN	**PR-423449_ACM_RP_EN_001**



CLIENT	PFIZER IRELAND PHARMACEUTICALS
PROJECT	SOIL AND GROUNDWATER BASELINE 2019 RINGASKIDDY API, Co. CORK
DRAWING TITLE	**FIGURE 4 _** BEDROCK GROUNDWATER CONTOUR MAP (MAY 2019)

DRAWN	TRACED	CHECKED	APPROVED	DATE
BMC		EO'H	KF	AUG 2019
SCALE: AS SHOWN	DRG NO.: **PR-423449_ACM_RP_EN_001**			

NOTES

- Hydraulic Containment Well
- Groundwater Monitoring Well (In Limestone)
- 2m — Groundwater Equipotential in Limestone (m AOD)
- Inferred Groundwater Equipotential
- Groundwater Flow Direction (Predicted) in Limestone

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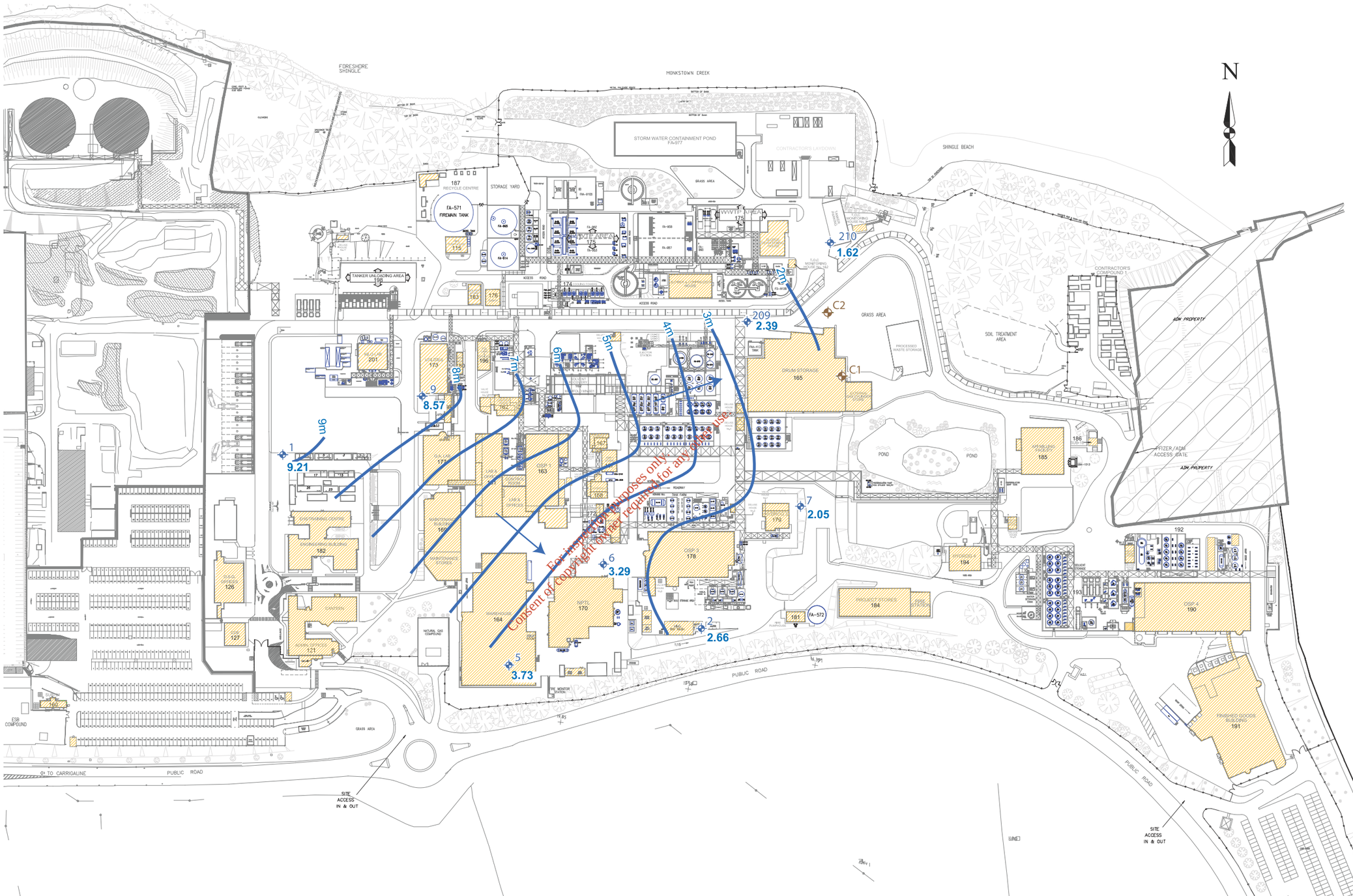

CLIENT

PFIZER IRELAND PHARMACEUTICALS

PROJECT

SOIL AND GROUNDWATER BASELINE 2019
RINGASKIDDY API, Co. CORK

DRAWING TITLE

FIGURE 5 _ DRIFT GROUNDWATER CONTOUR MAP (MAY 2019)

DRAWN	TRACED	CHECKED	APPROVED	DATE
BMC		EO'H	KF	MAY 2019
SCALE	DRG NO.			
AS SHOWN	**PR-423449_ACM_RP_EN_001**			

NOTES

- Hydraulic Containment Well
- Groundwater Monitoring Well (In Drift)
- 2m Groundwater Equipotential in Drift (m AOD)
- Groundwater Flow Direction (Predicted) in Drift

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Figure 6.1: Benzene Concentration Trends in IEL Wells from May 2005 to May 2019

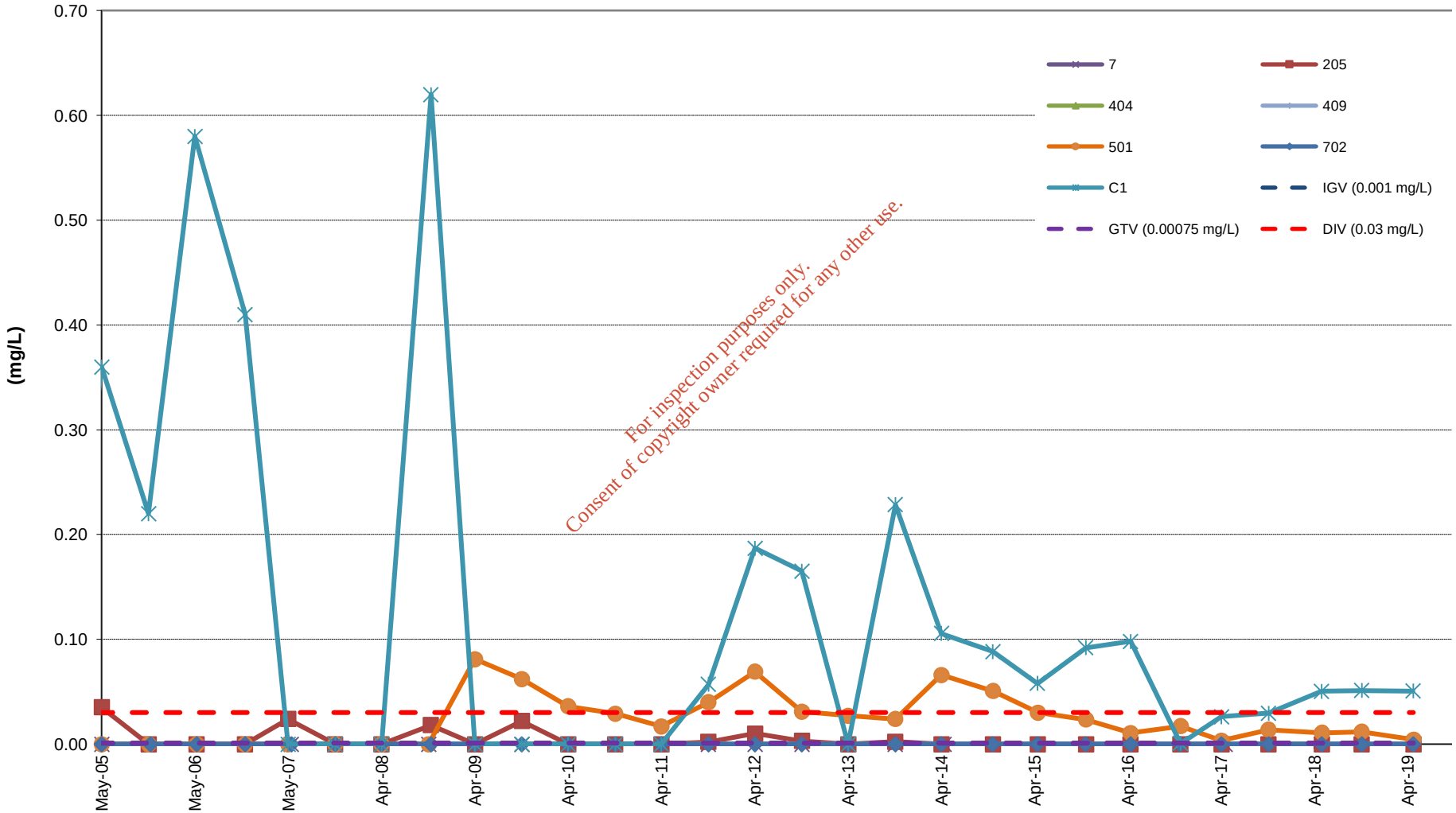


Figure 6.2: Benzene Concentration Trends in IEL Wells from May 2005 to May 2019

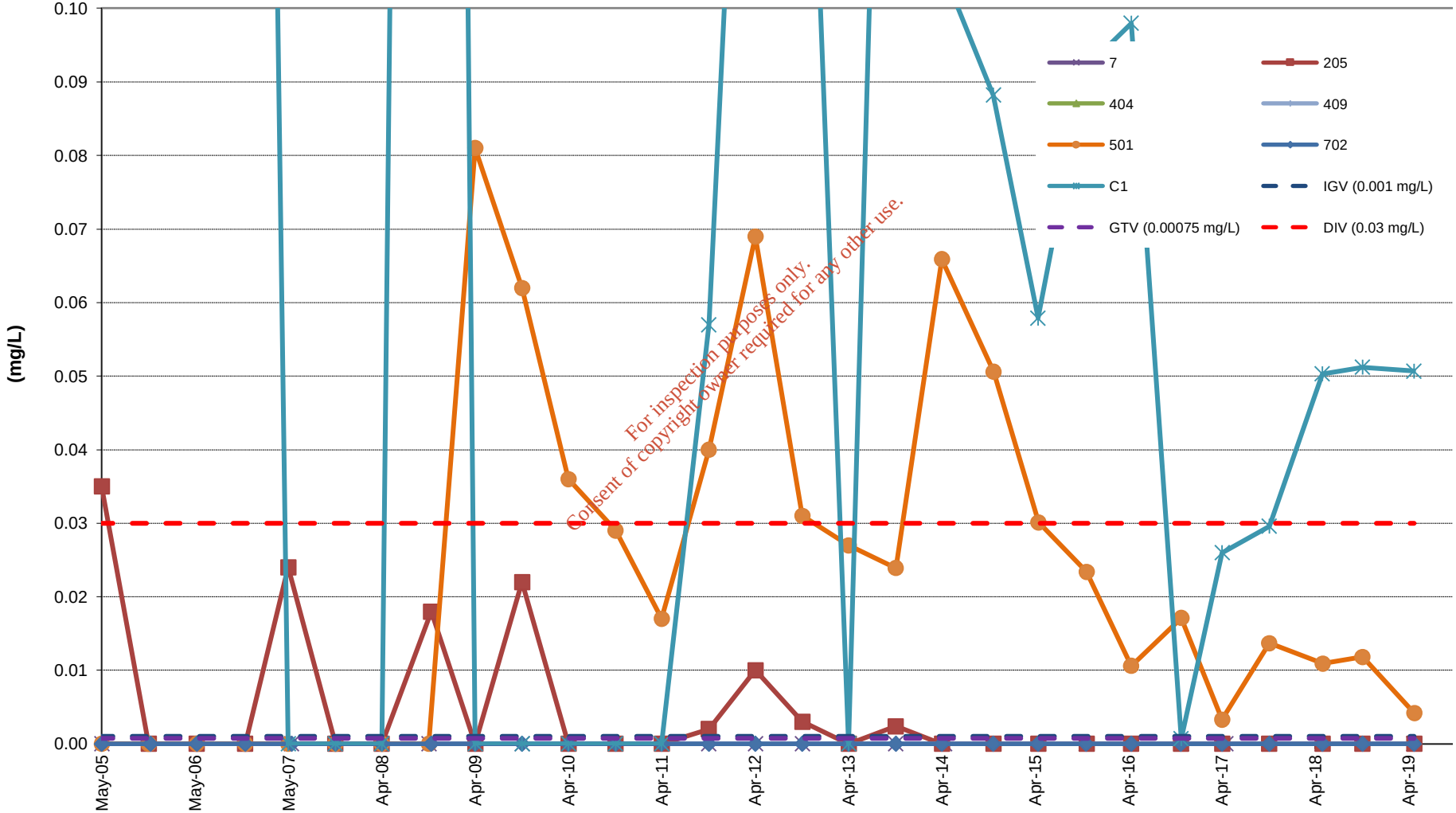


Figure 7.1: Toluene Concentration Trends in IEL Wells from May 2005 to May 2019

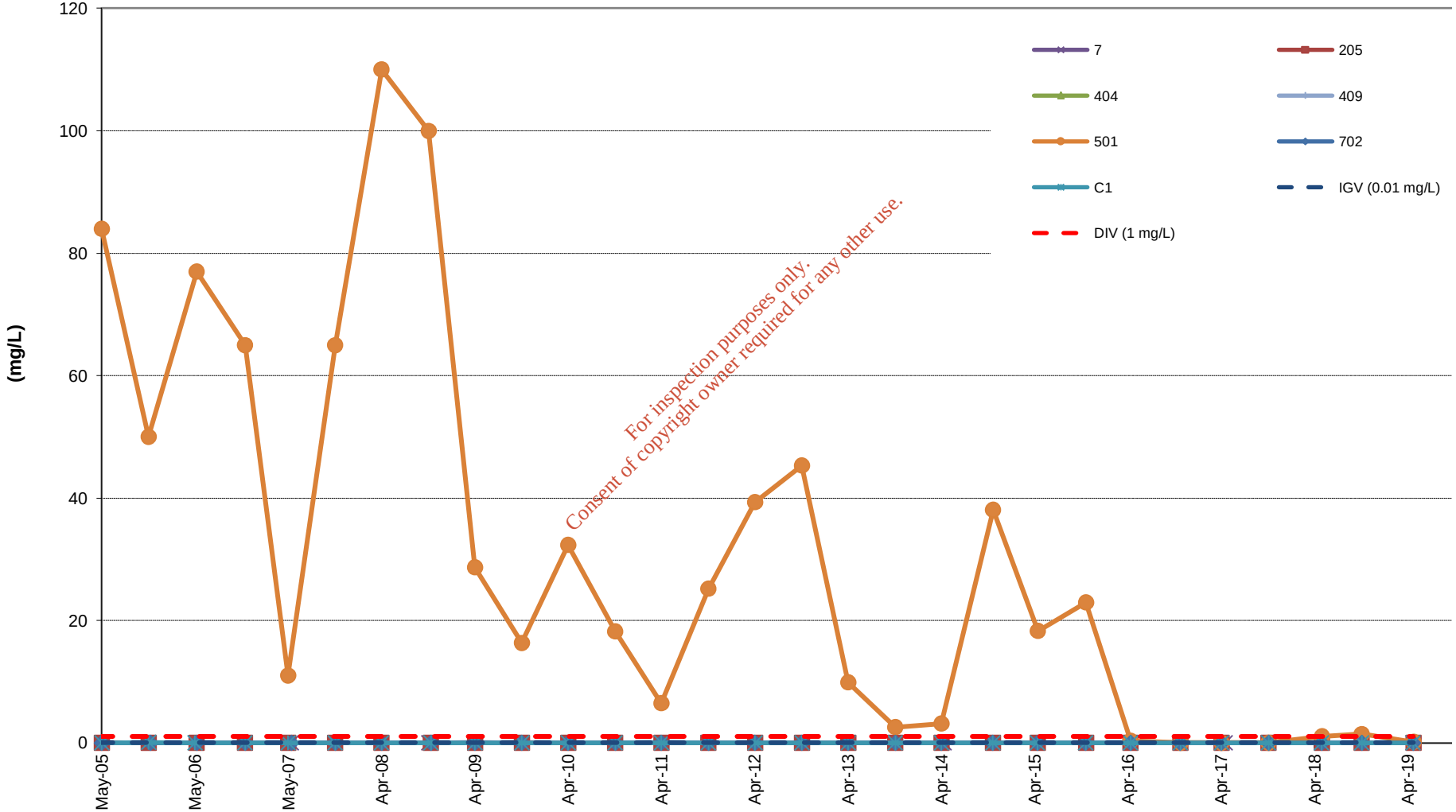


Figure 7.2: Toluene Concentration Trends in IEL Wells from May 2005 to May 2019

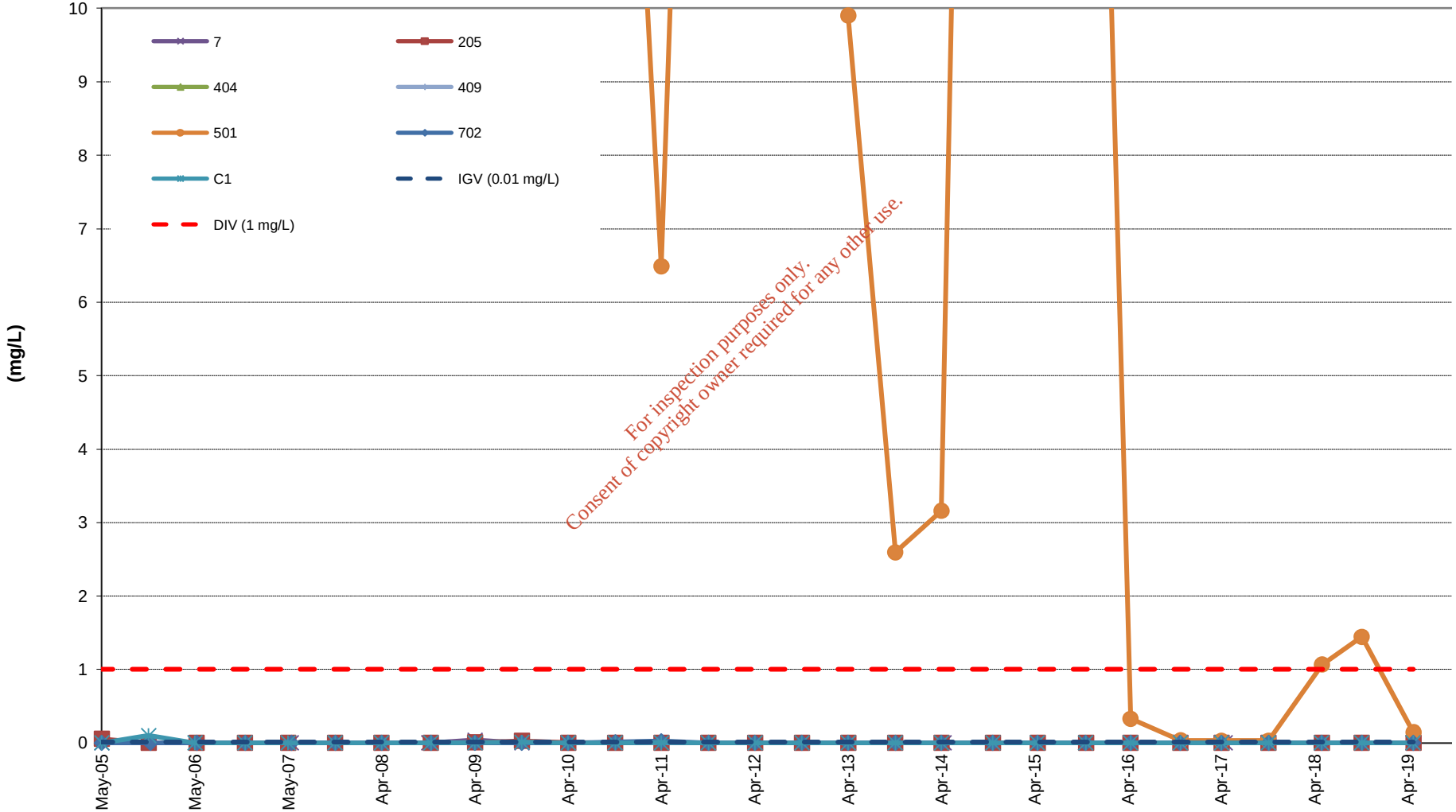


Figure 8.1: Total Xylene Concentration Trends in IEL Wells from May 2005 to May 2019

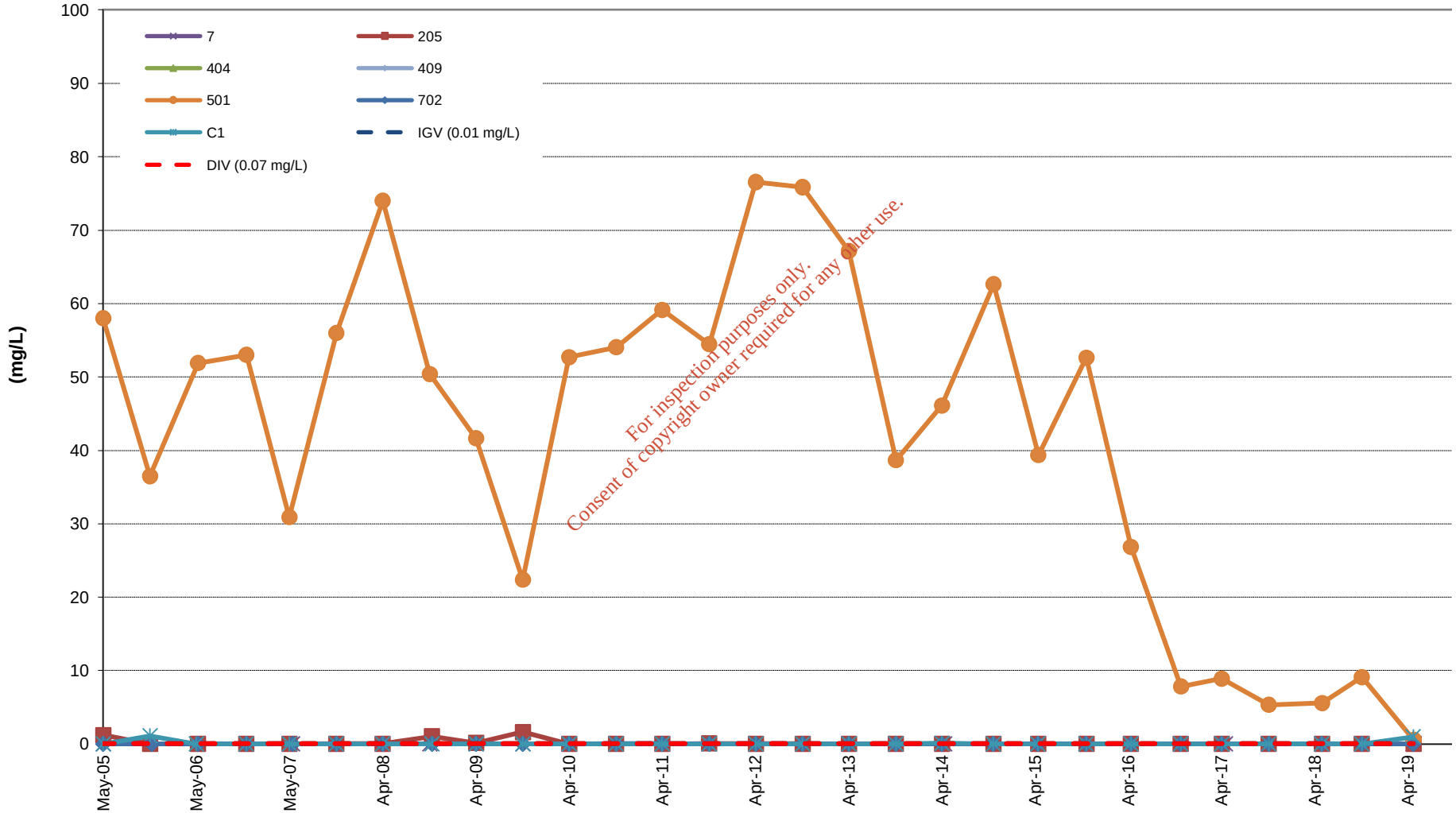


Figure 8.2 Total Xylene Concentration Trends in IEL Wells from May 2005 to May 2019

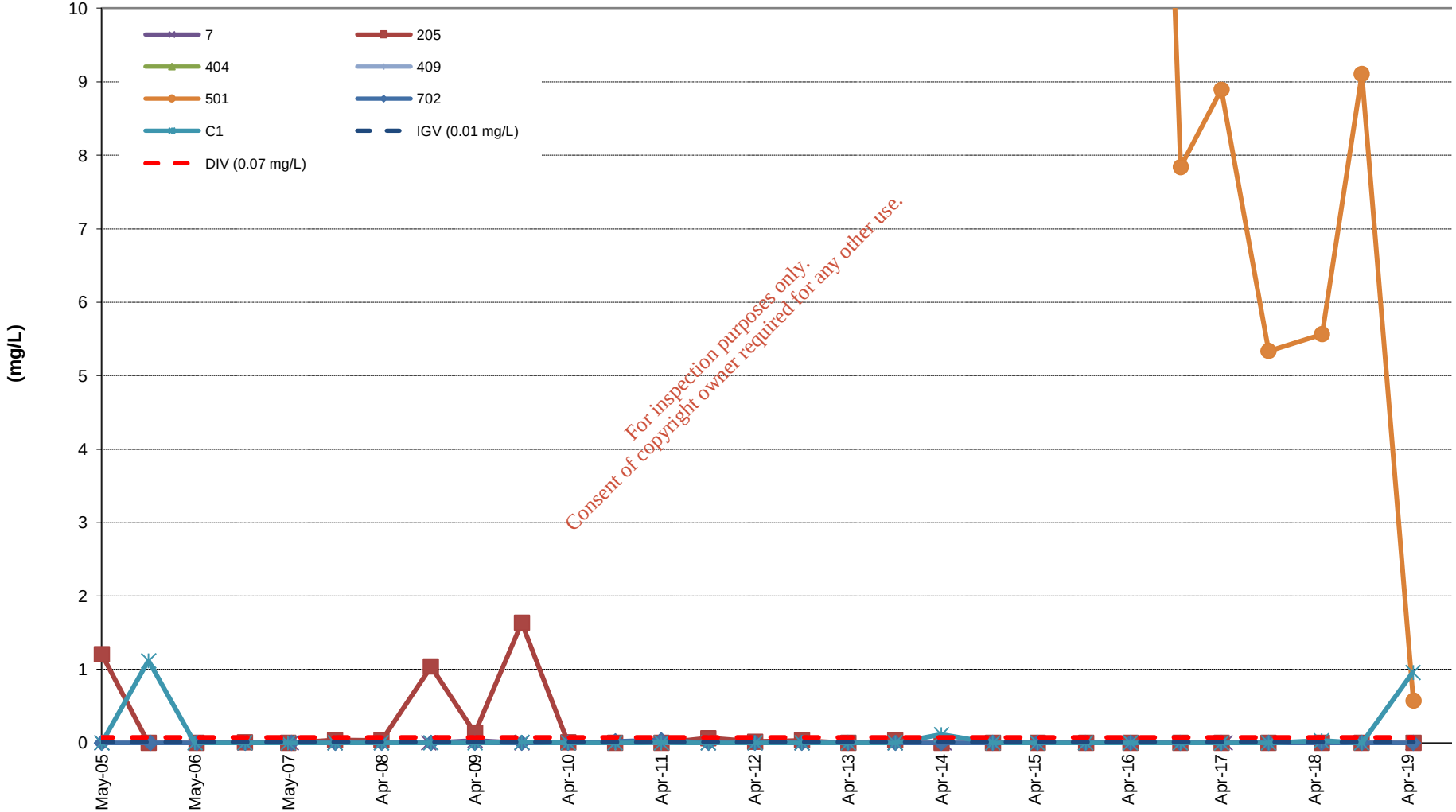


Figure 9.1: THF Concentration Trends in IEL Wells from May 2005 to May 2019

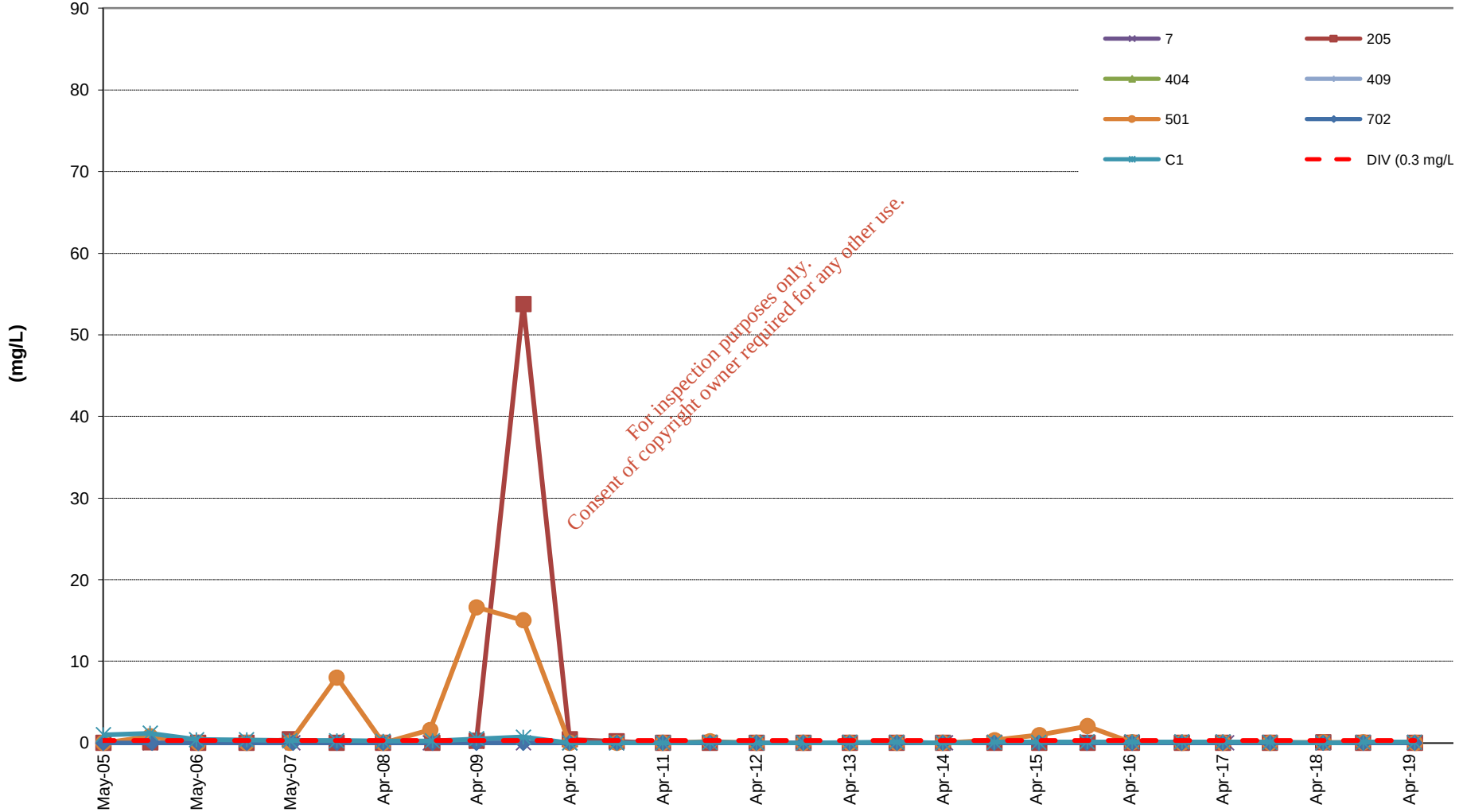


Figure 9.2: THF Concentration Trends in IEL Wells from May 2005 to May 2019

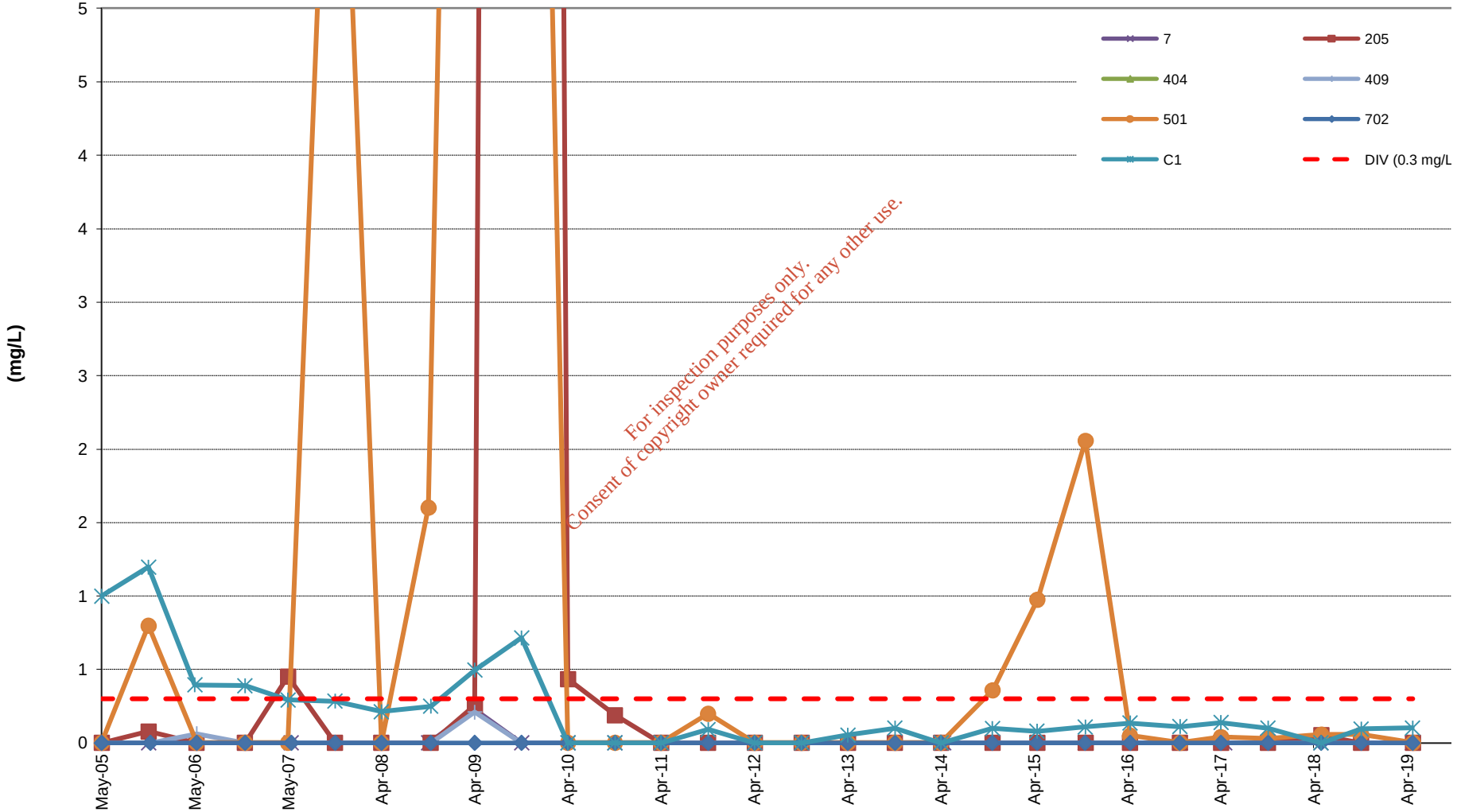


Figure 10.1: Cyclohexane Concentration Trends in IEL Wells from May 2005 to May 2019

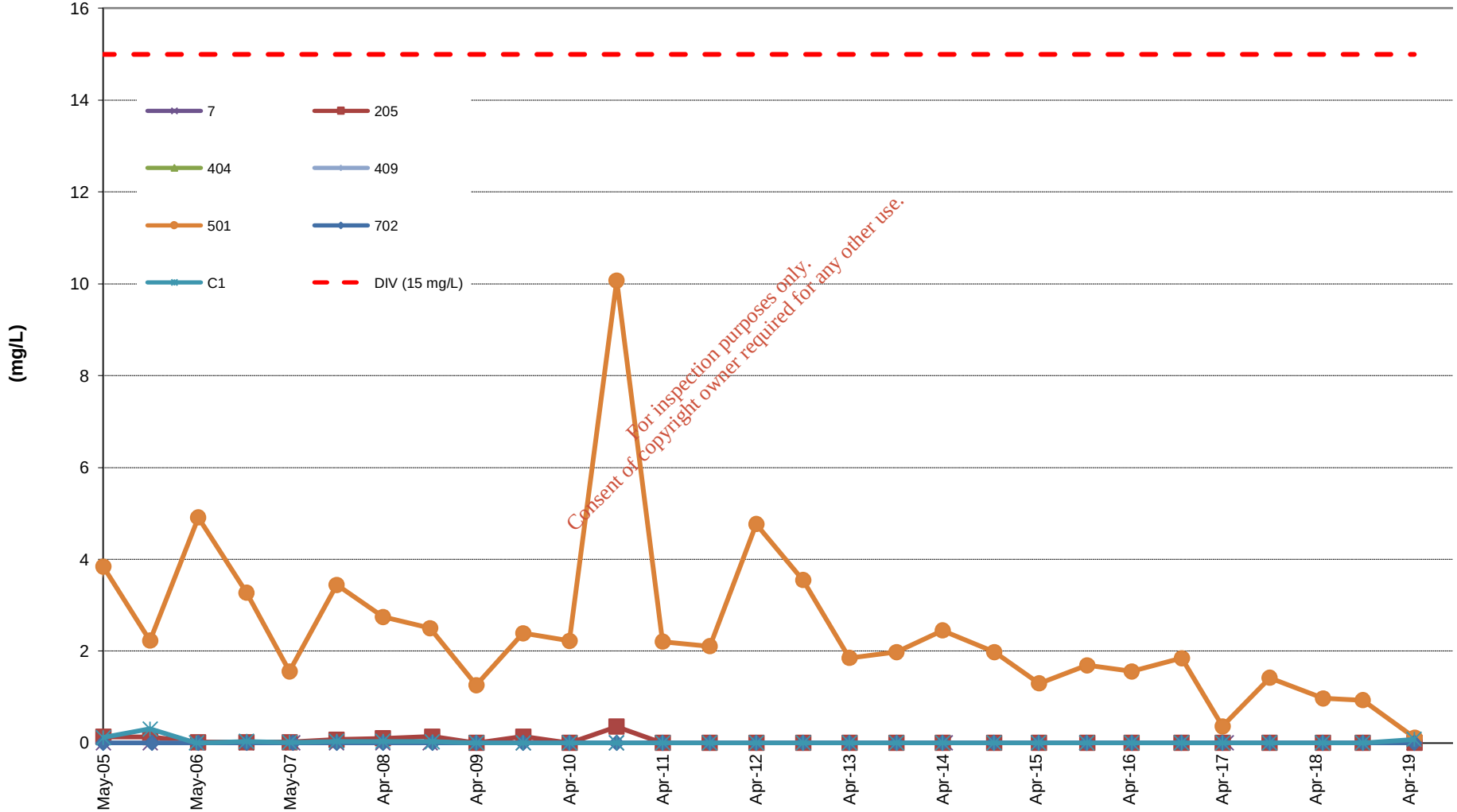
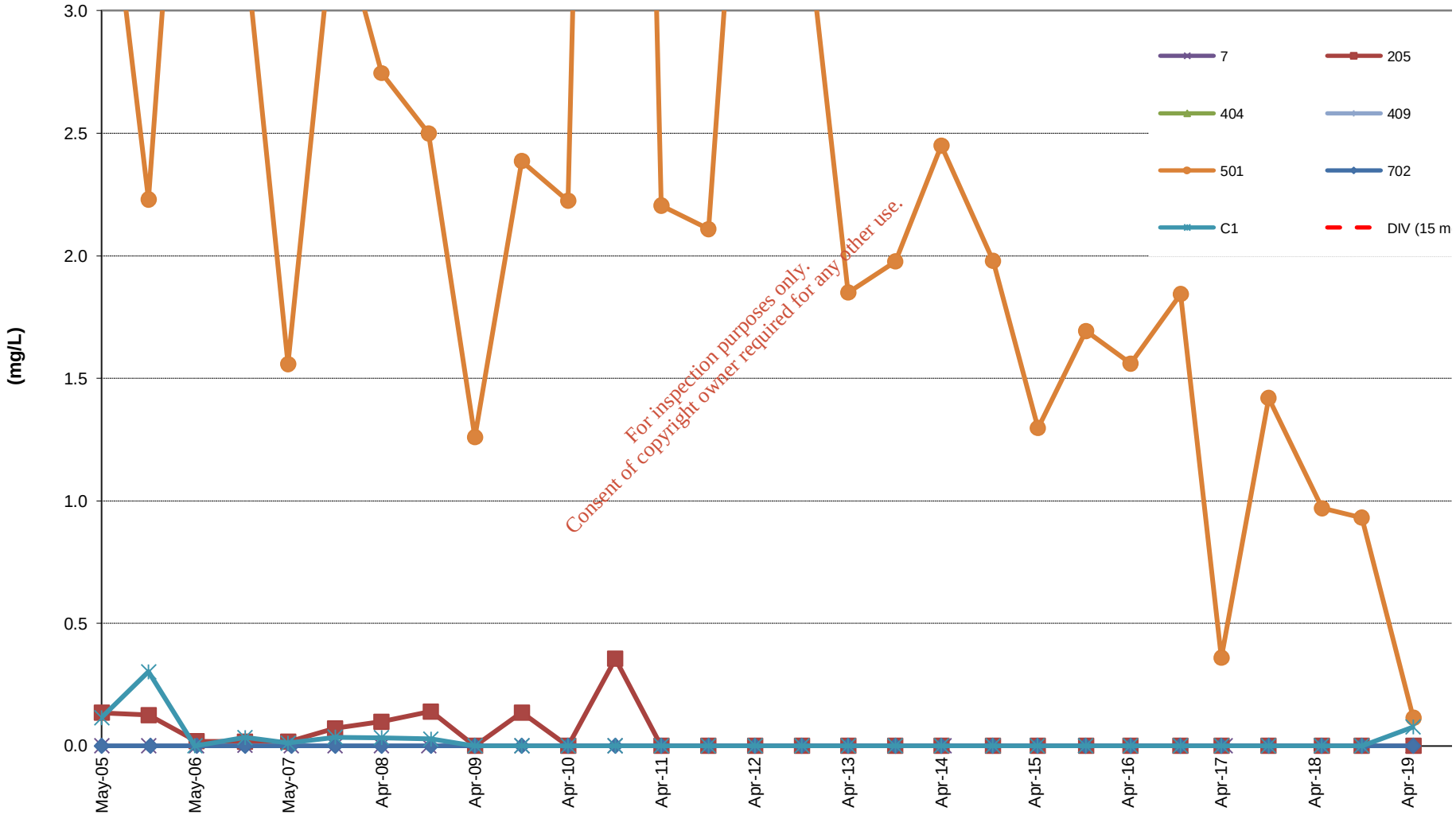


Figure 10.2: Cyclohexane Concentration Trends in IEL Wells from May 2005 to May 2019



Current Licensed Site Boundary

BH1 - Proposed Soil Bore Location, with 10m radius surround

Revision Details	By / Check	Date	Suffix

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. THIS DRAWING IS NOT TO SCALE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

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THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

Purpose of issue

Client: Strictly Confidential

Project Title: Strictly Confidential

Drawing Title: SITE LAYOUT PLAN

Designed	Drawn	Checked	Approved	Date
	BMC	KF	KF	14/06/2019

AECOM Internal Project No.: PR-423449 | Suitability:

Scale @ A1: NTS | Zone / Mileage:

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Carrigaline Road,
Douglas, Cork, Ireland. T12 H6XH
Tel:021 4365006
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Drawing Number: FIGURE 11

Rev:

Plot Date: 19 July 2019 14:05:51
File Name: Z:\PR-423449_PFIZER_RING_BASELINE_SOIL_ASSIT\400 TECHNICAL\4SD TECHNICAL\AREA XFIGURES\BOREHOLE LOCATIONS NEW BASEMAP

Appendix B Relevant Hazardous Substances Tables

Material/Substance	CAS Number	Stage 1				Stage 2			
		EPA's Classification of Hazardous and Non-hazardous Substances	Relevant Hazard Statement	Hazardous Substance	Annual Usage greater than 250 L / 250 kg	Physical State of Chemical Stored On-Site	Annual Usage (approximate)	Unit	Considered a Relevant Hazardous Substance
1,2 Dimethoxyethane	110-71-4	Not Listed	H360D, H360F	Yes	Yes	Liquid	3,570	L	Yes - Relevant Hazard Statement (H360D and H360F)
1,2-Dichlorobenzene	95-50-1	Hazardous	H400, H410	Yes	Yes	Liquid	33,000	L	Yes - Relevant Hazard Statements (H400 and H410)
1,3-Dibromo-5,5-dimethylhydantoin	77-48-5	Not Listed	H400, H410	Yes	Yes	Solid	25,700	kg	No - Material is a Solid
1,8-Diazabicyclo[5.4.0]undec-7-ene	6674-22-2	Not Listed	H412	Yes	Yes	Liquid	760	L	Yes - Relevant Hazard Statement (H412)
1-Naphthol	90-15-3	Undetermined	-	No	Yes	Solid	3,500	kg	No - Material is a Solid
2-(Dicyclohexylphosphino) biphenyl	247940-06-3	Not Listed	H413	Yes	Yes	Solid	700	kg	No - Material is a Solid
2,2,4-Trimethylpentane	540-84-1	Not Listed	H400, H410	Yes	Yes	Liquid	32,000	L	Yes - Relevant Hazard Statements (H400 and H410)
2-Amino pyridine	504-29-0	Not Listed	H411	Yes	Yes	Solid	1,600	kg	No - Material is a Solid
2-Butanol	78-92-2	Undetermined	-	No	Yes	Liquid	8,750	L	No - not classified as hazardous and no relevant hazard statement
2-Hydroxyethyl Hydrazine	109-84-2	Not Listed	H351	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
2-Methyl-2,4-Pentanediol	107-41-5	Undetermined	-	No	No	Liquid	<250	L	No - not classified as hazardous and no relevant hazard statement
2-Vinylpyridine	100-69-6	Not Listed	H411	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
4-Chloroaniline	106-47-8	Hazardous	H350, H400, H410	Yes	Yes	Solid	5,600	kg	No - Material is a Solid
4-Chlorophenyl isocyanate	104-12-1	Not Listed	H410	Yes	No	Solid	<250	kg	No - Material is a Solid
4-Dimethylaminopyridine	1122-58-3	Not Listed	H411	Yes	Yes	Solid	350	kg	No - Material is a Solid
5%-10% or greater Palladium on Carbon	440-05-3	Not Listed	H413	Yes	Yes	Solid	1,300	kg	No - Material is a Solid
5-Chlorooxindole	17630-75-0	Not Listed	H412	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
6-Chlorooxindole	56341-37-8	Not Listed	H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Acetic Acid	64-19-7	Undetermined	-	No	Yes	Liquid	50,000	L	No - not classified as hazardous and no relevant hazard statement
Acetone	67-64-1	Undetermined	-	No	Yes	Liquid	60,000	L	No - not classified as hazardous and no relevant hazard statement
Acetone (Recovered, Spent)	67-64-1	Undetermined	-	No	Yes	Liquid	50,000	L	No - not classified as hazardous and no relevant hazard statement
AG1859 Step 1	Unknown	Unknown	Unknown	Yes	Yes	Solid	862	kg	No - Material is a Solid
AG1859 Step 2	Unknown	Unknown	Unknown	Yes	Yes	Solid	1,136	kg	No - Material is a Solid
AG1859 Step 3	Unknown	Unknown	Unknown	Yes	Yes	Solid	953	kg	No - Material is a Solid
Airhitone A452	106-24-1	Not Listed	H410, H411 ,H412	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Alatrofloxacin step 1	Unknown	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Alatrofloxacin step 2	Unknown	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Alatrofloxacin step 2R	Unknown	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Alcoseal 3-6%	107-41-5	Undetermined	-	No	Yes	Gas	3,000	L	No - Material is a Gas
Allylamine	107-11-9	Not Listed	H411	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Aminoguanidine Bicarbonate	2582-30-1	Not Listed	H360, H411	Yes	Yes	Solid	6,000	kg	No - Material is a Solid
Amlodipine Step 2	88150-62-3	Not Listed	H413	Yes	Yes	Solid	5,000	kg	No - Material is a Solid
Amlodipine Step 3	88150-62-3	Not Listed	H413	Yes	Yes	Solid	4,000	kg	No - Material is a Solid
Amlodipine Step 4	88150-42-9	Not Listed	H410, H400	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Amlodipine Step 5	111470-99-6	Not Listed	H400, H410, H411, H361DF	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Ammonia Anhydrous (Refrigeration)	7664-41-7	Non-Hazardous	H400, H410	Yes	No	Gas	<250	L	No - Material is a Gas
Ammonia gas	7664-41-7	Non-Hazardous	H400	Yes	Yes	Gas	2,000	L	No - Material is a Gas
Ammonium Hydroxide	1336-21-6	Not Listed	H400	Yes	Yes	Liquid	2,500	L	Yes- Relevant Hazard Statement (H400)
Ammonium Trifluoroacetate	3336-58-1	Not Listed	H400	Yes	Yes	Solid	4,000	kg	No - Material is a Solid
Asenapine	85650-56-2	Not Listed	H400, H410, H413	Yes	Yes	Solid	282	kg	No - Material is a Solid
Atorvastatin Diketone	125971-96-2	Not Listed	H413	Yes	Yes	Solid	3,600	kg	No - Material is a Solid
Atorvastatin Lactone	125995-03-1	Not Listed	H413	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
Atorvastatin TCA	125971-57-5	Not Listed	H411	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Axitinib (AG-013736)	319460-85-0	Not Listed	H341, H361, H400	Yes	Yes	Solid	5,000,000	kg	No - Material is a Solid
Axitinib 5	319460-85-0a	Not Listed	H341, H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Axitinib API	319460-85-0b	Not Listed	H341, H361FD, H410, H373	Yes	No	Solid	<250	kg	No - Material is a Solid
Azithromycin Step 4	83905-01-5	Not Listed	H400, H410, H413	Yes	Yes	Solid	3,500	kg	No - Material is a Solid
Azobisisobutyronitrile (AIBN)	78-67-1	Not Listed	H412	Yes	Yes	Solid	500	kg	No - Material is a Solid
Benzene	71-43-2	Hazardous	H340, H350	Yes	No	Liquid	<250	L	Yes- Classified as 'Hazardous', Relevant Hazard Statements (H340 and H350) and Historic Groundwater Contamination
BETZ 415	2809-21-4	Hazardous	H413	Yes	Yes	Liquid	<250	L	No - Quantity below 250 L / 250 kg
BIBEA	125971-57-5	Not Listed	H411	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Bis Triphenyl phosphine Palladium (II) C	13965-03-2	Not Listed	H413	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Bosutnib API (WAY-173606)	918639-08-4	Not Listed	H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Bromine	7726-95-6	Undetermined	H400	Yes	No	Liquid	-	L	No - No longer used or stored on site
Butyl Vinyl Ether	111-34-2	Not Listed	H412	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Butylated Hydroxy Toluene (BHT)	128-37-0	Not Listed	H410, H400, H413	Yes	No	Solid	<250	kg	No - Material is a Solid
Calcium Oxide (Quicklime)	1305-78-8	Undetermined	-	No	Yes	Solid	30,000	kg	No - Material is a Solid
Carbon Activated	7440-44-0	Not Listed	H412	Yes	Yes	Solid	3,500	kg	No - Material is a Solid
Chloroacetyl Chloride	79-04-9	Not Listed	H400	Yes	Yes	Liquid	710	L	Yes- Relevant Hazard Statement (H400)
Chloroform	67-66-3	Hazardous	-	Yes	Yes	Liquid	-	L	Yes - Classified as 'Hazardous'
Chlorotirmethylsilane	75-77-4	Not Listed	H351	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Citric Acid	77-92-9	Undetermined	-	No	Yes	Solid	7,000	kg	No - Material is a Solid
Copper Chloride	7758-89-6	Not Listed	H400, H410	Yes	Yes	Solid	4,000	kg	No - Material is a Solid
Copper Iodide	7681-65-4	Not Listed	H400, H410, H411	Yes	No	Solid	<250	kg	No - Material is a Solid
Copper sulphate pentahydrate	7758-99-8	Not Listed	H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Cortrol IS3000 -GE BETZ	7631-90-5	Undetermined	-	No	Yes	Liquid	270	L	No - not classified as hazardous and no relevant hazard statement
CP-611,831-08	Unknown	Unknown	Unknown	Yes	Yes	Solid	850	kg	No - Material is a Solid
CP-690,550-10 Step 2 (CP-703,058-01 --	Unknown	Unknown	Unknown	Yes	Yes	Solid	1,800	kg	No - Material is a Solid
CP-690,550-10 Step 3	540737-29-9	Not Listed	H360	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
CP-703,458	Unknown	Unknown	Unknown	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
CP-74,972-1	4274-38-8	Not Listed	H400	Yes	Yes	Solid	800	kg	No - Material is a Solid
CP-759,970-01 (CP-690,550-10 - RSM)	Unknown	Unknown	Unknown	Yes	Yes	Solid	2,500	kg	No - Material is a Solid

Material/Substance	CAS Number	Stage 1				Stage 2			
		EPA's Classification of Hazardous and Non-hazardous Substances	Relevant Hazard Statement	Hazardous Substance	Annual Usage greater than 250 L / 250 kg	Physical State of Chemical Stored On-Site	Annual Usage (approximate)	Unit	Considered a Relevant Hazardous Substance
CP-80,087	122665-86-5	Not Listed	H412	Yes	Yes	Solid	840	kg	No - Material is a Solid
CP-945,598	Unknown	Unknown	Unknown	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
CP-945,598-01	Unknown	Unknown	Unknown	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
Crizotinib 2	877399-52-5	Not Listed	H411	Yes	Yes	Solid	500	kg	No - Material is a Solid
Crizotinib API	877399-52-5	Not Listed	H400	Yes	No	Solid	<250	kg	No - Material is a Solid
Crizotinib Step 2 (PF-00968604)	-	Not Listed	H341, H400	Yes	Yes	Solid	4,100	kg	No - Material is a Solid
Cumene Hydroperoxide	80-15-9	Not Listed	H411	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Cyclohexane	110-82-7	Not Listed	H410	Yes	Yes	Liquid	30,000	L	Yes - Relevant Hazard Statement (H410)
Cyclohexylmagnesium chloride/THF	109-99-9	Not Listed	H351	Yes	Yes	Liquid	14,500	L	Yes - Relevant Hazard Statement (H351)
Cyclopentylamine	1003-03-8	Not Listed	H412	Yes	Yes	Liquid	1,600	L	Yes - Relevant Hazard Statement (H412)
Dacomitinib Step 2 (PF-05201372-03)	1110813-31-4	Not Listed	H400, H410	Yes	Yes	Solid	1,700	kg	No - Material is a Solid
Dacomitinib Step 2R (PF-05201372-03)	1110813-31-4	Not Listed	H400, H410	Yes	Yes	Solid	1,400	kg	No - Material is a Solid
Dacomitinib Step 3 (PF-00299804-03)	1110813-31-4	Not Listed	H400, H410	Yes	Yes	Solid	640	kg	No - Material is a Solid
Dacomitinib Step 3R (PF-00299804-03)	1110813-31-4	Not Listed	H400, H410	Yes	Yes	Solid	640	kg	No - Material is a Solid
Danofloxacin 6N	93107-30-3	Not Listed	H412	Yes	Yes	Solid	2,500	kg	No - Material is a Solid
Danofloxacin 7(Base)	112398-08-0	Not Listed	H412	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Danofloxacin 8(Mesylate)	119478-55-6	Not Listed	H412	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Darifenacin step 1	-	Not Listed	H400, H410	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Darifenacin step 2	252317-48-9	Not Listed	H400, H410	Yes	Yes	Solid	450	kg	No - Material is a Solid
Darifenacin step 3	-	Not Listed	H400, H410	Yes	Yes	Solid	490	kg	No - Material is a Solid
Darifenacin step 3Rx	-	Not Listed	H400, H410	Yes	Yes	Solid	490	kg	No - Material is a Solid
Darifenacin step 5(Hydrobromide)	133099-07-7	Not Listed	H400, H410	Yes	Yes	Solid	380	kg	No - Material is a Solid
Darifenacin step 5R	133099-07-7	Not Listed	H400, H410	Yes	Yes	Solid	380	kg	No - Material is a Solid
Daunorubicin Hydrochloride	23541-50-6	Not Listed	H351, H360FD, H341	Yes	Yes	Solid	345	kg	No - Material is a Solid
Desvenlafaxine Step 1	93413-69-5	Not Listed	H360FD, H411	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
Desvenlafaxine Step 2	93413-62-8	Not Listed	H411	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
Desvenlafaxine Step 3	386750-22-7	Not Listed	H411	Yes	Yes	Solid	1,300	kg	No - Material is a Solid
Dianodic DN2108 - GE BETZ	1310-58-3	Undetermined	-	No	Yes	Liquid	800	L	No - not classified as hazardous and no relevant hazard statement
Dianodic DN2301 -GE BETZ	55965-84-9	Not Listed	H400, H410	Yes	Yes	Liquid	400	L	Yes - Relevant Hazard Statements (H400 and H410)
Dichloromethane	75-09-2	Hazardous	H351	Yes	Yes	Liquid	20,000	L	Yes - Relevant Hazard Statement (H351)
Dichloromethane	74-87-3	Not Listed	H351	Yes	Yes	Liquid	1,500	L	Yes - Relevant Hazard Statement (H351)
Diesel Oil	68334-30-5	Not Listed	H351	Yes	Yes	Liquid	8,895	L	Yes - Relevant Hazard Statement (H351)
Dimebon Step 1	3613-73-8	Not Listed	H413	Yes	Yes	Solid	37,000	kg	No - Material is a Solid
Dimebon Step 2/2R	Unknown	Unknown	Unknown	Yes	Yes	Solid	37,000	kg	No - Material is a Solid
Dimethyl Aniline	121-69-7	Not Listed	H351, H411	Yes	Yes	Liquid	700	L	Yes - Relevant Hazard Statements (H351 and H411)
Dimethylacetamide	127-19-5	Not Listed	H360D	Yes	Yes	Liquid	14,000	L	Yes - Relevant Hazard Statement (H360D)
Dimethylformamide	68-12-2	Not Listed	H360D	Yes	Yes	Liquid	14,000	L	Yes - Relevant Hazard Statement (H360D)
Dofetlide API	155256-11-6	Not Listed	H360D, H360F, H411	Yes	Yes	Solid	500	kg	No - Material is a Solid
Dofetilide step 1	115287-37-1	Not Listed	H360FD	Yes	No	Solid	<250	kg	No - Material is a Solid
Dofetilide step 1 Rx	115287-37-1	Not Listed	H360FD	Yes	No	Solid	<250	kg	No - Material is a Solid
Dofetilide step 2	115256-13-8	Not Listed	H360FD	Yes	No	Solid	<250	kg	No - Material is a Solid
Dofetilide step 3	115256-11-6	Not Listed	H360FD, H411	Yes	No	Solid	<250	kg	No - Material is a Solid
Dofetilide step 4	115256-11-6	Not Listed	H360FD, H411	Yes	No	Solid	<250	kg	No - Material is a Solid
Dofetilide step 5	115256-11-6	Not Listed	H360FD, H411	Yes	No	Solid	<250	kg	No - Material is a Solid
Dowtherm J	25340-17-4	Not Listed	H400, H410, H411	Yes	Yes	Liquid	45,000	L	Yes - Relevant Hazard Statements H400, H410 and H411
Doxazosin Mesylate	77883-43-3	Not Listed	H411, H413	Yes	Yes	Solid	550	kg	No - Material is a Solid
Doxazosin Step 4	70918-74-0	Not Listed	H411	Yes	Yes	Solid	600	kg	No - Material is a Solid
Doxycycline Carrageenate	-	Not Listed	H360D	Yes	Yes	Solid	500	kg	No - Material is a Solid
Doxycycline Hyclate	24390-14-5	Not Listed	H360D, H400	Yes	Yes	Solid	6,000	kg	No - Material is a Solid
Doxycycline Monohydrate	17086-28-1	Not Listed	H360D	Yes	Yes	Solid	4,000	kg	No - Material is a Solid
Doxycycline SSA	35689-59-9	Not Listed	H360D	Yes	Yes	Solid	8,000	kg	No - Material is a Solid
Droloxifene Step 1	57999-49-2	Not Listed	H411	Yes	No	Solid	<250	kg	No - Material is a Solid
Droloxifene Step 2	82413-20-5	Not Listed	H351, H410, H360F	Yes	No	Solid	<250	kg	No - Material is a Solid
Droloxifene Step 3 (Freebase)	82413-20-5	Not Listed	H351, H400, H410, H360F	Yes	No	Solid	<250	kg	No - Material is a Solid
Eletriptan step 3 (Freebase)	143322-58-1	Not Listed	H412	Yes	No	Solid	<250	kg	No - Material is a Solid
Eletriptan step 3R(Freebase)	143322-58-1	Not Listed	H412	Yes	No	Solid	<250	kg	No - Material is a Solid
Esomeprazole Magnesium Trihydrate	217087-09-7	Not Listed	H411, H412	Yes	Yes	Solid	20,220	kg	No - Material is a Solid
Esso Zerice 100	68081-77-6	Not Listed	H413	Yes	Yes	Liquid	410	L	Yes - Relevant Hazard Statement (H413)
Esso Zerice 68	68081-77-6	Not Listed	H413	Yes	Yes	Liquid	410	L	Yes - Relevant Hazard Statement (H413)
Ethanol/IMS	64-17-5	Undetermined	-	No	Yes	Liquid	40,000	L	No - not classified as hazardous and no relevant hazard statement
Ethanolamine	141-43-5	Undetermined	-	No	Yes	Liquid	700	L	No - not classified as hazardous and no relevant hazard statement
Ethylene Glycol	107-21-1	Undetermined	-	No	Yes	Liquid	40,000	L	No - not classified as hazardous and no relevant hazard statement
Ethylenediaminetetraacetic acid, potassium	2001-94-7	Not Listed	H412	Yes	No	Solid	<250	kg	No - Material is a Solid
Fesoterodine Base (Step 4/4R)	-	Not Listed	H402 (final product)	Yes	Yes	Solid	50,000	kg	No - Material is a Solid
Fesoterodine Chiral Acid	-	Not Listed	H402 (final product)	Yes	Yes	Solid	25,000	kg	No - Material is a Solid
Fesoterodine Mandelate (Step 3)	-	Not Listed	H402 (final product)	Yes	Yes	Solid	30,000	kg	No - Material is a Solid
Fesoterodine Methyl Ester (Step 4)	-	Not Listed	H402 (final product)	Yes	No	Solid	<250	kg	No - Material is a Solid
Fesoterodine Racemate (Step 2)	-	Not Listed	H402 (final product)	Yes	No	Solid	<250	kg	No - Material is a Solid
Fluconazole Step 4	86386-73-4	Not Listed	H360D	Yes	Yes	Solid	4,000	kg	No - Material is a Solid
Fluconazole Step 5	86386-73-4	Not Listed	H360D	Yes	Yes	Liquid	7,367	L	Yes - Relevant Hazard Statement H360D)
Fluconazole Step 6	86386-73-4	Not Listed	H360D	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Formaldehyde (37%)	50-00-0	Non-Hazardous	H350	Yes	No	Liquid	-	L	No - No longer used or stored on site
Freon R134A	811-97-2	Hazardous	-	Yes	Yes	Gas	1,400	L	No - Material is a Gas

Material/Substance	CAS Number	Stage 1				Stage 2			
		EPA's Classification of Hazardous and Non-hazardous Substances	Relevant Hazard Statement	Hazardous Substance	Annual Usage greater than 250 L / 250 kg	Physical State of Chemical Stored On-Site	Annual Usage (approximate)	Unit	Considered a Relevant Hazardous Substance
Gabapentin Step 4	133481-10-4	Not Listed	H412	Yes	Yes	Solid	11,600	kg	No - Material is a Solid
Gabapentin Step 5	133481-09-1	Not Listed	H412	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
Gabapentin Step 6	60142-96-3	Not Listed	H360, H351	Yes	Yes	Solid	6,000	kg	No - Material is a Solid
Gabapentin Step 6R	60142-96-3	Not Listed	H360, H351	Yes	Yes	Solid	5,400	kg	No - Material is a Solid
Glycerol (85%)	56-81-5	Undetermined	-	No	Yes	Liquid	5,000	L	No - not classified as hazardous and no relevant hazard statement
Glycerol (99%)	56-81-5	Undetermined	-	No	Yes	Liquid	5,000	L	No - not classified as hazardous and no relevant hazard statement
Hydrochloric Acid HCL / Isopropanol IPA	67-63-0 (IPA)	Undetermined	-	No	Yes	Liquid	50,000	L	No - not classified as hazardous and no relevant hazard statement
Hydrochloric Acid HCL\Ethanol 4M Solution	64-17-5	Undetermined	-	No	Yes	Liquid	50,000	L	No - not classified as hazardous and no relevant hazard statement
Hydrobromic acid	10035-10-6	Undetermined	-	No	Yes	Liquid	10,000	L	No - not classified as hazardous and no relevant hazard statement
Hydroxylamine Solution	7803-49-8	Not Listed	H351, H400	Yes	Yes	Liquid	520	L	Yes - Relevant Hazard Statements (H351 and H400)
Imagabalin Step 1	Unknown	Unknown	Unknown	Yes	Yes	Solid	19,300	kg	No - Material is a Solid
Imidazole	288-32-4	Not Listed	H360D	Yes	No	Solid	<250	kg	No - Material is a Solid
Iodine	7553-56-2	Non-Hazardous	H400	Yes	Yes	Solid	14,000	kg	No - Material is a Solid
Isopropanol IPA (Recovered, Spent)	67-63-0	Undetermined	-	No	Yes	Liquid	50,000	L	No - not classified as hazardous and no relevant hazard statement
Isopropanol IPA	67-63-0	Undetermined	-	No	Yes	Liquid	50,000	L	No - not classified as hazardous and no relevant hazard statement
IsopropylmagnesIum chloride/THF	109-99-9 (THF)	Not Listed	H351	Yes	Yes	Liquid	20,000	L	Yes - Relevant Hazard Statement (H351)
Lasofoxifene	190791-29-8	Not Listed	H360, H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Latanoprost API	130209-82-4	Not Listed	H360D, H413	Yes	No	Solid	<250	kg	No - Material is a Solid
Linezolid	165800-03-3	Not Listed	H411	Yes	No	Solid	<250	kg	No - Material is a Solid
Lithium Hexamethyldisilazide (20% in THF)	109-99-9 (THF)	Not Listed	H351	Yes	Yes	Liquid	2,000	L	Yes - Relevant Hazard Statements (H351)
Magnesium	7439-95-4	Undetermined	-	No	No	Solid	<250	kg	No - Material is a Solid
Magnesium Sulphate, Heptahydrate	10034-99-8	Undetermined	-	No	Yes	Solid	4,932	kg	No - Material is a Solid
Meglumine	6284-40-8	Not Listed	H351, H360	Yes	No	Solid	<250	kg	No - Material is a Solid
Meldrum's Acid	2033-24-1	Not Listed	H400, H411	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Methoxycetate	839705-03-2	Not Listed	H412	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Methyl ethyl ketone MEK	78-93-3	Undetermined	-	No	Yes	Liquid	555,000	L	No - not classified as hazardous and no relevant hazard statement
Methyl iodide	74-88-4	Not Listed	H351	Yes	Yes	Liquid	3,000	L	Yes - Relevant Hazard Statement (H351)
Methyl(5R)-3-cyano-5-methyloctanoate	-	Unknown	Unknown	Yes	Yes	Liquid	139,000	L	Yes - Hazard Statements and Classification are not known
Nafoxidine HCl	1847-63-8	Not Listed	H351	Yes	Yes	Solid	300	kg	No - Material is a Solid
n-Butyl-di-tertbutyl phosphonium tetrafluoroborate	1816254-91-7	Not Listed	H401	Yes	No	Solid	<250	kg	No - Material is a Solid
N-Chlorosuccinimide	128-09-6	Not Listed	H412	Yes	Yes	Solid	4,000	kg	No - Material is a Solid
n-Heptane	142-82-5	Not Listed	H400, H410	Yes	Yes	Liquid	400,000	L	Yes - Relevant Hazard Statements (H400 and H410)
n-Hexane	110-54-3	Not Listed	H411	Yes	Yes	Liquid	320	L	Yes - Relevant Hazard Statement (H411)
Nitric Acid	7697-37-2	Undetermined	-	No	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
N-Methyl Pyrrolidone	872-50-4	Not Listed	H360D	Yes	Yes	Liquid	103,000	L	Yes - Relevant Hazard Statement (H360D)
N-Pentane (Not used - too hazardous)	109-66-0	Not Listed	H411	Yes	Yes	Liquid	5,000	L	Yes - Relevant Hazard Statement (H411)
N-Trifluoroacetyldaunomycinone	51996-45-3	Not Listed	H351	Yes	No	Solid	<250	kg	No - Material is a Solid
Oxytetracycline Base	79-57-2	Not Listed	H360D, H400, H410	Yes	Yes	Solid	7,000	kg	No - Material is a Solid
Oxytetracycline HCl	2058-46-0	Non-Hazardous	H410	Yes	Yes	Solid	3,000	kg	No - Material is a Solid
Palbociclib Step 2 (PF-00266998)	-	Not Listed	H341, H411 (Final Product)	Yes	Yes	Solid	4,500	kg	No - Material is a Solid
Palbociclib Step 3 (PD-00332991)	571190-30-2	Not Listed	H360D	Yes	Yes	Solid	4,500	kg	No - Material is a Solid
Palladium acetate	3375-31-3	Not Listed	H400, H410, H413	Yes	Yes	Solid	990	kg	No - Material is a Solid
Parecoxib 3	181695-72-7	Not Listed	H411	Yes	Yes	Solid	500	kg	No - Material is a Solid
Parecoxib Sodium API; Parecoxib Step	198470-85-8	Not Listed	H360	Yes	Yes	Solid	1,100	kg	No - Material is a Solid
Parecoxib Step 3	181695-72-7	Not Listed	H410	Yes	Yes	Solid	1,150	kg	No - Material is a Solid
PD 0332334 (PD-332,334 Step 4/4R)	-	Unknown	Unknown	Yes	Yes	Solid	1,200	kg	No - Material is a Solid
PD-0326503	281214-27-5	Unknown	Unknown	Yes	Yes	Solid	400	kg	No - Material is a Solid
PD-348292	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Pearlman's Catalyst (PdOH on C)	12135-22-7	Not Listed	H413	Yes	No	Solid	<250	kg	No - Material is a Solid
PF 0110529 (PD-332,334 Step 2)	-	Unknown	Unknown	Yes	Yes	Liquid	3,000	L	Yes - Hazard Statements and Classification are not known
PF 0137611 (PD-332,334 Step 3)	-	Unknown	Unknown	Yes	Yes	Liquid	2,100	L	Yes - Hazard Statements and Classification are not known
PF 04579767	-	Unknown	Unknown	Yes	Yes	Liquid	3,500	L	Yes - Hazard Statements and Classification are not known
PF-00087132	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
PF-00146786	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
PF-00172516 (Palbociclib RSM)	-	Unknown	Unknown	Yes	Yes	Solid	3,500	kg	No - Material is a Solid
PF-00248529	-	Unknown	Unknown	Yes	Yes	Solid	25,000	kg	No - Material is a Solid
PF-00477380 (Palbo Sidechain RSM PrN/A	-	Unknown	Unknown	Yes	Yes	Solid	2,600	kg	No - Material is a Solid
PF-00483932	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
PF-00610355	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
PF-00868554	-	Unknown	Unknown	Yes	Yes	Solid	20,000	kg	No - Material is a Solid
PF-00995664	-	Unknown	Unknown	Yes	Yes	Liquid	2,000	L	Yes - Hazard Statements and Classification are not known
PF-01663710 (Palbociclib RSM)	-	Unknown	Unknown	Yes	Yes	Solid	3,700	kg	No - Material is a Solid
PF-02575329 (Crizotinib - RSM)	-	Unknown	Unknown	Yes	Yes	Solid	3,200	kg	No - Material is a Solid
PF-02872822-15	-	Unknown	Unknown	Yes	Yes	Solid	40,000	kg	No - Material is a Solid
PF-03018341	-	Unknown	Unknown	Yes	Yes	Solid	40,000	kg	No - Material is a Solid
PF0346643 (PD-332,334 Step 1)	874208-98-7	Unknown	Unknown	Yes	Yes	Solid	3,500	kg	No - Material is a Solid
PF-048003280	-	Unknown	Unknown	Yes	Yes	Solid	40,000	kg	No - Material is a Solid
PF-04803284	-	Unknown	Unknown	Yes	Yes	Solid	40,000	kg	No - Material is a Solid
PF-04850741	-	Unknown	Unknown	Yes	Yes	Solid	40,000	kg	No - Material is a Solid
PF-04881286-15	-	Unknown	Unknown	Yes	Yes	Solid	40,000	kg	No - Material is a Solid
PF-04905420	-	Unknown	Unknown	Yes	Yes	Solid	40,000	kg	No - Material is a Solid
PF-04965842 Step 1 (PF-07097547-24)N/A	-	Unknown	Unknown	Yes	Yes	Solid	5,421	kg	No - Material is a Solid
PF-04965842 Step 2 (PF-07094402)	-	Unknown	Unknown	Yes	Yes	Solid	4,321	kg	No - Material is a Solid

Material/Substance	CAS Number	Stage 1				Stage 2			
		EPA's Classification of Hazardous and Non-hazardous Substances	Relevant Hazard Statement	Hazardous Substance	Annual Usage greater than 250 L / 250 kg	Physical State of Chemical Stored On-Site	Annual Usage (approximate)	Unit	Considered a Relevant Hazardous Substance
PF-04965842 Step 3 (PF-0705579)	-	Unknown	Unknown	Yes	Yes	Solid	3,522	kg	No - Material is a Solid
PF-04965842 Step 4 (PF-03817968-09)N/A	-	Unknown	Unknown	Yes	Yes	Solid	3,400	kg	No - Material is a Solid
PF-04965842 Step 5 (PF-04965842-01)N/A	-	Unknown	Unknown	Yes	Yes	Solid	4,320	kg	No - Material is a Solid
PF-04965842 Step 6 (PF-04965842)	-	Unknown	Unknown	Yes	Yes	Solid	4,000	kg	No - Material is a Solid
PF-05150152 (Crizotinib - RSM)	-	Unknown	Unknown	Yes	Yes	Solid	4,100	kg	No - Material is a Solid
PF-06238566 (JAK1 - PF-04965842 RSN/A	-	Unknown	Unknown	Yes	Yes	Solid	4,500	kg	No - Material is a Solid
PF-06425000-13	-	Unknown	Unknown	Yes	Yes	Solid	15,500	kg	No - Material is a Solid
PF-06428297	1298086-15-3	Unknown	Unknown	Yes	Yes	Solid	7,200	kg	No - Material is a Solid
PF-06460201-02 Trisodium Salt (RivipaNot Availal	-	Unknown	Unknown	Yes	Yes	Solid	300	kg	No - Material is a Solid
PF-06460259-01 (Rivipansel Step 3)	-	Unknown	Unknown	Yes	Yes	Solid	1,900	kg	No - Material is a Solid
PF-06460260 (Rivipansel Step 4)	-	Unknown	Unknown	Yes	Yes	Solid	1,700	kg	No - Material is a Solid
PF-06460270 Crude (Rivipansel Step 6)N/A	-	Unknown	Unknown	Yes	Yes	Solid	700	kg	No - Material is a Solid
PF-06460270 Zwitterion (Rivipansel SteN/A	-	Unknown	Unknown	Yes	Yes	Solid	700	kg	No - Material is a Solid
PF-06478031-01 (Lorlatinib RSM)	1643141-20-1	Unknown	Unknown	Yes	Yes	Solid	1,300	kg	No - Material is a Solid
PF-06668559;	-	Unknown	Unknown	Yes	Yes	Solid	2,340	kg	No - Material is a Solid
PF-06684137 t-Amyl alcohol solvate	-	Unknown	Unknown	Yes	Yes	Solid	6,000	kg	No - Material is a Solid
PF-06739408	-	Unknown	Unknown	Yes	Yes	Solid	11,000	kg	No - Material is a Solid
PF-06811569 (Lorlatinib RSM)	1803573-19-4	Unknown	Unknown	Yes	Yes	Solid	1,600	kg	No - Material is a Solid
PF-06841215 (Lorlatinib RSM)	1803573-21-8	Unknown	Unknown	Yes	Yes	Solid	3,500	kg	No - Material is a Solid
PF-06961030 (Crisaborole Step 1)	-	Unknown	Unknown	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
PF-3315293	-	Unknown	Unknown	Yes	Yes	Solid	35,000	kg	No - Material is a Solid
PF-6463922;	-	Unknown	Unknown	Yes	Yes	Solid	500	kg	No - Material is a Solid
PF-982,260	-	Unknown	Unknown	Yes	Yes	Solid	18,400	kg	No - Material is a Solid
PHA-404620	-	Unknown	Unknown	Yes	Yes	Solid	850	kg	No - Material is a Solid
PHA-728669F	-	Unknown	Unknown	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
PHA-84176	364068-16-6	Unknown	Unknown	Yes	Yes	Solid	865	kg	No - Material is a Solid
Phosphoric acid	7664-38-2	Non-Hazardous	-	No	Yes	Liquid	26,000	L	No - not classified as hazardous and no relevant hazard statement
Pickling Paste	7697-37-2	Undetermined	-	No	No	Paste	<250	kg	No - Material is a Solid
Piperazine dihydrochloride/ dihydrobromide	142-64-3	Not Listed	H412	Yes	Yes	Solid	1,300	kg	No - Material is a Solid
Piroxicam	36322-90-4	Not Listed	H360D	Yes	Yes	Solid	3,500	kg	No - Material is a Solid
Potassium acetate	127-08-2	Undetermined	-	No	Yes	Solid	530	kg	No - Material is a Solid
Potassium dihydrogen Phosphate	7778-77-0	Non-Hazardous	-	No	Yes	Solid	740	kg	No - Material is a Solid
Potassium hydroxide	1310-58-3	Undetermined	-	No	Yes	Solid	1,300	kg	No - Material is a Solid
Potassium permanganate	7722-64-7	Not Listed	H400, H410	Yes	Yes	Solid	1,400	kg	No - Material is a Solid
Prazosin 4	-	Unknown	Unknown	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Pregabalin Cyanodiester	186038-82-4	Not Listed	H411	Yes	Yes	Solid	400	kg	No - Material is a Solid
Pregabalin Cyanomonoester	181289-17-8	Unknown	Unknown	Yes	Yes	Solid	700	kg	No - Material is a Solid
Propylene Glycol	57-55-6	Undetermined	-	No	No	Liquid	<250	L	No - not classified as hazardous and no relevant hazard statement
PSSK+ (PF-06047089 20% Aq Soln)	-	Unknown	Unknown	Yes	Yes	Liquid	800	L	Yes - Hazard Statements and Classification are not known
Raney Nickel Catalyst	7440-02-0	Not Listed	H351, H413	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Rapamycin Crystal Crude (Process II)	53123-88-9	Not Listed	H351	Yes	No	Solid	<250	kg	No - Material is a Solid
Reboxetine Methane Sulfonate API	98769-84-7	Not Listed	H360	Yes	Yes	Solid	1,800	kg	No - Material is a Solid
Reboxetine Methane Sulfonate Step 6	98769-76-6	Unknown	Unknown	Yes	Yes	Solid	4,500	kg	No - Material is a Solid
Rhodium trichloride	10049-07-7	Not Listed	H413	Yes	No	Solid	<250	kg	No - Material is a Solid
Rhodium/C Catalyst	7440-16-6	Not Listed	H413	Yes	No	Solid	<250	kg	No - Material is a Solid
Ribavirin Step 1	897977-67-1	Unknown	Unknown	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
Ribavirin Step 5	39925-11-6	Unknown	Unknown	Yes	Yes	Solid	15,000	kg	No - Material is a Solid
Ribavirin Step 6	36791-04-5	Not Listed	H341, H360	Yes	Yes	Solid	8,000	kg	No - Material is a Solid
Ribavirin Step 7	36791-04-5	Not Listed	H341, H360	Yes	Yes	Solid	7,000	kg	No - Material is a Solid
Rivipansel Sodium (PF-06460031-02)	1189037-60-2	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Roclean 3	50-00-0	Non-Hazardous	H350	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Sertraline HCl	79559-97-0	Not Listed	H400	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
Sertraline Step 2 mandelate	79617-97-3	Not Listed	H400, H410	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Sertraline Step 3 mandelate	79617-97-3	Not Listed	H400, H410	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Shell Diala BG	64742-53-6	Not Listed	H350	Yes	Yes	Liquid	400	L	Yes - Relevant Hazard Statement (H350)
Sildenafil Ester (PF-01209642)	304435-84-5	Unknown	Unknown	Yes	Yes	Solid	15,000	kg	No - Material is a Solid
Sildenafil step 1	-	Unknown	Unknown	Yes	Yes	Solid	950	kg	No - Material is a Solid
Sildenafil step 3	755-83-2 (as f300-	Not Listed	H412	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Sildenafil steps 2/2R	139755-83-2	Not Listed	H412	Yes	Yes	Solid	830	kg	No - Material is a Solid
Sodium Bisulphite	7631-90-5	Undetermined	-	No	No	Solid	<250	kg	No - Material is a Solid
Sodium Borohydride	16940-66-2	Not Listed	H360	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Sodium Bromate	7789-38-0	Not Listed	H350	Yes	Yes	Liquid	4,511	L	Yes - Relevant Hazard Statement (H350)
Sodium Bromide	7647-15-6	Not Listed	H360	Yes	Yes	Solid	263	kg	No - Material is a Solid
Sodium Carbonate	497-19-8	Undetermined	-	No	Yes	Solid	3,500	kg	No - Material is a Solid
Sodium Formate	141-53-7	Undetermined	-	No	No	Solid	<250	kg	No - Material is a Solid
Sodium Hypochlorite	7681-52-9	Non-Hazardous	H400, H410	Yes	Yes	Liquid	240,000	L	Yes - Relevant Hazard Statements (H400 and H410)
Sodium Iodide	7681-82-5	Not Listed	H400	Yes	No	Solid	<250	kg	No - Material is a Solid
Sodium Metabisulphite	7681-57-4	Undetermined	-	No	Yes	Solid	14,000	kg	No - Material is a Solid
Sodium Nitrite	7632-00-0	Not Listed	H400	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
Sodium Sulphide	1313-82-2	Not Listed	H400	Yes	Yes	Solid	1,300	kg	No - Material is a Solid
Sodium Thiosulphate	7772-98-7	Undetermined	-	No	Yes	Solid	400	kg	No - Material is a Solid
Sodium Triacetoxyborohydride	56553-60-7	Not Listed	H360	Yes	Yes	Solid	784	kg	No - Material is a Solid
Spectrus BD1500 -GE BETZ	1310-73-2	Undetermined	-	No	Yes	Liquid	500	L	No - not classified as hazardous and no relevant hazard statement

Material/Substance	CAS Number	Stage 1				Stage 2			
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Spectrus NX1101 -GE BETZ	52-51-7	Hazardous	H401, H411	Yes	Yes	Liquid	400	L	Yes - Relevant Hazard Statement (H401 and H411)
Spectrus OX1203 -GE BETZ	32718-18-6	Hazardous	H400	Yes	Yes	Liquid	350	L	Yes- Relevant Hazard Statement (H400)
Succinic Acid	110-15-6	Not Listed	H340, H350	Yes	Yes	Solid	700	kg	No - Material is a Solid
Sulphuric acid (conc)	7664-93-9	Undetermined	-	No	Yes	Liquid	17,000	L	No - not classified as hazardous and no relevant hazard statement
Sunitinib Malate	341031-54-7	Not Listed	H360	Yes	Yes	Solid	400	kg	No - Material is a Solid
Sunitnib Malate API	341031-54-7a	Not Listed	H360D, H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Sunitnib Malate Crude	341031-54-7b	Not Listed	H360D, H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Superscent 'B'	-	Unknown	Unknown	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Tafamidis API Meglumine Salt / Tafamidi	951396-08-7	Not Listed	H360D	Yes	No	Solid	<250	kg	No - Material is a Solid
Tafamidis Free Acid API / Tafamidis Ste	594839-88-0	Not Listed	H360	Yes	No	Solid	<250	kg	No - Material is a Solid
Tafamidis Step 1	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Talazoparib Step 2A (PF-06946658-27)1322616-3	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Talazoparib Step 2B (PF-06946658)	1322616-36-1	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Talazoparib Step 3 (PF-06946657-GF)	1872214-59-9	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Talazoparib Step 4 / 4R (PF-06946657)	373329-52-2	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
t-BAUS (Pregabalin Asymmetric RM)	-	Unknown	Unknown	Yes	Yes	Solid	3,780	kg	No - Material is a Solid
TBC 11251 (Sitaxsentan Step 4)	210421-74-2	Unknown	Unknown	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
TBC 3656 (5-Amino-4-Chloro-3-Methylis166964-0	-	Unknown	Unknown	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
TBC 3657 (Methyl 3-chlorosulfonylthioph	59337-92-7	Unknown	Unknown	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
TBC 3658 (Sitaxsentan Step 1)	184040-72-2	Unknown	Unknown	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
TBC 3659 (Sitaxsentan Step 2)	210421-71-9	Unknown	Unknown	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
TBC 3661 (5-(Chloromethyl)-6-methyl-1,	117661-72-0	Unknown	Unknown	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
TEMSIROLIMUS 1 (WAY-188318)	839720-26-7	Not Listed	H360D, H360F, H410	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
TEMSIROLIMUS API (PARENTERAL)	162635-04-3	Not Listed	H360D, H360F, H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Temsirolimus Step 1 (WAY-188318)	839720-61-5	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Tenidap 1	10059-06-2	Unknown	Unknown	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Tenidap 2/2R	10059-27-7	Unknown	Unknown	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Tenidap 3/4	10059-27-7	Unknown	Unknown	Yes	Yes	Solid	800	kg	No - Material is a Solid
Tert-Butylmagnesium Chloride in THF	109-99-9 (THF)	Not Listed	THF (H351)	Yes	Yes	Liquid	1,000	L	Yes - Relevant Hazard Statement (H351)
Tetrahydrofuran (THF)	109-99-9	Not Listed	H351	Yes	Yes	Liquid	760,000	L	Yes - Relevant Hazard Statement (H351)
Tetralone	79560-19-3	Not Listed	H410	Yes	Yes	Solid	4,500	kg	No - Material is a Solid
Tetralone, crude	79560-19-3	Not Listed	H410	Yes	Yes	Solid	5,000	kg	No - Material is a Solid
Tetra-N-butyl ammonium bromide	1643-19-2	Not Listed	H412	Yes	No	Solid	<250	kg	No - Material is a Solid
Tetra-N-Butyl-Ammonium hydrogen sulphate	32503-27-8	Not Listed	H412	Yes	Yes	Solid	500	kg	No - Material is a Solid
Tigeycline API	220620-09-7	Not Listed	H360D, H400, H411	Yes	No	Solid	<250	kg	No - Material is a Solid
Tigecycline Step 1	-	Unknown	Unknown	Yes	Yes	Solid	481	kg	No - Material is a Solid
Tigecycline Step 3	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
Tigecycline Step 4, Crude	220620-09-7	Not Listed	H360	Yes	No	Solid	<250	kg	No - Material is a Solid
Tigecycline Step 5	220620-09-7	Not Listed	H360	Yes	No	Solid	<250	kg	No - Material is a Solid
Tioconazole 7N	65899-73-2	Not Listed	H410	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Tioconazole 6	65899-73-2	Not Listed	H410	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Tioconazole 7R	65899-73-2	Not Listed	H410	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Tolterodine L-Tartrate	124937-52-6	Not Listed	H411	Yes	Yes	Solid	508	kg	No - Material is a Solid
Tolterodine Tartrate API	124937-52-6	Not Listed	H360D, H411	Yes	Yes	Solid	500	kg	No - Material is a Solid
Tolterodine Tartrate Step 1	40546-94-9	Not Listed	H412	Yes	Yes	Solid	800	kg	No - Material is a Solid
Toluene	108-88-3	Hazardous	-	Yes	Yes	Liquid	1,200,000	L	Yes - Classified as 'Hazardous'
Torcetrapib Step 1	-	Unknown	Unknown	Yes	Yes	Solid	16,000	kg	No - Material is a Solid
Torcetrapib Step 2	667937-05-5	Unknown	Unknown	Yes	Yes	Solid	1,600	kg	No - Material is a Solid
Torcetrapib Step 4	-	Unknown	Unknown	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Torcetrapib Step 5	-	Unknown	Unknown	Yes	Yes	Solid	1,000	kg	No - Material is a Solid
Tributylamine	102-82-9	Not Listed	H412	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Triethylsilane	617-86-7	Not Listed	H400, H410, H412	Yes	Yes	Liquid/Gas	425	L	Yes - Relevant Hazard Statements (H400, H410 and H412)
Trifluoroacetic Acid	76-05-1	Not Listed	H412	Yes	Yes	Gas	3,500	L	No - Material is a Gas
Trimethyl Borate	121-43-7	Not Listed	H360D, H360F	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Triphenylphosphine	603-35-0	Not Listed	H413	Yes	Yes	Solid	700	kg	No - Material is a Solid
Tris(2,3-epoxypropyl) isocyanurate (TGI	2541-62-9	Unknown	Unknown	Yes	Yes	Solid	24,200	kg	No - Material is a Solid
Triton Rx/100	9036-19-5	Undetermined	H411, H412	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Trovafloxacin 1	-	Unknown	Unknown	Yes	Yes	Solid	900	kg	No - Material is a Solid
Trovafloxacin 1S	151860-15-0	Not Listed	H512	Yes	Yes	Solid	750	kg	No - Material is a Solid
Trovafloxacin 2S	-	Unknown	Unknown	Yes	Yes	Solid	1,500	kg	No - Material is a Solid
TrovAfloxacin 4S	151860-18-3	Unknown	Unknown	Yes	Yes	Solid	600	kg	No - Material is a Solid
Trovafloxacin 5S	134677-60-4	Unknown	Unknown	Yes	Yes	Solid	360	kg	No - Material is a Solid
Trovafloxacin Nucleus	100491-29-0	Not Listed	H411	Yes	Yes	Solid	660	kg	No - Material is a Solid
UK-103,442	137234-87-8	Not Listed	H410	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
UK-103,442 (Voriconazole RSM)	137234-87-8	Not Listed	H400, H410	Yes	No	Solid	<250	kg	No - Material is a Solid
UK-111,975 (Eletriptan RSM)	143322-57-0	Not Listed	H410	Yes	No	Solid	<250	kg	No - Material is a Solid
UK-111,975(Eletriptan RS)	143322-57-0	Not Listed	H400, H410	Yes	Yes	Solid	300	kg	No - Material is a Solid
UK-143,108 (Sildenafil RSM)	194602-23-8	Unknown	Unknown	Yes	Yes	Solid	800	kg	No - Material is a Solid
UK-292,679	-	Unknown	Unknown	Yes	Yes	Solid	400	kg	No - Material is a Solid
UK-294,193	-	Unknown	Unknown	Yes	Yes	Solid	400	kg	No - Material is a Solid
UK-338,003	210538-44-6	Unknown	Unknown	Yes	Yes	Solid	400	kg	No - Material is a Solid
UK-338,003-27	-	Unknown	Unknown	Yes	Yes	Solid	400	kg	No - Material is a Solid
UK-348,959	-	Unknown	Unknown	Yes	Yes	Solid	500	kg	No - Material is a Solid

Material/Substance	CAS Number	Stage 1				Stage 2			
		EPA's Classification of Hazardous and Non-hazardous Substances	Relevant Hazard Statement	Hazardous Substance	Annual Usage greater than 250 L / 250 kg	Physical State of Chemical Stored On-Site	Annual Usage (approximate)	Unit	Considered a Relevant Hazardous Substance
UK-365,147	-	Unknown	Unknown	Yes	Yes	Solid	600	kg	No - Material is a Solid
UK-369,003	-	Unknown	Unknown	Yes	Yes	Solid	500	kg	No - Material is a Solid
UK-369,003-26	-	Unknown	Unknown	Yes	Yes	Solid	500	kg	No - Material is a Solid
UK-372,484	-	Unknown	Unknown	Yes	Yes	Solid	600	kg	No - Material is a Solid
UK-382,048	-	Unknown	Unknown	Yes	Yes	Solid	300	kg	No - Material is a Solid
UK-385,204	-	Unknown	Unknown	Yes	Yes	Solid	300	kg	No - Material is a Solid
UK-390,957	364321-71-1	Unknown	Unknown	Yes	Yes	Solid	500	kg	No - Material is a Solid
UK-408,026	376348-65-1	Not Listed	H412	Yes	Yes	Solid	750	kg	No - Material is a Solid
UK-408,027-15	-	Unknown	Unknown	Yes	Yes	Solid	800	kg	No - Material is a Solid
UK-427,857	376348-65-1	Not Listed	H412	Yes	Yes	Solid	810	kg	No - Material is a Solid
UK-440,106	-	Unknown	Unknown	Yes	Yes	Solid	570	kg	No - Material is a Solid
UK-444,120	13054-81-4	Not Listed	H410	Yes	Yes	Solid	415	kg	No - Material is a Solid
UK-453,059	79370-78-8	Not Listed	H412	Yes	Yes	Solid	350	kg	No - Material is a Solid
UK-453,061	473924-12-9	Unknown	Unknown	Yes	Yes	Solid	800	kg	No - Material is a Solid
UK-453,453	-	Unknown	Unknown	Yes	Yes	Solid	580	kg	No - Material is a Solid
UK-453,464	376348-76-4	Not Listed	H412	Yes	Yes	Solid	750	kg	No - Material is a Solid
UK-453,465	-	Unknown	Unknown	Yes	Yes	Solid	580	kg	No - Material is a Solid
UK-458,143	473924-01-5	Unknown	Unknown	Yes	Yes	Solid	500	kg	No - Material is a Solid
UK-464,748	-	Unknown	Unknown	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
UK-471,138-40	-	Unknown	Unknown	Yes	Yes	Solid	1,200	kg	No - Material is a Solid
UK-66,418-15	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
UK-67,787-1 (Dofetilide RSM)	166943-39-1	Not Listed	H411	Yes	Yes	Solid	500	kg	No - Material is a Solid
UK-73,689	69999-16-2	Unknown	Unknown	Yes	Yes	Solid	260	kg	No - Material is a Solid
UK-8,793	3383-72-0	Not Listed	H412	Yes	No	Solid	<250	kg	No - Material is a Solid
UK-8,793 (Dofetilide RSM)	3383-72-0	Not Listed	H411	Yes	Yes	Solid	500	kg	No - Material is a Solid
UK-81,786-57	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
UK-84,440 139	756-01-7	Not Listed	H412	Yes	Yes	Solid	500	kg	No - Material is a Solid
UK-88,861-04	-	Unknown	Unknown	Yes	Yes	Solid	460	kg	No - Material is a Solid
Urea	57-13-6	Undetermined	-	No	Yes	Liquid	14,000	L	No - not classified as hazardous and no relevant hazard statement
Varenicline Step 2	-	Unknown	Unknown	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Varenicline Step 4	-	Unknown	Unknown	Yes	Yes	Solid	2,000	kg	No - Material is a Solid
Varenicline Tartrate API	375815-87-5	Not Listed	H410	Yes	Yes	Solid	<250	kg	No - Material is a Solid
Voriconazole Step 1 (UK-103,444)	137237-74-3	-	H400, H410	Yes	Yes	Solid	10,000	kg	No - Material is a Solid
Voriconazole Step 2	137234-87-8	-	H400, H410	Yes	Yes	Solid	38,000	kg	No - Material is a Solid
Voriconazole Step 2 (UK-134,821)	78-67-1	Not Listed	H412	Yes	Yes	Solid	15,000	kg	No - Material is a Solid
Voriconazole Step 3 (UK-103,446-01)	188416-20-8	Not Listed	H360	Yes	Yes	Solid	17,000	kg	No - Material is a Solid
Voriconazole Step 4	-	Unknown	Unknown	Yes	Yes	Solid	800	kg	No - Material is a Solid
Voriconazole Step 5	-	Unknown	Unknown	Yes	Yes	Solid	800	kg	No - Material is a Solid
Voriconazole Step 6	137234-62-9	Not Listed	H351, H400, H412	Yes	Yes	Solid	800	kg	No - Material is a Solid
Walphos SL-W001-2	849925-17-3	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
WAY 317 Step 1	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
WAY 317 Step 1R	-	Unknown	Unknown	Yes	No	Solid	<250	kg	No - Material is a Solid
WAY-186478 (PF-05296712)	846023-24-3	Unknown	Unknown	Yes	Yes	Solid	690	kg	No - Material is a Solid
WAY-188471 (Bosutinib RSM)	92878-95-0	Not Listed	H411	Yes	Yes	Solid	500	kg	No - Material is a Solid
WAY-188471 (PF-0529677)	92878-95-10	Unknown	Unknown	Yes	Yes	Solid	880	kg	No - Material is a Solid
WAY189172 (step 3)	92878-95-10	Unknown	Unknown	Yes	Yes	Solid	1,298	kg	No - Material is a Solid
Xylene	1330-20-7	Hazardous	-	Yes	Yes	Liquid	137,000	L	Yes - Classified as 'Hazardous'
Xylene (Recovered, Spent)	1330-20-7	Hazardous	H412	Yes	Yes	Liquid	137,000	L	Yes - Relevant Hazard Statement (H412)
Zinc Dust	7440-66-6	Non-Hazardous	H410	Yes	Yes	Solid	18,000	kg	No - Material is a Solid
Ziprasidone 1S	118307-04-3	Unknown	Unknown	Yes	Yes	Solid	600	kg	No - Material is a Solid
Ziprasidone 2	118289-55-7	Not Listed	H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Ziprasidone 2S	118289-55-7	Not Listed	H400, H410	Yes	Yes	Solid	600	kg	No - Material is a Solid
Ziprasidone 4 Mesylate	-	Unknown	Unknown	Yes	No	Liquid	<250	L	No - Quantity below 250 L / 250 kg
Ziprasidone Nucleus	87691-88-1	Not Listed	H410	Yes	No	Solid	<250	kg	No - Material is a Solid
Zopolrestat Step 1	-	Unknown	Unknown	Yes	Yes	Liquid	1,400	L	Yes - Hazard Statements and Classification are not known
Zopolrestat Step 2 / 3	110703-94-1	Not Listed	H413	Yes	Yes	Liquid	1,400	L	Yes - Relevant Hazard Statement (H413)

Material/Substance	Stage 3				
	Storage Location	Transportation Method	Containment Measures	Likelihood of Release to Open Ground	To be Monitored as a Relevant Hazardous Substance - Rationale
1,2 Dimethoxyethane	Stored in drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
1,2-Dichlorobenzene	No longer used on site, historically held in USTs in the Northern and Southern UST Tank Farm	No longer used or stored on site	No longer used or stored on site	No longer used or stored on site	No - No longer used on site and has not been detected during site investigation
1,8-Diazabicyclo[5.4.0]undec-7-ene	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
2,2,4-Trimethylpentane	No longer used on site, historically held in USTs in the Northern and Southern UST Tank Farm	No longer used or stored on site	No longer used or stored on site	No longer used or stored on site	Yes - As VOC TIC, historically stored without secondary containment and has not been sampled as part of groundwater suite
Ammonium Hydroxide	Stored in 50 kg drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Benzene	No longer used on site, historically held in USTs in the former Northern and Southern UST Farms	No longer used or stored on site	No longer used or stored on site	Very Low - No longer used or stored on site	Yes - Has been detected in routine groundwater monitoring
Bromine	No longer used on site, historically held in 200 litre drums located in the Drum Store	No longer used or stored on site	No longer used or stored on site	No longer used or stored on site	No - No longer stored on site, historically stored in small quantities only
Chloroacetyl Chloride	Stored in 50 kg drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Chloroform	No longer used on site, historically held in USTs in the former Northern and Southern UST Farms	No longer used or stored on site	No longer used or stored on site	Very Low - No longer used or stored on site	Yes - Has been detected in routine groundwater monitoring
Cyclohexane	Stored in bulk AST in the Main Tank Farm and 200 litre drums located in the Drum Store. Historically stored in UST in the Northern and Southern UST Farms	Delivered to site by tanker. Transported across site and to point of use though pipelines. Drums transported by forklift.	Storage tank is bunded providing secondary containment. Bund contents may be discharged through the weak effluent system to the WWTP. In the event of a spill entering the storm water drainage system the diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP. All pipework is located above ground.	Low - Suitable containment measures in place	Yes - Has been detected in routine groundwater monitoring
Cyclohexylmagnesium chloride in THF	Cylinder	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Cyclopentylamine	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Dianodic DN2301 -GE BETZ	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only

Material/Substance	Stage 3				
	Storage Location	Transportation Method	Containment Measures	Likelihood of Release to Open Ground	To be Monitored as a Relevant Hazardous Substance - Rationale
Dichloromethane	Stored in bulk AST in the Main Tank Farm and 200 litre drums located in the Drum Store. Historically stored in UST in the Northern and Southern UST Farms	Delivered to site by tanker. Transported across site and to point of use though pipelines. Drums transported by forklift	Storage tank is bunded providing secondary containment. Bund contents may be discharged through the weak effluent system to the WWTP. In the event of a spill entering the storm water drainage system the diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP. All pipework is located above ground.	Low - Suitable containment measures in place	Yes - Has been detected in routine groundwater monitoring
Diesel (Low Sulphur Fuel)	Diesel is stored in eight bunded ASTs located across site near it's point of use	Delivered to site by tanker. Transported across site and to point of use though pipelines	Storage tank is bunded providing secondary containment. Bund contents may be discharged through the weak effluent system to the WWTP. In the event of a spill entering the storm water drainage system the diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP. All pipework is located above ground.	Low - Suitable containment measures in place	Yes - Stored in bulk
Dimethyl Aniline	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Dimethylacetamide	No longer stored on site	No longer stored on site	No longer stored on site	Very Low - No longer used or stored on site	Yes - As VOC TIC, may have been stored in bulk historically
Dimethylformamide	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Dowtherm J	Stored in a bulk AST within OSP 3	Delivered to site by tanker. Transported to points of use within OSP 3 though pipelines	Storage tank is bunded providing secondary containment. OSP3 drains to the weak effluent line providing remote tertiary containment in the event of a loss from primary and secondary containment. Losses from pipework will enter the weak effluent line.	Very Low - Secondary and tertiary containment provided	No - Secondary and tertiary containment in place
Esso Zerice 100	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Esso Zerice 68	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Fluconazole Step 5	Stored in 50 kg drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only, product/intermediary
Formaldehyde (37%)	No longer used on site, historically held in 200 litre drums located in the Drum Store	No longer used or stored on site	No longer used or stored on site	No longer used or stored on site	No - No longer stored on site, historically stored in small quantities only
Hydroxylamine Solution	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Isopropylmagnesium chloride/THF	Stored in cylinders located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Lithium Hexamethyldisilazide (20% in THF)	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only

Material/Substance	Stage 3				
	Storage Location	**Transportation Method**	**Containment Measures**	**Likelihood of Release to Open Ground**	**To be Monitored as a Relevant Hazardous Substance - Rationale**
Methyl iodide	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Methyl(5R)-3-cyano-5-methyloctanoate	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
n-Heptane	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
n-Hexane	Stored in bulk AST in the Main Tank Farm. Historically stored in UST in the Northern and Southern UST Farms	Delivered to site by tanker. Transported across site and to point of use though pipelines	Storage tank is bunded providing secondary containment. Bund contents may be discharged through the weak effluent system to the WWTP. In the event of a spill entering the storm water drainage system the diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP. All pipework is located above ground.	Low - Suitable containment measures in place	Yes - Stored in bulk, and historically in single-skinned USTs
n-Methyl Pyrrolidone	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
PF 0110529 (PD-332,334 Step 2)	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only, product/intermediary
PF 0137611 (PD-332,334 Step 3)	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only, product/intermediary
PF 04579767	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only, product/intermediary
PF-00995664	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only, product/intermediary
PSSK+ (PF-06047089 20% Aq Soln)	Stored in drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only, product/intermediary
Shell Diala BG	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only

Appendix B Table 2 - Stage 3

Material/Substance	Stage 3				
	Storage Location	Transportation Method	Containment Measures	Likelihood of Release to Open Ground	To be Monitored as a Relevant Hazardous Substance - Rationale
Sodium Bromate	No longer used on site, historically held in USTs in the Northern and Southern UST Farms	No longer used or stored on site	No longer used or stored on site	Very Low - No longer used or stored on site	Yes - As bromate, historically stored without secondary containment and has not been analysed as part of groundwater suite
Sodium Hypochlorite	Stored in IBCs located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Spectrus NX1101 -GE BETZ	205 l drum and 1,000 l IBC located in the drum store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Spectrus OX1203 -GE BETZ	Stored in 200 litre drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Tert-Butylmagnesium Chloride in THF	Stored in 25 kg drums located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Tetrahydrofuran (Pure and Spent)	Stored in bulk AST in the Main Tank Farm and 200 litre drums located in the Drum Store. Historically stored in UST in the Northern and Southern UST Farms	Delivered to site by tanker. Transported across site and to point of use though pipelines. Drums transported by forklift	Storage tank is bunded providing secondary containment. Bund contents may be discharged through the weak effluent system to the WWTP. In the event of a spill entering the storm water drainage system the diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP. All pipework is located above ground.	Low - Suitable containment measures in place	Yes - Has been detected in routine groundwater monitoring
Toluene (pure and spent)	Stored in bulk AST in the Main Tank Farm and 200 litre drums located in the Drum Store. Historically stored in UST in the Northern and Southern UST Farms	Delivered to site by tanker. Transported across site and to point of use though pipelines. Drums transported by forklift	Storage tank is bunded providing secondary containment. Bund contents may be discharged through the weak effluent system to the WWTP. In the event of a spill entering the storm water drainage system the diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP. All pipework is located above ground.	Low - Suitable containment measures in place	Yes - Has been detected in routine groundwater monitoring
Triethylsilane	Stored in 90 kg cylinders located in the Drum Store	Transported across site by forklift in small quantities	Stored in small containers within the covered drum pad. A leak would be limited to the quantity of the drum. The Drumpad drains through the weak effluent system to the WWTP. Transported to point of use by drum. In the event of a spill entering the storm water system the automatic diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP.	Very Low - stored, used and transported in small quantities	No - Stored in small quantities only
Xylene (Pure and Spent)	Stored in bulk AST in the Main Tank Farm. Historically stored in UST in the Northern and Southern UST Farms	Delivered to site by tanker. Transported across site and to point of use though pipelines	Storage tank is bunded providing secondary containment. Bund contents may be discharged through the weak effluent system to the WWTP. In the event of a spill entering the storm water drainage system the diversion valve will close to the storm water outfall diverting the spillage to the storm water retention pond. The spillage can then be handled by off-site treatment or treatment in the WWTP. All pipework is located above ground.	Low - Suitable containment measures in place	Yes - Has been detected in routine groundwater monitoring
Zopolrestat Step 1	No longer stored on site	No longer stored on site	No longer stored on site	Very Low - No longer used or stored on site	No - No longer used on site, was a product/intermediary
Zopolrestat Step 2 / 3	No longer stored on site	No longer stored on site	No longer stored on site	Very Low - No longer used or stored on site	No - No longer used on site, was a product/intermediary

Appendix C Groundwater Trend Tables

Volatile Organic Compound	DIV	IGV	GTV	7 Drift														
				Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	May-98	Jun-98	Jul-98	Nov-98	May-99	Nov-99	May-00	Nov-00	May-01	Nov-01
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dichloromethane	1	0.01	0.015	-	-	-	-	-	0.005	0.005	0.005	-	-	-	-	-	-	-
Acetone				0.83	-	-	-	-	0.053	0.053	0.053	-	-	-	-	-	-	0.028
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	*6.7*	*1.9*	*1.6*	*1.3*	*0.77*	-	-	-	*1.1*	-	*0.12*	0.005	*0.19*	0.017	*0.037*
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	0.016	-	-	-	0.003		-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		*0.61*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				0.47	0.048	0.068	-	0.26	-	-	-	-	-	-	-	0.031		-
o-Xylene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		*0.47*	0.048	0.068	-	*0.26*	-	-	-	-	-	-	-	0.031	-	-
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	0.004	1.0	2.0	-	0.003	0.003	0.001	0.006	0.006	0.004
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total BTEX				7.8	1.9	1.7	1.3	1.0	-	-	-	1.1	-	0.12	0.005	0.22	0.017	0.037
Total VOCs				**8.6**	**1.9**	**1.7**	**1.3**	**1.0**	**0.062**	**1.1**	**2.1**	**1.1**	**0.003**	**0.12**	**0.006**	**0.23**	**0.023**	**0.069**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	2.2	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				1.5	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	*0.88*	0.24	0.19	0.21	*0.31*	0.083	0.083	0.083	0.21	0.064	*0.46*	0.053	*2.3*	*0.31*	0.051
Cyclohexane	15			0.040	0.030	0.040	-	-	0.018	0.018	0.018	-	0.021	0.016	-	0.110	0.734	0.128
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	7 Drift														
				May-02	Nov-02	May-03	Nov-03	May-04	Nov-04	May-05	Nov-05	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	na	na	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-	0.007
Acetone				-	-	-	-	-	-	-	0.01	-	0.01	0.014	0.012	-	-	-
Carbon Disulphide				0.009	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01	0.03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	0.004	*0.064*	0.026	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.035
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.007
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.027
o-Xylene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008
Total Xylene	0.07	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.035
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	na
Methyl t-butyl ether		0.03	0.01	0.002	0.003	0.004	0.002	-	-	-	0.002	0.001	-	-	-	-	-	-
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	na
Total BTEX				0.004	0.064	0.026	-	-	-	-	-	-	-	-	-	-	-	0.077
Total VOCs				**0.015**	**0.067**	**0.030**	**0.002**	**-**	**-**	**-**	**0.012**	**0.001**	**0.010**	**0.014**	**0.012**	**0.002**	**-**	**0.084**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	0.072	-	-	-	-	-	-	-	-	-	-	-	-	0.23
Cyclohexane	15			0.055	0.054	0.134	0.008	-	-	-	-	-	0.002	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	7 Drift																		
				Nov-09	May-10	Nov-10	May-11	Nov-11	May-12	Nov-12	May-13	Nov-13	May-14	Nov-14	May-15	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	May-19
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freon 113				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	0.0003	-	-	-	-	-	-	0.0005	0.0002	0.0008	0.0018
Vinyl Acetate				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total BTEX				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total VOCs				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.0005**	**0.0002**	**0.0008**	**0.002**
Alcohols and VOA Compounds																							
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	205														
				Limestone														
				Jul-94	Feb-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	May-98	Sep-98	Nov-98	May-99	Nov-01	May-02	Nov-02	May-03
Chloromethane				-	-	-	0.24	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				33	32	220	110	100	-	54	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	2.4	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				2.8	2.6	-	-	2.0	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	*0.19*	-	-	-	-	-	-	*0.093*	-	*0.17*	*0.075*
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	*46*	*30*	*72*	*58*	*59*	*67*	*130*	*100*	*33*	*81*	*79*	0.49	-	*5.0*	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		*12*	*7.2*	*8.4*	*10*	*6.5*	*4.3*	*3.8*	*3.0*	*3.0*	*3.6*	*4.5*	*2.7*	*2.0*	*2.7*	*1.3*
Styrene	0.3			*0.37*	-		-	0.26	-	-	-	-	-		-	-	-	-
Xylenes(meta and para)				58	33	35	49	31	20	20	19	19	17	26	14	10	15	7.7
o-Xylene				13	8.9	11	11	7.7	4.3	5.1	4.0	3.6	3.3	6.0	0.25	-	1.7	-
Total Xylene	0.07	0.01		*71*	*42*	*46*	*60*	*39*	*24*	*25*	*23*	*23*	*20*	*32*	*14*	*10*	*17*	*7.7*
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate				0.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total BTEX				129	79	126	128	104	96	159	126	59	105	116	18	12	25	9.1
Total VOCs				**165**	**114**	**346**	**238**	**209**	**96**	**213**	**126**	**59**	**105**	**116**	**18**	**12**	**25**	**9.1**
Alcohols and VOA Compounds																		
Methanol				-	-	-	315	-	14	-	6.8	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	8.5	1.9	-	-	-	-	-	-	-
iso-Propanol				141	183	-	77	57	6.4	35	6.8	-	-	1.3	-	-	-	-
Tetrahydrofuran	0.3		0.115	*0.99*	*2.3*	-	0.060	-	*1.7*	-	*52*	*13*	*49*	*56*	*2.1*	-	*1.9*	-
Cyclohexane	15			8.4	1.9	0.63	0.92	0.63	0.30	-	-	-	-	-	0.99	0.76	0.51	0.32
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	205 Limestone														
				Nov-03	May-04	Nov-04	May-05	Nov-05	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09	Nov-09	May-10	Nov-10
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	0.002	0.011	-	-	-	-
Acetone				-	-	-	-	0.015	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	0.013	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	0.030	-	0.023	0.035	-	-	-	0.024	-	-	0.018	-	0.022	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-		-	-	-	-	-	-	-
Toluene	1	0.01	0.525	0.016	-	0.045	0.055	-	-	-	0.002	-	-	-	0.007	0.027	0.005	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		0.088	-	0.034	0.095	-	-	-	-	-	-	*0.20*	0.003	0.084	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				1.0	-	1.9	1.1	-	-	-	-	0.035	-	0.97	0.13	1.6	0.006	-
o-Xylene				0.043	0.004	0.16	0.11	-	-	0.006	-	0.004	0.035	0.069	0.007	0.037	-	-
Total Xylene	0.07	0.01		*1.0*	0.004	*2.1*	*1.2*	-	-	0.006	-	0.039	0.035	*1.0*	*0.14*	*1.6*	0.006	-
Freon 113				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
Methyl t-butyl ether		0.03	0.01	-	0.071	0.072	0.036	-	0.03	0.026	-	0.046	0.078	0.15	1.8	14	9.2	4.9
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
Total BTEX				1.2	0.004	2.2	1.4	-	-	0.006	0.026	0.039	0.035	1.3	0.15	1.8	0.011	-
Total VOCs				**1.2**	**0.075**	**2.2**	**1.4**	**0.015**	**0.032**	**0.032**	**0.026**	**0.085**	**0.115**	**1.4**	**1.9**	**16**	**9.2**	**4.9**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	0.099	-	-	-	0.078	-	-	*0.45*	-	-	-	0.25	*54*	*0.43*	0.19
Cyclohexane	15			-	0.045	0.17	0.14	0.13	0.019	0.018	0.017	0.072	0.099	0.14	-	0.14	-	0.36
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	205 Limestone																
				May-11	Nov-11	May-12	Nov-12	May-13	Nov-13	May-14	Nov-14	May-15	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	May-19
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0001	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				0.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	0.002	0.010	0.003	-	0.002	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	0.065	0.019	0.033	-	0.054	-	-	-	0.005	-	-	-	-	-	-	-
o-Xylene				-	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	0.065	0.019	0.033	-	0.033	-	-	-	0.005	-	-	-	-	-	-	-
Freon 113				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	0.59	0.23	0.31	0.24	0.15	0.11	0.40	0.11	0.058	0.29	0.081	0.027	0.018	0.024	0.016	0.021	**0.069**
Vinyl Acetate				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total BTEX				-	0.067	0.029	0.036	-	0.037	-	-	-	0.005	-	-	-	-	-	-	-
Total VOCs				**1.2**	**0.30**	**0.34**	**0.28**	**0.15**	**0.17**	**0.40**	**0.11**	**0.058**	**0.29**	**0.081**	**0.027**	**0.018**	**0.024**	**0.016**	**0.021**	**0.069**
Alcohols and VOA Compounds																				
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.052	-	-
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	404 Limestone														
				Feb-95	Nov-95	Jun-96	Dec-96	Jun-97	Dec-97	May-98	Jun-98	Sep-98	Nov-98	May-99	Nov-99	May-00	Nov-00	May-01
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				42	210	36	130	21	81	70	32	-	-	76	200	-	-	0.22
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	27	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	*0.57*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	*52*	*110*	*61*	*52*	*81*	*150*	*130*	*110*	*67*	*99*	*110*	*110*	*130*	*130*	0.31
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		*13*	*14*	*11*	*7.2*	*3.3*	*4.7*	*3.0*	*3.4*	*4.3*	*3.3*	*4.8*	*6.8*	*3.4*	*4.2*	0.033
Styrene	0.3			-	*0.51*	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				58	65	48	31	17	23	19	16	20	23	26	30	15	19	0.15
o-Xylene				15	16	12	9.1	3.9	6.0	4.6	3.7	4.4	4.4	6.1	6.9	3.6	4.2	0.025
Total Xylene	0.07	0.01		*73*	*81*	*60*	*40*	*21*	*29*	*24*	*20*	*24*	*27*	*32*	*37*	*19*	*23*	*0.18*
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total BTEX				139	205	132	99	105	184	157	133	96	130	147	154	152	157	0.52
Total VOCs				**186**	**416**	**168**	**229**	**126**	**265**	**227**	**165**	**96**	**130**	**223**	**381**	**152**	**157**	**0.74**
Alcohols and VOA Compounds																		
Methanol				-	-	711	-	15	9.2	5.4	-	-	5.0	-	-	-	-	-
Ethanol				-	1.2	-	-	-	38	19	-	-	-	-	-	-	-	-
iso-Propanol				161	43	175	109	13	69	84	31	-	-	69	-	6.9	-	24
Tetrahydrofuran	0.3		0.115	*1.0*	-	-	-	*2.0*	*46*	-	*69*	*17*	-	*83*	-	-	*3.1*	0.058
Cyclohexane	15			3.2	1.4	1.2	1.6	0.25	-	-	0.36	-	-	-	-	-	2.6	0.015
Ethyl Acetate				na	-	-	-	-	294	164	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	404 Limestone														
				Nov-01	Nov-01	May-02	May-02	Nov-02		May-03	Nov-03	Nov-03	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Nov-04
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-		-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	*0.070*	*0.092*	*0.092*	*0.14*	*0.15*	*0.13*	-	-	-	-	-	-	-	0.016
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	0.81	0.77	0.23	0.16	*5.8*	0.063	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		*2.5*	*2.3*	*2.1*	*2.1*	*2.0*	*0.62*	*0.55*	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				13	11	11	11	14	15	13	1.8	1.8	3.1	4.1	5.1	6.1	7.1	0.40
o-Xylene				1.0	0.91	0.67	0.64	2.5	0.12	0.10	0.025	0.025	-	-	-	-	-	-
Total Xylene	0.07	0.01		*14*	*12*	*12*	*12*	*17*	*15*	*13*	*1.8*	*1.8*	*3.1*	*4.1*	*5.1*	*6.1*	*7.1*	*0.40*
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total BTEX				17	15	14	14	24	16	14	1.8	1.8	3.1	4.1	5.1	6.1	7.1	0.42
Total VOCs				**17**	**15**	**14**	**14**	**24**	**16**	**14**	**1.8**	**1.8**	**3.1**	**4.1**	**5.1**	**6.1**	**7.1**	**0.43**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	*1.8*	*1.6*	*0.88*	*0.71*	*3.4*	*1.2*	*1.1*	-	-	-	-	-	-	-	*0.88*
Cyclohexane	15			0.97	1.3	0.94	0.82	0.63	0.70	0.61	0.40	0.40	-	1.52	2.52	3.52	4.52	0.35
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	404 Limestone														
				May-05	Nov-05	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09	Nov-09	May-10	Nov-10	May-11	Nov-11	May-12
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	0.12	0.007	-	*8.977*	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	0.16	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	0.009	-	-	-	-	-	-	*0.081*	-	0.008	*0.14*	-	-	*0.065*	*0.052*
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	0.014	-	*2.321*	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	-	0.006	0.006	0.15	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				1.9	0.072	-	-	-	-	-	-	0.016	0.32	2.4	-	-	0.013	0.064
o-Xylene				-	-	-	-	-	-	-	-	0.003	-	0.014	-	-	-	0.004
Total Xylene	0.07	0.01		*1.9*	*0.072*	-	-	-	-	-	-	0.019	*0.32*	*2.5*	-	-	0.013	0.068
Freon 113				-	-	-	-	-	-	-	-	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	-	-	0.001	0.001	-	0.004	0.99	0.84	3.3	17	17	15	4.2	4.2	2.1
Vinyl Acetate				-	-	-	-	-	-	-	-	na	na	na	na	na	na	na
Total BTEX				1.9	0.072	-	-	-	-	-	0.081	0.039	0.33	5.1	-	-	0.078	0.12
Total VOCs				**1.9**	**0.072**	**0.001**	**0.001**	-	**0.004**	**0.99**	**1.2**	**3.3**	**17**	**31**	**15**	**4.2**	**4.3**	**2.2**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	*3.2*	*0.39*	*0.54*	-	-	*1.0*	*4.0*	*14*	*84*	*71*	*0.75*	*1.3*	0.13	*0.54*	-
Cyclohexane	15			0.36	0.19	0.052	0.081	0.14	0.27	0.11	0.14	0.11	0.13	0.32	0.75	-	-	0.29
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	404 Limestone													
				Nov-12	May-13	Nov-13	May-14	Nov-14	May-15	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	May-19
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	0.004	-	-	-	0.005	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	0.005	-	-	0.003	0.024	-	-	0.003	-	-	-
Propylbenzene				-	-	0.013	-	-	-	-	0.007	-	-	-	-	-	-
Chloroethane				-	-	0.004	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	0.077	-
Acetone				-	-	-	-	-	-	-	-	0.14	-	-	-	12	-
Carbon Disulphide				-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01	0.03		-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	*0.036*	-	*0.023*	0.001	*0.014*	*0.009*	*0.012*	*0.062*	-	-	0.017	-	-	0.0006
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	0.0012	-	-	-	1.45	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				0.080	-	0.005	1.5	0.003	0.003	-	10	-	-	0.016	0.44	-	-
o-Xylene				0.005	-	-	-	-	-	-	0.005	-	-	0.002	-	-	-
Total Xylene	0.07	0.01		*0.085*	-	0.005	*1.5*	0.003	0.003	-	*10*	-	-	0.018	*0.44*	-	-
Freon 113				na	na	na	na	na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	0.85	0.38	0.27	0.18	0.10	0.066	0.55	0.14	0.031	0.017	0.031	0.038	0.031	0.023
Vinyl Acetate				na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total BTEX				0.121	-	0.029	1.531	0.017	0.012	0.012	11.89	-	-	0.035	0.440	-	0.001
Total VOCs				**0.969**	**0.377**	**0.318**	**1.723**	**0.115**	**0.078**	**0.570**	**12.06**	**0.170**	**0.017**	**0.068**	**0.478**	**11.739**	**0.023**
Alcohols and VOA Compounds																	
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	0.053	-	-	0.017	0.017	0.057	0.140	0.062	0.052	-	0.040	0.040	0.024
Cyclohexane	15			0.199	0.129	0.081	0.230	-	-	-	0.174	0.137	-	-	0.130	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	409 Limestone														
				May-04	Nov-04	May-05	Nov-05	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09	Nov-09	May-10	Nov-10	May-11
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	0.005	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		0.001	-	0.001	0.007	0.005	0.008	0.009	0.022	0.007	0.003	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	0.014	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freon 113				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
Methyl t-butyl ether		0.03	0.01	-	0.014	0.008	-	-	-	-	-	-	-	-	-	-	-	0.002
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	na	na	na	na
Total BTEX				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total VOCs				**0.001**	**0.014**	**0.009**	**0.007**	**0.005**	**0.008**	**0.009**	**0.022**	**0.007**	**0.003**	**0.019**	**-**	**-**	**-**	**0.002**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	-	0.062	-	-	-	-	-	0.21	-	-	-	-
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	409 Limestone															
				Nov-11	May-12	Nov-12	May-13	Nov-13	May-14	Nov-14	May-15	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	May-19
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	.	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01	0.03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		0.002	-	-	0.004	-	-	-	-	0.002	-	-	0.002	0.004	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freon 113				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	0.002	-	-	-	-	0.001	-	-	-	-	-	-	0.0003	0.0003	0.0002	0.0003
Vinyl Acetate				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total BTEX				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total VOCs				**0.004**	**-**	**-**	**0.004**	**-**	**0.001**	**-**	**-**	**0.002**	**-**	**-**	**0.002**	**0.004**	**0.0003**	**0.0002**	**0.0003**
Alcohols and VOA Compounds																			
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	501 Limestone														
				Dec-96	Jun-97	Dec-97	May-98	May-98	Jul-98	Sep-98	Nov-98	Feb-99	May-99	May-00	Nov-00	May-01	Nov-01	May-02
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	*8.1*	-	-	-	-	-	*5.5*	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	37	-	-	100	-	-	53	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	*65*	*140*	*220*	*220*	*190*	*210*	*270*	*210*	*180*	*150*	*230*	*200*	*72*	*58*	*83*
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		*7.0*	*7.3*	*7.3*	*25*	-	*9.7*	*14*	*8.4*	*13*	*7.3*	*6.6*	*8.1*	*3.4*	*4.9*	*7.3*
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				34	36	33	120	60	42	62	50	68	35	29	40	17	25	33
o-Xylene				9.9	9.7	9.6	40	16	12	17	12	17	9.5	7.4	11	4.2	5.7	8.8
Total Xylene	0.07	0.01		*44*	*46*	*43*	*160*	*76*	*54*	*79*	*62*	*85*	*45*	*36*	*51*	*21*	*31*	*42*
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total BTEX				116	193	270	405	266	274	363	280	278	202	273	259	97	94	132
Total VOCs				**116**	**201**	**270**	**405**	**266**	**274**	**400**	**286**	**278**	**302**	**273**	**259**	**150**	**94**	**132**
Alcohols and VOA Compounds																		
Methanol				154	609	594	61	347	80	165	83	371	61	6.8	-	-	-	-
Ethanol				342	141	542	57	353	114	194	-	9.3	-	45	-	-	-	-
iso-Propanol				276	161	347	399	630	61	159	31	27	304	135	15	226	-	1.5
Tetrahydrofuran	0.3		0.115	-	*3.0*	-	*284*	*3,230*	*32*	*65*	-	*66*	*62*	-	*24*	-	-	-
Cyclohexane	15			7.4	3.0	-	-	-	-	-	-	-	-	-	7.4	1.8	3.3	4.0
Ethyl Acetate				2.0	-	-	2,040	2,430	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	501 Limestone														
				Nov-02	May-03	Nov-03	May-04	Nov-04	May-05	Nov-05	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09	Nov-09
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	*2.2*	-	-	-	-	-	-	-	-	-	-	*1.0*	0.68	0.31	-
Acetone				-	-	-	-	-	-	-	-	-	-	0.42	3.2	-	71	12
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	1.9	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.081*	*0.062*
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	*87*	*120*	*85*	*79*	*69*	*84*	*50*	*77*	*65*	*11*	*65*	*110*	*100*	*29*	*16*
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	-
Ethylbenzene	0.15	0.01		*7.2*	*7.1*	*6.7*	*12*	*11*	*11*	*6.3*	*9.2*	*9.4*	*3.2*	*8.4*	*11*	*8.5*	*11*	*6.4*
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				32	32	31	52	49	46	29	42	42	27	45	60	41	27	15
o-Xylene				8.3	7.5	7.5	12	12	12	7.5	9.9	11	3.9	11	14	9.4	14	7.4
Total Xylene	0.07	0.01		*40*	*40*	*39*	*64*	*61*	*58*	*37*	*52*	*53*	*31*	*56*	*74*	*50*	*42*	*22*
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	na	na
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	0.28	0.44
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	na	na
Total BTEX				135	167	130	155	141	153	93	138	127	45	129	195	159	81	45
Total VOCs				**137**	**167**	**130**	**155**	**141**	**153**	**93**	**138**	**127**	**45**	**130**	**199**	**161**	**153**	**58**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	3.6	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.47
iso-Propanol				2.8	2.6	-	-	-	-	0.50	-	0.30	-	-	-	-	99	11
Tetrahydrofuran	0.3		0.115	*3.5*	-	-	-	-	-	*0.80*	-	-	-	*8.0*	-	*1.6*	*17*	*15*
Cyclohexane	15			2.8	2.3	3.9	5.0	-	3.8	2.2	4.9	3.3	1.6	3.4	2.7	2.5	1.3	2.4
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	501 Limestone																	
				May-10	Nov-10	May-11	Nov-11	May-12	Nov-12	May-13	Nov-13	May-14	Nov-14	May-15	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	May-19
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	0.036	0.020	0.014	0.027	0.018	0.017	0.028	0.011	0.016	0.004
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	0.044	0.021	0.011	0.022	0.010	0.013	0.011	0.006	0.006	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	0.163	0.117	0.068	0.114	0.013	0.018	0.081	0.041	0.061	0.010
Propylbenzene				-	-	-	-	-	-	-	-	-	0.038	0.031	0.012	0.031	-	-	0.020	0.010	0.019	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	0.048	-	-	-	-	-	-	-
Acetone				-	-	-	4.756	-	-	-	-	-	0.081	8.180	4.718	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	*0.036*	0.029	0.017	*0.040*	*0.069*	*0.031*	0.027	*0.024*	*0.066*	*0.051*	*0.030*	*0.023*	0.011	0.017	0.003	0.014	0.011	0.012	0.004
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				na	na	na	na	na	na	na	na	na	na	na	na	-	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	*32.365*	*18.202*	*6.489*	*25.178*	*39.327*	*45.338*	*9.903*	*2.594*	*3.161*	*38.098*	*18.312*	*22.960*	*0.330*	0.035	0.029	0.031	*1.068*	*1.446*	0.147
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		*8.894*	*5.073*	*3.116*	*9.960*	*26.79*	*14.101*	*9.897*	*7.170*	*8.985*	*7.469*	*5.776*	*2.795*	*2.990*	*0.615*	*1.075*	*0.632*	*1.000*	*1.074*	0.090
Styrene	0.3			-	-	-	-	-	-	-	-	1.6	*1.6*	-	-	-	*0.010*	-	0.006	-	-	-
Xylenes(meta and para)				39	43	46	44	63	62	58	33	40	53	34	44	25	7.6	8.5	5.2	4.6	7.6	0.46
o-Xylene				14	11	13	10	14	13	9.4	5.5	6.4	9.4	5.8	8.8	1.9	0.28	0.44	0.18	1.0	1.5	0.11
Total Xylene	0.07	0.01		*52.7*	*54.0*	*59.2*	*54.5*	*88.5*	*75.9*	*67.2*	*38.7*	*46.1*	*62.7*	*39.4*	*52.6*	*26.9*	*7.8*	*8.9*	*5.3*	*5.6*	*9.1*	*0.576*
Freon 113				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	0.035	0.029	-	0.146	-	0.019	0.006	-	0.074	*0.256*	0.036	4.769	0.176	0.107	0.008	-	0.054	0.023	0.005
Vinyl Acetate				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total BTEX				94.01	77.35	68.77	89.64	142.71	135.33	86.99	48.47	58.34	108.28	63.49	78.41	30.19	8.51	10.00	6.01	7.64	11.64	0.82
Total VOCs				**94.04**	**77.37**	**68.77**	**94.55**	**142.71**	**135.34**	**87.00**	**48.47**	**59.99**	**110.47**	**71.89**	**88.05**	**30.56**	**8.66**	**10.06**	**6.16**	**7.77**	**11.76**	**0.84**
Alcohols and VOA Compounds																						
Methanol				-	-	-	-	-	-	-	-	-	-	86	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	-	-
iso-Propanol				-	-	-	3.3	-	-	-	-	-	-	2.2	1.9	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	0.20	-	-	-	-	-	0.36	0.98	*2.1*	0.048	-	0.039	0.027	0.056	0.058	0.002
Cyclohexane	15			2.224	10.075	2.205	2.109	4.768	3.548	1.850	1.977	2.450	1.979	1.297	1.693	1.560	1.844	0.360	1.420	0.970	0.931	0.114
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	702 Limestone														
				Feb-98	May-00	Dec-00	May-01	Nov-01	May-02	Nov-02	May-03	Nov-03	May-04	Nov-04	May-05	Nov-05	May-06	Nov-06
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-	-
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total BTEX				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total VOCs				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	702 Limestone														
				May-07	Nov-07	May-08	Nov-08	May-09	Nov-09	May-10	Nov-10	May-11	Nov-11	May-12	Nov-12	May-13	Nov-13	May-14
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	na	na	na	na	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	0.003	-	-	0.009	0.022	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	0.003	0.006	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	-	-	-	-	-	-	0.018	0.031	-	-	-	-	-	-
o-Xylene				-	-	-	-	-	-	-	0.004	0.005	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	-	-	-	-	-	-	0.022	0.036	-	-	-	-	-	-
Freon 113				-	-	-	-	na	na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate				-	-	-	-	na	na	na	na	na	na	na	na	na	na	na
Total BTEX				**-**	**-**	**-**	**-**	**0.003**	**-**	**-**	**0.034**	**0.064**	**-**	**-**	**-**	**-**	**-**	**-**
Total VOCs				**-**	**-**	**-**	**-**	**0.003**	**-**	**-**	**0.034**	**0.064**	**-**	**-**	**-**	**-**	**-**	**-**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	702 Limestone									
				Nov-14	May-15	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	May-19
Chloromethane				-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	na	na	na	na	na	na
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	0.018	0.007
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	na	na	na	na	na	na
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	0.009	-
4-Methyl-2-Pentanone(MIBK)				na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	0.004	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				na	na	na	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	-	-	-	-	-	-	-	-	-
o-Xylene				-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	-	-	-	-	-	-	-	-	-
Freon 113				na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	0.0013
Vinyl Acetate				na	na	na	na	na	na	na	na	na	na
Total BTEX				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	**-**
Total VOCs				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.031**	**0.008**
Alcohols and VOA Compounds													
Methanol				-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	-	-	-	-	-	-	-	-
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	C1 Limestone														
				Jun-96	Dec-96	Jun-97	Dec-97	May-98	Sep-98	Nov-98	May-99	Nov-99	May-00	Nov-00	May-01	Nov-01	May-02	Nov-02
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	0.083	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-		-	-	-		-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-				-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	*6.5*	*5.2*	*2.9*	*2.9*	*2.8*	*2.1*	*3.0*	-	*3.2*	*3.5*	*2.7*	-	*1.2*	*3.1*	*1.6*
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	*5.2*	*3.8*	0.23	1.5	0.83	0.22	0.63	-	-	-	*2.1*	-	-	-	0.22
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		*2.9*	*1.9*	*0.51*	*0.94*	*0.44*	*0.39*	*0.71*	0.069	*0.73*	*0.34*	-	-	0.018	0.096	0.060
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				13	7.0	3.2	6.4	5.8	3.4	7.6	2.0	8.0	6.7	9.3	-	0.23	5.2	3.2
o-Xylene				2.1	1.4	0.43	0.81	0.62	0.27	0.58	0.10	0.40	-	0.74	-	-	-	0.14
Total Xylene	0.07	0.01		*15*	*8.4*	*3.6*	*7.2*	*6.4*	*3.7*	*8.2*	*2.1*	*8.4*	*6.7*	*10*	-	*0.23*	*5.2*	*3.3*
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether		0.03	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total BTEX				30	19	7.3	13	10	6.4	13	2.2	12	11	15	-	1.4	8.4	5.2
Total VOCs				**31**	**19**	**7.3**	**13**	**10**	**6.4**	**13**	**2.2**	**12**	**11**	**15**	**-**	**1.4**	**8.4**	**5.2**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	-
Tetrahydrofuran	0.3		0.115	*2.2*	*0.9*	*0.68*	*1.4*	*1.6*	*1.6*	*1.1*	*4.6*	*13*	*8.6*	*12*	*1.9*	*4.8*	*3.9*	*1.6*
Cyclohexane	15			0.11	0.10	0.040	-	-	-	-	-	-	-	0.66	0.069	0.054	0.80	0.56
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	C1 Limestone														
				May-03	Nov-03	May-04	Nov-04	May-05	Nov-05	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09	Nov-09	May-10
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				na	na	na	na	na	na	na	na	na	na	na	na	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	0.010	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				-	-	-	-	-	-	-	-	-	-	-	-	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	0.005	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	*2.1*	*1.5*	*0.84*	-	*0.36*	*0.22*	*0.58*	*0.41*	-	-	-	*0.62*	-	-	-
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				-	-	-	-	-	-	-	-	-	-	-	-	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	-	-	-	-	0.10	-	-	-	-	-	-	0.004	0.01	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	0.15	-	-	-	-	-	-	-	-	-
Styrene	0.3			-	-	-	-	-		-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				0.81	0.41	-	-	0.008	0.88	-	-	-	-	-	-	-	0.012	-
o-Xylene				-	-	-	-	-	0.24	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		*0.81*	*0.41*	-	-	-	*1.1*	-	-	-	-	-	-	-	0.012	-
Freon 113				-	-	-	-	-	-	-	-	-	-	-	-	na	na	na
Methyl t-butyl ether		0.03	0.01	-		-	0.002	0.002	-	-	0.019	0.013	0.007	0.018	0.016	0.053	0.29	0.023
Vinyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	na	na	na
Total BTEX				2.9	1.9	0.84	-	0.36	1.6	0.58	0.41	-	-	-	0.62	0.004	0.022	-
Total VOCs				**2.9**	**1.9**	**0.84**	**0.002**	**0.37**	**1.6**	**0.58**	**0.43**	**0.013**	**0.007**	**0.018**	**0.65**	**0.062**	**0.32**	**0.023**
Alcohols and VOA Compounds																		
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	*2.8*	*1.4*	*0.8*	*0.4*	*1.0*	*1.2*	*0.40*	*0.39*	0.29	0.28	0.21	0.25	*0.50*	*0.72*	-
Cyclohexane	15			0.37	0.51	0.14	0.032	0.12	0.30	-	0.034	0.011	0.036	0.033	0.028	-	-	-
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Volatile Organic Compound	DIV	IGV	GTV	C1 Limestone																	
				Nov-10	May-11	Nov-11	May-12	Nov-12	May-13	Nov-13	May-14	Nov-14	May-15	Nov-15	May-16	Nov-16	May-17	Nov-17	May-18	Nov-18	May-19
Chloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Isopropyltoluene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	0.005		0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.007
Propylbenzene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	1	0.01	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulphide				-	-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1-Dichloroethane	0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	0.02	0.03	0.000375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	0.4	0.012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.4	0.003	0.00225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butanone(MEK)				-	-	-	-	-	-	-	-	-	-	-	-	na	na	na	na	na	na
1,1,1-Trichloroethane	0.3	0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone(MIBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichloropropane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.5	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.04	0.01	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	0.03	0.001	0.00075	-	-	*0.057*	*0.19*	*0.17*	-	*0.23*	*0.11*	*0.09*	*0.058*	*0.092*	*0.098*	0.0007	0.026	0.030	0.050	0.051	0.051
trans-1,3-Dichloropropene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone(MBK)				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,1,2,2-Tetrachloroethane				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1	0.01	0.525	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.18	0.001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.15	0.01		-	-	-	-	-	-	-	0.016	-	-	-	0.007	-	-	-	-	-	0.004
Styrene	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes(meta and para)				-	0.004	-	-	-	-	-	0.115	-	-	-	0.299	-	-	-	0.032	-	0.960
o-Xylene				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.07	0.01		-	0.004	-	-	-	-	-	*0.12*	-	-	-	-	-	-	-	0.032	-	*0.960*
Freon 113				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Methyl t-butyl ether		0.03	0.01	0.015	0.83	0.47	0.12	0.043	0.020	0.045	0.010	0.009	0.017	0.034	0.049	0.022	0.018	0.066	0.044	0.058	0.031
Vinyl Acetate				na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total BTEX				-	0.008	0.057	0.19	0.17	-	0.23	0.24	0.088	0.058	0.092	0.105	0.001	0.026	0.030	0.082	0.051	1.015
Total VOCs				**0.015**	**0.84**	**0.53**	**0.31**	**0.21**	**0.020**	**0.27**	**0.25**	**0.097**	**0.074**	**0.13**	**0.45**	**0.023**	**0.044**	**0.096**	**0.13**	**0.109**	**1.052**
Alcohols and VOA Compounds																					
Methanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propanol				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	0.3		0.115	-	-	0.092	-	-	0.054	0.10	-	0.099	0.079	0.11	0.14	0.11	0.14	0.10	-	0.095	0.103
Cyclohexane	15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.077
Ethyl Acetate				-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-

- Indicates result below reporting limit
DIV: Dutch Intervention Value
IGV: EPA Interim Guideline Value
GTV: Groundwater Threshold Value
Indicates result above DIV
Indicates result above IGV
Indicates result above GTV

Appendix D Shallow Soil Site Investigation Tables

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sampling Date	Location ID	Sample Depth m bgl	Sample Matrix	Laboratory Analysis						
				VOCs + TICs	SVOCs + TICs	TPH-CWG	CLEA Metals	Cyclohexane	THF	Bromide
30/07/2019	BH1	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
30/07/2019	BH2	0.0 - 0.6	S	X	X	X	X	X	X	X
		–	–	–	–	–	–	–	–	–
30/07/2019	BH3	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
29/07/2019	BH4	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
29/07/2019	BH5	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
29/07/2019	BH6	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
29/07/2019	BH7	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
23/07/2019	BH8	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
24/07/2019	BH9	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
24/07/2019	BH10	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
24/07/2019	BH11	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
24/07/2019	BH12	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
25/07/2019	BH13	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
25/07/2019	BH14	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
26/07/2019	BH16	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
25/07/2019	BH17	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
25/07/2019	BH18	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
22/07/2019	BH19	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
23/07/2019	BH20	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
23/07/2019	BH21	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
22/07/2019	BH22	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.6	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
23/07/2019	BH23	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
23/07/2019	BH24	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
22/07/2019	BH25	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
25/07/2019	BH26	0.0 - 0.8	S	X	X	X	X	X	X	X
		–	–	–	–	–	–	–	–	–
26/07/2019	BH27	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
24/07/2019	BH28	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
23/07/2019	DUP 01 (BH8)	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
24/07/2019	DUP 02 (BH11)	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
25/07/2019	DUP 03 (BH13)	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
26/07/2019	DUP 04 (BH16)	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
29/07/2019	DUP 05 (BH6)	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X
30/07/2019	DUP 06 (BH3)	0.0 - 1.0	S	X	X	X	X	X	X	X
		1.0 - 2.0	S	X	X	X	X	X	X	X

Notes:
S - soil/subsoil
m bgl - metres below ground level
VOCs - Volatile Organic Compounds
TICs - Tentatively Identified Compounds
SVOCs - Semi-Volatile Organic Compounds
TPH-CWG - total petroleum hydrocarbons criteria working group (speciated hydrocarbons with aromatic/aliphatic split)
CLEA Metals - Antimony, Arsenic, Barium, Beryllium, Water Soluble Boron, Cadmium, Chromium, Chromium III, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Vanadium and Zinc
THF - Tetrahydrofuron

X - analysis scheduled
~ - analysis not scheduled

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						BH1		BH2		BH3		BH4		BH5		BH6		BH7		BH8	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-0.6	~	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						30/07/2019		30/07/2019		30/07/2019		29/07/2019		29/07/2019		29/07/2019		29/07/2019		23/07/2019	
Parameter (Volatile Organic Compounds)																					
Dichlorodifluoromethane	µg/kg	<2	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	µg/kg	<2	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	µg/kg	<3	480	nca	4	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/kg	<2	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	µg/kg	<1	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/kg	<2	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	µg/kg	<2	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene (1,1 DCE)	µg/kg	<6	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM)	µg/kg	<30	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
trans-1-2-Dichloroethene	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
cis-1-2-Dichloroethene	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane (1,1,1 TCA)	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloropropene	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/kg	<3	12,000	8.7	9	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene (TCE)	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	<6	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
cis-1-3-Dichloropropene	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/kg	<3	28,000,000	31	11	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
trans-1-3-Dichloropropene	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<3	2,700,000	132	5	-	-	-	~	-	-	-	5	-	-	-	-	-	-	-	-
p/m-Xylene	µg/kg	<5	2,900,000	67	313	-	-	9	~	-	-	-	16	-	-	-	-	-	-	-	-
o-Xylene	µg/kg	<3	3,100,000	67	14	-	-	4	~	-	-	-	14	-	-	-	-	-	-	-	-
Styrene	µg/kg	<3	1,660,000	240	9	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	µg/kg	<3	632,000	nca	6	-	-	-	~	-	-	-	6	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	µg/kg	<2	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene	µg/kg	<4	1,880,000	nca	18	-	-	-	~	-	-	-	18	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	<3	1,500,000	nca	32	-	-	-	~	-	-	-	32	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/kg	<3	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	µg/kg	<5	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	<6	19,200	nca	253	-	-	-	~	-	-	-	253	-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/kg	<4	120,000,000	nca	19	-	-	-	~	-	-	-	18	-	-	-	-	-	-	-	-
4-Isopropyltoluene	µg/kg	<4	nca	nca	28	-	-	-	~	-	-	-	28	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
n-Butylbenzene	µg/kg	<4	58,000,000	nca	36	-	-	-	~	-	-	-	36	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	<7	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	<4	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	<27	90,000	19	73	-	-	-	~	-	-	-	**73**	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	<7	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																					
Detected	-	-	-	-	-	-	-	-	~	-	-	-	Yes	-	-	-	-	-	-	-	-

Notes:
MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No sample taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected
xx (green) Exceeds Human Health GAC - Commercial / Industrial
xx (orange) Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						BH9		BH10		BH11		BH12		BH13		BH14		BH16		BH17		BH18		BH19		BH20		BH21		BH22					
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.60	1.0-2.0			
Date Sampled						24/07/2019		24/07/2019		24/07/2019		24/07/2019		25/07/2019		25/07/2019		26/07/2019		25/07/2019		25/07/2019		22/07/2019		23/07/2019		23/07/2019		22/07/2019					
Parameter (Volatile Organic Compounds)																																	
Dichlorodifluoromethane	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	µg/kg	<3	480	nca	4	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	µg/kg	<1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene (1,1 DCE)	µg/kg	<6	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM)	µg/kg	<30	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1-2-Dichloroethene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1-2-Dichloroethene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane (1,1,1 TCA)	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloropropene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/kg	<3	12,000	8.7	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-
Trichloroethene (TCE)	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	<6	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1-3-Dichloropropene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/kg	<3	28,000,000	31	11	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-
trans-1-3-Dichloropropene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<3	2,700,000	132	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
p/m-Xylene	µg/kg	<5	2,900,000	67	313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	313	6	-	-	-	-
o-Xylene	µg/kg	<3	3,100,000	67	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/kg	<3	1,660,000	240	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
Bromoform	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	µg/kg	<3	632,000	nca	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene	µg/kg	<4	1,880,000	nca	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	<3	1,500,000	nca	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	µg/kg	<5	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	<6	19,200	nca	253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/kg	<4	120,000,000	nca	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	7	-	-
4-Isopropyltoluene	µg/kg	<4	nca	nca	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
1,3-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Butylbenzene	µg/kg	<4	58,000,000	nca	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-
1,2-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	<7	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	<27	90,000	19	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	<7	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																																	
Detected	-	-	-	-	-	-	-	-	-	-	Yes	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-	-	-	-	-	-	-	-

Notes:
MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No sample taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						BH23		BH24		BH25		BH26		BH27		BH28		DUP01		DUP02		DUP03		DUP04		DUP05		DUP06	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-0.8	~	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						23/07/2019		23/07/2019		22/07/2019		25/07/2019		26/07/2019		24/07/2019		23/07/2019		24/07/2019		25/07/2019		26/07/2019		26/07/2019		30/07/2019	
Parameter (Volatile Organic Compounds)																													
Dichlorodifluoromethane	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	µg/kg	<3	480	nca	4	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	µg/kg	<1	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene (1,1 DCE)	µg/kg	<6	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM)	µg/kg	<30	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1-2-Dichloroethene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1-2-Dichloroethene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane (1,1,1 TCA)	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloropropene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/kg	<3	12,000	8.7	9	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene (TCE)	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	<6	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1-3-Dichloropropene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/kg	<3	28,000,000	31	11	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-
trans-1-3-Dichloropropene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<3	2,700,000	132	5	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p/m-Xylene	µg/kg	<5	2,900,000	67	313	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/kg	<3	3,100,000	67	14	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/kg	<3	1,660,000	240	9	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	µg/kg	<3	632,000	nca	6	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	µg/kg	<2	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene	µg/kg	<4	1,880,000	nca	18	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	<3	1,500,000	nca	32	-	-	-	-	-	-	-	~	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/kg	<3	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	µg/kg	<5	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	<6	19,200	nca	253	-	-	-	-	-	-	-	~	-	-	-	17	-	-	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/kg	<4	120,000,000	nca	19	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Isopropyltoluene	µg/kg	<4	nca	nca	28	-	-	-	-	-	-	-	~	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Butylbenzene	µg/kg	<4	58,000,000	nca	36	-	-	-	-	-	-	-	~	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	<7	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	<4	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	<27	90,000	19	73	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	<7	ncr	ncr	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																													
Detected	-	-	-	-	-	-	Yes	-	Yes	-	Yes	-	-	-	-	-	Yes	-	Yes	-	Yes	-	-	-	-	-	-	-	-

Notes:
MDL - Method Detection Limit
uMDL - microgrammes per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No sample taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil	
Sample ID						BH4		BH11		BH19		BH23	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						29/07/2019		24/07/2019		22/07/2019		23/07/2019	
Volatile Organic Compounds - Tentatively Identified Compounds (TICs)													
Cyclohexane, 1,2,4-trimethyl-	µg/kg	-	nca	nca	153	-	-	-	-	-	153	-	-
Cyclopentane, butyl-	µg/kg	-	nca	nca	133	-	-	-	-	-	-	-	-
Cyclohexene, 1-butyl-	µg/kg	-	nca	nca	213	-	-	-	-	-	-	-	-
Cyclohexanone, 2,3-dimethyl-	µg/kg	-	nca	nca	-	-	-	-	-	-	-	-	-
Undecane	µg/kg	-	nca	nca	345	-	345	-	-	-	-	-	-
1-Ethyl-3-methylcyclohexane (c,t)	µg/kg	-	nca	nca	131	-	-	-	-	-	-	-	-
1-Ethyl-4-methylcyclohexane	µg/kg	-	nca	nca	141	-	-	-	-	-	141	-	-
cis-1-Ethyl-3-methyl-cyclohexane	µg/kg	-	nca	nca	151	-	-	-	-	-	-	-	151
Pentalene, octahydro-2-methyl-	µg/kg	-	nca	nca	315	-	-	-	-	-	-	-	315
Decane, 3-methyl-	µg/kg	-	nca	nca	164	-	-	-	-	-	-	-	164
1H-Indene, octahydro-, cis-	µg/kg	-	nca	nca	137	-	-	-	131	-	137	-	-
trans-Decalin, 2-methyl-	µg/kg	-	nca	nca	166	-	-	-	166	-	-	-	-
Benzene, 1-methyl-4-propyl-	µg/kg	-	nca	nca	135	-	135	-	-	-	-	-	-
Benzene, 2-ethyl-1,4-dimethyl-	µg/kg	-	nca	nca	229	-	229	-	-	-	-	-	-
Benzene, 4-ethyl-1,2-dimethyl-	µg/kg	-	nca	nca	331	-	331	-	-	-	-	-	-
trans,trans-1,6-Dimethylspiro[4.5]decane	µg/kg	-	nca	nca	118	-	-	-	-	-	-	-	117
Dodecane	µg/kg	-	nca	nca	831	-	831	-	-	-	-	-	-
o-Cymene	µg/kg	-	nca	nca	278	-	278	-	-	-	-	-	-
trans-Decalin, 2-methyl-	µg/kg	-	nca	nca	552	-	-	-	-	-	-	-	-
cis-Decalin, 2-syn-methyl-	µg/kg	-	nca	nca	141	-	-	-	141	-	-	-	104
2(1H)-Naphthalenone, octahydro-, trans-	µg/kg	-	nca	nca	158	-	-	-	-	-	-	-	-
Naphthalene, decahydro-2-methyl-	µg/kg	-	nca	nca	275	-	-	-	-	-	-	-	164
Naphthalene, decahydro-, trans-	µg/kg	-	nca	nca	538	-	-	-	-	-	-	-	538
Naphthalene, decahydro-	µg/kg	-	nca	nca	268	-	-	-	268	-	-	-	-
Naphthalene, decahydro-, cis-	µg/kg	-	nca	nca	533	-	-	-	-	-	207	-	216
TICs Detected <80% Match	-	-	-	-	-	-	Yes	-	Yes	-	Yes	-	Yes

Notes:

MDL - Method Detection Limit

µg/kg - micrograms per kilogram

GAC - Generic Assessment Criteria

- <MDL

~ No sample taken

nca - No criteria available

ncr - No criteria required

ND - No TICs detected

xx	Exceeds Human Health GAC - Commercial / Industrial
xx	Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil		Soil	
Sample ID						BH24		BH25		BH28		DUP01		DUP02	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						23/07/2019		22/07/2019		24/07/2019		23/07/2019		24/07/2019	
Volatile Organic Compounds - Tentatively Identified Compounds (TICs)															
Cyclohexane, 1,2,4-trimethyl-	µg/kg	-	nca	nca	153	-	-	-	-	-	-	-	-	-	-
Cyclopentane, butyl-	µg/kg	-	nca	nca	133	-	-	-	-	-	-	-	-	-	133
Cyclohexene, 1-butyl-	µg/kg	-	nca	nca	213	-	-	-	-	-	-	-	-	-	213
Cyclohexanone, 2,3-dimethyl-	µg/kg	-	nca	nca	-	-	-	-	-	-	-	-	-	-	-
Undecane	µg/kg	-	nca	nca	345	-	-	-	-	-	-	-	-	-	-
1-Ethyl-3-methylcyclohexane (c,t)	µg/kg	-	nca	nca	131	-	-	-	-	-	-	-	-	-	131
1-Ethyl-4-methylcyclohexane	µg/kg	-	nca	nca	141	-	-	-	-	-	-	-	-	-	-
cis-1-Ethyl-3-methyl-cyclohexane	µg/kg	-	nca	nca	151	-	-	-	-	-	-	-	-	-	-
Pentalene, octahydro-2-methyl-	µg/kg	-	nca	nca	315	-	-	-	-	-	-	-	-	-	-
Decane, 3-methyl-	µg/kg	-	nca	nca	164	-	-	-	-	-	-	-	-	-	163
1H-Indene, octahydro-, cis-	µg/kg	-	nca	nca	137	-	-	-	-	-	-	-	-	-	-
trans-Decalin, 2-methyl-	µg/kg	-	nca	nca	166	-	-	-	-	-	-	-	-	-	-
Benzene, 1-methyl-4-propyl-	µg/kg	-	nca	nca	135	-	-	-	-	-	-	-	-	-	
Benzene, 2-ethyl-1,4-dimethyl-	µg/kg	-	nca	nca	229	-	-	-	125	-	125	-	-	-	-
Benzene, 4-ethyl-1,2-dimethyl-	µg/kg	-	nca	nca	331	-	-	-	-	-	-	-	-	-	-
trans,trans-1,6-Dimethylspiro[4.5]decane	µg/kg	-	nca	nca	118	-	-	-	-	-	-	-	-	-	118
Dodecane	µg/kg	-	nca	nca	831	-	-	-	150	-	-	-	-	-	-
o-Cymene	µg/kg	-	nca	nca	278	-	-	-	-	-	-	-	-	-	-
trans-Decalin, 2-methyl-	µg/kg	-	nca	nca	552	-	316	-	-	-	-	-	174	-	552
cis-Decalin, 2-syn-methyl-	µg/kg	-	nca	nca	141	-	-	-	-	-	-	-	-	-	118
2(1H)-Naphthalenone, octahydro-, trans-	µg/kg	-	nca	nca	158	-	-	-	-	-	-	-	-	-	158
Naphthalene, decahydro-2-methyl-	µg/kg	-	nca	nca	275	-	-	-	-	-	-	-	-	-	275
Naphthalene, decahydro-, trans-	µg/kg	-	nca	nca	538	-	-	-	-	-	-	-	161	-	-
Naphthalene, decahydro-	µg/kg	-	nca	nca	268	-	-	-	-	-	-	-	-	-	-
Naphthalene, decahydro-, cis-	µg/kg	-	nca	nca	533	-	-	-	-	-	-	-	-	-	533
TICs Detected <80% Match	-	-	-	-	-	-	-	-	-	-	Yes	-	-	-	Yes

Notes:

MDL - Method Detection Limit

µg/kg - micrograms per kilogram

GAC - Generic Assessment Criteria

- <MDL

~ No sample taken

nca - No criteria available

ncr - No criteria required

ND - No TICs detected

xx	Exceeds Human Health GAC - Commercial / Industrial
xx	Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC - Commercial / Industrial (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						BH1		BH2		BH3		BH4		BH5		BH6		BH7		BH8		BH9	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-0.6	~	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						30/07/2019		30/07/2019		30/07/2019		29/07/2019		29/07/2019		29/07/2019		29/07/2019		23/07/2019		24/07/2019	
Parameter (Semi Volatile Organic Compounds)																							
Phenols																							
2-Chlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	<10	82,000,000	nca	35	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	µg/kg	<10	370,000	4.1	214	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polyaromatic Hydrocarbons (PAHs)																							
2-Chloronaphthalene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	<10	3,000,000	nca	459	-	-	-	~	-	-	25	459	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	<10	90,000	19	47	-	-	-	~	-	-	-	47	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/kg	<10	59,000,000	nca	190	-	-	-	~	-	-	-	53	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	<10	22,000,000	nca	240	-	-	-	~	-	-	11	114	-	-	-	-	-	-	-	-	-	72
Anthracene	µg/kg	<10	520,000,000	8.2	107	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Fluoranthene	µg/kg	<10	2,300,000	1.7	153	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	153
Pyrene	µg/kg	<10	54,000,000	nca	128	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	128
Benzo(a)anthracene	µg/kg	<10	170,000	nca	94	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	94
Chrysene	µg/kg	<10	350,000	nca	73	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	73
Benzo(bk)fluoranthene	µg/kg	<10	1,244,000	nca	112	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	112
Benzo(a)pyrene	µg/kg	<10	35,000	0.32	72	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	72
Indeno(123cd)pyrene	µg/kg	<10	510,000	nca	32	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	32
Dibenzo(ah)anthracene	µg/kg	<10	3,500	nca	12	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Benzo(ghi)perylene	µg/kg	<10	3,900,000	nca	36	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	36
Benzo(b)fluoranthene	µg/kg	<10	44,000	nca	81	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	81
Benzo(k)fluoranthene	µg/kg	<10	1,200,000	nca	31	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	31
Phthalates																							
Bis(2-ethylhexyl) phthalate	µg/kg	<100	nca	nca	4616	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butyl phthalate	µg/kg	<100	15,400,000	202	1475	1,475	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Octyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other SVOCs																							
1,2-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethoxy)methane	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethyl)ether	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/kg	<10	nca	nca	105	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	<10	ncr	nca	77	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-nitrosodi-n-propylamine	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																							
Detected	-	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	-	-	-	-	-	-	-	-

Notes:

MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No samples taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

xx	Exceeds Human Health GAC - Commercial / Industrial
xx	Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC - Commercial / Industrial (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						BH10		BH11		BH12		BH13		BH14		BH16		BH17		BH18	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						24/07/2019		24/07/2019		24/07/2019		25/07/2019		25/07/2019		26/07/2019		25/07/2019		25/07/2019	
Parameter (Semi Volatile Organic Compounds)																					
Phenols																					
2-Chlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	<10	82,000,000	nca	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	µg/kg	<10	370,000	4.1	214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polyaromatic Hydrocarbons (PAHs)																					
2-Chloronaphthalene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	<10	3,000,000	nca	459	-	-	-	-	-	-	-	-	-	-	75	-	-	-	-	-
Naphthalene	µg/kg	<10	90,000	19	47	-	-	-	-	-	-	-	-	-	-	**21**	-	-	-	-	-
Acenaphthylene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/kg	<10	59,000,000	nca	190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	<10	22,000,000	nca	240	-	-	-	-	-	-	-	-	-	-	34	-	-	-	-	-
Anthracene	µg/kg	<10	520,000,000	8.2	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	<10	2,300,000	1.7	153	-	-	-	-	-	-	-	-	-	**19**	-	-	-	-	-	-
Pyrene	µg/kg	<10	54,000,000	nca	128	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	<10	170,000	nca	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	<10	350,000	nca	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(bk)fluoranthene	µg/kg	<10	1,244,000	nca	112	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-
Benzo(a)pyrene	µg/kg	<10	35,000	0.32	72	-	-	-	-	-	-	-	-	-	**14**	-	-	-	-	-	-
Indeno(123cd)pyrene	µg/kg	<10	510,000	nca	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	µg/kg	<10	3,500	nca	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	µg/kg	<10	3,900,000	nca	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	µg/kg	<10	44,000	nca	81	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/kg	<10	1,200,000	nca	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phthalates																					
Bis(2-ethylhexyl) phthalate	µg/kg	<100	nca	nca	4616	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butyl phthalate	µg/kg	<100	15,400,000	202	1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Octyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other SVOCs																					
1,2-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethoxy)methane	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethyl)ether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/kg	<10	nca	nca	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	<10	ncr	nca	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-nitrosodi-n-propylamine	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																					
Detected	-	-	-	-	-	-	-	-	Yes	-	Yes	-	-	-	-	Yes	-	-	-	-	Yes

Notes:

MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No samples taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC - Commercial / Industrial (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil			Soil		Soil		Soil		Soil		Soil	
Sample ID						BH19		BH20		BH21		BH22			BH23		BH24		BH25		BH26			
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.60	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-0.8	~		
Date Sampled						22/07/2019		23/07/2019		23/07/2019		22/07/2019			23/07/2019		23/07/2019		22/07/2019		25/07/2019			
Parameter (Semi Volatile Organic Compounds)																								
Phenols																								
2-Chlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2-Methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2,4-Dichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2,4-Dimethylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2,4,5-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2,4,6-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
4-Chloro-3-methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
4-Methylphenol	µg/kg	<10	82,000,000	nca	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
4-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Pentachlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Phenol	µg/kg	<10	370,000	4.1	214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Polyaromatic Hydrocarbons (PAHs)																								
2-Chloronaphthalene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2-Methylnaphthalene	µg/kg	<10	3,000,000	nca	459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Naphthalene	µg/kg	<10	90,000	19	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Acenaphthylene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Acenaphthene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Fluorene	µg/kg	<10	59,000,000	nca	190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Phenanthrene	µg/kg	<10	22,000,000	nca	240	-	-	-	-	-	-	-	240	-	-	-	-	-	-	-	-	~		
Anthracene	µg/kg	<10	520,000,000	8.2	107	-	-	-	-	-	-	-	**107**	-	-	-	-	-	-	-	-	~		
Fluoranthene	µg/kg	<10	2,300,000	1.7	153	-	-	-	-	**16**	-	-	-	-	-	-	-	-	-	-	-	~		
Pyrene	µg/kg	<10	54,000,000	nca	128	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	~		
Benzo(a)anthracene	µg/kg	<10	170,000	nca	94	-	-	-	-	33	-	-	-	-	-	-	-	-	-	-	-	~		
Chrysene	µg/kg	<10	350,000	nca	73	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	~		
Benzo(bk)fluoranthene	µg/kg	<10	1,244,000	nca	112	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	~		
Benzo(a)pyrene	µg/kg	<10	35,000	0.32	72	-	-	-	-	**14**	-	-	-	-	-	-	-	-	-	-	-	~		
Indeno(123cd)pyrene	µg/kg	<10	510,000	nca	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Dibenzo(ah)anthracene	µg/kg	<10	3,500	nca	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Benzo(ghi)perylene	µg/kg	<10	3,900,000	nca	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Benzo(b)fluoranthene	µg/kg	<10	44,000	nca	81	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	~		
Benzo(k)fluoranthene	µg/kg	<10	1,200,000	nca	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Phthalates																								
Bis(2-ethylhexyl) phthalate	µg/kg	<100	nca	nca	4616	-	-	-	-	-	-	-	4,616	206	-	-	-	-	-	-	-	~		
Butylbenzyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Di-n-butyl phthalate	µg/kg	<100	15,400,000	202	1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Di-n-Octyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Diethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Dimethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Other SVOCs																								
1,2-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
1,2,4-Trichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
1,3-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
1,4-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2,4-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
2,6-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
3-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
4-Bromophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
4-Chloroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
4-Chlorophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
4-Nitroanilline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Azobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Bis(2-chloroethoxy)methane	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Bis(2-chloroethyl)ether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Carbazole	µg/kg	<10	nca	nca	105	-	-	-	-	-	-	-	105	-	-	-	-	-	-	-	-	~		
Dibenzofuran	µg/kg	<10	ncr	nca	77	-	-	-	-	-	-	-	77	-	-	-	-	-	-	-	-	~		
Hexachlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Hexachlorobutadiene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Hexachlorocyclopentadiene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Hexachloroethane	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Isophorone	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
N-nitrosodi-n-propylamine	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Nitrobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	~		
Semi Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																								
Detected	-	-	-	-	-	Yes	Yes	Yes	-	-	-	-	Yes	Yes	-	-	-	-	-	-	-	-		

Notes:

MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No samples taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC - Commercial / Industrial (µg/kg)	Max Concentration (µg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						BH27		BH28		DUP01		DUP02		DUP03		DUP04		DUP05		DUP06			
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0		
Date Sampled						26/07/2019		24/07/2019		23/07/2019		24/07/2019		25/07/2019		26/07/2019		29/07/2019		30/07/2019			
Parameter (Semi Volatile Organic Compounds)																							
Phenols																							
2-Chlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	<10	82,000,000	nca	35	-	-	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	µg/kg	<10	370,000	4.1	214	-	-	-	**214**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polyaromatic Hydrocarbons (PAHs)																							
2-Chloronaphthalene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	<10	3,000,000	nca	459	-	-	-	242	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	<10	90,000	19	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/kg	<10	59,000,000	nca	190	-	-	-	190	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	<10	22,000,000	nca	240	-	-	-	199	-	-	-	-	-	-	16	-	-	-	-	-	-	-
Anthracene	µg/kg	<10	520,000,000	8.2	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	<10	2,300,000	1.7	153	**24**	-	**12**	-	**17**	-	-	-	-	-	**12**	-	-	-	-	-	-	-
Pyrene	µg/kg	<10	54,000,000	nca	128	24	-	-	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	<10	170,000	nca	94	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	<10	350,000	nca	73	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(bk)fluoranthene	µg/kg	<10	1,244,000	nca	112	24	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/kg	<10	35,000	0.32	72	**15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(123cd)pyrene	µg/kg	<10	510,000	nca	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	µg/kg	<10	3,500	nca	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	µg/kg	<10	3,900,000	nca	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	µg/kg	<10	44,000	nca	81	17	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/kg	<10	1,200,000	nca	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phthalates																							
Bis(2-ethylhexyl) phthalate	µg/kg	<100	nca	nca	4616	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butyl phthalate	µg/kg	<100	15,400,000	202	1475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Octyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/kg	<100	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other SVOCs																							
1,2-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenylphenylether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethoxy)methane	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethyl)ether	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/kg	<10	nca	nca	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	<10	ncr	nca	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-nitrosodi-n-propylamine	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	µg/kg	<10	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																							
Detected	-	-	-	-	-	-	-	-	Yes	Yes	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No samples taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Sample Type						Soil		Soil		Soil		Soil	
Sample ID	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC - Commercial / Industrial (µg/kg)	Max Concentration (µg/kg)	BH4		BH11		BH12		BH16	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						29/07/2019		24/07/2019		24/07/2019		26/07/2019	
Semi Volatile Organic Compounds - Tentatively Identified Compounds (TICs)													
p-Ethyldiphenylmethane	µg/kg	-	nca	nca	322,183	-	-	-	-	-	-	-	-
Decane	µg/kg	-	nca	nca	1,078	-	-	-	-	-	-	-	-
Undecane	µg/kg	-	nca	nca	3,008	-	-	-	-	-	-	-	-
Dodecane	µg/kg	-	nca	nca	4,178	-	3242	-	-	-	-	-	-
Benzene, 2,6-dimethyl-1-(phenylmethyl)-	µg/kg	-	nca	nca	22,271	-	-	-	-	-	-	-	-
Benzene, 1-ethyl-3-(phenylmethyl)-	µg/kg	-	nca	nca	249,499	-	-	-	-	-	-	-	-
1-Nonadecene	µg/kg	-	nca	nca	5,241	-	-	-	-	-	-	-	-
4-Methylnaphtho[1,2-b]thiophene	µg/kg	-	nca	nca	4,908	-	-	-	-	-	-	-	-
Naphthalene, decahydro-2-methyl-	µg/kg	-	nca	nca	934	-	-	-	-	-	-	-	-
Naphthalene, 1,4-dimethyl-	µg/kg	-	nca	nca	1,863	-	-	-	-	-	-	-	-
Naphthalene, 1,6-dimethyl-	µg/kg	-	nca	nca	0	-	-	-	-	-	-	-	-
Naphthalene, 1,7-dimethyl-	µg/kg	-	nca	nca	6,065	-	1085	-	-	-	-	-	-
Octadecane, 2,6-dimethyl-	µg/kg	-	nca	nca	1,784	-	-	-	-	-	-	-	-
Hexadecane	µg/kg	-	nca	nca	23,463	-	-	-	-	-	-	-	-
Benzene, 1-methyl-4-(phenylmethyl)-	µg/kg	-	nca	nca	2,287	-	-	-	-	-	-	-	-
Tridecane, 5-methyl-	µg/kg	-	nca	nca	1,360	-	-	-	-	-	-	-	-
4,4'-Dimethylbiphenyl	µg/kg	-	nca	nca	1,045	-	-	-	-	-	-	-	-
2,7-Dimethyldibenzothiophene	µg/kg	-	nca	nca	4,781	-	-	-	-	-	-	-	-
3,7-Dimethyldibenzothiophene	µg/kg	-	nca	nca	3,309	-	-	-	-	-	-	-	-
1-Methyldibenzothiophene	µg/kg	-	nca	nca	954	-	954	-	-	-	-	-	-
Naphthalene, 2,3,6-trimethyl-	µg/kg	-	nca	nca	5,738	-	-	-	-	-	-	-	-
Pentadecane	µg/kg	-	nca	nca	24,364	-	7568	-	-	-	-	-	-
Naphthalene, 2,3,6-trimethyl-	µg/kg	-	nca	nca	5,738	-	-	-	-	-	-	-	-
Naphthalene, 1,6,7-trimethyl-	µg/kg	-	nca	nca	5,049	-	-	-	-	-	-	-	-
Naphthalene, 1,4,6-trimethyl-	µg/kg	-	nca	nca	4,597	-	-	-	-	-	-	-	-
Pentadecane, 2,6,10-trimethyl-	µg/kg	-	nca	nca	4,669	-	-	-	-	-	-	-	-
Eicosane	µg/kg	-	nca	nca	14,524	349	-	-	-	-	-	-	-
Eicosane, 2-methyl-	µg/kg	-	nca	nca	5,612	-	-	-	-	-	-	-	-
3-Ethylbenzophenone	µg/kg	-	nca	nca	4,321	-	-	-	-	-	-	-	-
Dibenzothiophene, 4,6-dimethyl-	µg/kg	-	nca	nca	1,207	-	1207	-	-	-	-	-	-
3,4-Dimethylbenzophenone	µg/kg	-	nca	nca	16,291	-	-	-	-	-	-	-	-
3,7-Dimethyldibenzothiophene	µg/kg	-	nca	nca	1,291	-	1291	-	-	-	-	-	-
(4-Acetylphenyl)phenylmethane	µg/kg	-	nca	nca	1,445	-	-	-	-	-	-	-	-
Heptacosane, 1-chloro-	µg/kg	-	nca	nca	2,358	-	-	-	-	-	-	-	-
Nonadecane, 1-chloro-	µg/kg	-	nca	nca	3,391	-	-	-	355	-	-	-	-
Nonadecane	µg/kg	-	nca	nca	23,172	-	3881	-	-	-	-	-	-
1-Nonadecene	µg/kg	-	nca	nca	315	-	315	-	-	-	-	-	-
Disulfide, di-tert-dodecyl	µg/kg	-	nca	nca	1,672	-	-	-	-	-	-	-	-
1,4,5,8-Tetramethylnaphthalene	µg/kg	-	nca	nca	6,883	-	-	-	-	-	-	-	-
Tetratetracontane	µg/kg	-	nca	nca	3,662	-	-	-	-	-	-	-	-
Tetradecane	µg/kg	-	nca	nca	16,936	-	7533	-	-	-	-	-	-
Tetracosane	µg/kg	-	nca	nca	697	-	-	-	-	-	408	-	-
Benzene, 1,4-bis(phenylmethyl)-	µg/kg	-	nca	nca	1,885	-	-	-	-	-	-	-	-
Acetonitrile, (3-chloro-5,5-dimethyl-2-cyclohexen-1-ylidene)-, (E)-	µg/kg	-	nca	nca	1,792	-	-	-	-	-	-	-	-
(E)-Stilbene	µg/kg	-	nca	nca	28,221	-	-	-	-	-	-	-	-
Dibenzothiophene, 3-methyl-	µg/kg	-	nca	nca	847	-	847	-	-	-	-	-	-
5H-Dibenzo[a,c]cyclohepten-5-ol	µg/kg	-	nca	nca	2,394	-	-	-	-	-	-	-	-
Triphenylphosphine sulfide	µg/kg	-	nca	nca	2,270	-	-	-	-	-	-	-	-
Heneicosane	µg/kg	-	nca	nca	5,478	-	-	-	-	-	-	-	-
Tridecane	µg/kg	-	nca	nca	11,533	-	11533	-	-	-	-	-	-
Tridecane, 4-methyl-	µg/kg	-	nca	nca	1,212	-	1212	-	-	-	-	-	-
Tridecane, 3-methyl-	µg/kg	-	nca	nca	713	-	713	-	-	-	-	-	-
Octacosanol	µg/kg	-	nca	nca	538	-	-	-	-	-	-	-	-
1-Octadecene	µg/kg	-	nca	nca	6,184	-	-	-	-	-	-	-	-
Heptadecane	µg/kg	-	nca	nca	23,369	-	-	-	-	-	-	-	-
Heptadecane, 4-methyl-	µg/kg	-	nca	nca	8,091	-	-	-	-	-	-	-	-
Hexathiane	µg/kg	-	nca	nca	321	-	-	-	-	-	-	-	-
Hexadecane	µg/kg	-	nca	nca	9,503	-	9503	-	-	-	-	-	-
Hexadecane, 2,6,10,14-tetramethyl-	µg/kg	-	nca	nca	13,783	-	4649	-	-	-	-	-	-
Octadecane	µg/kg	-	nca	nca	5,608	-	5608	-	-	-	-	-	-
Cycloeicosane	µg/kg	-	nca	nca	414	-	-	-	-	-	-	-	-
13-Docosenamide, (Z)-	mg/kg	-	nca	nca	2,820	-	-	-	-	-	-	-	-
TICs Detected <80% Match	-	-	-	-		Yes	Yes	-	Yes	-	-	Yes	-

Notes:

MDL - Method Detection Limit

µg/kg - micrograms per kilogram

GAC - Generic Assessment Criteria

- <MDL

~ No samples taken

nca - No criteria available

ncr - No criteria required

ND - No TICs detected

xx Exceeds Human Health GAC - Commercial / Industrial

xx Exceeds Controlled Waters GAC - Commercial / Industrial

Sample Type						Soil		Soil		Soil		Soil			Soil		Soil	
Sample ID	Units	MDL (µg/kg)	Human Health GAC - Commercial / Industrial (µg/kg)	Controlled Waters GAC - Commercial / Industrial (µg/kg)	Max Concentration (µg/kg)	BH18		BH19		BH20		BH22			BH28		DUP01	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.60	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						25/07/2019		22/07/2019		23/07/2019		22/07/2019			24/07/2019		23/07/2019	
Semi Volatile Organic Compounds - Tentatively Identified Compounds (TICs)																		
p-Ethyldiphenylmethane	µg/kg	-	nca	nca	322,183	-	-	-	-	-	-	-	322183	7246	-	-	-	-
Decane	µg/kg	-	nca	nca	1,078	-	-	-	-	-	-	-	-	-	-	1078	-	-
Undecane	µg/kg	-	nca	nca	3,008	-	-	-	-	-	-	-	-	-	-	3008	-	-
Dodecane	µg/kg	-	nca	nca	4,178	-	-	-	-	-	-	-	-	-	-	4178	-	-
Benzene, 2,6-dimethyl-1-(phenylmethyl)-	µg/kg	-	nca	nca	22,271	-	-	-	-	-	-	-	22271	-	-	-	-	-
Benzene, 1-ethyl-3-(phenylmethyl)-	µg/kg	-	nca	nca	249,499	-	-	-	-	-	-	-	249499	6897	-	-	-	-
1-Nonadecene	µg/kg	-	nca	nca	5,241	-	-	-	-	-	-	-	-	1013	-	5241	-	-
4-Methylnaphtho[1,2-b]thiophene	µg/kg	-	nca	nca	4,908	-	-	-	-	-	-	-	-	-	-	4908	-	-
Naphthalene, decahydro-2-methyl-	µg/kg	-	nca	nca	934	-	385	-	-	-	-	-	934	-	-	-	-	-
Naphthalene, 1,4-dimethyl-	µg/kg	-	nca	nca	1,863	-	-	-	-	-	-	-	-	-	-	1863	-	-
Naphthalene, 1,6-dimethyl-	µg/kg	-	nca	nca	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene, 1,7-dimethyl-	µg/kg	-	nca	nca	6,065	-	-	-	-	-	-	-	-	-	-	6065	-	-
Octadecane, 2,6-dimethyl-	µg/kg	-	nca	nca	1,784	-	-	-	-	-	-	-	1784	-	-	1129	-	-
Hexadecane	µg/kg	-	nca	nca	23,463	-	-	540	-	-	-	-	1478	-	-	23463	-	-
Benzene, 1-methyl-4-(phenylmethyl)-	µg/kg	-	nca	nca	2,287	-	-	-	-	-	-	-	2287	-	-	-	-	-
Tridecane, 5-methyl-	µg/kg	-	nca	nca	1,360	-	-	-	-	-	-	-	-	-	-	1360	-	-
4,4'-Dimethylbiphenyl	µg/kg	-	nca	nca	1,045	-	-	-	-	-	-	-	1045	-	-	-	-	-
2,7-Dimethyldibenzothiophene	µg/kg	-	nca	nca	4,781	-	-	-	-	-	-	-	-	-	-	4781	-	-
3,7-Dimethyldibenzothiophene	µg/kg	-	nca	nca	3,309	-	-	-	-	-	-	-	-	-	-	3309	-	-
1-Methyldibenzothiophene	µg/kg	-	nca	nca	954	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene, 2,3,6-trimethyl-	µg/kg	-	nca	nca	5,738	-	-	-	-	-	-	-	1627	-	-	5738	-	-
Pentadecane	µg/kg	-	nca	nca	24,364	-	-	-	-	-	-	-	-	-	-	24364	-	-
Naphthalene, 2,3,6-trimethyl-	µg/kg	-	nca	nca	5,738	-	-	-	-	-	-	-	-	-	-	5738	-	-
Naphthalene, 1,6,7-trimethyl-	µg/kg	-	nca	nca	5,049	-	-	-	-	-	-	-	-	-	-	5049	-	-
Naphthalene, 1,4,6-trimethyl-	µg/kg	-	nca	nca	4,597	-	-	-	-	-	-	-	-	-	-	4597	-	-
Pentadecane, 2,6,10-trimethyl-	µg/kg	-	nca	nca	4,669	-	-	-	-	-	-	-	3384	-	-	4669	-	-
Eicosane	µg/kg	-	nca	nca	14,524	-	337	1050	-	-	-	-	4039	-	-	14524	-	-
Eicosane, 2-methyl-	µg/kg	-	nca	nca	5,612	-	-	-	-	-	-	-	-	-	-	5612	-	-
3-Ethylbenzophenone	µg/kg	-	nca	nca	4,321	-	-	-	-	-	-	-	4321	-	-	-	-	-
Dibenzothiophene, 4,6-dimethyl-	µg/kg	-	nca	nca	1,207	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4-Dimethylbenzophenone	µg/kg	-	nca	nca	16,291	-	-	-	-	-	-	-	16291	-	-	-	-	-
3,7-Dimethyldibenzothiophene	µg/kg	-	nca	nca	1,291	-	-	-	-	-	-	-	-	-	-	-	-	-
(4-Acetylphenyl)phenylmethane	µg/kg	-	nca	nca	1,445	-	-	-	-	-	-	-	1445	-	-	-	-	-
Heptacosane, 1-chloro-	µg/kg	-	nca	nca	2,358	-	-	-	-	-	-	-	2358	-	-	-	-	-
Nonadecane, 1-chloro-	µg/kg	-	nca	nca	3,391	-	-	-	-	-	-	-	-	-	-	3391	-	-
Nonadecane	µg/kg	-	nca	nca	23,172	-	-	-	-	-	-	-	842	-	-	23172	-	-
1-Nonadecene	µg/kg	-	nca	nca	315	-	-	-	-	-	-	-	-	-	-	-	-	-
Disulfide, di-tert-dodecyl	µg/kg	-	nca	nca	1,672	-	-	-	-	-	-	-	-	-	-	1672	-	-
1,4,5,8-Tetramethylnaphthalene	µg/kg	-	nca	nca	6,883	-	-	-	-	-	-	-	-	-	-	6883	-	-
Tetratetracontane	µg/kg	-	nca	nca	3,662	-	-	-	-	-	-	-	-	-	-	3662	-	-
Tetradecane	µg/kg	-	nca	nca	13,936	-	-	-	-	-	-	-	-	-	-	13936	-	-
Tetracosane	µg/kg	-	nca	nca	697	-	697	-	-	-	-	-	-	-	-	-	-	-
Benzene, 1,4-bis(phenylmethyl)-	µg/kg	-	nca	nca	1,086	-	-	-	-	-	-	-	1086	-	-	-	-	-
Acetonitrile, (3-chloro-5,5-dimethyl-2-cyclohexen-1-ylidene)-, (E)-	µg/kg	-	nca	nca	2,792	-	-	-	-	-	-	-	2792	-	-	-	-	-
(E)-Stilbene	µg/kg	-	nca	nca	28,221	-	-	-	-	-	-	-	28221	-	-	-	-	-
Dibenzothiophene, 3-methyl-	µg/kg	-	nca	nca	847	-	-	-	-	-	-	-	-	-	-	-	-	-
5H-Dibenzo[a,c]cyclohepten-5-ol	µg/kg	-	nca	nca	2,394	-	-	-	-	-	-	-	2394	-	-	-	-	-
Triphenylphosphine sulfide	µg/kg	-	nca	nca	2,270	-	-	-	-	-	-	-	2270	-	-	-	-	-
Heneicosane	µg/kg	-	nca	nca	5,478	-	-	-	-	-	-	-	-	-	-	5478	-	-
Tridecane	µg/kg	-	nca	nca	11,533	-	-	-	-	-	-	-	-	-	-	9935	-	-
Tridecane, 4-methyl-	µg/kg	-	nca	nca	1,212	-	-	-	-	-	-	-	-	-	-	-	-	-
Tridecane, 3-methyl-	µg/kg	-	nca	nca	713	-	-	-	-	-	-	-	-	-	-	-	-	-
Octacosanol	µg/kg	-	nca	nca	538	-	-	538	-	-	-	-	-	-	-	-	-	-
1-Octadecene	µg/kg	-	nca	nca	6,184	-	-	-	-	-	-	-	-	-	-	6184	-	-
Heptadecane	µg/kg	-	nca	nca	23,369	-	-	-	-	-	-	-	-	-	-	23369	-	-
Heptadecane, 4-methyl-	µg/kg	-	nca	nca	8,091	-	-	-	-	-	-	-	-	-	-	8091	-	-
Hexathiane	µg/kg	-	nca	nca	321	-	-	-	321	-	-	-	-	-	-	-	-	-
Hexadecane	µg/kg	-	nca	nca	9,503	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexadecane, 2,6,10,14-tetramethyl-	µg/kg	-	nca	nca	13,783	-	-	-	-	-	-	-	-	-	-	13783	-	-
Octadecane	µg/kg	-	nca	nca	5,608	-	-	-	-	-	-	-	-	-	-	5015	-	-
Cycloeicosane	µg/kg	-	nca	nca	414	-	-	-	414	-	-	-	-	-	-	-	-	-
13-Docosenamide, (Z)-	mg/kg	-	nca	nca	2,820	-	-	-	2820	-	-	-	-	-	-	-	-	-
TICs Detected <80% Match	-	-	-	-		-	-	-	-	Yes	-	-	-	Yes	-	Yes	-	Yes

Notes:

MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ No samples taken
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						**BH1**		**BH2**		**BH3**		**BH4**		**BH5**		**BH6**	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-0.6	~	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						30/07/2019		30/07/2019		30/07/2019		29/07/2019		29/07/2019		29/07/2019	
Parameter																	
TPH Aromatics																	
TPH (>EC5-7) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC7-8) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC8-10) aromatic	mg/kg	<0.1	1,800,000	nca	0.2	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC10-12) aromatic	mg/kg	<0.2	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC12-16) aromatic	mg/kg	<4.0	34,000,000	nca	260	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC16-21) aromatic	mg/kg	<7.0	28,000,000	nca	201	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC21-35) aromatic	mg/kg	<7.0	28,000,000	nca	628	-	-	105	~	-	-	-	-	-	-	-	-
Total Aromatics (C5-35)	mg/kg	<19.0	ncr	nca	1089	-	-	105	~	-	-	-	-	-	-	-	-
TPH Aliphatics																	
TPH (>EC5-6) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC6-8) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC8-10) aliphatic	mg/kg	<0.1	1,000,000	nca	3.2	-	-	-	~	-	-	-	0.2	-	-	-	-
TPH (>EC10-12) aliphatic	mg/kg	<0.2	5,000,000	nca	30	-	-	-	~	-	-	-	-	-	-	-	-
TPH (>EC12-16) aliphatic	mg/kg	<4.0	37,000,000	nca	54	-	-	-	~	-	-	-	15	-	-	-	6
TPH (>EC16-21) aliphatic	mg/kg	<7.0	nca	nca	83	-	-	-	~	-	-	-	21	-	-	-	-
TPH (EC21-35) aliphatic	mg/kg	<7.0	nca	nca	139	-	-	57	~	-	-	-	31	-	-	-	-
Total Aliphatics (C5-35)	mg/kg	<19.0	nca	nca	233	-	-	57	~	-	-	-	67	-	-	-	-
Total aliphatics and aromatics (C5-C35)	mg/kg	<38.0	nca	nca	1322	-	-	162	~	-	-	-	67	-	-	-	-
BTEX																	
Benzene	µg/kg	<5.0	12,000	8.7	9	-	-	-	~	-	-	-	-	-	-	-	-
Toluene	µg/kg	<5.0	28,000,000	31	11	-	-	-	~	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<5.0	2,700,000	132	5	-	-	-	~	-	-	-	5	-	-	-	-
m/p-Xylene	µg/kg	<5.0	5,600,000	669	313	-	-	9	~	-	-	-	16	-	-	-	-
o-Xylene	µg/kg	<5.0	3,100,000	669	14	-	-	4	~	-	-	-	14	-	-	-	-
MTBE																	
MTBE	µg/kg	<5.0	ncr	ncr	-	-	-	-	~	-	-	-	-	-	-	-	-

Notes:

MDL - Method Detection Limit
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ Samples not taken
nca - No criteria available
ncr - No criteria required
NA - Not Analysed

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						BH7		BH8		BH9		BH10		BH11		BH12		BH13	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						29/07/2019		23/07/2019		24/07/2019		24/07/2019		24/07/2019		24/07/2019		25/07/2019	
Parameter																			
TPH Aromatics																			
TPH (>EC5-7) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC7-8) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aromatic	mg/kg	<0.1	1,800,000	nca	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC10-12) aromatic	mg/kg	<0.2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC12-16) aromatic	mg/kg	<4.0	34,000,000	nca	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC16-21) aromatic	mg/kg	<7.0	28,000,000	nca	201	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC21-35) aromatic	mg/kg	<7.0	28,000,000	nca	628	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Aromatics (C5-35)	mg/kg	<19.0	ncr	nca	1089	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH Aliphatics																			
TPH (>EC5-6) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC6-8) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aliphatic	mg/kg	<0.1	1,000,000	nca	3.2	-	-	-	-	-	-	-	0.2	-	0.7	-	-	-	-
TPH (>EC10-12) aliphatic	mg/kg	<0.2	5,000,000	nca	30	-	-	-	-	-	-	-	-	-	30	-	-	-	-
TPH (>EC12-16) aliphatic	mg/kg	<4.0	37,000,000	nca	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC16-21) aliphatic	mg/kg	<7.0	nca	nca	83	-	-	-	-	-	-	-	-	-	10	-	-	-	-
TPH (EC21-35) aliphatic	mg/kg	<7.0	nca	nca	139	-	-	-	-	-	-	-	-	-	139	-	-	-	-
Total Aliphatics (C5-35)	mg/kg	<19.0	nca	nca	233	-	-	-	-	-	-	-	-	-	180	-	-	-	-
Total aliphatics and aromatics (C5-C35)	mg/kg	<38.0	nca	nca	1322	-	-	-	-	-	-	-	-	-	180	-	-	-	-
BTEX																			
Benzene	µg/kg	<5.0	12,000	8.7	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/kg	<5.0	28,000,000	31	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<5.0	2,700,000	132	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m/p-Xylene	µg/kg	<5.0	5,600,000	669	313	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/kg	<5.0	3,100,000	669	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTBE																			
MTBE	µg/kg	<5.0	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MDL - Method Detection Limit
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ Samples not taken
nca - No criteria available
ncr - No criteria required
NA - Not Analysed

xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						**BH14**		**BH16**		**BH17**		**BH18**		**BH19**		**BH20**		**BH21**	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						25/07/2019		26/07/2019		25/07/2019		25/07/2019		22/07/2019		23/07/2019		23/07/2019	
Parameter																			
TPH Aromatics																			
TPH (>EC5-7) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC7-8) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aromatic	mg/kg	<0.1	1,800,000	nca	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
TPH (>EC10-12) aromatic	mg/kg	<0.2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC12-16) aromatic	mg/kg	<4.0	34,000,000	nca	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC16-21) aromatic	mg/kg	<7.0	28,000,000	nca	201	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC21-35) aromatic	mg/kg	<7.0	28,000,000	nca	628	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Aromatics (C5-35)	mg/kg	<19.0	ncr	nca	1089	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH Aliphatics																			
TPH (>EC5-6) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC6-8) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aliphatic	mg/kg	<0.1	1,000,000	nca	3.2	-	-	-	-	-	-	-	-	-	0.2	-	-	-	1.0
TPH (>EC10-12) aliphatic	mg/kg	<0.2	5,000,000	nca	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC12-16) aliphatic	mg/kg	<4.0	37,000,000	nca	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC16-21) aliphatic	mg/kg	<7.0	nca	nca	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (EC21-35) aliphatic	mg/kg	<7.0	nca	nca	139	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Aliphatics (C5-35)	mg/kg	<19.0	nca	nca	233	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total aliphatics and aromatics (C5-C35)	mg/kg	<38.0	nca	nca	1322	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTEX																			
Benzene	µg/kg	<5.0	12,000	8.7	9	-	-	-	-	-	-	-	-	-	-	-	-	-	**9**
Toluene	µg/kg	<5.0	28,000,000	31	11	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<5.0	2,700,000	132	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m/p-Xylene	µg/kg	<5.0	5,600,000	669	313	-	-	-	-	-	-	-	-	-	-	-	-	-	313
o-Xylene	µg/kg	<5.0	3,100,000	669	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTBE																			
MTBE	µg/kg	<5.0	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MDL - Method Detection Limit
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
~ Samples not taken
nca - No criteria available
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xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil			Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						**BH22**			**BH23**		**BH24**		**BH25**		**BH26**		**BH27**		**BH28**	
Sample Depth (m)						0.0-1.0	1.60	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-0.8	~	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled							22/07/2019			23/07/2019		23/07/2019		22/07/2019		25/07/2019		26/07/2019		24/07/2019
Parameter																				
TPH Aromatics																				
TPH (>EC5-7) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC7-8) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC8-10) aromatic	mg/kg	<0.1	1,800,000	nca	0.2	-	-	-	-	0.1	-	-	-	-	-	~	-	-	-	-
TPH (>EC10-12) aromatic	mg/kg	<0.2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC12-16) aromatic	mg/kg	<4.0	34,000,000	nca	260	-	260	75	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC16-21) aromatic	mg/kg	<7.0	28,000,000	nca	201	-	201	54	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC21-35) aromatic	mg/kg	<7.0	28,000,000	nca	628	-	628	180	-	-	-	-	-	-	-	~	-	-	-	-
Total Aromatics (C5-35)	mg/kg	<19.0	ncr	nca	1089	-	1089	309	-	-	-	-	-	-	-	~	-	-	-	-
TPH Aliphatics																				
TPH (>EC5-6) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC6-8) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC8-10) aliphatic	mg/kg	<0.1	1,000,000	nca	3.2	-	-	-	-	3.2	-	0.3	-	-	-	~	-	-	-	0.5
TPH (>EC10-12) aliphatic	mg/kg	<0.2	5,000,000	nca	30	-	14	6.9	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC12-16) aliphatic	mg/kg	<4.0	37,000,000	nca	54	-	54	31	-	-	-	-	-	-	-	~	-	-	-	-
TPH (>EC16-21) aliphatic	mg/kg	<7.0	nca	nca	83	-	83	46	-	-	-	-	-	-	-	~	-	-	-	-
TPH (EC21-35) aliphatic	mg/kg	<7.0	nca	nca	139	-	82	46	-	19	-	46	-	-	-	~	-	-	-	-
Total Aliphatics (C5-35)	mg/kg	<19.0	nca	nca	233	-	233	130	-	22	-	46	-	-	-	~	-	-	-	-
Total aliphatics and aromatics (C5-C35)	mg/kg	<38.0	nca	nca	1322	-	1322	439	-	-	-	46	-	-	-	~	-	-	-	-
BTEX																				
Benzene	µg/kg	<5.0	12,000	8.7	9	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-
Toluene	µg/kg	<5.0	28,000,000	31	11	11	-	-	-	-	-	-	-	-	-	~	-	-	-	-
Ethylbenzene	µg/kg	<5.0	2,700,000	132	5	-	3	-	-	-	-	-	-	-	-	~	-	-	-	-
m/p-Xylene	µg/kg	<5.0	5,600,000	669	313	6	-	-	-	-	-	-	-	-	-	~	-	-	-	-
o-Xylene	µg/kg	<5.0	3,100,000	669	14	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-
MTBE																				
MTBE	µg/kg	<5.0	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-

Notes:
MDL - Method Detection Limit
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
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xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						DUP01		DUP02		DUP03		DUP04		DUP05		DUP06	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						23/07/2019		24/07/2019		25/07/2019		26/07/2019		29/07/2019		30/07/2019	
Parameter																	
TPH Aromatics																	
TPH (>EC5-7) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC7-8) aromatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aromatic	mg/kg	<0.1	1,800,000	nca	0.2	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC10-12) aromatic	mg/kg	<0.2	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC12-16) aromatic	mg/kg	<4.0	34,000,000	nca	260	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC16-21) aromatic	mg/kg	<7.0	28,000,000	nca	201	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC21-35) aromatic	mg/kg	<7.0	28,000,000	nca	628	-	-	-	-	-	-	-	-	-	-	-	-
Total Aromatics (C5-35)	mg/kg	<19.0	ncr	nca	1089	-	-	-	-	-	-	-	-	-	-	-	-
TPH Aliphatics																	
TPH (>EC5-6) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC6-8) aliphatic	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aliphatic	mg/kg	<0.1	1,000,000	nca	3.2	-	1.1	-	0.3	-	-	-	-	-	-	-	-
TPH (>EC10-12) aliphatic	mg/kg	<0.2	5,000,000	nca	30	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC12-16) aliphatic	mg/kg	<4.0	37,000,000	nca	54	-	-	-	-	-	-	-	-	-	-	-	-
TPH (>EC16-21) aliphatic	mg/kg	<7.0	nca	nca	83	-	-	-	-	-	-	-	-	-	-	-	-
TPH (EC21-35) aliphatic	mg/kg	<7.0	nca	nca	139	-	49	-	-	-	-	-	-	-	-	-	-
Total Aliphatics (C5-35)	mg/kg	<19.0	nca	nca	233	-	50	-	-	-	-	-	-	-	-	-	-
Total aliphatics and aromatics (C5-C35)	mg/kg	<38.0	nca	nca	1322	-	50	-	-	-	-	-	-	-	-	-	-
BTEX																	
Benzene	µg/kg	<5.0	12,000	8.7	9	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/kg	<5.0	28,000,000	31	11	-	-	-	-	8	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<5.0	2,700,000	132	5	-	-	-	-	-	-	-	-	-	-	-	-
m/p-Xylene	µg/kg	<5.0	5,600,000	669	313	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/kg	<5.0	3,100,000	669	14	-	-	-	-	-	-	-	-	-	-	-	-
MTBE																	
MTBE	µg/kg	<5.0	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
MDL - Method Detection Limit
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
– Samples not taken
nca - No criteria available
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xx Exceeds Human Health GAC - Commercial / Industrial
xx Exceeds Controlled Waters GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (mg/kg)	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						**BH1**		**BH2**		**BH3**		**BH4**		**BH5**		**BH6**	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-0.6	–	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						30/07/2019		30/07/2019		30/07/2019		29/07/2019		29/07/2019		29/07/2019	
Parameter																	
Arsenic	mg/kg	<0.5	640	10	44	**17.4**	**39.9**	7.0	–	8.8	**19.6**	9.6	**15.9**	6.1	8.3	**12.1**	**16.2**
Barium	mg/kg	<1.0	22,100	nca	218	54	68	46	–	37	45	35	39	35	40	27	32
Beryllium	mg/kg	<0.5	12	nca	2.4	1.2	1.8	0.8	–	0.9	1.7	0.9	1.2	-	0.8	1.0	1.1
Cadmium	mg/kg	<0.1	190	0.02	3.6	**1.8**	**1.7**	**0.6**	–	**0.1**	**0.6**	-	**0.3**	**0.5**	**0.7**	-	-
Chromium	mg/kg	<0.5	8,600	nca	68	59	23	68	–	43	36	38	47	24	22	29	37
Chromium III	mg/kg	<0.5	8,600	nca	68	59	23	68	–	43	36	38	47	24	22	29	37
Chromium VI	mg/kg	<0.3	ncr	ncr	-	-	-	-	–	-	-	-	-	-	-	-	-
Copper	mg/kg	<1.0	68,000	0.50	43	**29**	**42**	**43**	–	**19**	**27**	**16**	**22**	**11**	**15**	**21**	**20**
Lead	mg/kg	<5.0	2,300	3.5	220	**39**	**65**	**22**	–	**220**	**54**	**21**	**41**	**81**	**31**	**23**	**58**
Mercury	mg/kg	<0.1	ncr	ncr	-	-	-	-	–	-	-	-	-	-	-	-	-
Nickel	mg/kg	<0.7	980	4.3	236	**43**	**68**	**236**	–	**34**	**55**	**32**	**40**	**13**	**23**	**35**	**39**
Selenium	mg/kg	<1.0	12,000	nca	3.0	-	2	-	–	-	1	-	1	-	-	1	1
Vanadium	mg/kg	<1.0	9,000	1.3	31	**21**	**25**	**13**	–	**21**	**30**	**23**	**26**	**11**	**20**	**22**	**26**
Water Soluble Boron	mg/kg	<0.1	240,000	71	2.3	0.2	0.2	0.4	–	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.3
Zinc	mg/kg	<5.0	730,000	1.5	275	**160**	**238**	**242**	–	**116**	**255**	**112**	**167**	**81**	**206**	**111**	**152**
Miscellaneous Parameters																	
Cyclohexane	µg/kg	<50	ncr	ncr	-	-	-	-	–	-	-	-	-	-	-	-	-
Tetrahydrofuran	µg/kg	<50	ncr	ncr	-	-	-	-	–	-	-	-	-	-	-	-	-
Bromide	mg/kg	<0.3	nca	nca	0.7	-	-	-	–	-	-	-	-	-	-	-	-
Natural Moisture Content	%	<0.1	nca	nca	27	10	14	10	–	8	15	11	15	6	8	8	12

Notes:

MDL - Method Detection Limit

mg/kg - milligrams per kilogram

GAC - Generic Assessment Criteria

- <MDL

– No samples taken

ncr - No criteria required

nca - No criteria available

xx Exceedance to Controlled Waters GAC

xx Exceeds Human Health GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (mg/kg)	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						**BH7**		**BH8**		**BH9**		**BH10**		**BH11**		**BH12**	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						29/07/2019		23/07/2019		24/07/2019		24/07/2019		24/07/2019		24/07/2019	
Parameter																	
Arsenic	mg/kg	<0.5	640	10	44	**14.1**	**44.2**	2.0	2.9	7.2	**18.4**	8.6	**19.8**	4.1	3.2	**11.1**	2.7
Barium	mg/kg	<1.0	22,100	nca	218	34	57	37	32	35	35	29	37	23	28	74	18
Beryllium	mg/kg	<0.5	12	nca	2.4	1.0	1.9	0.9	0.9	0.8	1.3	0.9	1.3	0.6	0.5	-	-
Cadmium	mg/kg	<0.1	190	0.02	3.6	-	**0.2**	**0.4**	**0.6**	-	**0.2**	**0.3**	**0.6**	**0.3**	**0.4**	**1.7**	**1.2**
Chromium	mg/kg	<0.5	8,600	nca	68	52	47	31	26	49	30	32	40	16	21	29	15
Chromium III	mg/kg	<0.5	8,600	nca	68	52	47	31	26	49	30	32	40	16	21	29	15
Chromium VI	mg/kg	<0.3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	<1.0	68,000	0.50	43	**14**	**31**	**16**	**15**	**14**	**25**	**17**	**26**	**7**	**8**	**12**	**10**
Lead	mg/kg	<5.0	2,300	3.5	220	**31**	**56**	**24**	**27**	**17**	**38**	**18**	**35**	**13**	**18**	**23**	**12**
Mercury	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	<0.7	980	4.3	236	**34**	**55**	**28**	**30**	**26**	**40**	**27**	**42**	**15**	**13**	**26**	**10**
Selenium	mg/kg	<1.0	12,000	nca	3.0	1	1	-	-	-	-	-	-	-	-	3	2
Vanadium	mg/kg	<1.0	9,000	1.3	31	**22**	**26**	**16**	**15**	**20**	**22**	**17**	**22**	**9**	**8**	**21**	**9**
Water Soluble Boron	mg/kg	<0.1	240,000	71	2.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.8	0.2
Zinc	mg/kg	<5.0	730,000	1.5	275	**139**	**207**	**123**	**117**	**72**	**178**	**141**	**189**	**84**	**61**	**207**	**105**
Miscellaneous Parameters																	
Cyclohexane	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/kg	<0.3	nca	nca	0.7	-	-	-	-	-	0.4	-	-	-	-	-	-
Natural Moisture Content	%	<0.1	nca	nca	27	12	19	10	12	10	14	8	13	5	4	14	12

Notes:

MDL - Method Detection Limit

mg/kg - milligrams per kilogram

GAC - Generic Assessment Criteria

- <MDL

– No samples taken

ncr - No criteria required

nca - No criteria available

xx Exceedance to Controlled Waters GAC

xx Exceeds Human Health GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (mg/kg)	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						**BH13**		**BH14**		**BH16**		**BH17**		**BH18**		**BH19**	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						25/07/2019		25/07/2019		26/07/2019		25/07/2019		25/07/2019		22/07/2019	
Parameter																	
Arsenic	mg/kg	<0.5	640	10	44	**12.1**	**11.6**	**22.4**	**11.4**	8.1	1.7	**15.8**	**12.9**	**10.8**	**21.1**	**10.2**	**14.6**
Barium	mg/kg	<1.0	22,100	nca	218	64	56	44	71	41	27	50	77	28	36	30	56
Beryllium	mg/kg	<0.5	12	nca	2.4	1.1	1.2	0.9	1.0	0.6	-	1.4	1.7	0.5	1.3	1.0	1.1
Cadmium	mg/kg	<0.1	190	0.02	3.6	**0.8**	**1.2**	**0.6**	**0.5**	-	**0.3**	**0.2**	**3.6**	**0.3**	**0.3**	**0.2**	-
Chromium	mg/kg	<0.5	8,600	nca	68	43	40	29	37	34	6.5	48	46	25	28	35	51
Chromium III	mg/kg	<0.5	8,600	nca	68	43	40	29	37	34	6.5	48	46	25	28	35	51
Chromium VI	mg/kg	<0.3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	<1.0	68,000	0.50	43	**20**	**19**	**24**	**24**	**12**	**3**	**26**	**19**	**13**	**20**	**8**	**15**
Lead	mg/kg	<5.0	2,300	3.5	220	**47**	**47**	**22**	**102**	**20**	**7**	**38**	**29**	**14**	**69**	**11**	**33**
Mercury	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	<0.7	980	4.3	236	**33**	**35**	**34**	**26**	**14**	**4**	**43**	**95**	**14**	**28**	**21**	**28**
Selenium	mg/kg	<1.0	12,000	nca	3.0	-	1	-	-	-	-	-	1	-	-	-	-
Vanadium	mg/kg	<1.0	9,000	1.3	31	**29**	**25**	**15**	**24**	**18**	**3**	**26**	**23**	**15**	**19**	**13**	**30**
Water Soluble Boron	mg/kg	<0.1	240,000	71	2.3	0.8	0.3	0.3	2.3	0.5	0.2	0.3	0.3	0.2	0.4	0.3	0.5
Zinc	mg/kg	<5.0	730,000	1.5	275	**162**	**162**	**100**	**129**	**48**	**20**	**143**	**265**	**54**	**110**	**70**	**114**
Miscellaneous Parameters																	
Cyclohexane	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/kg	<0.3	nca	nca	0.7	-	-	-	-	-	-	-	-	-	-	-	0.7
Natural Moisture Content	%	<0.1	nca	nca	27	13	15	7	27	11	3	13	22	11	13	5	21

Notes:

MDL - Method Detection Limit

mg/kg - milligrams per kilogram

GAC - Generic Assessment Criteria

- <MDL

– No samples taken

ncr - No criteria required

nca - No criteria available

xx Exceedance to Controlled Waters GAC

xx Exceeds Human Health GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (mg/kg)	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil			Soil		Soil		Soil	
Sample ID						**BH20**		**BH21**		**BH22**			**BH23**		**BH24**		**BH25**	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.60	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						23/07/2019		23/07/2019		22/07/2019			23/07/2019		23/07/2019		22/07/2019	
Parameter																		
Arsenic	mg/kg	<0.5	640	10	44	8.2	5.7	6.4	**17.1**	2.8	**14.2**	**14.6**	3.4	2.9	3.2	1.0	**14.7**	**20.2**
Barium	mg/kg	<1.0	22,100	nca	218	27	41	32	37	15	38	42	18	15	50	23	38	62
Beryllium	mg/kg	<0.5	12	nca	2.4	0.7	1.3	-	1.1	-	1.1	1.1	-	-	-	-	1.4	2.4
Cadmium	mg/kg	<0.1	190	0.02	3.6	**0.5**	**0.4**	**0.4**	-	**0.6**	**0.5**	**0.3**	**0.4**	**0.5**	**0.4**	**0.4**	**0.5**	**1.4**
Chromium	mg/kg	<0.5	8,600	nca	68	18	38	23	46	20	39	51	17	6.6	15	13	39	48
Chromium III	mg/kg	<0.5	8,600	nca	68	18	38	23	46	20	39	51	17	6.6	15	13	39	48
Chromium VI	mg/kg	<0.3	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	<1.0	68,000	0.50	43	**8**	**19**	**11**	**19**	**4**	**21**	**24**	**9**	**3**	**7**	**5**	**24**	**31**
Lead	mg/kg	<5.0	2,300	3.5	220	**9**	**72**	**11**	**44**	**-**	**30**	**40**	**5**	-	**6**	-	**41**	**54**
Mercury	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	<0.7	980	4.3	236	**13**	**33**	**13**	**41**	**8**	**32**	**38**	**15**	**3**	**11**	**8**	**40**	**59**
Selenium	mg/kg	<1.0	12,000	nca	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	<1.0	9,000	1.3	31	**9**	**19**	**13**	**26**	**6**	**20**	**25**	**5**	**2**	**7**	**5**	**23**	**31**
Water Soluble Boron	mg/kg	<0.1	240,000	71	2.3	0.2	0.4	0.2	0.4	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.3	0.3
Zinc	mg/kg	<5.0	730,000	1.5	275	**53**	**132**	**60**	**157**	**57**	**127**	**144**	**48**	**20**	**51**	**34**	**173**	**275**
Miscellaneous Parameters																		
Cyclohexane	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/kg	<0.3	nca	nca	0.7	-	-	-	0.5	-	-	-	-	-	-	-	-	-
Natural Moisture Content	%	<0.1	nca	nca	27	5	12	7	16	1	13	15	4	2	3	2	12	18

Notes:

MDL - Method Detection Limit

mg/kg - milligrams per kilogram

GAC - Generic Assessment Criteria

- <MDL

– No samples taken

ncr - No criteria required

nca - No criteria available

xx Exceedance to Controlled Waters GAC

xx Exceeds Human Health GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (mg/kg)	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil		Soil		Soil		Soil	
Sample ID						**BH26**		**BH27**		**BH28**		**DUP01**		**DUP02**		**DUP03**	
Sample Depth (m)						0.0-0.8	–	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						25/07/2019		26/07/2019		24/07/2019		23/07/2019		24/07/2019		25/07/2019	
Parameter																	
Arsenic	mg/kg	<0.5	640	10	44	7.6	–	11.8	**20.3**	11.7	9.0	3.2	2.3	4.5	3.9	**12.4**	**12.0**
Barium	mg/kg	<1.0	22,100	nca	218	32	–	51	37	39	70	40	35	28	33	58	49
Beryllium	mg/kg	<0.5	12	nca	2.4	0.7	–	0.9	1.7	0.8	0.7	1.1	0.9	0.6	1.0	1.0	1.3
Cadmium	mg/kg	<0.1	190	0.02	3.6	-	–	**0.4**	**0.6**	**0.3**	**0.4**	**0.6**	**0.4**	**0.3**	**0.3**	**0.9**	**0.9**
Chromium	mg/kg	<0.5	8,600	nca	68	41	–	42	42	28	30	40	37	19	18	35	42
Chromium III	mg/kg	<0.5	8,600	nca	68	41	–	42	42	28	30	40	37	19	18	35	42
Chromium VI	mg/kg	<0.3	ncr	ncr	-	-	–	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	<1.0	68,000	0.50	43	**18**	–	**20**	**27**	**16**	**19**	**22**	**15**	**8**	**16**	**19**	**17**
Lead	mg/kg	<5.0	2,300	3.5	220	**19**	–	**43**	**50**	**34**	**24**	**36**	**26**	**14**	**11**	**47**	**44**
Mercury	mg/kg	<0.1	ncr	ncr	-	-	–	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	<0.7	980	4.3	236	**31**	–	**31**	**56**	**24**	**23**	**36**	**32**	**17**	**22**	**31**	**39**
Selenium	mg/kg	<1.0	12,000	nca	3.0	-	–	-	-	-	-	-	-	-	-	1	1
Vanadium	mg/kg	<1.0	9,000	1.3	31	**19**	–	**27**	**27**	**21**	**21**	**20**	**18**	**9**	**11**	**26**	**26**
Water Soluble Boron	mg/kg	<0.1	240,000	71	2.3	0.3	–	0.4	0.2	0.4	0.5	0.4	0.3	0.2	0.2	0.7	0.2
Zinc	mg/kg	<5.0	730,000	1.5	275	**90**	–	**123**	**247**	**116**	**258**	**192**	**117**	**99**	**88**	**158**	**167**
Miscellaneous Parameters																	
Cyclohexane	µg/kg	<50	ncr	ncr	-	-	–	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran	µg/kg	<50	ncr	ncr	-	-	–	-	-	-	-	-	-	-	-	-	-
Bromide	mg/kg	<0.3	nca	nca	0.7	-	–	-	-	-	-	-	-	-	-	-	-
Natural Moisture Content	%	<0.1	nca	nca	27	8	–	12	14	13	17	13	12	5	7	13	16

Notes:
MDL - Method Detection Limit
mg/kg - milligrams per kilogram
GAC - Generic Assessment Criteria
- <MDL
– No samples taken
ncr - No criteria required
nca - No criteria available

xx Exceedance to Controlled Waters GAC
xx Exceeds Human Health GAC - Commercial / Industrial

Table 7: Soil Heavy Metal and Miscellaneous Results
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	Units	MDL (mg/kg)	Human Health GAC - Commercial / Industrial (mg/kg)	Controlled Waters GAC - Commercial / Industrial (mg/kg)	Max Concentration (mg/kg)	Soil		Soil		Soil	
Sample ID						DUP04		DUP05		DUP06	
Sample Depth (m)						0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled						26/07/2019		29/07/2019		30/07/2019	
Parameter											
Arsenic	mg/kg	<0.5	640	10	44	6.8	2.6	**14.1**	**14.8**	**10.3**	**14.6**
Barium	mg/kg	<1.0	22,100	nca	218	49	32	40	34	218	39
Beryllium	mg/kg	<0.5	12	nca	2.4	0.6	-	1.1	1.1	0.9	1.3
Cadmium	mg/kg	<0.1	190	0.02	3.6	-	**0.2**	-	-	**3.2**	**0.3**
Chromium	mg/kg	<0.5	8,600	nca	68	34	10.2	50	62	58	59
Chromium III	mg/kg	<0.5	8,600	nca	68	34	10.2	50	62	58	59
Chromium VI	mg/kg	<0.3	ncr	ncr	-	-	-	-	-	-	-
Copper	mg/kg	<1.0	68,000	0.50	43	**11**	**6**	**25**	**19**	**23**	**23**
Lead	mg/kg	<5.0	2,300	3.5	220	**19**	**7**	**26**	**40**	**57**	**39**
Mercury	mg/kg	<0.1	ncr	ncr	-	-	-	-	-	-	-
Nickel	mg/kg	<0.7	980	4.3	236	**13**	**6**	**36**	**41**	**49**	**48**
Selenium	mg/kg	<1.0	12,000	nca	3.0	-	-	1	1	2	1
Vanadium	mg/kg	<1.0	9,000	1.3	31	**18**	**5**	**23**	**26**	**23**	**26**
Water Soluble Boron	mg/kg	<0.1	240,000	71	2.3	0.4	0.2	0.2	0.3	0.3	0.2
Zinc	mg/kg	<5.0	730,000	1.5	275	**42**	**28**	**109**	**164**	**165**	**166**
Miscellaneous Parameters											
Cyclohexane	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-
Tetrahydrofuran	µg/kg	<50	ncr	ncr	-	-	-	-	-	-	-
Bromide	mg/kg	<0.3	nca	nca	0.7	-	-	-	0.4	-	-
Natural Moisture Content	%	<0.1	nca	nca	27	11	-	9	13	9	14

Notes:

MDL - Method Detection Limit

mg/kg - milligrams per kilogram

GAC - Generic Assessment Criteria

- <MDL

– No samples taken

ncr - No criteria required

nca - No criteria available

xx	Exceedance to Controlled Waters GAC
xx	Exceeds Human Health GAC - Commercial / Industrial

Table 7: Relative Percentage Differences
Pfizer Pharmaceuticals Ireland - Ringaskiddy Baseline Soil Assessment - July 2019

Sample Type	MDL	DUP01		DUP02		DUP03		DUP04		DUP05		DUP06	
Sample ID		BH8		BH11		BH13		BH16		BH6		BH3	
Sample Depth (m)	(µg/kg)	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0	0.0-1.0	1.0-2.0
Date Sampled		23/07/2019		24/07/2019		25/07/2019		26/07/2019		29/07/2019		30/07/2019	
Parameter (Volatile Organic Compounds)													
Chloromethane	3	0	0	0	0	0	0	190	0	0	0	0	0
Toluene	3	0	0	0	0	0	195	0	0	0	0	0	0
Parameter (Semi Volatile Organic Compounds)													
Polyaromatic Hydrocarbons (PAHs)													
2-Methylnaphthalene	10	0	0	0	0	0	0	199	0	0	0	0	0
Naphthalene	10	0	0	0	0	0	0	198	0	0	0	0	0
Phenanthrene	10	0	0	0	0	0	0	72	0	0	0	0	0
Anthracene	10	0	0	0	0	0	0	0	0	0	0	0	0
Fluoranthene	10	198	0	0	0	0	0	197	0	0	0	0	0
Benzo(bk)fluoranthene	10	0	0	0	0	0	0	198	0	0	0	0	0
Benzo(b)fluoranthene	10	0	0	0	0	0	0	197	0	0	0	0	0
Parameter													
TPH (>EC8-10) aliphatic	0.1	0	167	0	80	0	0	0	0	0	0	0	0
TPH (>EC10-12) aliphatic	0.2	0	0	0	199	0	0	0	0	0	0	0	0
TPH (>EC12-16) aliphatic	4	0	0	0	0	0	0	0	0	0	193	0	0
TPH (>EC16-21) aliphatic	7	0	0	0	196	0	0	0	0	0	0	0	0
TPH (EC21-35) aliphatic	7	0	199	0	200	0	0	0	0	0	0	0	0
Total Aliphatics (C5-35)	19	0	199	0	200	0	0	0	0	0	0	0	0
Total aliphatics and aromatics (C5-C35)	38	0	199	0	200	0	0	0	0	0	0	0	0
BTEX													
Toluene	5	0	0	0	0	195	0	0	0	0	0	0	0
Ethylbenzene	5	0	0	0	0	0	0	0	0	0	0	0	0
m/p-Xylene	5	0	0	0	0	0	0	0	0	0	0	0	0
o-Xylene	5	0	0	0	0	0	0	0	0	0	0	0	0
Bromide	0.3	0	0	0	0	0	0	0	0	0	120	0	0
Natural Moisture Content	0.1	25	4	6	48	1	10	3	32	14	6	16	12
Parameter													
Arsenic	0.5	46	23	9	20	2	3	17	42	15	9	16	29
Barium	1	8	9	20	16	10	13	18	17	39	6	142	14
Beryllium	0.5	20	0	0	67	10	8	0	0	10	0	0	27
Cadmium	0.1	40	40	0	29	12	29	0	40	0	0	188	67
Chromium	0.5	25	32	17	16	21	5	1	44	52	49	29	47
Chromium III	0.5	25	32	17	16	21	5	1	44	52	49	29	47
Chromium VI	0.3	0	0	0	0	0	0	0	0	0	0	0	0
Copper	1	32	0	13	67	5	11	9	67	17	5	19	16
Lead	5	40	4	7	48	0	7	5	0	12	37	118	32
Nickel	0.7	26	7	16	56	7	11	2	54	3	5	37	14
Selenium	1	0	0	0	0	164	0	0	0	0	0	181	0
Vanadium	1	22	18	0	32	11	4	0	50	4	0	9	14
Water Soluble Boron	0.1	29	0	0	0	13	40	22	0	0	0	0	0
Zinc	5	44	0	16	36	3	3	13	33	2	8	35	42

Notes:

Result is greater than 10 times the MDL and RPD is greater than 40%

Appendix E Geological Logs

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH1**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 30-07-19 End Date 30-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.20) 0.20	MADEGROUND - Grey fine to coarse, sub angular to sub rounded, silty, sandy GRAVEL.	Dry, NEC.	
					(0.20) 0.40	MADEGROUND - Reinforced concrete.	Dry, NEC.	
0.5	BH1 0.0-1.0m	0.3			(1.00) 1.40	Light brown silty, slightly sandy gravelly CLAY.	Dry, NEC.	
1.5	BH1 1.0-2.0m	0.8			(0.60) 2.00	Reddish brown, silty, gravelly CLAY.	Dry, NEC.	
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Made Ground
- Concrete
- Sandy Gravelly CLAY
- Gravelly SILT/CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH2**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 30-07-19 End Date 30-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation / Backfill
	BH2 0.0-0.6m				(0.50)	MADEGROUND - Light brown fine to coarse sub angualr to sub rounded silty sandy GRAVEL.	Dry, NEC.	
0.5		0.2			0.50			
					(0.10)	MADEGROUND - Reinforced concrete.	Dry, NEC.	
					0.60	End of hole - Target depth not reached due to thickness of concrete.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Concrete

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH3**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 30-07-19 End Date 30-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.30) 0.30	MADEGROUND - Light brown fine to coarse, sub angular to sub rounded sandy GRAVEL with medium cobble content.	Dry, NEC.	
0.5	BH3 0.0-1.0m	0.6			(0.40) 0.70	MADEGROUND - Light brown fine to coarse sub angular to sub rounded silty, sandy GRAVEL.	Dry, NEC.	
					(0.50) 1.20	Reddish brown sandy, gravelly CLAY.	Dry, NEC.	
1.5	BH3 1.0-2.0m	1.6			(0.40) 1.60	Light brown sandy, gravelly CLAY.	Dry, NEC.	
					(0.40) 2.00	Dark brown, sandy gravelly CLAY.	Dry, NEC.	
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Sandy Gravelly CLAY

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH4**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 29-07-19 End Date 29-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.10) 0.10	MADEGROUND - Grey, fine to coarse, angular to sub angular, sandy GRAVEL.	Dry, NEC.	
					(0.20) 0.30	MADEGROUND - Tarmcadam.	Dry, NEC.	
0.5	BH4 0.0-1.0m	0.3			(0.40) 0.70	Reddish brown, fine to coarse, sub angular to sub rounded, sandy GRAVEL.	Dry, NEC.	
1.0					(1.30)	Light brown silty, sandy, gravelly CLAY.	Dry, NEC.	
1.5	BH4 1.0-2.0m	0.6						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground
Tarmac
Sandy GRAVEL
Sandy Gravelly CLAY
Groundwater Table
Water Strike
bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH5**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 29-07-19 End Date 29-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH5 0.0-1.0m	1.0			(1.70)	MADEGROUND - Greyish brown fine to coarse, angular to sub angualr silty, sandy GRAVEL with high cobble content.	Dry, NEC.	
1.0								
1.5	BH5 1.0-2.0m	1.1						
					1.70			
					(0.30)	MADEGROUND - Grey, medium to coarse, sub angular to sub rounded, sandy GRAVEL.	Dry, NEC.	
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH6**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 29-07-19 End Date 29-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation / Backfill
					(0.30) 0.30	MADEGROUND - Greyish brown fine to coarse, sub angualr to sub rounded, sandy GRAVEL.	Dry, NEC.	
					0.35	MADEGROUND - Concrete.	Dry, NEC.	
0.5	BH6 0.0-1.0m	0.0			(1.55)	MADEGROUND Light brown sandy, silty, gravelly CLAY with pieces of glass, plastic and metal.	Dry, NEC.	
1.0								
1.5	BH6 1.0-2.0m	0.0			1.90			
2.0					(0.10) 2.00	Dark brown sandy, silty, gravelly CLAY.	Dry, NEC.	
						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Concrete

Sandy Gravelly CLAY

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH7**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 29-07-19 End Date 29-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.50)	MADEGROUND - Brown fine to coarse, sub angular to sub rounded, silty sandy GRAVEL with a high cobble content.	Dry, NEC.	
0.5	BH7 0.0-1.0m	0.2			0.50			
					(1.50)	MADEGROUND - Light brown sandy gravelly silty CLAY.	Dry, NEC.	
1.0								
1.5	BH7 1.0-2.0m	0.3						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Groundwater Table Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH8**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 23-07-19 End Date 23-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.35) 0.35	MADEGROUND - Brown, sandy, silty, gravelly CLAY with low cobble content.	Dry, NEC.	
					(0.10) 0.45	MADEGROUND - Grey, coarse, angular to sub angular, silty GRAVEL.	Dry, NEC.	
0.5	BH8 0.0-1.0m	4.9				MADEGROUND - Brown, silty, sandy, gravelly CLAY with medium cobble content and peices of wood, brick and metal.	Dry, NEC.	
1.0					(1.55)			
1.5	BH8 1.0-2.0m	1000						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS	LEGEND	GENERAL REMARKS
SAMPLE TYPE DETAILS	Made Ground Groundwater Table Water Strike bgl = Below Ground Level	Evidence of contamination. Hole backfilled with soil arisings. Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH9**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 24-07-19 End Date 24-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.40) 0.40	TOPSOIL	Dry, NEC.	
0.5	BH9 0.0-1.0m	0.5			(0.40) 0.80	Reddish brown, medium to coarse, sub rounded to rounded,sandy, silty GRAVEL with low cobble content.	Dry, NEC.	
1.0					(0.30) 1.10	Reddish brown, fine to medium, sub rounded silty SAND & GRAVEL.	Dry, NEC.	
1.5	BH9 1.0-2.0m	0.6			(0.90) 2.00	Light brown, silty, gravelly CLAY.	Dry, NEC.	
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Topsoil
- Sandy Silty/Clayey GRAVEL
- SAND & GRAVEL with silt
- Gravelly SILT/CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH10**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 24-07-19 End Date 24-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.60)	MADEGROUND - Greyish brown, fine to coarse, angular to sub rounded, sandy GRAVEL.	Dry, NEC.	
0.5	BH10 0.0-1.0m	0.4			0.60			
					(0.30)	MADEGROUND - Brown sandy gravelly CLAY with low cobble content.	Dry, NEC.	
					0.90			
1.0					(0.30)	Brown, fine to coarse, sub angular to sub rounded, very sandy, clayey GRAVEL.	Dry, NEC.	
					1.20			
1.5	BH10 1.0-2.0m	0.9			(0.80)	Brown slightly sandy, gravelly CLAY with low cobble content present.	Dry, NEC.	
2.0					2.00			
						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Made Ground
- Sandy Silty/Clayey GRAVEL
- Sandy gravelly SILT/CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH11**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 24-07-19 End Date 24-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.30)	TOPSOIL	Dry, NEC.	
					0.30			
0.5	BH11 0.0-1.0m	2.2			(1.10)	Brown, very sandy, very gravelly CLAY with a high cobble content.	Dry, NEC.	
1.0								
					1.40			
1.5	BH11 1.0-2.0m	9.1			(0.60)	Grey, fine to coarse angular, sandy, silty GRAVEL.	Dry, NEC.	
2.0					2.00			
						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Topsoil
- Sandy gravelly CLAY
- Sandy Silty/Clayey GRAVEL
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH12**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 24-07-19 End Date 24-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation / Backfill
					(0.40)	MADEGROUND - Light brown, fine to coarse, angular to sub angular, sandy GRAVEL with high cobble content.	Dry, NEC.	
					0.40			
0.5	BH12 0.0-1.0m	2.4				Brown, sandy, gravelly CLAY.	Dry, NEC.	
1.0					(1.60)			
1.5	BH12 1.0-2.0m	0.4						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Sandy gravelly CLAY

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH13**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 25-07-19 End Date 25-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	STRATA: Depth (Thick-ness)	STRATA: DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH13 0.0-1.0m	0.3			(2.00)	Light brown, very gravelly, slightly sandy CLAY with low to medium cobble content.	Dry, NEC.	
1.5	BH13 1.0-2.0m	1.4						
2.0					2.00			

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Sandy gravelly CLAY

Groundwater Table Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH14**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 25-07-19 End Date 25-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.10) 0.10	MADEGROUND - Grey fint to coarse, sandy GRAVEL.	Dry, NEC.	
					(0.20) 0.30	MADEGROUND - Concrete.	Dry, NEC.	
0.5	BH14 0.0-1.0m	0.2			(0.40) 0.70	MADEGROUND - Brown, fine to coarse, sub angualr to sub rounded, silty, sandy GRAVEL.	Dry, NEC. Evidence of pieces of plastic and brick.	
1.0					(1.30)	Dark brown, sandy, gravelly CLAY.	Dry, NEC.	
1.5	BH14 1.0-2.0m	2.7						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Made Ground
- Concrete
- Sandy Silty/Clayey GRAVEL
- Sandy Gravelly CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH16**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 26-07-19 End Date 26-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.50)	TOPSOIL	Dry, NEC.	
0.5	BH16 0.0-1.0m	1.5			0.50	Grey, fine to coarse, angular to sub angular, sandy, silty GRAVEL.	Dry, NEC.	
1.0					(1.50)			
1.5	BH16 1.0-2.0m	2.7						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Topsoil

Sandy Silty/Clayey GRAVEL

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH17**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 25-07-19 End Date 25-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH17 0.0-1.0m	1.2			(1.30)	MADEGROUND - Light brown, sandy, gravelly CLAY.	Dry, NEC.	
1.0					1.30			
1.5	BH17 1.0-2.0m	0.5			(0.70)	MADEGROUND - Yellow brown, silty, sandy, gravelly CLAY.	Dry, NEC.	
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Topsoil

Sandy Gravelly CLAY

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH18**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 25-07-19 End Date 25-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.25)	TOPSOIL	Dry, NEC.	
					0.25			
						MADEGROUND - Greyish brown, fine to coarse, sub angualr to sub rounded GRAVEL.	Dry, NEC. Evidence of pieces of plastic, metal, brick & concrete.	
0.5	BH18 0.0-1.0m	1.0			(0.50)			
					0.75			
						Light brown, sandy, gravelly CLAY with low cobble content.	Dry, NEC.	
1.0								
					(1.25)			
1.5	BH18 1.0-2.0m	0.9						
					2.00			
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Topsoil

Made Ground

Sandy Gravelly CLAY

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH19**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 22-07-19 End Date 22-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Instalation / Backfill
					(0.50)	MADEGROUND - Grey coarse, angular silty, sandy GRAVEL.	Dry, NEC.	
0.5	BH19 0.0-1.0m	0.5			0.50			
					(0.70)	Brown, fine to coarse, sub angular, clayey, sandy GRAVEL.	Dry, NEC.	
1.0					1.20			
					(0.80)	Greyish brown, slightly sandy, slightly gravelly CLAY.	Dry, NEC.	
1.5	BH19 1.0-2.0m	2.4			2.00			
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Made Ground
- Sandy Clayey GRAVEL
- Sandy Gravelly CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH20**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 23-07-19 End Date 23-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH20 0.0-1.0m	4.2			(0.70) 0.70	MADEGROUND - Greyish brown, fine to coarse, sub angular to sub rounded, silty, sandy GRAVEL with low cobble content. Bolders present.	Dry, NEC.	
1.0					(0.60) 1.30	MADEGROUND - Light brown, sandy, gravelly CLAY with low cobble content.	Dry, NEC.	
1.5	BH20 1.0-2.0m	5.4			(0.40) 1.70	Light brown, fine to coarse, angular, sandy, silty GRAVEL.	Dry, NEC.	
2.0					(0.30) 2.00	Light brown, sandy, gravelly CLAY.		
						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Made Ground
- Sandy Silty/Clayey GRAVEL
- Sandy Gravelly CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH21**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 23-07-19 End Date 23-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.30) 0.30	TOPSOIL.	Dry, NEC.	
					(0.15) 0.45	MADEGROUND - Grey, fine to coarse, angular, sandy, silty GRAVEL.	Dry, NEC.	
0.5	BH21 0.0-1.0m	3.1			(0.55) 1.00	MADEGROUND - Concrete.	Dry, NEC.	
1.0					(0.20) 1.20	MADEGROUND - Grey, sandy, silty CLAY.	Dry, NEC. Evidence of burnt wood.	
1.5	BH21 1.0-2.0m	70.3			(0.80) 2.00	Grey, sandy, silty, gravelly CLAY.	Dry, NEC.	
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Topsoil
- Made Ground
- Concrete
- Sandy Gravelly CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH22**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 22-07-19 End Date 22-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH22 0.0-1.0m	0.5			(1.30)	MADEGROUND - Coarse, angular, sandy GRAVEL.	Dry, NEC.	
1.0								
1.5	BH22 1.0-2.0m	0.3 8.9			(0.70)	MADEGROUND - Light brown, sandy, gravelly CLAY.	Dry, NEC. Some evidence of staining and hydrocarbon odours at 1.6m BGL.	
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Groundwater Table Water Strike

bgl = Below Ground Level

GENERAL REMARKS

Evidence of contamination - hydrocarbon odours & staining.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH23**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 23-07-19 End Date 23-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH23 0.0-1.0m	5.2				MADEGROUND - Grey coarse, angular, sandy, clayey GRAVEL.	Dry, NEC.	
1.0					(2.00)			
1.5	BH23 1.0-2.0m	58.3						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Groundwater Table Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH24**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 23-07-19 End Date 23-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH24 0.0-1.0m	1.7			(1.20)	MADEGROUND - Grey fine to coarse, angular, silty, sandy GRAVEL with high cobble content.	Dry, NEC.	
1.0					1.20			
1.5	BH24 1.0-2.0m	8.7			(0.80)	MADEGROUND - Grey, fine to coarse, angular, sandy GRAVEL, with high cobble content.	Dry, NEC.	
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Groundwater Table Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH25**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 22-07-19 End Date 22-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.10) 0.10	MADEGROUND - Concrete.	Dry, NEC.	
					(0.30) 0.40	MADEGROUND - Grey, coarse, angualr sandy, silty GRAVEL.	Dry, NEC.	
0.5	BH25 0.0-1.0m	0.4			(1.60)	Light orange brown, sandy, gravelly, silty CLAY with low bolder content.	Dry, NEC.	
1.0								
1.5	BH25 1.0-2.0m	0.2						
2.0					2.00	End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Concrete

Made Ground

Sandy Gravelly CLAY

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

		Logged By	Approved By
		R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH26**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 25-07-19 End Date 25-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
0.5	BH26 0.0-0.8m	0.1			(0.60) 0.60	MADEGROUND - Light brown, fine to coare, sub angualr to sub rounded. silty, sandy GRAVEL.	Dry, NEC.	
					(0.25) 0.85	MADEGROUND - Reddish brown, fine to medium, sub angular to sub rounded GRAVEL.	Dry, NEC.	
						End of hole - Target depth not reached as services were encountered.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Made Ground

Groundwater Table Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH27**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 26-07-19 End Date 26-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.10) 0.10	TOPSOIL	Dry, NEC.	
						MADEGROUND - Orange brown, very sandy, very gravelly CLAY, with low cobble content.	Dry, NEC.	
0.5	BH27 0.0-1.0m	0.5			(0.80)			
					0.90			
1.0						Light brown silty, sandy, gravelly CLAY with medium cobble content.	Dry, NEC.	
					(1.10)			
1.5	BH27 1.0-2.0m	1.0						
					2.00			
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

Topsoil

Made Ground

Sandy Gravelly CLAY

Groundwater Table

Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By R.McGovern

Approved By E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

EXPLORATORY HOLE LOG

Project Name and Site Location	Client	BOREHOLE No
Pfizer Ringaskiddy, Baseline Soil Assessment	Pfizer Ireland Pharmaceuticals	**BH28**

Job No	Date	Ground Level (m)	Co-Ordinates ()
PR-423449	Start Date 24-07-19 End Date 24-07-19		

Contractor	Method / Plant Used	Sheet
Causeway Geotech Limited	Window Sampler Rig	1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA: Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS	Instalation /Backfill
					(0.40)	TOPSOIL	Dry, NEC. Evidence of pieces of plastic	
					0.40			
0.5	BH28 0.0-1.0m	0.2			(0.60)	MADEGROUND - Brown, sandy, gravelly CLAY with low cobble content.	Dry, NEC.	
					1.00			
1.0					(0.30)	MADEGROUND - White, gravelly CLAY with medium plasticity.	Dry, NEC. (Possible Gypsum Waste).	
					1.30			
1.5	BH28 1.0-2.0m	19.1			(0.70)	MADEGROUND - Brown, sandy, gravelly CLAY.	Dry, NEC. Evidence of glass and plastic present.	
					2.00			
2.0						End of hole - Target depth reached.		

WELL INSTALLATION DETAILS

SAMPLE TYPE DETAILS

LEGEND

- Topsoil
- Made Ground
- Gravelly CLAY
- Sandy Gravelly CLAY
- Groundwater Table
- Water Strike

bgl = Below Ground Level

GENERAL REMARKS

NEC - No evidence of contamination.

Hole backfilled with soil arisings.

Hole hand dug to 1.20 m below ground level.

Logged By	Approved By
R.McGovern	E. O'Hannelly

EXPLORATORY HOLE LOG 21/09/07 PFIZER SBA RING LOGS.GPJ AGS3_ALL.GDT 7/8/19

Appendix F Shallow Soil Investigation Validated Laboratory Certificates

Element Materials Technology
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Zone 3
Deeside Industrial Park
Deeside
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AECOM
1st Floor, Montrose House
Carrigaline Road
Douglas
Cork
Ireland

Attention :	Edel O'Hannelly
Date :	30th July, 2019
Your reference :	PR-423449
Our reference :	Test Report 19/11899 Batch 1 Schedule A 19/11899 Batch 1 Schedule B
Location :	Ringaskiddy
Date samples received :	24th July, 2019
Status :	Final report
Issue :	1

Seven samples were received for analysis on 24th July, 2019 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11899

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	BH22	BH22	BH22	BH25	BH25	BH19	BH19						
Depth	0.00-1.00	1.00-2.00	1.60	1.00-2.00	0.00-1.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019						
Arsenic #M	2.8	14.6	14.2	20.2	14.7	10.2	14.6				<0.5	mg/kg	TM30/PM15
Barium #M	15	42	38	62	38	30	56				<1	mg/kg	TM30/PM15
Beryllium	<0.5	1.1	1.1	2.4	1.4	1.0	1.1				<0.5	mg/kg	TM30/PM15
Cadmium #M	0.6	0.3	0.5	1.4	0.5	0.2	<0.1				<0.1	mg/kg	TM30/PM15
Chromium #M	19.5	51.4	39.1	48.2	39.3	34.6	51.1				<0.5	mg/kg	TM30/PM15
Copper #M	4	24	21	31	24	8	15				<1	mg/kg	TM30/PM15
Lead #M	<5	40	30	54	41	11	33				<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Nickel #M	7.6	38.2	31.6	58.8	40.0	21.0	28.0				<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	<1	<1	<1	<1	<1				<1	mg/kg	TM30/PM15
Vanadium	6	25	20	31	23	13	30				<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.1	0.3	0.2	0.3	0.3	0.3	0.5				<0.1	mg/kg	TM74/PM32
Zinc #M	57	144	127	275	173	70	114				<5	mg/kg	TM30/PM15
VOC TICs	ND	ND	ND	ND	ND	ND	See Attached					None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Toluene #	11	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
m/p-Xylene #	6	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	98	93	87	90	90	100	94				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	94	84	73	92	83	91	77				<0	%	TM15/PM10
SVOC TICs	ND	See Attached	See Attached	ND	ND	See Attached	See Attached					None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2				<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	6.9	14.4	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	31	54	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	46	83	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	46	82	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	130	233	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11899

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	BH22	BH22	BH22	BH25	BH25	BH19	BH19						
Depth	0.00-1.00	1.00-2.00	1.60	1.00-2.00	0.00-1.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019						
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	75	260	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	54	201	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	180	628	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	309	1089	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	439	1322	<38	<38	<38	<38				<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Natural Moisture Content	1.2	15.2	12.5	18.1	11.9	5.3	20.6				<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Chromium III	19.5	51.4	39.1	48.2	39.8	34.6	51.1				<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay					None	PM13/PM0
Sample Colour	Medium Grey	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown					None	PM13/PM0
Other Items	mostly stones	stones	stones	stones	stones	stones	stones, vegetation					None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11899

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	BH22	BH22	BH22	BH25	BH25	BH19	BH19						
Depth	0.00-1.00	1.00-2.00	1.60	1.00-2.00	0.00-1.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019						
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Naphthalene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Fluorene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	<10	240	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Anthracene	<10	<10	107	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Pyrene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Chrysene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	206	4616	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11899

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	BH22	BH22	BH22	BH25	BH25	BH19	BH19						
Depth	0.00-1.00	1.00-2.00	1.60	1.00-2.00	0.00-1.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019						
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Carbazole	<10	<10	105	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10	77	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	130	126	126	130	85	93	127				<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	119	120	127	122	128	128	122				<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

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Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11899

VOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21					
Sample ID	BH22	BH22	BH22	BH25	BH25	BH19	BH19					
Depth	0.00-1.00	1.00-2.00	1.60	1.00-2.00	0.00-1.00	0.00-1.00	1.00-2.00					
COC No / misc												
Containers	V J	V J	V J	V J	V J	V J	V J					
Sample Date	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019					
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay					
Batch Number	1	1	1	1	1	1	1					
Date of Receipt	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019					

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1				<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30				<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Toluene #	11	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
m/p-Xylene #	6	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Styrene	<3	<3	9	<3	<3	<3	<3				<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	7	19	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	9	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	6	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7				<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27				<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7				<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	98	93	87	90	90	100	94				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	94	84	73	92	83	91	77				<0	%	TM15/PM10

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/11899
Sample number: 19
Sample identity: BH19
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
2234-75-5	Cyclohexane, 1,2,4-trimethyl-	5.894 - 5.927	92,93	153
3728-56-1	1-Ethyl-4-methylcyclohexane	5.961	94	141
6236-88-0	Cyclohexane, 1-ethyl-4-methyl-, trans-	6.122	81	139
1678-92-8	Cyclohexane, propyl-	6.273	87	171
4551-51-3	1H-Indene, octahydro-, cis-	6.770	97	137
493-01-6	Naphthalene, decahydro-, cis-	7.219	94	207

Job number: 19/11899
Sample number: 6
Sample identity: BH22
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
620-85-9	p-Ethyldiphenylmethane	9.506	95	7246
28122-29-4	Benzene, 2,6-dimethyl-1-(phenylmethyl)-	9.559	87	419
28122-24-9	Benzene, 1-ethyl-3-(phenylmethyl)-	9.637	94	6897
18435-45-5	1-Nonadecene	12.224	95	1013

Job number: 19/11899
Sample number: 9
Sample identity: BH22
Sample depth: 1.60
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
2958-76-1	Naphthalene, decahydro-2-methyl-	6.515	90	934
75163-97-2	Octadecane, 2,6-dimethyl-	7.631	83	1784
544-76-3	Hexadecane	8.309	86	1478
620-83-7	Benzene, 1-methyl-4-(phenylmethyl)-	9.106	98	2287
613-33-2	4,4'-Dimethylbiphenyl	9.135	97	1045
829-26-5	Naphthalene, 2,3,6-trimethyl-	9.237	96	1627
620-85-9	p-Ethyldiphenylmethane	9.519	95	322183
28122-29-4	Benzene, 2,6-dimethyl-1-(phenylmethyl)-	9.571	94	22271
28122-25-0	Benzene, 1-ethyl-2-(phenylmethyl)-	9.663	90	249499
3892-00-0	Pentadecane, 2,6,10-trimethyl-	9.820	96	3384
112-95-8	Eicosane	10.052	92	4039
66067-43-4	3-Ethylbenzophenone	10.515	96	4321
2571-39-3	3,4-Dimethylbenzophenone	10.702	93	16291
782-92-3	(4-Acetylphenyl)phenylmethane	10.768	89	1445
62016-79-9	Heptacosane, 1-chloro-	10.977	86	2358
629-92-5	Nonadecane	11.414	90	842
793-23-7	Benzene, 1,4-bis(phenylmethyl)-	12.392	94	1086
76399-17-2	Acetonitrile, (3-chloro-5,5-dimethyl-2-cyclohexen-1-ylidene)-, (E)-	12.527	86	2792
103-30-0	(E)-Stilbene	12.730	81	28221
80636-47-1	5H-Dibenzo[a,c]cyclohepten-5-ol	13.535	81	2394
3878-45-3	Triphenylphosphine sulfide	14.039	98	2270

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/11899
Sample number: 18
Sample identity: BH19
Sample depth: 0.00-1.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
557-61-9	Octacosanol	12.224	86	538
544-76-3	Hexadecane	13.160	91	540
112-95-8	Eicosane	14.092	95	1050

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/11899
Sample number: 21
Sample identity: BH19
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
13798-23-7	Hexathiane	8.879	90	321
296-56-0	Cycloeicosane	12.224	93	414
112-84-5	13-Docosenamide, (Z)-	14.690	81	2820

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Notification of Deviating Samples

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/11899						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/11899

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/11899

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes

EMT Job No: 19/11899

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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AECOM
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Carrigaline Road
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Ireland

Attention :	Edel O'Hannelly
Date :	30th July, 2019
Your reference :	PR-423449
Our reference :	Test Report 19/11899 Batch 1 Schedule C
Location :	Ringaskiddy
Date samples received :	24th July, 2019
Status :	Final report
Issue :	1

Seven samples were received for analysis on 24th July, 2019 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11899

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21				LOD/LOR	Units	Method No.
Sample ID	BH22	BH22	BH22	BH25	BH25	BH19	BH19						
Depth	0.00-1.00	1.00-2.00	1.60	1.00-2.00	0.00-1.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019	22/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019						
Alcohols/Acetates													
Cyclohexane	<50	<50	<50	<50	<50	<50	<50				<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50	<50	<50	<50	<50	<50				<50	ug/kg	TM83/PM10
Bromide	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.7				<0.3	mg/kg	TM27/PM20

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/11899						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/11899

SOILS

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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It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

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As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/11899

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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AECOM
1st Floor, Montrose House
Carrigaline Road
Douglas
Cork
Ireland

Attention :	Edel O'Hannelly
Date :	2nd August, 2019
Your reference :	PR423449
Our reference :	Test Report 19/11989 Batch 1
Location :	Ringaskiddy
Date samples received :	25th July, 2019
Status :	Final report
Issue :	1

Twelve samples were received for analysis on 25th July, 2019 of which twelve were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Simon Gomery BSc
Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH20	BH20	BH21	BH21	BH23	BH23	BH24	BH24	BH08	BH08			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
Arsenic #M	8.2	5.7	6.4	17.1	3.4	2.9	3.2	1.0	2.0	2.9	<0.5	mg/kg	TM30/PM15
Barium #M	27	41	32	37	18	15	50	23	37	32	<1	mg/kg	TM30/PM15
Beryllium	0.7	1.3	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	0.9	0.9	<0.5	mg/kg	TM30/PM15
Cadmium #M	0.5	0.4	0.4	<0.1	0.4	0.5	0.4	0.4	0.4	0.6	<0.1	mg/kg	TM30/PM15
Chromium #M	17.9	38.0	22.7	45.9	16.8	6.6	15.0	13.4	31.4	26.4	<0.5	mg/kg	TM30/PM15
Copper #M	8	19	11	19	9	3	7	5	16	15	<1	mg/kg	TM30/PM15
Lead #M	9	72	11	44	5	<5	6	<5	24	27	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #M	12.6	33.4	12.5	40.7	14.8	3.4	10.5	8.1	27.7	29.9	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Vanadium	9	19	13	26	5	2	7	5	16	15	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.2	0.4	0.2	0.4	0.2	0.1	0.1	0.1	0.3	0.3	<0.1	mg/kg	TM74/PM32
Zinc #M	53	132	60	157	48	20	51	34	123	117	<5	mg/kg	TM30/PM15
VOC TICs	ND	ND	ND	ND	ND	See Attached	ND	See Attached	ND	ND		None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	9	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	31	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	95	96	95	91	64	99	97	100	92	94	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	88	87	85	78	60	92	87	94	90	85	<0	%	TM15/PM10
SVOC TICs	See Attached	ND	ND	ND	ND	See Attached	ND	ND	ND	ND		None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	1.0	<0.1	3.2	<0.1	0.3	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	19	<7	46	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	22	<19	46	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH20	BH20	BH21	BH21	BH23	BH23	BH24	BH24	BH08	BH08			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1	<0.1	0.2	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	<38	<38	46	<38	<38	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	ug/kg	TM83/PM10
Natural Moisture Content	4.7	11.9	7.2	16.2	3.6	1.5	3.4	2.0	9.8	12.0	<0.1	%	PM4/PM0
Bromide	<0.3	<0.3	<0.3	0.5	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	17.9	38.0	22.7	15.9	16.8	6.6	15.0	13.4	31.4	26.4	<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones, sand	stones	stones, vegetation	stones	stones, sand	mostly stones	stones	mostly stones	stones	stones		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP01	DUP01											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	23/07/2019	23/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	25/07/2019	25/07/2019											
Arsenic #M	3.2	2.3									<0.5	mg/kg	TM30/PM15
Barium #M	40	35									<1	mg/kg	TM30/PM15
Beryllium	1.1	0.9									<0.5	mg/kg	TM30/PM15
Cadmium #M	0.6	0.4									<0.1	mg/kg	TM30/PM15
Chromium #M	40.3	36.5									<0.5	mg/kg	TM30/PM15
Copper #M	22	15									<1	mg/kg	TM30/PM15
Lead #M	36	26									<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #M	36.0	32.2									<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1									<1	mg/kg	TM30/PM15
Vanadium	20	18									<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.4	0.3									<0.1	mg/kg	TM74/PM32
Zinc #M	192	117									<5	mg/kg	TM30/PM15
VOC TICs	ND	See Attached										None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2									<2	ug/kg	TM15/PM10
Benzene #	<3	<3									<3	ug/kg	TM15/PM10
Toluene #	<3	<3									<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5									<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3									<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	99	95									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	91	87									<0	%	TM15/PM10
SVOC TICs	ND	See Attached										None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	1.1									<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	49									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	50									<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP01	DUP01											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	23/07/2019	23/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	25/07/2019	25/07/2019											
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	50									<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50									<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50									<50	ug/kg	TM83/PM10
Natural Moisture Content	12.6	11.5									<0.1	%	PM4/PM0
Bromide	<0.3	<0.3									<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Chromium III	40.3	36.5									<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay										None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown										None	PM13/PM0
Other Items	stones	stones										None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH20	BH20	BH21	BH21	BH23	BH23	BH24	BH24	BH08	BH08			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluorene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	<10	16	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pyrene #M	<10	<10	12	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10	33	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Chrysene	<10	<10	13	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10	20	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10	14	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10	14	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH20	BH20	BH21	BH21	BH23	BH23	BH24	BH24	BH08	BH08			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Carbazole	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	124	123	126	123	121	124	124	125	125	124	<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	119	116	115	115	116	126	120	122	118	120	<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP01	DUP01											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	23/07/2019	23/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	25/07/2019	25/07/2019											
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10									<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10									<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10									<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10									<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10									<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10									<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10									<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10									<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10									<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10									<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10									<10	ug/kg	TM16/PM8
Phenol #M	<10	<10									<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10									<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	<10									<10	ug/kg	TM16/PM8
Naphthalene	<10	<10									<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10									<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10									<10	ug/kg	TM16/PM8
Fluorene	<10	<10									<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	<10									<10	ug/kg	TM16/PM8
Anthracene	<10	<10									<10	ug/kg	TM16/PM8
Fluoranthene #M	17	<10									<10	ug/kg	TM16/PM8
Pyrene #M	17	<10									<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10									<10	ug/kg	TM16/PM8
Chrysene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10									<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10									<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10									<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100									<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100									<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36											
Sample ID	DUP01	DUP01											
Depth	0.00-1.00	1.00-2.00									Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J	V J											
Sample Date	23/07/2019	23/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	25/07/2019	25/07/2019											
SVOC MS											LOD/LOR	Units	Method No.
Other SVOCs													
1,2-Dichlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10									<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10									<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10									<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10									<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10									<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10									<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10									<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10									<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10									<10	ug/kg	TM16/PM8
Azobenzene	<10	<10									<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10									<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10									<10	ug/kg	TM16/PM8
Carbazole	<10	<10									<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10									<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10									<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10									<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10									<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10									<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10									<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10									<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	128	125									<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	116	123									<0	%	TM16/PM8

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

VOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	BH20	BH20	BH21	BH21	BH23	BH23	BH24	BH24	BH08	BH08			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019	23/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	9	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	313	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	95	96	95	91	64	99	97	100	92	94	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	88	87	85	78	60	92	87	94	90	85	<0	%	TM15/PM10

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All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/11989

VOC Report : **Solid**

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP01	DUP01											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	23/07/2019	23/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	25/07/2019	25/07/2019											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2									<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3									<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2									<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1									<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2									<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2									<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6									<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30									<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4									<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3									<3	ug/kg	TM15/PM10
Chloroform #	<3	<3									<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3									<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4									<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4									<4	ug/kg	TM15/PM10
Benzene #	<3	<3									<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6									<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3									<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4									<4	ug/kg	TM15/PM10
Toluene #	<3	<3									<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3									<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3									<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3									<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3									<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3									<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3									<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3									<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5									<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3									<3	ug/kg	TM15/PM10
Styrene	<3	<3									<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3									<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3									<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2									<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4									<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4									<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3									<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3									<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5									<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6									<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4									<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4									<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4									<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4									<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4									<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4									<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4									<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7									<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4									<4	ug/kg	TM15/PM10
Naphthalene	<27	<27									<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7									<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	99	95									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	91	87									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/11989
Sample number: 16
Sample identity: BH23
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
19489-10-2	cis-1-Ethyl-3-methyl-cyclohexane	5.954	91	151
13395-76-1	Cyclohexanone, 2,3-dimethyl-	6.273	86	253
15869-93-9	Octane, 3,5-dimethyl-	6.367	81	291
7045-67-2	Cyclohexane, 2-ethyl-1,3-dimethyl-	6.478	87	116
3868-64-2	Pentalene, octahydro-2-methyl-	6.770	90	315
13151-34-3	Decane, 3-methyl-	7.063	95	164
-	2,6-Dimethylbicyclo[3.2.1]octane	7.097	80	202
493-02-7	Naphthalene, decahydro-, trans-	7.219	91	538
493-01-6	Naphthalene, decahydro-, cis-	7.514	93	216
-	trans-Decalin, 2-methyl-	7.551 - 7.698	93,96	657
2958-76-1	Naphthalene, decahydro-2-methyl-	7.787	97	164
-	cis-Decalin, 2-syn-methyl-	7.827	91	104
-	trans,trans-1,6-Dimethylspiro[4.5]decane	7.945 - 8.060	94,95	117

Job number: 19/11989
Sample number: 22
Sample identity: BH24
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
-	trans-Decalin, 2-methyl-	7.551 - 7.657	83,95	316

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/11989
Sample number: 34
Sample identity: DUP01
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
493-02-7	Naphthalene, decahydro-, trans-	7.219	92	161
-	trans-Decalin, 2-methyl-	7.551	96	174

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/11989
Sample number: 3
Sample identity: BH20
Sample depth: 0.00-1.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
13798-23-7	Hexathiane	8.892	81	151

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/11989
Sample number: 18
Sample identity: BH23
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
2958-76-1	Naphthalene, decahydro-2-methyl-	6.376	95	385
112-95-8	Eicosane	13.641	95	337
646-31-1	Tetracosane	14.092	94	697

Job number: 19/11989
Sample number: 36
Sample identity: DUP01
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
13798-23-7	Hexathiane	8.878	81	125

Client Name: AECOM
Reference: PR423449
Location: Ringaskiddy
Contact: Edel O'Hannelly

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/11989						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/11989

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/11989

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes

EMT Job No: 19/11989

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 19/11989

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland

Attention :	Edel O'Hannelly
Date :	2nd August, 2019
Your reference :	PR-423449
Our reference :	Test Report 19/12086 Batch 1
Location :	Ringaskiddy
Date samples received :	26th July, 2019
Status :	Final report
Issue :	1

Twelve samples were received for analysis on 26th July, 2019 of which twelve were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH9	BH9	BH10	BH10	BH11	BH11	BH12	BH12	BH28	BH28			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019			
Arsenic #M	7.2	18.4	8.6	19.8	4.1	3.2	11.1	2.7	11.7	9.0	<0.5	mg/kg	TM30/PM15
Barium #M	35	35	29	37	23	28	74	18	39	70	<1	mg/kg	TM30/PM15
Beryllium	0.8	1.3	0.9	1.3	0.6	0.5	<0.5	<0.5	0.8	0.7	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	0.2	0.3	0.6	0.3	0.4	1.7	1.2	0.3	0.4	<0.1	mg/kg	TM30/PM15
Chromium #M	48.7	29.7	32.3	40.4	16.2	20.7	28.8	15.3	27.8	29.9	<0.5	mg/kg	TM30/PM15
Copper #M	14	25	17	26	7	8	12	10	16	19	<1	mg/kg	TM30/PM15
Lead #M	17	38	18	35	13	18	23	12	34	24	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #M	25.6	39.7	27.2	41.8	14.5	12.5	26.1	10.3	23.9	23.3	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	<1	<1	<1	<1	3	2	<1	<1	<1	mg/kg	TM30/PM15
Vanadium	20	22	17	22	9	8	21	9	21	21	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.2	0.3	0.3	0.3	0.2	0.2	0.8	0.2	0.4	0.5	<0.1	mg/kg	TM74/PM32
Zinc #M	72	178	141	189	84	60	207	105	116	258	<5	mg/kg	TM30/PM15
VOC TICs	ND	ND	ND	ND	ND	See Attached	ND	ND	ND	See Attached		None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	100	95	96	102	99	96	101	99	93	67	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	97	88	84	95	91	91	91	93	75	62	<0	%	TM15/PM10
SVOC TICs	ND	ND	ND	ND	ND	See Attached	ND	See Attached	ND	See Attached		None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	0.2	<0.1	0.7	<0.1	<0.1	<0.1	0.5 SV	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	29.9	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	10	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	139	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	180	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH9	BH9	BH10	BH10	BH11	BH11	BH12	BH12	BH28	BH28			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	180	<38	<38	<38	<38	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50 SV	<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50 SV	<50	ug/kg	TM83/PM10
Natural Moisture Content	9.5	13.5	7.8	13.4	5.3	4.3	13.9	11.5	11.6	16.5	<0.1	%	PM4/PM0
Bromide	<0.3	0.4	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	48.7	29.7	32.3	40.4	16.2	20.7	28.8	15.3	27.8	29.9	<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones	stones	stones, sand	bricks, stones	stones	sand, stones	sand, stones	stones	stones	stones, chalk		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP-02	DUP-02											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	24/07/2019	24/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	26/07/2019	26/07/2019											
Arsenic #M	4.5	3.9									<0.5	mg/kg	TM30/PM15
Barium #M	28	33									<1	mg/kg	TM30/PM15
Beryllium	0.6	1.0									<0.5	mg/kg	TM30/PM15
Cadmium #M	0.3	0.3									<0.1	mg/kg	TM30/PM15
Chromium #M	19.2	17.7									<0.5	mg/kg	TM30/PM15
Copper #M	8	16									<1	mg/kg	TM30/PM15
Lead #M	14	11									<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #M	17.0	22.3									<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1									<1	mg/kg	TM30/PM15
Vanadium	9	11									<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.2	0.2									<0.1	mg/kg	TM74/PM32
Zinc #M	99	88									<5	mg/kg	TM30/PM15
VOC TICs	ND	See Attached										None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2									<2	ug/kg	TM15/PM10
Benzene #	<3	<3									<3	ug/kg	TM15/PM10
Toluene #	<3	<3									<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5									<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3									<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	89	92									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	81	85									<0	%	TM15/PM10
SVOC TICs	ND	ND										None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	0.3									<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19									<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36											
Sample ID	DUP-02	DUP-02											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	24/07/2019	24/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	26/07/2019	26/07/2019											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38									<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50									<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50									<50	ug/kg	TM83/PM10
Natural Moisture Content	5.0	7.0									<0.1	%	PM4/PM0
Bromide	<0.3	<0.3									<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Chromium III	19.2	17.7									<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay										None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown										None	PM13/PM0
Other Items	stones	sand, stones										None	PM13/PM0

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH9	BH9	BH10	BH10	BH11	BH11	BH12	BH12	BH28	BH28			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019			
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	35	<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	214	<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	242	<10	ug/kg	TM16/PM8
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluorene	<10	<10	<10	<10	<10	<10	<10	<10	<10	190	<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	72	<10	<10	<10	<10	<10	<10	<10	199	<10	ug/kg	TM16/PM8
Anthracene	<10	24	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	153	<10	<10	<10	<10	<10	<10	12	<10	<10	ug/kg	TM16/PM8
Pyrene #M	<10	128	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	94	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Chrysene	<10	73	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	112	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	72	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	32	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	36	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	81	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	31	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	BH9	BH9	BH10	BH10	BH11	BH11	BH12	BH12	BH28	BH28			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Carbazole	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	118	120	127	122	127	121	119	123	127	129	<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	114	116	118	118	118	118	116	115	119	127	<0	%	TM16/PM8

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All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP-02	DUP-02											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	24/07/2019	24/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	26/07/2019	26/07/2019											
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10									<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10									<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10									<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10									<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10									<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10									<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10									<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10									<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10									<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10									<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10									<10	ug/kg	TM16/PM8
Phenol #M	<10	<10									<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10									<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	<10									<10	ug/kg	TM16/PM8
Naphthalene	<10	<10									<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10									<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10									<10	ug/kg	TM16/PM8
Fluorene	<10	<10									<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	<10									<10	ug/kg	TM16/PM8
Anthracene	<10	<10									<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	<10									<10	ug/kg	TM16/PM8
Pyrene #M	<10	<10									<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10									<10	ug/kg	TM16/PM8
Chrysene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10									<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10									<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10									<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10									<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100									<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100									<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100									<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

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Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP-02	DUP-02											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	24/07/2019	24/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	26/07/2019	26/07/2019											
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10									<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10									<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10									<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10									<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10									<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10									<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10									<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10									<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10									<10	ug/kg	TM16/PM8
Azobenzene	<10	<10									<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10									<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10									<10	ug/kg	TM16/PM8
Carbazole	<10	<10									<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10									<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10									<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10									<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10									<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10									<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10									<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10									<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10									<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	123	125									<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	114	118									<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

VOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH9	BH9	BH10	BH10	BH11	BH11	BH12	BH12	BH28	BH28			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019	24/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	5	<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6	<6	<6	17	<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	6	<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	8	<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	100	95	96	102	99	96	101	99	93	67	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	97	88	84	95	91	91	91	93	75	62	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12086

VOC Report : **Solid**

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	DUP-02	DUP-02											
Depth	0.00-1.00	1.00-2.00											
COC No / misc													
Containers	V J	V J											
Sample Date	24/07/2019	24/07/2019											
Sample Type	Clay	Clay											
Batch Number	1	1											
Date of Receipt	26/07/2019	26/07/2019											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2									<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3									<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2									<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1									<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2									<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2									<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6									<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30									<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4									<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3									<3	ug/kg	TM15/PM10
Chloroform #	<3	<3									<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3									<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4									<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4									<4	ug/kg	TM15/PM10
Benzene #	<3	<3									<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6									<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3									<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4									<4	ug/kg	TM15/PM10
Toluene #	<3	<3									<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3									<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3									<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3									<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3									<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3									<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3									<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3									<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5									<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3									<3	ug/kg	TM15/PM10
Styrene	<3	<3									<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3									<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3									<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2									<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4									<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4									<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3									<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3									<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5									<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6									<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4									<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4									<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4									<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4									<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4									<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4									<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4									<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7									<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4									<4	ug/kg	TM15/PM10
Naphthalene	<27	<27									<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7									<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	89	92									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	81	85									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Job number: 19/12086
Sample number: 16
Sample identity: BH11
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
13395-76-1	Cyclohexanone, 2,3-dimethyl-	6.273	87	132
4551-51-3	1H-Indene, octahydro-, cis-	6.770	95	131
91-17-8	Naphthalene, decahydro-	7.219	93	268
1000152-47-3	trans-Decalin, 2-methyl-	7.547	97	166
1000155-85-6	cis-Decalin, 2-syn-methyl-	7.698 - 7.827	92,95,96	141

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/12086
Sample number: 28
Sample identity: BH28
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
1758-88-9	Benzene, 2-ethyl-1,4-dimethyl-	7.379 - 7.584	93,93	125
112-40-3	Dodecane	7.780	86	150

Job number: 19/12086
Sample number: 34
Sample identity: DUP-02
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
2040-95-1	Cyclopentane, butyl-	5.927	91	133
3728-55-0	1-Ethyl-3-methylcyclohexane (c,t)	5.954	91	131
1678-92-8	Cyclohexane, propyl-	6.273	83	221
15869-93-9	Octane, 3,5-dimethyl-	6.367	81	257
13151-34-3	Decane, 3-methyl-	7.058	96	163
2808-75-5	1-Methyl-2-methylenecyclohexane	7.098	89	199
493-01-6	Naphthalene, decahydro-, cis-	7.219	92	533
73937-05-0	1-Tetradecanol, 14-chloro-	7.332	87	182
3282-53-9	Cyclohexene, 1-butyl-	7.514	93	213
1000152-47-3	trans-Decalin, 2-methyl-	7.551	95	552
2958-76-1	Naphthalene, decahydro-2-methyl-	7.658 - 7.787	93,97	275
16021-08-2	2(1H)-Naphthalenone, octahydro-, trans-	7.698	91	158
1000155-85-6	cis-Decalin, 2-syn-methyl-	7.827	90	118
1000111-72-1	trans,trans-1,6-Dimethylspiro[4.5]decane	7.944 - 8.025	89,94	118

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/12086
Sample number: 18
Sample identity: BH11
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
2958-76-1	Naphthalene, decahydro-2-methyl-	6.375	89	140
62016-76-6	Nonadecane, 1-chloro-	13.641	92	355
646-31-1	Tetracosane	14.092	89	547

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/12086
Sample number: 24
Sample identity: BH12
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
646-31-1	Tetracosane	13.160	90	408

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/12086
Sample number: 30
Sample identity: BH28
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
124-18-5	Decane	5.289	91	1078
17302-32-8	Nonane, 3,7-dimethyl-	5.998	81	400
1120-21-4	Undecane	6.255	94	3008
1002-43-3	Undecane, 3-methyl-	6.861	87	1231
112-40-3	Dodecane	7.086	96	4178
13287-24-6	Nonadecane, 9-methyl-	7.553	80	1608
2051-30-1	Octane, 2,6-dimethyl-	7.631	80	1129
25117-31-1	Tridecane, 5-methyl-	8.154	92	1360
582-16-1	Naphthalene, 2,7-dimethyl-	8.401	89	1632
629-59-4	Tetradecane	8.436	96	13936
575-37-1	Naphthalene, 1,7-dimethyl-	8.493	97	6065
571-58-4	Naphthalene, 1,4-dimethyl-	8.612	90	1863
629-62-9	Pentadecane	9.018	96	24364
829-26-5	Naphthalene, 2,3,6-trimethyl-	9.120	97	5738
2245-38-7	Naphthalene, 1,6,7-trimethyl-	9.149	98	5049
2131-42-2	Naphthalene, 1,4,6-trimethyl-	9.237	97	4597
7098-22-8	Tetratetracontane	9.362	87	3662
544-76-3	Hexadecane	9.545	96	23463
3892-00-0	Pentadecane, 2,6,10-trimethyl-	9.820	97	4669
629-73-2	Cetene	9.846	83	2972
2717-39-7	1,4,5,8-Tetramethylnaphthalene	9.986	92	6883
629-78-7	Heptadecane	10.052	91	23369
31295-56-4	Dodecane, 2,6,11-trimethyl-	10.107	87	14769
112-88-9	1-Octadecene	10.228	90	6184
629-50-5	Tridecane	10.272	91	9935
26429-11-8	Heptadecane, 4-methyl-	10.338	90	8091
638-36-8	Hexadecane, 2,6,10,14-tetramethyl-	10.603	94	13783
67388-11-8	4-Methylnaphtho[1,2-b]thiophene	10.768	94	4908
629-92-5	Nonadecane	10.977	97	23172
18435-45-5	1-Nonadecene	11.043	92	5241

Job number: 19/12086
Sample number: 30
Sample identity: BH28
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
31317-19-8	2,7-Dimethyldibenzothiophene	11.230	95	4781
1560-84-5	Eicosane, 2-methyl-	11.296	91	5612
1136-85-2	3,7-Dimethyldibenzothiophene	11.318	97	3309
112-95-8	Eicosane	11.415	98	14524
593-45-3	Octadecane	11.575	91	5015
1000351-81-4	Dotriacontyl pentafluoropropionate	11.895	87	3607
15096-10-3	Benzene, 1,1'-[(methylthio)ethenylidene]bis-	11.937	87	5408
62016-76-6	Nonadecane, 1-chloro-	12.030	92	3391
56009-20-2	Cyclohexane, 1-(1,5-dimethylhexyl)-4-(4-methylpentyl)-	12.224	86	2995
629-94-7	Heneicosane	12.586	90	5478
7320-37-8	Oxirane, tetradecyl-	12.645	87	3764
27458-90-8	Disulfide, di-tert-dodecyl	12.991	90	1672

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/12086						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/12086

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/12086

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes

EMT Job No: 19/12086

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 19/12086

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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Attention :	Edel O'Hannelly
Date :	6th August, 2019
Your reference :	PR-423449
Our reference :	Test Report 19/12278 Batch 1
Location :	Ringaskiddy
Date samples received :	30th July, 2019
Status :	Final report
Issue :	1

Seventeen samples were received for analysis on 30th July, 2019 of which seventeen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH26	BH13	BH13	BH14	BH14	BH17	BH17	BH18	BH18	DUP03			
Depth	0.00-0.85	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019			
Arsenic #M	7.6	12.1	11.6	22.4	11.4	15.8	12.9	10.8	21.1	12.4	<0.5	mg/kg	TM30/PM15
Barium #M	32	64	56	44	71	50	77	28	36	58	<1	mg/kg	TM30/PM15
Beryllium	0.7	1.1	1.2	0.9	1.0	1.4	1.7	0.5	1.3	1.0	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	0.8	1.2	0.6	0.5	0.2	3.6	0.3	0.3	0.9	<0.1	mg/kg	TM30/PM15
Chromium #M	40.9	43.3	39.6	29.4	36.9	47.7	45.8	24.6	27.7	35.0	<0.5	mg/kg	TM30/PM15
Copper #M	18	20	19	24	24	26	19	13	20	19	<1	mg/kg	TM30/PM15
Lead #M	19	47	47	22	102	38	29	14	69	47	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #M	30.6	33.4	34.8	33.7	26.0	43.0	94.5	13.8	27.5	31.0	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	1	<1	<1	<1	1	<1	<1	1	<1	mg/kg	TM30/PM15
Vanadium	19	29	25	15	24	26	23	15	19	26	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.3	0.8	0.3	0.3	2.3	0.3	0.3	0.2	0.4	0.7	<0.1	mg/kg	TM74/PM32
Zinc #M	90	162	162	100	129	143	265	54	110	158	<5	mg/kg	TM30/PM15
VOC TICs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	5	<3	<3	<3	<3	<3	8	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	103	94	103	97	93	105	97	102	105	104	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	96	82	100	88	76	102	96	93	100	90	<0	%	TM15/PM10
SVOC TICs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH26	BH13	BH13	BH14	BH14	BH17	BH17	BH18	BH18	DUP03			
Depth	0.00-0.85	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	<38	<38	<38	<38	<38	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	ug/kg	TM83/PM10
Natural Moisture Content	7.8	13.1	14.9	6.6	27.1	13.1	21.7	10.7	12.7	13.0	<0.1	%	PM4/PM0
Bromide	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	40.9	43.3	39.6	29.4	36.9	47.7	45.8	24.6	27.7	35.0	<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones	stones, vegetation	stones	stones	stones	stones	stones	stones, vegetation	stones	stones, vegetation		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	DUP03	BH16	BH16	BH27	BH27	DUP04	DUP04						
Depth	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	25/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
Arsenic #M	12.0	8.1	1.7	11.8	20.3	6.8	2.6				<0.5	mg/kg	TM30/PM15
Barium #M	49	41	27	51	37	49	32				<1	mg/kg	TM30/PM15
Beryllium	1.3	0.6	<0.5	0.9	1.7	0.6	<0.5				<0.5	mg/kg	TM30/PM15
Cadmium #M	0.9	<0.1	0.3	0.4	0.6	<0.1	0.2				<0.1	mg/kg	TM30/PM15
Chromium #M	41.7	33.5	6.5	41.6	41.8	33.7	10.2				<0.5	mg/kg	TM30/PM15
Copper #M	17	12	3	20	27	11	6				<1	mg/kg	TM30/PM15
Lead #M	44	20	7	43	50	19	7				<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Nickel #M	39.0	13.5	3.5	30.9	55.9	13.2	6.1				<0.7	mg/kg	TM30/PM15
Selenium #M	1	<1	<1	<1	<1	<1	<1				<1	mg/kg	TM30/PM15
Vanadium	26	18	3	27	27	18	5				<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.2	0.5	0.2	0.4	0.2	0.4	0.2				<0.1	mg/kg	TM74/PM32
Zinc #M	167	48	20	123	247	42	28				<5	mg/kg	TM30/PM15
VOC TICs	ND	ND	ND	ND	ND	ND	ND					None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	103	96	77	56	103	96	104				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	91	81	74	51	99	84	100				<0	%	TM15/PM10
SVOC TICs	ND	See Attached	ND	ND	ND	ND	ND					None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	DUP03	BH16	BH16	BH27	BH27	DUP04	DUP04						
Depth	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	25/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	<38	<38				<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50	<50	<50	<50	<50	<50				<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50	<50	<50	<50	<50	<50				<50	ug/kg	TM83/PM10
Natural Moisture Content	16.4	10.6	2.9	12.1	14.1	10.9	4.0				<0.1	%	PM4/PM0
Bromide	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Chromium III	41.7	33.5	6.5	41.6	41.8	33.7	10.2				<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay					None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown					None	PM13/PM0
Other Items	stones, chalk	stones, chalk, vegetation	stones, sand	stones, vegetation	stones, chalk	stones, vegetation	stones					None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH26	BH13	BH13	BH14	BH14	BH17	BH17	BH18	BH18	DUP03			
Depth	0.00-0.85	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019			
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluorene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	<10	<10	<10	19	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pyrene #M	<10	<10	<10	<10	18	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Chrysene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10	<10	<10	34	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10	<10	<10	14	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10	<10	<10	17	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH26	BH13	BH13	BH14	BH14	BH17	BH17	BH18	BH18	DUP03			
Depth	0.00-0.85	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019			
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Carbazole	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	123	126	130	115	128	121	124	127	129	128	<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	123	123	122	120	126	118	121	126	128	126	<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	DUP03	BH16	BH16	BH27	BH27	DUP04	DUP04						
Depth	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	25/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	75	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Naphthalene	<10	21	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Fluorene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	34	<10	<10	<10	16	<10				<10	ug/kg	TM16/PM8
Anthracene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	<10	<10	24	<10	12	<10				<10	ug/kg	TM16/PM8
Pyrene #M	<10	<10	<10	24	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10	<10	43	<10	<10	<10				<10	ug/kg	TM16/PM8
Chrysene	<10	<10	<10	17	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10	<10	24	<10	16	<10				<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10	<10	15	<10	<10	<10				<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10	<10	17	<10	12	<10				<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51					
Sample ID	DUP03	BH16	BH16	BH27	BH27	DUP04	DUP04					
Depth	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00					
COC No / misc												
Containers	V J	V J	V J	V J	V J	V J	V J					
Sample Date	25/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019					
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay					
Batch Number	1	1	1	1	1	1	1					
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019					

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Carbazole	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	122	127	126	128	127	127	126				<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	121	124	127	123	126	125	125				<0	%	TM16/PM8

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

VOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH26	BH13	BH13	BH14	BH14	BH17	BH17	BH18	BH18	DUP03			
Depth	0.00-0.85	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019	25/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	5	<3	<3	<3	<3	<3	8	<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	103	94	103	97	93	105	97	102	105	104	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	96	82	100	88	76	102	96	93	100	90	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12278

VOC Report : **Solid**

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	DUP03	BH16	BH16	BH27	BH27	DUP04	DUP04						
Depth	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	25/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Chloromethane #	<3	4	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1				<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30				<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7				<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27				<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7				<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	103	96	77	56	103	96	104				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	91	81	74	51	99	84	100				<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Job number: 19/12278
Sample number: 36
Sample identity: BH16
Sample depth: 0.00-1.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
575-43-9	Naphthalene, 1,6-dimethyl-	8.401	87	227

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/12278						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/12278

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/12278

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes

EMT Job No: 19/12278

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 19/12278

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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AECOM
1st Floor, Montrose House
Carrigaline Road
Douglas
Cork
Ireland

Attention :	Edel O'Hannelly
Date :	6th August, 2019
Your reference :	PR-423449
Our reference :	Test Report 19/12362 Batch 1
Location :	Ringaskiddy
Date samples received :	31st July, 2019
Status :	Final report
Issue :	1

Seventeen samples were received for analysis on 31st July, 2019 of which seventeen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc
Senior Project Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH4	BH4	BH5	BH5	BH6	BH6	BH7	BH7	DUP05	DUP05			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019			
Arsenic #M	9.6	15.9	6.1	8.3	12.1	16.2	14.1	44.2	14.1	14.8	<0.5	mg/kg	TM30/PM15
Barium #M	35	39	35	40	27	32	34	57	40	34	<1	mg/kg	TM30/PM15
Beryllium	0.9	1.2	<0.5	0.8	1.0	1.1	1.0	1.9	1.1	1.1	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	0.3	0.5	0.7	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #M	38.2	46.8	23.8	21.7	29.0	37.1	52.0	47.1	49.6	61.5	<0.5	mg/kg	TM30/PM15
Copper #M	16	22	11	15	21	20	14	31	25	19	<1	mg/kg	TM30/PM15
Lead #M	21	41	81	31	23	58	31	56	26	40	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #M	32.3	39.7	12.8	22.8	35.1	39.1	34.4	34.8	36.0	41.3	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	1	<1	<1	1	1	1	1	1	1	<1	mg/kg	TM30/PM15
Vanadium	23	26	11	20	22	26	22	26	23	26	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	<0.1	mg/kg	TM74/PM32
Zinc #M	112	167	81	206	111	152	139	207	109	164	<5	mg/kg	TM30/PM15
VOC TICs	ND	See Attached	ND	ND	ND	ND	ND	ND	ND	ND		None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	5	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	16	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	14	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	99	88	99	105	103	97	103	107	107	107	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	102	81	92	99	98	94	99	103	102	102	<0	%	TM15/PM10
SVOC TICs	See Attached	See Attached	ND	ND	ND	ND	ND	ND	ND	ND		None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	15	<4	<4	<4	6	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	21	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	31	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	67	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH4	BH4	BH5	BH5	BH6	BH6	BH7	BH7	DUP05	DUP05			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	67	<38	<38	<38	<38	<38	<38	<38	<38	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	ug/kg	TM83/PM10
Natural Moisture Content	11.4	15.3	6.1	8.3	8.7	12.2	12.3	19.0	9.3	13.0	<0.1	%	PM4/PM0
Bromide	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	38.2	46.8	23.8	21.7	29.0	37.1	52.0	47.1	49.6	61.5	<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Light Brown	Medium Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown		None	PM13/PM0
Other Items	stones	stones	stones	stones	stones	stones	stones	stones	stones	stones		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	BH1	BH1	BH2	BH3	BH3	DUP06	DUP06						
Depth	0.00-1.00	1.00-2.00	0.50	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019						
Arsenic #M	17.4	39.9	7.0	8.8	19.6	10.3	14.6				<0.5	mg/kg	TM30/PM15
Barium #M	54	68	46	37	45	218	39				<1	mg/kg	TM30/PM15
Beryllium	1.2	1.8	0.8	0.9	1.7	0.9	1.3				<0.5	mg/kg	TM30/PM15
Cadmium #M	1.8	1.7	0.6	0.1	0.6	3.2	0.3				<0.1	mg/kg	TM30/PM15
Chromium #M	59.1	23.0	68.3	43.4	36.2	58.2	58.5				<0.5	mg/kg	TM30/PM15
Copper #M	29	42	43	19	27	23	23				<1	mg/kg	TM30/PM15
Lead #M	39	65	22	220	54	57	39				<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Nickel #M	43.0	67.5	236.3	33.7	55.0	49.2	47.8				<0.7	mg/kg	TM30/PM15
Selenium #M	<1	2	<1	<1	1	2	1				<1	mg/kg	TM30/PM15
Vanadium	21	25	13	21	30	23	26				<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.2	0.2	0.4	0.3	0.2	0.3	0.2				<0.1	mg/kg	TM74/PM32
Zinc #M	160	238	242	116	255	165	166				<5	mg/kg	TM30/PM15
VOC TICs	ND	ND	ND	ND	ND	ND	ND					None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	9	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	4	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	97	106	98	105	101	107	108				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	95	104	87	101	86	101	91				<0	%	TM15/PM10
SVOC TICs	ND	ND	ND	ND	ND	ND	ND					None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	<7	<7	57	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	57	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	BH1	BH1	BH2	BH3	BH3	DUP06	DUP06						
Depth	0.00-1.00	1.00-2.00	0.50	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019						
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	105	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	105	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	162	<38	<38	<38	<38				<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Alcohols/Acetates													
Cyclohexane	<50	<50	<50	<50	<50	<50	<50				<50	ug/kg	TM83/PM10
Tetrahydrofuran	<50	<50	<50	<50	<50	<50	<50				<50	ug/kg	TM83/PM10
Natural Moisture Content	9.6	14.1	9.6	7.7	15.1	9.0	13.6				<0.1	%	PM4/PM0
Bromide	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM27/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Chromium III	59.1	23.0	68.3	43.4	36.2	58.2	58.5				<0.5	mg/kg	NONE/NONE
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay					None	PM13/PM0
Sample Colour	Light Brown	Medium Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown					None	PM13/PM0
Other Items	stones	stones	stones, sand	stones	stones	stones	stones					None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH4	BH4	BH5	BH5	BH6	BH6	BH7	BH7	DUP05	DUP05			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019			
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	25	459	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Naphthalene	<10	47	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluorene	<10	53	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phenanthrene #M	11	114	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Pyrene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Chrysene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

SVOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH4	BH4	BH5	BH5	BH6	BH6	BH7	BH7	DUP05	DUP05			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019			
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Carbazole	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	115	109	111	106	118	108	123	124	126	114	<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	119	126	115	114	121	111	116	114	113	112	<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	BH1	BH1	BH2	BH3	BH3	DUP06	DUP06						
Depth	0.00-1.00	1.00-2.00	0.50	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019						
SVOC MS													
Phenols													
2-Chlorophenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phenol #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Naphthalene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Acenaphthylene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Acenaphthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Fluorene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phenanthrene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Anthracene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Fluoranthene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Pyrene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Chrysene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	1475	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<100	<100	<100	<100	<100	<100	<100				<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

SVOC Report : **Solid**

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	BH1	BH1	BH2	BH3	BH3	DUP06	DUP06						
Depth	0.00-1.00	1.00-2.00	0.50	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019						
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Carbazole	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Dibenzofuran #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Isophorone #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Nitrobenzene #M	<10	<10	<10	<10	<10	<10	<10				<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	117	110	115	114	111	110	112				<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	118	111	116	113	111	110	116				<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

VOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	BH4	BH4	BH5	BH5	BH6	BH6	BH7	BH7	DUP05	DUP05			
Depth	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019	29/07/2019			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	5	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	16	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
o-Xylene #	<3	14	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	6	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Propylbenzene #	<4	18	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	32	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	253	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	18	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	28	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	36	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Naphthalene	<27	73	<27	<27	<27	<27	<27	<27	<27	<27	<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	99	88	99	105	103	97	103	107	107	107	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	102	81	92	99	98	94	99	103	102	102	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly
EMT Job No: 19/12362

VOC Report : **Solid**

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51				LOD/LOR	Units	Method No.
Sample ID	BH1	BH1	BH2	BH3	BH3	DUP06	DUP06						
Depth	0.00-1.00	1.00-2.00	0.50	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00						
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J						
Sample Date	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019	30/07/2019						
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019	31/07/2019						
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1				<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	<30				<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	9	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	4	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2				<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3				<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6				<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7				<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4				<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27				<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7				<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	97	106	98	105	101	107	108				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	95	104	87	101	86	101	91				<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Job number: 19/12362
Sample number: 4
Sample identity: BH4
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
1120-21-4	Undecane	7.219	94	345
1074-55-1	Benzene, 1-methyl-4-propyl-	7.285	90	135
2870-04-4	Benzene, 2-ethyl-1,3-dimethyl-	7.337	93	229
934-80-5	Benzene, 4-ethyl-1,2-dimethyl-	7.379 - 7.540	95,95	331
7045-71-8	Undecane, 2-methyl-	7.584	83	148
112-40-3	Dodecane	7.780	96	831
527-84-4	o-Cymene	7.835	95	278
6117-97-1	Dodecane, 4-methyl-	8.094	87	196
294-62-2	Cyclododecane	8.117	86	216

Job number: 19/12362
Sample number: 3
Sample identity: BH4
Sample depth: 0.00-1.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
629-59-4	Tetradecane	8.424	89	352
629-62-9	Pentadecane	9.003	83	408
112-95-8	Eicosane	10.042	90	349

All solid results are expressed on a dry weight basis unless stated otherwise.

Job number: 19/12362
Sample number: 6
Sample identity: BH4
Sample depth: 1.00-2.00
Sample Type: Clay
Units: ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
1120-21-4	Undecane	6.246	87	852
112-40-3	Dodecane	7.072	93	3242
6117-97-1	Dodecane, 4-methyl-	7.513	89	543
629-50-5	Tridecane	7.787 - 10.042	91,96	11533
26730-12-1	Tridecane, 4-methyl-	8.179	93	1212
6418-41-3	Tridecane, 3-methyl-	8.251	93	713
638-36-8	Hexadecane, 2,6,10,14-tetramethyl-	8.297 - 10.588	87,93,94	4649
629-59-4	Tetradecane	8.424 - 10.273	81,97	7533
575-37-1	Naphthalene, 1,7-dimethyl-	8.481	97	1085
629-62-9	Pentadecane	9.003	96	7568
544-76-3	Hexadecane	9.546 - 12.246	95,96,96	9503
17312-53-7	Decane, 3,6-dimethyl-	9.808	86	1314
25117-26-4	Hexadecane, 4-methyl-	9.847	80	998
13187-99-0	2-Bromo dodecane	9.873	83	557
3031-15-0	Naphthalene, 1,2,3,4-tetramethyl-	9.976	87	851
593-45-3	Octadecane	10.523 - 12.693	97,97	5608
16587-52-3	Dibenzothiophene, 3-methyl-	10.758	95	847
31317-07-4	1-Methyldibenzothiophene	10.849	92	954
629-92-5	Nonadecane	10.967	97	3881
112-95-8	Eicosane	11.163	86	619
1136-85-2	3,7-Dimethyldibenzothiophene	11.215 - 11.307	98,99	1291
1207-12-1	Dibenzothiophene, 4,6-dimethyl-	11.385	90	1207
18435-45-5	1-Nonadecene	12.212	96	315

Client Name: AECOM
Reference: PR-423449
Location: Ringaskiddy
Contact: Edel O'Hannelly

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/12362						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/12362

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 19/12362

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes

EMT Job No: 19/12362

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
TM83	Modified USEPA method 8260. Determination of Alcohols, Acetates, Acetone, Fuel Oxygenates, THF and Cyclohexane by Headspace GC-MS	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

EMT Job No: 19/12362

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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